Compatible Windows Software

- DT Active Open Layers
- 32-Bit Frame Grabber SDK for Windows 98/NT 4.0/2000/ME
- DT-*Acquire*

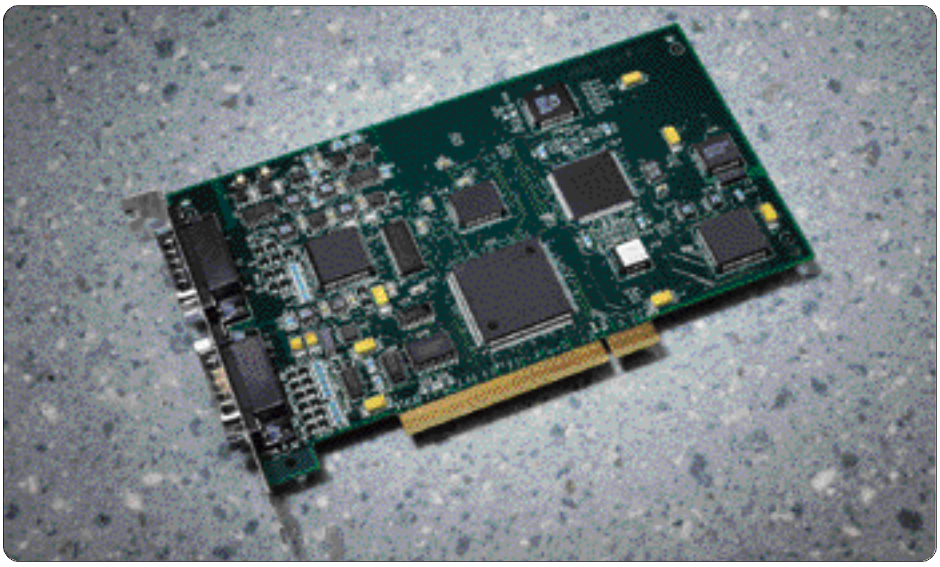
Member of MACH Series™

DT3152-LS

Line-Scan & Variable-Scan Frame Grabber for the PCI Bus

Key Features

- *Flexible input timing and spatial resolution allows use with a wide range of cameras.*
- *Digital Clock Sync™ reduces jitter to less than ±4 ns (max) for high-accuracy data sampling.*
- *Specially designed Fidelity™ circuitry ensures accurate data sampling.*
- *MACH Series™ PCI bus-mastering architecture enables acquisition and transfer to memory at 30 fps (RS-170/NTSC), 25 (CCIR, PAL)*
- *Ideal for applications requiring high-accuracy area-scan and line-scan data capture.*
- *Sync Sentinel™ improves image capture with VCRs.*
- *General-purpose digital inputs/outputs for interfacing to peripheral devices.*
- *Free DT-Acquire™ and LS-Acquire™ software enable you to capture, display, and save image data.*



M-5884

The DT3152-LS is a high-accuracy line-scan/variable-scan monochrome frame grabber for the PCI Bus.

Overview

The DT3152-LS is a high-performance, flexible, line-scan and variable-scan frame grabber designed for the PCI bus. The board interfaces to RS-170, NTSC, CCIR, PAL, variable-scan, and line-scan input sources.

High-Accuracy Fidelity Input for Line-Scan and Variable-Scan Devices

Software programmable input timing and spatial resolution allow you to use the DT3152-LS with a wide variety of video sources. The board accepts pixel clock speeds from 0-20 MHz, and can capture images up to 4 k x 4 k (4 M pixel max) in area-scan mode, and up to 8 k pixels per line in line-scan mode.

Extensive Camera Compatibility

The DT3152-LS allows users to acquire 8-bit monochrome images from a wide variety of video inputs, including: non-standard cameras/sources (i.e., slow-scan, SEM, and high-resolution); standard cameras/sources (i.e., RS-170, NTSC, PAL, CCIR); and RS-422-controlled analog line-scan cameras. Line-scan camera support includes models manufactured by Loral/Fairchild, EG&G Reticon, and others.*

Ideal Applications

Web Inspection
Machine Vision
Medical Imaging/Diagnostics
Scientific Image Analysis

High Performance Data Transfer and Display

The DT3152-LS employs the industry-leading MACH Series architecture for real-time image display. Taking advantage of the PCI bus' high speed, up to 132 MB/s, the DT3152-LS can transfer an unlimited number of consecutive frames, in real-time, across the bus to host memory. And by using the DirectDraw (DDI) standard built into Windows 98/NT 4.0/2000/ME you can display live video with non-destructive overlays (on area-scan images) without having expensive display hardware on the frame grabber. By using a separate VGA card for display, you are free to choose the graphics card that satisfies your particular application needs and perfor-mance requirements.

*Visit www.datatranslation.com/products for a list of supported models.

DT3152-LS (MACH Series™)

BUS: PCI

Type: Line Scan / Variable Scan

High-Accuracy Image Pr ocessing

The DT3152-LS is designed specifically for scientific and industrial applications where data accuracy is critical. Special circuits assure accurate data sampling.

Digital Clock Sync for Low Pixel Jitter

More consistent timing yields more accurate data. Our Digital Clock Sync has no more than ±4 ns jitter max. (±2.5 ns typical). This permits flawless operation with asynchronous input devices, which output only one frame at a time, permitting the DT3152-LS to sync immediately to the incoming signal on the first frame. To further reduce pixel jitter, the DT3152-LS lets you use a video camera's pixel clock to control image acquisition.

Precision Input for Superior Grayscale Resolution

Our proprietary input circuitry allows you to precisely match the input range to your video source to maximize the effectiveness of the A/D converter. The DT3152-LS' low noise programmable gain amplifier and adjustable offset and A/D reference can digitize a narrow band of the video signal with full accuracy.

Sync Sentinel for Excellent VCR Compatibility

For improved image capture with VCRs, even in pause mode, onboard circuitry ignores extra sync pulses and inserts sync pulses where they are missing for accurate image acquisition.

UltraSharp ™ Analog Design for Crisp Edges

Our high-speed, low-noise analog circuitry delivers sharp images, even across severe grayscale transitions.

System CPU Free for Image Processing

Because system resources are not involved in transferring data with the DT3152-LS Bus Master design, your computer's CPU is free to perform high-speed image processing on the data you acquire. You can acquire a second image while using the host CPU to process the first.

External Trigger, Digital I/O

The DT3152-LS accepts an external trigger to synchronize image acquisition with an external event. Eight digital I/O ports (4 TTL inputs, 4 TTL outputs) can be used as additional triggers or to control external devices.

Extensive Software Support Saves Programming Time, Protects Your Investment

The Frame Grabber SDK™ is a complete library of hardware-independent function calls that enables you to control the operations of Data Translation's PCI frame grabbers in Visual C and Visual C++.

The SDK adheres to Data Translation's DT-Open Layers® software architecture, which provides a common application programming interface (API) across all supported boards. This means that you can easily switch from one Data Translation frame grabber to another, or add more frame grabbers, with little or no reprogramming. Adding support for a new board is as easy as installing a new driver.

Precision Input™ Ranges

Input Ranges (V)	Gain	Range (mV)	Offset Range (V)	Offset (mV)
0–0.48 to 0–3.04	0.5	10	±1.07	8.4
0–0.24 to 0–1.52	1	5	±1.07	8.4
0–0.12 to 0–0.76	2	2.5	±1.07	8.4
0–0.06 to 0–0.38	4	1.25	±1.07	8.4

Notes: Input ranges are adjustable from the lower value to the upper value in specified increments. Each range can also be offset by any value from –1.07V to +1.07 V in increments of 8.4mV.

Real-Time Display; Non-Destructive Overlays

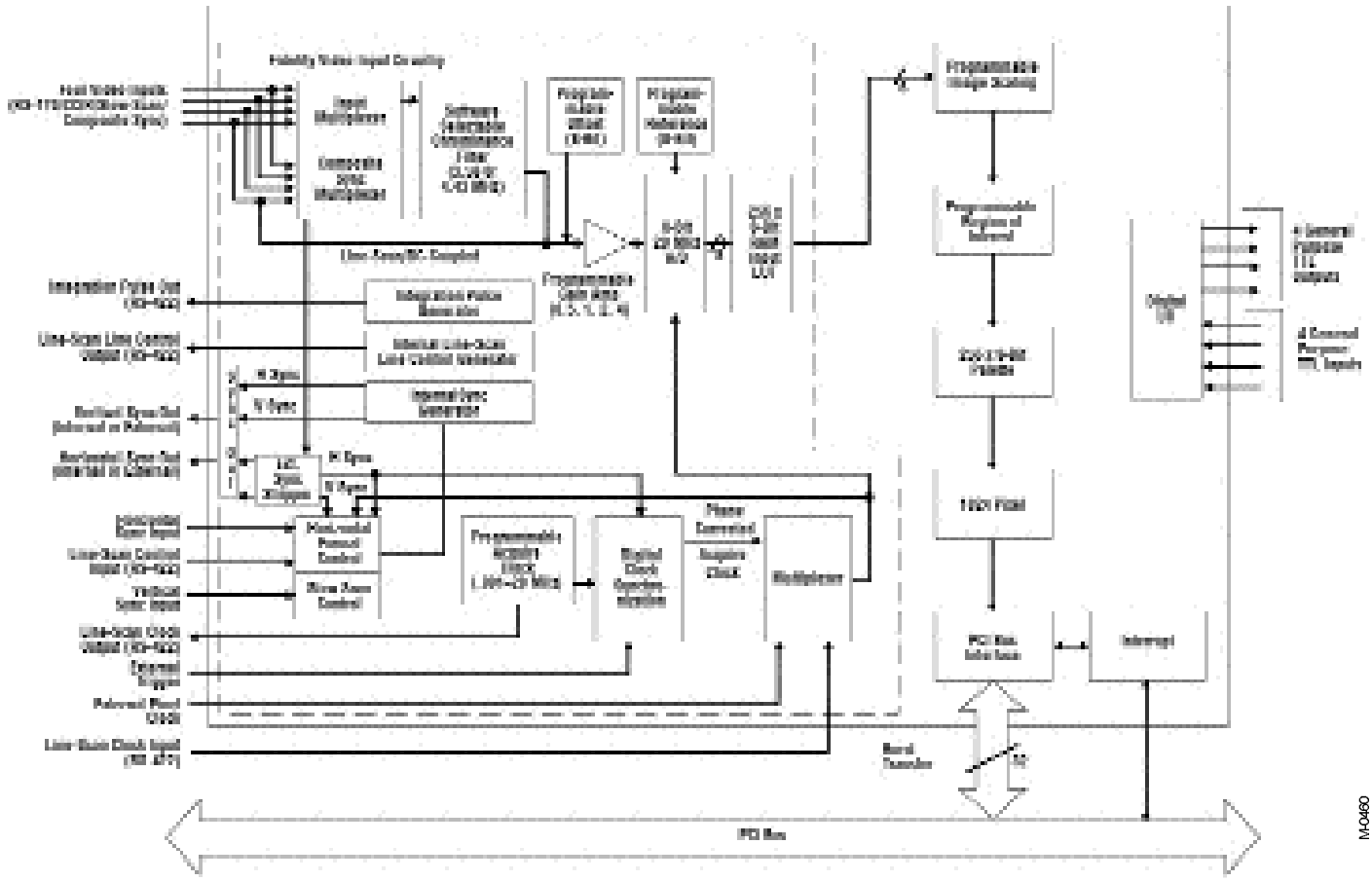
MACH Series frame grabbers employ Microsoft's DirectDraw (DDI) standard, allowing you to display real-time, live video with non-destructive overlays without adding costly display hardware (i.e. VGA circuitry) to the frame grabber. This approach offers many advantages over traditional frame grabber display and overlay methods, including:

Minimal CPU Bandwidth: The DirectDraw display technique requires minimal CPU bandwidth, leaving the CPU free to perform image processing or other tasks. Ideal for applications where display video and processing occur simultaneously, DDI allows for stagger-free images and smooth flowing, real-time video with overlays.

Upgradable Compatibility: With DDI, your MACH Series frame grabber will work with any DirectDraw-compatible graphics card. And since DirectDraw is enabled through the graphics card driver, you can upgrade an existing graphics card to DDI by simply loading a new driver.

Flexible Graphics Card Selection: Because the graphics card is not built onto the frame grabber, you are not "locked in" to the performance of the frame grabber's display circuitry. This allows you to choose the frame grabber that suits your needs and the graphics card that meets your performance requirements and budget.

Additional Features: Since DDI is the same overlay technique used by video game manufacturers, this capability gives you the ability to have non-destructive overlays of any size, shape, or color on top of live video. In addition, overlays can be translucent (semi clear), rotated, animated, or even placed over scaled images.



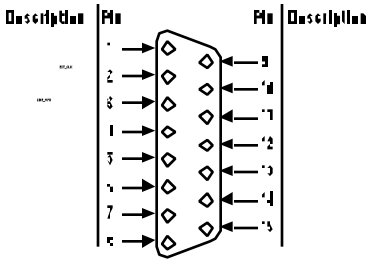
DT3152-LS Block Diagram

Technical Support

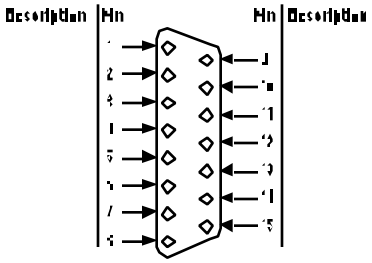
As you develop your application, technical support is available when you need it. Extensive information is available 24 hours a day on our web site at www.datatranslation.com, including drivers, example code, bug fixes, pinouts, a searchable KnowledgeBase, and much more.

Support is also available from your point of purchase. Telephone support is free for the first 90 days; you can also request complimentary support via e-mail or fax at any time. Additional support options are available; contact your Data Translation representative for details.

User Connections



Connector J1



Connector J2

Compatible Cable Assembly

EP306; one is required to handle video inputs and area-scan signals; a second EP306 accommodates line-scan signals

Mating Connectors

Connector J1 and J2; AMP 747953-1 or equivalent (15-pin female D-shell connector)

Specifications

All specifications are typical at +25°C and rated voltage, unless otherwise specified.

Video Input

Video Format: RS-170, RS-330, and NTSC (60 Hz) or CCIR and PAL (50 Hz); interlaced and/or non-interlaced/progressive-scan, slow-scan, line-scan; software selectable.

Timing Format: Standard, non-standard (variable-scan), asynchronous or custom timing; software selectable

Inputs: **Area-Scan**—4 monochrome composite inputs; ac coupled (dc coupled operation is available for one input channel).
Line-Scan—1 monochrome input, dc coupled; 3 monochrome inputs, accoupled

Video Signal: 1 Volt peak-to-peak, 75 ohms

Spatial Resolution: **Area-Scan**—Programmable, 4 to 4096 pixels/line by 1 to 4096 lines/frame (4 MPixels max).
Line-Scan—Programmable up to 8192 pixels/line

Chrominance Filters: **Area-Scan**—Notch type, 3.58 MHz (60 Hz) or 4.43 MHz (50 Hz); software selectable

Acquisition

Digitization: 8 bits, 256 gray levels

Pixel Jitter: ±2.5 nsec typical, ±4 nsec max

Pixel Acquire Rate: 0–20 MHz

Onboard Pixel Clock: Programmable; 1 KHz–20 MHz, 0.25% frequency resolution

Accuracy: Integral non-linearity ±0.5 LSB; RMS Noise 0.4 LSB

Aspect Ratio: Programmable; determined by input format used

Frame Grab Speed: 1/30 s (60 Hz) or 1/25 s (50 Hz)

Modes: Interlaced or non-interlaced/progressive-scan, (start on next even, next odd, or next field for interlaced), single frame or continuous operation, line-scan; all software selectable

Input Ranges: Programmable, 0–0.06 V to 0–3.04 V (see table, Precision Input Ranges).

Gain Ranges: Programmable, 0.5, 1, 2, 4; equivalent to <0.5 to >16 overall when combined with A/D reference settings.

Offset Ranges: Programmable, ±1.07 V, selectable in increments of 8.4 mV

Onboard Processing

Input LUT: 256 x 8-bit; allows for gray-scale threshold adjustments on image in real-time

Palette-Match LUT: 256 x 8-bit; matches image gray-scale map to the palette used by Windows, ensures proper gray-scale image display

Region Of Interest: **Area-Scan**—Programmable ROI window defines video data to be transferred to memory; pixels outside window are discarded.

Scaling: **Area-Scan**—Scales images by discarding lines, pixels, or both; increments programmable from every other line/pixel (1/2) to every sixteenth (1/16); line and pixel scaling separately selected.

Data Formats

Image data can be output in 8-bit monochrome format

Control Signals

External Trigger Inputs: One, TTL levels, software selectable on rising/falling edge

Sync Select: **Area-Scan**—Sync can be stripped from any of the four video inputs or taken from separate horizontal and vertical inputs. Sync detection level is software programmable for 50, 75, 100 or 125 mV.

Sync/Control Inputs: **Area-Scan**—VSYNC, HSYNC, Pixel Clock; signals supplied by camera(s) to board.
Line-Scan—Line Control, Master Clock; all RS-422

Sync/Control Outputs: **Area-Scan**—VSYNC, HSYNC; signals provided to camera(s), board acts as Sync Master.
Line-Scan—Line Control, Master Clock, Integration Time; all RS-422

Digital Inputs/Outputs: Four general-purpose TTL inputs, Four general-purpose TTL outputs, fan-out of two TTL loads each

Video Display

Uses PC's graphics card and monitor for display. Real-time video display and non-destructive, real-time animated overlays performed using Direct Draw (DDI)

Video Transfer Rate

10 to 25 MB/s typical, 132 MB/s max. Board operates as a Bus Master using burst mode for data transfer to host memory

Power Requirements

+5 V @ 2 A typical

+12 V @ 150 mA typical

–12 V@ 100 mA typical

Physical/Environmental

Form: Half-size PCI bus board (short card)

Dimensions: 10.7 cm x 17.5 cm (4.2 in. x 6.875 in.)

Weight: 150 g (5.3 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

DT3152-LS (MACH Series™)

BUS: PCI

Type: Line Scan / Variable Scan

System Requirements

- Pentium-class processor, 133 MHz or faster; Pentium II recommended
- At least one available PCI Bus slot
- Microsoft Windows 98/NT 4.0/2000/ME
- Triton PCI chipset (or better) and supporting system BIOS
- 16 MB of system RAM minimum for Windows 98; 32 MB minimum for Windows NT 4.0/2000/ME
- CD-ROM drive (for software installation)
- DDI-compatible graphics adapter

Ordering Summary

All Data Translation hardare products are covered by a 1-year warranty. For prices please consult a price list, visit our web site, or contact your local reseller.

DT3152-LS

The DT3152-LS is shipped with a CD-ROM containing DT-Acquire and LS-Acquire™ software, software driver, 32-bit SDK, and a comprehensive hardware User's Manual in PDF form. Manuals are available in hard-copy form for an additional charge.

- **DT3152-LS**

Call for information on OEM and volume discounts.

Accessories

- EP306—1.5m (5 ft.) cable assembly; one required for video inputs, digital inputs, digital outputs, and sync signals; a second is required for line scan signals; terminates to BNC connectors; connects to board using a mini D-shell connector
- DT3152-LS User's Manual in hard-copy form

Software

All software packages include a copy of the software on CD-ROM, a user's manual, and 90 days of complimentary telephone support.

For compatible software, consult the software section of this handbook, or call for details.