Matrox Iris GT with Design Assistant

Installation and Technical Reference

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Chapter

1

Before you begin

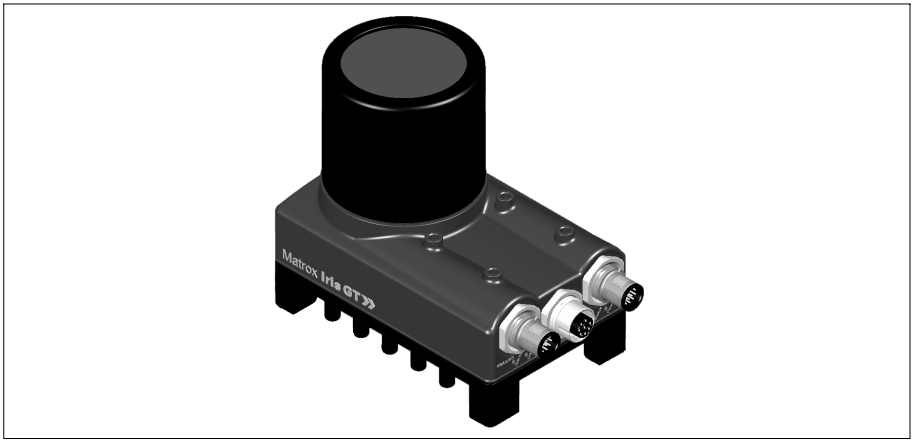
This chapter describes the features of your Matrox Iris GT with Design Assistant, lists the various smart camera models available, describes the software required to develop your imaging applications, outlines documentation conventions, provides an overview of this manual, and specifies where to find further support.

Introduction

The Matrox Iris GT with Design Assistant combines the integration of a conventional smart camera with the flexibility of a traditional PC-based machine vision system. Matrox Iris GT is a fully programmable device, allowing extensive customization.

In addition, this powerful smart camera comes with an intuitive, flowchart-based, integrated development environment (IDE) called Matrox Design Assistant. Systems integrators and professional end-users can easily and quickly develop and deploy machine vision applications on a highly integrated platform without the need for traditional programming skills. The integrated development environment provides access to a comprehensive set of highly-efficient and field-proven image analysis and measurement tools.

Matrox Iris GT features an Intel-architecture processor and Microsoft Windows CE, a real-time operating system. Matrox Iris GT uses an interline transfer, progressive scan, CCD image sensor with square pixels. The sensor provides an externally triggered electronic shutter.



Matrox Iris GT is fully integrated in an IP67 enclosure, eliminating the need to separately source a sealed camera housing, while still providing easy access to the lens.

The Intel-architecture processor is an Intel Atom 1.6 GHz processor with an Intel SCH companion interface bridge. The 2-Gbyte flash disk provides in-camera (on-board) storage for both the operating system and additional data. The 512 Mbytes of DDR2 memory provide in-camera (on-board) volatile storage.

Matrox Iris GT can connect to an analog RGB display device, and can communicate with other devices through the Ethernet (100/1000 BaseT), RS-232 serial port, VGA/USB port, and user-defined digital I/O signals.

Models available

There are seven models available in the Matrox Iris GT family of products.

Matrox Iris GT feature	**GT300**	**GT300C**	**GT1200**	**GT1200C**	**GT1900**	**GT1900C**	**GT5000**
Sensor chip type	Diagonal 6 mm (1/3"-type)		Diagonal 6 mm (1/3"-type)		Diagonal 8.9 mm (1/ 1.8"-type)		Diagonal 10.9 mm (2/3"-type)
Effective resolution	640x480		1280x960		1600x1200		2448x2058
Color / Monochrome	Monochrome	Color	Monochrome	Color	Monochrome	Color	Monochrome
Frame rate	Up to 110 fps		Up to 22.5 fps		Up to 15 fps		Up to 15 fps

Matrox Starter Kit and connection modules

To start developing your application quickly, you can purchase the Matrox Starter Kit. The kit includes a simple lens, cables, and the Matrox breakout board. The Matrox breakout board is a connection module that allows you to test the I/O auxiliary signals and power your camera easily. Note that you can also purchase the lens, cables, and connection module separately.

To install your Matrox Iris GT in an industrial environment, you can purchase the Matrox Breakout Box module. This module is a DIN-rail mountable connection module that allows you to power your camera and opto-isolate input and output signals with separate G4 Opto-22 standard I/O modules.
Matrox Breakout Box is better suited for installation in an industrial panel than the Matrox breakout board.

❖ Note that you can also purchase a 3rd-party connection module. For more information, refer to the *Available separately* subsection of the *Inspecting your Matrox Iris GT with Design Assistant package* section, later in this chapter.

This manual discusses using the Matrox Iris GT with the Matrox breakout board; for information on how to use it with the Matrox Breakout Box module, refer to the *Matrox Breakout Box Installation and Technical Reference* manual.

Inspecting your Matrox Iris GT with Design Assistant package

You should check the contents of your Matrox Iris GT with Design Assistant package when you first open it. If something is missing or damaged, contact your Matrox representative.

Base package

If you have purchased Matrox Iris GT with Design Assistant, your package should include the following:

- Matrox Iris GT smart camera.
- A quick start guide.
- Matrox Design Assistant DVD.

❖ Note that your Matrox Iris GT base package does not include any cables, a power supply, or a manual iris lens. To purchase these items, refer to the Matrox Iris GT starter kit, described later in this section, or contact a Matrox sales representative.

Matrox Iris GT starter kit

The Matrox Iris GT starter kit includes the following:

- Power supply.
- 100/1000 BaseT Ethernet cable with an M12 8-pin (male) connector on one end and an RJ-45 registered jack on the other. This cable is meant to connect your Matrox Iris GT to another computer or network device.
- Digital I/O and power cable with an M12 17-pin (female) connector on one end and open ended wires on the other. This cable is meant to connect your Matrox Iris GT to power and third-party digital I/O devices.

- VGA/USB cable with an M12 12-pin (female) connector on one end and a HD-15 (female) connector and a USB connector on the other end. This cable is meant to connect your Matrox Iris GT to a display device and a USB device (such as, a keyboard or mouse).

- Matrox breakout board.

- One C-mount 12 mm lens.

Handling precautions

The lens of Matrox Iris GT is a sensitive device. It should never be touched directly. Always cover the lens if the smart camera is not in use to reduce dust buildup.

If dust accumulates on the lens, use either a can of compressed air or a lens cloth to remove the dust.

Available separately

You might have also ordered one or more of the following cables:

- GT-CBL-PWR/3*, an open-wire digital I/O and power cable. On one end is an M12 17-pin (female) connector. The other end consists of 17 separately-colored wires. For more details about this cable, refer to the *Digital I/O and power connector* subsection of the *Matrox Iris GT connectors* section, in *Appendix B: Technical Reference*. This cable is meant to connect your Matrox Iris GT to your Matrox Breakout board, or to obtain power and to connect with third-party digital I/O devices.

- GT-CBL-PWRDB25*, a digital I/O and power cable. On one end is an M12 17-pin (female) connector and a DB-25 connector on the other. This cable is meant to connect your Matrox Iris GT to your Matrox Breakout Box.

- GT-CBL-ETH/5*, a 100/1000 BaseT cable with an M12 8-pin (male) connector on one end and an RJ-45 registered jack on the other. For more details about this cable, refer to the *100/1000 BaseT connector* subsection of the *Matrox Iris GT connectors* section, in *Appendix B: Technical Reference*. This cable is meant to connect your Matrox Iris GT to another computer or network device.

- GT-CBL-VGAUSB*, a VGA and USB cable with an M12 12-pin (female) connector on one end and a HD-15 (female) connector and a USB connector on the other end. For more details about this cable, refer to *VGA/USB connector* subsection of the *Matrox Iris GT connectors* section, in *Appendix B: Technical Reference*. This cable is meant to connect your Matrox Iris GT to a display device and a USB device (such as, a keyboard or mouse).

- BREAKOUT-BOX* (Matrox Breakout Box), a DIN-rail mountable connection module that connects the digital I/O and power cable of your Matrox Iris GT to third-party devices. Your Matrox Breakout Box also connects to a serial cable, allowing you to view the RS-232 (serial) signal information of your Matrox Iris GT (transmitted over the digital I/O and power cable) through a terminal emulation program. Matrox Iris GT I/O signals can be routed either through standard wire terminals or through opto-isolated paired wire terminals. Each pair of opto-isolated wire terminals has a separate connector for a G4 Opto-22 standard I/O module; these modules provide high noise rejection, the ability to safely connect high voltage equipment (either AC or DC) to your Matrox Iris GT, and transient free “clean” switching. This product ships with an M12 to DB-25 cable that has an M12 17-pin connector on one end and a DB-25 connector on the other.

- GT-IPCAP*, a replacement glass lens cap.

- GT-IPCAP-P*, a replacement polycarbonate lens cap.

The following products are available from Phoenix Contact GmbH & Co. KG:

- VIP-3/SC/D25SUB/F (2315188) (The VIP-3/SC/D25SUB/F VARIOFACE module), a DIN-rail mountable connection module. It is similar to the BREAKOUT-BOX* connection module, described previously, but lacks the serial connection and the compatibility with G4 Opto-22 standard I/O modules. The VIP-3/SC/D25SUB/F VARIOFACE module does not ship with a cable. This module is described in detail in *Appendix E: Connection modules*.

- DFLK-D25 SUB/B (2280323) (The DFLK-D25 SUB/B VARIOFACE module), a rack-mountable connection module. It is similar to the VARIOFACE module with screw connection, described earlier, but is smaller and is not DIN-rail mountable. The DFLK-D25 SUB/B VARIOFACE module does not ship with a cable. This module is described in detail in *Appendix E: Connection modules*.

Software overview

Matrox Iris GT comes with the Matrox Iris portal website installed. The Matrox Iris portal website consists of a series of pages through which you can configure your Matrox Iris GT, find other smart cameras on your network, update the firmware, manage Matrox Design Assistant projects, and handle licensing information.

The Matrox Iris GT with Design Assistant package is also distributed with Matrox Design Assistant, a flowchart-based, Windows program that integrates a development environment for Matrox Iris GT smart cameras. It allows you to create an imaging application without writing a single line of code. Application development is visually a step-by-step approach, where each step is taken from an existing toolbox and is configured through a series of dialog windows. Matrox Design Assistant runs on your development computer and uses the resources of your Matrox Iris GT smart camera (for example, to grab an image and communicate with connected devices) to build projects. Once the project is built, it runs on your Matrox Iris GT without relying on the resources of your development computer.

With Matrox Design Assistant, you can:

- Create your project as a series of steps using a flowchart.
- Test your project from your computer without any additional code editors or compilers and without deploying (copying and running) your project on your Matrox Iris GT.
- Design and layout a web page (operator view) to receive operator input and to display your project's output.
- Run, terminate, and re-run the project on your Matrox Iris GT from within Matrox Design Assistant.

Imaging projects can:

- Grab images from your Matrox Iris GT or use images from disk.
- Analyze images using several industry-proven image analysis and measurement tools (for example, code reader and geometric model finder tools).
- Send and receive user-defined signals from the I/O port of your Matrox Iris GT.
- Send and receive information from the serial port of your Matrox Iris GT.
- Send and receive information and save images across the network using TCP/IP, Modbus, or Ethernet/IP protocols.

Documentation conventions

Your Matrox Iris GT is a network-aware device. The terminology used throughout this document mirrors that of local area networks (LANs).

In this document, any computer that can communicate with your Matrox Iris GT is referred to as "your computer". If you use your computer to develop your applications for your Matrox Iris GT, it is referred to as your development computer.

References to the submenu items of the **Windows Start** menu refer to the folders listed beneath the **All programs** menu of Microsoft Windows.

The procedure to select a menu command from a submenu uses a simplified format. For example, the following procedure:

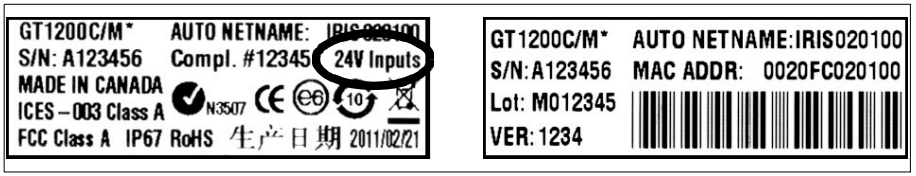
> Select the **Edit** menu command from the main menu, and then select the **Copy** menu command from the presented submenu.

will be replaced by:

> Select the **Edit Copy** menu command.

Differentiating between versions of your Matrox Iris GT

Matrox Iris GT was modified in March 2011 so that it now accepts 24 V auxiliary input signals without additional resistors. You can identify this new version of the smart camera by the phrase *24V Inputs* on a sticker at the back of your Matrox Iris GT. Both stickers on your smart camera are depicted below:



If the sticker does not list *24V Inputs*, you have a Matrox Iris GT smart camera that accepts 5 V auxiliary input signals. Information pertaining to the 5 V input version is available in *Appendix K: Using a version of Matrox Iris GT that accepts 5 V auxiliary input signals*. In all other cases, this manual assumes you have a Matrox Iris GT smart camera that accepts 24 V auxiliary input signals.

Installing Matrox Design Assistant

This section list the minimum requirements for your computer so that you can use your Matrox Iris GT with Design Assistant, and access the Matrox Iris portal website. This section also describes Matrox Design Assistant installation details.

Minimum requirements to use Matrox Iris GT

The following lists the minimum requirements for your computer so that you can use your Matrox Iris GT smart camera:

- Matrox Design Assistant.
- A 100/1000 Mbits (sometimes referred to as 100/1000 BaseT) Ethernet port with an RJ45 connector, installed and functioning Ethernet drivers, and a configured TCP/IP communication network protocol.
- Matrox Iris GT 100/1000 BaseT M12 8-pin to RJ-45 cable.
- Matrox Iris GT digital I/O and power cable, plus a power supply.
- An optional VGA/USB cable.

Minimum requirements to install Matrox Design Assistant

The following lists the minimum requirements for your computer so that you can use Matrox Design Assistant on your computer.

- Microsoft Windows 7 (32/64 bit), Windows Vista (32 bit) or Windows XP SP3 (32 bit).
- A DVD reader.
- Up to 450 Mbytes of free hard disk space to install Matrox Design Assistant.
  - ❖ Note that less space might be required if Microsoft .NET Framework files are already installed on your computer.
- Microsoft Internet Explorer version 7 or above.
- Administrator privileges on your computer.
- A display board compatible with DirectX 9 (Pixel Shader 1.4 or higher) is required to use the operator view.

Minimum requirements to manage projects and configure your Matrox Iris GT

To manage projects and configure your Matrox Iris GT using the Matrox Iris portal website, the following ActiveX settings must be set to either **Prompt** or **Enable** on your computer in Microsoft Internet Explorer:

- Download signed ActiveX controls.
- Run ActiveX controls and plug-ins.
- Script ActiveX controls marked safe for scripting.
- Initialize and script ActiveX controls not marked as safe. Note that, for this setting, we recommend you set this to **Prompt** rather than **Enable**.

Installing Matrox Design Assistant

To install Matrox Design Assistant on your computer, place your Matrox Design Assistant DVD into an appropriate drive. The setup.exe program will run automatically. Note that to install Matrox Design Assistant, you must have administration privileges.

During installation, you will be asked a number of questions, such as:

- Whether you agree or do not agree to the license agreement. Note that if you reject the license agreement, the installation will stop.[1]
- The drive and directory on which to install the program.
  - ❖ Note that if another Matrox Imaging product (such as MIL) is installed on your computer, Matrox Design Assistant installs in the same Imaging folder.
- Whether you also require the previous version of Matrox Design Assistant to support projects designed with that version of the software.
  - ❖ Note that projects can be upgraded to a newer version of Matrox Design Assistant, but projects cannot be downgraded to an earlier version.
- Whether you want to add custom step development templates to your copy of Visual Studio.

For the latest information on Matrox Design Assistant, refer to the *Readme* section of the *Matrox Design Assistant user guide*.

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1. You are required to follow the *Quick Start Guide* to access and legally use Matrox and other related software licenses. In the event that you use Matrox and other related software without following the *Quick Start Guide* or without agreeing to the said license terms, and you click on the **I AGREE** button, you will be deemed to have refused the terms of said licenses, as if you have clicked on the **I DO NOT AGREE** button. In such a case, please return Matrox hardware and related software to your seller at your cost.

Manual overview

The installation procedure is explained in the *Quick Start Guide*. This manual is provided for additional information and instruction in maintenance tasks, utilities, and technical information for your Matrox Iris GT.

For information on connecting the LAN and power cables to your Matrox Iris GT, refer to *Chapter 2: Powering and connecting to your Matrox Iris GT*.

For information on communicating with your Matrox Iris GT, refer to *Chapter 3: Configuring your Matrox Iris GT to work on a network* and *Chapter 4: Configuring your Matrox Iris GT to work with your computer directly*.

To determine how to use Microsoft Internet Explorer, Microsoft Windows Explorer, FTP, and telnet to access your Matrox Iris GT, refer to *Chapter 5: Accessing Matrox Iris GT*.

For a summary of the key features of Matrox Iris GT, and pinout descriptions for external connectors of your Matrox Iris GT, refer to *Appendix B: Technical Reference*.

To select a lens, refer to *Appendix C: Selecting a lens*.

To determine how to connect devices to the digital I/O and power connector of your Matrox Iris GT, refer to *Appendix D: Using the I/O signals and controlled-current output of Matrox Iris GT*.

To determine how to use the Matrox breakout board, refer to *Appendix F: The Matrox breakout board*. Additional connection modules are described in *Appendix E: Connection modules*.

To read the LEDs, refer to *Reading the state of your Matrox Iris GT* section, in *Chapter 2: Powering and connecting to your Matrox Iris GT* and *Appendix J: Reading the LEDs*.

To determine how to use the Matrox Iris GT utilities, refer to *Appendix G: Matrox Iris GT utilities*.

To determine more about the Matrox Iris portal website, refer to *Appendix H: Matrox Iris portal website details*.

To determine more about the 5 V Input version of Matrox Iris GT, refer to *Appendix K: Using a version of Matrox Iris GT that accepts 5 V auxiliary input signals*.

Need help?

To deal with the most commonly-occurring problems when trying to connect to your Matrox Iris GT, refer to *Appendix I: Troubleshooting*.

Additional help can be found on the support page of the Matrox Imaging website: **http://www.matrox.com/imaging/support**. This page provides answers to frequently asked questions, as well as offers registered customers additional ways of obtaining support.

If your question is not addressed and you are registered, you can contact technical support. To do so, you should first complete the steps described in the *Before calling technical support* section, in *Appendix I: Troubleshooting*. Then complete and submit the online Technical Support Request Form using the gathered information, accessible from the above-mentioned page. Once the information is submitted, a Matrox support agent will contact you shortly thereafter by email or phone, depending on the problem.

Chapter

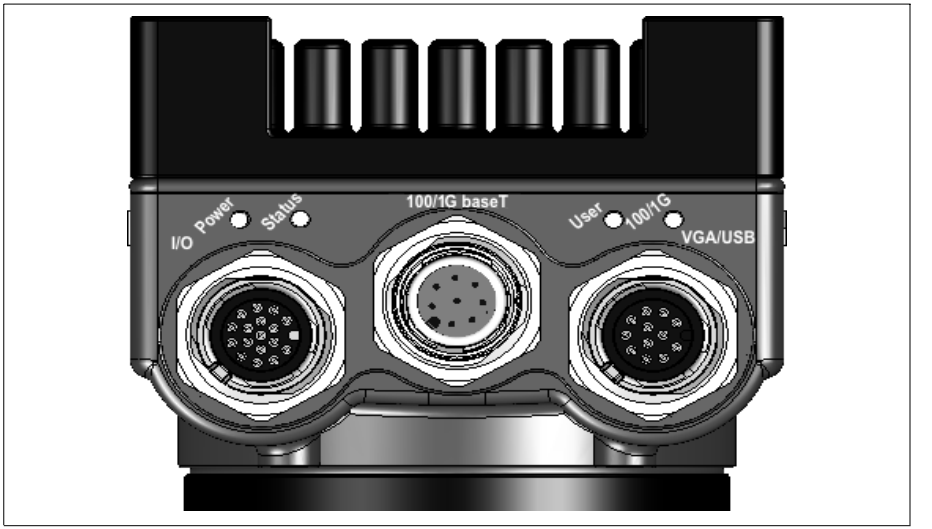
2

Powering and connecting to your Matrox Iris GT

This chapter guides you through powering your Matrox Iris GT, connecting it to another device, and reading the LEDs.

Powering and connecting to your Matrox Iris GT

The Matrox Iris GT has the following interfaces:



- **Digital I/O and power connector.** Used to receive power from an external power source. The connector can also send/receive RS-232 (input/output), trigger (input), strobe (output), controlled-current output, and general user-defined I/O signals to/from third-party I/O devices.

- **100/1000 BaseT connector.** Provides connectivity between your Matrox Iris GT and your computer or your network. Matrox Iris GT can gain access to a LAN via Gbit Ethernet (GigE, 1G BaseT, or 1000BaseT), fast Ethernet (100BaseT), or twisted pair Ethernet (10BaseT).

- **VGA/USB connector.** Provides connectivity between your Matrox Iris GT and a display device and/or USB device (such as a keyboard or a mouse).

  If you have not purchased the Matrox Iris GT starter kit, refer to the *Matrox Iris GT connectors* section, in *Appendix B: Technical Reference* for the pinout of your Matrox Iris GT's connectors and for part/cable purchasing information.

To use your Matrox Iris GT, perform the following:

1. Connect a power supply and your third-party I/O devices to the digital I/O and power connector of your Matrox Iris GT.

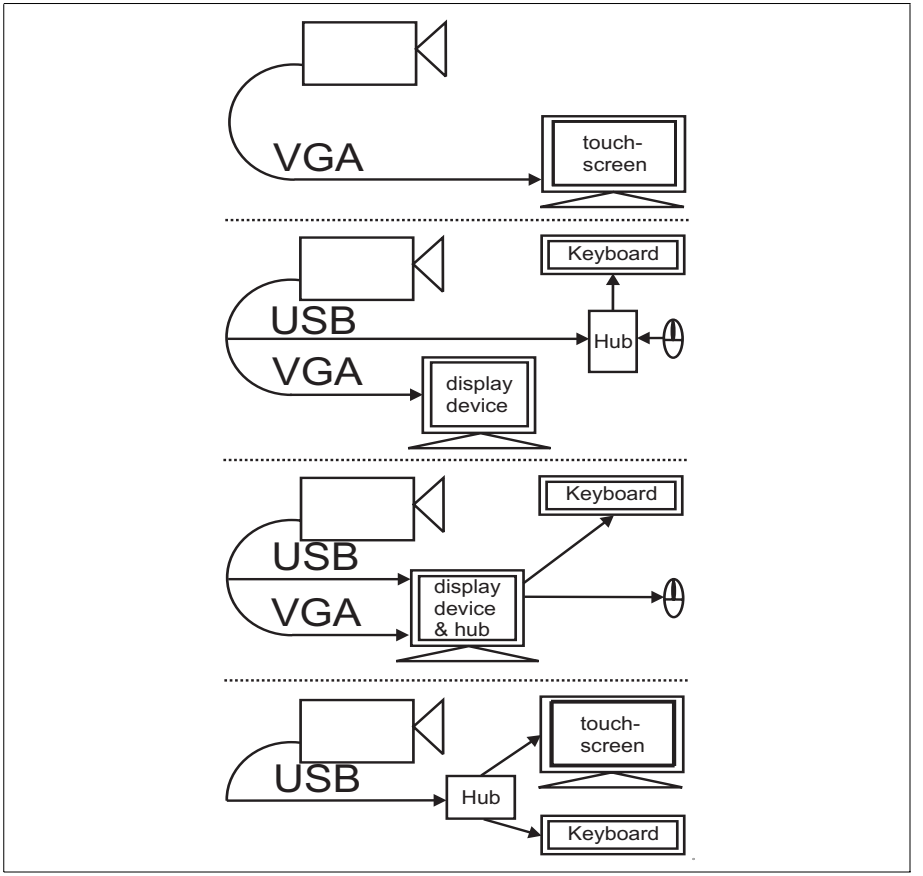
   If you have purchased the Matrox Iris GT starter kit, use the open-ended digital I/O and power cable and the Matrox breakout board, included in the kit, to make the connections. For instructions, refer to the *Powering and connecting to your Matrox Iris GT* section, in *Appendix F: The Matrox breakout board*.

   If you have not purchased the Matrox Iris GT starter kit, the Matrox Breakout Box module, the GT-CBL-PWRDB25* cable, or the GT-CBL-PWR/3* cable from Matrox, use a custom cable with an M12 17-pin connector. For the pinout and a description of the digital I/O and power connector, refer to the *Digital I/O and power connector* subsection of the *Matrox Iris GT connectors* section, in *Appendix B: Technical Reference*.

2. Connect your display device and USB device to the VGA/USB connector of your Matrox Iris GT. Use the optional GT-CBL-VGAUSB* cable, or if you have purchased the Matrox Iris GT starter kit, use the VGA/USB cable included in the kit. If you have not purchased either of these, you can acquire a similar cable using the information in the *VGA/USB connector* subsection of the *Matrox Iris GT connectors* section, in *Appendix B: Technical Reference*.

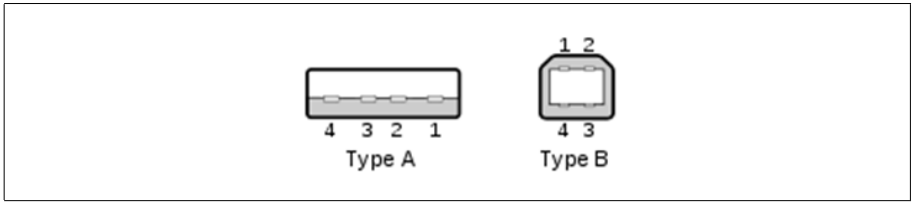
   There are multiple ways to connect devices to the VGA/USB cable. If connecting to a display device that has a VGA connector available, we recommend using it. To connect your Matrox Iris GT to a display device and one or more input devices (such as a keyboard and mouse), connect a USB hub to the USB connector of

your VGA/USB cable. Once the hub is connected, connect your keyboard and mouse to the hub. Note that, in some cases, your display device can also act as a USB hub.



❖ Note that if you are using a Matrox VGA/USB cable, the cable has a type A USB connector.

If connecting your VGA/USB cable to a device requiring a type B connector (such as some touch-screen monitors), use a type A to type B USB cable to connect your VGA/USB cable to your device.



3. Connect your network or your computer (peer-to-peer) to the standard network M12 8-pin connector of your Matrox Iris GT. Use the optional Matrox GT-CBL-ETH/5* cable or, if you have purchased the Matrox Iris GT starter kit, use the standard network cable included in the kit. If you have not purchased either of these, you will have to purchase one from a third-party.

   Connect the M12 connector of the network cable to the 100/1000 BaseT connector of your Matrox Iris GT. Connect the RJ45 connector of the cable to the network connector of your network/computer.

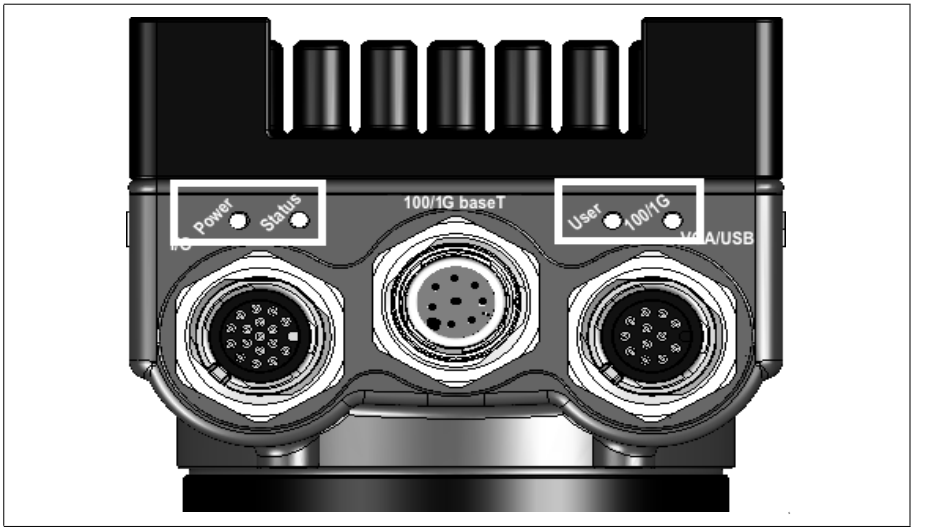
4. After making the network connection, you might need to configure your Matrox Iris GT so that it can communicate with your network or computer.

   If you connected your Matrox Iris GT to your network, refer to *Chapter 3: Configuring your Matrox Iris GT to work on a network*.

   If you connected your Matrox Iris GT directly to your computer, refer to *Chapter 4: Configuring your Matrox Iris GT to work with your computer directly*.

Reading the state of your Matrox Iris GT

From the moment you power up your Matrox Iris GT to the moment you power it down, at least one of the four light-emitting diodes (LEDs) at the back of Matrox Iris GT should be lit.



The LEDs on your Matrox Iris GT are:

- **Power LED and User LED**. The colors of these two LEDs change as your Matrox Iris GT boots.
- **100/1G LED**. This LED shows the connection status of your Matrox Iris GT.
- **Status LED**. This LED shows the general activity of your Matrox Iris GT.

Once the boot process is complete, the Power and User LEDs typically display one of the following sets of colors:

LED Color		**Description**
Power	**User**	
Off	Off	Matrox Iris GT has no power.
Red	Red	An error has occurred. Refer to *Appendix J: Reading the LEDs* for more information.
Green	Off	Your Matrox Iris GT is configured in static IP mode.
Green	Green	Your Matrox Iris GT is configured in DHCP mode.
Blinking green to red	Off	An error has occurred. Refer to *Appendix J: Reading the LEDs* for more information.

For a complete list of the LED states, refer to *Appendix J: Reading the LEDs*.

Chapter

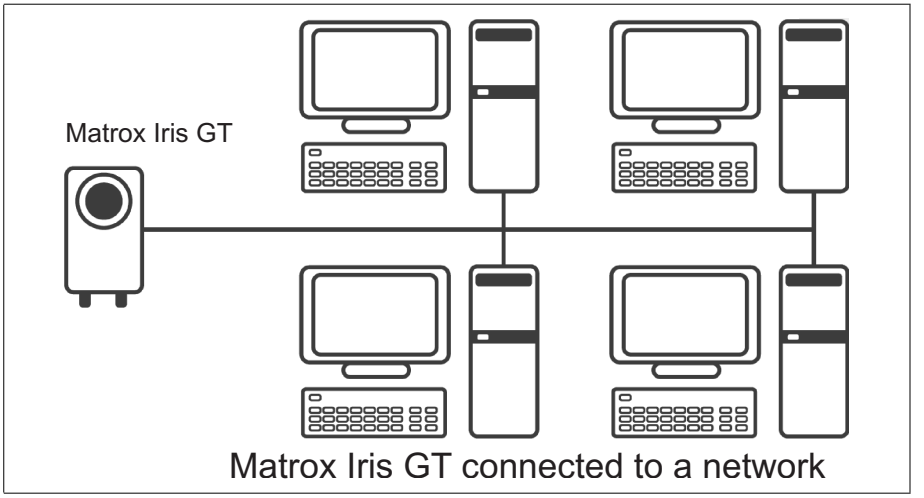
3

Configuring your Matrox Iris GT to work on a network

This chapter guides you through configuring your Matrox Iris GT to communicate with a network.

Network configuration overview

This chapter details how to configure your Matrox Iris GT if it is connected to a network. If your Matrox Iris GT is directly connected to your computer, refer to *Chapter 4: Configuring your Matrox Iris GT to work with your computer directly*.



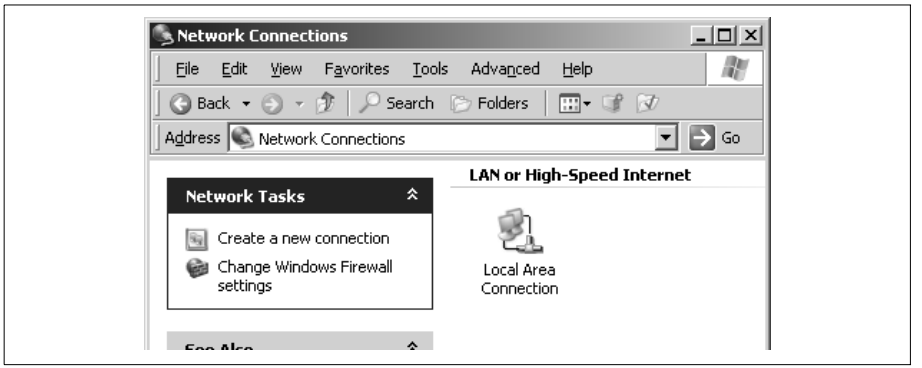
Matrox Iris GT connected to a network

The amount of configuration required to connect your Matrox Iris GT to a network depends on whether your network uses automatically assigned IP addresses from a DHCP server, or uses static IP addresses. Matrox Iris GT is factory-configured to receive an IP address from a DHCP server on your network. If your Matrox Iris GT is still in its factory-configured state, and your network uses a DHCP server, no configuration should be required to use your Matrox Iris GT on your network.

Determining whether your network uses DHCP

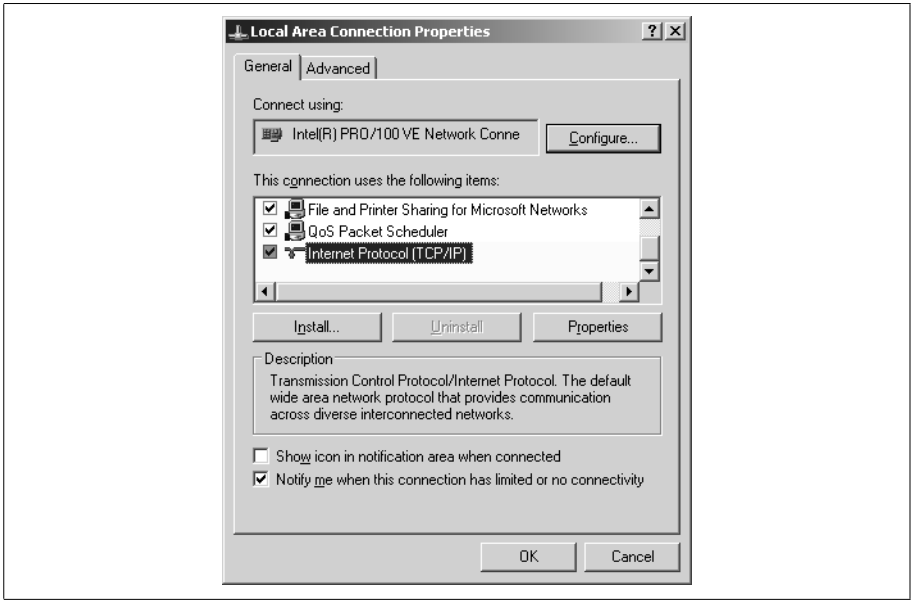
To determine whether your network uses a static IP address or DHCP, check the configuration of your computer by performing the following:

1. Open the **Windows Control Panel** and double-click on the **Network Connections** icon. The **Network Connections** dialog box opens.

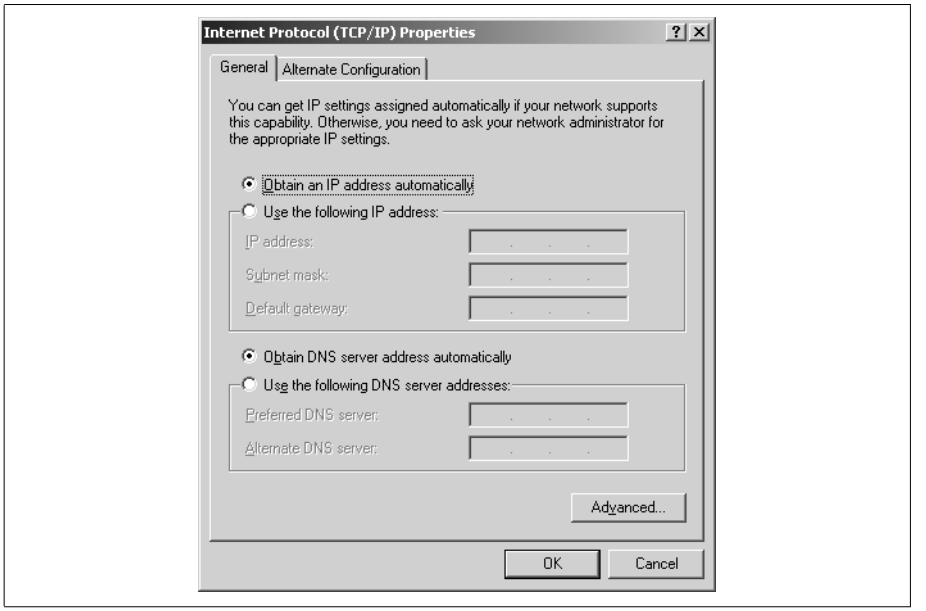


If you have more than one active Local area connection, or an active wireless connection, you might experience a problem with Matrox Design Assistant connecting to your Matrox Iris GT. If this occurs, refer to the *Appendix I: Troubleshooting*.

2. Right-click on the **Local Area Connection** icon to display the context menu. Select the **Properties** command. The **Local Area Connection Properties** dialog box opens.



3. Select **Internet Protocol** (**TCP/IP**) from the **This connection uses the following items** list box, and click on the **Properties** button. The **Internet Protocol** (**TCP/IP**) **Properties** dialog box opens.



If **Obtain an IP address automatically** is selected, your computer uses an automatically assigned IP address (DHCP). In this case, refer to the *Configuring your Matrox Iris GT to work with a network that uses DHCP* section.

If, however, **Use the following IP address** is selected, your computer uses a static IP address. Refer to the *Configuring your Matrox Iris GT to work with a network that uses static IP addresses* section.

Configuring your Matrox Iris GT to work with a network that uses DHCP

To configure your Matrox Iris GT to work with a network that uses DHCP, start by verifying that the default settings of your Matrox Iris GT have not changed. Your Matrox Iris GT is configured to use DHCP by default.

Check the LEDs of your Matrox Iris GT. If the power and user LEDs are both green, your Matrox Iris GT is configured for DHCP. You should be able to access the camera by name, using Microsoft Internet Explorer:

```
http://IrisName
```

If, however, the power LED is green and the user LED is off, your Matrox Iris GT uses a static IP address. In this case, you will need to configure your Matrox Iris GT to use DHCP; to do so, proceed to the next subsection.

How to configure your Matrox Iris GT for DHCP

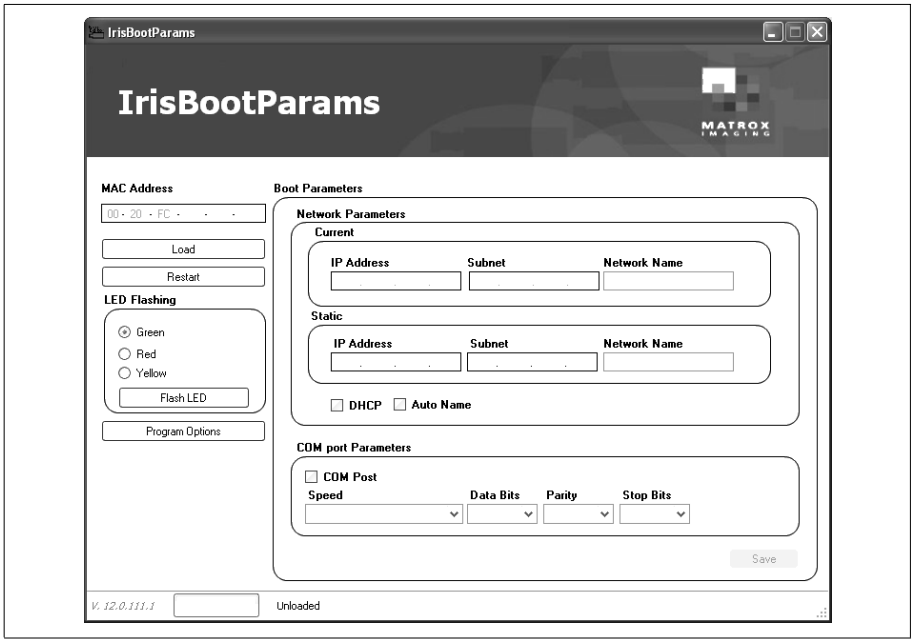
To configure your Matrox Iris GT so that it will obtain an IP address automatically (that is, use DHCP), use the Matrox IrisBootParams utility, and perform the following:

1. Disconnect your Matrox Iris GT 100/1000 BaseT cable from your network.

2. Connect your Matrox Iris GT 100/1000 BaseT cable directly to your computer.

3. On your computer, launch the Matrox IrisBootParams utility. From the **Matrox Imaging** submenu of the **Windows Start** menu, select **Design Assistant X.X for Iris GT**, where *X.X* represents the current release number. From the presented submenu, select **Tools**, and then click on **Iris Network and Boot Settings.**

The Matrox IrisBootParams utility opens.



4. Enter the MAC address of your Matrox Iris GT in the **MAC Address** text box. Note that the MAC address is written on a sticker attached to your Matrox Iris GT.

5. Click on the **Load** button. The network settings currently in use are displayed on-screen.

   If Matrox IrisBootParams has difficulty locating your Matrox Iris GT, a timeout error is displayed. Verify that the MAC address is entered correctly. If the problem persists, verify that your firewall settings or network router settings are not blocking communications.

6. Select the **DHCP** option.

7. Click on the **Save** button.

8. Close the Matrox IrisBootParams utility.

9. Disconnect the power supply from your Matrox Iris GT.

10. Disconnect your computer from your Matrox Iris GT, and connect your computer to your network.

11. Connect your Matrox Iris GT to your network.

12. Reconnect the power supply to your Matrox Iris GT and wait.

    The Power LED and the User LED of your Matrox Iris GT should turn green. This indicates that your Matrox Iris GT is now using an automatically assigned IP address and is ready to communicate with your network.

Automatic naming

Each Matrox Iris GT must have a unique name on the network. By default, Matrox Iris GT automatically uses a unique network name:

```
IRIS999999
```

The last six digits of your Matrox Iris GT's MAC address are used as the alphanumeric part of the network name. This ensures that each Matrox Iris GT has a unique network name. Both the network name of your Matrox Iris GT and its MAC address are written on stickers on your Matrox Iris GT. This automatic name can be used instead of an IP address when you try to access your Matrox Iris GT.

❖ Throughout the documentation *IrisName* is used whenever you should use the name or the IP address of your Matrox Iris GT.

Note that you can change the automatic name using either the **Static network name** field on the **Identification settings** page of Matrox Iris portal website or with the Matrox IrisBootParams utility.

Configuring your Matrox Iris GT to work with a network that uses static IP addresses

To add your Matrox Iris GT to a network using static IP addresses, perform the following:

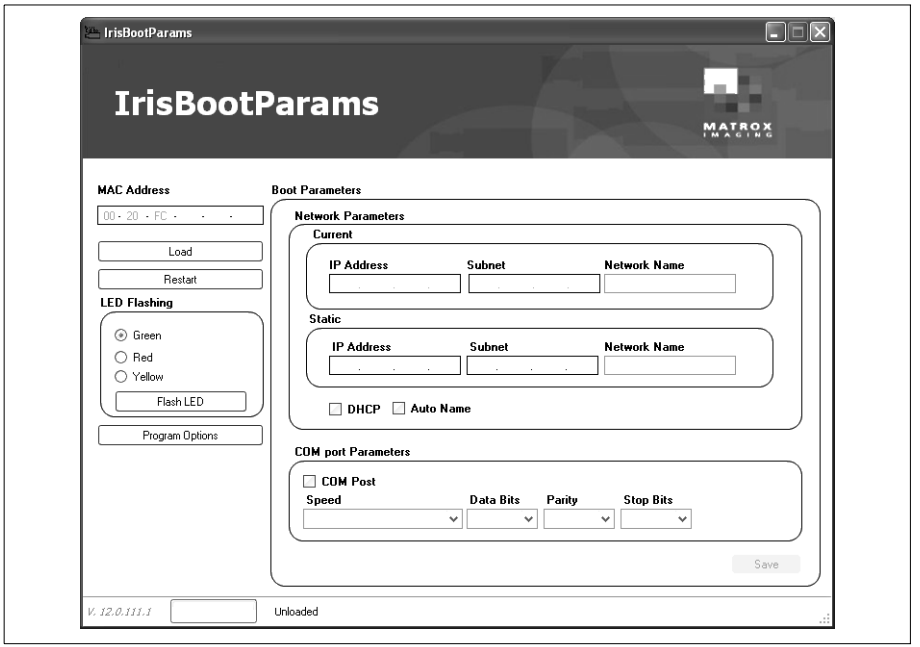
1. Contact your network administrator for a unique IP address for your Matrox Iris GT and to determine the subnet mask for your network. Most networks have IP addresses all on the same subnet.

2. Disconnect the Matrox Iris GT 100/1000BaseT cable from your network.

3. Plug your Matrox Iris GT 100/1000BaseT cable directly to your computer.

4. On your computer, launch the Matrox IrisBootParams utility. From the **Matrox Imaging** submenu of the **Windows Start** menu, select **Design Assistant X.X for Iris GT**, where *X.X* represents the current release number. From the presented submenu, select **Tools**, and then click on **Iris Network and Boot Settings**.

   The Matrox IrisBootParams utility opens.



5. Enter the MAC address of your Matrox Iris GT in the **MAC Address** text box. Note that the MAC address is written on a sticker attached to your Matrox Iris GT.

6. Click on the **Load** button.

   If Matrox IrisBootParams has difficulty locating your Matrox Iris GT, a timeout error is displayed. Verify that the MAC address is entered correctly. If the problem persists, verify that your firewall settings or network router settings are not blocking communications.

   The network settings currently in use are displayed on-screen. Write them down for future reference. Deselect the **DHCP** option.

7. Enter the static IP address that your network administrator gave you in the **Static IP address** text box.

8. Enter the subnet mask that your network administrator gave you in the **Subnet** text box.

9. Click on the **Save** button.

10. Close the Matrox IrisBootParams utility.

11. Disconnect the power supply from your Matrox Iris GT.

12. Disconnect your computer from your Matrox Iris GT, and connect your computer to your network.

13. Connect your Matrox Iris GT to your network.

14. Reconnect the power supply to your Matrox Iris GT and wait.

    The power LED of your Matrox Iris GT should turn green and the user LED of your Matrox Iris GT should be off. This indicates that your Matrox Iris GT uses a statically assigned IP address and is ready to communicate with your network.

Chapter

4

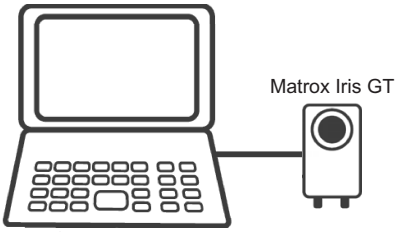
Configuring your Matrox Iris GT to work with your computer directly

This chapter guides you through configuring your Matrox Iris GT to communicate with your computer directly.

Connecting without DHCP

This chapter guides you through the process of configuring your Matrox Iris GT if it is directly connected to your computer (in a peer-to-peer configuration) and you want it to use a static IP address. If you have connected your Matrox Iris GT to a network that uses DHCP, refer to *Chapter 3: Configuring your Matrox Iris GT to work on a network*.

Your Matrox Iris GT is factory-configured to receive an IP address from a DHCP server on your network. If your Matrox Iris GT is directly connected to your computer and you do not change your Matrox Iris GT from using DHCP, you incur a significant delay (5 minutes) every time your Matrox Iris GT reboots. This is because your Matrox Iris GT tries to connect to a DHCP server (and fails) before trying to use its backup auto IP address. To avoid this 5 minute process every time your Matrox Iris GT is rebooted, it is strongly recommended that both your Matrox Iris GT and your computer be configured to use a static IP address.



Matrox Iris GT connected directly to your computer

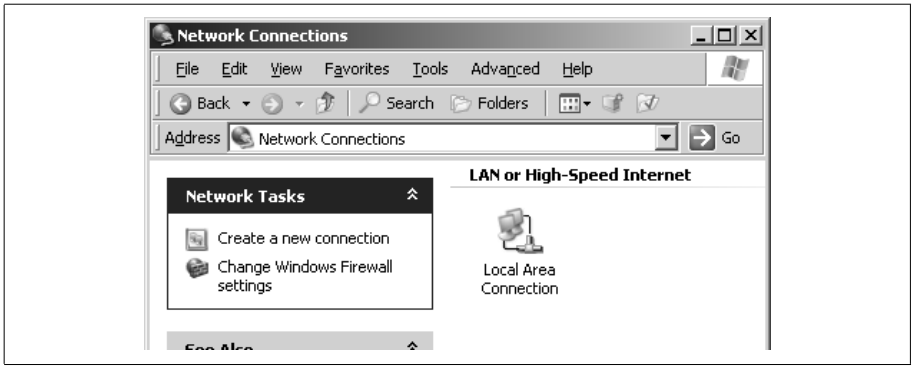
❖ Note that, if you are changing your Matrox Iris GT from using DHCP to connecting to a computer directly, go to the **General network settings** page of the Matrox Iris portal website and clear the default authentication domain before disconnecting from the DHCP network.

Determining a static IP address for Matrox Iris GT

If you have directly connected your Matrox Iris GT to your computer and you want to assign it a static IP address, you must first determine an appropriate IP address. The static IP address that you assign your Matrox Iris GT must be on the same subnet as your computer so that the two can communicate.

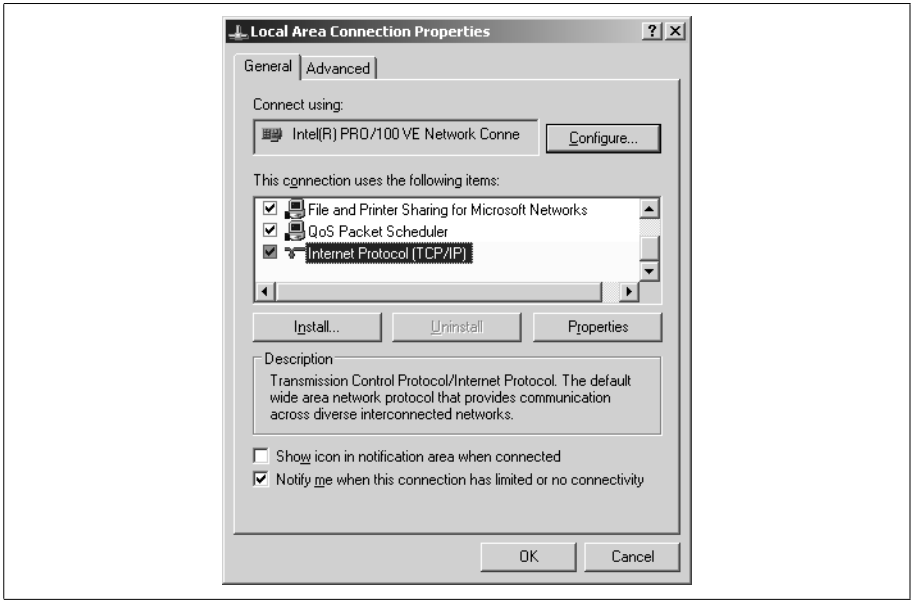
To determine the subnet of your computer, perform the following:

1. Open the **Windows Control Panel** and double-click on the **Network Connections** icon. The **Network Connections** dialog box opens.

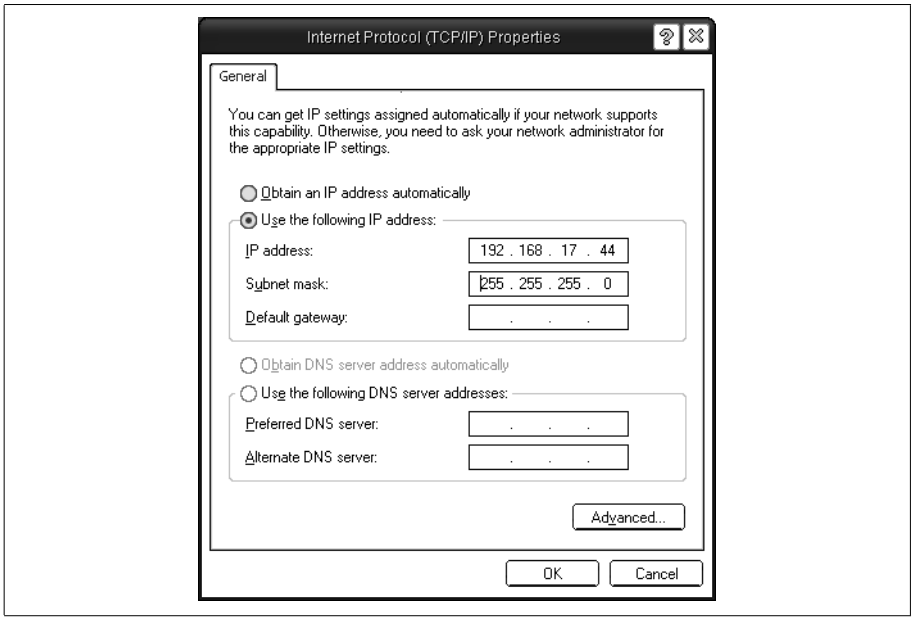


If you have more than one active Local area connection, or an active wireless connection, you might experience a problem with Matrox Design Assistant connecting to your Matrox Iris GT. If this occurs, refer to the *Appendix I: Troubleshooting*.

2. Right-click on the **Local Area Connection** icon to display the context menu. Select the **Properties** command. The **Local Area Connection Properties** dialog box opens.



3. Select **Internet Protocol** (**TCP/IP**) from the **This connection uses the following items** list box, and click on the **Properties** button. The **Internet Protocol** (**TCP/IP**) **Properties** dialog box opens.



4. Copy down your IP address and subnet mask or print a screen capture of this dialog box. This information is important in later sections.

5. Determine your computer's subnet address from its IP address and subnet mask. The bits in your computer's IP address that have enabled bits in the subnet mask, correspond to your computer's subnet address. For example, if your computer's IP address is 192.168.17.44 and its subnet mask is 255.255.255.0, the subnet address is 192.168.17.

   Select an IP address for your Matrox Iris GT that has the same subnet address as your computer and is not equal to the IP address of your computer. For the above example, select an IP address that starts with 192.168.17 but is not 192.168.17.44.

Changing the IP address of your Matrox Iris GT

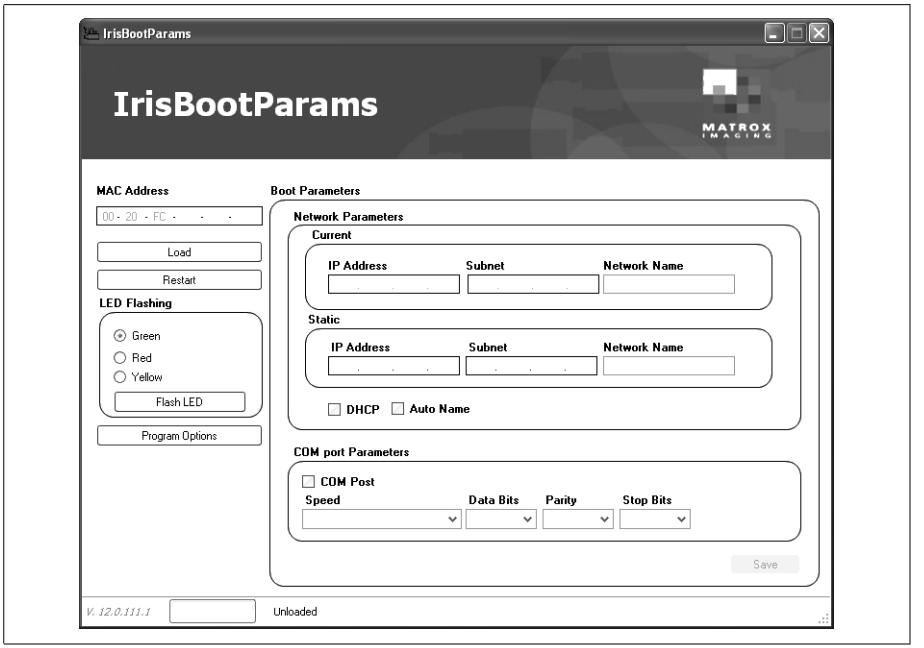
A quick way to change the IP address and subnet mask of your Matrox Iris GT is to use the Matrox IrisBootParams utility. This utility displays and allows you to change the IP address, subnet mask, and network name of your Matrox Iris GT, as well as the COM port settings. It also allows you to enable or disable DHCP and automatic naming.

Using the Matrox IrisBootParams utility

To use the Matrox IrisBootParams utility, perform the following:

1. On your computer, launch the Matrox IrisBootParams utility. From the **Matrox Imaging** submenu of the **Windows Start** menu, select **Design Assistant X.X for Iris GT**, where *X.X* represents the current release number. From the presented submenu, select **Tools**, and then click on **Iris Network and Boot Settings.**

   The Matrox IrisBootParams utility opens.



2. Enter the MAC address of your Matrox Iris GT in the **MAC Address** text box. Note that the MAC address is written on a sticker attached to your Matrox Iris GT.

3. Click on the **Load** button.

   If Matrox IrisBootParams has difficulty locating your Matrox Iris GT, a timeout error is displayed. Verify that the MAC address is entered correctly. If the problem persists, verify that your firewall settings or network router settings are not blocking communications.

   The network settings currently in use are displayed on-screen. Write them down for future reference.

4. If the **DHCP** option is selected, deselect it.

5. Enter the static IP address established for your Matrox Iris GT in the previous section, in the **Static IP address** text box. Recall that this IP address must be on the same subnet as your computer and cannot be the same as the IP address of your computer.

6. Enter the subnet mask of your computer in the **Subnet** text box. Note that the subnet mask of your Matrox Iris GT must be identical to the one used by your computer.

7. Click on the **Save** button.

8. Close the Matrox IrisBootParams utility.

9. Disconnect and then reconnect the power supply to your Matrox Iris GT and wait.

   When the power LED is green and the user LED is off, your Matrox Iris GT uses a statically assigned IP address and is ready to communicate with your computer.

Chapter

5

Accessing Matrox Iris GT

This chapter provides an overview of how to access your Matrox Iris GT using its web interface, FTP, file access, and telnet.

Accessing Matrox Iris GT

After you have connected a power supply and networking cables to your Matrox Iris GT, and configured your Matrox Iris GT so that it can communicate with your network/computer, you can access and configure your Matrox Iris GT using the Matrox Iris portal website (HTTP). You can also use Matrox Design Assistant to develop and deploy a project on your Matrox Iris GT. In addition, you can access your Matrox Iris GT using three other methods: telnet, FTP, and file server.

❖ Throughout this chapter *IrisName* is used whenever you should use the name or the IP address of your Matrox Iris GT.

Using the Matrox Iris portal website

The Matrox Iris portal website consists of a series of pages through which you can configure your Matrox Iris GT, find other Matrox smart cameras on your network, update the firmware, manage Matrox Design Assistant projects, and handle licensing information. For the minimum requirements to install Matrox Design Assistant, refer to the *Installing Matrox Design Assistant* section, in *Chapter 1: Before you begin*.

Accessing the portal website

To access the Matrox Iris portal website, open Microsoft Internet Explorer and go to the following address:

```
http://IrisName
```

The home page of the Matrox Iris portal website is displayed.

❖ Note that the first time that you view the Matrox Iris portal website, the **License terms** page might be displayed. Verify that the current date and time displayed are correct on this page. If they are not correct, they should be modified. The time and date of your Matrox Iris GT are used to validate activated provisional licenses. Once the provisional period begins, any attempt to tamper with the time or date of your Matrox Iris GT, before the date of expiry, will disable the provisional license.

For more information, refer to the *Matrox Design Assistant online help*.

Viewing images from your Matrox Iris GT

The **View utility** page of the Matrox Iris portal website provides a view utility to view the image being grabbed. You can focus and examine the view of the smart camera from a distance with the **View utility** page.

Many simultaneous connections to the **View utility** page are possible, but the total amount of bandwidth available to Matrox Iris GT is limited and will be shared by all active connections (for example, if two or more computers view the same image simultaneously, the available bandwidth is divided evenly, providing the maximum possible bandwidth to each computer).

❖ Note that the largest amount of bandwidth is consumed when the zoom is set to 1. Matrox Iris GT sends only what is needed to keep the amount of bandwidth used as low as possible. If the zoom is less than or greater than 1, the amount of bandwidth consumed decreases.

On the first use of the **View utility** page, Microsoft Internet Explorer will try to download and install an ActiveX display support tool from Matrox Iris GT. Once downloaded and installed, you can select a display and view the image grabbed from your Matrox Iris GT.

❖ Note to install anything in Microsoft Windows 7, you must be logged into the computer with a user account that has administration privileges.

Select a display item

To see the view from your Matrox Iris GT, perform the following:

1. Go to the **View utility** page of the Matrox Iris portal website.
2. Under the **Display selection** section, click on the **Refresh list** button.
3. Select your display from the list box below the **Display selection** buttons.

   The default display (*DesignAssistantAgent.exe:DESIGN_ASSISTANT_AGENT_FOCUS*) is listed here when a project is not running on your Matrox Iris GT. The Matrox Design Assistant display (*DesignAssistantAgentCF.exe)* is displayed when a project is running. Note that the remote agent display (*RemoteAgent.exe*) will not have access to the grabbed image unless it is the only display in the list. Selecting it while a Matrox Design Assistant project is listed will result in an error.

One display is added to the **List of displays** list for each display element that you have in your project's operator view.

4. Click on the **Set display** button.

   The screen will refresh automatically and, when it does, the grabbed image from your Matrox Iris GT should appear.

Panning and zooming displayed images

You can control panning and zooming through the Matrox Iris portal website's **View utility** page. The panning and zooming controls are a set of web buttons that allow zooming in and out, and panning up, left, right, and down.

Web access (HTTP)

Each Matrox Iris GT has a web server. Through a web session, you can browse to the pages stored on your Matrox Iris GT. The web server allows you to access the Matrox Iris portal website and the operator view of your Matrox Design Assistant project.

All HTTP activity is saved in a file on the Matrox Iris GT flash disk. You can access the file through the **Review HTTP** page, accessed from the **Administration utility** page. The **Administration utility** page can be accessed from the **Administration** page of the Matrox Iris portal website.

File access

Each Matrox Iris GT has a file server, which allows you to navigate the folders of your Matrox Iris GT using Microsoft Windows Explorer, create network-shared folders, and access network-shared folders.

To access files on your Matrox Iris GT from your computer, enter the following in the Microsoft Windows Explorer's location bar:

```
\\IrisName
```

Folders of your Matrox Iris GT

The following shared folders are available on your Matrox Iris GT:

- *UserDisk*. This folder contains all the projects deployed to your Matrox Iris GT, including sample images and calibration files.

  - Note that you can backup the contents of the *UserDisk* folder using your normal backup procedure for files. Alternatively, you can use the IrisBackup utility to make a full image of your Matrox Iris GT's current state. For more information, refer to the *IrisBackup utility* section, in *Appendix G: Matrox Iris GT utilities*.

- *CEDisk*. This folder contains the operating system, Matrox Iris GT utilities, and the Matrox Iris portal website. Note that you should not need to access this folder using Microsoft Windows Explorer (via file access).

- *RAMFiles*. This folder contains execution log and error log files.

Important

Files in the *RAMFiles* folder are lost when you power down your Matrox Iris GT. Copy any required new files in the *RAMFiles* folder to the *UserDisk* folder before powering down your Matrox Iris GT.

- Note that the *CEDisk*, *UserDisk*, and *RAMFiles* folders are visible through the file server by default.

Accessing your Matrox Iris GT from your computer

With file server access, you can logically map shared folders on your Matrox Iris GT as drives on your computer's file system. Mapping drives also allows easy access of Matrox Iris GT files from applications running on your computer.

Using Microsoft Windows Explorer

The easiest way to access frequently accessed Matrox Iris GT folders is to either map a network drive to one of the folders of your Matrox Iris GT or create a shortcut.

Using Microsoft Internet Explorer

Another way to access Matrox Iris GT folders is to use Microsoft Internet Explorer. You can browse your files and folders using the **Browse in user files using the web server** link, available from the Matrox Iris portal website.

In addition, shared folders can be created and managed using **File server setting** page, accessible from the **Administration utility** page. The **Administration utility** page can be accessed from the **Administration** page.

Accessing your computer from your Matrox Iris GT

To access files and folders on your computer from your Matrox Iris GT, create a network-shared folder on your own computer. Your Matrox Design Assistant project and the IrisBackup utility save files to your network-shared folder, and the FullRescue utility fetches files from your network-shared folder. For more information regarding the IrisBackup and FullRescue utilities, refer to *Appendix G: Matrox Iris GT utilities*.

For your Matrox Design Assistant project to access your network-shared folder, configure and save the login credentials on the **LAN connections settings** page, accessible from the **Administration utility** page. The **Administration utility** page can be accessed from the **Administration** page.

Telnet

Each Matrox Iris GT has a telnet server. The telnet server allows you to access the command prompt of Matrox Iris GT remotely to manually start processes, run batch files, run command-line utilities, and execute commands. Error messages (for example, MIL error messages) are redirected to a telnet console, along with **printf** statements from applications running remotely, over the telnet session.

When using Matrox Iris GT with Design Assistant, telnet is only required to run the Matrox Iris GT utilities (such as the IrisBackup and FullResecue utilities described in *Appendix G: Matrox Iris GT utilities*) or if performing operations at the request of technical support.

Installing the telnet client on your computer in Microsoft Windows 7

By default, Microsoft Windows 7 does not include the telnet client, while Microsoft Windows XP does.

To install the telnet client, perform the following:

1. Open the **Windows Control Panel** menu command from the **Windows Start** menu.

2. Select the **Programs and Features** utility. The **Programs and features** dialog box opens inside the **Control Panel** window.

3. Select **Turn Windows features on or off** from the Task sidebar. The **Windows features** dialog box opens.

4. Select the **telnet client** option from the tree list and click on the **OK** button.

   A dialog box appears, confirming the installation of new features.

❖ Note that the Windows Telnet client must be configured so that CRLF is turned off and the terminal type is set to VT100.

Accessing your Matrox Iris GT using telnet

To access Matrox Iris GT using a telnet application, Open a command prompt window and type the following at the prompt:

```
telnet IrisName
```

By default, telnet is enabled. You can enable or disable your Matrox Iris GT telnet server through the **Telnet / FTP server settings** page of the Matrox Iris portal website.

File transfer protocol (FTP)

Each Matrox Iris GT has an FTP server. Through an FTP session, you can transfer files to/from the flash disk from/to any drive mounted on your computer.

To access Matrox Iris GT using an FTP application, perform one of the following on your computer:

- Open a command prompt window and type the following:

```
ftp IrisName
```

- Open Microsoft Internet Explorer and go to the following address:

```
ftp://IrisName
```

By default, FTP is enabled. You can enable or disable the Matrox Iris GT FTP server through the **Telnet / FTP server settings** page of the Matrox Iris portal website.

FTP server activity is recorded (logged) and saved in a temporary file in *\CEDisk* on your Matrox Iris GT.

❖ Note that you can also access Matrox Iris GT folders with FTP by using the **Browse in user files using the FTP server** link, accessible from the **Administration utility** page. The **Administration utility** page can be accessed from the **Administration** page.

Appendix A: Glossary

This appendix defines some of the specialized terms used in this manual.

Glossary

- **Auto IP.**

  Automatic IP. Auto IP is a client-side service that assigns a dynamic IP address that, by default, might change each time your computer (and/or your Matrox Iris GT) reboots. Auto IP is used when your Matrox Iris GT is configured to get its IP address automatically from a DHCP server, and either there is no DHCP server present or the DHCP server is not responding. Auto IP is a service of a DHCP client.

- **Auxiliary signal.**

  An auxiliary signal is a user-defined I/O signal that can have one or more additional functions. For example, a signal that can be both a trigger signal and a user-defined input signal, is an auxiliary signal.

- **DHCP.**

  Dynamic host configuration protocol. DHCP is a protocol that requires a client and a server. Your computer and Matrox Iris GT are DHCP clients. A DHCP server serves DHCP client requests on a network and automatically assigns each DHCP client a unique dynamic IP address. DHCP works with a DNS server to associate a computer's name with its IP address so that, to connect to the computer, you can use its name instead of its IP address. Netbios over TCP/IP (an older client-side technology) can provide the name association whenever a DNS server is not present on a LAN.

  - Note that if a DHCP server is not available, the Auto IP service of a DHCP client can assign your Matrox Iris GT a unique dynamic IP address within a given subnet.

- **DNS**.

  Domain name service. DNS provides the association between a given IP address and the name of the computer using that IP address. The association between an IP address and a computer's name is stored in a DNS resolver cache, located on the computer that requested the association. Without a DHCP server, if the IP

address of a computer changes, the DNS cache on all the computers using the computer's name must be cleared to re-establish the association. Note that with a DHCP server, DNS is managed by a DNS server and not by the client.

- **Domain**.

  Computers connected in a network that uses DHCP and other services for shared resources and communications.

- **Duty cycle.**

  The duty cycle is the ratio between the pulse duration and the period of a rectangular waveform (the period of the pulse-train).

- **Dynamic IP address**.

  A dynamic IP address is an IP address that can change. If not using a DHCP server, the Auto IP service of a DHCP client assigns a dynamic IP address that, by default, might change each time your Matrox Iris GT reboots. A DHCP server, if used, can assign an IP address to a computer for a fixed amount of time. When that time expires, the DHCP server can assign a new IP address to that computer.

- **Inductive load devices.**

  Inductive load devices are devices that have inductive properties (inductive reactance), such as a relay or a motor. Devices connected to an inductive load device require a diode to protect them from over-voltage. Over-voltage typically occurs when the the connected device disconnects.

- **IP67 enclosure.**

  An IP67 enclosure is a specific type of industrial enclosure that is dust and water-tight. The name is derived using the incarnation protection rating (or ingress protection code), and defined in the international standard IEC 60529.

- **LAN**.

  Local area network, also called a network. A LAN is a group of computers connected to communicate and share resources and data. In this manual, a LAN has several computers (servers) that are dedicated to serving the others (clients) in a client/server architecture.

- **NetBios over TCP/IP**.

  NetBios over TCP/IP is used by Microsoft Windows operating systems as a peer-to-peer networking protocol. Microsoft Windows CE uses NetBios over TCP/IP to synchronize and communicate with networked computers running a Microsoft Windows operating system. NetBios associates a computer's name with its IP address so that, to connect to the computer, you can use its name instead of its IP address. This domain name service (DNS) is also provided by a DNS server when using a DHCP server.

- **Peer-to-peer**.

  A peer-to-peer network is a type of network in which each computer has equivalent capabilities and responsibilities. This differs from client/server architectures, in which some computers are dedicated to serving the others. In this manual, a peer-to-peer network refers to when your network is composed of only your Matrox Iris GT and your computer, and these are directly connected to each other without using another device (for example, a router).

- **Private IP address**.

  A private IP address is an IP address that is reserved for use on private networks. These IP addresses cannot be used on the internet. The range of private IP addresses includes the following:

Subnet range	Start IP address	End IP address
10	10.0.0.0	10.255.255.255
169.254	169.254.0.0	169.254.255.255
172.16 to 172.31	172.16.0.0	172.31.255.255
192.168.0 to 192.168.255	192.168.0.0	192.168.255.255

- **Public IP address**.

  A public IP address is an IP address that can be used anywhere, including on the internet. The ranges available include everything from 1.1.1.1 to 223.255.255.255, with the exception of 127.x.y.z and those ranges defined as private IP addresses (see above).

- **Pulse width modulator.**

  Pulse width modulator (PMW). A specialized timer that generates a pulse-train, whose duty cycle is proportional to the intensity of a connected light (such as, a ring LED).

- **Pulse**.

  A pulse is a temporary change of a signal's state (for example, from OFF to ON), typically reoccuring at regular intervals.

- **SOAP.**

  Simple object access protocol. An internet protocol that is used to encode information from web service requests and respond to messages before sending them over a network.

- **Static IP address**.

  A static IP address is an IP address that does not change. Unlike a dynamic allocation, a static allocation does not expire. Your Matrox Iris GT and your computer can both be assigned static IP addresses manually or through a fixed IP address returned by a DHCP server request.

- **Subnet**.

  A subnet is the portion of an IP address that must be common between computers for direct communication to occur. Special hardware (routers) is required for computers on different subnets to communicate. The subnet is defined by an IP address and a subnet mask. IP addresses and subnet masks are written in dotted decimal notation (each group of numbers is separated by a period).

To determine your subnet address, examine your subnet mask. For example, if an IP address of 169.254.17.26 has a subnet mask of 255.255.0.0, the subnet address would be 169.254. If an IP address of 192.168.12.34 has a subnet mask of 255.255.255.0, the subnet address would be 192.168.12.

- **Transistor-transistor logic (TTL) devices**.

  Transistor-transistor logic devices expect the connected device to provide the necessary voltage. Note that a TTL device can be used as either an input or an output device.

- **Wire-terminal**.

  A wire-terminal is a connector designed to receive a single wire that will carry a signal. For example, an output wire-terminal is designed to send a signal to your third-party device.

- **Workgroup**.

  Computers connected in a network without a domain controller.

Appendix B: Technical Reference

This appendix summarizes the hardware elements of Matrox Iris GT. In addition, this appendix provides pinout descriptions for the external connectors of your Matrox Iris GT.

Matrox Iris GT smart camera summary

Sensor board

Specifications		GT300	GT300C	GT1200	GT1200C	GT1900	GT1900C	GT5000
CCD sensor	Geometry	Diagonal 6 mm (1/3"-type)		Diagonal 6 mm (1/3"-type)		Diagonal 8.9 mm (1/ 1.8"-type)		Diagonal 10.9 mm (2/3"-type)
	Format	Monochrome	Color	Monochrome	Color	Monochrome	Color	Monochrome
	Make and model	Kodak KAI-0340S		Sony ICX445AL		Sony ICX274AL		Sony ICX625AL
Effective resolution (H x V)		640 x 480		1280 x 960		1600 x 1200		2448 x 2058
Frame rate		Up to 110 fps		Up to 22.5 fps		Up to 15 fps		Up to 15 fps
Pixel size (H x V)		7.4 µm x 7.4 µm		3.75 µm x 3.75 µm		4.4 µm x 4.4 µm		3.45 µm x 3.45 µm
Gain range		0 to 36 dB						
Shutter speeds		34 µs to 1.19 sec		58 µs to 2.91 sec		82 µs to 3.50 sec		58 µs to 2.10 sec
External trigger latency (Typical value measured from OFF to ON)		7.3 µs		8.1 µs		12.3 µs		6.8 µs
External trigger to output strobe delay (Typical value measured from OFF to ON)		7.3 µs		8.1 µs		12.3 µs		6.8 µs

CPU board

The CPU board of Matrox Iris GT has the following features:

- **CPU**: 1.6 GHz Intel® Atom®.
- **Volatile memory**: 512 Mbytes of DDR2 SDRAM.
- **Non-volatile memory**: 2 Gbytes of flash disk memory.
- **Networking**: One 100/1000 Mbits (or 100 Mbit/1 Gbit) Ethernet networking interface.
- **Serial communication interface**: RS-232.

- **Digital I/Os**: 5 inputs and 4 open-collector outputs.

  - 4 independent sink-driver auxiliary output signals, used to connect TTL or non-TTL devices (up to 24 V). Note that two of the four auxiliary output signals can be used as strobe signals.

  - 4 independent opto-isolated auxiliary input signals (implemented using high-speed opto-isolators).

  - 1 opto-isolated trigger input signal (implemented using a high-speed opto-isolator).

  - Input signals have interrupt generation capabilities.

  - The opto-isolated auxiliary input signals are debounced (that is, configured to reject signals of less than a specified width). By default, this width is 250 nsecs.

    The debouncing time can be configured using Matrox Design Assistant. For more information, refer to the *Matrox Design Assistant online help*.

- **Controlled-current output**. 1 controlled-current output (CCS) designed to provide programmable current to an illuminator.

- **Timers**:

  - 2 exposure timers. One is used to generate the exposure signal and the other is used to enable or disable the strobe signals (available on auxiliary output signals 4 and 5) and the controlled-current output (CCS).

  - 1 hi-drive timer. Used to control the time during which the controlled-current output transmits the maximum current (500 mA) to the connected LED lighting device. This allows the LEDs to reach a steady state quickly.

- **Display**. Your Matrox Iris GT can use a display device (a video screen), either connected to it through the VGA/USB port or through the network (using a web browser).

  ❖ Note that a standard USB keyboard and mouse are supported natively. To connect any other device (such as a specialized keyboard or touch screen) to your Matrox Iris GT, it must have a specialized device driver. If the device has a third-party provided Microsoft Windows CE 6.0 driver, inquire whether a specialized device driver is available for your Matrox Iris GT by contacting your local Matrox Imaging representative.

  The following information relates to the device that can be connected to the VGA/USB port.

  - **Output**: RGB analog output.

  - **Maximum supported resolution**: 1920 x 1200.

  - **Maximum pixel depth**: 32-bits.

  - **Maximum vertical refresh frequency**: 60 Hz - 85 Hz, depending on resolution.

  - **Supported:** Color and monochrome.

Software environment

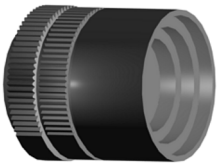
Your Matrox Iris GT uses Microsoft Windows CE.

Your Matrox Iris GT requires that your development computer has the following:

- Microsoft Windows 7 (32/64 bit), or Windows XP SP3 (32 bit).
- Microsoft Internet Explorer 7.0, DirectX 9.0.
- 100/1000 BaseT Ethernet port.

Lenses

The Matrox Iris GT starter kit ships with a C-mount lens. Contact your Matrox sales representative for details.



Keep the lens free of fingerprints and dust. Do not clean with an alcohol-based cleaning solution and do not spray water or cleaning fluids directly onto the lens. Instead, use a pressurized air dispenser or a lens cleaning cloth to remove dust.

Matrox Iris GT specifications

The following specifications detail your Matrox Iris GT.

Electrical specifications

		GT300, GT300C, GT1200, GT1200C, GT1900, GT1900C, GT5000 (24 V inputs version)		
Operating voltage for the Matrox Iris GT under testing conditions			24 V.	12 V.
	Typical current consumption[a]		500 mA used.	1000 mA used.
	Operating voltage tolerance		± 10%	± 10%
I/O specifications				
	Output signals in IND format	Open collector driver. Operating voltage range: Up to 24 V. Sink currents: Minimum: 0 mA, Maximum: 100 mA. Maximum leakage current 10 µA max. ON voltage drop 25 mV. Maximum inrush current 4 A for 300 µs max. OFF to ON response 250 nsec. ON to OFF response 250 nsec.		
	Opto-isolated input signals	Operating voltage	24 V	
		Input current	1.6 mA	
		External resistor requirement	0 kΩ[b]	
		ON voltage level	>15 V	
		OFF voltage level	< 0.8 V	
		Minimum ON current	0.5 mA	
		Typical OFF voltage	2 V	
		OFF to ON response	5 µsec	
		ON to OFF response	25 µsec	
	Controlled-current output	Operating voltage	24 V	12 V
		Output voltage	2.4 V to 21 V	2.4 V to 10 V
		Output current	0 to 500 mA max	0 to 500 mA max

a. This measurement was taken under testing conditions. There were no USB devices connected to Matrox Iris GT and Matrox Iris GT was not driving CCS.

b. The external resistor requirement for your 5 V input version of Matrox Iris GT is 3 kΩ. For more details, see the *Matrox Iris GT electrical specifications* section, in *Appendix K: Using a version of Matrox Iris GT that accepts 5 V auxiliary input signals*.

Environmental specifications

	GT300, GT300C, GT1200, GT1200C, GT1900, GT1900C, GT5000
Operating temperature	0 °C to 50 °C (32 °F to 122 °F)
Ventilation requirements	Natural convection.
Operating humidity	Up to 95% (non-condensing).

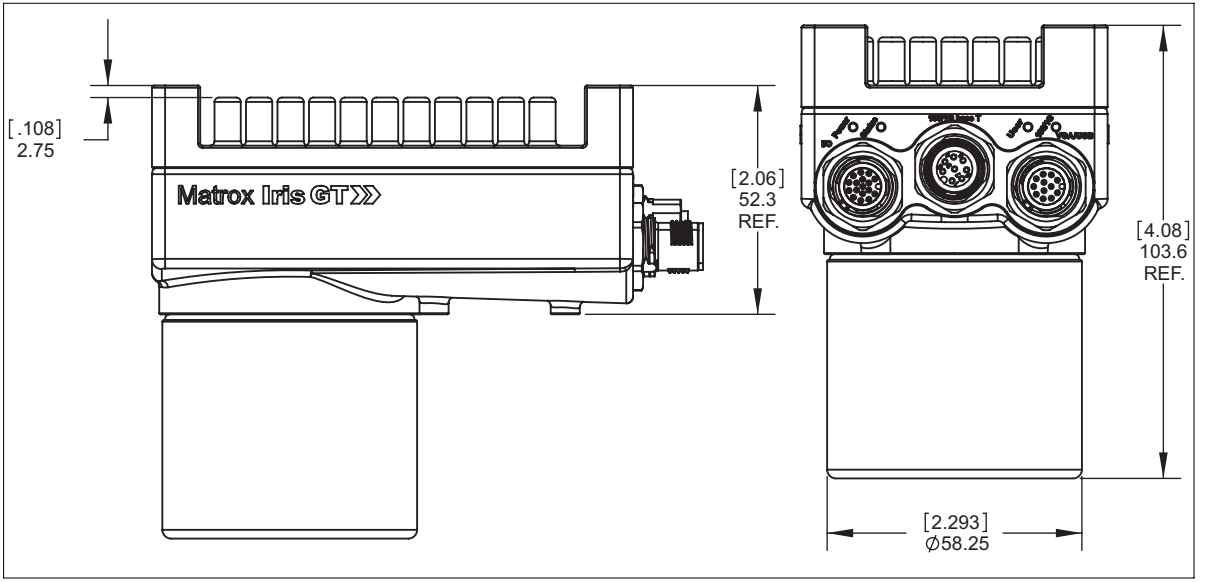
Mechanical specifications

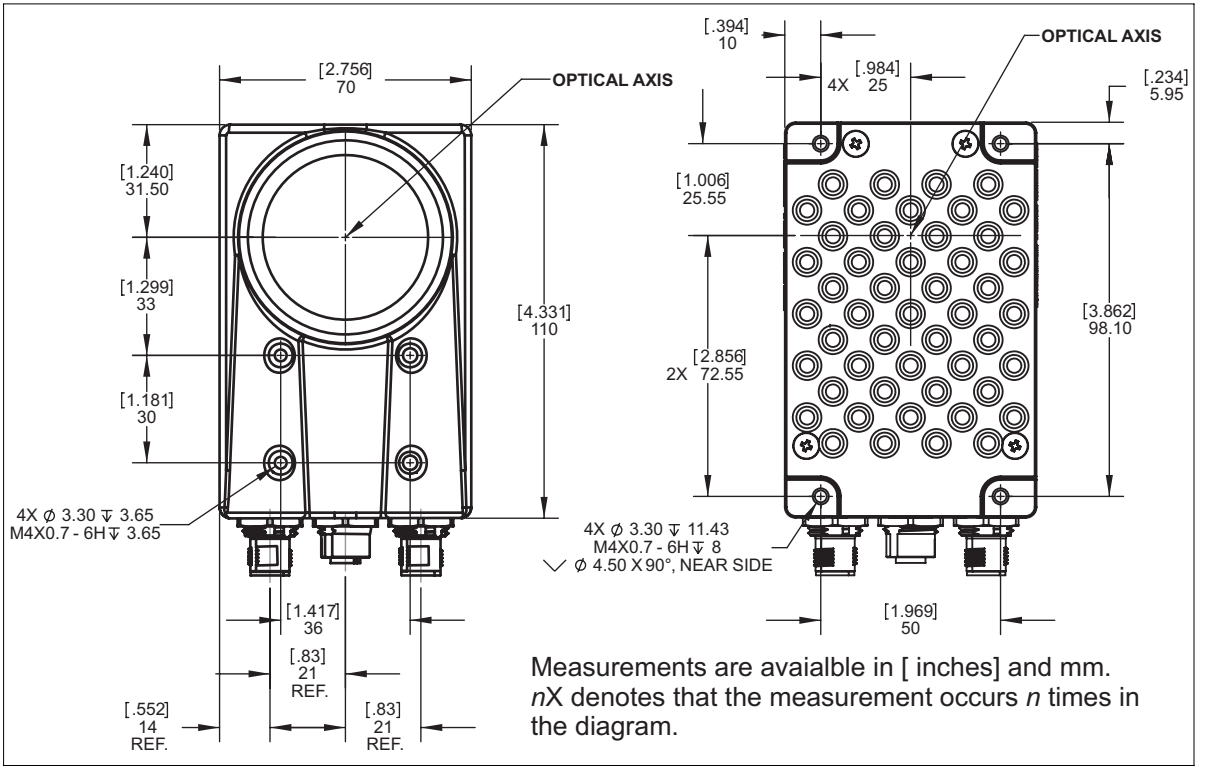
	GT300, GT300C, GT1200, GT1200C, GT1900, GT1900C, GT5000
Connectors	M12 8-pin connector for 100/1000 BaseT Ethernet.
	M12 12-pin connector for VGA/USB.
	M12 17-pin connector for digital I/O and power.
Certification	FCC class A, CE class A, and RoHS-compliant.

Dimension and mounting bracket specifications

Dimensions	GT300, GT300C, GT1200, GT1200C, GT1900, GT1900C, GT5000
Weight	0.7 kg (1.5 lbs.)
Smart camera length (without the connectors)	110 mm (4.33") ± 2 mm (0.079")
Smart camera height	104 mm (4.08") ± 2 mm (0.079")
Smart camera width	70 mm (2.76")

Mounting bracket dimensions (not depicted)	GT300, GT300C, GT1200, GT1200C, GT1900, GT1900C, GT5000	
Screw locations	Top	Bottom
Screw type	M4X7	M4X7
Number of screws	4	4
Depth	3.65 mm (0.14")	11.43 mm (0.45")
Vertical distance apart	36 mm (1.42")	50 mm (1.97")
Horizontal distance apart	30 mm (1.18")	98.10 mm (3.86")





Measurements are avaialble in [inches] and mm.
*n*X denotes that the measurement occurs *n* times in the diagram.

Matrox Iris GT connectors

Your Matrox Iris GT has several interface connectors. These are the digital I/O and power connector, 100/1000 BaseT connector, and the VGA/USB connector.

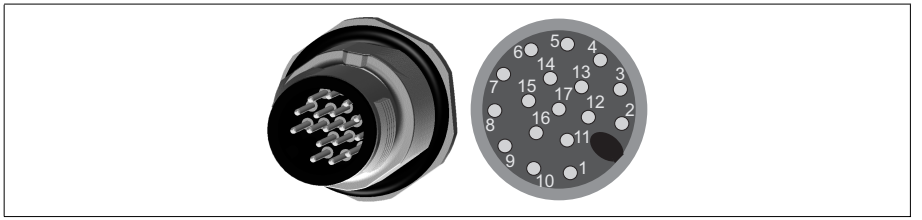
The following describes the nomenclature used for signal names:

1. Signal function.
2. Signal format.
3. Signal direction.
4. Signal rank.

Signal nomenclature	**Description**	
Signal function	Defines the signal's purpose.	
	Signal function type	**Description**
	AUX(XXXX)	Auxiliary signal. Auxiliary signals can have one or more functions; they can always be user-defined. Their primary function is displayed in the brackets (for example, AUX(STB) is an auxiliary signal that is typically used to control a strobe).
	RxD	Receive serial data signal.
	STB	Strobe signal.
	TRIG	Trigger signal.
	TxD	Transmit serial data signal.
Signal format	Indicates the format in which the signal is transmitted/expected.	
	Signal format type	**Description**
	OPENC	Open-collector.
	OPTO	Opto-coupled.
	RS232	RS-232.
Signal direction	Indicates whether the signal is an input or output signal.	
Signal rank	Indicates a count of the number of signals with the same function, starting from 0.	

Digital I/O and power connector

The digital I/O and power connector is an M12 17-pin (male) connector that transmits and receives both RS-232 and digital I/O signals, controlled-current output signal, and provides power to your Matrox Iris GT.



The pinout for the digital I/O and power connector is as follows:

Pin number	Signal name	Description
1	RxD_RS232	RS-232 receive.
2	AUX(USER)_OPENC_OUT7	Open-collector auxiliary signal 7 (output). Supported function: User-defined signal 7 (output 4 of 4).
3	AUX(STB)_OPENC_OUT5	Open-collector auxiliary signal 5 (output). Supported function: Standard strobe signal (pulse), user-defined signal 5 (output 2 of 4), exposure signal, or trigger signal bypass.
4	Reserved	Do not connect.
5	AUX(USER)_OPTO_IN2+	Opto-isolated auxiliary signal 2 (input), positive. Supported function: User-defined signal 2 (input 3 of 4). Note: The negative component of this signal is internally connected to the ground.
6	AUX(USER)_OPTO_IN1+	Opto-isolated auxiliary signal 1 (input), positive. Supported function: User-defined signal 1 (input 2 of 4). Note: The negative component of this signal is internally connected to the ground.
7	TRIG_OPTO_IN0+	Opto-isolated trigger input signal, positive.
10	TxD_RS232	RS-232 transmit.
11	AUX(USER)_OPENC_OUT6	Open-collector auxiliary signal 6 (output). Supported function: User-defined signal 6 (output 3 of 4) or exposure signal.
12	AUX(STB)_OPENC_OUT4	Open-collector auxiliary signal 4 (output). Supported function: Pulse-train strobe signal (pulse-train generated with a pulse width modulator (PMW)), user-defined signal 4 (output 1 of 4), exposure signal, or trigger signal bypass.

Pin number	Signal name	Description
13	AUX(USER)_OPTO_IN3+	Opto-isolated auxiliary signal 3 (input), positive. Supported function: User-defined signal 3 (input 4 of 4). Note: The negative component of this signal is internally connected to the ground.
14	AUX(USER)_OPTO_IN0+	Opto-isolated auxiliary signal 0 (input), positive. Supported function: User-defined signal 0 (input 1 of 4). Note: The negative component of this signal is internally connected to the ground.
15	TRIG_OPTO_IN0-	Opto-isolated trigger input signal, negative.
16	GND	Ground. This ground is reserved for use with the ground from your power supply.
17	CCS	Controlled-current output, designed to be connected to a LED lighting device (0-500 mA, intensity controlled using the internal version of the pulse-train strobe signal, generated with a pulse width modulator (PMW)). Note that when you use a 24 V power source for your Matrox Iris GT, the CCS can output from 2.4 V to 21 V to your LED lighting device. If, however, you use a 12 V power source, the CCS can output from 2.4 V to 10 V to your LED lighting device.
8,9	PWR	Power provided to your Matrox Iris GT. The power must be either +12 V or +24 V +/- 10%. The amount of power required is determined by the power requirements of the devices attached to your Matrox Iris GT (such as a ring LED).

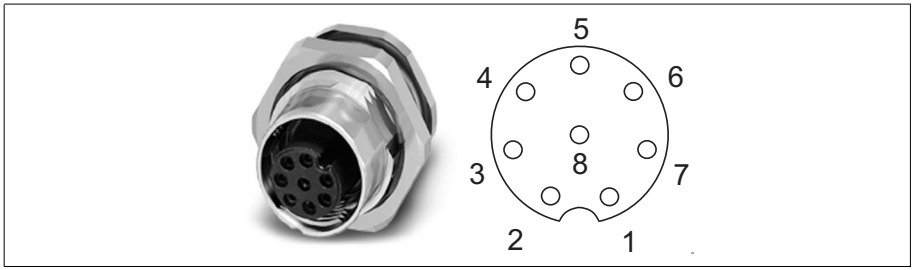
The Matrox Iris GT starter kit includes an open-wire digital I/O and power cable. In addition, this cable can be purchased separately from Matrox (GT-CBL-PWR/3*).

To build your own digital I/O and power cable, parts can be purchased from:

	Cable information
Manufacture	Phoenix Contact GmbH & Co. KG
Part number:	SAC-17P- 3,0-PVC/FS SCO Order No.: 1555350
Description:	Sensor/actuator cable, 17-pos., black PVC, straight M12 SPEEDCON socket on the free conductor end, length: 3.0 m

100/1000 BaseT connector

The 100/1000 BaseT connector is an M12 (female) 8-pin connector that provides communication capabilities at 10 Mbit/sec, 100 Mbit/sec, or 1 Gbit/sec (1000 Mbit/sec). The pinout of this connector follows the 100/1000 BaseT Ethernet standard found in the IEEE 802.3-2002 standard.



The pinout for the Ethernet connector is as follows:

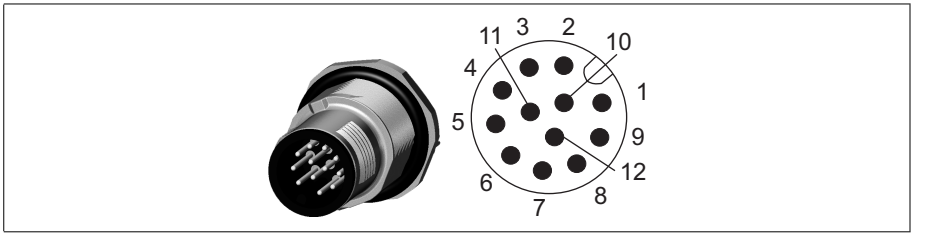
Pin number	Signal name	Description
1	MDI_3-	Bidirectional data C-.
2	MDI_4+	Bidirectional data D+
3	MDI_4-	Bidirectional data D-
4	MDI_1-	Bidirectional data A-
5	MDI_2+	Bidirectional data B+
6	MDI_1+	Bidirectional data A+
7	MDI_3+	Bidirectional data C+
8	MDI_2-	Bidirectional data B-

This cable can be purchased separately from Matrox (GT-CBL-ETH/5*). For an alternate source of 100/1000 BaseT cables, contact:

	Cable information
Manufacture	Phoenix Contact GmbH & Co. KG
Part number:	VS-M12MS-IP20-94B-LI/5,0 Order No.: 1412053
Description:	Assembled Ethernet cable, shielded, 4-pair, AWG 26 stranded (7-wire), RAL 5021 (sea blue), M12 connector to RJ45 connector/IP20, line, length 5 m

VGA/USB connector

The VGA/USB connector is an M12 12-pin (male) connector that transmits and receives both output video and transmits and receives USB signals. The output video signal is a standard RGB analog video output used to send the operating system's desktop to the connected independent display device. The video output can be used to display an extended Windows desktop or the Windows desktop and an exclusive display. However, when grabbing with your Matrox Iris GT, a remote display (on your Matrox Iris GT's operating system display or a computer on your network) must be used to view the grab.



The table below summarizes the supported standard display resolutions:

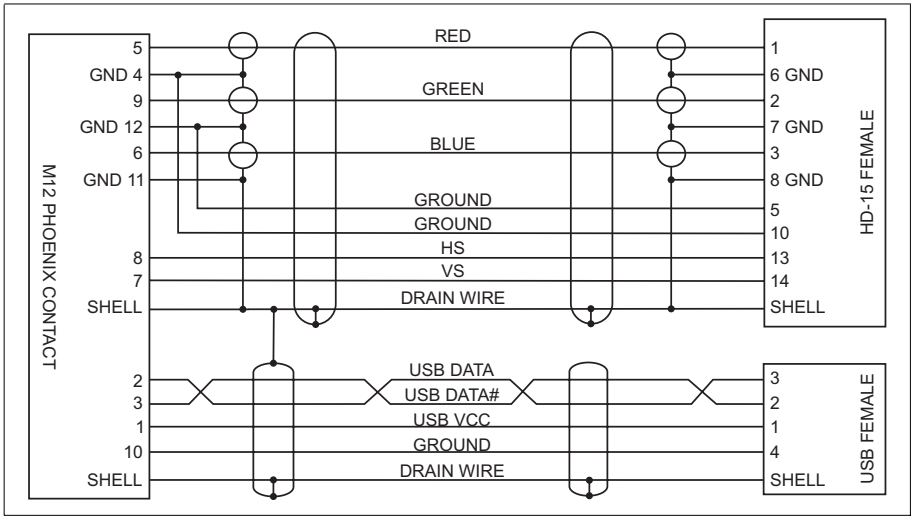
Standard display resolution	Analog video	Maximum refresh rate
1920 × 1200	RGB	60 Hz
1920 × 1080	RGB	60 Hz
1600 × 1200	RGB	60 Hz
1280 × 1024	RGB	85 Hz
1024 × 768	RGB	85 Hz
800 × 600	RGB	85 Hz
640 × 480	RGB	85 Hz

The pinout for the VGA/USB connector is as follows:

Pin number	Signal name	Description
1	USB PWR	5 V supplied from your Matrox Iris GT to the USB peripherals.
2	USB_DATA_P	USB data +.
3	USB_DATA_N	USB data -.
4	GND	Ground.
5	RED_VID_OUT	R component of the RGB video output signal.
6	BLUE_VID_OUT	B component of the RGB video output signal.

Pin number	Signal name	Description
7	VSYNC	Vertical sync of the RGB video output signal.
8	HSYNC	Horizontal sync of the RGB video output signal.
9	GREEN_VID_OUT	G component of the RGB video output signal.
10	GND	Ground.
11	GND	Ground.
12	GND	Ground.

The following is a wire-diagram of the VGA/USB cable, showing the connection between the Matrox Iris GT VGA/USB connector on one end and the HD-15 and USB connectors on the other.



This cable can be purchased separately from Matrox (GT-CBL-VGAUSB*).

Appendix C: Selecting a lens

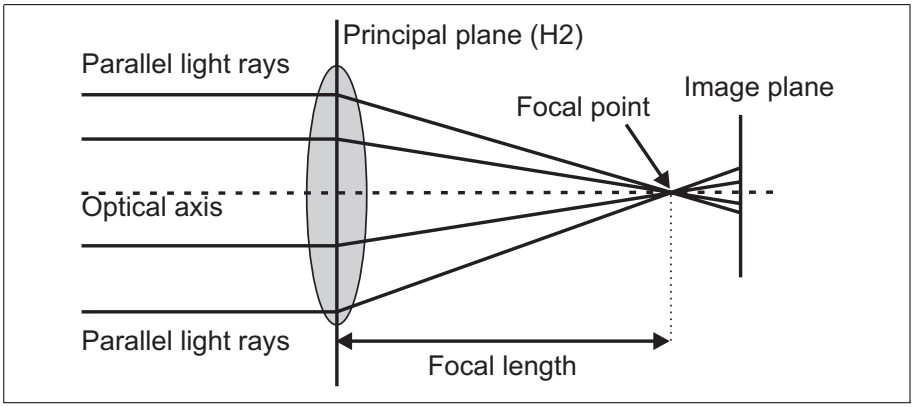
This appendix provides information on how to select the lens best suited to your needs.

Introduction

This appendix includes information on lens selection, an important consideration when building your application.

The primary consideration during lens selection is that the focal length of the selected lens meets your application's requirements.

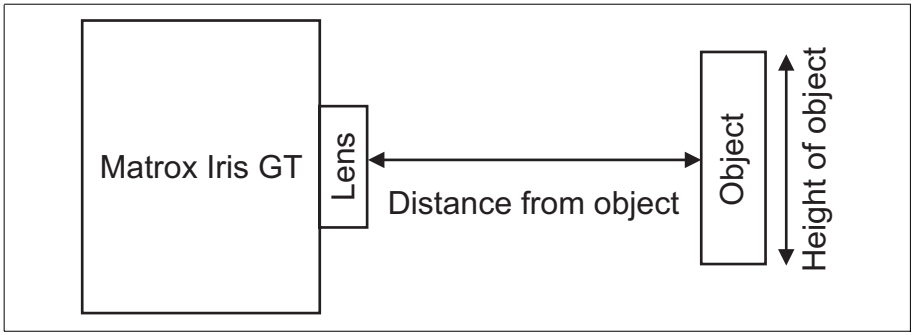
The focal length is the distance between the principal plane and the point where parallel light rays, bent at the principal plane, intersect the optical axis.



❖ Note that each lens is designed for a specific focal length; a zoom lens is designed for variable focal lengths.

Calculating the required focal length

To calculate the required focal length, measure the distance from the smart camera to the object, as well as the height (vertical size) and width (horizontal size) of the object.



Use the following calculations to determine the required focal length for your situation.

$$\frac{\text{Vertical constant} \times \text{Distance from object}}{\text{Vertical size of object} + \text{Vertical constant}} \quad \text{and} \quad \frac{\text{Horizontal constant} \times \text{Distance from object}}{\text{Horizontal size of object} + \text{Horizontal constant}}$$

By selecting the smallest focal length from the vertical and the horizontal focal length calculations, you assure that both the vertical and horizontal dimensions of your object fit within the view of your lens.

The product name of your smart camera determines the horizontal and vertical constants required in the above-mentioned calculations.

Product name	Horizontal constant	Vertical constant
GT300, GT300C	4.8 mm	3.6 mm
GT1200, GT1200C	4.8 mm	3.6 mm
GT1900, GT1900C	7.1 mm	5.3 mm
GT5000	8.4 mm	7.0 mm

For example, your Matrox Iris GT300 has a 4.8 mm horizontal constant and a 3.6 mm vertical constant. If there is a 52 mm distance between the object and the front of the lens (distance to the object) and the object is 14 mm wide (horizontal size) and 15 mm tall (vertical size), then the following calculations are used to determine the required focal length:

$$\frac{4.8\text{ mm} \times 52\text{ mm}}{14\text{ mm} + 4.8\text{ mm}} = 3.71\text{ mm (rounded)} \quad \text{and} \quad \frac{3.6\text{ mm} \times 52\text{ mm}}{15\text{ mm} + 3.6\text{ mm}} = 3.47\text{ mm (rounded)}$$

In this example, a lens with a focal length of 3.47 mm (horizontal) is required.

If the lens shipped with your Matrox Iris GT starter kit has a focal length equal to the focal length of your calculation, you have the correct lens for your situation. If the lens does not match the focal length of your calculation, you can still use it. However, if your lens has a focal length smaller than your calculation, there will be empty space around your object in the image. If your lens has a focal length greater than your calculation, part of your object might not fully fit within the image.

Appendix D: Using the I/O signals and controlled-current output of Matrox Iris GT

This appendix describes how to use the digital I/O and power connector of your Matrox Iris GT to connect to power and/or to third-party devices, such as input generators, trigger generators, and output receiving devices (such as LED lighting).

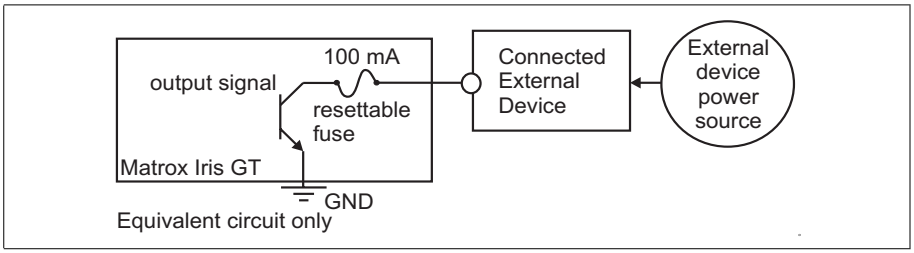
Input and output connector

This appendix examines the requirements when connecting devices to the Matrox Iris GT digital I/O and power connector. For the rise and fall time, pulse width, maximum frequency, and power characteristics of the I/O signals, refer to the *Matrox Iris GT specifications* section, in *Appendix B: Technical Reference*.

Connecting external devices to auxiliary output signals

You can send auxiliary output signals of your Matrox Iris GT to a wide variety of external devices, such as programmable logic controllers (PLC) and devices that only accept transistor-transistor logic (TTL) signals for their trigger inputs.

Each of the auxiliary output signals of your Matrox Iris GT uses an open collector (sink driver); instead of transmitting a high or low voltage state, a current from a connected device is either terminated (grounded) or not. The connected device must have its own power source because the Matrox Iris GT output signals are not capable of providing (sourcing) voltage to drive a device. In the circuit depicted below, the device connected to the Matrox Iris GT smart camera is terminated.



Your Matrox Iris GT supports a nominal voltage of 24 V. Each of the sink drivers of your Matrox Iris GT uses a resettable fuse to protect your smart camera from connected external devices. The fuse tries to protect your Matrox Iris GT if you accidentally connect it to an external device that provides more amperage than your Matrox Iris GT can safely ground; the amount of current from which the fuse can protect is 100 mA.

When the auxiliary output signal is on, the circuit is grounded and the current flows from the connected device to your Matrox Iris GT (the observed voltage at the output pin will be low). When the auxiliary output signal is off, the circuit is open (the observed voltage will be high if pulled high by the connected circuitry).

State of the output signal	State of the sink driver	Circuit goes to
On	Closed	Ground
Off	Open	Not grounded (floating)

The exact connection between your Matrox Iris GT, the connected external device, and its power source depends entirely on the type of external device to which you connect.

There are several types of devices to which your Matrox Iris GT can be connected. These include:

- **NPN-compatible PLC devices**. These devices include all forms of external devices that are programmable logic controllers with NPN transistor types. An NPN-compatible PLC device has an input that is enabled when it is grounded (sinking input). An NPN-compatible PLC device does not provide power to the connected device.

- **PNP-compatible PLC devices**. These devices include all forms of external devices that are programmable logic controllers with PNP transistor types. A PNP-compatible PLC device has an input that is enabled when it receives a voltage (sourcing input).

- **Inductive load devices**. These devices include all forms of external devices that have inductor wiring, such as a relay or small motor. Devices connected to an inductive load device require a diode to protect them from over-voltage. Over-voltage typically occurs when the connected device disconnects.

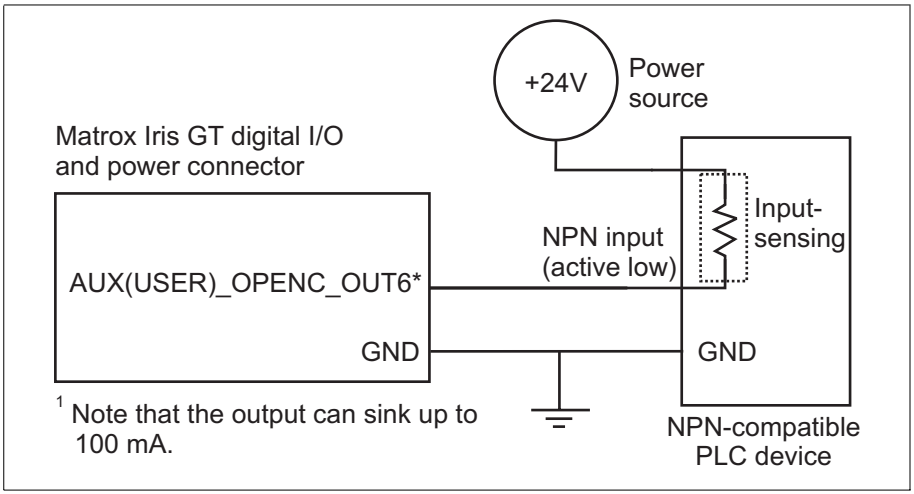
- **Transistor-transistor logic (TTL) devices**. These devices expect the connected device to provide the necessary voltage.

- **Lighting controllers**. These devices control illuminators to provide additional lighting upon request. To control and power an illuminator without a lighting controller, see the *Powering and controlling a LED lighting device with controlled-current output* section, later in this appendix.

Connecting to an NPN-compatible PLC device

To connect your Matrox Iris GT to an NPN-compatible PLC device, connect the ground of the NPN-compatible PLC device and the ground of your Matrox Iris GT to a common ground. In addition, an auxiliary output signal of your Matrox Iris GT must be connected to the device's sinking input.

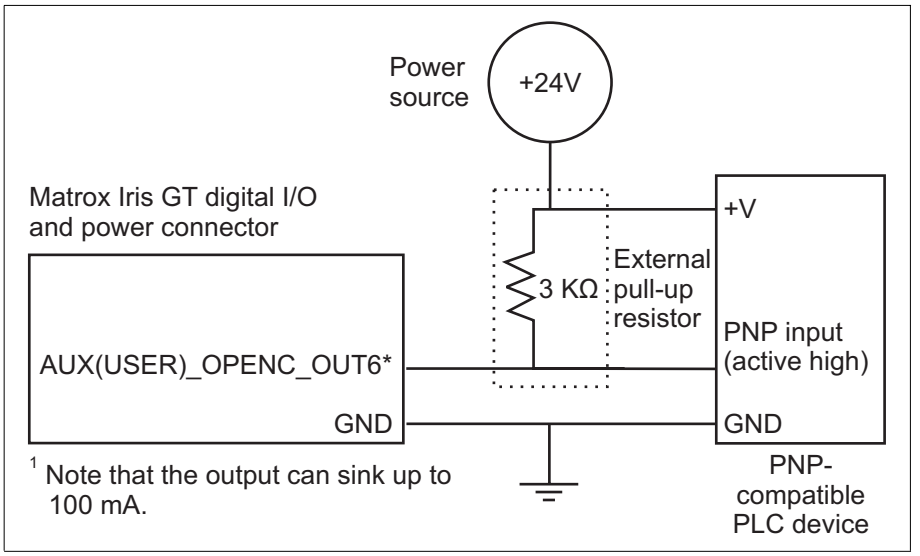
The NPN-compatible PLC device provides its own power source. When the Matrox Iris GT output signal is "on", the NPN-compatible PLC device connects to the ground and completes the circuit.



Connecting to a PNP-compatible PLC device

To connect your Matrox Iris GT to a PNP-compatible PLC device, you must first connect an external pull-up resistor between them. The external pull-up resistor is needed because PNP-compatible PLC devices expect to be connected to a sourcing signal and your Matrox Iris GT's auxiliary output signals are all sinking signals. Therefore, connect an output signal of your Matrox Iris GT and the sourcing input to an external pull-up resistor. In addition, connect the ground of the PNP-compatible PLC device and the ground of your Matrox Iris GT to a common ground.

The external pull-up resistor assures that when the output signal is disabled (off), the external resistor will pull-up the PLC input to a positive voltage (+V). This creates an inversion, with the PLC input "on" when your Matrox Iris GT output is "off", and vice-versa.

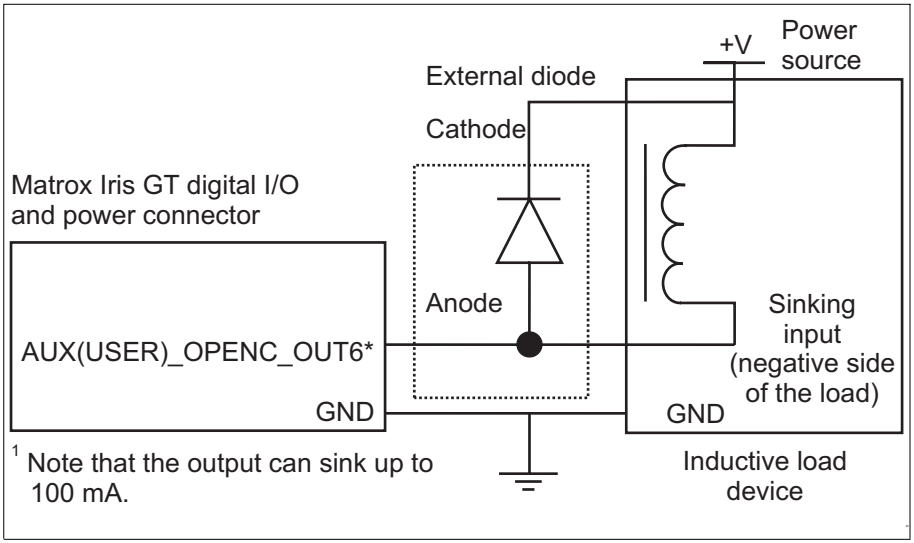


- Note that resistors rated for ¼ W are recommended, since they can handle the expected power.

Connecting to an inductive load device

To connect your Matrox Iris GT to an inductive load device, you must first connect a high-voltage diode between them. The diode protects your Matrox Iris GT from sudden voltage spikes, which occur when the signal routed to the sinking input (that is, the negative side of the load) of the inductive load device is turned off.

You should connect the negative side of the load and a Matrox Iris GT output signal to the anode of the external diode. In addition, you should connect the cathode of the external diode to the positive side of the load. Connect the ground of the inductive load device and the ground of your Matrox Iris GT to a common ground.



When the auxiliary output signal is enabled (on), the negative side of the load is reduced to 0 V, and +V appears across the circuit.

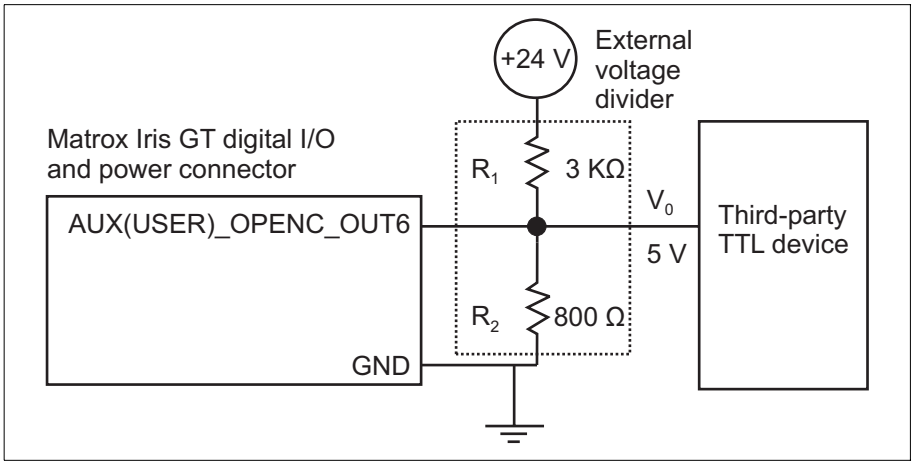
Connecting to a TTL device

To connect your Matrox Iris GT to a device that only accepts TTL signals, you must use an external voltage source because TTL devices expect to be connected to a sourcing signal and the auxiliary output signals of your Matrox Iris GT are sinking signals. If using a 24 V voltage source, you must first connect an external voltage divider between them. Select a voltage divider whose resistors reduce the voltage such that the connected third-party device receives 5 V.

$$V_0 = 24\text{V} \times \frac{R_2}{R_1 + R_2}$$

❖ Note that resistors rated for ¼ W are recommended, since they can handle the expected power.

Then, connect the voltage input wire from your external voltage divider to the 24 V voltage source, and connect the ground of your voltage divider to the ground of your smart camera.



If using a different voltage than 24 V, replace 24 V in the above formula accordingly. If the external voltage source is 5 V, use a pull-up resistor instead of a voltage divider. For more information, refer to *Connecting to a lighting controller* subsection, later in this section.

Connecting to a lighting controller

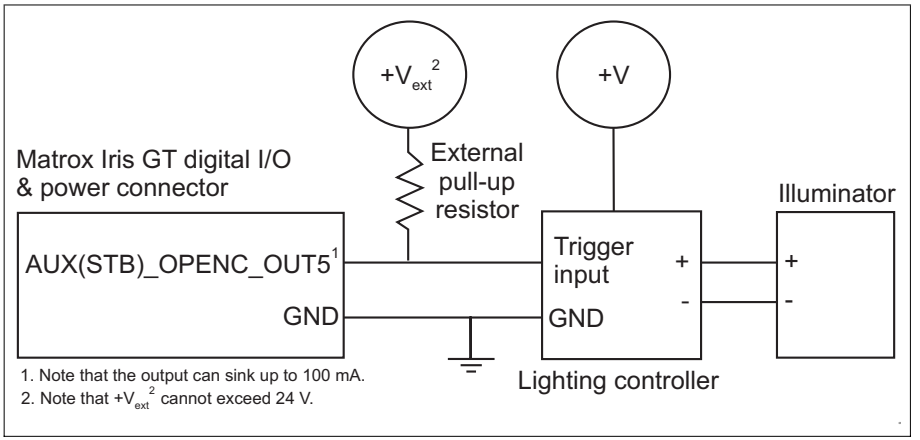
You can control an illuminator with a lighting controller that is connected to auxiliary output signal 4 or 5 of your Matrox Iris GT. For example, you can control a LED lighting device (such as a ring LED) that is connected to a lighting controller.

❖ Note, to connect a LED lighting device directly to your Matrox Iris GT, see the *Powering and controlling a LED lighting device with controlled-current output* section, later in this appendix.

Your Matrox Iris GT can generate a standard strobe signal to control a lighting controller. You can route the strobe signal to either auxiliary output signal 4 or 5, Connect the auxiliary output signal (for example, AUX(STB)_OPENC_OUT5) directly to the lighting controller's trigger input. Connect the ground of the lighting controller and the ground of your Matrox Iris GT to a common ground. In this connection, you also need an additional voltage source and depending on the voltage source, either a pull-up resistor or a voltage divider between your smart camera and the lighting controller.

- If the voltage source outputs the amount of voltage expected by the lighting controller, you need to add an external pull-up resistor. The external resistor pulls the voltage up to the external power supply's voltage ($+V_{ext}$).

In the following diagram, to control a light controller with a standard strobe pulse, connect AUX(STB)_OPENC_OUT5 to your light controller.

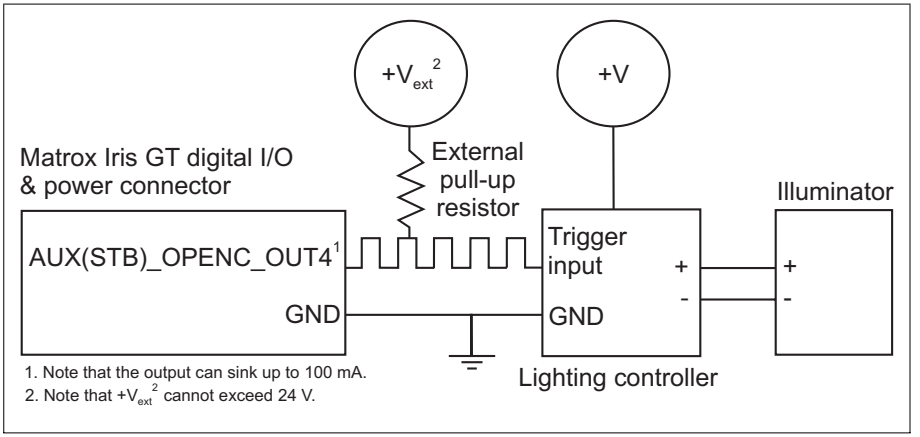


- Note that you must choose an appropriate resistance value for the pull-up resistor based on the voltage (V) and current (I) that your lighting controller expects for its illuminator trigger input. Also, you should choose a resistor rated at a power higher than the expected average power. The following formulas can be used to calculate the required resistance (R) and the expected power for that resistance (P).

$$R = \frac{V}{I} \qquad P = \frac{V^2}{R}$$

For example, if the external voltage, $+V_{ext}$, is 5 V, and your lighting controller expects a 5 V input signal with 5 mA of current, you should use a 1 KΩ resistor. The expected power would be 25 mW. In this case, it is recommended that you use a resistor rated for ¼ W, which is sufficiently higher than the average expected power.

- To control a light controller with a pulse-train strobe signal, connect AUX(STB)_OPENC_OUT4 to your light controller. Instead of having a pulse to indicate the start and duration of a light, it also has a pulse-train to indicate the required intensity of the light.



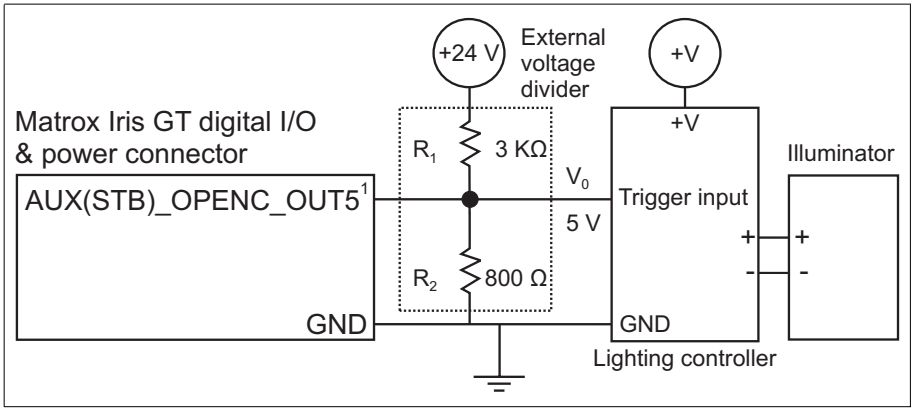
The pulse-train strobe output signal has a pulse-train with a duty cycle proportional to the intensity setting in your Matrox Design Assistant project. For more information on setting the intensity of the lighting device, refer to the Strobe section in the *Acquisition* chapter of the *Matrox Design Assistant User Guide*.

When the expected voltage is not supplied

- If the voltage source outputs a voltage that is different from what the lighting controller expects, you must add an external voltage divider between the external power supply, the Matrox Iris GT auxiliary output signal, and the lighting controller.

  In the following example, the lighting controller expects a 5 V TTL input signal. A 24 V voltage source is used to supply the voltage for the illuminator trigger input. As a result, a voltage divider is required to drop the voltage to 5 V.

$$V_0 = 24\text{V} \times \frac{R_2}{R_1 + R_2}$$



  - Note that resistors rated for ¼ W are recommended, since they can handle the expected power.

Powering and controlling a LED lighting device with controlled-current output

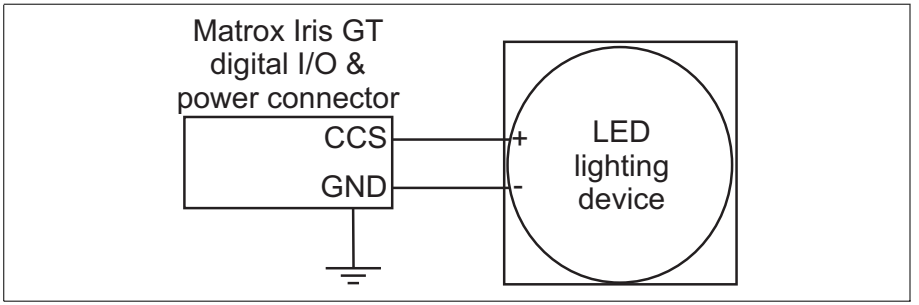
You can power and control a LED lighting device with the controlled-current output of your Matrox Iris GT. Note, to connect to a lighting controller, see the *Connecting to a lighting controller* subsection of the *Connecting external devices to auxiliary output signals* section, earlier in this appendix.

❖ Unlike the auxiliary output signals, the Matrox Iris GT controlled-current output (CCS) sources the current for a LED lighting device. Matrox Iris GT allows you to control the amount of current (mA) that is transmitted when the controlled-current output is enabled (ON), allowing you to control the intensity of the LED lighting device. Matrox Iris GT can provide up to 500 mA of current.

Matrox Design Assistant allows you to specify a value for the intensity, which maps to a value between 0 and 500 mA, in 256 steps. For more information, refer to the *Acquisition* chapter of the *Matrox Design Assistant User Guide*.

Refer to the documentation that came with your LED lighting device to learn the recommended amount of current to send.

Connect your Matrox Iris GT controlled-current output directly to the LED lighting device's positive terminal (+). Connect the ground of your Matrox Iris GT and the ground of the LED lighting device to a common ground.



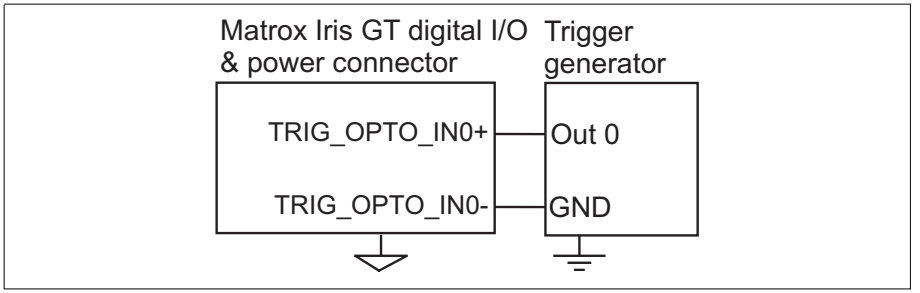
Connecting external devices to input signals

You can connect a wide variety of external devices to the input signals of your Matrox Iris GT, such as external triggering devices. For information on the electrical specifications of the ON and OFF voltage levels, see the *Electrical specifications* subsection of the *Matrox Iris GT specifications* section, in *Appendix B: Technical Reference*.

Connecting external triggering devices using the dedicated trigger signal

Connect TRIG_OPTO_IN0+ to the positive (+) trigger connector of your trigger generator.

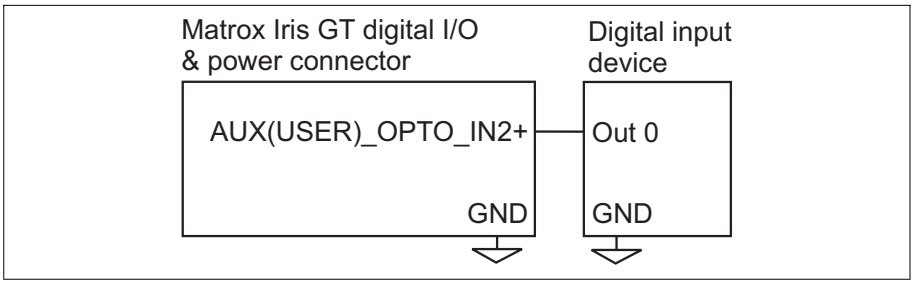
❖ Note that in all cases, your Matrox Iris GT auxiliary input and trigger signals expect to have a nominal voltage of 15 to 24 V.



In addition, connect the TRIG_OPTO_IN0- to the ground of the third party device. In this case, the trigger connection is reliant on the ground of the trigger generator, rather than the ground of your Matrox Iris GT. This results in your Matrox Iris GT and your trigger generator to each maintain its independent ground, and allows the connection with the trigger generator to be fully isolated.

Connecting an external device to an input signal

When using an auxiliary input signal, the negative versions of the signals are internally connected to the ground of your Matrox Iris GT. This results in a partially isolated connection, even when the external device has its own ground.



Appendix E: Connection modules

This appendix details the connection modules available for use with your Matrox Iris GT.

Connection modules

Instead of joining the wires of an open-ended cable, attached to your Matrox Iris GT, to your input and output devices, you can use a connection module. This ensures a safer, more robust, and reliable connection.

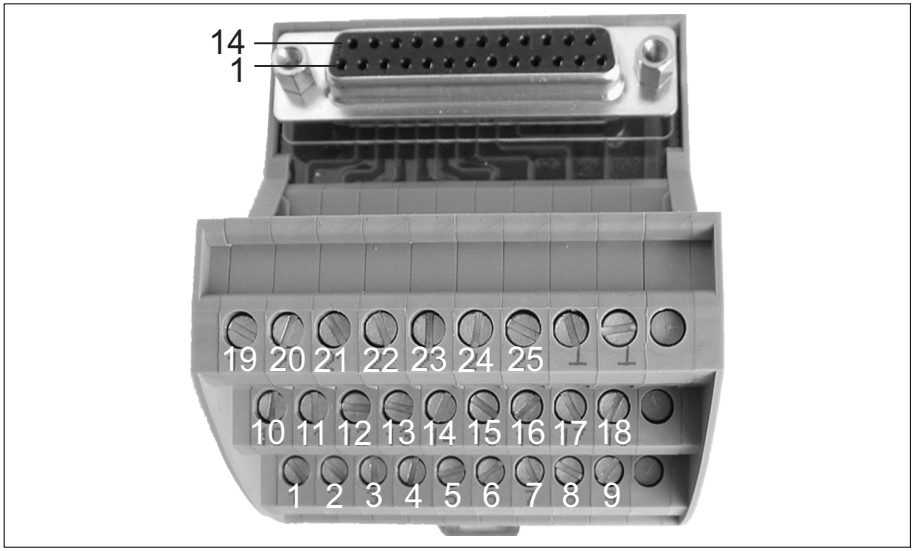
Simple connection modules, like the VIP-3/SC/D25SUB/F VARIOFACE module and the DFLK-D25 SUB/B VARIOFACE module, route I/O signals directly to/from specific wire terminals. Other, more feature-rich connection modules, like the Matrox breakout board and the Matrox Breakout Box connection module, provide additional features.

Feature	Simple connection modules		Feature-rich connection modules	
	VIP-3/SC/D25SUB/F VARIOFACE module	DFLK-D25 SUB/B VARIOFACE module	Matrox breakout board	Matrox Breakout Box
Route I/O signals directly to/from specific wire terminals from/to your Matrox Iris GT.	Yes	Yes	Yes	Yes
Connect to a serial cable, allowing you to view the RS-232 (serial) signal information from your smart camera on your computer.			Yes	Yes
Create input signals without a third-party device.			Yes	
Reroute output signals to your input signals.			Yes	
Opto-isolate I/O signals using G4 Opto-22 standard I/O modules.				Yes
Support for an open-ended M12 17-pin cable.			Yes	
Support for an M12 17-pin to DB-25 cable that has a M12 17-pin connector on one end and a DB-25 connector on the other.	Yes	Yes		Yes
Cable is provided with the connection module.			Yes	Yes

This appendix provides pinout information for the simple connection modules. For information about the Matrox breakout board, refer to *Appendix F: The Matrox breakout board*. For information about the Matrox Breakout Box connection module, refer to the *Matrox Breakout Box Installation and Technical Reference* manual.

VIP-3/SC/D25SUB/F VARIOFACE module

The VIP-3/SC/D25SUB/F VARIOFACE module is a DIN-rail mountable module that connects a DB-25 connector to 25 wire terminals. The VIP-3/SC/D25SUB/F VARIOFACE module passes the signals from the digital I/O and power connector of your Matrox camera to the connected third-party product(s).



Wire terminal of VIP-3/SC/D25SUB/F VARIOFACE module	Matrox Iris GT signal name	Pin number of Matrox Iris GT digital I/O and power cable connector (DB-25)	Matrox Iris GT signal description
1	AUX(USER)_OPTO_IN0+	14	Opto-isolated auxiliary signal 0 (input), positive. Supported function: User-defined signal 0 (input 1 of 4). Note: The negative component of this signal is internally connected to the ground.
2	AUX(USER)_OPTO_IN2+	5	Opto-isolated auxiliary signal 2 (input), positive. Supported function: User-defined signal 2 (input 3 of 4). Note: The negative component of this signal is internally connected to the ground.
4	Reserved	4	Do not connect.
5	AUX(STB)_OPENC_OUT4	12	Open-collector auxiliary signal 4 (output). Supported function: Pulse-train strobe signal (pulse-train generated with a pulse width modulator (PMW)), user-defined signal 4 (output 1 of 4), exposure signal, or trigger signal bypass.

Wire terminal of VIP-3/SC/D25SU B/F VARIOFACE module	Matrox Iris GT signal name	Pin number of Matrox Iris GT digital I/O and power cable connector (DB-25)	Matrox Iris GT signal description
6	AUX(USER)_OPENC_OUT6	11	Open-collector auxiliary signal 6 (output). Supported function: User-defined signal 6 (output 3 of 4) or exposure signal.
7	CCS	17	Controlled-current output, designed to be connected to a LED lighting device (0-500 mA, intensity controlled using the internal version of the pulse-train strobe signal, generated with a pulse width modulator (PMW)). Note that when you use a 24 V power source for your Matrox Iris GT, the CCS can output from 2.4 V to 21 V to your LED lighting device. If, however, you use a 12 V power source, the CCS can output from 2.4 V to 10 V to your LED lighting device.
8	Reserved	4	Do not connect.
9	GND	16	Ground. This ground is reserved for use with the ground from your power supply.
10	Reserved	4	Do not connect.
10	TxD_RS232	10	RS-232 transmit.
11, 23	PWR	8,9	Power provided to your Matrox Iris GT. The power must be either +12 V or +24 V +/- 10%. The amount of power required is determined by the power requirements of the devices attached to your Matrox Iris GT (such as a ring LED).
12	Reserved	4	Do not connect.
13	RxD_RS232	1	RS-232 receive.
14	AUX(USER)_OPTO_IN1+	6	Opto-isolated auxiliary signal 1 (input), positive. Supported function: User-defined signal 1 (input 2 of 4). Note: The negative component of this signal is internally connected to the ground.
15	AUX(USER)_OPTO_IN3+	13	Opto-isolated auxiliary signal 3 (input), positive. Supported function: User-defined signal 3 (input 4 of 4). Note: The negative component of this signal is internally connected to the ground.
16	TRIG_OPTO_IN0-	15	Opto-isolated trigger input signal, negative.
17	Reserved	4	Do not connect.
18	AUX(STB)_OPENC_OUT5	3	Open-collector auxiliary signal 5 (output). Supported function: Standard strobe signal (pulse), user-defined signal 5 (output 2 of 4), exposure signal, or trigger signal bypass.
19	AUX(USER)_OPENC_OUT7	2	Open-collector auxiliary signal 7 (output). Supported function: User-defined signal 7 (output 4 of 4).

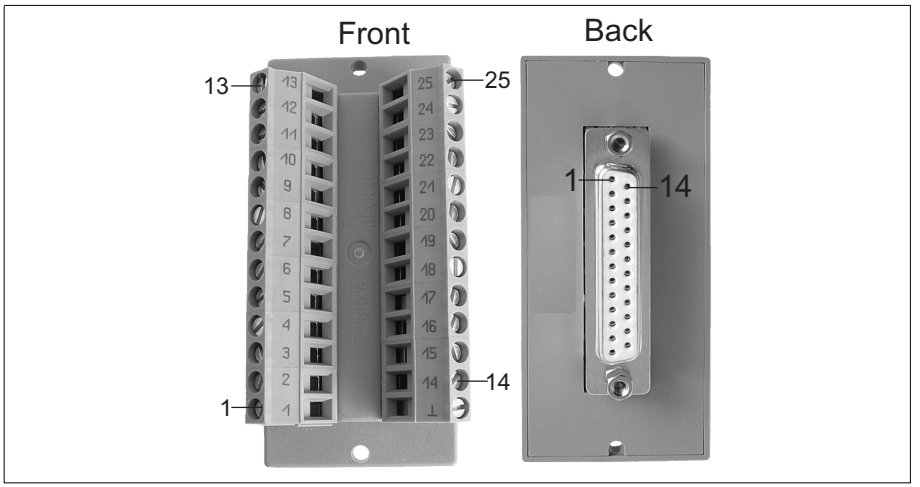
Wire terminal of VIP-3/SC/D25SUB/F VARIOFACE module	Matrox Iris GT signal name	Pin number of Matrox Iris GT digital I/O and power cable connector (DB-25)	Matrox Iris GT signal description
20, 21, 22, 24	Reserved	4	Do not connect.
25	TRIG_OPTO_IN0+	7	Opto-isolated trigger input signal, positive.

This connection module can be purchased from the following source:

	Cable information
Manufacture:	Phoenix Contact GmbH & Co. KG
Connector:	VIP-3/SC/D25SUB/F
Part Number:	2315188
Description:	VARIOFACE module, with screw connection and female D-Subminiature pin strip, for mounting on NS 35/7.5 or NS 32, 25-pos.

DFLK-D25 SUB/B VARIOFACE module

The DFLK-D25 SUB/B VARIOFACE module is a screw-mountable connection module that connects a DB-25 connector to 25 wire terminals. The DFLK-D25 SUB/B VARIOFACE module passes the signals from the digital I/O and power connector of your Matrox camera to the connected third-party product(s).



The DFLK-D25 SUB/B VARIOFACE module has the same pin-out information as the VIP-3/SC/D25SUB/F VARIOFACE module, described earlier in this appendix.

This module can be purchased from the following source:

	Cable information
Manufacture:	Phoenix Contact GmbH & Co. KG
Connector:	DFLK-D25 SUB/B
Part Number:	2280323
Description:	VARIOFACE panel feed-through module, for direct coupling of single signal lines of up to 2.5 mm^2, with D-Subminiature socket strip, 25-pos.

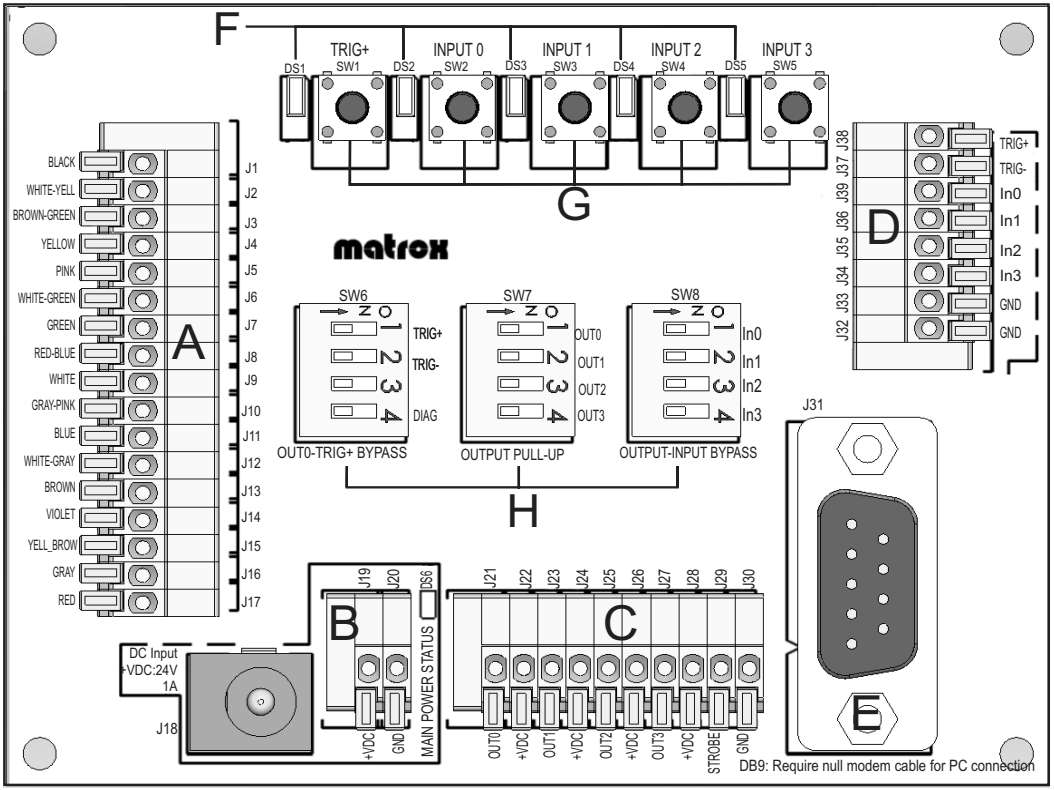
Appendix F: The Matrox breakout board

This appendix describes how to use the Matrox breakout board to connect your Matrox Iris GT to power and/or to third-party devices, such as input generators, trigger generators, and output-receiving devices (such as LED lighting).

Introducing the Matrox breakout board

The Matrox breakout board allows you to test the inputs and outputs of your Matrox Iris GT, as well as initially power your smart camera. The Matrox breakout board provides a convenient way to connect the digital I/O and power cable, re-route signals, and generate triggers.

In addition, the Matrox breakout board allows you to send and receive RS-232 information over a serial cable between your Matrox Iris GT and your development computer, allowing you to view the RS-232 signal information through a terminal emulation program.



A. Matrox camera connector.
B. Power source connector.
C. Output connector.
D. Input connector.
E. RS-232 serial connector.
F. LEDs.
G. Push buttons.
H. Switch boxes.

Matrox breakout board

Your Matrox breakout board has the following connectors:

- **Input connector.** The input connector receives trigger-generating signals and auxiliary input signals from third-party input-generating devices. The input connector can receive signals between 15 and 24 V.

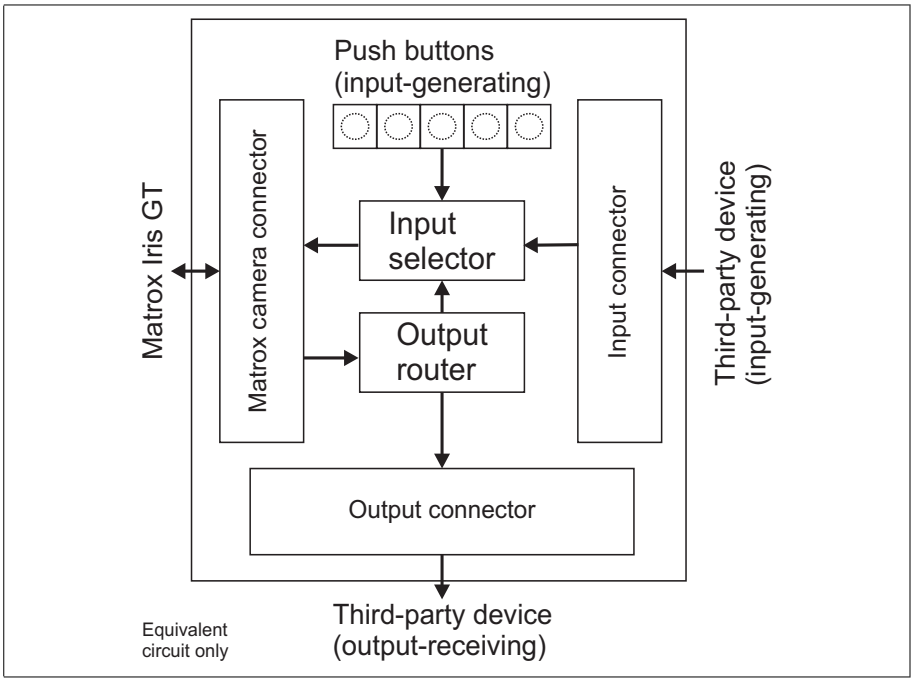
- **Output connector**. The output connector sends controlled-current output and auxiliary output signals to third party devices. The output connector uses Open-collector output signals that support from 0 to 24 V.

- **Power source connector**. The power source connector is used to power the Matrox breakout board and your Matrox Iris GT. The power source connector includes both a terminal block connector and a DC power socket.

- **Matrox camera connector**. The Matrox camera connector is used to connect your Matrox breakout board to your Matrox Iris GT, using the Matrox Iris GT digital I/O and power cable.

- **RS-232 connector**. The RS-232 connector can send and receive RS-232 signals over a serial cable. You can use a terminal emulation program to view your Matrox camera's operating systems output information.

The following is a flow diagram of the input and output signals of the Matrox breakout board:



When an auxiliary output signal is on, the circuit is grounded and the current flows from the connected device to your Matrox Iris GT (the observed voltage at the output pin will be low). When the auxiliary output signal is off, the circuit is open (the observed voltage will be high if pulled high by the connected circuitry).

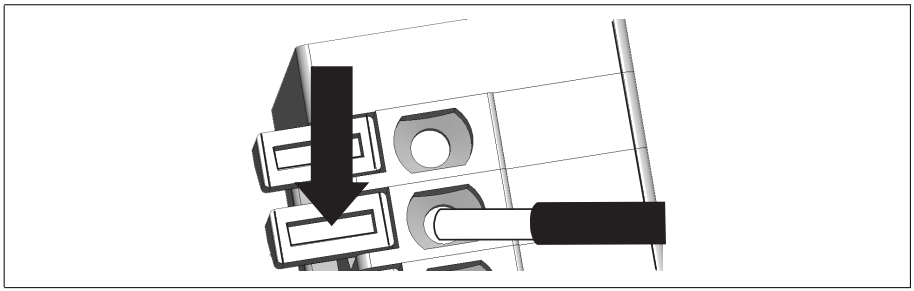
State of the output signal	State of the sink driver	Circuit goes to
On	Closed	Ground
Off	Open	Not grounded (floating)

The exact connection between your Matrox breakout board, the connected external device, and its power source depends entirely on the type of external device to which you connect.

Connecting an open-wire to a wire-terminal

Most connectors on your Matrox breakout board have wire-terminals instead of pins. To connect an open-wire to a wire-terminal, perform the following:

1. Press down on the orange flange with a small tool or pen.



2. Insert the un-insulated and tinned wire tip into the hole before releasing the orange flange.

   The wire is now attached to the terminal block connector on the Matrox breakout board.

Powering and connecting to your Matrox Iris GT

To power your Matrox Iris GT and connect its I/O signals to your Matrox breakout board, perform the following:

1. Connect the gray, red, and yellow-brown wires of the digitial I/O and power cable to the J15, J16, and J17 wire terminals (connectors) of the Matrox camera connector, respectively. For information on how to connect a wire to the wire-terminal, refer to the *Connecting an open-wire to a wire-terminal* section, earlier in this appendix.

2. If only powering your Matrox Iris GT, wrap insulating tape around each of the unused wires of the Matrox Iris GT digital I/O and power cable. Otherwise, connect them to the appropriate wire terminals of the Matrox camera connector; for information, see the *Matrox camera connector* subsection of the *Open-wire connectors reference* section, later in this appendix.

3. Connect the digital I/O and power cable to your Matrox Iris GT.

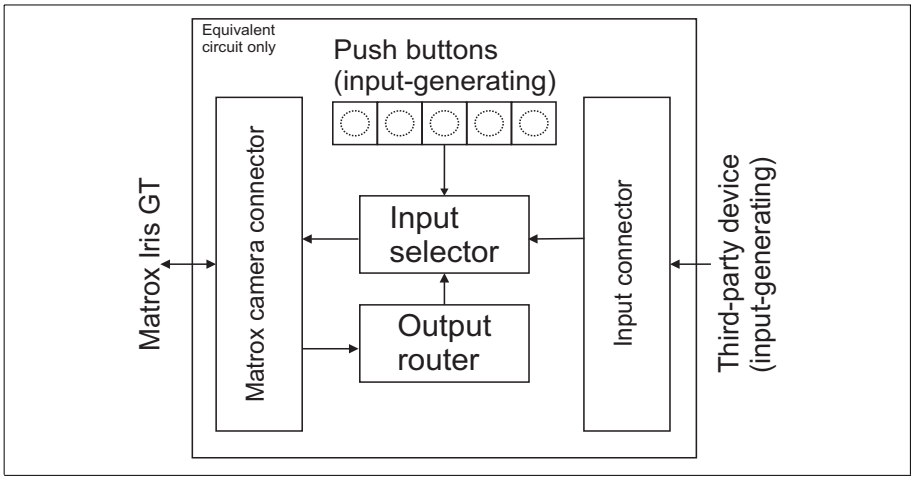
4. Connect the external power supply, included in the Matrox Iris GT starter kit, to your AC power source.

5. Connect the external power supply to the DC power socket of the power source connector (J18) on your Matrox breakout board.

Routing input signals to Matrox Iris GT

There are four exclusive ways to route an input signal to your Matrox Iris GT:

- Route a signal from a third party device to your Matrox Iris GT.
- Generate a Matrox Iris GT auxiliary input or trigger signal with a push button.
- Route a Matrox Iris GT auxiliary output signal to a Matrox Iris GT auxiliary input signal.
- Route one Matrox Iris GT auxiliary output signal to the Matrox Iris GT trigger signal.



Routing a signal from a third party device to your Matrox Iris GT

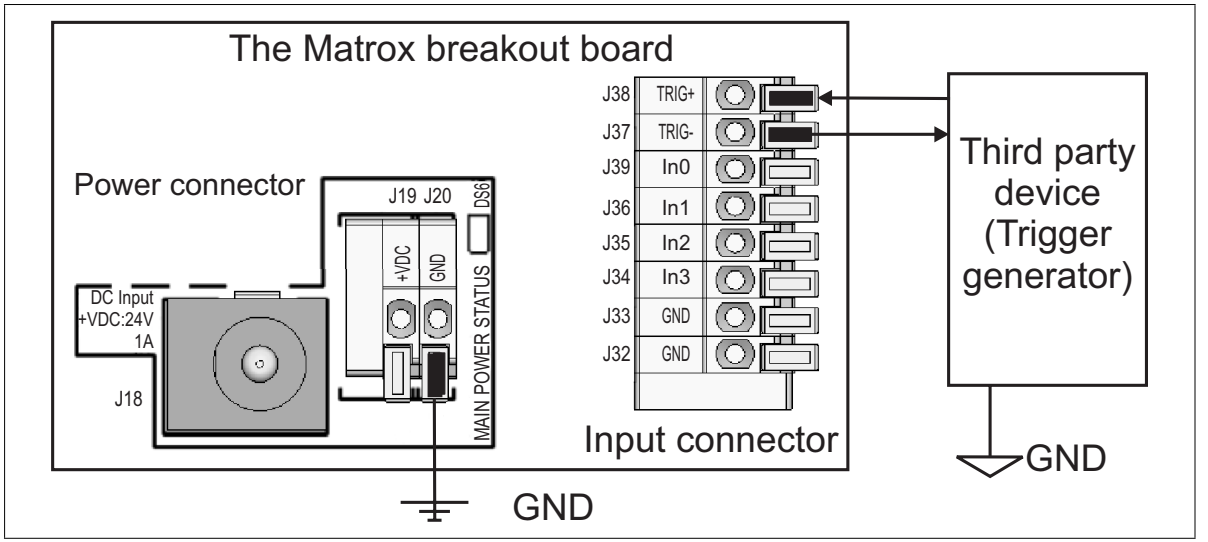
The Matrox breakout board can route an auxiliary input or trigger signal from a third-party device to your Matrox Iris GT through its input connector. For more information, refer to the *Connecting external devices to auxiliary output signals* section, in *Appendix D: Using the I/O signals and controlled-current output of Matrox Iris GT*.

To route an auxiliary input from a third-party device to your Matrox Iris GT through your Matrox breakout board's input connector, perform the following:

1. Connect the power and the digital I/O signals of your Matrox Iris GT to your Matrox breakout board by following the steps in the *Powering and connecting to your Matrox Iris GT* section, earlier in this appendix.

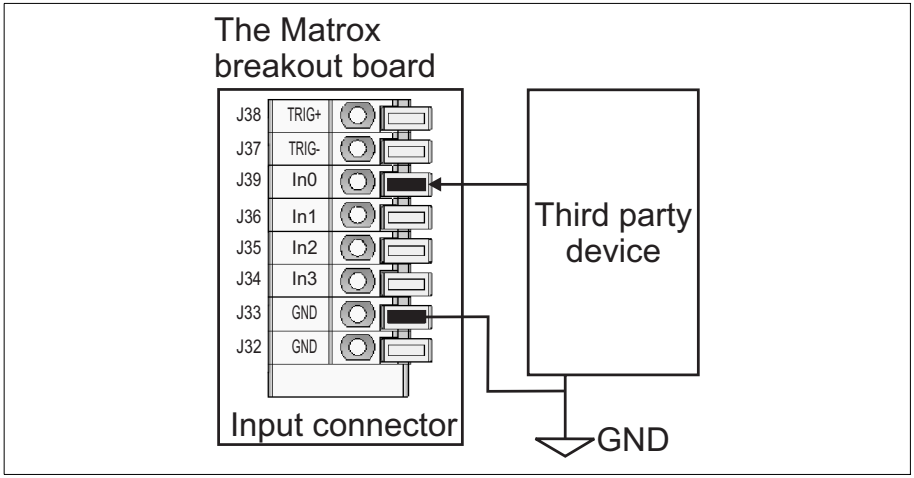
   - Note that your Matrox breakout board expects the auxiliary input signal to have a nominal voltage of 15 to 24 V.

2. If routing the signal to the Matrox Iris GT trigger input signal, connect the TRIG+ wire terminal (J37 on the input connector) to the positive (+) trigger output of your trigger generator.



In addition, connect TRIG- to the ground of the third-party device. Alternatively, turn on output-to-trigger bypass switch 2 (SW6[2]). This grounds the trigger signal (TRIG-).

3. If routing auxiliary input signals that are not trigger signals, connect the ground of the input connector (J32 or J33) to the ground of the third-party device providing the signal.



Generating a Matrox Iris GT auxiliary input or trigger signal with a push button

You can generate a Matrox Iris GT auxiliary input signal or a Matrox Iris GT trigger signal using the push buttons on the Matrox breakout board. To do so, perform the following:

1. Connect the power and the digitial I/O signals of your Matrox Iris GT to the Matrox breakout board by following the steps in the *Powering and connecting to your Matrox Iris GT* section, earlier in this appendix.

2. If generating a trigger signal, turn on output-to-trigger bypass switch 2 (SW6[2]). This grounds the trigger signal (TRIG-).

3. Press a push button to generate an auxiliary input or trigger signal. Your Matrox breakout board has 5 push buttons (TRIG+ through INPUT 3), one for each of the four auxiliary input signals of your Matrox Iris GT and one for the trigger signal. See the *Push buttons* section, later in this appendix, for the correspondence between the push button and the Matrox Iris GT input signals. For example, to generate a signal that will be received by Matrox Iris GT auxiliary input signal 0 (AUX(USER)_OPTO_IN0+), press the INPUT 0 push button.

   Each input signal should have only one input source. For example, when using a push button, it should always be the only source of input for that signal, and not have to compete with the signal from a third-party device or the re-routing of an output signal.

4. Repeat for each Matrox Iris GT auxiliary input or trigger signal that you want to generate.

Routing a Matrox Iris GT auxiliary output signal to a Matrox Iris GT auxiliary input signal

You can route Matrox Iris GT auxiliary output signals 4 to 7 to Matrox Iris GT auxiliary input signal 0 to 3, respectively. This is primarily used for testing, allowing you to receive what was sent on the Matrox Iris GT auxiliary output signals. To route a Matrox Iris GT auxiliary output signal to a Matrox Iris GT auxiliary signal, perform the following:

1. Connect the power and the digital I/O signals of your Matrox Iris GT to the Matrox breakout board by following the steps in the *Powering and connecting to your Matrox Iris GT* section, earlier in this appendix.

2. For each auxiliary output signal to route to an auxiliary input, switch on an output-to-input bypass switch. The output-to-input bypass switch box (SW8) has 4 switches, each one representing one of the four auxiliary input signals of your Matrox Iris GT. To route Matrox Iris GT auxiliary output signal 4 (AUX(STB)_OPENC_OUT4) to auxiliary input signal 0 (AUX(USER)_OPTO_IN0+), turn on output-to-input bypass switch 1 (SW8[1]). Repeat for each auxiliary output signal to be re-routed to a auxiliary input signal. For more information on the output-to-input bypass switch box (SW8), see the *Output-to-input bypass switch box* subsection of the *Switch boxes* section, later in this appendix.

   Each input signal should have only one input source. For example, when an output signal is re-routed to an input signal, it should always be the only source of input for that signal, and not have to compete with the signal from a third-party device or a push button.

3. For each auxiliary output signal routed to an auxiliary input, switch on an output pull-up resistor. The output pull-up resistor switch box (SW7) has 4 switches, each one representing one of the four auxiliary output signals of your Matrox Iris GT. If routing Matrox Iris GT auxiliary output signal 4 (AUX(STB)_OPENC_OUT4) to auxiliary input signal 0 (AUX(USER)_OPTO_IN0+), turn on output pull-up resistor switch 1 (SW7[1]). For more information on the output pull-up resistor switch box (SW7), see the *Output pull-up resistor switch box* subsection of the *Switch boxes* section, later in this appendix.

Routing one Matrox Iris GT auxiliary output signal to the Matrox Iris GT trigger signal

You can route Matrox Iris GT auxiliary output signal 4 (AUX(STB)_OPENC_OUT4) to the Matrox Iris GT trigger signal (TRIG_OPTO_IN0+), using the output-to-trigger bypass switch box (SW6). To do so, perform the following:

1. Connect the power and the digital I/O signals of your Matrox Iris GT to the Matrox breakout board by following the steps in the *Powering and connecting to your Matrox Iris GT* section, earlier in this appendix.

2. Turn on output-to-trigger bypass switch 1 (SW6[1]).

   The trigger input signal should have only one input source. For example, when auxiliary output signal 4 is re-routed to the trigger signal, it should always be the only source of input for that signal, and not have to compete with the signal from a third-party device or a push button.

3. Turn on output-to-trigger bypass switch 2 (SW6[2]). This grounds the Matrox Iris GT TRIG_OPTO_IN- signal.

   For more information on the output-to-trigger bypass switch box (SW6), see *Output-to-trigger bypass switch box* subsection of the *Switch boxes* section, later in this appendix.

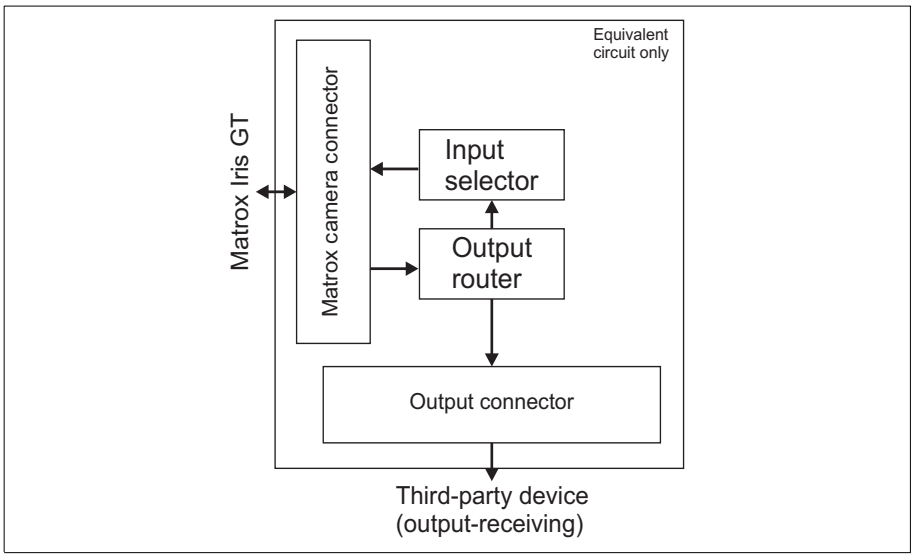
4. Turn on output pull-up resistor switch 1 (SW7[1]).

   For more information on the output pull-up resistor switch box (SW7), see the *Output pull-up resistor switch box* subsection of the *Switch boxes* section, later in this appendix.

Routing Matrox Iris GT output signal

There are five ways to route a Matrox Iris GT output:

- Route a Matrox Iris GT auxiliary output signal to a third-party device.
- Route an auxiliary output signal (strobe signal) from your Matrox Iris GT to a lighting controller.
- Route a controlled-current output from your Matrox Iris GT to a LED lighting device.
- Route a Matrox Iris GT auxiliary output signal to a Matrox Iris GT auxiliary input signal. See the *Routing a Matrox Iris GT auxiliary output signal to a Matrox Iris GT auxiliary input signal* subsection of the *Routing input signals to Matrox Iris GT* section, earlier in this appendix.
- Route Matrox Iris GT auxiliary output signal 4 (AUX(STB)_OPENC_OUT4) to the Matrox Iris GT trigger signal (TRIG_OPTO_IN+). See the *Routing one Matrox Iris GT auxiliary output signal to the Matrox Iris GT trigger signal* subsection of the *Routing input signals to Matrox Iris GT* section, earlier in this appendix.



Routing a Matrox Iris GT auxiliary output signal to a third-party device

You can route an auxiliary output signal from your Matrox Iris GT to a third-party device. To do so, perform the following:

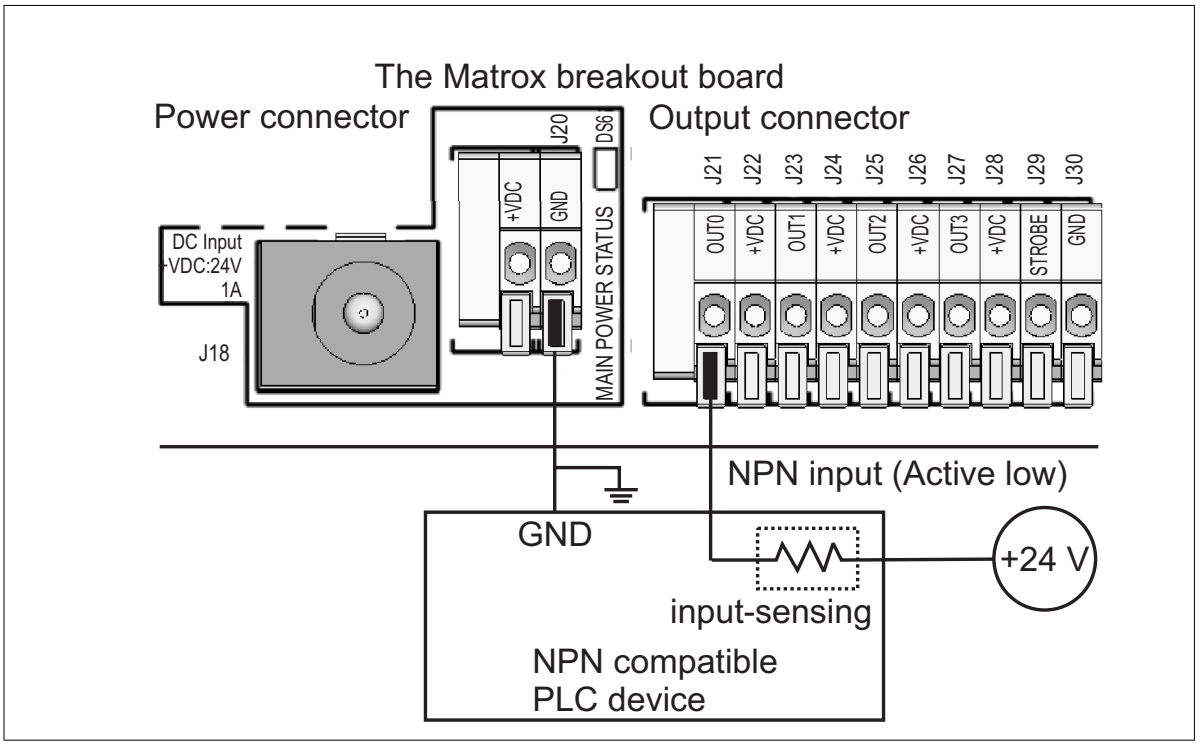
1. Connect the power, current-controlled output, and the digital I/O signals of your Matrox Iris GT to the Matrox breakout board by following the steps in the *Powering and connecting to your Matrox Iris GT* section, earlier in this appendix.

2. Connect an open-wire cable from the third-party device to the relevant wire-terminal of the output connector. For more information, refer to the *Connecting an open-wire to a wire-terminal* section, earlier in this appendix.

   - Note that when the auxiliary output signal is on, the circuit is grounded and the current flows from the connected device to your Matrox breakout box (the observed voltage at the output pin will be low). When the auxiliary output signal is off, the circuit is open (the observed voltage will be high if pulled high by the connected circuitry). For more information, refer to the *Connecting external devices to auxiliary output signals* section, in *Appendix D: Using the I/O signals and controlled-current output of Matrox Iris GT*.

Connecting to an NPN-compatible PLC device

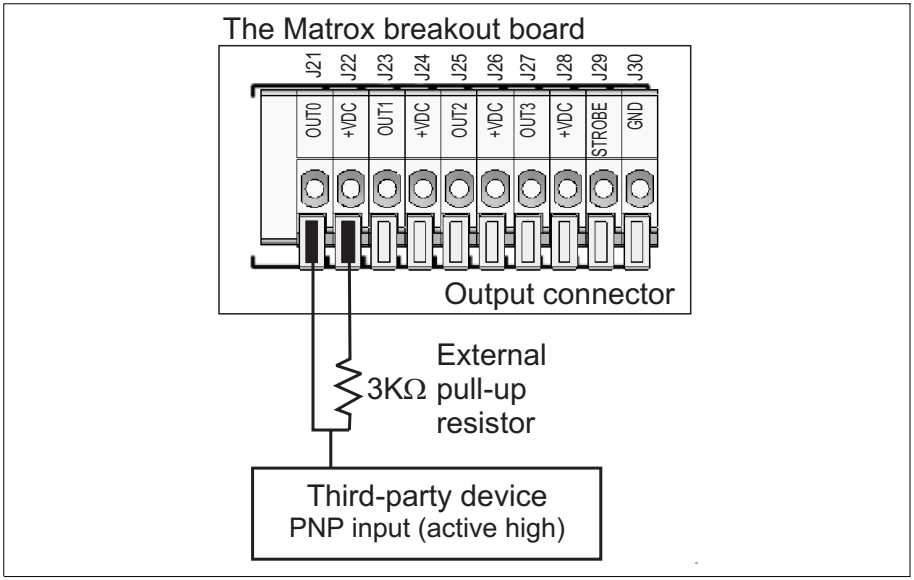
- To connect to an NPN-compatible PLC device, connect the ground of the third-party device and the GND wire-terminal of your Matrox breakout board to a common ground.



Connecting to a PNP-compatible PLC device

- When connecting to a PNP-compatible PLC device, you can either add an external pull-up resistor between the third-party device and your Matrox breakout board, or use the output pull-up resistor of your Matrox breakout board.

  To use an external pull-up resistor, connect the voltage input wire from your external pull-up resistor to the associated +VDC wire terminal. This connection will power your external pull-up.



  - Note that resistors rated for ¼ W are recommended, since they can handle the expected power.

Using the Matrox breakout board's output pull-up resistor

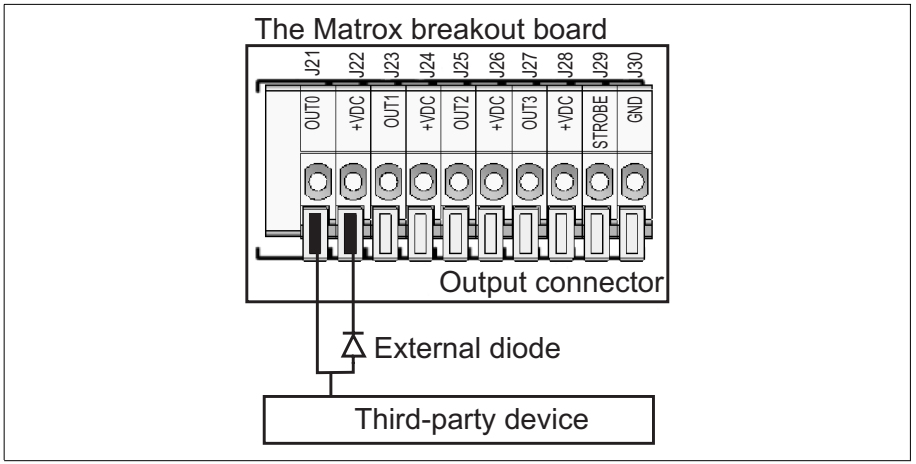
To use an output pull-up resistor on the Matrox breakout board, turn on the output pull-up resistor switch for the auxiliary output signal used. The output pull-up resistor switch box (SW7) has 4 switches, each one representing one of the four auxiliary output signals of your Matrox Iris GT.

- Note that the amount of resistance provided by the Matrox breakout board is 3 KΩ, which is suitable for a 24 V power supply. If another level of resistance is required, an external pull-up resistor must be used.

For the correspondence between the output signals and the output pull-up resistor switch box (SW7), see the *Output pull-up resistor switch box* subsection of the *Switch boxes* section, later in this appendix. For example, to use Matrox Iris GT auxiliary output signal 4 (AUX(STB)_OPENC_OUT4), turn on output pull-up resistor switch 1 (SW7[1]).

Connecting to an inductive load device

- When connecting to an inductive load device, use an external diode between the third-party device and your Matrox breakout board. The diode protects your Matrox breakout board from over-voltage, which occurs when the connected device disconnects.

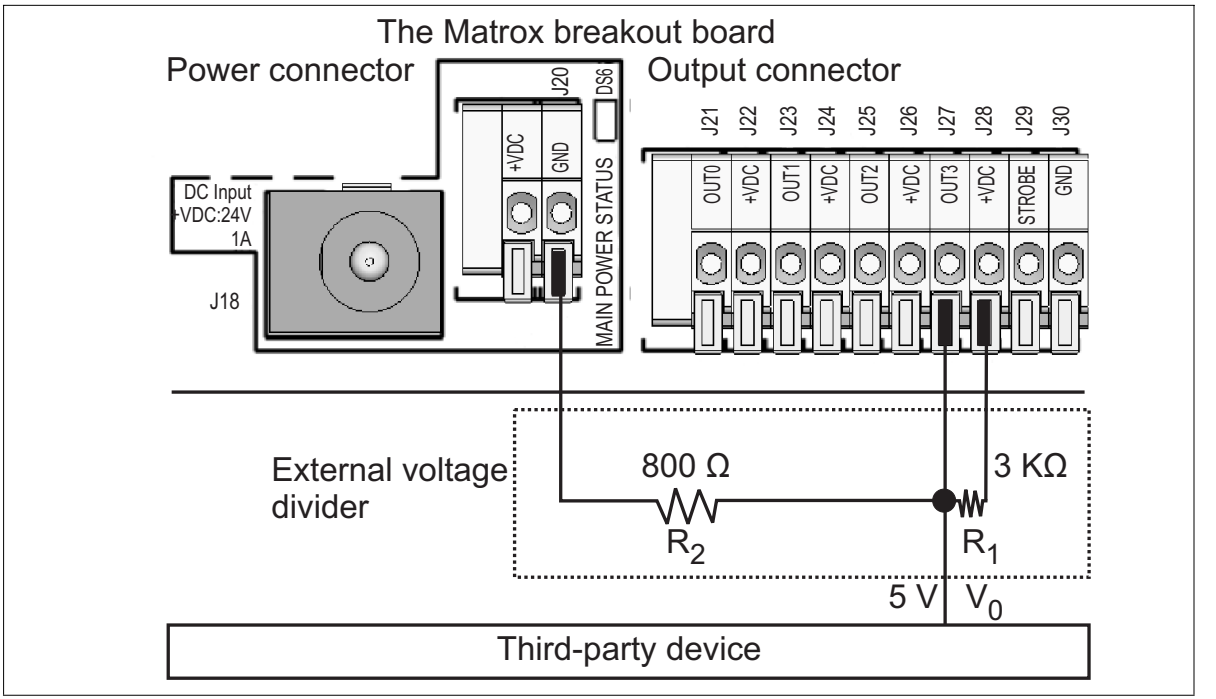


In addition, connect the ground of the inductive load device and the ground of your Matrox breakout board to a common ground.

- Note that, in this configuration, your third-party device must be powered at the same voltage as the Matrox breakout board (that is, either 12 or 24 V).

Connecting to a device that only accepts TTL signals

- When connecting to a third-party device that only accepts TTL signals, add an external voltage divider between the third-party device and the Matrox breakout board. Connect the voltage input wire from your external voltage divider to the 24 V wire-terminal and connect the ground of your voltage divider to the GND wire-terminal of the Matrox breakout board. Select a voltage divider whose resistors reduce the voltage such that the connected third-party device receives 5 V.



- Note that resistors rated for ¼ W are recommended, since they can handle the expected power.

Routing an auxiliary output signal from your Matrox Iris GT to a light controller

You can route an auxiliary output signal from your Matrox Iris GT to the illuminator trigger input of the light controller (for example, a strobe controller device). To do so, perform the following:

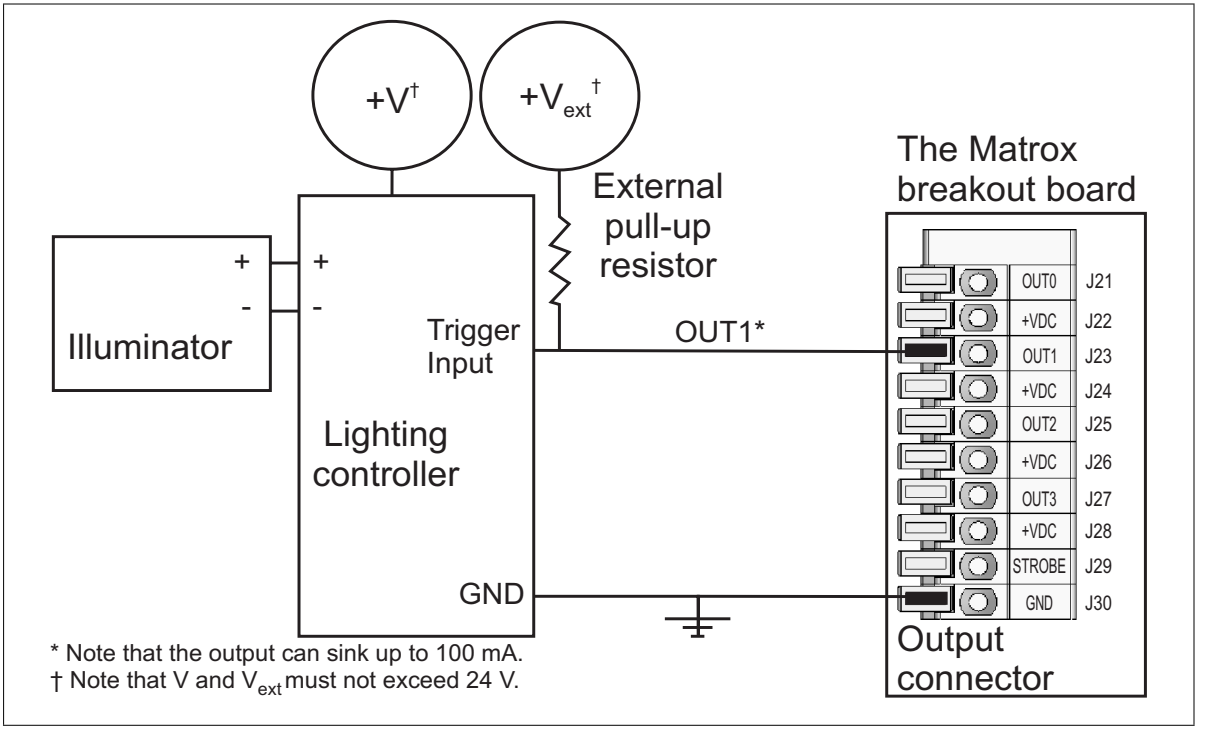
1. Connect the power and the digital I/O signals of your Matrox Iris GT to the Matrox breakout board by following the steps in the *Powering and connecting to your Matrox Iris GT* section, earlier in this appendix.

2. Connect auxiliary output signal 0 (OUT0) or auxiliary output signal 1 (OUT1) to the trigger input pin (for example, a TTL In) of your lighting controller. To source the voltage for the signal, use an external power supply. Connecting to the lighting controller depends on how the expected voltage is supplied:

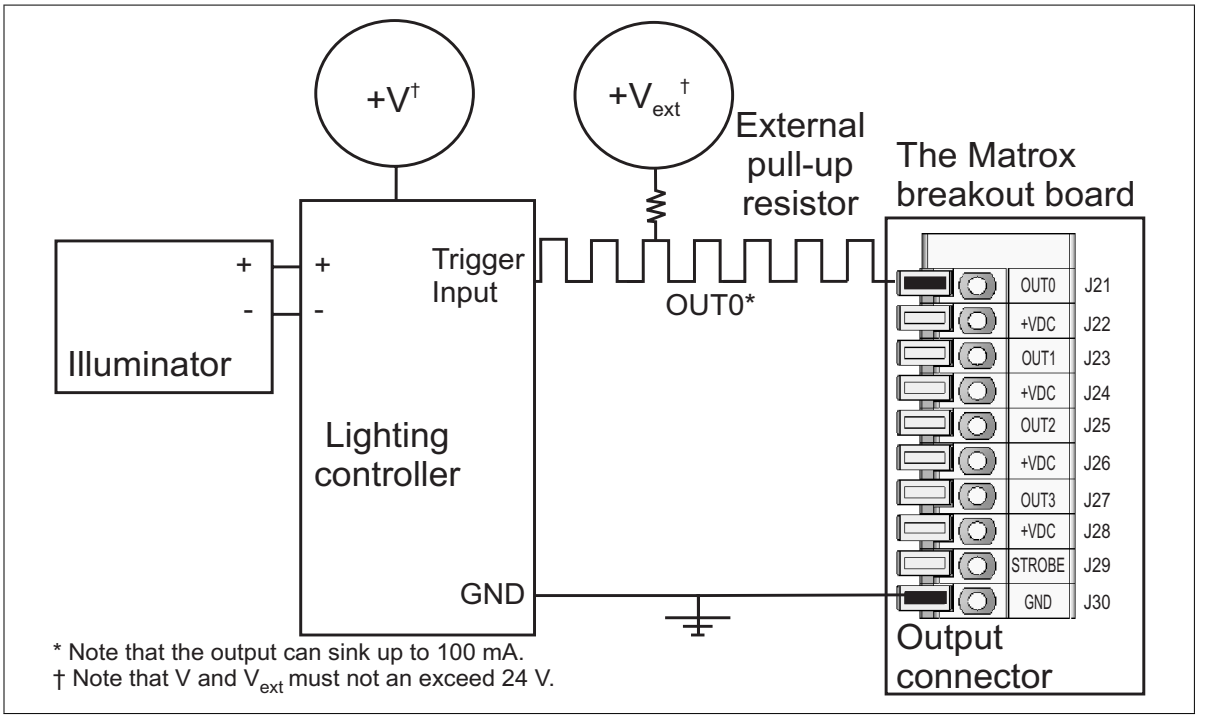
When the expected voltage is supplied

- If the voltage source outputs the amount of voltage expected by the lighting controller, you need to add an external pull-up resistor. The external resistor pulls the voltage up to the external power supply's voltage ($+V_{ext}$).

  Connect the GND wire-terminal of the output connector and the ground of the lighting controller to a common ground. To control a lighting controller with a standard strobe pulse, connect OUT1 to the trigger input pin of your lighting controller.



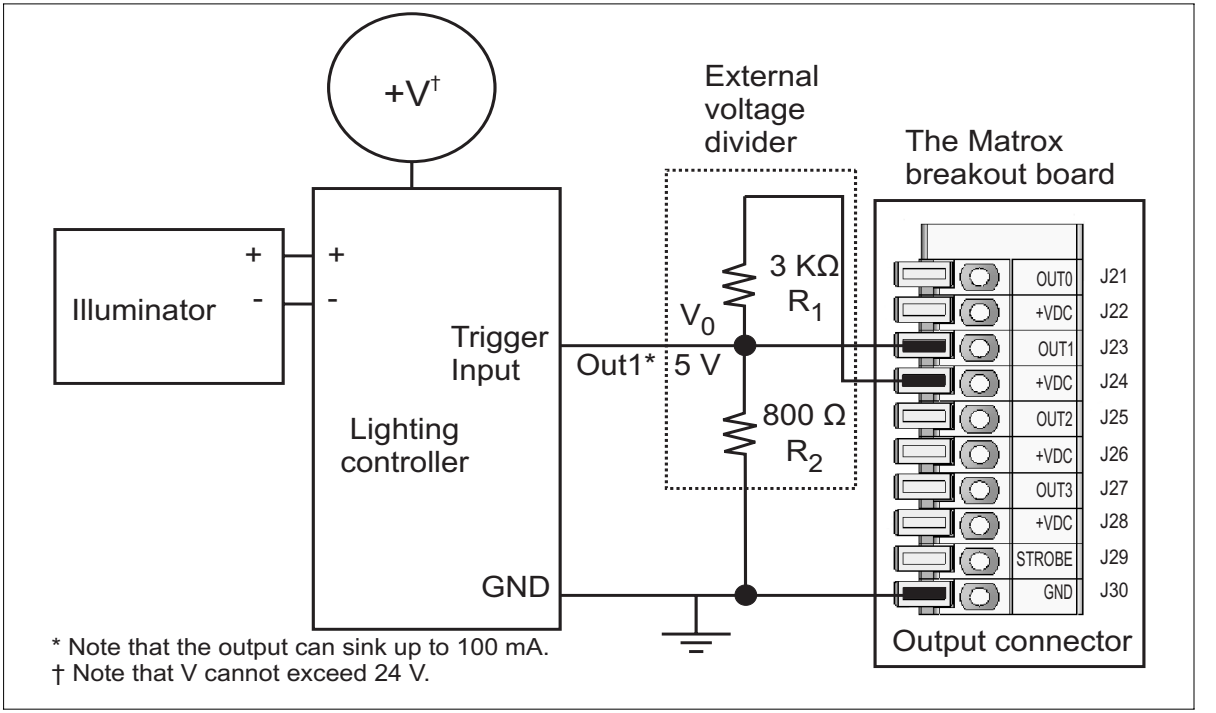
To control a light controller with a pulse-train strobe signal (PWM, strobe pulse), connect OUT0 to your lighting controller.



When the supplied voltage is higher or lower than expected

- If the voltage source outputs a voltage that is different from what the lighting controller expects, you must add an external voltage divider between the power supply, your Matrox breakout board output signal, and the lighting controller.

  In the following example, the lighting controller expects a 5 V TTL input signal. The 24 V output of the Matrox breakout board is used to supply the strobe signal voltage. As a result, a voltage divider is required to drop the voltage to 5 V.



  - Note that resistors rated for ¼ W are recommended, since they can handle the expected power.

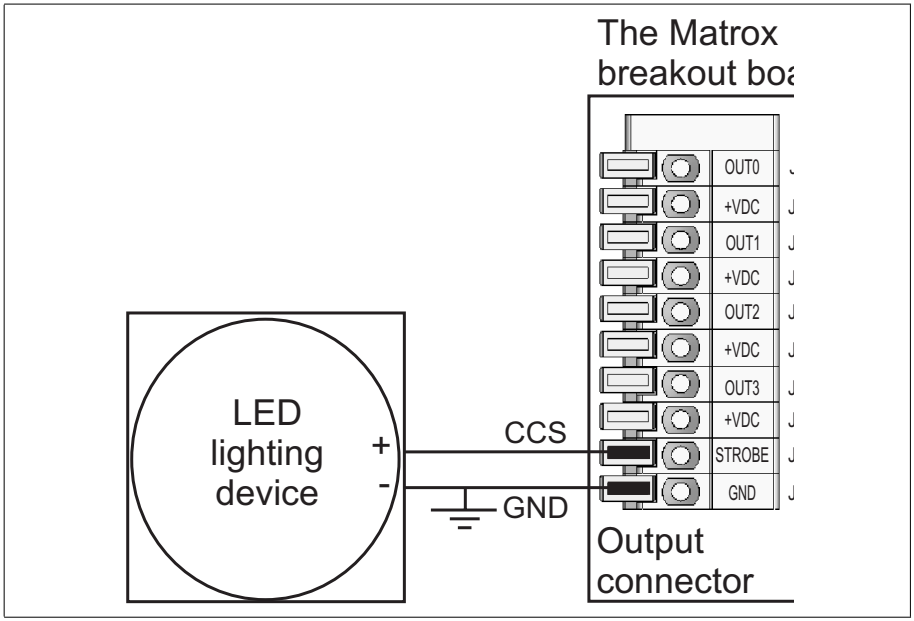
Routing the controlled-current output from your Matrox Iris GT to a LED lighting device

You can route the controlled-current output from your Matrox Iris GT to a LED lighting device through your Matrox breakout board. To do so, perform the following:

1. Connect the power, current-controlled output, and the digital I/O signals of your Matrox Iris GT to the Matrox breakout board by following the steps in the *Powering and connecting to your Matrox Iris GT* section, earlier in this appendix.

2. Connect an open-wire cable from the positive wire terminal (+) of the LED lighting device to the STROBE[1]/J29 wire terminal of the output connector.

3. Connect an open-wire cable from the negative wire terminal (-) of the LED lighting device to the GND/J30 wire terminal of the output connector.



For more information, refer to *Powering and controlling a LED lighting device with controlled-current output* section, in *Appendix D: Using the I/O signals and controlled-current output of Matrox Iris GT*.

1. The CCS is labeled STROBE on the Matrox breakout board.

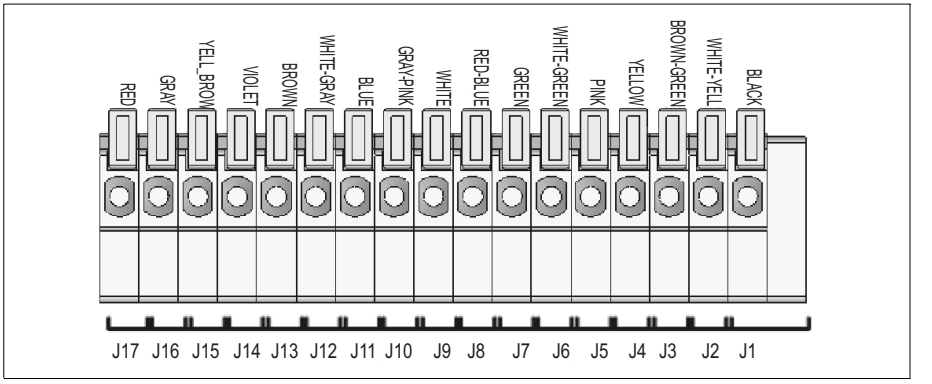
Open-wire connectors reference

The Matrox breakout board has four separate cable connectors (see A, B, C and D in the diagram at the beginning of this appendix) designed for open-wire connections. Each connector is composed of multiple wire terminals. Each of these wire terminals requires a stripped cable to be inserted, wire by wire, into the available holes. Each wire terminal is numbered J1 though J39 on the board.

Matrox breakout board connector name	Wire terminal	Connector type
Matrox camera connector	J1-J17	Connects your Matrox Iris GT to the Matrox breakout board via the digital I/O and power cable.
Power source connector	J19-J20	Provides power to the Matrox breakout board.
Output connector	J21-J30	Connects to a third-party devices so that they can receive auxiliary output signals and controlled-current output (CCS) from your Matrox Iris GT.
Input connector	J32-J39	Connects to a third-party device so that they can send auxiliary input and trigger signals to your Matrox Iris GT.

Matrox camera connector

The Matrox camera connector is a series of 17 wire terminals. It connects to the digitial I/O and power connector of your Matrox Iris GT, using the open-wire digital I/O and power cable that comes with the Matrox Iris GT starter kit. Each wire terminal receives a wire with a color corresponding to the color listed on the Matrox breakout board. This connector provides power to your Matrox Iris GT, receives Matrox Iris GT auxiliary output signals and controlled-current output (CCS), and transmits auxiliary input and trigger signals to your Matrox Iris GT. This connector can also receive and transmit RS-232 messages.



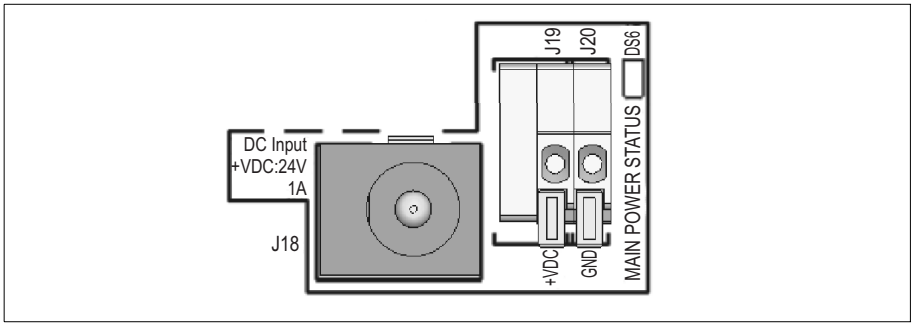
The pinout for the Matrox camera connector is as follows.

Matrox camera connector		**Digital I/O and power connector on Matrox Iris GT**		
Wire terminal	**Wire color**	**Pin number**	**Signal name**	**Description**
J1	Black	7	TRIG_OPTO_IN0+	Opto-isolated trigger input signal, positive. When using the push-button trigger generator, turn on switch 2 of the output-to-trigger bypass switch box (SW6[2]).
J2	White-yellow	15	TRIG_OPTO_IN0-	Opto-isolated trigger input signal, negative.
J3	Brown-green	14	AUX(USER)_OPTO_IN0+	Opto-isolated auxiliary signal 0 (input), positive. Supported function: User-defined signal 0 (input 1 of 4). Note: The negative component of this signal is internally connected to the ground.
J4	Yellow	6	AUX(USER)_OPTO_IN1+	Opto-isolated auxiliary signal 2 (input), positive. Supported function: User-defined signal 2 (input 3 of 4). Note: The negative component of this signal is internally connected to the ground.
J5	Pink	5	AUX(USER)_OPTO_IN2+	Opto-isolated auxiliary signal 2 (input), positive. Supported function: User-defined signal 2 (input 3 of 4). Note: The negative component of this signal is internally connected to the ground.
J6	White-green	13	AUX(USER)_OPTO_IN3+	Opto-isolated auxiliary signal 3 (input), positive. Supported function: User-defined signal 3 (input 4 of 4). Note: The negative component of this signal is internally connected to the ground.
J7	Green	4	Reserved	Reserved.
J8	Red-blue	12	AUX(STB)_OPENC_OUT4	Open-collector auxiliary signal 4 (output). Supported function: Pulse-train strobe signal (pulse-train generated with a pulse width modulator (PMW)), user-defined signal 4 (output 1 of 4), exposure signal, or trigger signal bypass.
J9	White	3	AUX(STB)_OPENC_OUT5	Open-collector auxiliary signal 5 (output). Supported function: Standard strobe signal (pulse), user-defined signal 5 (output 2 of 4), exposure signal, or trigger signal bypass.
J10	Gray-pink	11	AUX(USER)_OPENC_OUT6	Open-collector auxiliary signal 6 (output). Supported function: User-defined signal 6 (output 3 of 4) or exposure signal.
J11	Blue	2	AUX(USER)_OPENC_OUT7	Open-collector auxiliary signal 7 (output). Supported function: User-defined signal 7 (output 4 of 4).

Matrox camera connector		**Digital I/O and power connector on Matrox Iris GT**		
Wire terminal	**Wire color**	**Pin number**	**Signal name**	**Description**
J12	White-gray	17	CCS	Controlled-current output, designed to be connected to a LED lighting device (0-500 mA, intensity controlled using the internal version of the pulse-train strobe signal, generated with a pulse width modulator (PMW)). Note that when you use a 24 V power source for your Matrox Iris GT, the CCS can output from 2.4 V to 21 V to your LED lighting device. If, however, you use a 12 V power source, the CCS can output from 2.4 V to 10 V to your LED lighting device.
J13	Brown	1	RxD_RS232	RS-232 receive.
J14	Violet	10	TxD_RS232	RS-232 transmit.
J15	Yellow-brown	16	GND	Ground.
J16	Gray	8	PWR	Power provided to your Matrox Iris GT. The power must be either +12 V or +24 V +/- 10%. The amount of power required is determined by the power requirements of the devices attached to your Matrox Iris GT (such as a ring LED).
J17	Red	9	PWR	Power provided to your Matrox Iris GT. The power must be either +12 V or +24 V +/- 10%. The amount of power required is determined by the power requirements of the devices attached to your Matrox Iris GT (such as a ring LED). To properly power Matrox Iris GT, J15, J16 and J17 must be connected to your smart camera.

Power source connector

The power source connector is a combination of one DC power socket and two wire terminals. You can use either the DC power socket or the two wire terminals to connect the power supply to the Matrox breakout board. Note that a DC power supply is provided in the Matrox Iris GT starter kit. Alternatively, you can connect an open-wire power supply to the J19 and J20 wire terminals.



❖ Note that the wire terminals are meant to receive power from an external source and should not be connected to the open-ended digitial I/O and power cable.

The pinout for the power source connector is as follows:

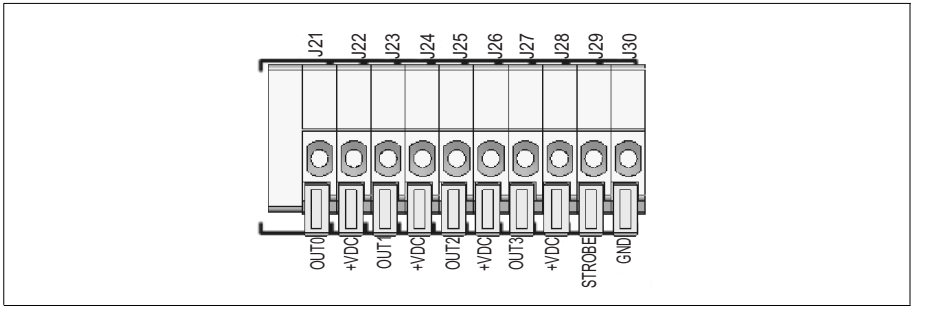
Board reference	Description
J18 /DC Input	External DC input (+VDC). This connection is rated up to 24 V (1 A). Note that this connector includes its own grounding through the shielding.
J19.+VDC	External DC input (+VDC) for use with an open-wire power cable, rated up to 24 V (1 A).
J20/GND	Ground for use when receiving power through the J19 wire terminal.

Output connector

The output connector is a series of 10 wire terminals. They connect to your third-party devices so these devices can receive auxiliary output signals and controlled-current output (STROBE[1]), via an open-wire.

Each auxiliary output signal sent to a third-party device requires two wires: one to carry the signal from your Matrox Iris GT, and one to connect the external pull-up resistor to +VDC, depending on the third-party device.

For information on using the output connector, refer to the *Routing Matrox Iris GT output signal* section, earlier in this appendix.



The pinout for the output connector is as follows:

Wire terminal	Description	Matrox Iris GT signal sent	Routed through the Matrox camera connector
J21/OUT0	Open-collector auxiliary signal 4 (output).	AUX(STB)_OPENC_OUT4	J8
J22/+VDC	+VDC supply.		
J23/OUT1	Open-collector auxiliary signal 5 (output).	AUX(STB)_OPENC_OUT5	J9
J24/+VDC	+VDC supply.		
J25/OUT2	Open-collector auxiliary signal 6 (output).	AUX(USER)_OPENC_OUT6	J10
J26/+VDC	+VDC supply.		
J27/OUT3	Open-collector auxiliary signal 7 (output).	AUX(USER)_OPENC_OUT7	J11
J28/+VDC	+VDC supply.		

1. The CCS is labeled STROBE on the Matrox breakout board.

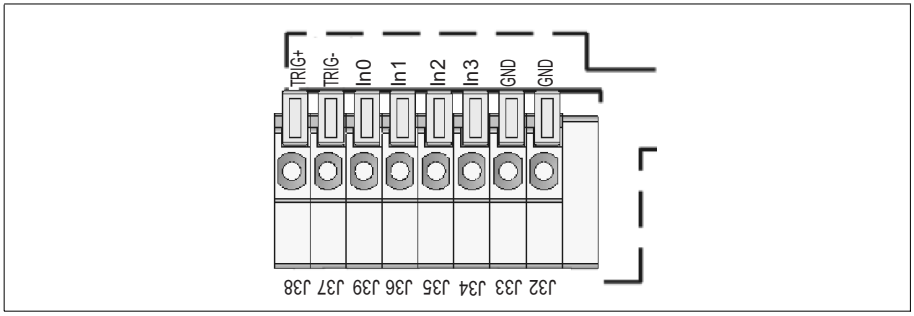
Wire terminal	Description	Matrox Iris GT signal sent	Routed through the Matrox camera connector
J29/STROBE	Controlled-current output, designed to be connected to a LED lighting device (0-500 mA, intensity controlled using the internal version of the pulse-train strobe signal, generated with a pulse width modulator (PMW)).	CCS	J12
J30/GND	Ground for the controlled-current output.		

Input connector

The input connector is a series of 8 wire terminals. They connect to your third-party devices so that the devices can send auxiliary and trigger signals to your Matrox Iris GT.

Each input signal should have only one input source. For example, when an input signal comes from a connected third-party device, it should always be the only source of input for that signal, and not have to compete with the signal from a re-routed output signal or a push button.

For information on using the input connector, refer to the *Routing input signals to Matrox Iris GT* section, earlier in this appendix.



The pinout for the input connector is as follow.

Wire terminal	Description	Matrox Iris GT signal received	Routed through the Matrox camera connector
J32/GND	Ground.		
J33/GND	Ground.		
J34/IN3	Opto-isolated auxiliary signal 3 (input).	AUX(USER)_OPTO_IN3[a]	J6
J35/IN2	Opto-isolated auxiliary signal 2 (input).	AUX(USER)_OPTO_IN2[a]	J5

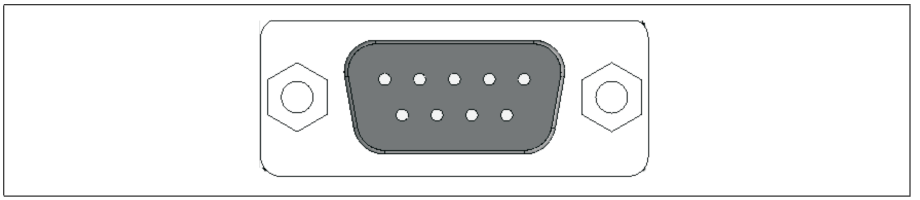
Wire terminal	Description	Matrox Iris GT signal received	Routed through the Matrox camera connector
J36/IN1	Opto-isolated auxiliary signal 1 (input).	AUX(USER)_OPTO_IN1[a]	J4
J39/IN0	Opto-isolated auxiliary signal 0 (input).	AUX(USER)_OPTO_IN0[a]	J3
J37/TRIG-	Opto-isolated trigger signal, negative. This signal must be connected to the ground of the trigger-generating third party device.	TRIG_OPTO_IN0-	J2
J38/TRIG+	Opto-isolated trigger signal, positive.	TRIG_OPTO_IN0+	J1

a. Note that the negative signal is internally connected to the ground inside your Matrox Iris GT.

RS-232 serial connector

The RS-232 serial connector is a DB-9 connector. It connects to your development computer using a null-modem cable.

It allows the Matrox Design Assistant SerialPortReader and SerialPortWriter steps to send and receive RS-232 messages from your Matrox Iris GT, via the J13 and J14 wire terminals of the Matrox camera connector...



To view the operating system's console output information using a terminal emulator program, such as HyperTerminal[1], enable the **POST** (Power On Self Test) **string print** option in either the Matrox IrisBootParams utility or the **COM port availability** section on the **Boot settings** page, accessible from the **Administration utility** page of the Matrox Iris portal website. The **Administration utility** page can be accessed from the **Administration** page of the Matrox Iris portal website.

1. Note that HyperTerminal is copyright Hilgraeve Inc. It is available as part of a Microsoft Windows XP installation. With Microsoft Windows 7 however, HyperTerminal is no longer part of a Windows installation. You can download a private edition trial of HyperTerminal from the Hilgraeve website.

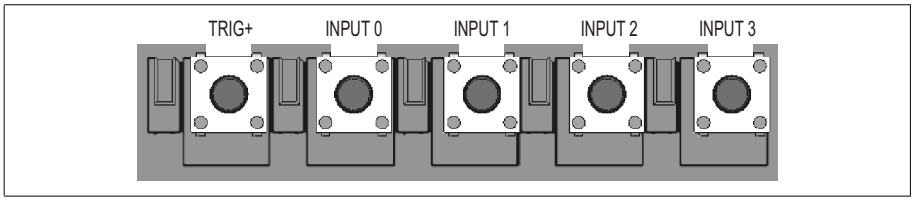
Push buttons

Each push button generates an input signal that is sent to your Matrox Iris GT through the Matrox camera connector. When you press a push button to create an input signal, content bounce (also called chatter) might occur. To guarantee that the created input signal is not interpreted as multiple input pulses, set the minimum duration (debounce time) of the input or trigger pulse.

For more information, refer to the *Matrox Design Assistant online help*.

Each input signal should have only one input source. For example, when a push button is used to provide an input signal, it should always be the only source of input for that signal, and not have to compete with the signal from a re-routed output signal or an input signal from a connected third-party device.

For information on using the push buttons, refer to the *Generating a Matrox Iris GT auxiliary input or trigger signal with a push button* subsection of the *Routing input signals to Matrox Iris GT* section, earlier in this appendix.

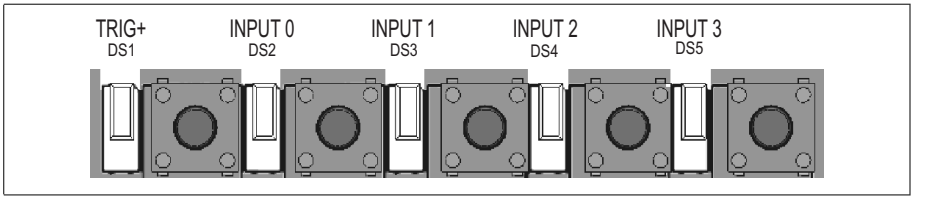


The board reference for the push buttons is as follows:

Push button	Description	Matrox Iris GT signal received	Routed through the Matrox camera connector
Trig+	Opto-isolated trigger signal, positive. Note that output-to-trigger bypass switch 2 (SW6[2]) must be set to on; this grounds the negative part of the trigger signal.	TRIG_OPTO_IN+	J1
Input 0	Opto-isolated auxiliary signal 0 (input).	AUX(USER)_OPTO_IN0	J3
Input 1	Opto-isolated auxiliary signal 1 (input).	AUX(USER)_OPTO_IN1	J4
Input 2	Opto-isolated auxiliary signal 2 (input).	AUX(USER)_OPTO_IN2	J5
Input 3	Opto-isolated auxiliary signal 3 (input).	AUX(USER)_OPTO_IN3	J6

LEDs

The LEDs show the activity on the signal associated with the push button. Note that the activity on the signal can be caused either by using the push button or by the third-party device connected to the input connector.

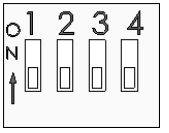


The board reference for the LEDs is as follows:

LED	Description	Associated Matrox Iris GT signal	Routed through the Matrox camera connector
TRIG+/DS1	Opto-isolated trigger signal LED.	TRIG_OPTO_IN+	J1
INPUT 0/DS2	Opto-isolated auxiliary signal 0 (input) LED.	AUX(USER)_OPTO_IN0	J3
INPUT 1/DS3	Opto-isolated auxiliary signal 1 (input) LED.	AUX(USER)_OPTO_IN1	J4
INPUT 2 /DS4	Opto-isolated auxiliary signal 2 (input) LED.	AUX(USER)_OPTO_IN2	J5
INPUT 3/DS5	Opto-isolated auxiliary signal 3 (input) LED.	AUX(USER)_OPTO_IN3	J6

Switch boxes

The switch boxes redirect the signals of your Matrox Iris GT. There are three switch boxes, labeled SW6 through SW8, on the Matrox breakout board. Each switch box has 4 switches.



Output-to-trigger bypass switch box

The output-to-trigger bypass switch box (SW6) allows you to route a Matrox Iris GT auxiliary output signal to the Matrox Iris GT trigger signal, and allows the trigger signal to be grounded when not from a third-party device.

Each trigger signal should have only one input source. For example, when an output signal is re-routed to a trigger signal, it should always be the only source of input for that signal, and not have to compete with the signal from a third-party device or a push button.

Switch	Description (ON)
1	Routes the Matrox Iris GT AUX(STB)_OPENC_OUT4 signal to the TRIG_OPTO_IN0+ signal.
2	Grounds the Matrox Iris GT TRIG_OPTO_IN0- signal. Note that this must be turned on when using the trigger push button (Trig+), or when switch 1 of this switch box (SW6[1]) is on; otherwise, by default, the negative opto-isolated trigger signal is floating (that is, it is not connected to ground).
3	Reserved.
4	Diagnostic switch. Set this switch to OFF unless otherwise directed by technical support. If this switch is ON, your Matrox Iris GT will not finish booting until it receives a CRLF through the serial port.

Output pull-up resistor switch box

The output pull-up resistor switch box (SW7) is used when routing a Matrox Iris GT auxiliary output signal to a Matrox Iris GT auxiliary or trigger input signal. It also can be used when routing a signal to a third-party device.

Switch	Description (ON)
1	Adds an on-board pull-up resistor to the AUX(STB)_OPENC_OUT4 signal.
2	Adds an on-board pull-up resistor to the AUX(STB)_OPENC_OUT5 signal.
3	Adds an on-board pull-up resistor to the AUX(USER)_OPENC_OUT6 signal.
4	Adds an on-board pull-up resistor to the AUX(USER)_OPENC_OUT7 signal.

Output-to-input bypass switch box

The output-to-input bypass switch box (SW8) allows you to route a Matrox Iris GT auxiliary output signal to a Matrox Iris GT auxiliary input signal.

For the Matrox Iris GT output signals to be used as input signals, the respective switch on the output pull-up resistor switch box (SW7) must be enabled. For example, for user-defined output signal 4 (AUX(STB)_OPENC_OUT4) to be re-routed to user-defined input signal 0 (AUX(USER)_OPTO_IN0+ signal), switch 1 (SW7[1]) must be set to ON.

Each input signal should have only one input source. For example, when an output signal is re-routed to an input signal, it should always be the only source of input for that signal, and not have to compete with the signal from a third-party device or a push button.

Switch	Description (ON)
1	Routes the AUX(STB)_OPENC_OUT4 signal to the AUX(USER)_OPTO_IN0 signal.
2	Routes the AUX(STB)_OPENC_OUT5 signal to the AUX(USER)_OPTO_IN1 signal.
3	Routes the AUX(USER)_OPENC_OUT6 signal to the AUX(USER)_OPTO_IN2 signal.
4	Routes the AUX(USER)_OPENC_OUT7 signal to the AUX(USER)_OPTO_IN3 signal.

Appendix G: Matrox Iris GT utilities

This appendix describes how to use the utilities stored on your Matrox Iris GT, as well as those installed by Matrox Design Assistant.

Introduction

The Matrox Iris GT utilities are a series of tools required to support all the functionality of your Matrox Iris GT. Some are installed when you install the Matrox Design Assistant utilities on your development computer, while others come factory-installed by default on your Matrox Iris GT (either as part of the operating system, or in the *\CEDISK\Tools* folder).

Utility documentation conventions

The utilities launched from within a telnet window in this appendix follow a specific format. The syntax of the command line call is as follows:

```
>UtilityName Obligatory [Optional] {Prompted}
```

- **Obligatory**. If denoted in the syntax without any brackets, the parameter must be used. If the parameter is omitted either the utility will not do anything, or quit with error messages.

- **Optional**. If denoted in the syntax with square brackets [], the parameter is optional and does not have to be used.

- **Prompted**. If denoted in the syntax with curly brackets {}. and if the information is not included in the call, the utility will prompt you for the information.

Utilities installed on your development computer

The following utilities are available on your development computer:

- The Matrox IrisBootParams utility.

- The Matrox Iris Camera Finder utility.

- The Matrox Iris OS Downloader utility.

Matrox IrisBootParams utility

The Matrox IrisBootParams utility allows you to connect to your Matrox Iris GT using its MAC address. Once connected, you can change its IP address, subnet, and network name, as well as set it to use DHCP or automatic naming,

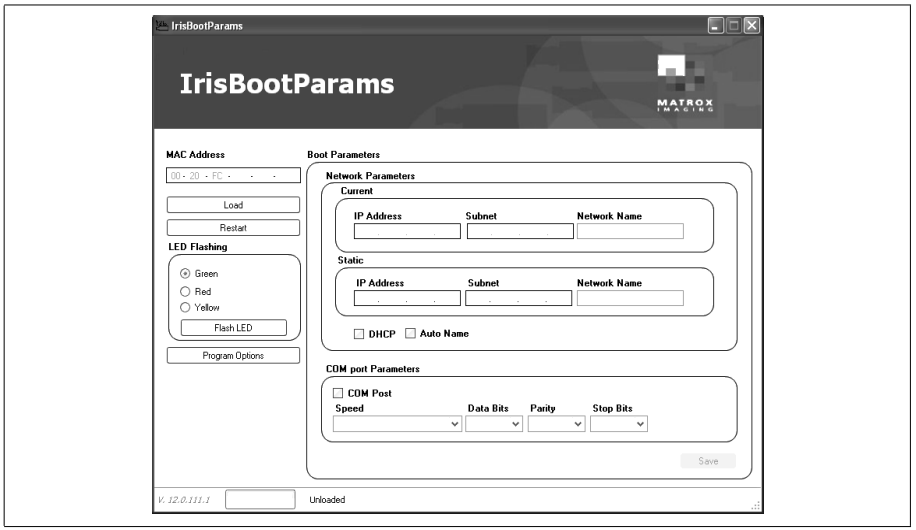
❖ Note that this utility works best if your Matrox Iris GT is directly connected to your computer. If your Matrox Iris GT is plugged into a network and there are routers between your Matrox Iris GT and your computer, this utility might not be able to find your Matrox Iris GT.

If Matrox IrisBootParams has difficulty locating your Matrox Iris GT, check your firewall settings and your network router settings.

To run this utility, perform the following:

1. On your computer, launch the Matrox IrisBootParams utility. To do so, from the **Matrox Imaging** submenu of the **Windows Start** menu, select **Design Assistant X.X**, where *X.X* represents the current release number. From the presented submenu, select **Tools**, and then click on **Iris Network and Boot Settings**.

   The Matrox IrisBootParams utility opens.



2. Enter the MAC address of your Matrox Iris GT in the **MAC Address** text box. Note that the MAC address is written on a sticker attached to your Matrox Iris GT.

3. Click on the **Load** button.

   If Matrox IrisBootParams has difficulty locating your Matrox Iris GT, a timeout error is displayed. Verify that the MAC address is entered correctly. If the problem persists, verify that your firewall settings or network router settings are not blocking communications.

   The network settings currently in use are displayed on-screen.

   Once the Matrox IrisBootParams utility has the IP address of your Matrox Iris GT, you can:

   - Change the IP address, subnet, and/or network name of your Matrox Iris GT by entering the new information in the **Static** section.
   - Set your Matrox Iris GT to use DHCP by selecting the **DHCP** option.
   - Set your Matrox Iris GT to use automatic naming by selecting the **Auto name** option.
   - Change the COM port settings by entering the new information in the **COM port parameters** section.
     - Note that if you enable the **COM Post** option to display power on self-test diagnostics, you cannot use the serial port in your Matrox Design Assistant project (specifically, the SerialPortReader and SerialPortWriter steps).

4. Click on the **Save** button. This will change the settings of your Matrox Iris GT.

5. Reboot your Matrox Iris GT by clicking on the **Restart** button.

Matrox Iris Camera Finder utility

The Matrox Iris Camera Finder utility scans a selected range of IP addresses to discover all the powered-up and connected Matrox Iris smart cameras (including Matrox Iris GT, E-Series, and P-Series smart cameras) on your network in the selected range.

Contact your network administrator to identify the IP address range in which to search. Some administrators might restrict IP address scanning for security or productivity reasons.

To use this utility, perform the following:

1. On your computer, launch the Matrox Iris Camera Finder utility. The Matrox Iris Camera Finder utility can be found in the Matrox Design Assistant installation folder (for example, *C:\Program Files...\Matrox Imaging\Design Assistant...\Tools\Discovery Utilities\CameraFinder.exe*).

2. Enter the starting IP address in the **Start IP** text box. This is the first address that the Camera Finder utility will query.

3. Enter the ending IP address in the **End IP** text box. This is the last address that the Camera Finder utility will query.

4. Click on the **Discover** button. A warning will appear. Click on the **OK** button to continue or the **Cancel** button to stop.

   When the process is complete, the utility lists the names and IP addresses of all Matrox Iris smart cameras (including Matrox Iris GT, E-Series, and P-Series smart cameras) within the specified IP address range.

Matrox Iris OS Downloader utility

The Matrox Iris OS Downloader utility lets your Matrox Iris GT boot using a specified operating system file located on another computer on your network.

❖ Note that you should only use this utility if directed to do so by technical support.

When your Matrox Iris GT cannot boot from the local copy of its operating system. It will broadcast a request on your network for an operating system, and its Power LED will turn orange and its User LED will turn red. The color of these LEDs will not change until you launch the Matrox Iris OS Downloader utility on your development computer and begin the process of transferring an operating system to your smart camera. If your development computer is on the same subnet as your Matrox Iris GT, the Matrox Irs OS Downloader utility will automatically find the Matrox Iris GT requesting the operating system. Your Matrox Iris GT will then connect to your development computer, and use the temporary copy of the operating system to boot.

The process is similar to booting your computer from a floppy disk. This utility does not replace the Matrox Iris GT's operating system. Instead, it allows an otherwise non-booting smart camera to boot.

To boot your Matrox Iris GT, you can use the backup copy of the operating system for your Matrox Iris GT, located in the *Rescue* folder of the Matrox Design Assistant installation folder of your development computer (for example, *C:\Program Files...\Matrox Imaging\Design Assistant...\Rescue*).

To use the Matrox Iris OS Downloader utility, perform the following:

1. On your computer, launch the Matrox Iris OS Downloader utility. The Matrox Iris OS Downloader utility (*IrisOSDownloader.exe)* can be found in the *Tools* folder of the Matrox Design Assistant installation folder (for example, *C:\Program Files...\Matrox Imaging\Design Assistant...\Tools*).

2. Click on the **Browse** button and navigate to the location of the *NK.bin* file; this file contains the operating system for your Matrox Iris GT. Note that the *NK.bin* file is in the *Rescue* folder of the Matrox Design Assistant installation folder (for example, *C:\Program Files...\Matrox Imaging\Design Assistant...\Rescue*).

3. Click on the *NK.bin* file containing the operating system for your Matrox Iris GT (*NK.bin*), and click on the **OK** button.

4. Wait for the name of your Matrox Iris GT to appear in the name list. Select the target smart camera and click on the **Download** button. The download process begins.

   If no Matrox Iris GT names appear in the Matrox Iris OS Downloader utility, try running this utility when your Matrox Iris GT is directly connected to your computer instead of being connected through a network.

   As this utility progresses, the User LED will go through a series of changes.

LED Color		Description
Power	**User**	
Orange	Red (solid)	Your Matrox Iris GT cannot boot from the local copy of its operating system. Your smart camera has begun broadcasting a message that it is waiting for a copy of the operating system to be transferred over the network. Launch the Matrox Iris OS Downloader utility on a development computer that is on the same subnet as your smart camera. This utility will automatically detect your Matrox Iris GT's message and provides a way to send a copy of the operating system to your smart camera so it can boot. Note that this is a temporary solution and further debugging steps might be required.
Orange	Red (blinking)	Your Matrox Iris GT is in the process of booting and is still in communication with the computer across the network, which has the operating system.
Orange	Orange	Matrox Iris GT is copying Microsoft Windows CE information to RAM from the flash disk.
Orange	Green	Microsoft Windows CE is starting.

❖ Note that if the User LED stops blinking without changing its color (to orange and then to green), the operating system download has failed.

Make sure that your Matrox Iris GT is not being forced to download the operating system image from the Ethernet. To do this, once your Matrox Iris GT successfully boots, verify that the **Download OS image from Ethernet** option is not selected. This option is available on the **Boot settings** page, which is accessible from the **Administration utility** page of the Matrox Iris portal website.

If the **Download OS image from Ethernet** option is not selected, you should perform a full rescue to correct the corruption that might have caused your Matrox Iris GT to initially have problems booting. For more information, refer to the *FullRescue utility* subsection of the *Utilities installed on your Matrox Iris GT* section, later in this chapter.

Utilities installed on your Matrox Iris GT

The following is a description of the utilities available on your Matrox Iris GT.

The following utilities are available:

- The FullRescue utility.
- The IrisBackup utility.
- The MemMon utility.
- The ProcMon utility.
- The TempMon utility.

Steps to run utilities installed on your Matrox Iris GT

To run the utilities installed on your Matrox Iris GT, perform the following:

1. Before running either the FullRescue or IrisBackup utility, stop any running projects by performing the following:

   a. Open Microsoft Internet Explorer and go to the **Manage projects** page of the Matrox Iris portal website using the following address:

   ```
   http://IrisName/manage_projects.asp
   ```

   b. Terminate any running project by clicking on the project's **Terminate project** button.

   c. Verify that the **Select the project you want to start on Iris start-up** drop-down list box is set to **No project**.

   d. Close Microsoft Internet Explorer.

2. Create a network-shared folder on your computer. This folder must be accessibly by your Matrox Iris GT.

3. Open a command prompt and type the following at the prompt:

```
telnet IrisName
```

   A welcome message appears, followed by the telnet prompt.

4. At the telnet prompt, type the name of the utility along with the required parameters, and then press the **Enter** key.

FullRescue utility

The FullRescue utility rescues your Matrox Iris GT and restores it to its factory settings or restores the previous backup created using the IrisBackup utility. Note that this will remove any changes made since that point in time, and wipe the flash disk clear. Before using the FullRescue utility, you should backup any files added to the flash disk since the installation (or last full rescue) of your Matrox Iris GT using the IrisBackup utility. For more information, refer to the *IrisBackup utility* subsection, later in this appendix.

You are prompted to confirm the operation before continuing.

Important

It is essential that you don't disconnect the power until after the Power LED and User LED are green and your Matrox Iris GT finishes the rescue operation. This can take up to 10 minutes. Prematurely powering down your Matrox Iris GT can render your smart camera inoperable.

The files used to restore your Matrox Iris GT to its factory defaults are located in the rescue folder of your Matrox Iris GT with Design Assistant installation folder. Note that you can move these files to any location on your network, accessible by your Matrox Iris GT, but if the files are renamed, the **FullRescue** utility will return an error.

❖ Note that it is strongly recommended that you save a copy of the **Essential Information** page of the Matrox Iris portal website as a text file, before using the FullRescue utility.

Before running this utility, you must stop any project running on your Matrox Iris GT.

Syntax

```
\>FullRescue [DEFSET] [QUIET] {SharedFolder} {UserName} {Password}
```

Parameters

If you enter the command and all its parameters at the command line, you must enclose any string containing spaces in quotations.

- **DEFSET**. Specifies to restore all the factory-configured settings of your Matrox Iris GT (boot and registry) from the rescue files. If this option is not specified, the current settings will not be overwritten.

  ❖ Note that, if the factory-configured settings of your Matrox Iris GT are restored, and you are in Static IP mode, you will have to use IrisBootParams to connect to your smart camera and reset the IP allocation mode back to Static IP. For more information, refer to *Chapter 4: Configuring your Matrox Iris GT to work with your computer directly*.

  This parameter has no effect if used with files generated from the Matrox IrisBackup utility.

- **QUIET**. Specifies that the FullRescue utility will run without requiring a user's intervention.

- **SharedFolder**. Specifies the location that holds the rescue files. This location must be a network-shared folder and be accessible by the user, specified by the UserName parameter of this utility. The location must be entered in the following format:

  ```
  \\server\share:folderpath
  ```

❖ Note that the name of the network-shared folder (for example, *server**share:*) must end with a colon (:), regardless of whether the files are stored in a subfolder or the root of the network-shared folder.

The FullRescue utility automatically creates a temporary LAN connection to the specified folder. For more information on connections, see the **LAN Connections** page, which can be accessed from the **Administration utility** page of the Matrox Iris portal website.

Prior to calling this utility, share the folder, on your development computer, containing the rescue files. By default, the rescue files can be found in the *\Rescue* folder of the Matrox Design Assistant installation folder (for example, *C:\Program Files...\Matrox Imaging\Design Assistant...\Rescue*).

- **UserName**. Specifies the user name required to access the specified network-shared folder. If your computer is on a domain, enter the domain name. For example:

```
Domain\UserName
```

If your computer is not on a domain, enter the name of your computer to force Matrox Iris GT to use your local account.

The user name must have a password associated with it.

  - ❖ Note that the specified user must have write-permission to the specified network-shared folder.

- **Password**. Specifies the user password required to access the specified folder.

Example

The following example will take files from a network-shared folder named *myrescue*, on your development computer named *mycomputer,* and use them to restore your Matrox Iris GT. It will keep the factory-configured boot parameters.

```
\>FullRescue DEFSET \\mycomputer\myrescue: mydomain\myname mypassword
```

Errors

- **No rescue can be done while a MIL application is running**. Terminate all projects running on your Matrox Iris GT before using the FullRescue utility.

- **Error restoring CEDisk**. The content of CEDisk could not be restored to its factory-configured state. Contact Matrox Imaging technical support.

- **Error restoring FPGA ROM content.** The firmware of the acquisition section in your Matrox Iris GT could not be restored to its factory-configured state. Contact Matrox Imaging technical support.

- **Unable to connect to file server resource** ***server name***. Either the credential or file server location is not valid for the server name provided.

- **Cannot downgrade to this version with current hardware**. Your Matrox Iris GT hardware and the rescue files do not match. Perform the rescue using the rescue files best associated with the version of your Matrox Iris (Matrox Iris GT with Design Assistant, Matrox Iris GT with MIL, Matrox Iris P-Series, or Matrox Iris E-Series).

- **Error finding file** ***fname.ext***. The specified file name cannot be found in the given path. The specified file is required for the rescue procedure to continue.

- **Error formatting the SSD**. The flash disk cannot be formatted. Contact Matrox Imaging technical support.

- **Error updating the OS in SSD**. The operating system cannot be written to the flash disk. Contact Matrox Imaging technical support.

IrisBackup utility

The IrisBackup utility captures the state of your Matrox Iris GT and saves it as a set of files to a network-shared folder. The resulting set of files can be restored to the smart camera using the FullRescue utility, described earlier in this appendix. Note that the IrisBackup utility backs up all files on all disks of your Matrox Iris GT, packing them into a series of files which can be restored individually, or combined.

The backup creates a folder named *MatroxIrisBackup*. If a folder with this name already exists, the utility prompts for permission to overwrite its contents. You can rename the folder, but do not change any of the files contained within the folder.

Before running this utility, you must stop any project running on your Matrox Iris GT.

Syntax

```
\>IrisBackup {Comment} {SharedFolder} {Domain} {UserName} {Password}
```

Parameters

If you enter the command and all its parameters at the command line, you must enclose any string containing spaces in quotations.

- **Comment**. A brief comment to describe the contents of the backup or the reason for the backup.

- **SharedFolder**. Specifies the location to save the backup files. This location must be a network-shared folder and be accessible by the user, specified by the UserName parameter of this utility. The location specified must be entered in the following format:

```
\\server\share
```

- **Domain**. If your computer is on a domain, enter the domain name. If your computer is not on a domain, enter the name of your computer to force Matrox Iris GT to use your local account. The user name must have a password associated with it.

- **UserName**. Specifies the user name required to access the specified network-shared folder. If your computer is on a domain, enter the domain name. For example:

```
Domain\UserName
```

  If your computer is not on a domain, enter the name of your client computer to force Matrox Iris GT to use your local account.

  The user name must have a password associated with it.

  - Note that the specified user must have write-permission to the Matrox Iris GT backup folder.

- **Password**. Specifies the user's password to access the specified folder.

Example

The following example will save the backup files to a network-shared folder named backup, on your development computer.

```
\>IrisBackup "monthly backup iris090123" \\mycomputer\backup mydomain
myname mypassword
```

Errors

- **Error creating folder...**. The specified network-shared folder is not accessible with the user name and password provided.

- **Error: Cannot execute a backup while one MIL application is running**. Terminate all Matrox Design Assistant projects (using the **Manage Projects** page of the Matrox Iris portal website) before using the IrisBackup utility.

MemMon utility

The MemMon utility monitors the changes to the global memory state of your Matrox Iris GT. It inquires the amount of memory at a specified interval of time, repeating until you interrupt it, by typing **q**. This utility can report this information to the screen or to a file.

Syntax

```
\>MemMon [Command] [msec] [Filename]
```

Parameters

- **Command**. Specifies what should be queried.
  - DMA. Queries the amount of free non-paged linear (DMA) memory.
  - RAM. Queries the amount of free RAM.
  - LPOOL Queries the amount of memory reserved for loading EXE and DLL files (the loader pool).

❖ You can press **d** to monitor DMA memory while the utility is running, **r** to monitor RAM, or l to monitor the loader pool.

- **msec**. Specifies the number of msecs between inquires of the global memory state.
- **Filename**. Specifies the file in which to log the results. Use NULL to have results reported only to the screen.

Errors

None.

ProcMon utility

The ProcMon utility allows you to inquire about all running applications on your Matrox Iris GT. It lists the threads and modules of each process, as well as the CPU load of each thread. It can also be used to kill a process.

Syntax:

```
\>ProcMon [Action] [procid] [procarg] [-l]
```

Parameters

- **Action**. Specifies the action that the utility should perform. This parameter can be set to one of the following values:
  - **lproc**. Lists all processes.
  - **lthread**. Lists all threads in all processes or in one specified process. To specify the process, use the **procid** parameter.
  - **lmod**. Lists all modules in all processes or in one specified process. To specify the process, use the **procid** parameter.
  - **lload**. Lists the load in all the processes or one specified process. To specify the process, use the **procid** parameter.
  - **kproc**. Kills one specified process. You must use the **procid** parameter to specify the process to be killed.
- **procid**. Specifies the process identifier. Note that this parameter is required for use with **kproc**. It is optional for **lmod**, **lthread**, and **lload**.
- **procarg**. Specifies the number of msecs to allow a process to terminate using the **kproc** command, before declaring an error.
- **-l**. Specifies to show additional details about the threads used by each process. Note that this can only be used with **lload**.

Example

The following example lists all threads in the 9ABF4412 process.

```
ProcMon lthread 9ABF4412
```

All executable process identifiers can be listed using the following command:

```
ProcMon lproc
```

Errors

None.

TempMon utility

The TempMon utility monitors three different temperatures in Matrox Iris GT: the sensor, CPU, and ambient in-box temperature. It inquires the temperature at a specified interval of time, repeating until you interrupt it, by typing **q**. This utility can report these temperatures to the screen or to a file.

Syntax

```
\>TempMon [msec] {Filename}
```

Parameters

- **msec**. Specifies the number of msecs between inquires of the temperature.
- **Filename**. Specifies the name of the file in which to log the results. Use NULL to have results reported only to the telnet window.

Errors

None.

Appendix H: Matrox Iris portal website details

This appendix provides a description of the pages of the Matrox Iris portal website.

Matrox Iris portal website

Once your Matrox Iris GT has joined your network, you can browse to the Matrox Iris portal website, which exists on your Matrox Iris GT. The Matrox Iris portal website allows you to configure your Matrox Iris GT smart camera, find other Matrox Iris GT smart cameras on your network (using the Matrox Discover utility), view a live image from your smart camera (using the View utility web page), update the firmware, and handle licensing information. For information on how to access the Matrox Iris portal website, refer to *Using the Matrox Iris portal website* section, in *Chapter 5: Accessing Matrox Iris GT*.

Manage projects page

The **Manage projects** page allows you to start and delete projects that are currently not running. If a project is running, you can view the project's execution log and its operator view, and you can stop the project.

This page also displays the amount of space available on your Matrox Iris GT for new projects.

- **Disk space available for projects**. Specifies the amount of free space on your Matrox Iris GTflash disk available for new projects, in Kbytes.

- **View projects execution log**. Specifies the project name, start time, end time, and duration for each project that has run on your Matrox Iris GT.

- **Manage operator view access rights on deployed projects.** Opens the **Manage operator view** page, which allows you to view a list of deployed projects, and lists users that have been granted access to the operator view of each project. The **Manage operator view** page also allows you to add, change, and delete users.

- **Project... will be started on next Iris start-up**. Allows you to specify which project will run automatically the next time your Matrox Iris GT smart camera starts up.

Field name	Description
Project name	Allows you to select the project to start the next time your Matrox Iris GT starts up. Note that this must be set to None before using the IrisBackup or FullRescue utility, or restoring to factory default options.

Button name	Description
Save setting	Updates your Matrox Iris GT with the setting specified in the **Project name** field.

- **Running**. Specifies the project currently running on your Matrox Iris GT, if any.

Field name	Description
Project name	Specifies the name of the project.
Start time	Specifies the time that the project started.
Duration	Specifies the amount of time that the project has been running.
Project size	Specifies the size of the project, in Kbytes.

Link name	Description
View execution messages of latest run	Allows you to view a list of the execution messages generated by the project.
View project execution log	Allows you to view a list of any of the run-time messages generated by the project the previous time it was deployed.

Button name	Description
Open operator view	Opens a new window and displays the project's operator view. Note that this button is only available when the project is running.
Terminate project	Stops the project currently deployed on your Matrox Iris GT. Note that this button is only available when the project is running.

- **Projects**. Provides a list of all the projects currently stored on your Matrox Iris GT, with the following information for each:

Field name	Description
Project name	Specifies the name of the project.
Deployment date	Specifies the date and time that the project was last deployed.
Last start/end time	Specifies the date and time that the project was last run.

Link name	Description
View execution messages of latest run	Allows you to view a list of the execution messages generated by the project. Note that if this link is not available, the project has not been deployed.
View project execution log	Allows you to view a list of any of the run-time messages generated by the project when it was last deployed. Note that if this link is not available, the project has not been deployed.

Button name	Description
Start project	Starts the selected project.
Delete project	Deletes the selected project.

View utility page

The **View utility** page allows you to select a display from your Matrox Iris GT and view it remotely. Refer to the *Viewing images from your Matrox Iris GT* subsection of the *Using the Matrox Iris portal website* section, in *Chapter 5: Accessing Matrox Iris GT* for more details.

❖ Note that the frames per second (FPS) ratio on the image specifies the rate that the display updates and not the rate at which your Matrox Iris GT grabs images.

- **Display selection**. Allows you to refresh the list of displays, select which of the listed displays to use, and remove the view of the current display from the browser window.

Button name	Description
Refresh list	Fetches and updates the list of displays available.
Set display	Sets the highlighted display as the display to use and presents its view in the browser window.
Unset display	Removes the display from the browser window. A blank window opens.

List name	Description
List of displays	Specifies the available displays. The default display (DesignAssistantAgent.exe:DESIGN_ASSISTANT_AGENT_FOCUS) and the remote agent display (RemoteAgent.exe) are listed when a project is not running on your Matrox Iris GT. The Matrox Design Assistant display (DesignAssistantAgentCF.exe) is displayed when a project is running. Note that the remote agent display (RemoteAgent.exe) will not have access to the grabbed image unless it is the only display in the list. Selecting it while a Matrox Design Assistant display is listed will result in an error. One display is added to the **List of displays** list for each display element in your project's operator views.

- **Display controls**. Allows you to modify the view by zooming and panning.

Button name	Description
Zoom out	Decreases the size of the viewable image.
Zoom in	Increases the size of the viewable image.
Pan up / down / left / right	Moves the viewable image. Note that panning allows you to see parts of a zoomed image that you would not otherwise be able to see.

Manage calibrations and white balance settings page

The **Manage calibrations and white balance settings** page allows you to define a new calibration and new white balance settings, and save them to files that can be used in a Matrox Design Assistant project. This page also allows you to see the list of files and delete them. For more information regarding calibrations, refer to the Matrox Design Assistant User Guide.

- **Define a new calibration**. This section lists three possible projects with which you can define a new calibration.

Field name	Description
Projects	Specifies which predefined project to use to define your calibration. You can define a calibration from a scale, a list of points, or a grid.

Button name	Description
Define calibration	Launches the associated calibration project and displays its operator view. Follow all on-screen instructions to calibrate your image.

- **Existing calibrations.** This section lists all the calibration files currently saved on your Matrox Iris GT smart camera.

❖ Note that calibration files are saved in the *\UserDisk\DesignAssistant\Calibrations* folder. To access this folder and make a backup copy of your calibration files, you can use Microsoft Windows Explorer or your preferred backup software.

Field name	Description
Calibration name	Specifies the name of the calibration file saved to your Matrox Iris GT smart camera.
Creation date	Specifies the date on which the file was created.
Last modification date	Specifies the date on which the file was last modified.

Button name	Description
Delete	Deletes the calibration file.

- **Define a new white balance.** This section allows you to create and save the white balance settings for images grabbed with color cameras (such as, the Matrox Iris GT 300C).

Button name	Description
Define white balance	Launches the associated white balance project and displays its operator view. Follow all on-screen instructions to calculate white balance settings for your image.

- **Existing white balance** This section lists the white balance files currently saved on your Matrox Iris GT smart camera.

❖ Note that white balance files are saved in the *\UserDisk\DesignAssistant\Calibrations* folder. To access this folder and make a backup copy of your white balance files, you can use Microsoft Windows Explorer or your preferred backup software.

Field name	Description
White balance name	Specifies the name of the white balance file saved to your Matrox Iris GT smart camera.
Creation date	Specifies the date on which the file was created.
Last modification date	Specifies the date on which the file was last modified.

Button name	Description
Delete	Deletes the white balance file.

Essential information page

The **Essential information** page presents information about your Matrox Iris GT. Note that the information presented on the **Essential information** page cannot be modified directly. Refer to the individual field descriptions to determine how to modify the displayed information (when possible).

Note that it is strongly recommended that you save a copy of this webpage as a text file before using the FullRescue utility, upgrading the software for your Matrox Iris GT, or for future reference.

Field name	Description
Model	Specifies the model number of your Matrox Iris GT. This value is directly associated with the hardware of your Matrox Iris GT and cannot be changed.
Date & Time	Specifies the current date and time. To change this information, refer to the **Time/date settings** page, which can be accessed from the **Administration utility** page. The **Administration utility** page can be accessed from the **Administration** page.
Network name	Specifies the name used by a DNS server to identify your Matrox Iris GT. This document refers to this name as the Matrox Iris GT name. To change this information, refer to the **Identification settings** page, which can be accessed from the **Administration utility** page. The **Administration utility** page can be accessed from the **Administration** page. This can also be set using the Matrox IrisBootParams utility.
Network IP address	Specifies the IP address of your Matrox Iris GT. To change this information, refer to the **TCP/IP settings** page, which can be accessed from the **Administration utility** page. The **Administration utility** page can be accessed from the **Administration** page. Note that if the network allocation mode is set to DHCP, the IP address cannot be changed without first disabling DHCP. This can also be set using the Matrox IrisBootParams utility.
Network IP allocation mode	Specifies whether DHCP is used to obtain the IP address of your Matrox Iris GT. To change this information, refer to the **TCP/IP settings** page, which can be accessed from the **Administration utility** page. The **Administration utility** page can be accessed from the **Administration** page. This can also be set using the Matrox IrisBootParams utility.
Network subnet mask	Specifies the bit mask used to identify which bits in the IP address correspond to the subnet portions of the address. To change this information, refer to the **TCP/IP settings** page, which can be accessed from the **Administration utility** page. The **Administration utility** page can be accessed from the **Administration** page. Note that if the network allocation mode is set to DHCP, the subnet mask cannot be changed without first disabling DHCP. This can also be set using the Matrox IrisBootParams utility.
Network domain	Specifies the common name shared by all computers on the network (for example, Matrox.com). To change this information, refer to the **TCP/IP settings** page, which can be accessed from the **Administration utility** page. The **Administration utility** page can be accessed from the **Administration** page. Note that the domain can only be changed when your Matrox Iris GT uses a static IP address.

Field name	Description
Network interface	Specifies the type of hardware connection used to connect to your network. This value reflects the hardware of your Matrox Iris GT and cannot be changed.
Network MAC address	Specifies the MAC address used to identify your Matrox Iris GT on the network. The network MAC address reflects the hardware of your Matrox Iris GT and cannot be changed.
Owner name	Specifies the information entered in the **Owner's name** field on the **Identification settings** page, which can be accessed from the **Administration utility** page. The **Administration utility** page can be accessed from the **Administration** page.
Owner company	Specifies the information entered in the **Owner's company** field on the **Identification settings** page, which can be accessed from the **Administration utility** page. The **Administration utility** page can be accessed from the **Administration** page.
Description	Specifies the information entered in the **Description** field on the **Identification settings** page, which can be accessed from the **Administration utility** page. The **Administration utility** page can be accessed from the **Administration** page.
MIL DMA memory size	Specifies the total amount of non-paged linear memory (DMA) currently reserved for imaging projects, in Kbytes. This value can be changed on the **Boot settings** page, which can be accessed from the **Administration utility** page. The **Administration utility** page can be accessed from the **Administration** page.
MIL DMA memory used	Specifies the amount of non-paged linear (DMA) memory currently in use by imaging projects, in Kbytes. This value changes dynamically. This value is related to the number of image buffers available to the acquisition queue. Refer to the Matrox Design Assistant User Guide for more information about the Camera step.
MIL DMA memory free	Specifies the amount of non-paged linear (DMA) memory currently available for imaging projects, in Kbytes. This value changes dynamically.
RAM total size	Specifies the physical (total) amount of RAM available on your Matrox Iris GT, in Kbytes. This value reflects the hardware and cannot be changed.
Disk total size	Specifies the sum total amount of space on both the */CEDisk* and */UserDisk* partitions, in Kbytes. This value reflects the hardware and cannot be changed.
Current RAM file system size	Specifies the current amount of RAM dedicated to the file system, in Kbytes. This value can be changed on the **Boot settings** page, which can be accessed from the **Administration utility** page. The **Administration utility** page can be accessed from the **Administration** page.
Free RAM file system size	Specifies the amount of RAM not currently used by the RAM file system, in Kbytes. This value is dynamic.
Total RAM for OS	Specifies the total amount of RAM for all applications running on the operating system, in Kbytes. This value reflects the hardware and cannot be changed.
Free RAM for OS	Specifies the total amount of RAM available for the operating system and not currently used by applications running on your Matrox Iris GT, in Kbytes. This value is dynamic.
RAM OS load	Specifies the amount of RAM used by the operating system, including applications and processes, as a percentage. This value is dynamic.
OS loader page pool usage	Specifies the amount of memory reserved for the operating system to use from the flash drive. This value can be changed on the **Boot Settings** page, which can be accessed from the **Administration utility** page. The **Administration utility** page can be accessed from the **Administration** page.

Field name	Description
CPU load	Specifies the amount of work being performed by the CPU, as a percentage. This value is dynamic.
IRQ load	Specifies the number of interrupt requests (IRQs) being generated per second. This value is dynamic.
Web server total address space	Specifies the total amount of address space given to the process of the Matrox Iris GT web server, in Kbytes. This value reflects the hardware and cannot be changed.
Web server available address space	Specifies the amount of free address space (that includes unreserved and uncommitted), in Kbytes. This value reflects the hardware and cannot be changed.
Total disk space	Specifies the total amount of space for both *\CEDisk* and *\UserDisk*, in Kbytes. This value reflects the hardware and cannot be changed.
Disk free space	Specifies the total amount of free space available for each of the partitions (*\CEDisk* and *\UserDisk*) on your Matrox Iris GT, in Kbytes. This value is dynamic.
RemoteView CAB VROOT	Specifies the flash disk folder to store temporary files required when ASP pages interact with a RemoteViewActiveX object.
RemoteView CAB file name	Specifies the name of the cabinet (CAB) file used by the RemoteClientActiveXCtrl Class Microsoft Internet Explorer add-on.
RemoteView ActiveX CLSID	Specifies the unique class identifier for the ActiveX control used when creating ASP web pages for your Matrox Iris GT.
Main processor information	Specifies the type of processor used by your Matrox Iris GT. This value reflects the hardware and cannot be changed.
Main processor temperature	Specifies the temperature, in Celsius, of the main processor. This value is dynamic.
In box temperature	Specifies the temperature, in Celsius, inside your Matrox Iris GT. This value is dynamic.
Sensor temperature	Specifies the temperature, in Celsius, of the image sensor inside your Matrox Iris GT. This value is dynamic.
Motherboard revision	Specifies the version number of the main PCB board installed in your Matrox Iris GT. This value reflects the hardware and cannot be changed.
Sensor board revision	Specifies the number and version of the sensor PCB board installed in your Matrox Iris GT. This value reflects the hardware and cannot be changed.
FPGA ROM version	Specifies the version number of the FPGA ROM hardware.
EPROM content versions	Specifies the current version of the content of the EPROM of your Matrox Iris GT. This value reflects the hardware and cannot be changed. It is composed of two parts: motherboard (MB) information and sensor (SB) information.
Serial number	Specifies a unique serial number for your Matrox Iris GT. This value reflects your Matrox Iris GT, and cannot be changed.
Sub assembly PCB serial numbers	Specifies the serial numbers for your Matrox Iris GT motherboard (MB), sensor (SB), and a global number (serial number). These values reflect the hardware and cannot be changed.
Sub assembly PCB production lot numbers	Specifies the production lot numbers for your Matrox Iris GT motherboard (MB) and sensor (SB) when it was produced. These values reflect the hardware and cannot be changed.
Sub assembly PCB production dates	Specifies the date on which the different parts went through production: motherboard (MB) and sensor (SB). These values reflect the hardware and cannot be changed.

Field name	Description
Production Boot ROM version	Specifies the version number of the factory-configured boot firmware. This value reflects the hardware and cannot be changed.
Production OS version	Specifies the version number of the factory-configured operating system. This value reflects the hardware and cannot be changed.
Production file system version	Specifies the version number of the factory-configured file system. This value reflects the hardware and cannot be changed.
Production FPGA ROM version	Specifies the version number of the factory-configured FPGA ROM firmware.
Boot ROM version and build number	Specifies the version and build number of the Boot ROM firmware.
Boot ROM date stamp	Specifies the date and time when the Boot ROM firmware was created.
Running OS version	Specifies the version number of the operating system currently running on your Matrox Iris GT.
OS description	Specifies the type of operating system on your Matrox Iris GT. This value reflects the hardware and cannot be changed.
OS configuration version and build number	Specifies the version and build number of the operating system.
OS date stamp	Specifies the date when the operating system was created.
OS QFE stamp	Specifies the version number of the last QFE that was applied.
OS license acceptation date	Specifies the date when the license was accepted by the first visitor to the Matrox Iris portal website.
MIL version	Specifies the version of MIL.
MIL date stamp	Specifies the date when the MIL version was created.
MIL build number	Specifies the build number of MIL.
MIL service/processing pack	Specifies the version of the last MIL service/processing pack that was installed.
MIL Update	Specifies the version of the last MIL update that was applied.
MIL Hot Fix	Specifies the latest MIL hot fix (MHF) applied.
Design Assistant version and build number	Specifies the version and build number of Matrox Design Assistant.

Administration page

The **Administration** page provides links to a variety of pages, allowing you to perform basic and advanced administration on your Matrox Iris GT:

- **LAN connection settings.** The **LAN connections** page contains configuration options that allow your Matrox Iris GT to access specified network resources (for example, to map a network drive on your Matrox Iris GT) and to allow Matrox Design Assistant projects to read and write image files and log files on network-shared folders. For more information, refer to the Matrox Design Assistant User Guide.

- **MIL licensing settings**. The **MIL licensing settings** page allows you to select license packages to purchase, generate corresponding lock codes, and enable the purchased license packages. For more information, refer to the Matrox Design Assistant User Guide.

- **Administration utility**. The **Administration utility** page provides links to a variety of pages allowing you to perform more advanced administration tasks. Note that this group of pages is rarely needed by developers using Matrox Design Assistant, unless adjusting the amount of non-paged linear memory (DMA) on the **Boot setting**s page, or changing the display resolution of VGA output on the **Display settings** page.

- **Manage project security settings**. The **Manage project security settings** page provides the ability to lock a Matrox Design Assistant project to your Matrox Iris GT. From this webpage, you can also manage the access rights of the operator view for deployed projects.

- **Assignment settings**. The **Assignment settings** page provides control over the application executed during the initialization of your Matrox Iris GT. Generally, this page is not required when running Matrox Design Assistant projects. To automatically start a Matrox Design Assistant project, use the **Manage projects** page.

- **Discover utility**. The **Matrox Discover utility** page searches your LAN for Matrox Iris cameras (P-Series, E-Series, and GT) using Universal Plug and Play (UPnP). Note that, by default, your computer has universal plug and play (UPnP) disabled. The Matrox Iris portal website requires UPnP to be enabled on any computer that uses the Matrox Discover utility.

- **Monitor process**. The **Monitor processes** page provides a list of all the processes and their threads currently running on your Matrox Iris GT. Monitoring allows you to examine thread priorities, associating processes (*.EXE* files) to modules (*.DLL* files) and modules to threads, as well as killing processes.

- **Review log**. The **Review log** pages display listings in your web browser of the Matrox Iris GT logs. Each listing is a text-dump with very little formatting provided. Note that these page are useful to Matrox technical support, when trying to debug problems on your Matrox Iris GT.

A note about ActiveX security settings

The Matrox Iris portal website and the Matrox Discover utility use ActiveX components. ActiveX must be enabled on your computer. In addition, the Matrox Iris portal website must be listed in Microsoft Internet Explorer as a trusted site.

Verify that the following settings under the ActiveX controls and plug-ins element are either set to enabled or enabled on prompt:

- Download signed ActiveX controls.
- Initialize and script ActiveX controls not marked as safe.[1]
- Run AcitveX controls and plug-ins.
- Script ActiveX controls marked safe for scripting.

Note that, if these settings are set to prompt, you will be prompted each time an ActiveX control requires downloading and is waiting to start. You must accept each prompt (click on OK) to allow Matrox Iris GT to use the ActiveX object.

1. This setting is required by the Matrox Discover utility on the Matrox Iris portal website, but not the Matrox Discover utility on your computer.

Appendix I: Troubleshooting

This appendix provides solutions to the most commonly-occurring problems when trying to connect to your Matrox Iris GT.

Problems with accessing the Matrox Iris portal website

The following sections describe typical solutions for when you cannot access the Matrox Iris portal website.

Your Matrox Iris GT is directly connected to your computer or a network that uses static IP addresses

The following table describes typical solutions for access problems when your Matrox Iris GT is directly connected to your computer (in a peer-to-peer configuration) or a network that uses static IP addresses. Note that, if your Matrox Iris GT uses DHCP, refer to the *Your Matrox Iris GT is connected to a network that uses DHCP* subsection, later in this section.

Item	Situation	Typical messages	What to do	Where to get more information
A	Microsoft Internet Explorer cannot connect to the Matrox Iris portal website using the name of your Matrox Iris GT (for example **//iris080123**).	"Internet Explorer cannot display the web page." OR "No standard web pages containing all your search terms were found. Your search - **iris080123** - did not match any documents."[a]	1. Verify that the Power and Status LEDs of your Matrox Iris GT are green, the User LED is either off or green, and that the LEDs are not reporting an error. If this is not the case, contact technical support. 2. Use the Matrox IrisBootParams utility to determine your Matrox Iris GT's IP address and whether it is using DHCP or static addressing. It is recommended that DHCP is deselected when using static addressing. 3. Try using the IP address instead of the name of your Matrox Iris GT. If this does not work, refer to item B in this table.	*Reading the state of your Matrox Iris GT* section, in *Chapter 2: Powering and connecting to your Matrox Iris GT*. *Appendix J: Reading the LEDs*. *Matrox IrisBootParams utility* section, in *Appendix G: Matrox Iris GT utilities*. *Determining a static IP address for Matrox Iris GT* section, in *Chapter 4: Configuring your Matrox Iris GT to work with your computer directly*.
B	Microsoft Internet Explorer cannot connect to the Matrox Iris portal website when using the smart camera's IP address (for example //169.254.1.3).	As above in item A.	1. Make sure that your computer and your Matrox Iris GT have IP addresses on the same subnet and have the same subnet mask. 2. Reboot your Matrox Iris GT. 3. Try item C.	*Determining a static IP address for Matrox Iris GT* section, in *Chapter 4: Configuring your Matrox Iris GT to work with your computer directly*.

Item	Situation	Typical messages	What to do	Where to get more information
C	When you ping your Matrox Iris GT (for example: Ping 169.254.1.12), the ping fails.	"Destination host unreachable." There was no reply. OR "Reply from 169.254.1.12: Destination host unreachable." What replies is not what you addressed. This implies that you are still connected to a network.	1. If you did not deselect DHCP (see item A), wait 5 minutes for DHCP to time-out and try to ping your Matrox Iris GT again. 2. Verify the number of active network or wireless connections using the **Network Connections** utility (accessible from the Windows Control Panel). More than one active connection can cause problems communicating with your Matrox Iris GT. 3. Disable all network or wireless connections except for the one connected to your Matrox Iris GT. 4. Reboot your Matrox Iris GTand your computer. 5. Open a command prompt window on your computer. 6. Try to ping your Matrox Iris GT again.	*Chapter 3: Configuring your Matrox Iris GT to work on a network*
D	Your Firewall utility blocks the ping from being sent.	As above in item A. OR A dialog box might appear describing that a ping or ICMP command was blocked.	Enable file sharing using the Firewall utility (accessible from the Windows Control Panel). This opens port 445 on the firewall and allows ping echoes to occur.	
E	FullRescue utility fails on a computer within a workgroup network environment.	"Unable to connect to file server resource." OR "Error finding file *fname.ext*"	1. Do not use the **Enable LMHOSTS lookup** option of the WINS configuration on your computer since this prevents your Matrox Iris GT from seeing subfolders inside of a shared folder. 2. Shared folders must be named with the same name as the folder itself. 3. When changing from a domain into a workgroup, do not reuse shared folders. Instead create new shared folders, as necessary. 4. From your Matrox Iris GT, try to navigate to the shared folder on your development computer (*MyComputer**IrisGTRescue*) to verify that the firewall of the development computer does not prevent the Matrox Iris GT to reach the selected shared rescue folder. • If you cannot access the shared folder, modify your firewall software to allow the connection.	*FullRescue utility* subsection of the *Utilities installed on your Matrox Iris GT* section, in *Appendix G: Matrox Iris GT utilities*.

Item	Situation	Typical messages	What to do	Where to get more information
F	Unable to find your Matrox Iris GT through various means (for example, using Microsoft Windows Explorer, Internet Explorer, or ping).	As above in item A. OR Windows cannot find... Check the spelling and try again..."	Before unplugging your Matrox Iris GT from a network that uses DHCP, go to the **General network settings** page, which can be accessed from the **Administration utility** page. The **Administration utility** page can be accessed from the **Administration** page. Clear the **Matrox Iris GT default authentication domain** field.	

a. Note that if Microsoft Internet Explorer cannot find the URL specified, it might search the internet for the specified address.

Your Matrox Iris GT is connected to a network that uses DHCP

The following table describes typical solutions for access problems when your Matrox Iris GT is connected to a network that uses DHCP. Note that, if your Matrox Iris GT does not use DHCP, refer to the *Your Matrox Iris GT is directly connected to your computer or a network that uses static IP addresses* subsection, earlier in this section.

Item	Situation	Typical messages	What to do	Where to get more information
A	Microsoft Internet Explorer cannot connect to the **View utility** page of the Matrox Iris portal website when using the name of your Matrox Iris GT (for example //**iris080123**).	"Internet Explorer cannot display the web page." OR "No standard web pages containing all your search terms were found. Your search - **iris080123** - did not match any documents."	1. Verify that the Power, Status, and User LEDs of your Matrox Iris GT are green. If they are not, contact technical support. 2. Use the Matrox IrisBootParams utility to determine whether your Matrox Iris GT and your computer both use DHCP.	*Reading the state of your Matrox Iris GT* section, in *Chapter 2: Powering and connecting to your Matrox Iris GT*. *Matrox IrisBootParams utility* section, in *Appendix G: Matrox Iris GT utilities*. *Chapter 3: Configuring your Matrox Iris GT to work on a network*.
B	After changing the IP address of your Matrox Iris GT from one subnet to another, connections fail.	Web page cannot be displayed.	Connecting to your Matrox Iris GT using its *IrisName* can produce a temporary latency, or even fail. Most of the time this problem resolves itself the next time your DNS server refreshes its information. If it does not, refer to item C.	
C	After changing subnets, your Matrox Iris GT still tries to respond to its old IP address.	Web page cannot be displayed.	Eventually, the problem should resolve itself. Contact your network administrator if the problem persists.	

Problems with the View utility page

The following table describes typical solutions for problems that occur when using the **View utility** page of the Matrox Iris portal website.

Item	Situation	Typical messages	What to do	Where to get more information
A	Microsoft Internet Explorer cannot connect to the **View utility** page of the Matrox Iris portal website when using the name of your Matrox Iris GT (for example **//iris080123**).	"Internet Explorer cannot display the web page." OR "No standard web pages containing all your search terms were found. Your search - **iris080123** - did not match any documents."[a]	1. Try to connect to the Matrox Iris portal website. 2. If you cannot connect to the Matrox Iris portal website, refer to *Problems with accessing the Matrox Iris portal website* section, earlier in this appendix.	*Problems with accessing the Matrox Iris portal website* section, earlier in this appendix.
B	Accessing the **View utility** page of the Matrox Iris portal website causes errors.	"Do you want to install this software - RemoteView." OR "Your security settings do not allow web sites to use ActiveX controls installed on your computer." OR "A runtime error has occurred... Object doesn't support this property or method."	The RemoteClientActiveX control is not installed on your computer. When you visit the Matrox Iris GT's **View utility** page, a copy of RemoteClientActiveX should download automatically. If necessary, modify the security settings of your Microsoft Internet Explorer settings to allow this process to complete.	Matrox Iris GT QuickStart guide. *A note about ActiveX security settings* subsection of the *Administration page* section, in *Appendix H: Matrox Iris portal website details*.
C	The **View utility** page of the Matrox Iris portal website displays an error in the image area.	"MdigAlloc failed! MIL Digitizer already allocated."	Set the display to either *DesignAssistantAgent.exe* or *DesignAssistantCF.exe*, if they are in the list. Selecting *RemoteAgent.exe* will display an error if it is selected when either *DesignAssistantAgent.exe* or *DesignAssistantCF.exe* are also in the list.	*Installing Matrox Design Assistant* section, in *Chapter 1: Before you begin*. *View utility page* section, in *Appendix H: Matrox Iris portal website details*.

a. Note that if Microsoft Internet Explorer cannot find the URL specified, it might search the internet for the specified address.

Problems with Matrox Design Assistant connecting to your Matrox Iris GT

The following table describes typical solutions for problems that occur when Matrox Design Assistant tries to connect to your Matrox Iris GT.

Item	Situation	Typical messages	What to do	Where to get more information
A	Matrox Design Assistant cannot connect to your Matrox Iris GT - Matrox Design Assistant agent is not running.	"The camera iris080999 is not reachable on the network".	1. Confirm that the *DesignAssistantAgent.exe* process is not running. There are two ways to do this: • Go to the **Monitor process** web page, accessible from the **Administration** web page on the Matrox Iris portal website. • Go to the **View utility** web page on the Matrox Iris portal website. *DesignAssistantAgent.exe* should be listed in the display selection list box. 2. If the process is running, refer to the other items described in this section. 3. If the process is not listed, go to the **MIL licensing settings** webpage, accessible from the **Administration** web page on the Matrox Iris portal website. 4. Verify that there are no messages concerning expired licenses. 5. Contact technical support with the information just established from the previous steps and a copy of the **Review execution log** webpage, accessible from the **Administration** web page on the Matrox Iris portal website.	The *Administration page* section, in *Appendix H: Matrox Iris portal website details*. The *Licences* section of the *Matrox Design Assistant User Guide*.

Item	Situation	Typical messages	What to do	Where to get more information
B	Matrox Design Assistant cannot connect to your Matrox Iris GT - name translation issues.	"The camera iris080999 is not reachable on the network".	There is a problem finding the smart camera using the name of your Matrox Iris GT. 1. Confirm that you can communicate with the camera using Microsoft Internet Explorer (see item A in *Your Matrox Iris GT is directly connected to your computer or a network that uses static IP addresses* subsection of the *Problems with accessing the Matrox Iris portal website* section). 2. If you can access your Matrox Iris GT by the name of your Matrox Iris GT, but the problem persists, use the Matrox IrisBootParams utility to determine the smart camera's IP address. Note that the **Modify Network settings** button in the **Matrox Design Assistant error message** dialog box opens the Matrox IrisBootParams utility. 3. Try connecting to your smart camera using its IP address rather than its name. 4. If you can access your Matrox Iris GT by its IP address, but not by its name, there are two possible causes: • You have moved your smart camera physically from one subnet to another within your facility and the DHCP server tables still have the old address. Wait 20 minutes or contact your network administrator. • You have a workgroup and the services that translate names to addresses are not working; contact your network administrator.	*Matrox IrisBootParams utility* subsection of the *Utilities installed on your development computer* section, in *Appendix G: Matrox Iris GT utilities*.
C	Matrox Design Assistant cannot connect to your Matrox Iris GT when you are connected to a workgroup with multiple TCP/IP stacks.	"The camera iris090999 is not reachable on the network."	There is a problem finding the smart camera using its name. 1. If you can access your Matrox Iris GT by its name in Microsoft Internet Explorer, but the not using Matrox Design Assistant, verify the number of active network or wireless connections, using the **Network Connections** utility (accessible from the Windows Control Panel). More than one active connection can cause problems communicating with your Matrox Iris GT. 2. Disable all network or wireless connections except for the one connected to your Matrox Iris GT. 3. Reboot your Matrox Iris GTand your computer. 4. Try to communicate with the smart camera using Matrox Design Assistant.	*Determining a static IP address for Matrox Iris GT* section, in *Chapter 4: Configuring your Matrox Iris GT to work with your computer directly*.

Item	Situation	Typical messages	What to do	Where to get more information
D	Matrox Design Assistant cannot determine the version of software used on your Matrox Iris GT.	"Design Assistant cannot determine whether the camera iris0090999 needs to be updated."	In most cases, if this occurs, Matrox Design Assistant was unsuccessful at sending an inquiry to the smart camera using the SOAP protocol. If you are using the Matrox Design Assistant 2,1 EA (pre-release) version under Microsoft Vista, upgrade your version. If this occurs with a released version, contact technical support.	

Booting problems

The following problems relate to the blink patterns of your Matrox Iris GT's LEDs that occur while your Matrox Iris GT boots. For more information, refer to the *Reading the LEDs* section, in *Appendix J: Reading the LEDs*.

Item	Situation	Typical messages	What to do	Where to get more information
A	Shortly after a full rescue or an automatic version update, your Matrox Iris GT is not responding.	None, however, the Power LED is red/orange, and the User LED is red and blinking in a specific pattern: 6-1-4-3-1	Your Matrox Iris GT is waiting to receive its operating system over the network. Wait until the Power and User LEDs are green or their blink pattern changes before trying to communicate with your Matrox Iris GT. If your Matrox Iris GT cannot find a valid operating system on your smart camera's disk, it will try to download one from the Ethernet. If the problem persists, refer to item C.	
		None, however, the Power LED is red/orange, and the User LED is red and blinking in a specific pattern: 6-1-1-2-1.	The maximum number of boot failures has occurred. By default, the Boot failure watch feature is enabled on the Matrox Iris portal website. This means that after 15 consecutive boot failures, the boot settings of your Matrox Iris GT will be automatically reset to their factory defaults. Wait until the Power and User LEDs are green or their blink pattern changes before trying to communicate with your Matrox Iris GT. If the problem persists, refer to item B.	

Item	Situation	Typical messages	What to do	Where to get more information
B	Your Matrox Iris GT has failed a number of times in its attempt to boot successfully.	None, however, the User LED blink sequence is 6-1-1-2-1.	Your firmware should be restored to its factory default. To do so, perform the following: 1. Share the folder containing the factory-default rescue files. The rescue folder can be found in the Matrox Design Assistant installation folder (for example, *C:\Program Files (x86)\Matrox Imaging\Design Assistant 2.3\Rescue*). 2. From your Matrox Iris GT, ping the shared folder on your computer (*\\MyComputer\IrisGTRescue*) to verify that the firewall of your computer or network router does not prevent your Matrox Iris GT to reach the selected shared rescue folder. 3. If the ping fails, modify your firewall software or network router to allow the connection. 4. If your computer uses a static IP address, take note of the IP address and subnet mask used by your development computer. 5. Use the FullRescue utility, with the contents of the IrsGTRescue shared folder. 6. When the FullRescue utility is complete, close the telnet window. Wait for both the Power and the User LEDs to turn green before reassessing the status of your Matrox Iris GT. 7. If the problem persists, refer to item C.	*FullRescue utility* subsection of the *Utilities installed on your Matrox Iris GT* section, in *Appendix G: Matrox Iris GT utilities*.
C	After trying all the above, your Matrox Iris GT will not boot properly.	None, however, the User LED blink sequence shows an error occurred.	1. If you cannot access the **Administration** page of the Matrox Iris portal website, use the IrisBootParams utility to enable COM Post. 2. If the IrisBootParams utility times out trying to connect to your Matrox Iris GT, enable the diagnostic switch on the Output-to-trigger bypass switch box of the Matrox breakout board. This will force diagnostic output to be sent to the COM port. 3. Open a terminal emulation program to receive the messages sent by your Matrox Iris GT. 4. If these messages do not make the problem easier to diagnose or solve, contact Matrox technical support.	*Appendix J: Reading the LEDs*. *Matrox IrisBootParams utility* subsection of the *Utilities installed on your development computer* section, in *Appendix G: Matrox Iris GT utilities*. *Output-to-trigger bypass switch box* subsection of the *Switch boxes* section, in *Appendix F: The Matrox breakout board*. Contact Matrox technical support for assistance.

Item	Situation	Typical messages	What to do	Where to get more information
D	Your Matrox Iris GT is out of memory.	None, however the Power LED blinks green then red, and then repeats.	1. A critical out of memory error has occurred. Stop all running projects and make certain they will not launch on the restart of your Matrox Iris GT. 2. Launch the Memmon utility to monitor your project's memory usage. Then, step through the project to see where memory usage exceeds expectations. 3. Do not keep adding new models to your project without removing older ones. Note that this problem is most likely to occur when dealing with projects that contain many steps that generate output images (for example, image processing steps) and are run on a Matrox Iris GT 1200 or 1900 smart camera with 256 Mbytes of RAM.	**Manage projects** page of the Matrox Iris portal website. *MemMon utility* subsection of the *Utilities installed on your Matrox Iris GT* section, in *Appendix G: Matrox Iris GT utilities*. *Optimizing projects* chapter of *the Matrox Design Assistant online user guide*.

Problems while Matrox Design Assistant is running

The following problem relates to a situation that can occur while Matrox Design Assistant is running.

Item	Situation	Typical messages	What to do	Where to get more information
A	An unexpected exception occurs.	None, however no other information provided in this section solves the problem.	1. Gather information by enabling the **Fast Log** option in the **Troubleshooting** tab of MilConfig. 2. Contact Matrox Technical support with this information.	*Before calling technical support* section, later in this chapter.

Before calling technical support

In the event that the previous sections do not resolve your issue and you need to contact Technical Support, it is important to determine and provide some diagnostic information from your development computer, by performing the following:

1. Run the MilConfig application and select the **Troubleshooting** item from the tree menu.

2. Enable the **Fast log** option, and then click on the **Start Log** button. The logging process begins.

   - Note that this process can take several minutes.

3. When the process completes, click on the **Save As** button, and save the file.

4. Go to the **Essential Information** page of your Matrox Iris portal website. Save the file (as text) to your hard drive.

5. Complete and submit the online Technical Support Request Form, accessible from the Matrox Imaging web site: **http://www.matrox.com/imaging/support/**. Attach the files that you created to the form. Once the information is submitted, a Matrox support agent will contact you shortly thereafter by email or phone, depending on the problem.

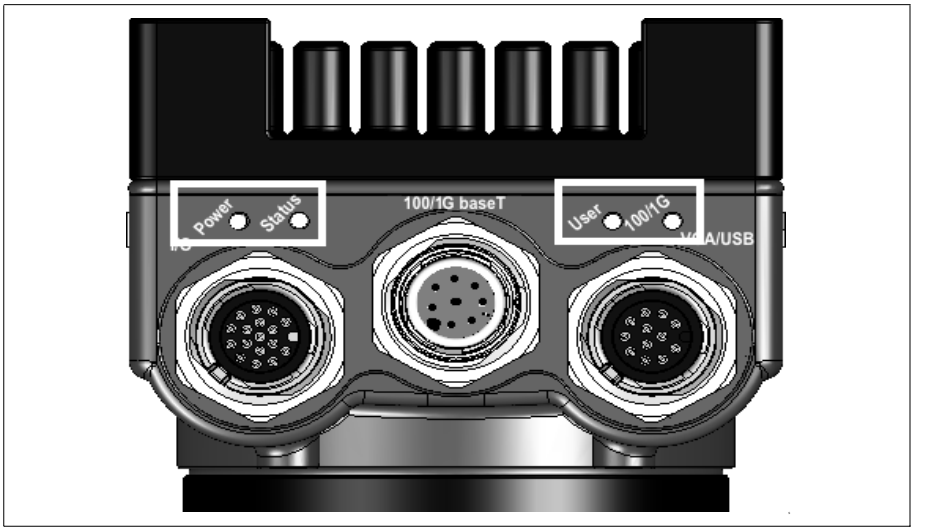
   - Note that, to use the online Technical Support Request Form, you must be registered with Matrox. Please take a few moments to register your copy of Matrox Design Assistant, using the **Register Software** webpage, available from the **Support** webpage of the Matrox Imaging web site. For more information about the software support and maintenance programs, see the **Software Support and Maintenance** web page, available from the **Support** webpage of the Matrox Imaging web site.

Appendix J: Reading the LEDs

This appendix details how to read the LEDs of your Matrox Iris GT and details the potential LED error codes.

Reading the LEDs

The four light-emitting diodes (LEDs), located at the back of your Matrox Iris GT, show the activity and state of your Matrox Iris GT.



- **Power LED and User LED**. The Power and User LED should be read together.

  - Note that your Matrox Design Assistant project can control the User LED after your Matrox Iris GT boots. Any LED state that occurs after the operating system loads can be configured to have a different definition than the one documented.

By default, the Power and User LEDs have the following meaning:

LED Color		Description
Power	**User**	
Off	Off	Matrox Iris GT has no power.
Red	Red	If this occurs during the power-up phase, your Matrox Iris GT is not receiving +12 V or +24 V +/- 10%. If this occurs after the power-up phase, your Matrox Iris GT is experiencing critical problems while booting. If, after a few minutes, the User LED does not blink or change color, contact Matrox Technical support.
Red	Red (blinking)	Your Matrox Iris GT is experiencing problems while booting, and the User LED is reporting the error by blinking. For a description of LED blink codes, refer to *Reading the LEDs* section.
Red	Off	A critical execution is in progress.

LED Color		Description
Power	**User**	
Red	Orange	ROM is being updated.
Off	Red	A diagnostic on ROM is running.
Off	Green	The ROM diagnostic is sending its output to the serial port.
Off	Orange	The ROM diagnostic is being updated.
Red	Green	Matrox Iris GT is copying information from ROM to RAM.
Orange	Off	ROM power-on self tests are in progress.
Orange	Red (solid)	Your Matrox Iris GT cannot boot from the local copy of its operating system. Your smart camera has begun broadcasting a message that it is waiting for a copy of the operating system to be transferred over the network. Launch the Matrox Iris OS Downloader utility on a development computer that is on the same subnet as your smart camera. This utility will automatically detect your Matrox Iris GT's message and provides a way to send a copy of the operating system to your smart camera so it can boot. Note that this is a temporary solution and further debugging steps might be required.
Orange	Red (blinking)	Your Matrox Iris GT is in the process of booting and is still in communication with the computer across the network, which has the operating system.
Orange	Orange	Matrox Iris GT is copying Microsoft Windows CE information to RAM from the flash disk.
Orange	Green	Microsoft Windows CE is starting.
Green	Off	Microsoft Windows CE is now running on your Matrox Iris GT. Your Matrox Iris GT is configured in static IP mode.
Green	Orange	Matrox Iris GT is launching applications set to run automatically when the smart camera starts. The applications are specified on the **Manage projects** page, available from the **Administration utility** page of the Matrox Iris portal website.
Green	Green	Your Matrox Iris GT is configured in DHCP mode.
Blinking green then red	Any	An unrecoverable out-of-memory condition was detected by the operating system. For more information, refer to the *Problems while Matrox Design Assistant is running* section, in *Appendix I: Troubleshooting*.

- **100/1G LED**. This LED shows the connection status of your Matrox Iris GT.

LED	Description
Off	There is either no activity or a low speed (10 Mbits) connection between your Matrox Iris GT and the network.
Solid yellow	There is a link on the 100 Mbits/sec connection.
Blinking yellow	The 100 Mbits/sec connection has activity.
Solid green	There is a link on the 1000 Mbits/sec connection.
Blinking green	The 1 Gbit/sec connection has activity.

- **Status LED.** This LED shows the general activity of your Matrox Iris GT.

LED	Description
Off	There is no power.
Red	Matrox Iris GT is booting.
Orange	The Matrox Iris GT is being initialized or a deployed Matrox Design Assistant project is either waiting for a trigger or using image files from disk.
Green	Matrox Iris GT is grabbing.

Power LED error codes

Whenever the User LED is blinking red while the Power LED is also red, an error has occurred. These are errors declared by the bootloader at boot time. A text version of the error message can be seen among the messages sent to the COM port by Matrox Iris GT.

❖ Note that this assumes the **POST string print to memory** option is enabled on the **Boot settings** page, which can be accessed from the **Administration utility** page. The **Administration utility** page can be accessed from the **Administration** page of the Matrox Iris portal website.

The following only applies when the Power LED stays red while the User LED blinks red.

User LED blink sequence	Error
6-1-1-1-1	Invalid error or unknown error.
6-1-1-1-2	Boot ROM checksum error.
6-1-1-1-3	CMOS error.
6-1-1-1-4	CMOS data error.
6-1-1-2-1	Maximum boot failure count reached.
6-1-1-2-2	Memory initialization error.
6-1-1-2-3	FPGA Load firmware error.
6-1-1-2-4	ROM interface block error.
6-1-1-3-1	CPU microcode update error.
6-1-1-3-2	Memory bus data line error.
6-1-1-3-3	Memory bus address line error.
6-1-3-1-1	RTC error.

User LED blink sequence	Error
6-1-3-1-2	100/1000 BaseT Ethernet controller error.
6-1-3-1-3	Solid state device size error.
6-1-3-1-4	RAM row size error.
6-1-3-2-1	Sensor FPGA error.
6-1-3-2-2	Sensor FPGA RAM error.
6-1-3-2-3	Aux IO FPGA error.
6-1-3-3-1	SMBus error.
6-1-3-3-2	Clock synthesizer error.
6-1-3-3-3	Motherboard SEEPROM communication error.
6-1-3-3-4	Motherboard SEEPROM data error.
6-1-3-4-1	CPU temperature monitor communication error.
6-1-3-4-2	CPU temperature too high.
6-1-4-1-1	Ethernet SEEPROM error.
6-1-4-1-3	Sensor SEEPROM communication error.
6-1-4-1-4	Sensor SEEPROM data error.
6-1-4-2-1	Sensor temperature sensor communication error.
6-1-4-2-2	Sensor temperature too high.
6-1-4-2-3	Boot parameters block error.
6-1-4-2-4	Boot parameters block data error.
6-1-4-3-1	Matrox Iris GT sent a maximum number of requests to boot from the Ethernet without receiving an answer from a computer running the Matrox Iris OS Downloader utility.
6-1-4-3-2	Operating system downloaded through Ethernet is not valid.
6-1-4-3-3	Operating system image on the solid state drive is not valid.

For example, the Power and User LEDs have the following blink sequence when the operating system image on the smart camera is invalid.

- The Power LED is red and constant.
- The User LED flashes 17 times (6-1-4-3-3). The flashes are divided into groups (pulses) with a 300 msec pause between each pulse. A 1 second pause occurs before the blink pattern repeats.

  When the User LED stops blinking, the error code is complete.

❖ Note that your Matrox Iris GTmight stop the bootloader execution when an error occurs. Any critical error will prevent your Matrox Iris GT from continuing the boot process.

Appendix K: Using a version of Matrox Iris GT that accepts 5 V auxiliary input signals

This appendix details the electrical specifications and connection information when dealing with user-defined auxiliary input signals and using a version of Matrox Iris GT that accepts 5 V auxiliary input signals.

Matrox Iris GT electrical specifications

The following specifications detail the version of Matrox Iris GT that supports 5 V auxiliary input signals. For the electrical specifications pertaining to the version of Matrox Iris GT that supports 24 V auxiliary input signals, refer to the *Electrical specifications* section, in *Appendix B: Technical Reference*.

		GT300, GT300C, GT1200, GT1200C, GT1900, GT1900C (5 V input version)			
Operating voltage and current		12 V provided: 1000 mA used ± 10%. 24 V provided: 500 mA used ± 10%.			
I/O specifications					
	Output signals in IND format	Open collector driver. Operating voltage range: Up to 24 V. Sink currents: Minimum: 0 mA, Maximum: 100 mA. Maximum leakage current 10 µA max. ON voltage drop 25 mV. Maximum inrush current 4 A for 300 µs max. OFF to ON response 250 nsec. ON to OFF response 250 nsec.			
	Opto-isolated input signals	Operating voltage	TTL (5 V)	12 V	24 V
		Input current	6.8 mA	6.8 mA	6.8 mA
		External resistor requirement	--	1 kΩ	3 kΩ
		ON voltage level	> 2.7 V	> 5.3 V	>10.16 V
		OFF voltage level	< 1.8 V	< 2.0 V	< 2.5 V
		Minimum ON current	2.5 mA	2.5 mA	2.5 mA
		Maximum OFF current	0.25 mA	0.25 mA	0.25 mA
		OFF to ON response	250 nsec	250 nsec	250 nsec
		ON to OFF response	250 nsec	250 nsec	250 nsec
	Controlled-current output	Operating voltage		24 V	12 V
		Output voltage		2.4 V to 21 V	2.4 V to 10 V
		Output current		0 to 500 mA max	0 to 500 mA max

Connecting external devices to input signals

The following information relates to the version of Matrox Iris GT that supports 5 V auxiliary input signals. For the information pertaining to the version of Matrox Iris GT that supports 24 V auxiliary input signals, refer to the *Connecting external devices to input signals* section, in *Appendix D: Using the I/O signals and controlled-current output of Matrox Iris GT*.

You can connect a wide variety of external devices to the input signals of your Matrox Iris GT, such as external triggering devices.

Your Matrox Iris GT auxiliary input and trigger signals can have a 5 V, 12 V, or 24 V power source. For information regarding the electric specifications regarding the ON and OFF voltage levels, see the *Matrox Iris GT electrical specifications* section, earlier in this appendix.

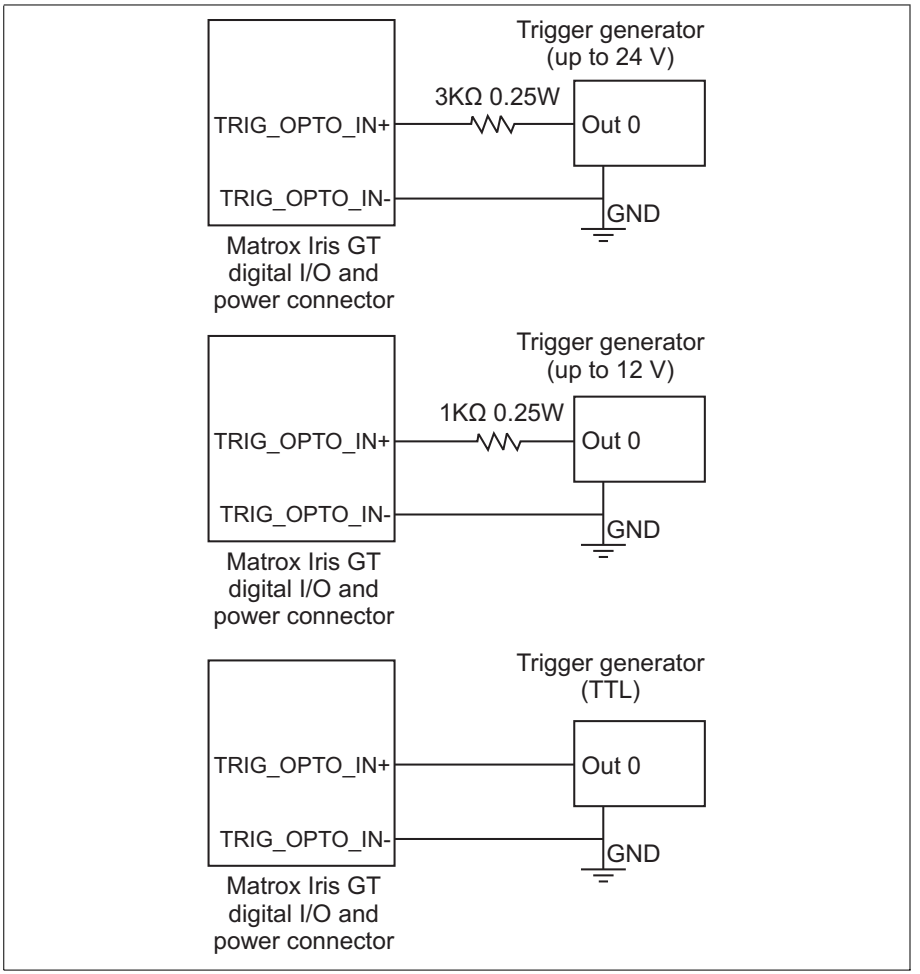
An external resistor must be used when dealing with non-TTL signals:

Voltage	External resistor required
5 V	0 KΩ and 0 W
12 V	1 KΩ and ¼ W
24 V	3 KΩ and ¼ W

Connecting to an external triggering device

To connect your Matrox Iris GT to an external triggering device, connect the ground of your Matrox Iris GT directly to the external triggering device's ground. Then, connect a resistor between your Matrox Iris GT and the external triggering device. Your Matrox Iris GT takes the output signal of the external triggering device as its input.

You can create a Matrox Design Assistant project that will accept the trigger signal and grab an image either on the signal's rising or falling edge.



Using the Matrox breakout board

The following instructions detail using the Matrox breakout board with the version of Matrox Iris GT that supports 5 V auxiliary input signals. For the instructions pertaining to the Matrox breakout board with the version of Matrox Iris GT that supports 24 V auxiliary input signals, refer to the *Routing input signals to Matrox Iris GT* section, in *Appendix F: The Matrox breakout board*.

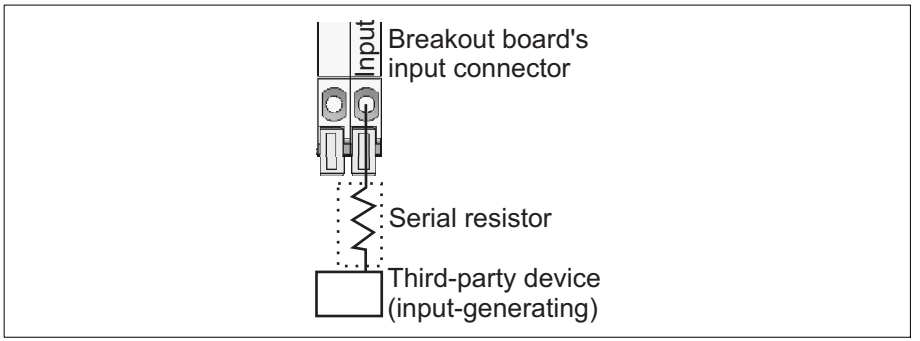
Routing a signal from a third party device to your Matrox Iris GT

You can route a signal from a third-party device to your Matrox Iris GT. To do so, perform the following:

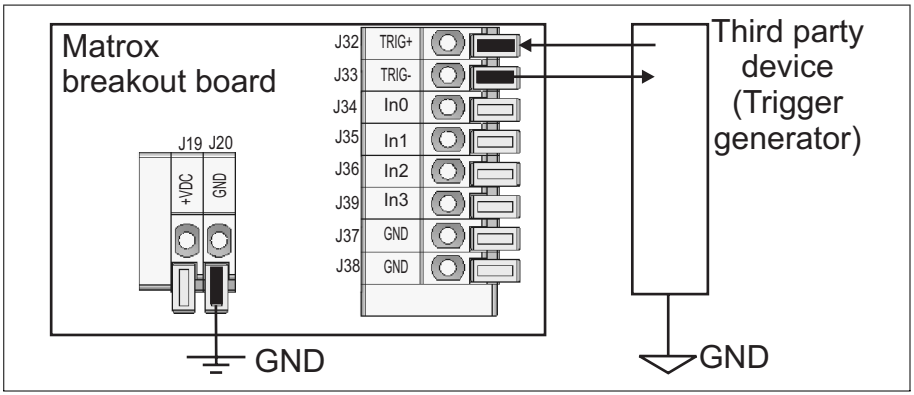
1. Connect the power and the digital I/O signals of your Matrox Iris GT to the breakout board by following the steps in the *Powering and connecting to your Matrox Iris GT* section, in *Appendix F: The Matrox breakout board*.

2. Connect an open-wire cable from the third-party device to the Matrox breakout board's input connector.

   To adjust for the various current requirements of trigger and auxiliary input signals, a serial resistor must be added between the third-party device and the Matrox breakout board's input connector.



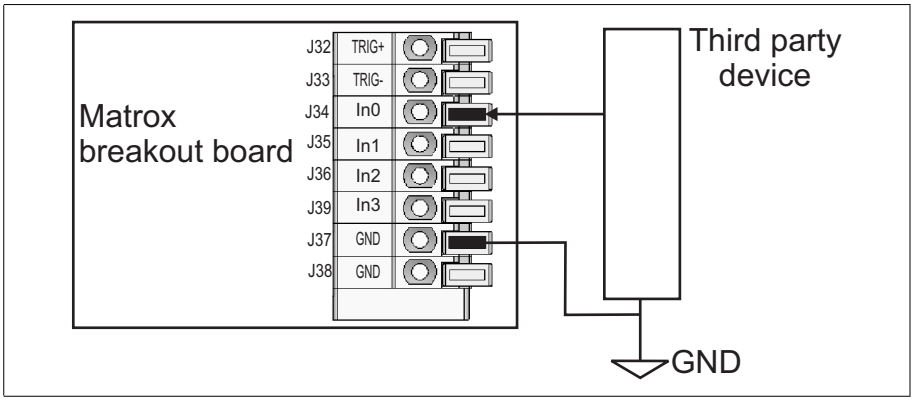
3. If routing the signal to the Matrox Iris GT trigger signal, the trigger signal must be grounded. Connect the TRIG_OPTO_IN- wire terminal (J37 on the Matrox breakout board's input connector) to a ground (floating ground) that is not electrically connected to the ground of your Matrox Iris GT.



This results in your Matrox Iris GT being fully isolated electrically from the opto-coupled trigger signal (that is, both TRIG_OPTO_IN+ and TRIG_OPTO_IN-).

Alternatively, turn on output-to-trigger bypass switch 2 (SW6[2]). This grounds the trigger signal (TRIG_OPTO_IN-).

4. If routing auxiliary input signals that are not trigger signals, connect the ground of the input connector on the Matrox breakout board (J32 or J33 of the breakout board input connector) to the ground of the third-party device providing the signal.



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Regulatory Compliance

FCC Compliance Statement

Warning

Changes or modifications to these units not expressly approved by the party responsible for the compliance could void the user's authority to operate this equipment.

The use of shielded cables for connections of these devices to other peripherals is required to meet the regulatory requirements.

Note

These devices comply with Part 15 of FCC Rules. Operation is subject to the following two conditions:

1. These devices may not cause harmful interference, and
2. These devices must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for Class A digital devices, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of these devices in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense.

Industry Canada Compliance Statement

These digital apparatuses do not exceed the Class A limits for radio noise emission from digital apparatuses set out in the Radio Interference Regulations of Industry Canada.

Ces appareils numériques n'émettent pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de Classe A prescrites dans le Règlement sur le brouillage radioélectrique édicté par Industrie Canada.

EU Notice (European Union)

WARNING: These are class A products. In a domestic environment these products may cause radio interference in which case the user may be required to take adequate measures.

AVERTISSEMENT: Ces appareils sont des produits informatiques de Classe A. Lorsque ces appareils sont utilisent dans un environnement résidentiel, ces produits peuvent entraîner des interférences radioélectriques. Dans ce cas, l'usager peut être prié de prendre des mesures correctives appropriées.

This device complies with EC Directive 89/336/EEC for Class A digital devices. They have been tested and found to comply with EN55022/CISPR22 and EN55024/CISPR24 when installed in a typical class A compliant host system. It is assumed that these devices will also achieve compliance in any Class A compliant system.

Ces unités sont conformes à la Directive communautaire 89/336/EEC pour les unités numériques de Classe A. Les tests effectués one prouvé qu'elles sont conformes aux normes EN55022/CISPR22 et EN55024/CISPR24 lorsqu'elles sont installées dans un système hôte typique de la Classe A. On suppose qu'ils présenteront la même compatibilité dans tout système compatible de la Classe A.

Directive on Waste Electrical and Electronic Equipment (WEEE)

Europe

(English) European user's information – Directive on Waste Electrical and Electronic Equipment (WEEE)

Please refer to the Matrox Web site (**www.matrox.com/environment/weee**) for recycling information.

(Français) Informations aux utilisateurs Européens – Règlementation des déchets d'équipements électriques et électroniques (DEEE)

Se référer au site Web de Matrox (**www.matrox.com/environment/weee**) pour l'information concernant le recyclage.

(Deutsch) Information für europäische Anwender – Europäische Regelungen zu Elektro- und Elektronikaltgeräten (WEEE)

Bitte wenden Sie sich an dem Matrox-Website (**www.matrox.com/environment/weee**) für Recycling Informationen.

(Italiano) Informazioni per gli utenti europei – Direttiva sui rifiuti di apparecchiature elettriche ed elettroniche (RAEE)

Si prega di riferirsi al sito Web Matrox (**www.matrox.com/environment/weee**) per le informazioni di riciclaggio.

Limited Warranty

Refer to the warranty statement that came with your product.