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Compatible Windows Software

- DT Active Open Layers
- 32-Bit Frame Grabber SDK for Windows 98/NT 4.0/2000/ME
- DT-*Acquire*
- GLOBAL LAB Image 2
- DT Vision Foundry

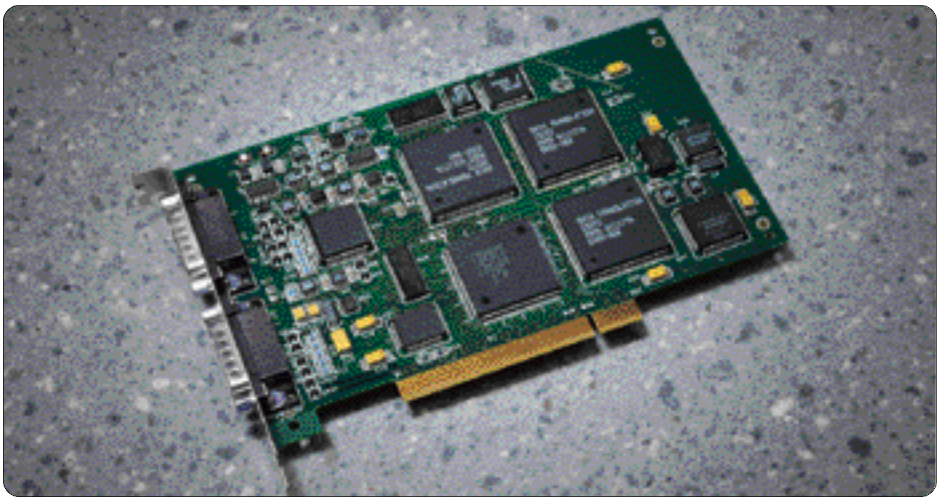
Member of MACH Series™

DT3152

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 outputs for interfacing to peripheral devices.*
- *Free DT-Acquire™ and LS-Acquire™ software enable you to capture, display, and save image data.*



M5885

The DT3152 is a highly-accurate, variable-scan frame grabber for the PCI Bus.

Overview

The DT3152 is a frame grabber for the PCI bus that uses Fidelity™ input circuitry for high-accuracy, variable-scan performance. Operating as a Bus Master, the DT3152 transfers images continuously in real time to the system monitor for display or to system memory for storage.

Ideal Applications

Visual Inspection
Machine Vision
Medical Imaging/Diagnostics
Scientific Image Analysis

Fidelity Input Delivers Variable Scan, Up to 4 Mb Image Size

Software programmable input timing and spatial resolution let you use the DT3152 with a wide variety of video inputs, including standard RS-170 or CCIR devices and large format, progressive-scan, and slow-scan cameras.

High Performance Data Transfer and Display

The DT3152 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 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 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 performance requirements.

High-Accuracy Image Pr ocessing

The DT3152 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), more than twice as good as the best phase-locked loop circuits. This permits flawless operation with asynchronous input devices, which output only one frame at a time, permitting the DT3152 to sync immediately to the incoming signal on the first

frame. To further reduce pixel jitter, the DT3152 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 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 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 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 Outputs

The DT3152 accepts an external trigger to synchronize image acquisition with an external event. Eight digital outputs can control or actuate external devices.

Extensive Software Support Saves Time, Protects Your Investment

Several software products are available to help you get your application up and running quickly and easily. The Frame Grabber SDK™ (included) 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 or Visual C++.

Optionally, DT-Active Open Layers™ is an ActiveX® control that enables you to use Data Translation's PCI frame grabbers with graphical programming environments such as Microsoft Visual Basic and Visual C++.

Both packages adhere to Data Translation's DT-Open Layers® software architecture, which provides a common application programming interface (API) across all DT PCI frame grabbers. 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 Increment (mV)	Offset Range (V)	Offset Increment (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 +1.07V in increments of 8.4mV.

Real-Time Display, Non-Destructive Overlays

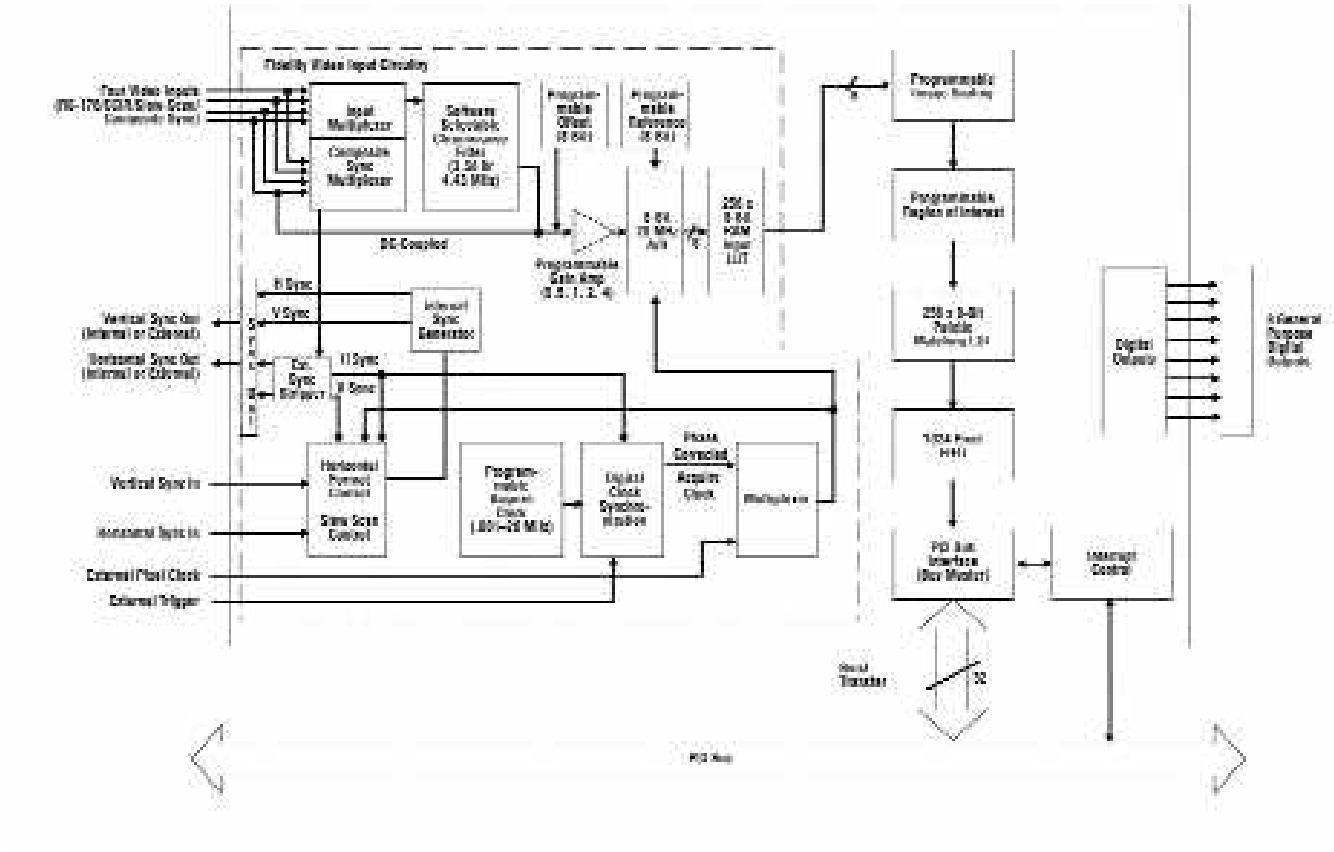
MACH Series frame grabbers employ Microsoft's DirectDraw (DDI) standard, allowing you to display real-time, live video with non-destructive overlays without adding costly display hardware (i.e. VGA circuitry) to the frame grabber. This approach offers many advantages over traditional frame grabber display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



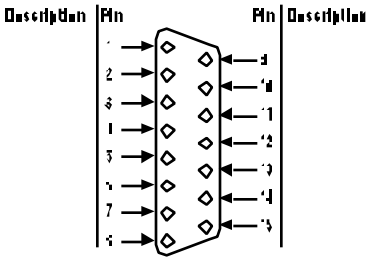
DT3152 Block Diagram

Technical Support

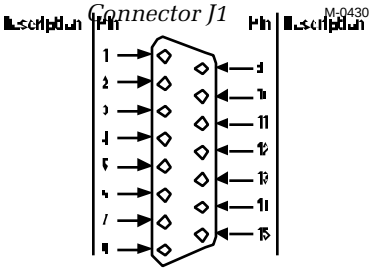
As you develop your application, technical support is available when you need it. Extensive information is available 24 hours a day on our web site at www.datatranslation.com, including drivers, example code, bug fixes, pinouts, a searchable KnowledgeBase, and much more.

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; a second EP306 accommodates digital and sync outputs

Mating Connectors

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

DT3152 (MACH Series™)

BUS: PCI

Type: Variable Scan

DT3152 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; software selectable

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

Inputs: 4 monochrome composite inputs; ac coupled (dc coupled operation is available for one input channel)

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

Spatial Resolution: Programmable, 4 to 4096 pixels/line by 1 to 4096 lines/frame (4 MPixels max)

Chrominance Filters: 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; 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: Programmable ROI window defines video data to be transferred to memory; pixels outside window are discarded

Scaling: 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: 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: VSYNC, HSYNC, Pixel Clock; signals supplied by camera(s) to board

Sync/Control Outputs: VSYNC, HSYNC; signals provided to camera(s), board acts as Sync Master

Digital Outputs: Eight 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

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
- DDI-compatible graphics adapter

Ordering Summary

All Data Translation hardware 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

The DT3152 is shipped with DT-Acquire software, software driver, 32-bit SDK, and a comprehensive hardware User's Manual.

- DT3152

Call for information on OEM and volume discounts.

Accessories

- EP306—1.5m (5 ft.) cable assembly; one required for video inputs, one optional for digital and sync outputs; terminates to BNC connectors; connects to board using a mini D-shell connector

Software

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

- DT-Active Open Layers ActiveX control for Microsoft Visual Basic 5.0 or higher, Visual C++ 5.0 or higher, running under Windows 98 or Windows NT 4.0/2000/ME SP0974-CD

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

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