Compatible Windows Software

- GLOBAL LAB Image/2
- DT Vision Foundry

DT3145

Camera Link Digital Frame Grabber for the PCI Bus

Key Features

- *Developed under the Camera Link standard for use with Camera Link digital cameras - control and cabling use a standard interface.*
- *Includes camera set-up files for leading Camera Link cameras.*
- *Connect to area-scan or line-scan cameras.*
- *4K x 4K spatial resolution…up to 16K for line-scan...high-resolution image.*
- *Camera configurations – single-port 8, 10, 12, 14 & 16-bit monochrome, dual-port 8, 10 & 12-bit monochrome, 24-bit RGB.*
- *User-programmable camera controls and general purpose output signals.*
- *Control all standard functions through one Camera Link connector.*
- *Asynchronous reset gives deterministic repeatability for machine vision.*
- *Custom high-performance, high-bandwidth PCI architecture provides zero wait state, scatter gather transfers directly to host memory.*
- *Eight digital control lines (4 out, 4 in) to monitor and control peripherals.*
- *Interrupt on change for mission critical timing needs.*
- *External trigger.*
  - *Area-scan mode — used to trigger the acquisition of a frame or a series of frames.*
  - *Line-scan mode — used to trigger the acquisition of an individual line. A separate line-scan frame trigger is used along with the external trigger to trigger the acquisition of a frame built up from individual lines.*
- *Non-destructive overlays can be placed on top of live video.*
- *Onboard processing via a look-up table (LUT) and ROI.*
- *Ships with valuable software bundle featuring WDM drivers, software evaluations, a powerful ActiveX control, and DT-AcquireCL ready-to-run application.*

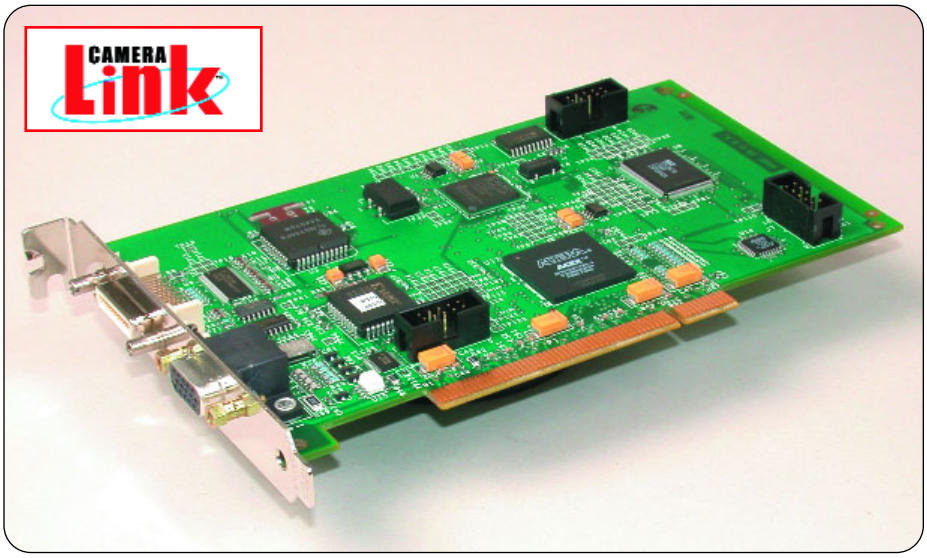

Figure 1 — The DT3145 is a high-resolution, high-speed Camera Link base configuration frame grabber. Set-up files for leading Camera Link cameras are provided.

Overview

The DT3145 is a high-performance, high-speed image acquisition board especially designed for use with Camera Link digital cameras. The DT3145 performs area-scan/line-scan operations on monochrome or RGB signals. Camera Link is a high-speed LVDS (Low Voltage Differential Signaling) serial data format that provides a convenient, single cable interconnect standard between cameras and image acquisition boards. The DT3145 is ideal for high-resolution scientific imaging, general-purpose imaging, and machine vision applications requiring high-performance image capture with simple cable interfacing.

The Virtues of Camera Link

Camera Link is a new high-speed serial data interface standard developed by a consortium of camera and frame grabber companies, including Data Translation. Camera Link, based on National Semiconductor's Channel Link technology, provides a universal, high-speed, serial cable interconnection standard for both digital cameras and image acquisition boards. You can connect your Camera Link camera to the DT3145 frame grabber using a single 26-pin cable. Because Camera Link is a universal interface, Camera Link products are easily interchanged using the same cable.

Wide Camera Support

The DT3145 supports Camera Link digital camera products produced by Basler, Dalsa, JAI, Pulnix, and other camera manufacturers. The DT3145 ships with camera set-up files for leading Camera Link cameras. Visit the Data Translation web site at www.datx.com/imaging/CameraLinkinfo for the latest updates.

High-Bandwidth PCI Architecture

A 32-bit 33 MHz PCI bus provides the ultimate in data transfer. Because of its high-bandwidth, intelligent Scatter/Gather memory management architecture and Bus Master design, the DT3145 can handle large amounts of image data – 80 Mbytes/sec typical, up to 132 Mbytes/sec maximum – quickly and effectively, and with no CPU intervention. This leaves the host CPU free to do other tasks such as image processing, data manipulation, or other processor-intensive operations.

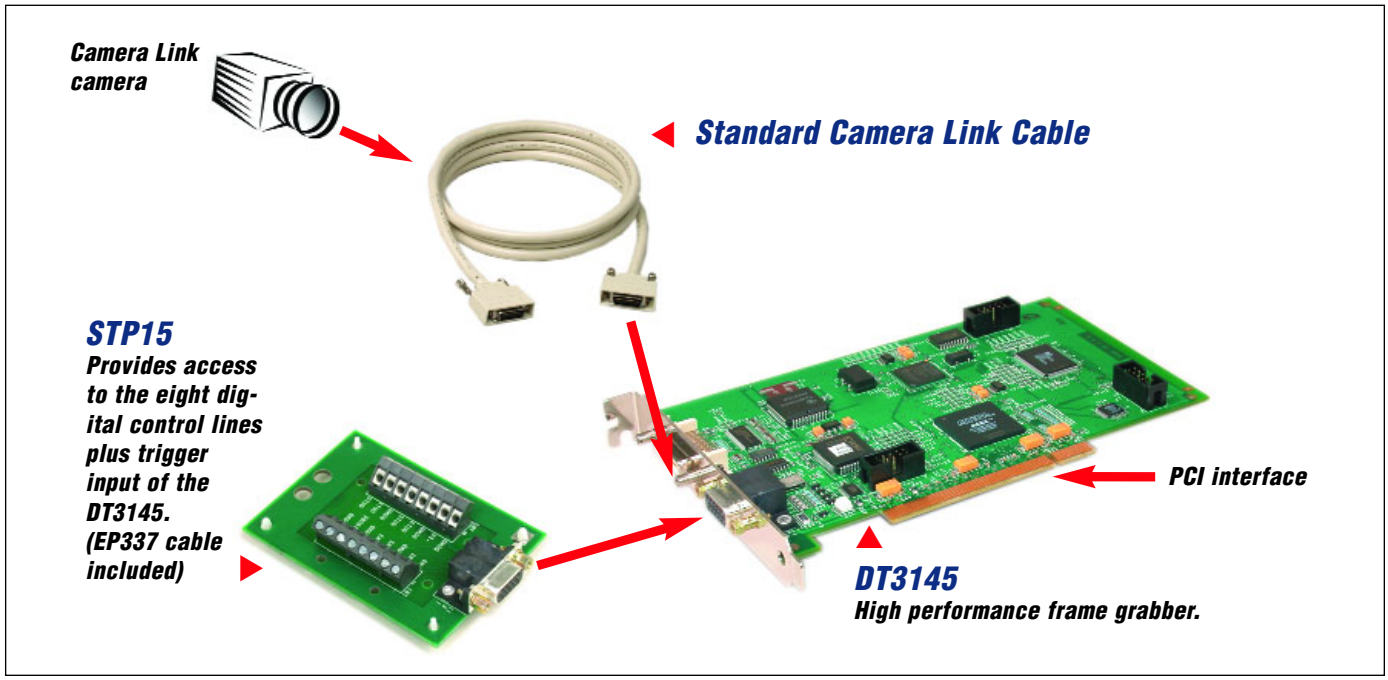

Figure 2 — Camera Link interface simplifies camera integration – control and cabling use a standard interface.

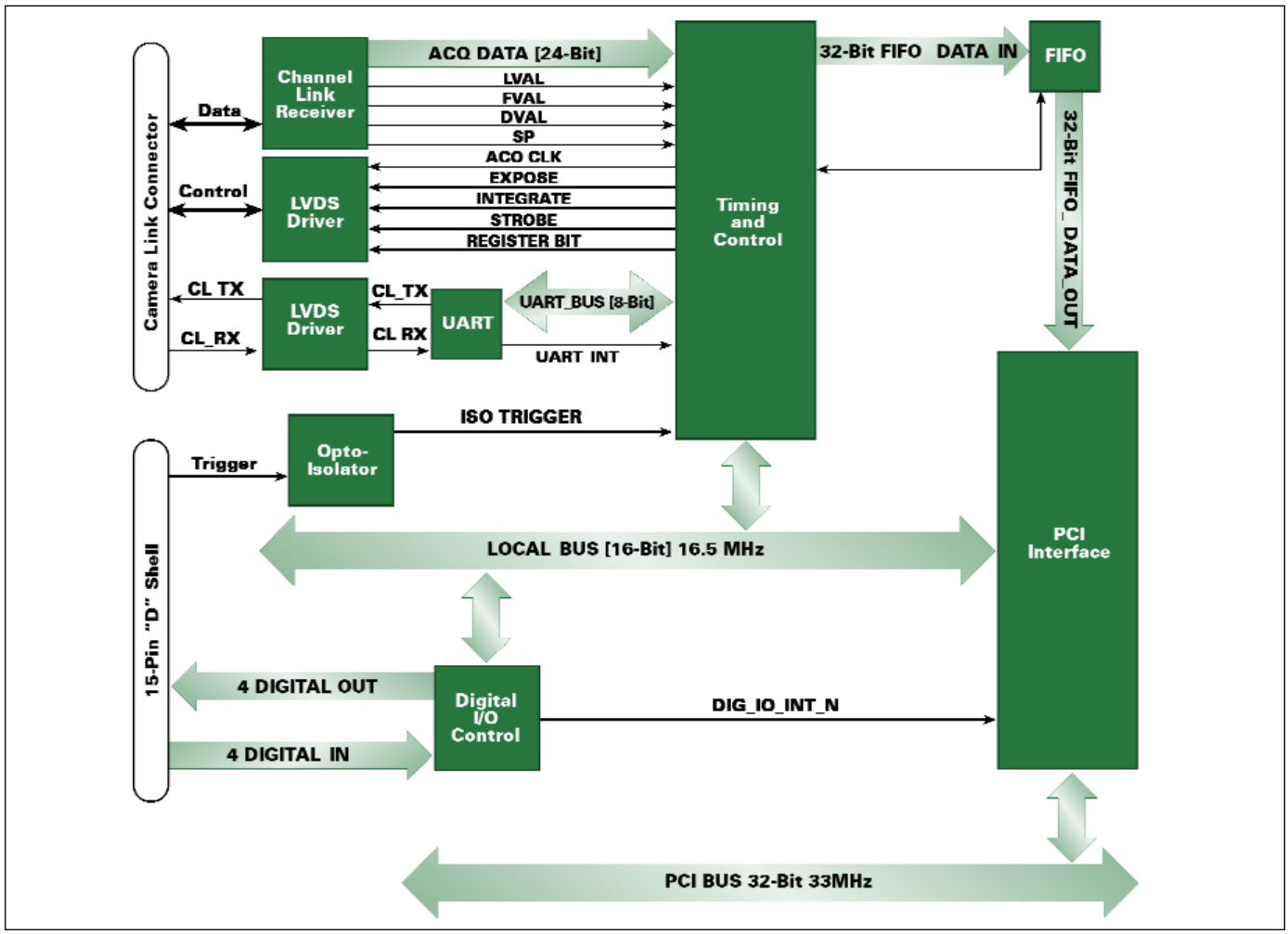

Figure 3 — The DT3145 frame grabber has a high resolution front-end and provides a direct data path to the PCI bus for superior performance. The board supports a single camera base configuration. Digital I/O control signals with interrupt on change allow the frame grabber to be used for process control and automation. Extensive flexible camera controls allow you to connect and control a standard Camera Link camera with one connector.

Extensive Software Support

The Imaging Omni CD that is shipped with the DT3145 provides the tools you need to set up your Data Translation frame grabber and develop imaging applications.

The Imaging Omni CD includes:

- Camera Set-Up Files – Use these camera set-up files for leading Camera Link cameras. Updated files can be found on the Data Translation web site at: www.datx.com/imaging/CameraLinkInfo
- DT-Active Camera Link Frame Grabber Control – Use this ActiveX® control if you want to develop your own application software for the DT3145 using Microsoft Visual Basic® or Visual C++® in Windows 2000 or Windows XP.
- DT-AcquireCL – Use this ready-to-run software application to verify the operation of your DT3145 board during startup, and to capture, display and save images (see Figure 5).
- DT3145 Device Driver – You must install this device driver to use a DT3145 board with any of the supported software packages or utilities. The device driver is for use with Windows 2000/XP.
- DT Vision Foundry Evaluation – DT Vision Foundry is a versatile and extensible machine vision software package that integrates powerful vision tools with multiple programming environments to provide a robust, flexible, easy-to-use visual inspection package. DT Vision Foundry is supported under Windows 2000/XP. The Imaging Omni CD lets you evaluate the great new features of DT Vision Foundry for 14 days.
- GLOBAL LAB Image/2 Evaluation – GLI/2 is a complete image analysis software package, ideal for scientific and general-purpose applications that require measuring, classification, counting, and other analysis. GLI/2 is supported under Windows 2000/XP. The Imaging Omni CD lets you evaluate the great new features of GLI/2 for 14 days.
- Documentation – User and Getting Started Manuals for the DT3145 in PDF format.

External Trigger – Area-Scan Mode

The DT3145 accepts an external trigger signal that is software selectable for rising or falling edge to synchronize line capture with external events. In area-scan mode, the external trigger is used to start the acquisition of a frame or to start the acquisition of a series of frames (see Figure 4).

External Trigger – Line-Scan Mode

The DT3145 accepts an external trigger signal that is software selectable for rising or falling edge to synchronize line capture with external events. In line-scan mode, the external trigger is used to start the acquisition of a line. A separate line-scan frame trigger is used along with the external trigger to start the acquisition of a frame built up from individual lines (see Figure 4).

Digital Inputs/Outputs, Interrupt on Change

Eight digital control lines (4 input and 4 output) plus one trigger input line and one strobe output line are provided on the STP15 screw terminal panel, with a 15-pin D-SUB connector. These lines provide flexible control of external peripherals and external events. Each digital input is capable of generating an interrupt when its state changes to provide control feedback to the process.

TRIGGERS

	Area-Scan	Line-Scan
External Trigger	Used to trigger the acquisition of each frame or a series of frames	Used to trigger the acquisition of each line
Line-Scan Frame Trigger	N/A	Used to trigger the acquisition of a frame built up from individual lines

Figure 4 — The DT3145 features triggering options in area-scan and line-scan mode.

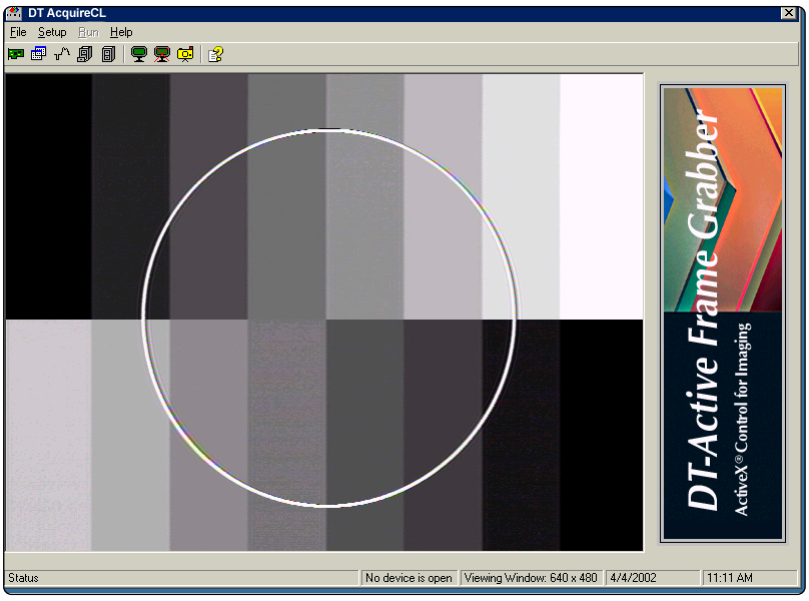

Figure 5 — DT-AcquireCL, included with the DT3145, is a ready-to-run application for capturing, displaying and saving images.

Figure 6 — Connector Specifications

Connector	Specifications
DT3145 J1 Connector	Camera Link MDR-26 connector
DT3145 J2 Connector	AMP 15-pin subminiature-D connector (HTEMP, R/A, REC) part number 743890-5
DT3145 J2 Mating Connector	AMP 15-pin male subminiature-D connector part number 749798-1

Figure 7 — DT3145 - J2 Connector Pin Assignments

Pin	Description	Pin	Description
1	Digital Input 0	2	Digital Input 1
3	Digital Input 2	4	Digital Input 3
5	Ground	6	Digital Output 0
7	Digital Output 1	8	Digital Output 2
9	Not Connected	10	Ground
11	Digital Output 3	12	Strobe Output
13	Trigger Input	14	+5 V (250 mA) Output
15	Ground		

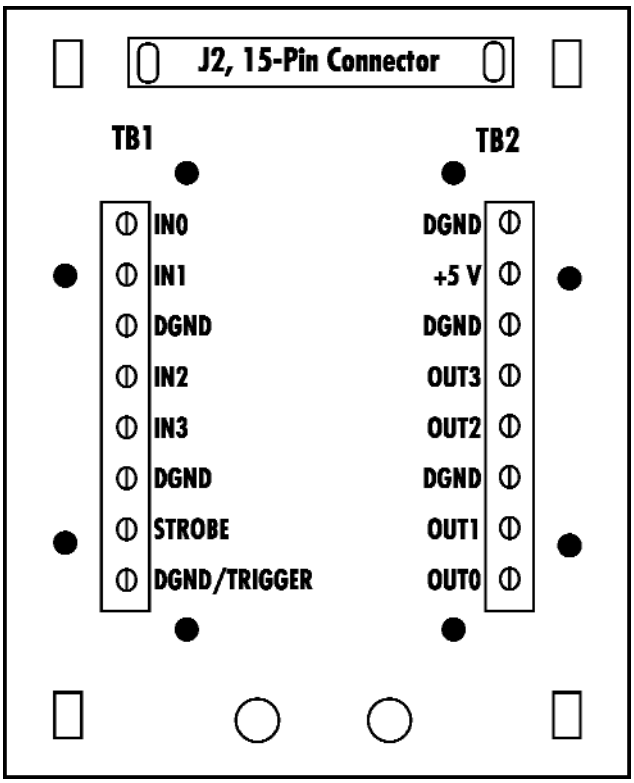

Figure 8 — Layout of the STP15 Screw Terminal Panel. The STP15 contains one 15-pin connector and two screw terminal blocks (TB1 and TB2). The 15-pin connector provides access to the signals from connector J2 on the DT3145 board.

DT3145

BUS: PCI

Type: Camera Link

DT3145 Specifications

Video Input
Video Format: Camera Link base configuration — Single-port, 8, 10, 12, 14 and 16-bit, dual-port 8, 10 and 12-bit, and 24-bit RGB
Timing Formats: — Camera Link up to 66 Mhz
Inputs: Single Camera Link base configuration
Spatial Resolution: Area-scan — 16 to 4096 pixels per line by 1 to 4096 lines per frame
Line-scan — 16 to 16384 pixels per line

Acquisition
Pixel Acquire Rate: Determined by Camera Link clock up to 66 MHz
Aspect Ratio: Programmable; determined by input format and ROI
Frame Grab Speed: Determined by input format used
Area-Scan Mode: Non-interlaced progressive-scan; single or continuous; software or hardware triggered; asynchronous reset
Line-Scan Mode: Single or continuous; software or hardware triggered; asynchronous reset

On-Board Processing
LUT: One programmable for single and dual port 8-bit and RGB
Region of Interest: Programmable ROI window defines video data to be transferred to memory; pixels outside window are discarded

Data Formats
Captured image data is transferred to host memory matching the incoming data format

Control Signals
External Trigger Inputs: One isolated on TTL-level, programmable rising/falling edge.
Area-Scan Mode: The external trigger starts the acquisition of a frame or series of frames
Line-Scan Mode: The external trigger starts the acquisition of a line. Digital input 0 is used for the line-scan frame trigger
Digital Inputs: Four general-purpose TTL inputs; interrupt on change; all accessible from 15-pin "D" shell connector
Digital Outputs: Four general-purpose TTL outputs +/ - 24 mA
Camera Control Outputs: Four Camera Link camera control outputs — software selectable to any of the following: expose, integrate, strobe or general-purpose signal
Serial Com Port: Camera Link asynchronous serial communications used for camera setup

Video Display
Uses PC's graphics card and monitor for display. Supports real-time video display and non-destructive, real-time animated overlays

PCI Architecture
32-Bit 33MHz PCI Bus support with intelligent Scatter/Gather memory management architecture. Board operates as a PCI Bus Initiator/Bus Master using Burst Mode for data transfers to host memory

Video Transfer Rate
80 Mbytes/sec typical, 132 Mbytes/sec max

Faceplate Connections
Primary: One Camera Link MDR-26 Connector; provides access to Camera Link camera video, camera controls and serial com port.
One 15-pin D-shell connector provides access to digital I/O, trigger input, and strobe output

Power Requirements
5V @ 30 mA Typical
3.3v @ 250 mA Typical

Physical/Environmental
Form: Half-Size PCI Board
Dimensions: 10.6 cm x 17.5 cm (4.2 in. x 6.9 in.)
Weight: 130 g (4.6 ounces)
Operating Temperature: 0° C to 50° C (32° F to 122°F)
Storage Temperature: -25° C to 70° C (-13° F to 158° F)
Relative Humidity: Up to 90%, non-condensing

Warranty
One year limited parts and labor.

System Requirements

All Data Translation hardware products are covered by a 1-year warranty. For pricing information, see a current price list, visit our web site, or contact your local reseller.

- Pentium-III class processor
- 32-bit/33MHz PCI bus and supporting BIOS
- At least one available PCI Bus slot
- Microsoft Windows 2000/XP
- 256 MB of system RAM minimum
- CD-ROM drive (for software installation)
- Graphics controller with DirectX driver

Ordering Summary

All Data Translation hardware products are covered by a 1-year warranty. For pricing information, see a current price list, visit our web site, or call your local reseller.

The DT3145 frame grabber is shipped with the Imaging Omni CD, a valuable software bundle which includes evaluations of DT Vision Foundry and GLOBAL LAB Image/2, WDM device drivers, complete documentation, an ActiveX control, and a ready-to-run software application.

- DT3145 Camera Link Frame Grabber for PCI bus.

Accessories

- STP15 — Screw terminal panel for digital I/O - includes EP337 cable, a 2m cable that connects the STP15 to connector J2 of the DT3145.
- EP327-2m — 2.0m (6 ft.) standard Camera Link cable.
- EP327-5m — 5.0m (16 feet) standard Camera Link cable.

Software

- DT Vision Foundry Machine Vision Software
  SP1400-CD Development
  SP1402-CD Run-Time
- GLOBAL LAB Image/2 Image Analysis Software
  SP1500-CD

Technical Support
As you develop your application, technical support is available when you need it. Extensive information is available 24/7 on our website at www.datatranslation.com, including drivers, example code, connector pin-outs, a searchable KnowledgeBase, user manuals, and more.
Support is also available from your point of purchase. Complimentary telephone support is available for the first 90 days; you can also request complimentary support via e-mail or fax anytime.