DATA TRANSLATION

UM-18235-E

DT3157
Getting Started Manual

Fifth Edition
August, 2002

Data Translation, Inc.
100 Locke Drive
Marlboro, MA 01752-1192
(508) 481-3700
www.datatranslation.com
Fax: (508) 481-8620
E-mail: info@datx.com

Table of Contents

About this Manual

This manual describes how to get started using a DT3157 frame grabber board.

Intended Audience

This document is intended for engineers, scientists, technicians, or others responsible for setting up a DT3157 board to perform machine vision and/or image analysis operations. It is assumed that you have some familiarity with the operating characteristics of your video source. It is also assumed that you are familiar with the Microsoft® Windows® 98, Windows Me (Millennium Edition), Windows 2000, or Windows XP operating system.

What You Should Learn from this Manual

This manual will help you install and set up your board and device driver successfully. It is organized as follows:

- Chapter 1, "Overview," describes the key features of the DT3157 Series hardware and software, and provides an overview of the getting started procedure;
- Chapter 2, "Preparing to Use the DT3157," describes how to unpack the board and software, check system requirements, install the DT3157 software, and view the DT3157 documentation online;
- Chapter 3, "Installing the Board," describes how to install the DT3157 board;
- Chapter 4, "Connecting Signals," describes how to connect signals to the board;
- Chapter 5, "Installing and Configuring the Device Driver," describes how to install and configure the device driver; and

- Chapter 6, "Verifying Board Operation," describes how to verify the board's operation using DT-Acquire.
- An index completes this manual.

Conventions Used in this Manual

The following conventions are used in this manual:

- Notes provide useful information that requires special emphasis, cautions provide information to help you avoid losing data or damaging your equipment, and warnings provide information to help you avoid catastrophic damage to yourself or your equipment.
- Items that you select or type are shown in **bold**.
- `Courier font` is used to represent source code.

Related Information

Refer to the following documents for more information on using a DT3157 board:

- The *DT3157 User's Manual* (UM-15024), included on the Imaging OMNI CD™ provided with the DT3157 board, describes the features of the DT3157 board and DT3157 Device Driver in detail.
- *Frame Grabber SDK User's Manual* (UM-13442) and the Frame Grabber SDK online help, included on the Imaging OMNI CD provided with the DT3157 board, describes the Dynamic Linkable Library (DLL) that you can use to write image acquisition application software.
- *DT-Active Open Layers User's Manual* (UM-17325), available from Data Translation, describes DT-Active Open Layers™, an ActiveX control, which allows you to use Data Translation PCI frame grabber boards within graphical programming environments such as Microsoft Visual Basic® and Visual C++®.

- *GLOBAL LAB Image/2 User's Manual* (UM-17790) and *GLOBAL LAB Image/2 API Manual* (UM-17792), available from Data Translation, describe how to use GLOBAL LAB® Image/2 and GLOBAL LAB Image/2 Streamline™ to create scientific applications using object-oriented image processing tools.
- *DT Vision Foundry User's Manual* (UM-17755) and *DT Vision Foundry API Manual* (UM-17757), available from Data Translation, describe how to use DT Vision Foundry™ to create machine vision applications using object-oriented image processing tools.

Where to Get Help

Should you run into problems installing or using a DT3157 board, our Technical Support Department is available to provide technical assistance. Refer to the Troubleshooting chapter of the *DT3157 User's Manual* for more information (see page 11 for information on installing and viewing this manual). If you are outside the United States or Canada, call your local distributor, whose number is listed in your Data Translation product handbook.

Overview

Key Hardware Features

The DT3157 frame grabber accepts video from digital input sources. It is suitable for both image analysis and machine vision applications.

Key features of the DT3157 board are summarized as follows:

- Operates as a PCI bus master;
- Accepts 8-, 10-, 12-, 14-, or 16-bit monochrome video from a single RS-422 video channel (programmable to 2 KB x 2 KB, 4 KB x 1 KB, or 1 KB x 4 KB), or 8-bit monochrome from two RS-422 video channels (programmable to 1 KB x 1 KB);
- Supports Kodak dual 8-bit video format (such as the Model ES1.0);
- Supports up to 20 MHz on a single channel (8 to 16 bits), and 40 MHz for dual channels;
- Provides real-time image transfer to host memory or to the display frame buffer;
- Provides real-time scaling, using decimation, up to 1/16 size (except in dual-channel mode);
- Accepts an external trigger;
- Provides an input look-up-table that supports single- and dual-channel mode;
- Provides eight TTL lines, each programmable as either input or output; and
- Provides a standard SCSI-II, 68-pin, D-shell connector for I/O connections.

For more information on the boards, refer to the *DT3157 User's Manual* (see page 11 for information on viewing this manual).

DT3157 Software

The DT3157 software, which is provided on the Imaging OMNI CD, includes the following components:

- **DT3157 Device Driver** –You *must* install this device driver to use the DT3157 board with any of the supported software packages or utilities.
- ***DT3157 User's Manual*, in PDF format** –Describes the features of the DT3157 board and how to use the DT3157 Device Driver with the Frame Grabber SDK to write an application program.
- This manual in PDF format.

Refer to Chapter 2 starting on page 5 for information on installing the DT3157 software.

Getting Started Procedure

The flow diagram shown in Figure 1 illustrates the steps needed to get started using the DT3157 board. This diagram is repeated in each chapter; the shaded area in the diagram shows you where you are in the getting started procedure.

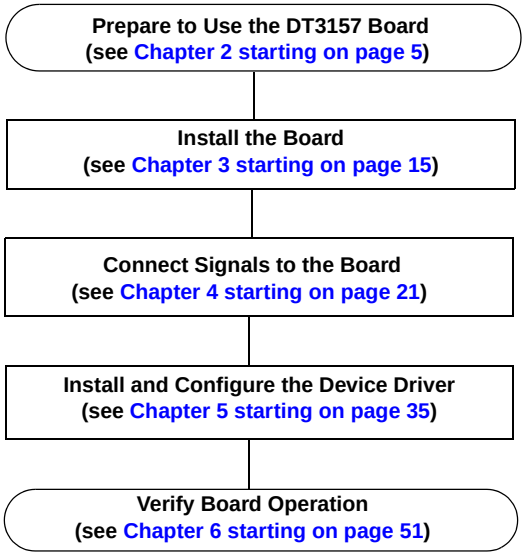
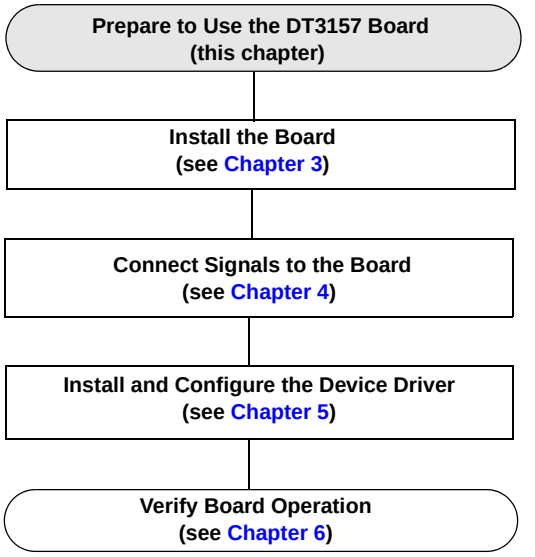


Figure 1: Getting Started Flow Diagram

Preparing to Use the DT3157


Prepare to Use the DT3157 Board
(this chapter)
Install the Board
(see Chapter 3)
Connect Signals to the Board
(see Chapter 4)
Install and Configure the Device Driver
(see Chapter 5)
Verify Board Operation
(see Chapter 6)

Unpacking

Open the shipping box and carefully remove the DT3157 frame grabber board.

WARNING!

Keep the DT3157 board in its protective antistatic bag until you are ready to install it.

Verify that the following items are present:

- DT3157 frame grabber board and
- Imaging OMNI CD-ROM.

If an item is missing or damaged, call Data Translation's Customer Service Department at (508) 481-3700 x394. Customer Service will guide you through the appropriate steps for replacing missing or damaged items. If you are located outside the USA, call your local distributor, listed in your Data Translation Product Handbook.

Note: We suggest that you save the original packing material in the unlikely event that your board requires servicing in the future.

Checking the System Requirements

For reliable operation, your DT3157 board requires the following minimum system requirements:

- 120 MHz Pentium processor with an Intel PCI chip set that supports and enables PCI-to-posted memory writes. The following Intel PCI chip sets are known to work properly:
  - Triton 8243xFX,
  - Triton2 8243xHX,
  - Triton VX 8243xVX,
  - Triton TX 8243xTX,
  - Natoma 8244xFX, or
  - Natoma 8244xLX.

Note: The following Intel PCI chip sets are known not to work properly: Saturn 8242x, Mercury 8243xLX, Neptune 8243xNX, Orion 8245xKX, and Orion 8245xKG. If your system contains one of these chip sets, please call your system manufacturer to replace the chip set with one that is supported.

- A BIOS that complies with PCI specifications, such as one of the following:
  - AMI, or
  - AWARD (version 4.51PG).

Note: Version 4, revision 6 of the Phoenix BIOS works properly. However, early versions of this BIOS are known not to work properly. If your system contains an earlier version of the Phoenix BIOS, please call your system manufacturer to upgrade the BIOS to Version 4, revision 6.

- At least one available PCI 32-bit or 64-bit bus master expansion slot.
- At least 16 MB of RAM for Windows 98 or Windows Me; at least 32 MB of RAM for Windows 2000 or Windows XP. Note that for a 640-by-480 image, using an 8-bit digital camera, 1 MB holds approximately three frames.
- A PCI graphics card with a 16-bit or 24-bit color palette. A DDI-compatible, PCI graphics card is recommended for real-time display.
- An digital input source (8-, 10-, 12-, 14-, or 16-bit) with appropriate cabling.
- At least one CD-ROM drive.
- A hard disk.
- Windows 98, Windows Me, Windows 2000, or Windows XP.

Installing the Software

To install the DT3157 software, perform the following procedure:

1. Insert the Imaging OMNI CD into your CD-ROM drive.
2. Click **Start** from the Task Bar, then click **Run**.
   The Run dialog box appears.
3. In the **Command Line** edit box, enter **x:\LAUNCH.EXE** (where *x* is the letter of your CD-ROM drive).
4. Click **OK**.
   The Imaging OMNI CD splash screen appears.
5. Click **Install Products**.
6. Click **Mach I Series**.
7. Click **Device Drivers**.
8. Click **DT3157**, then click Next.
   If you are using Windows 2000 or Windows XP, the installation instructions are displayed. If you are using Windows 98 or Windows Me, the files are copied.
9. If you are using Windows 2000 or Windows XP, click **Print** to print the installation instructions, or go to the next section to install and print the DT3157 documentation.
10. Click **Main Menu**, then click **Exit**.

Installing the DT3157 Documentation

If you are using Windows 98 or Windows Me and installed the DT3157 device driver, the DT3157 documentation is automatically copied to your hard drive. Refer to the next section for information on viewing these documents.

If you are using Windows 2000 or Windows XP, perform the following steps to install the DT3157 documentation:

1. Insert the Imaging OMNI CD into your CD-ROM drive.
2. Click **Start** from the Task Bar, then click **Run**.
   The Run dialog box appears.
3. In the **Command Line** edit box, enter **x:\LAUNCH.EXE** (where *x* is the letter of your CD-ROM drive)**.**
4. Click **OK**.
   The Imaging OMNI CD splash screen appears.
5. Click **Install Products**.
6. Click **Mach I Series**.
7. Click **Documentation**.
8. Click **Getting Started**.
9. Click **DT3157**.
10. Browse to the directory in which to copy the manual on your hard disk, the click **Next**.
    The manual is copied to your hard disk.
11. Click **OK**.
12. Click **Back**.
13. Click **User's Manual**.
14. Click **DT3157**.

15. Browse to the directory in which to copy the manual on your hard disk, the click **Next**.
    The manual is copied to your hard disk.
16. Click OK.
17. Click **Main Menu**, then click **Exit**.

Refer to the next section for information on viewing these documents.

Viewing the DT3157 Documentation

Note: To view the DT3157 documentation, ensure that Adobe Acrobat 4.0 or greater is installed on your system. Acrobat Reader 5.0 is provided on the Imaging OMNI CD. If you install Acrobat Reader 5.0 from this CD, you must open Acrobat Reader and accept the license agreement before you can view the documentation.

Once you have installed the manuals to your hard disk, you can view these documents by accessing them through the Data Translation, Inc\DT3157 program folder.

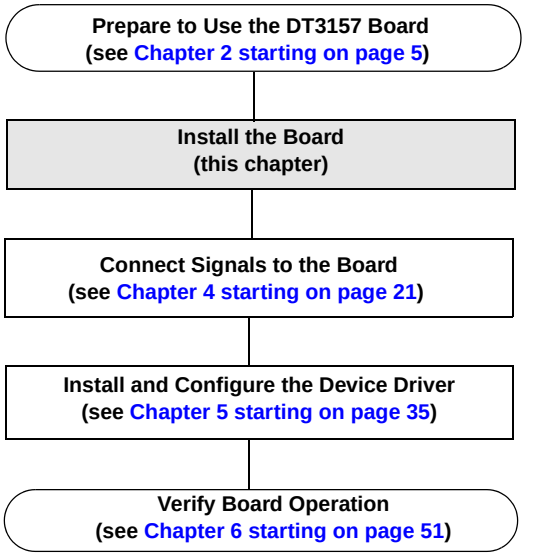
You can also view the documents from the Imaging OMNI CD, by performing the following steps:

1. Insert the Imaging OMNI CD into your CD-ROM drive.
2. Click **Start** from the Task Bar, then click **Run**.
   The Run dialog box appears.
3. In the **Command Line** edit box, enter **x:\LAUNCH.EXE** (where *x* is the letter of your CD-ROM drive)**.**
4. Click **OK**.
   The Imaging OMNI CD splash screen appears.
5. Click **View Documentation**
6. Click **Getting Started Manuals** and click **DT3157**, or click **User's Manuals** and click **DT3157**.
   Adobe Acrobat Reader opens.

Here are a few helpful hints about using Adobe Acrobat Reader:

- To navigate to a specific section of the document, click a heading from the table of contents on the left side of the document.
- Within the document, click the text shown in blue to jump to the appropriate reference (the pointer changes from a hand to an index finger).
- To go back to the page from which the jump was made, click the right mouse button and **Go Back,** or from the main menu, click **Document**, then **Go Back.**
- To print the document, from the main menu, click **File**, then **Print**.
- To increase or decrease the size of the displayed document, from the main menu, click **View**, then **Zoom**.
- By default, text and monochrome images are smoothed in Acrobat Reader, resulting in blurry images. If you wish, you can turn smoothing off by clicking **File**, then **Preferences/General**, and unchecking **Smooth Text and Images**.

Installing the Board


Prepare to Use the DT3157 Board
(see Chapter 2 starting on page 5)
Install the Board
(this chapter)
Connect Signals to the Board
(see Chapter 4 starting on page 21)
Install and Configure the Device Driver
(see Chapter 5 starting on page 35)
Verify Board Operation
(see Chapter 6 starting on page 51)

Setting up the Computer

CAUTION:

To prevent electrostatic damage that can occur when handling electronic equipment, use a ground strap or similar device when performing this installation procedure.

Perform the following procedure to set up the computer:

1. Turn off the computer.
2. Turn off all peripherals (printer, modem, monitor, and so on) connected to the computer.
3. Unplug the computer and all peripherals.
4. Remove the cover from you computer. Refer to your computer's user manual for instructions.

Next, select an expansion slot, as described in the next section.

Selecting an Expansion Slot

Perform the following procedure to select an expansion slot:

1. Select a 32-bit or 64-bit PCI master expansion slot. Refer to your computer system's user manual to determine which slots are bus masters.

   PCI slots are shorter than ISA or EISA slots and are usually white or ivory. Commonly, three PCI slots (one of which may be a shared ISA/PCI slot) are available. If an ISA board exists in the shared slot, you cannot use the slot for a PCI board; likewise if a PCI board exists in the shared slot, you cannot use the slot for an ISA board.

   Note: In most PCI systems, any PCI slot can be a bus master.

2. Remove the cover plate from the selected expansion slot. Retain the screw that held it in place; you will use it later to install the board.

Next, insert the DT3157 board in the expansion slot, as described in the next section.

Inserting the DT3157 Board in the Computer

To insert the DT3157 board in the computer, perform the following steps:

1. To discharge any static electricity, hold the wrapped board in one hand while placing your other hand firmly on a metal portion of the computer chassis.
2. Carefully remove the antistatic packing material from the board. (We suggest that you save the original packing material in the unlikely event that your board requires servicing in the future.)
3. Hold the board by its edges and do not touch any of the components on the board.
4. Position the board so that the cable connectors are facing the rear of the computer, as shown in Figure 2.

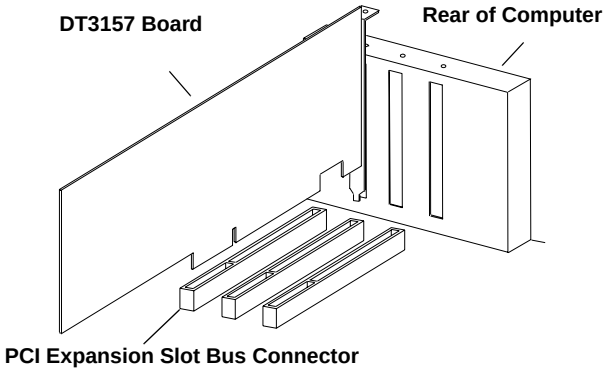


Figure 2: Inserting the DT3157 Board in the Computer

5. Carefully lower the board into the PCI expansion slot using the card guide to properly align the board in the slot. When the bottom of the board contacts the bus connector, gently press down on the board until it clicks into place.

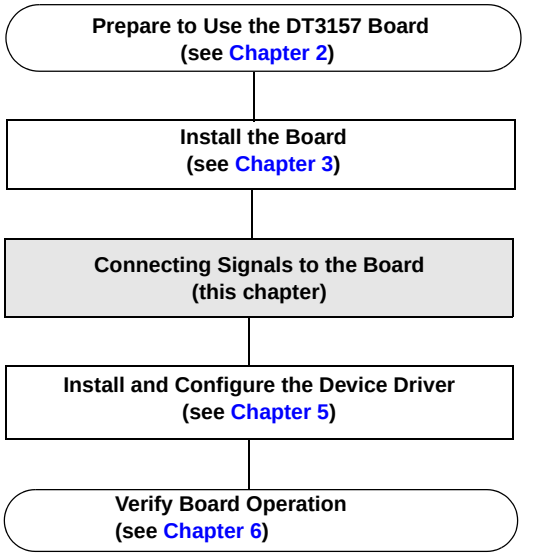
CAUTION:

Do not force the board into place. Moving the board from side to side during installation may damage the bus connector. If you encounter resistance when inserting the board, remove the board and try again.

6. Secure the board in place at the rear panel of the system unit using the screw removed from the slot cover.

When you are finished with this procedure, continue by connecting signals to the board. Refer to Chapter 4 starting on page 21.

Connecting Signals


Prepare to Use the DT3157 Board
(see Chapter 2)
Install the Board
(see Chapter 3)
Connecting Signals to the Board
(this chapter)
Install and Configure the Device Driver
(see Chapter 5)
Verify Board Operation
(see Chapter 6)

WARNING!

Always turn off the power to both your computer and the input device before making these connections. Damage can result if connections are made with the power on.

Data Translation provides three cables for connection to the most popular digital cameras: the EP-299, EP-300, and EP-301. These cables are 9 feet (2.75 m) long and are constructed with 105 Ω differential, 28 AWG wire, aluminum polyester foil cover, and tinned copper-braid shielding.

This chapter describes how to connect your video input source to the DT3157 board using these cables. For cameras not accommodated by the three Data Translation cables, use a cable provided by your camera manufacturer.

Using the EP-299 Cable (Kodak Cameras)

The EP-299 cable is for use with Kodak (and similar) digital cameras. The cable provides connection between the DT3157 and the camera's 68-pin, D-shell connector. Also provided is a BNC connector at the board end for connecting an external trigger and a 9-pin, RS-232 connector at the camera end for connecting the CNTR_IN/OUT signals. The cable is illustrated in Figure 3.

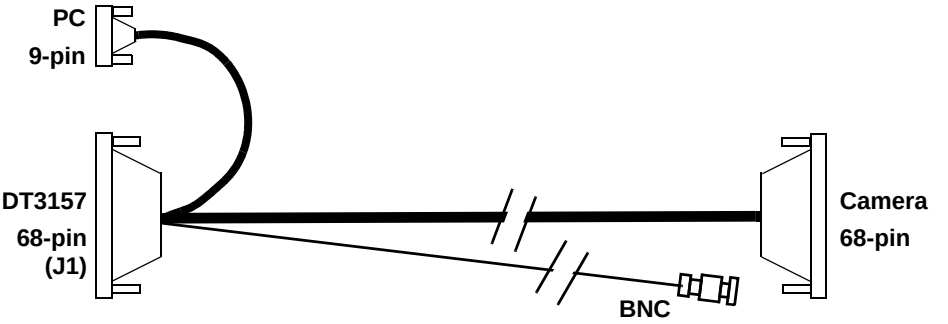


Figure 3: EP-299 Cable

To connect your digital camera to the DT3157 board, perform the following steps:

1. Push the 68-pin connector of the EP-299 cable into the J1 socket at the rear of the DT3157 board and tighten the retaining screws.
2. Attach the other 68-pin connector of the EP-299 cable to the camera.
3. If you are using an external trigger, connect the BNC connector to the digital output signal from your camera.
4. Connect the 9-pin, RS-232 connector of the EP-299 cable to the RS-232 port of your computer.

The signals brought out by the 68-pin connectors of the EP-299 cable are defined in Table 1.

Table 1: EP-299 Cable Pin Assignments

Pin (DT3157)	Pin (Camera)	Signal Name	Pin (DT3157)	Pin (Camera)	Signal Name
1	1	GND	35	35	GND
2	2	AD0 (+) (MSB)	36	36	AD0 (-) (MSB)
3	3	AD1 (+)	37	37	AD1 (-)
4	4	AD2 (+)	38	38	AD2 (-)
5	5	AD3 (+)	39	39	AD3 (-)
6	6	AD4 (+)	40	40	AD4 (-)
7	7	AD5 (+)	41	41	AD5 (-)
8	8	AD6 (+)	42	42	AD6 (-)
9	9	AD7 (+)	43	43	AD7 (-)
10	10	AD8 (+)	44	44	AD8 (-)
11	11	AD9 (+)	45	45	AD9 (-)
12	12	GND	46	46	GND
13	13	AD10 (+)	47	47	AD10 (-)
14	14	AD11 (+)	48	48	AD11 (-)
15	15	AD12 (+)	49	49	AD12 (-)
16	16	AD13 (+)	50	50	AD13 (-)
17	17	DIG_IO0	51	51	DIG_IO1
18	18	DIG_IO2	52	52	DIG_IO3
19	19	AD14 (+)	53	53	AD14 (-)
20	20	AD15 (+) (LSB)	54	54	AD15 (-) (LSB)
21	From BNC conn.	EXTRGRIN	55	55	GND

Table 1: EP-299 Cable Pin Assignments (cont.)

Pin (DT3157)	Pin (Camera)	Signal Name	Pin (DT3157)	Pin (Camera)	Signal Name
22	22	RESERVED	RS-232 (see Table 2)	56	RS-232 CNTR_OUT
23	23	UNUSED	RS-232 (see Table 2)	57	RS-232 CNTR_IN
24	24	FRAENAOUT (+)	58	58	FRAENAOUT (-)
25	25	FRAENAIN (+)	59	59	FRAENAIN (-)
26	26	LINENAIN (+)	60	60	LINENAIN (-)
27	27	LINENAOUT (+)	61	61	LINENAOUT (-)
28	28	PIXCLKOUT (+)	62	62	PIXCLKOUT (-)
29	29	PIXCLKIN (+)	63	63	PIXCLKIN (-)
30	30	EXPOSE (+)	64	64	EXPOSE (-)
31	31	DIG_IO4	65	65	GND
32	32	DIG_IO5	66	66	GND
33	33	DIG_IO6	67	67	DIG_IO7
34	34	GND	68	68	GND

The signals brought out by the 9-pin, RS-232 connector of the EP-299 cable are defined in Table 2.

Table 2: EP-299 Cable Pin Assignments

Pin (RS-232)	Pin (Camera)	Signal Name	Pin (RS-232)	Pin (Camera)	Signal Name
1	N/A	Open	6	N/A	Open
2	56	RS-232 CNTR_OUT	7	N/A	Conn. to RS-232 pin 8
3	57	RS-232 CNTR_IN	8	N/A	Conn. to RS-232 pin 7
4	N/A	Open	9	N/A	Open
5	55	GND			

Using the EP-300 Cable (EG&G Cameras)

The EP-300 cable is for use with EG&G and similar digital cameras. The cable provides connection between the DT3157 and the camera's 37-pin, D-shell connector. Also provided is a BNC connector at the camera end for connecting an external trigger. The cable is illustrated in Figure 4.

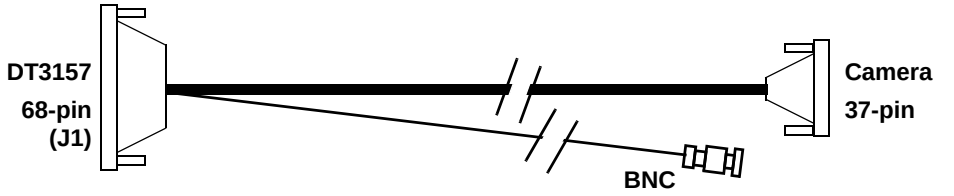


Figure 4: EP-300 Cable

To connect your digital camera to the DT3157 board, perform the following steps:

1. Push the 68-pin connector of the EP-300 cable into the J1 socket at the rear of the DT3157 board and tighten the retaining screws.
2. Attach the 37-pin connector of the EP-300 cable to the camera.
3. If you are using an external trigger, connect the BNC connector to the digital output signal from your camera.

The signals brought out by the connectors on the EP-300 cable are defined in Table 3.

Table 3: EP-300 Cable Pin Assignments

Pin (DT3157)	Pin (Camera)	Signal Name	Pin (DT3157)	Pin (Camera)	Signal Name
1		UNUSED	35		UNUSED
2	15	DATA0 + (MSB)	36	34	DATA0 –(MSB)
3	14	DATA1 +	37	33	DATA1 –
4	13	DATA2 +	38	32	DATA2 –
5	12	DATA3 +	39	31	DATA3 –
6	11	DATA4 +	40	30	DATA4 –
7	10	DATA5 +	41	29	DATA5 –
8	9	DATA6 +	42	28	DATA6 –
9	8	DATA7 + (LSB)	43	27	DATA7 – (LSB)
10		UNUSED	44		UNUSED
11		UNUSED	45		UNUSED
12		UNUSED	46		UNUSED
13		UNUSED	47		UNUSED
14		UNUSED	48		UNUSED
15		UNUSED	49		UNUSED
16		UNUSED	50		UNUSED
17		UNUSED	51		UNUSED
18		UNUSED	52		UNUSED
19		UNUSED	53		UNUSED
20		UNUSED	54		UNUSED
21	From BNC conn.	EXTRAGRIN	55	From BNC conn.	GND
22	7	RESERVED	56	26	RESERVED
23	5	FST +	57	24	FST –
24		UNUSED	58		UNUSED
25	3	FEN +	59	22	FEN –

Table 3: EP-300 Cable Pin Assignments (cont.)

Pin (DT3157)	Pin (Camera)	Signal Name	Pin (DT3157)	Pin (Camera)	Signal Name
26	2	LEN +	60	21	LEN –
27		UNUSED	61		UNUSED
28		UNUSED	62		UNUSED
29	1	CCLK +	63	20	CCLK –
30	6	SHUT +	64	25	SHUT –
31	17	RESERVED 1	65	16	GND1
32	18	RESERVED2	66	23	GND2
33	19	RESERVED3	67	37	RESERVED 4
34	35	GND3	68		UNUSED

Using the EP-301 Cable (Pulnix Cameras)

The EP-301 cable is for use with Pulnix and similar digital cameras. The cable provides connection between the DT3157 and the camera's 31-pin, D-shell connector. Also provided is a BNC connector at the camera end for connecting an external trigger. The cable is illustrated in Figure 5.

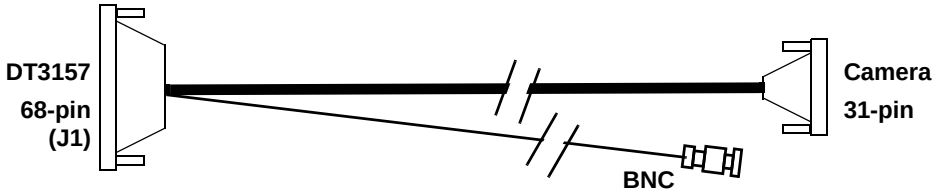


Figure 5: EP-301 Cable

To connect your digital camera to the DT3157 board, perform the following steps:

1. Push the 68-pin connector of the EP-301 cable into the J1 socket at the rear of the DT3157 board and tighten the retaining screws.
2. Attach the 31-pin connector of the EP-301 cable to the camera.
3. If you are using an external trigger, connect the BNC connector to the digital output signal from your camera.

The signals brought out by the connectors on the EP-301 cable are defined in Table 4.

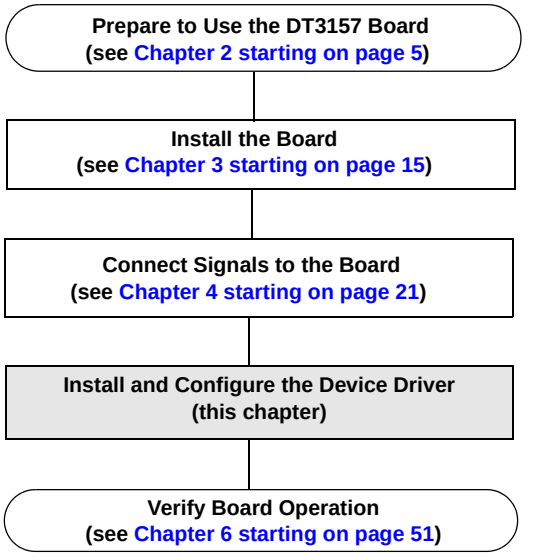
Table 4: EP-301 Cable Pin Assignments

Pin (DT3157)	Pin (Camera)	Signal Name	Pin (DT3157)	Pin (Camera)	Signal Name
1		UNUSED	35		UNUSED
2	15	DATA0+ (MSB)	36	31	DATA0– (MSB)
3	14	DATA1+	37	30	DATA1–
4	13	DATA2+	38	29	DATA2–
5	12	DATA3+	39	28	DATA3–
6	11	DATA4+	40	27	DATA4–
7	10	DATA5+	41	26	DATA5–
8	9	DATA6+	42	25	DATA6–
9	8	DATA7+ (LSB)	43	24	DATA7– (LSB)
10		UNUSED	44		UNUSED
11		UNUSED	45		UNUSED
12		UNUSED	46		UNUSED
13		UNUSED	47		UNUSED
14		UNUSED	48		UNUSED
15		UNUSED	49		UNUSED
16		UNUSED	50		UNUSED
17		UNUSED	51		UNUSED
18		UNUSED	52	7	LPULSE
19		UNUSED	53		UNUSED
20		UNUSED	54		UNUSED
21	From BNC conn.	EXTRAGRIN	55	From BNC conn.	GND
22		UNUSED	56		UNUSED
23		UNUSED	57		UNUSED
24	21	EXTVD	58		UNUSED

Table 4: EP-301 Cable Pin Assignments (cont.)

Pin (DT3157)	Pin (Camera)	Signal Name	Pin (DT3157)	Pin (Camera)	Signal Name
25	3	FEN+	59	19	FEN–
26	2	LEN+	60	18	LEN–
27	5	EXTHD	61		UNUSED
28		UNUSED	62		UNUSED
29	1	CCLK+	63	17	CCLK–
30	20	VINIT	64		UNUSED
31	22	ENINT	65	16	GND1
32	6	INTEG CONT	66	4	GND2
33		UNUSED	67		UNUSED
34	23	GND3	68		UNUSED

Installing and Configuring the Device Driver


Prepare to Use the DT3157 Board
(see Chapter 2 starting on page 5)
Install the Board
(see Chapter 3 starting on page 15)
Connect Signals to the Board
(see Chapter 4 starting on page 21)
Install and Configure the Device Driver
(this chapter)
Verify Board Operation
(see Chapter 6 starting on page 51)

Before Installing the Device Driver

The DT3157 Device Driver is provided to support the DT3157 board in IBM PC-compatible Pentium systems running Windows 98, Windows Me, Windows 2000, or Windows XP. The DT3157 Device Driver is compatible with any application developed using the 32-bit Frame Grabber SDK, which follows the DT-Open Layers Application Programming Interface (API) standards.

Before installing the software, ensure that you have

- Installed Microsoft Windows 98, Windows Me, Windows 2000, or Windows XP,
- Read the file README.TXT in the \DRIVERS\DT3157\Win98, WinNT, or Win2K directory (if present on the Imaging OMNI CD) for any information not included in this documentation at release time,
- Installed the board, and
- (Optional) Installed the 32-bit Frame Grabber SDK (SP0585).

Installing and Configuring the Device Driver in Windows 98

Perform the following steps to install the device driver under Windows 98:

1. If you have not already done so, power up your computer and any attached peripherals.

Note: On power-up, the PCI bus takes one available interrupt from system resources for the DT3157 board. If any devices are using this interrupt, problems may arise. Verify that no other devices in your system are using the same interrupt that the DT3157 board is using and ensure that PCI interrupts are enabled in your system BIOS.

---

2. Start Windows 98.
   The New Hardware Found dialog box appears. The board is recognized as the DT3157, then a dialog box appears prompting you to restart your system.

Note: In some machines, the DT3157 may not be detected automatically when you start Windows 98. If this should occur, remove any other imaging drivers by using the MACHUNLD.EXE utility (accessed from Start\Programs\Data Translation, Inc), then perform the following procedure:

a. From the Control Panel, double-click **Multimedia**.
b. Double-click **System**.
c. Click **Device Manager**.
d. Click **Refresh**.
   The New Hardware Found wizard appears.
e. Click **Next**.
f. Click **Search for best driver for your device**, then click **Next**.

g. Browse to the **Drivers\DT3157\Win98** directory on the Imaging OMNI CD, then click **OK**.
h. Click **Next**.
i. Click **Next**.
j. Click **Finish**.
A dialog box appears prompting you to restart your system.

---

3. Remove the CD-ROM from the CD-ROM drive, then click **Yes**.
After the system restarts, a dialog box appears prompting you to configure the driver.

4. Click **OK**, then click **OK**.

5. Click **Add New** to add a DT3157 board.
The DT3157 Installation dialog box appears for the new board.

6. Enter a board name (alias), which can be any name you choose, then click **Add**. The board name is used by supported software, such as DT-Acquire and the Frame Grabber SDK. Only one name (alias) per installed board is allowed.
The DT3157 Configuration dialog box appears.

7. Select **Enable Board** to activate the board. If you want to retain the settings but disable the board (and therefore not use the memory), remove the checkmark next to Enable Board.

8. For **Camera Type**, specify the type of digital camera attached to the input source of the board. You can change this setting at a later time using software. Note that selecting the camera type selects the number of bytes required to store pixel data.

9. For **Desired Memory Size**, select the amount of contiguous memory (in MB) that you want to allocate in your system to hold the acquired frames. For a 640-by-480 image, using an 8-bit digital camera, 1 MB holds approximately three frames. The actual amount of memory that the device driver can allocate depends on your system resources. It is recommended that you select only as much memory as you need to leave memory for other devices. Once you enter the desired memory size, the

device driver allocates as much memory as possible to match the value you entered; the actual memory size allocated is shown in the **Actual Memory Size** text box when you restart your system.

10. Click **Done**.
    The DT3157 Device Driver Configuration dialog box is redisplayed with the name of the board you just added.

11. Click **Close** to end the DT3157 configuration.
    The DT3157 Configuration COMPLETE! dialog box is displayed.

12. Click **OK**.

13. Click **OK** to restart the system.
    The system automatically restarts so that the changes take effect.

Once you have configured the device driver with the information for your board, verify the operation of your board using the instructions in Chapter 6 starting on page 51.

Installing and Configuring the Device Driver in Windows Me

Perform the following steps to install the device driver under Windows Me:

1. If you have not already done so, power up your computer and any attached peripherals.

Note: On power-up, the PCI bus takes one available interrupt from system resources for the DT3157 board. If any devices are using this interrupt, problems may arise. Verify that no other devices in your system are using the same interrupt that the DT3157 board is using and ensure that PCI interrupts are enabled in your system BIOS.

---

2. Start Windows Me.
   The New Hardware Found dialog box appears. The board is recognized as the DT3157, then a dialog box appears prompting you to restart your system.

Note: In some machines, the DT3157 may not be detected automatically when you start Windows Me. If this should occur, remove any other imaging drivers by using the MACHUNLD.EXE utility (accessed from Start\Programs\Data Translation, Inc), then perform the following procedure:

a. From the Control Panel, double-click **Multimedia**.
b. Double-click **System**.
c. Click **Device Manager**.
d. Click **Refresh**.
   The New Hardware Found wizard appears.
e. Click **Next**.
f. Click **Search for best driver for your device**, then click **Next**.

g. Browse to the **Drivers\DT3157\Win98** directory on the Imaging OMNI CD, then click **OK**.
h. Click **Next**.
i. Click **Next**.
j. Click **Finish**.
A dialog box appears prompting you to restart your system.

3. Remove the CD-ROM from the CD-ROM drive, then click **Yes**.
After the system restarts, a dialog box appears prompting you to configure the driver.

4. Click **OK**, then click **OK**.

5. Click **Add New** to add a DT3157 board.
The DT3157 Installation dialog box appears for the new board.

6. Enter a board name (alias), which can be any name you choose, then click **Add**. The board name is used by supported software, such as DT-Acquire and the Frame Grabber SDK. Only one name (alias) per installed board is allowed.
The DT3157 Configuration dialog box appears.

7. Select **Enable Board** to activate the board. If you want to retain the settings but disable the board (and therefore not use the memory), remove the checkmark next to Enable Board.

8. For **Camera Type**, specify the type of digital camera attached to the input source of the board. You can change this setting at a later time using software. Note that selecting the camera type selects the number of bytes required to store pixel data.

9. For **Desired Memory Size**, select the amount of contiguous memory (in MB) that you want to allocate in your system to hold the acquired frames. For a 640-by-480 image, using an 8-bit digital camera, 1 MB holds approximately three frames. The actual amount of memory that the device driver can allocate depends on your system resources. It is recommended that you select only as much memory as you need to leave memory for other devices. Once you enter the desired memory size, the

device driver allocates as much memory as possible to match the value you entered; the actual memory size allocated is shown in the **Actual Memory Size** text box when you restart your system.

10. Click **Done**.
    The DT3157 Device Driver Configuration dialog box is redisplayed with the name of the board you just added.

11. Click **Close** to end the DT3157 configuration.
    The DT3157 Configuration COMPLETE! dialog box is displayed.

12. Click **OK**.

13. Click **OK** to restart the system.
    The system automatically restarts so that the changes take effect.

Once you have configured the device driver with the information for your board, verify the operation of your board using the instructions in Chapter 6 starting on page 51.

Installing and Configuring the Driver in Windows 2000

Perform the following steps to install and configure the device driver in Windows 2000:

Note: This procedure assumes that no other MACH I Series drivers (DT3152, DT3152-LS, DT3153, DT3154, DT3155, or DT3157) are installed in your system. If you previously installed a MACH I Series driver, refer to the Data Translation knowledgebase at www.datx.com for information on removing the existing inf file before performing this procedure.

---

1. If you have not already done so, power up your computer and any attached peripherals.

   Note: On power-up, the PCI bus takes one available interrupt from system resources for the DT3157 board. If any devices are using this interrupt, problems may arise. Verify that no other devices in your system are using the same interrupt that the DT3157 board is using and ensure that PCI interrupts are enabled in your system BIOS.

   ---

2. Start Windows 2000.
   The Found New Hardware dialog box appears.
3. Click **Next**.
4. Click **Search for a suitable driver for my device (recommended)**, then click **Next.**
5. Click **Specify a location** and uncheck all other checkboxes, then click **Next**.

6. Insert the Imaging OMNI CD into the CD-ROM drive.
7. Click **Browse**, browse to **x:\DRIVERS\DT3157\WIN2K** (where *x* is the letter of your CD-ROM drive), and click **Open**.
8. Click **OK**, then click **Next**.
   A Digital signature not found message appears.
9. Click **Yes**.
   The files are copied, then the DT3157 Configuration dialog appears.
10. Click **Add New** to add a DT3157 board to the configuration.
    The DT3157 Installation dialog box appears for the new board.
11. Enter any unique name (or alias) for the DT3157 board, then click **Add**. Only one alias per installed board is allowed.
    The DT3157 Configuration dialog box appears.
12. Select **Enable Board** to activate the board. If you want to retain the settings but disable the board (and therefore not use the memory), remove the checkmark next to Enable Board.
13. For **Camera Type**, specify the type of digital camera attached to the input source of the board. You can change this setting at a later time using software. Note that selecting the camera type selects the number of bytes required to store pixel data.
14. For **Desired Memory Size**, select the amount of contiguous memory (in MB) that you want to allocate in your system to hold the acquired frames. For a 640-by-480 image, using an 8-bit digital camera, 1 MB holds approximately three frames. The actual amount of memory that the device driver can allocate depends on your system resources. It is recommended that you select only as much memory as you need to leave memory for other devices. Once you enter the desired memory size, the device driver allocates as much memory as possible to match the value you entered; the actual memory size allocated is shown in the **Actual Memory Size** text box when you restart your system.
15. Click **Done**.
    The DT3157 Configuration dialog box is redisplayed; you can see the name of the board you just added.

16. Click **Close** to end the DT3157 configuration.
    The Changes Saved dialog box appears.
17. Click **Finish**.
18. Remove the Imaging OMNI CD from the CD-ROM, then click **Yes** to restart the system.

Once you have configured the device driver with the information for your board, verify the operation of your board using the instructions in Chapter 6 starting on page 51.

Installing and Configuring the Device Driver in Windows XP

Perform the following steps to install and configure the device driver in Windows XP:

Note: This procedure assumes that no other MACH I Series drivers (DT3152, DT3152-LS, DT3153, DT3154, DT3155, or DT3157) are installed in your system. If you previously installed a MACH I Series driver, refer to the Data Translation knowledgebase at www.datx.com for information on removing the existing inf file before performing this procedure.

---

1. If you have not already done so, power up your computer and any attached peripherals.

Note: On power-up, the PCI bus takes one available interrupt from system resources for the DT3152 board. If any devices are using this interrupt, problems may arise. Verify that no other devices in your system are using the same interrupt that the DT3152 board is using and ensure that PCI interrupts are enabled in your system BIOS.

---

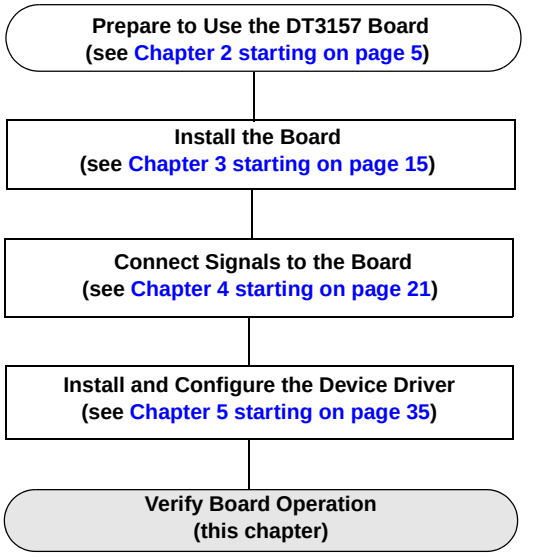
2. Start Windows XP.
   The Found New Hardware dialog box appears.
3. Click **Next**.
4. Click **Install from a list or specific location (advanced)**, then click **Next.**
5. Insert the Imaging OMNI CD into the CD-ROM drive.
6. Click **Search for the best driver in the these locations**.

7. Click **Include this location in the search**.
8. Click **Browse**, browse to **x:\DRIVERS\DT3152\WIN2K** (where *x* is the letter of your CD-ROM drive), and click **Next**.
   A Hardware Installation dialog box appears.
9. Click **Continue Anyway**.
   The DT3152 Configuration dialog appears.
10. Click **Add New** to add a DT3152 board to the configuration.
    The DT3152 Installation dialog box appears for the new board.
11. Enter any unique name (or alias) for the DT3152 board, then click **Add**. Only one alias per installed board is allowed.
    The DT3152 Configuration dialog box appears.
12. Select **Enable Board** to activate the board. If you want to retain the settings but disable the board (and therefore not use the memory), remove the checkmark next to Enable Board.
13. For **Camera Type**, specify the type of digital camera attached to the input source of the board. You can change this setting at a later time using software. Note that selecting the camera type selects the number of bytes required to store pixel data.
14. For **Desired Memory Size**, select the amount of contiguous memory (in MB) that you want to allocate in your system to hold the acquired frames. For a 640-by-480 image, using an 8-bit digital camera, 1 MB holds approximately three frames. The actual amount of memory that the device driver can allocate depends on your system resources. It is recommended that you select only as much memory as you need to leave memory for other devices. Once you enter the desired memory size, the device driver allocates as much memory as possible to match the value you entered; the actual memory size allocated is shown in the **Actual Memory Size** text box when you restart your system.
15. Click **Done**.
    The DT3152 Configuration dialog box is redisplayed; you can see the name of the board you just added.

16. Click **Close** to end the DT3152 configuration.
    The Changes Saved dialog box appears.
17. Click **Finish**.
18. Remove the Imaging OMNI CD from the CD-ROM, then click **Yes** to restart the system.

Once you have configured the device driver with the information for your board, verify the operation of your board using the instructions in Chapter 6 starting on page 51.

Verifying Board Operation


Prepare to Use the DT3157 Board
(see Chapter 2 starting on page 5)
Install the Board
(see Chapter 3 starting on page 15)
Connect Signals to the Board
(see Chapter 4 starting on page 21)
Install and Configure the Device Driver
(see Chapter 5 starting on page 35)
Verify Board Operation
(this chapter)

Overview

The DT-Acquire example program provides a quick way to verify that your board is properly installed, that the camera or cameras are properly connected, and that you can acquire images.

DT-Acquire allows you to

- Acquire an image to system memory,
- Display live video in passthru mode,
- Open a previously saved image, and
- Save an acquired image in BMP format.

Note: DT-Acquire works with your display monitor set to 16 colors, 256 colors, or high color (16-bit) only.

Installing DT-Acquire

To install DT-Acquire, perform the following steps:

1. Insert the Imaging OMNI CD into the CD-ROM drive.
2. Click **Start** from the Task Bar, then click **Run**.
   The Run dialog box appears.
3. Enter **x:\LAUNCH.EXE** (where *x* is the letter of your CD-ROM drive).
   The Imaging OMNI splash screen appears.
4. Click **Install Products**.
5. Click **Mach I Series**.
6. Click **DT Acquire**.
7. Click **Next**.
   The default installation destination folder is displayed.
8. Change the destination folder or accept the default folder, then click **Next**.
   The default installation program folder is displayed.
9. Change the program folder or accept the default folder, then click **Next**.
   The files are copied to the specified folders.
10. Click **Finish**.
11. Click **Main Menu**.
12. Click **Exit**.

Using DT-Acquire

To start DT-Acquire, click the **DT-Acquire** icon in the Data Translation, Inc\DT-Acquire\ program group. The main menu is displayed.

The following subsections describe how to use DT-Acquire to verify that the DT3157 board is working. If you have any trouble performing any of these operations, refer to the Troubleshooting chapter of the *DT3157 User's Manual* (see page 11 for information on viewing this manual).

Note: This utility allows you to verify basic operations on the board; however, it does not support all of the board's features.

For information on each of the features provided, read the Readme.txt file provided with the utility.

For detailed information on the supported features of the board, refer to the *DT3157 User's Manual* (see page 11 for information on viewing this manual).

Synchronously Acquiring a Single Frame to Memory

To synchronously acquire a single frame to memory, perform the following steps:

1. Connect your digital camera to the DT3157 board using the appropriate cable (see Chapter 4 starting on page 21).
2. From the DT-Acquire main menu, click **Setup**, then **Select Device**.
3. Select the alias that you gave to the DT3157 board when you configured the device driver, then click **OK**.
4. To get started, leave the remainder of the settings under **Setup** at their default values.
5. From the DT-Acquire main menu, click **Run**, then **Single Frame Acquire!**.
   A single frame is acquired (synchronously) and displayed on the screen.
6. To acquire another frame, repeat step 5.
7. If you wish, modify the parameters available for the DT3157 board by clicking the desired parameter under **Setup** and changing the associated values, then repeat step 5.
8. If you wish, save the graphic by clicking **File** from the DT-Acquire main menu, then **Save Graphic File**.
9. When you are finished with this utility, from the DT-Acquire main menu, click **Setup**, and **Close Device**. Then, close the application.

Performing a Passthru Operation

To capture live images and display them (without saving the images), perform the following steps:

1. Connect your digital camera to the DT3157 board using the appropriate cable (see Chapter 4 starting on page 21).
2. From the DT-Acquire main menu, click **Setup**, then **Select Device**. Leave the remainder of the settings under **Setup** at their default values.
3. Select the alias that you gave to the DT3157 board when you configured the device driver, then click **OK**.
4. From the DT-Acquire main menu, click **Run**, then **Start Pass Thru!**.
   Live video is asynchronously acquired to display memory, converted to bitmap format, and displayed on the screen.
5. To stop the asynchronous passthru operation, click **Run**, then **Stop Pass Thru!** from the DT-Acquire main menu.
6. If you wish, modify the parameters available for the DT3157 board by clicking the desired parameter under **Setup** and changing the associated values, then repeat steps 4 and 5.
7. When you are finished with this utility, from the DT-Acquire main menu, click **Setup**, and **Close Device**. Then, close the application.

Index

P

Q

R

S

U

V

W