

Annotator CL

CameraLink Annotator



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CameraLink Annotator

- Works with existing hardware and software
- **Annotate CameraLink data streams** with time stamp and 32-bit frame number
- Time stamp is synchronized to modulated IRIG-B input (operates in a free running mode in the absence of an IRIG input)
- Ideal for high speed cameras, spectrometers, radiometers, and other instruments with meta-data and time tagging needs
- **Time stamp is injected directly into the CameraLink data stream**
- Additional ancillary annotation data can be injected into the data stream:
 - Minimum and maximum data values and locations
 - User defined data statistics, digital inputs, and analog inputs
- **Annotation data is collected synchronously with the primary sensor data**
- **No complicated post processing is required to correlate the data**
- Available in a standalone enclosure or as an OEM PC board

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Multiple functions in a single stand-alone product

Similar COTS Products

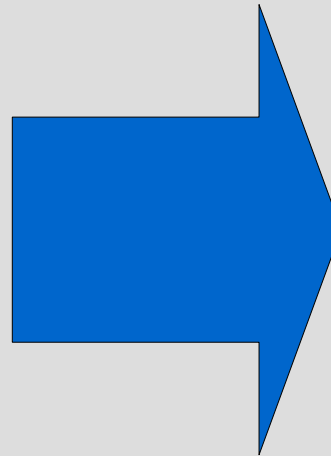
CameraLink Repeater	\$400
CameraLink Video Splitter	\$500
CameraLink Breakout Box	\$450
IRIG Time Code Board	\$1200
Estimated COTS Total	\$2550

Necessary Custom Development

Real-time Sensor Control	\$2000
Correlation Integration	\$2000
Estimated Custom Total	\$4000

Unique Annotator CL Features

CameraLink Annotation	\$\$\$
TTL-to-CamLink Converter	\$\$\$
No Comparable Product	\$\$\$



Ionetrix

Annotator CL (COTS)	\$1175
All-In-One COTS Solution	\$0
Deprecation of Custom Dev.	\$0
Unique Ionetrix Features	\$0
Ionetrix Annotator CL	\$1175

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Annotation Overview

- The annotation occurs directly in hardware with zero software overhead
- The annotation data is guaranteed to be perfectly correlated with the primary data from the instrument (CameraLink or TTL)
- Alphanumeric character generation at speed and resolution matching the CameraLink data input
- Multiple user defined annotation parameters can be accommodated in addition to the IRIG event time stamp and a 32-bit frame or scan number
- Annotation features work with both 16-bit and 24-bit frame grabbers
- Master and slave CameraLink outputs are perfectly synchronized to exactly the same output data stream
- Very flexible IRIG time code latching options:
 - rising or falling edge of frame sync
 - rising or falling edge of a selectable line sync
 - user defined event triggering options

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Annotation Modes

Two Modes of Annotation Use Together or Separately

Digital Annotation

- 32-Word Encoded Block
- Inserted into Data Stream
- User Defined Position
- IRIG Time and Frame Number
- Independently Enabled
- Options for 8-bit or 16-bit annotation data
- 16-bit annotation can be in either high-low or low-high byte order

Text Overlay

- Alphanumeric Bit Pattern
- Overlaid onto Data Stream
- User Defined Position
- User Defined Background Color
- User Defined Foreground Color
- IRIG Time or Frame Number
- Independently Enabled

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Annotation example showing both text overlay
and digital annotation block



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16-bit Mode Digital Annotation Block Details

Word	Definition
1	Year*
2	Day of Year (BCD)
3, 4	Second of Day
5, 6	Microseconds
7, 8	Frame Number
9	AOI1 Maximum
10	AOI1 Maximum X Location
11	AOI1 Maximum Y Location
12	AOI1 Minimum
13	AOI1 Minimum X Location
14	AOI1 Minimum Y Location
15, 16, 17, 18	AOI1 Sum
19	AOI2 Maximum
20	AOI2 Maximum X Location
21	AOI2 Maximum Y Location
22	AOI2 Minimum
23	AOI2 Minimum X Location
24	AOI2 Minimum Y Location
25, 26, 27, 28	AOI2 Sum
29, 30	Text Overlay Background
31, 32	Text Overlay Foreground

*Bit 15 of Year is the CaptureTrigger bit; bit 14 of Year is the IRIG locked bit

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8-bit Mode Digital Annotation Block Details

Byte

1, 2

3, 4

5, 6, 7, 8

9, 10, 11, 12

13, 14, 15, 16

17, 18, 19, 20

21, 22, 23, 24

25, 26, 27, 28, 29, 30

31, 32

Definition

Year*

Day of Year (BCD)

Second of Day

Microseconds

Frame Number

Text Overlay Background

Text Overlay Foreground

0

Checksum

*Bit 15 of Year is the CaptureTrigger bit; bit 14 of Year is the IRIG locked bit

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Flexible Text Overlay Modes

- Text Background and Foreground colors can be independently set to any 24-bit value
- Text Background and Foreground can independently be set to one of four modes
- In “Pixel Replacement” mode, the 24-bit Background or Foreground color replaces the original pixel value
- In “Transparent” mode, the output pixel value is set to the original input pixel value; this can be useful for the Background to reduce the overlay area footprint
- In “XOR” mode, the output pixel value is set to the original input pixel value XORed with the Background or Foreground color; with a color of 0xFFFFFFFF, this is useful to allow recovery of the original pixel values by repeating the XOR operation in processing software
- In “OR” mode, the output pixel value is set to the original input pixel value ORed with the Background or Foreground color; this is useful for 10/12/14 bit cameras with a 16-bit frame grabber to allow recovery of the original pixel values by ANDing with the proper mask; for example, a 14-bit camera could use a color of 0xC000 in OR mode, then the original pixel values could be recovered by ANDing with 0x3FFF

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Breakout Box Functions

External SMA Connectors

- “Sync 1” and “Sync 2”
- Independently Selectable
- Any CameraLink Signal, or an Operation on a CameraLink Signal, Such As:

FVal	CC1	PixelClock	PixelClock/16	PixelClock/256	PixelClock/4096
LVal	CC2	PixelClock/2	PixelClock/32	PixelClock/512	PixelClock/8192
DVal	CC3	PixelClock/4	PixelClock/64	PixelClock/1024	PixelClock/16384
	CC4	PixelClock/8	PixelClock/128	PixelClock/2048	PixelClock/32768

- Any TTL Signal
- Custom User Defined Parameters and Functions

RS232 Connector

- Pixels Per Line
- Line Per Frame
- Frames Per Second
- Lines Per Second
- Pixels Per Second



Easily Determine Image Parameters
For Unknown Cameras
No Frame Grabber Necessary!

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Flexible “Remote Start” Capture Trigger

- Capture Trigger can be inserted as an annotation bit or used to turn CameraLink outputs on and off
- Capture Trigger is synchronized with CameraLink FVAL signal
- Capture Trigger can be set to trip on a user defined input
 - Rising or falling edge
 - Switch closure or opening
 - Trigger input compatible with LVTTTL, TTL, and CMOS outputs
 - Arbitrary analog trigger inputs can be accommodated as well
- Capture Trigger can be set to trip on a user defined time trip point

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AnnCLe Control Software

- Can run alongside end user software as a dedicated Annotator CL control panel
- Comm link documentation provided for easy integration into end-user software

The screenshot shows the AnnCLe 1.2.1 control software interface, which is organized into several sections:

- Image Statistics:** Displays Frame Rate (59.862 Hz), Frame Size (718 x 521), Line Rate (31.486 KHz), and Pixel Clock (25.000 MHz). It includes a Frame Counter Reset button.
- Trigger Control:** Features an IRIG Latch dropdown set to 'FSync Rising Edge', an LSync Number spinner set to 16, a Remote Start dropdown set to 'Switch Closure', an unchecked checkbox for 'Enable CameraLink Start/Stop Control', and a Stop button.
- Digital Annotation:** Includes X Offset and Y Offset spinners both set to 8, an unchecked checkbox for 'Enable Digital Annotation', Mode radio buttons (8-bit, 16-bit HL, 16-bit LH) with 16-bit HL selected, and a Timestamp Year spinner set to 2008.
- Text Overlay:** Contains X Offset and Y Offset spinners set to 486 and 443 respectively. It has Line 1 and Line 2 Mode dropdowns set to 'Time Stamp' and 'Frame Number'. Foreground settings show Color 0xFFFFFFFF and Mode Replacement. Background settings show Color 0x0 and Mode Transparent.
- Output Port Order:** A grid of radio buttons for port configurations: ABC, ACB, BAC, CAB, BCA, CBA, AAA, BBB, and CCC. CBA is selected.
- Breakout Box:** Features Sync 1 and Sync 2 dropdowns set to 'Frame Sync' and 'Line Sync'.