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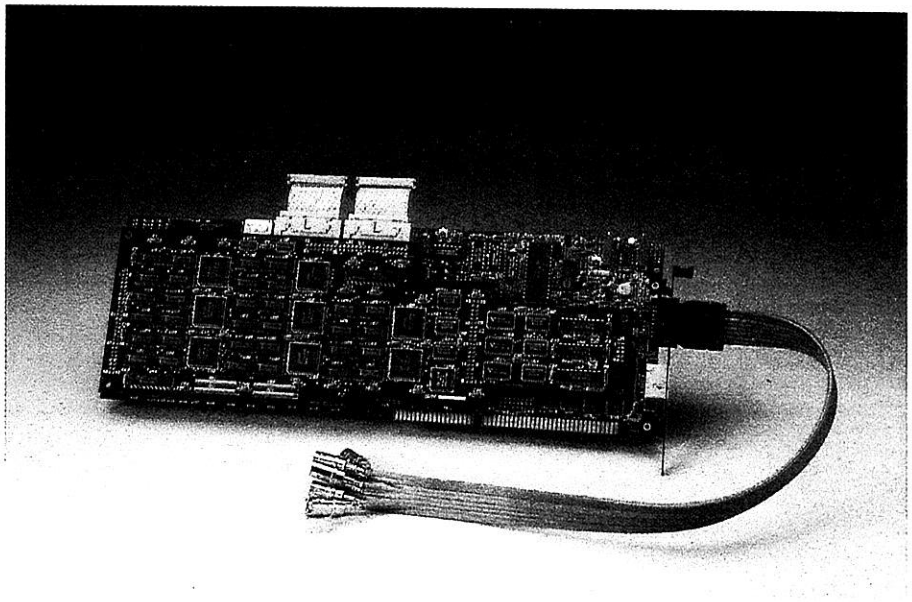
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Find the *Measurement Computing / Data Translation DT2862-60Hz* at our website: *Click HERE*

DT2861 and DT2862

Arithmetic Frame Grabbers for the PC AT

The DT2861 and DT2862 are Arithmetic Frame Grabbers that can acquire and display video images, and store 4 or 16 video frames in real time using onboard memory. Optimized for processing operations, these boards contain built-in ALUs that perform 8-bit real-time operations and DT-Connect® ports for direct connection to dedicated processors. IRIStutor™ application software ships free with each board; additional software support is available from Image-Pro Plus®, VISILOG, and the DT-IRIS™ subroutine library.



M-4685

DT2861 and DT2862 *Arithmetic Frame Grabbers for the PC AT*

4 or 16 Frames Onboard, Complete Access

Multiple onboard buffers, each with full access to four separate data paths, provide exceptional operating flexibility. You can display any buffer, combine any buffer with incoming data or any other buffer, or acquire frames into any buffer or sequence of buffers, all in real time. You can also transfer data between any buffer and the PC AT bus or the DT-Connect data ports for off-board storage or processing.

ALU and Look-Up Tables for Real-Time Processing

An 8-bit ALU lets you perform over 40 arithmetic and logic operations in real time. This includes adding and subtracting images for inspection, multiplying and dividing by a constant to adjust contrast, and performing AND, OR, and XOR logic operations. Input and result look-up tables (LUTs) can also be used for real-time processing. A feedback path supports iterative operations by channeling the output of any buffer back to the ALU input for additional processing.

Plug-In Processors Add Power

MEMBER OF DT-Connect® DT-Connect data ports give high speed access to the DT2868 and DT2878 external processors that provide 16 or 32-bit accuracy, and can accelerate more complex operations, including histograms, convolutions, FFTs, rotation, and warping.

Summary

Video Input: 1 monochrome, RS-170/NTSC/RS-330 (512 x 480 x 8) or CCIR/PAL (512 x 512 x 8); slow-scan-compatible (0–12 MHz)

Processing: 8-bit ALU, eight 256 x 8-bit input LUTs, and four 512 x 8-bit result LUTs; DT2868, DT2878 via DT-Connect ports

Memory: Stores 4 or 16 frames onboard

Video Display: Uses external monochrome or RGB monitor; monochrome (256 levels) or RGB false color (256 from a palette of >16.7 million colors)

Flexibility: Slow-Scan, Square Pixels, Overlays

In addition to sampling standard RS-170/NTSC/RS-330 or CCIR/PAL standard video inputs, the DT2861 and DT2862 can also be used with non-standard, non-interlaced signals from such devices as scanning electron microscopes, CAT scanners, MRI scanners, and spectrophotometers. To simplify processing, the DT2862 is available in a square pixel version. An overlay capability on display lets you mix live or stored images with graphics to label images or create special effects.

Comprehensive Software Support

The DT2861 and DT2862 are supported by a wide range of applications, including Image-Pro Plus and VISILOG (Noesis Vision). Each board also ships with the IRIStutor application software. For programmers, DT-IRIS offers exceptional flexibility, transparent support for the DT2868, and calling structure compatibility with the DT2878's Advanced Image Processing Library.

Hardware Processing

	CONFIGURATION		
OPERATION	DT-IRIS (SP0215) & DT2861 or DT2862	DT-IRIS (SP0215) & DT2861 or DT2862 with DT2868	DT-IRIS (SP0215) & DT2861 or DT2862, Advanced Image Processing Library & DT2878
True Frame Averaging	SW	HW (16-bit)	HW (32-bit)
Weighted Frame Averaging	RT	RT	RT
Arithmetic/Logic Operations			
1 Frame	RT (8-bit) HW (16-bit)	RT (8-bit) or HW (32-bit)	RT (8-bit) or
2 Frames (buffer & video input)	RT (8-bit)	RT (8-bit) or HW (16-bit)	RT (8-bit) or HW (32-bit)
2 Frames (two buffers)	RT (8-bit)	RT (8-bit) or HW (16-bit)	RT (8-bit) or HW (32-bit)
Windowing	RT	RT	RT
Zoom, Pan, Scroll	RT	RT	RT
Histograms	SW	HW	HW
Convolutions	—	HW (16-bit)	HW (32-bit)
FFTs	—	—	HW (32-bit)

SW means the operation must be performed in software.
HW means the operation is performed in hardware at accelerated speed.
RT means the operation is performed in hardware at real-time video rates.

DT-Connect Configurations

HARDWARE CONFIGURATION		SOFTWARE CONFIGURATION		
Frame Grabber Board	Processor Board	Image-Pro Plus (SP0230)	DT-IRIS[1] (SP0215)	DT-IRIS[1] (SP0215) & Advanced Image Processing Library
DT2861 or DT2862		✓	✓	
DT2861 or DT2862	DT2868		✓	
DT2861 or DT2862	DT2878			✓

Note: 1. DT-IRIS also supports channel selection on the DT2859 Eight-Channel Video Multiplexer.

Software

Available From Data Translation

DT-IRIS™ (SP0215)
Subroutine library for programmers
IRIStutor (FREE)
Command-driven application for image acquisition, processing, and display*

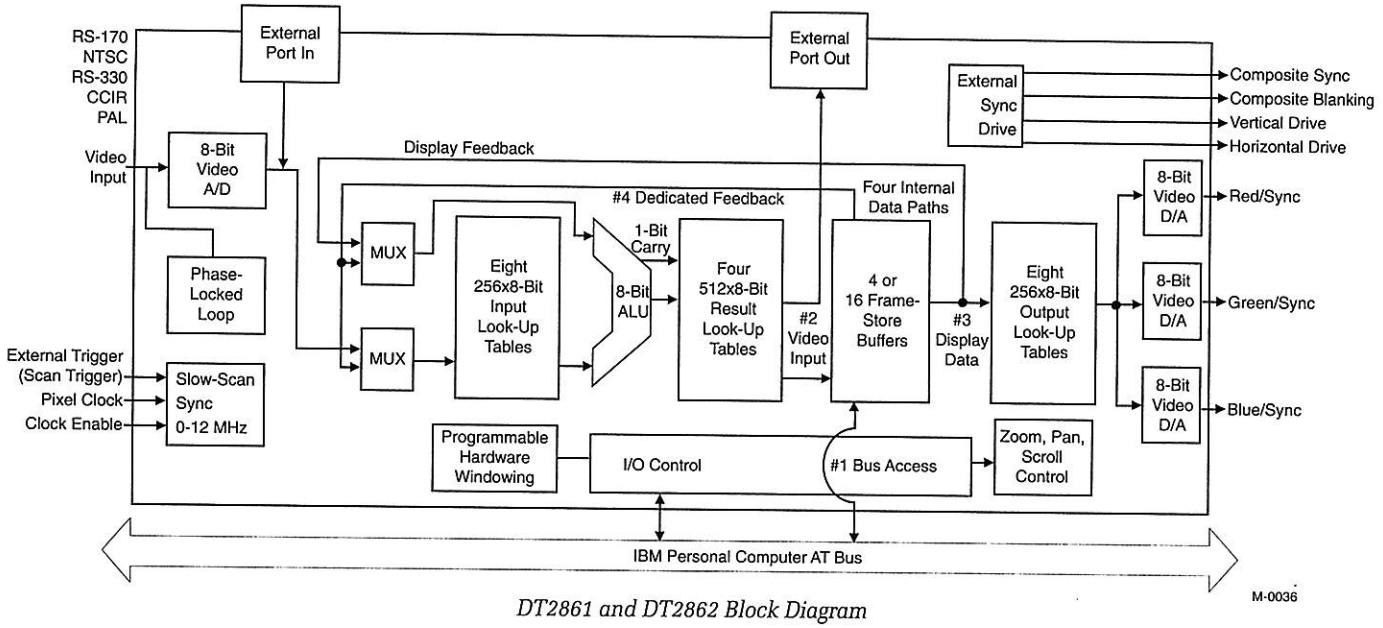
*See the DT2851 and DT2858 data sheet for a complete description of IRIStutor.

Other Industry-Standard Application Packages

VISILOG (Noesis Vision Inc.)
TCL-Image (Multihouse TSI B. V.)
NeoroVision (Vision Harvest Inc.)

Microsoft Windows-Compatible Software

C_IMAGES and PC_Image
(Foster Findlay Associates Ltd.)
ImPro-Lab (Hyperception)



DT2861 and DT2862 Block Diagram

Specifications

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

VIDEO INPUT

Compatible Video Signals

-60Hz Models—RS-170, RS-330, NTSC

-50Hz Models—CCIR, PAL

Input

Input can be 75Ω terminated or non-terminated (high impedance); selectable chrominance notch filter; 3.0 or 4.5 MHz bandwidth

Standard Video—1 monochrome input, interlaced; ac-coupled, dc restoration, sync stripping; composite sync from input signal or internally-generated sync with sync output; phase-locked loop conditions composite sync from input

Slow-Scan Video—1 monochrome input, non-interlaced; dc-coupled, no dc restoration, no sync stripping; Ranges: .340 to 1.0V, 0 to .66V, or 0 to .66–1.32V (resistor-selected); timing controlled by Scan Trigger, Pixel Clock, Clock Enable inputs; 0–12 MHz clock rate

Resolution

Gray Levels—256 (8 bits)

Spatial—512 x 480 (-60Hz models); 512 x 512 (-50Hz models)

Frame Grab Speed

-60Hz Models—1/30s

-50Hz Models—1/25s

Aspect Ratio

DT2862-SQ—1:1 (square pixels)

DT2861-50Hz, DT2862-50Hz—3:2

DT2861-60Hz, DT2862-60Hz—5:4

External Trigger

Starts frame acquisition; permits acquisition to be synchronized with off-board event; TTL levels

ONBOARD PROCESSING

ALU

Can perform operations on two 512 x 512 x 8-bit images, or one image and a constant, in real time (one frame period) 8-bit operands; 8-bit plus carry result

LUTs

Eight input LUTs (256 x 8); four result LUTs (512 x 8)

MEMORY

DT2861—16 frame-store buffers (4 Mbytes total)

DT2862—4 frame-store buffers (1 Mbyte total)

Overlays

Bit planes can be write-protected in all buffers permitting overlaying of video images with graphics; planes 0; 1; 2 & 3; or 4–7 can be selected

Access

Bus can read or write memory buffers anytime

VIDEO DISPLAY

Output Signal

-60Hz Models—RS-170, dc-coupled, interlaced

-50Hz Models—CCIR, dc-coupled, interlaced

Display

16,777,216 colors or 256 shades of gray; color or intensity value mapped by eight output LUTs (256 x 24)

Aspect Ratio

DT2862-SQ—1:1 (square pixels)

DT2861-50Hz, DT2862-50Hz—3:2

DT2861-60Hz, DT2862-60Hz—5:4

DT-IRIS

DT-IRIS™ is a programmer's subroutine library that supports all operations on the DT2851, DT2853, DT2861, and DT2862 frame grabbers, including transfers to and from all frame-store memory buffers, selection and programming of input and output LUTs, and channel selection using the DT2859. The package also provides file compression to reduce file storage requirements, control of PC AT extended memory, and windowing.

Additional hardware features specific to each board are also supported: processing using the onboard DT2861 or DT2862's ALU, and processing operations using a DT2868 or DT2858 frame processor (DT2851, DT2861, and DT2862).

DT-IRIS™ ships with a file conversion utility. This standalone, menu-driven program converts between files in the following formats: DT-IRIS™, Aurora™, TIFF (grayscale, color-mapped, palette, and RGB formats), and TARGA (monochrome; color-mapped; and 16-, 24-, and 32-bit formats). To assist programmers, conversions can be executed in command-line format.

DT-IRIS Subroutines

Acquisition and Display Operations

All Models:

Select internal or external sync

Enable or disable display

Select input or output buffer

Copy one buffer to another

Acquire one frame, or average multiple frames

Acquire frames continuously to specified buffer (passthrough)

Halt acquisition after the next frame

Check status of acquisition

Wait until acquisition completes

Select DT2859 input channel

DT2851, DT2861, and DT2862 Only:

Acquire a slow-scan input

DT2861, DT2862, and DT2853 Only:

Acquire one frame on receipt of each external trigger

DT2861 and DT2862 Only:

Disable or re-enable system clock

Acquire sequential frames into specified buffers

ALU Processing Operations

(These operations are performed using the DT2861 or DT2862's onboard ALU.)

DT2861and DT2862 Only:

Acquire one frame and perform specified ALU operation

Acquire frames continuously and perform specified ALU operation (passthrough)

Acquire single frame on receipt of external trigger, and perform specified ALU operation

Perform ALU operation on two buffers

Convolutions

DT2851, DT2861, and DT2862 with DT2858 or DT2868 Only:

Perform an n x m convolution on the active region with user-specified coefficients

Perform high-pass, low-pass, or Laplacian filter (3 x 3)

Perform vertical or horizontal line enhancement (3 x 3)

Arithmetic, Logical, and Statistical Operations

All Models:

Sum all pixel values in active region

Perform a histogram of the active region

Set all values in active region to a constant

Calculate sum, difference, or logical AND, OR, or XOR of two buffers

Calculate product, quotient, sum, or logical AND, OR, or XOR of all pixel values and a constant

Exchange the contents of two buffers

Process a buffer through a specified input LUT

LUTS

All Models:

Return entire contents or single entry

Load entire contents or single entry

Select LUT

Windowing and Region Manipulation

All Models:

Set active region

Copy active region to another buffer.

Place pixel values from active region into array

Put pixel values from array into active region

Place specified number of pixel values into array

Put specified number of pixel values into buffer

DT2861 and DT2862 Only:

Report active region

Overlays

All Models:

Set or report drawing point

Load write-protect mask

Set foreground or background pixel value

Draw lines through specified points

Draw arc from specified center point

Draw text using specified font at specified size

Set drawing mode: overlay or opaque

DT-Connect Operations

DT2851, DT2861, and DT2862 Only:

Read from or write to DT-Connect port

DT2861 and DT2862 Only:

Check to see if DT-Connect port operation has completed, or wait until it has completed

Auxiliary Frame Processor Operations

(These operations are performed on the DT2868 or DT2858 Auxiliary Frame Processor.)

DT2851, DT2861 and DT2862 Only:

Transfer data from processor memory to selected buffer

Perform hardware zoom, pan, or scroll

DT2861 and DT2862 Only:

Select input look-up table

Read single value or all values of input LUT

Load single value or all values of input LUT

Normalize data in processor memory

Perform specified ALU function

Copy a rectangular region

Buffer Operations

All Models:

Allocate or deallocate a buffer in system or extended memory

Clear specified frame buffer

Initialization, Termination, and Error Handling

All Models:

Initialize or shut down hardware

Indicate current configuration

Stop operations immediately with or without resetting boards

Enable or disable error message display

DT2853, DT2861, and DT2862 Only:

Initialize LUTs

Stop operations

Test board

Reset board

Miscellaneous

All Models:

Save active region to or restore active region from disk file, with or without run-length encoding

Perform software zoom, pan, or scroll within selected buffer

Turn hardware cursor on or off

Move cursor, or report current position

Display the color defined by the specified output LUT location

Customer Support

Several support options provide continuing product coverage as you use your Data Translation hardware or software. Options include extended telephone support, extended hardwarre warranty, and specialized application support for hands-on assistance debugging code. Call for details of coverage and cost in your local area.

DT-IRIS System Requirements

To run DT-IRIS, you'll need:

- IBM PC AT or compatible with high-capacity 5.25" floppy disk drive
- 512 Kbytes of memory
- One frame grabber
- RS-170 (CCIR, 50Hz) composite video display monitor, either monochrome or RGB
- SP0210 and SP0215: PC-DOS Version 3.30 or 4.01 or MS-DOS Version 3.30 SP0217: PC-DOS Version 3.30
- One of the following supported compilers:
  SP0210: Microsoft C[1] or Pascal[1]
  SP0215 or SP0217: Microsoft C[1]

1. Consult factory for software version numbers.
2. DT-IRIS™ does not use an 8087 or 80287 arithmetic coprocessor.

Supported Boards

	SP0210	SP0215	SP0217
Frame Grabber	DT2851-50Hz	DT2861-50Hz	DT2853-50Hz
	DT2851-60Hz	DT2861-60Hz	DT2853-60Hz
		DT2862-50Hz	DT2853-SQ-50Hz
		DT2862-60Hz	DT2853-SQ-60Hz
		DT2862-SQ-50Hz	
		DT2862-SQ-60Hz	
Frame Processor	DT2868	DT2868	
	DT2858	DT2858	
Multiplexer	DT2859	DT2859	DT2859

Specifications (Continued)

Sync
Composite sync embedded in red, green, and blue outputs; separate composite sync, composite blanking, vertical drive, horizontal drive outputs; sync is derived from composite sync on video input or onboard sync generator

OPERATING MODES
Video In; Slow-Scan; Port In; Port Out; Load LUTs

DT-Connect PORTS
8-bit input and output ports; 26-pin connectors; 8.3 MHz transfer rate; master

PROGRAMMABLE HARDWARE WINDOW
1–512 lines (increments of 1); 16–512 pixels (increments of 16); start and end at any legal increment

GENERAL

Interface
IBM PC AT bus or EISA bus; one interrupt, jumper-selected level; source: vertical sync, board not busy

Registers—I/O mapped, 10-bit I/O address; 16-bit data path

Memory—memory-mapped into extended memory space; use in a system containing 12 Mbytes or less extended memory

Slow Scan Mating Connector—9-pin D-shell female; AMP 747905-2 or equivalent

Power Requirements
+5V @ 4.5A typical; +12V @ .080A typical; –12V @ .080A typical

Physical/ Environmental
Dimensions—full-size PC AT board mecanically compatible with any EISA slot; 12.7 x 35.6 x 1.9 cm (5" x 14" x .75")

Temperature—operating: 0 to 50°C; storage: –25 to 70°C

Relative Humidity—to 95%, non-condensing.

To Order

All Data Translation products are covered by a 1-year warranty.

DT2861 Arithmetic Frame Grabber
Each board is shipped with IRIStutor software and comprehensive hardware and software user manuals.

- DT2861-60Hz—16 frame-store buffers, RS-170/RS-330/NTSC
- DT2861-50Hz—16 frame-store buffers, CCIR/PAL
- DT2862-60Hz—4 frame-store buffers, RS-170/RS-330/NTSC
- DT2862-50Hz—4 frame-store buffers, CCIR/PAL
- DT2862-SQ-50Hz—Square pixels, 4 frame-store buffers, CCIR/PAL
- DT2862-SQ-60Hz—Square pixels, 4 frame-store buffers, RS-170/RS-330/NTSC

Software
All DT-IRIS™ packages include the software and a user manual.

- DT-IRIS™—Single user package includes initial license; 5.25" high capacity media; SP0215-CN
  Source/multi-user package includes multi-user license and software sources. SP0215-CN is a prerequisite; 5.25" high capacity media; SP0215-MN

Note: An upgrade kit is available to upgrade customers with -C license to the latest version of DT-IRIS™. Contact the Data Translation sales department for details.

Accessories
For DT2861 and DT2862 User Connections

- EP277—Coaxial cable assembly (1.5m); accommodates video in, video out, sync, composite blanking out, vertical drive out, and horizontal drive out signals on male BNC connectors

Compatible DT-Connect Products
For information on compatible products, see the individual hardware and software data sheets.

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