

**PRIORITY VISION SYSTEM
ENGINEERING SUPPORT**

DALSA customers benefit from priority technical support, ensuring a quick response and access to experienced technical/applications support staff who understand that your machine vision application is unique.

**FAST REPAIR AND COMPONENT
REPLACEMENT**

A downed inspection system can cost thousands of dollars in production yield and potentially lost business. We can work with you to ensure you have back-up components ready and waiting for you when you need them.

DALSA will work with you to develop a priority delivery and order tracking program to give you 100% visibility on order fulfillment. We can also build in flexibility to modify delivery schedules, hold back or accelerate shipments to meet your needs.

**TECHNOLOGY,
SERVICE AND SUPPORT**

With rapidly evolving technology, design engineers are rightfully concerned that components they've specified for their vision system today may become discontinued or supplanted by newer technology tomorrow, leaving them scrambling to redesign and retrofit. DALSA is committed to supporting legacy products and providing an efficient migration path when products are discontinued.

**LOGISTICAL SUPPORT
AND TRAINING**

DALSA partners have 24/7 access to on-line, web-based tools for order tracking, account management, and technical support. These tools offer unprecedented visibility and control over the supply chain allowing them a quick response to change production demands.

We offer comprehensive training to support your front line staff. Customers can take advantage of both hardware and software training programs that can be conducted at our training facility or easily suitcased to a location of your choice.

www.dalsa.com

AMERICAS

700 Technology Park Drive
Billerica, MA 01821
USA

Tel: 978.670.2002
Fax: 978.670.2010

sales.ipd@dalsa.com

EUROPE

Breslauer Str. 34
D-82194 Gröbenzell (Munich)
Germany

Tel: +49.8142.46770
Fax: +49.8142.467746

sales.europe@dalsa.com

ASIA PACIFIC

Ikebukuro East 13F
3-4-3 Higashi Ikebukuro,
Toshima-ku, Tokyo, Japan

Tel: +81.3.5960.6353
Fax: +81.3.5960.6354

sales.asia@dalsa.com

SENSORS | CAMERAS | FRAME GRABBERS | PROCESSORS | SOFTWARE | VISION SOLUTIONS

MACHINEVISION

ADVANCED IMAGE CAPTURE, ACQUISITION, AND PROCESSING

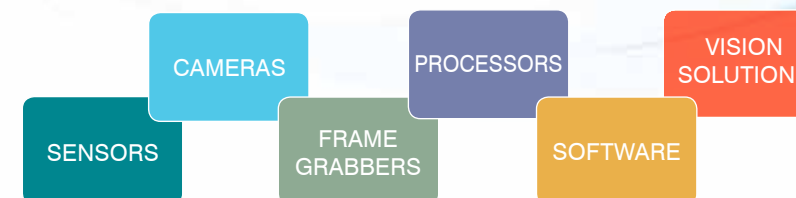
Get more vision
Get more vision
Get more vision
Get more vision
Get more vision
VISION

Get more vision



For more than 30 years, DALSA has been a leading innovator of advanced imaging technology. We offer our customers and partners a fully integrated technology path - from wafers and image sensors supplied by our wholly-owned semiconductor foundry to stand-alone cameras and complete vision solutions, we've delivered image capture and acquisition technology to help customers increase yields, lower field failures and speed time to market.

INTEGRATED TECHNOLOGY PATH



- secure, reliable supply of image sensors from our wholly-owned foundry
- single source for your system build – from image sensors to integrated solutions
- synergistic technology design and development for easy integration and performance optimization

Cameras	2
Frame Grabbers and Vision Processors	11
Vision Software	15
Industrial Vision Solutions	17
Custom Solutions	21


[DALSA Overview](#)
[Everywhere you Look Video](#)
[Annual Report](#)
[Semiconductor Overview](#)

Get more VISION

Get more vision
Get more vision
Get more vision
Get more vision

Piranha HS-12K

12k resolution, 1.12 gigapixels per second throughput, and a fast 90 kHz line rate



Falcon™ 1.4M100

Smear-free imaging at 100 fps with a global shutter



Genie™ HM1400

Versatile, high speed (300 fps) GigE Vision for machine vision applications



DALSA cameras offer unmatched combinations of speed, responsivity, and dynamic range. With features such as 8, 10, 12 and now 16 bit output, Camera Link®, GigE™, next generation Camera Link and Smart Camera technology, DALSA cameras help lower production costs, improve quality and reduce time to market.

We offer the broadest range of CCD and CMOS cameras—including multi-megapixel area scan, line scan and high sensitivity line scan (TDI: Time Delay & Integration) technology. In addition to our standard product offering, we can modify existing technology to meet your requirements or provide a solution designed from the ground up.

BILINEAR COLOR imaging is built on DALSA's dual line scan image sensor technology. The first line is made up of alternating red (R) and blue (B) pixels; the second is comprised of green (G) pixels only. There is no gap between the lines which minimizes any artifacts due to spatial correction.



GIGE VISION™

Gigabit Ethernet (GigE) technology delivers longer cable lengths, lower costs, and simplified system setup. Using DALSA's GigE Vision cameras, images are transmitted over standard, low-cost CAT-5e or CAT-6 cables. Our GigE cameras feature value added functionality designed for machine vision applications.



Camera Link®

Camera Link has become the de facto interface for high-speed machine vision applications. DALSA offers a full range of products based on this important interface.



NEW! SMART CAMERA TECHNOLOGY

We've leveraged the full breadth and depth of our design, engineering, and manufacturing expertise including sensor, camera, image-processing and vision software development to deliver the next generation in smart camera technology. See BOA Smart Camera on page 18.

COLOR IMAGING

RGB Trilinear sensor technology eliminates artifacts by placing a separate row of pixels for each color on a single sensor die. Our advanced design minimizes the distance between rows to eliminate image artifacts due to synchronization.

Bayer Color Filter Array architecture uses a mosaic filter pattern over the area sensor's pixels. Color information is reconstructed with a demosaic algorithm from within the camera or on the host.

Advanced Color Software Tools are a critical and invaluable part of any color vision application. DALSA's Sapera Essential now offers a comprehensive library of classes for color conversion, processing, calibration, and classification. See Sapera Essential on page 15.

NEW! HS INTERFACE (HSLINK)

DALSA is leading the development of the next generation camera-to-frame grabber interface. Designed to meet the needs of its new Piranha HS 12k cameras and Xcelera PX8 frame grabbers, the new HS interface will carry image and configuration data, while enabling low jitter, real time triggering signals over a simple topology.

See sidebar on page 5 for more details or download the new interface primer from our web site.

- ▼ Camera Overview
- Primer: Making the Move from Analog to Digital
- Primer: When is Color Required by Machine Vision
- Genie Quick Reference Guide
- BOA Overview brochure

LINE SCAN

										
	SPYDER2	SPYDER3	SPYDER3 COLOR	PIRANHA COLOR	PIRANHA2 10 MICRON	PIRANHA2 7 MICRON	PIRANHA3	PIRANHA ES	PIRANHA HS	PIRANHA HS 12K
OVERVIEW	Cost effective Compact 40 Mpixels/s	Dual line scan 40 to 80 Mpixels/s	High Color Fidelity Flexibility Dual line scan	Color at 240 Mpixels/s Compact User-friendly	1K to 4K resolution 80 to 160 Mpixels/s	4K to 8K resolution 80 to 160 Mpixels/s	Up to 12K resolution 320 Mpixels/s	Higher Sensitivity Bi-directional imaging Selectable TDI or Area	High Sensitivity 2k to 8k resolution 120 to 640 Mpixels/s Bi-directional imaging	Breakthrough High Sensitivity Highest Resolution TDI Bi-directional imaging
FEATURES	Lowest Noise Industry Proven Performance Internal FFC	High responsivity Full s/w Support	80 Mpixels/s High responsivity Full s/w Support	Highest Speed Tri-linear Color High Resolution Tri-linear technology	Fast with low noise High Resolution Ultra high reliability	Fast with low noise High Resolution Ultra high reliability	Fast with low noise High Resolution, Flat Body Ultra high reliability	TDI Technology 100x Antiblooming Higher Line Rates	TDI Technology Low Light Imaging Highest Line Rate, Anti-blooming	TDI Technology 12000 pixels Up to 1.08 Gpix/s
RESOLUTION	512 / 1024 / 2048 / 4096	1024 x 2 / 2048 x 2 / 4096 x 2	2048 x 2 / 4096 x 2	2048 x 3 / 4096 x 3	1024 / 2048 / 4096	4096 / 6144 / 8192	8192 / 12288	8192 / 4096 x 32 or 16 TDI	2048 x 64 / 4096 x 96 or 48 / 8192 x 96	12000 x 256 TDI
LINE/FRAME RATE	64 / 35 / 18 / 10 kHz	68 / 36 / 18 kHz	68 / 36 / 18 / 9 kHz	32 / 18 kHz	67 / 35 or 68 / 18 or 36 kHz	18 or 36/12 or 24/ 18 kHz	33 / 23 kHz	68 / 110 kHz	52 / 36 / 68 / 110 kHz	90 / 45 kHz
PIXEL SIZE	14 / 10 µm	14 / 10 µm	14 / 10 µm	14 / 10 µm	10 µm	7 µm	7 / 5 µm	14 / 7 µm	14 / 13 / 7 µm	5.2 µm
DATA FORMAT	8, 10 bit	8, 12 bit	8, 12 bit	8, 12 bit	8, 10 bit	8, 10 bit	8, 12 bit	8, 12 bit	8, 10, 12 bit	8, 12 bit
INTERFACE	Camera Link	GigE Vision or Camera Link	GigE Vision or Camera Link	Camera Link	Camera Link	Camera Link	Camera Link	Camera Link	Camera Link	HSLink
SIZE	50 x 85 x 54 mm 85 x 85 x 53.7 mm	60 x 72 x 54 mm 65 x 85 x 54	60 x 72 x 54 mm 65 x 85 x 54	76 x 105 x 53 mm	50 x 85 x 54 mm 85 x 85 x 54 mm	50 x 85 x 54 mm 85 x 85 x 54 mm 105 x 76 x 67	150 x 80 x 42 mm 80 x 85 x 54 mm	150 x 80 x 65 mm	85 x 85 x 55 mm 150 x 80 x 65 mm	180 x 90 x 92.5 mm
SAMPLE APPLICATIONS	Food Inspection Electronics Electronics Manufacturing Postal & Parcel Inspection Solar Cell Inspection	General Machine Vision Pick and place Web Inspection Film Inspection	General Machine Vision Food Inspection Electronics Web Inspection Film Inspection	100% Print Inspection Electronics Manufacturing Food Inspection Electronics Manufacturing	Flat Panel Display Inspection Semiconductor Inspection High Speed Web Inspection Solar Cell Inspection	Flat Panel Display Inspection Semiconductor Inspection High Speed Web Inspection Solar Cell Inspection	Flat Panel Display Inspection Semiconductor Inspection High Speed Web Inspection Solar Cell Inspection	Solar cell inspection Flat panel display inspection Postal sorting (flats) Document scanning	Electronics Manufacturing Flat Panel Display Inspection Postal (Letter & Flats) Sorting High Performance Web Inspection	Flat panel display inspection PCB/electronics inspection Large web applications High performance document scanning
COMPLIANCE	CE	RoHS, CE	RoHS, CE	RoHS, CE	CE	CE	RoHS, CE	RoHS, CE	RoHS (4k, 8k), CE	RoHS, CE (pending)
DYNAMIC RANGE	54 dB	64 dB	64 dB	57 dB	60 dB	60 dB	60 dB	56 dB	54 dB	54 dB
RESPONSIVITY	43 / 21 DN/(nJ/cm ²) @ 0 dB (8 bit)	129 / 85 DN/(nJ/cm ²) @ 0 dB (8 bit)	8 / 4 DN/(nJ/cm ²) @ 0 dB (8 bit)	22 / 11 DN/(nJ/cm ²) @ 0 dB (8 bit)	21 / 10 DN/(nJ/cm ²) @ 0 dB (8 bit)	11 / 10 DN/(nJ/cm ²) @ 0 dB (8 bit)	14 / 9 DN/(nJ/cm ²) @ 0 dB (8 bit)	246 DN/(nJ/cm ²) @ 0 dB 8 bit)	738 DN/(nJ/cm ²) @ 0 dB (8 bit)	300 DN/(nJ/cm ²) @ 0 dB 8 bit)
OPERATING TEMPERATURE	10~50 °C	0~50 °C	0~50 °C	0~50 °C	10~50 °C	10~50 °C	0~50 °C	0~50 °C	0~50 °C	0~50 °C

LINE SCAN

Line scan imaging uses a single line of pixels to build seamless two dimensional images of moving objects. DALSA line scan cameras are designed to optimize speed, responsivity, and dynamic range.

HIGH SENSITIVITY LINE SCAN (TDI)

For low light, high speed applications, DALSA offers high sensitivity line scan cameras which provide even faster line rates and 100x the responsivity.



DALSA cameras are supported by DALSA's Sopera™ vision software libraries featuring CamExpert for simplified camera set-up and configuration.

See Sopera vision software on page 15.

- ✓ Linescan Overview
- ✓ Primer: HSLink Tech
- ✓ HSLink Overview
- ✓ How TDI Works



NEW! HS INTERFACE (HSLINK)

DALSA is leading the development of the next generation camera-to-frame grabber interface. Designed to meet the needs of its new Piranha HS 12k cameras and Xcelera PX8 frame grabbers, the new HS interface will carry image and configuration data, while enabling low jitter, real time triggering signals over a simple topology. The new HS interface builds on the strengths of Camera Link, adding new features and functionality to meet existing Camera Link requirements while addressing the demands of emerging bandwidth-hungry applications.

Features:

- Scalable bandwidth from 300MB/s to 6000MB/s
- Off-the-shelf components
- Guaranteed data transmission
- Real-time triggering
- Data forwarding for distributed image processing
- Single cable solution
- Future proof -- CX4, coax or optical

AREA SCAN

FALCON HG (High Gain) Series (NEW)

XDR - Extended Dynamic Range NEW!



	GENIE SERIES next page	FALCON VGA300 HG	FALCON 1M120 HG	FALCON 1.4M100 HG	FALCON 1.4M100 XDR	FALCON 2M30/4M15	FALCON 4M30/60	PANTERA 1M, 6M, 11M	PANTERA 22M
OVERVIEW	VGA to 2 Mpixels GigE Vision for all 15 Models Up to 300 fps	VGA resolution, 300 fps High responsivity DALSA CMOS	1.0 Mpixels, 120 fps Power Over Camera Link (PoCL) DALSA CMOS	1.4 Mpixels, 100 fps Mini-CameraLink DALSA CMOS	1.4 Mpixels @ 100 fps Excellent dynamic range DALSA CMOS	2, 4 Mpixels Up to 34 fps ILT CCD	4 Mpixels Up to 60 fps DALSA CMOS	Up to 11 Mpixels; 12 / 14 bits High dynamic range Full frame CCD, Frame Transfer	22 Mpixels High dynamic range, Full frame CCD
FEATURES	Global shutter, Ruggedized RJ45 connector Full s/w support Affordable	Global shutter Exposure Control	Global shutter Fully programmable Low Power consumption	Global shutter High speed, Good NIR Fully programmable	Global Shutter Exposure Control Fully Programmable	Global Shutter, High Resolution Vertical Windowing Low noise	Global shutter Ultra High Speed Good NIR Performance	High resolution 80 Mpixels/sec High Speed Low noise	Low read noise Low dark current Low FPN
RESOLUTION	640 x 480 up to 1600 x 1200 Color or Mono	640 x 480	1024 x 1024	1400 x 1024	1400 x 1024	1600 x 1200 / 1920 x 1080 / 2048 x 2048	2352 x 1728	1024 x 1024 / 3072 x 2048 4008 x 2672	5344 x 4008
LINE/FRAME RATE	up to 300 fps	300 fps	120 fps	100 fps	100 fps	34 / 16 fps	31 / 62 fps	1M: 30 / 60 fps 6M, 11M: 7.5 / 4.4 fps	3.6 fps
PIXEL SIZE	4.4 µm to 9.9 µm	7.4 µm	7.4 µm	7.4 µm	7.4 µm	7.4 µm	7.4 µm	1M: 12 µm 6M: 9 µm	9 µm
DATA FORMAT	8, 10 bit	8 bit	8 bit	8, 10 bit	8, 10 bit	8, 10 bit	8, 10 bit	1M: 12 bit / 6M: 14 bit	8, 10, 12 bit
INTERFACE	GigE Vision	Base mini-Camera Link PoCL compatible	Base mini-Camera Link PoCL compatible	Base Mini Camera Link PoCL compatible	Base Mini Camera Link PoCL compatible	Base Mini Camera Link	Base Mini Camera Link	Base Camera Link	Base Camera Link
SIZE	45 x 29 x 67 mm	44 x 44 x 44 mm	44 x 44 x 44 mm	44 x 44 x 44 mm	44 x 44 x 44 mm	56 x 56 x 56 mm	94 x 94 x 50 mm	94 x 94 x 45 mm	78 mm x 78 mm x 70 mm
SAMPLE APPLICATIONS	General Machine Vision Electronics Manufacturing Traffic Management Security	Electronics Manufacturing Semiconductor Wafer Inspection Print registration General Machine Vision	Electronics Manufacturing Semiconductor Wafer Inspection Print registration General Machine Vision	Electronics Manufacturing Semiconductor Wafer Inspection General Machine Vision Industrial Metrology	Electronics manufacturing Semiconductor inspection Print registration Flat panel display inspection	Electronics Manufacturing General Machine Vision Industrial Metrology	Electronics Manufacturing Flat Panel Display Inspection Semiconductor Wafer Inspection Solar Panel Inspection	Film Scanning & Archiving Microscopy Non-Destructive Test Medical Imaging	Solar Panel Inspection Aerial Reconnaissance Medical Imaging Film Scanning & Archiving
COMPLIANCE	CE, RoHS	RoHS, CE	RoHS, CE	RoHS, CE	RoHS, CE	CE	CE, RoHS	CE	CE, RoHS pending
DYNAMIC RANGE	up to 57 dB	50 dB	50 dB	57 dB	50 dB	58 dB	56 dB	66 dB	66 dB
RESPONSIVITY	see Genie datasheet	45 DN/(nJ/cm ²) @ 600 nm, 1x gain	45 DN/(nJ/cm ²) @ 600 nm, 1x gain	45 DN/(nJ/cm ²) @ 600 nm, 1x gain	18 DN/(nJ/cm ²) @ 600 nm, 1x gain	22.9 DN/(nJ/cm ²) @ 530 nm, 1x gain	18 DN/(nJ/cm ²) @ 600 nm, 1x gain	40 / 20 DN/(nJ/cm ²) @ 540 / 530 nm, 1x gain	20 DN/(nJ/cm ²) @ 540 nm, 0dB gain
OPERATING TEMPERATURE	0~45 °C	0~50 °C	0~50 °C	0~50 °C	0~50 °C	0~40 °C	0~50 °C	0~40 °C	0~50 °C

AREA SCAN

Our area scan cameras offer the most advanced feature sets in the industry. Models can include global shutter, programmable operation, electronic shuttering, Camera Link or GigE interface, mounting adapters for readily-available lenses, color, backside-thinned for UV sensitivity, and built-in pixel correction.



DALSA cameras are supported by DALSA's Sapera™ vision software libraries featuring CamExpert for simplified camera set-up and configuration.

See Sapera vision software on page 15.



- Global Shutter Overview
- Primer: 4 Keys to Maximizing Digital Image Capture
- Primer: 5 Critical Factors for Choosing Digital Image Capture
- Primer: Choosing a Sensor for Machine Vision



GLOBAL SHUTTER IMAGING

High-speed, smear-free still image capture is the hallmark of DALSA's Falcon and Genie cameras. Applications such as **traffic management**, **metrology** and **robotics inspection** all need to image fast-moving objects without smear or distortion. To meet this need, DALSA offers true global shutter CMOS and interline transfer CCDs. With both technologies, the sensor has the ability to electronically shutter itself and "stop the action."

To stop the action, the camera starts and stops exposure of all pixels in an array simultaneously, under electronic control. This functionality requires specific design features, and not all sensors have them.

- **Full-frame CCDs** require mechanical shutters or strobing to achieve this result, introducing more cost and complexity into the vision system.
- **Frame-transfer CCDs** may not provide the speed required, or may be difficult to cost-justify due to the extra silicon required for the storage area.
- **Standard rolling-shutter CMOS** sensors distort images of moving objects because they read out only one line of their arrays at a time--by the time they read the next line, the object has moved. This distortion is a major obstacle for machine vision applications such as **automated sorting or defect inspection**--objects that that should be a "pass" are judged as "fail" because the image fed into the pattern-matching algorithms is distorted. As an example, instead of valid round holes, the system would see unacceptable ellipses.
- **Interline CCDs and true global shutter CMOS sensors** are ideally suited to imaging fast-moving objects. They capture crisp images without smear or distortion by electronically shuttering all pixels simultaneously even at short exposure times. DALSA's Falcon cameras (Camera Link) and Genie cameras (GigE) both provide true global shuttering.



Genie camera models combine standard gigabit Ethernet technology with DALSA's Trigger-to-Image Reliability framework to dependably capture and transfer images from the camera to the host PC. Small and compact, the Genie series includes Color (C), Monochrome (M) and High speed (HM) models. With options that include mounts for C- or CS-type lenses and right-angle lensing, Genie cameras provide flexibility for almost any application.



Color or Monochrome Image Capture

	C/M640 1/3	C/M640 1/2	C/M1024	C/M1280	C/M1400 1/2	C/M1410 2/3	C/M1600	HM640	HM1024	HM1400	HM1400XDR
RESOLUTION	640 x 480	640 x 480	1024 x 768	1280x960	1360 x 1024	1360 x 1024	1600 x 1200	640 x 480	1024 x 768	1400 x 1024	1400 x 1024
LINE/FRAME RATE	64 fps	64 fps	20 fps	24fps	15 fps	21.8 fps	15 fps	300 fps	117 fps	64 fps	64 fps
PIXEL SIZE	7.4 µm	9.9 µm	4.65 µm	3.75 µm	4.65 µm	6.45 µm	4.40 µm	7.4 µm	7.4 µm	7.4 µm	7.4 µm
DATA FORMAT	Mono: 8 bit Color: RGB 32-bit, UYVY, YUY2 or Raw Bayer	Mono: 8 bit Color: RGB 32-bit, UYVY, YUY2 or Raw Bayer	Mono: 8 bit Color: RGB 32-bit, UYVY, YUY2 or Raw Bayer	Mono: 8 bit Color: RGB 32-bit, UYVY, YUY2 or Raw Bayer	Mono: 8 bit Color: RGB 32-bit, UYVY, YUY2 or Raw Bayer	Mono: 8 bit Color: RGB 32-bit, UYVY, YUY2 or Raw Bayer	Mono: 8 bit Color: RGB 32-bit, UYVY, YUY2 or Raw Bayer	Mono: 8 bit	Mono: 8 bit	Mono: 8, 10 bit	Mono: 8, 10 bit
DYNAMIC RANGE	54 dB	54 dB	54 dB	52 dB	54 dB	54 dB	54 dB	48 dB	48 dB	48 dB	55 dB
IMAGER DIMENSIONS	4.80 x 3.60 mm	6.40 x 4.80 mm	4.80 x 3.60 mm	4.60 x 3.60 mm	6.40 x 4.80 mm	8.80 x 6.60 mm	7.20 x 5.40 mm	4.80 x 3.60 mm	8.80 x 6.60 mm	10.40 x 7.60 mm	10.40 x 7.60 mm
DIAGONAL MEASUREMENT	6 mm (1/3")	8 mm (1/2")	6 mm (1/3")	6 mm (1/3")	8 mm (1/2")	11 mm (2/3")	9 mm (1/1.8")	6 mm (1/3")	11 mm (2/3")	12.88 mm (1")	12.88 mm (1")

SAMPLE APPLICATIONS:

- Industrial inspection
 - Electronics
 - PCB- Food
 - Food container
 - X-rays
- Industrial metrology
- Industrial Laser Profiling
- Medical & Life Sciences
- Intelligent traffic systems
- Entertainment
 - Roller coaster
 - Sport



Genie cameras are supported by DALSA's Sapera™ vision software libraries featuring CamExpert for simplified camera set-up and configuration.

See Sapera vision software on page 15.

COMMON FOR ALL GENIES

Exposure Control	Programmable, or via External Trigger
Nominal Gain Range	-6 dB to +12 dB (C/M) 0 dB to +12 dB (HM)
Output	Gigabit Ethernet, also supports 100 Mbps
I/O Ports	2 opto-isolated input, 2 opto-isolated output
Size	44 x 29 x 67 mm (including lens adapter)
Mass	~115 g (without lens)
Operating Temp	0°-45°C
Power Supply	12 V 12 to 24V
Power Dissipation	up to 4W
Data Connector	Standard or Screw mount RJ-45
Power and I/O	Hirose 12-Pin
Software Platform	DALSA Sapera LT/ 3rd party GigE Vision compliant
Regulatory Compliance	FCC Class A, CE, RoHs 2002/95/EC
Lens Mount	C or CS-mount or Right-Angle option



Get more
Get more vision
Get more vision
Get more vision
Get more vision

Xcelera-CL+ PX8 and Xcelera-HS PX8

DALSA frame grabbers and image processors integrate high-bandwidth acquisition, real-time scalable processing and autonomous operation



Meet the industry's most reliable and versatile family of frame grabbers and vision processors with the ability to acquire images from multiple cameras and formats. DALSA offers both board-based and standalone image processors to meet a wide-range of applications from general purpose to more complex embedded FPGA based programming applications, high-bandwidth acquisition, real-time scalable processing, and autonomous operation.

VERSATILE CAMERA INTERFACE

DALSA frame grabbers and vision processors support monochrome and color applications and are available in a wide variety of camera interfaces including analog-to-digital as well as direct from digital. Our image acquisition boards support common interface standards including Camera Link, LVDS, and the new HSLink interface.

SUPPORT PCI, PCI-X, AND PCI EXPRESS BUS INTERCONNECT

DALSA frame grabbers support conventional Peripheral Component Interfaces (PCI and PCI-X) based on standard 32- and 64-bit parallel buses and next generation PCI Express.

ON-BOARD PROCESSING

Many DALSA boards are equipped with Field Programmable Gate Array (FPGA) based image processing. Fast and efficient, this embedded processing capability frees up the host CPU and performs tasks such as shading correction and Bayer decoding at a board level, delivering images that can be readily used by demanding vision applications without further pre-processing.

CAMEXPERT™ CAMERA CONFIGURATION UTILITY

DALSA has developed one of the industry's most efficient and easy-to-use proprietary camera configuration utilities specifically designed to leverage the power of our image acquisition boards. CamExpert is Windows based and provides an interactive environment to create new or modify existing configuration files.

EXTENSIVE CAMERA SUPPORT

DALSA image acquisition boards are field tested and approved for use with more than 200 cameras covering a wide range of characteristics, requirements and specifications, including:

- Digital (Camera Link, LVDS, RS422) and analog video source
- NTSC/RS170, PAL/CCIR, and non-standard cameras
- Monochrome and Color – composite video, Y/C and RGB
- Area and line scan cameras
- Variable length acquisition using line scan cameras
- Custom formats – analog and digital

Please visit our website for a complete listing of frame grabbers along with specifications and full datasheets.

- ▼ Frame grabbers / Vision Processors Overview
- Primer: HSLink Tech
- Primer: PCIe Advances Machine Vision
- Primer: Trigger to Image Reliability brochure

FRAME GRABBERS

PCIe Analog Solutions

	X64 XCELER-A LX1 QUAD	PC2-VISION EXPRESS	PC2-COMP EXPRESS	X64-CL EXPRESS	X64 XCELER-CL LX1 BASE	X64 XCELER-CL PX4 DUAL/FULL	X64 XCELER-CL PX4 SE	X64 XCELER-CL+ PX8 FULL/DUAL ¹	X64 XCELER-LVDS PX4	NEW! XCELER-HS
CAMERA INTERFACE	Variable Scan Analog	Variable Scan Analog	Standard Analog	Camera Link	Camera Link	Camera Link	Camera Link	Camera Link compatible	Parallel Data	HSLink
CAMERA INPUT & FORMAT	4 Independent RS170, CCIR or progressive scan	CV (6:1 mux), RGB (2:1 mux) or 3:2 genlocked RS170, CCIR or progressive scan	6 CCV (6:1 Mux) or 2 S-Video (2:1 Mux) RS170, CCIR, NTSC and PAL	1 Medium or 2 Base	1 Base PoCL	Full: 1 Full, Medium or Base PoCL Dual: 1 Medium or 2 Base PoCL	Full: 1 Full, Medium or Base PoCL	Full: Full, Medium or Base PoCL Dual: Medium or Base PoCL	LVDS/RS422	HSLink Up to 1800MB/s
PIXEL CLOCK	Up to 40MHz per input	Variable, up to 40 MHz	Fixed, 12.27 MHz or 14.75MHz	Variable, up to 85 MHz	Variable, up to 85 MHz	Variable, up to 85 MHz	Variable, up to 85 MHz	Variable, 33-85 MHz	Variable, up to 75 MHz	Independent
BITS/PIXEL	8-bit/pixel	8-bit/pixel	8-bit/pixel or 16-bit YUV	8, 10, 12, 14 & 16	8, 10, 12, 14 & 16	8, 10, 12, 14 & 16	8, 10, 12, 14 & 16	8, 10, 12, 14 & 16	8, 10, 12, 14 & 16	8, 10, 12, 14 & 16
HOST INTERFACE	PCIe x1	PCIe x1	PCIe x1	PCIe x1	PCIe x1	PCIe x4	PCIe x4	PCIe x8	PCIe x4	PCIe x8
IMAGE PROCESSING	ILUTs/Image Flip	ILUTs	Image Flip and Inverting	ILUTs/FFC/DPC ² /Bayer		ILUTs/DPC ² /FFC/Bayer/Image Flip	Multiple LUT/FFC/DPC ² Color conversion, RLE, Image Flip	ILUTs/Bayer/ FFC/DPC ² / Image Flip	ILUTs/FFC/DPC ²	ILUTs/FFC/DPC ²
OS SUPPORT	32/64-bit: Windows Vista, Windows XP, & Windows 7	32/64-bit: Windows Vista, Windows XP, & Windows 7	32-bit: Windows Vista, Windows XP, & Windows 7	32/64-bit: Windows Vista, Windows XP, & Windows 7	32/64-bit: Windows Vista, Windows XP, & Windows 7	32/64-bit: Windows Vista, Windows XP & Windows 7, Linux**	32/64-bit: Windows Vista, Windows XP, & Windows 7, Linux**	32/64-bit: Windows Vista, Windows XP, & Windows 7	32/64-bit: Windows Vista, Windows XP, & Windows 7	32/64-bit: Windows Vista, Windows XP, & Windows 7
GPIO	XIO module (optional)	On-board 8-in/8-out	N/A	XIO Module (optional)	N/A	On-board 4-in/4-out	On-board 4-in/4-out	On-board 4-in/4-out	On-board 4-in/4-out	On-board 4-in/4-out
COMPLIANCE	RoHS, CE, FCC	RoHS, CE, FCC	RoHS, CE, FCC	RoHS, CE, FCC	RoHS, CE, FCC	RoHS, CE, FCC	RoHS, CE, FCC	RoHS, CE, FCC	RoHS, CE, FCC	RoHS, CE, FCC

PCI Analog Solutions

	X64-AN QUAD	PC2-VISION	X64-CL FULL	X64-CL IPRO	PC2-CAMLINK	X64-LVDS
CAMERA INTERFACE	Analog	Variable Scan Analog	Digital - Camera Link®	Digital - Camera Link®	Digital - Camera Link®	Digital - Parallel Data
CAMERA FORMAT	RS170, CCIR or progressive scan	RS170, CCIR or progressive scan	CameraLink Full, Medium or Base	CameraLink Base or Medium	Camera Link Base	LVDS/RS422
CAMERA INPUTS	4 independent	6 composite video (6:1 mux), 2 RGB (2:1 mux) or 2 banks of 3 genlocked cameras	One Full, Medium or Base	Two Base or One Medium	Single Base	One
PIXEL CLOCK	Variable up to 50MHz per input	Variable up to 40MHz	Variable up to 85MHz	Variable up to 85MHz	Variable up to 85MHz	Variable up to 75MHz
BITS/PIXEL	8-bit/pixel	8-bit/pixel	8, 10, 12, 14 & 16	8, 10, 12, 14 & 16	8, 10, 12, 14 & 16	8, 10, 12, 14 & 16
BUS INTERFACE	PCI-64/PCI-X 66*	PCI-32	PCI-64/PCI-X 66*	PCI-64/PCI-X 66*	PCI-32	PCI-64/PCI-X 66*
IMAGE PROCESSING	ILUTs	ILUTs	ILUTs	ILUTs/FFC/DPC ² /Bayer	ILUTs*	ILUTs/FFC/DPC ²
OS SUPPORT	32-bit: Windows Vista, XP & 2000	32/64-bit: Windows 7, Windows Vista, Windows XP & Windows 2000, Linux**	32-bit, Windows 7, Windows Vista, Windows XP & Windows 2000, Linux**	32/64-bit, Windows 7, Windows Vista, Windows XP & Windows 2000, Linux**	32-bit, Windows Vista, XP & 2000	32-bit, Windows 7, Windows Vista, Windows XP & Windows 2000, Linux**
GPIO	XIO module (optional)	On-board 8in/8out	N/A	XIO Module (optional)	N/A	XIO Module (optional)
COMPLIANCE	RoHS, CE, FCC	RoHS, CE, FCC	RoHS, CE, FCC	RoHS, CE, FCC	RoHS, CE, FCC	RoHS, CE, FCC

Digital Solutions

VISION PROCESSORS

DALSA vision processors combine high-speed image acquisition capability with FPGAs (Field Programmable Gate Array) and streamlined memory architecture to deliver real-time image processing capability on a single slot board. The vision processors support multiple camera interface technologies on the PCIe platform.

DALSA's XRI-1600™ a vertically targeted vision processor offers PC based real-time digital image processing boards specifically engineered for demanding X-ray instrumentation and radiology applications.

Key Features

- Adaptive Image Averaging--reduces noise in both still and dynamic images
- Programmable Digital Filter--improves image quality and contrast
- Local Image Storage--improves reliability and processing time
- Flexible Input Data Formats--Supports higher resolution detectors with higher bit depths (10, 12, 14, 16 bits), CCD, CMOS, flat panel and linear
- Available in Camera Link
- Windows compatible C++ library for image acquisition and processor control--includes easy to use tools, utilities, and installation scripts



DALSA Platform Development Advantage - Free Run-Time Licensing (RTL)

The Sapera vision software standard processing tool RTL is offered at no additional charge when combined with DALSA frame grabbers and cameras. This run-time license includes access to over 400 image processing functions, area-based (normalized correlation based) template matching tool, blob analysis and lens correction tools.

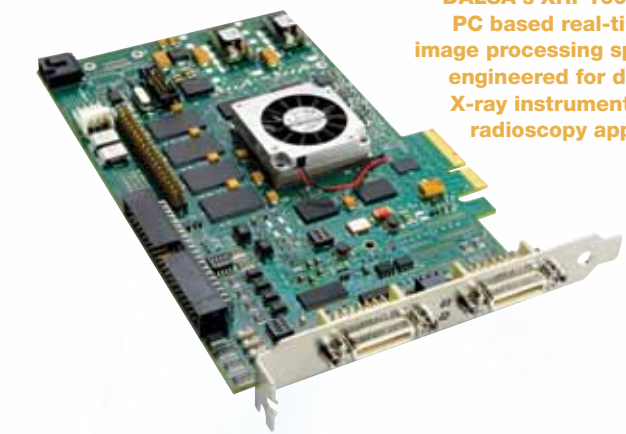
¹ Availability in H1 2010

² Dead Pixel Correction (DPC)

*Compatible.

**List of supported features may vary with Linux ver. and board model

All product specifications and attributes are certified accurate at the time of publishing (March 2010). DALSA Inc. reserves the right to make changes at any time without notice.



DALSA's XRI-1600™ offers PC based real-time digital image processing specifically engineered for demanding X-ray instrumentation and radiology applications.

Get more vision



Sapera™
Field proven vision software with
powerful imaging libraries
and application tools
New "Nitrous" Suite and
Measurement Tool
New Enhanced Color Tools

Sapera vision software bundles image acquisition and control with image processing and analysis tools to provide developers with the critical functionality to design, develop and deploy high-performance vision systems. Choose from two integrated platforms Sapera Essential or Sapera Nitrous optimized for GPU and Multi-core CPUs.

SAPERA™ ESSENTIAL

ADVANCED IMAGE ACQUISITION PROCESSING AND ANALYSIS

Sapera Essential vision software delivers a full suite of software libraries for image acquisition, display and control and includes an extensive list of image processing functions. Sapera Essential's feature set includes program portability, versatile camera controls, functions for display management and easy-to-use application development wizards. Sapera Essential applications can be developed using C++, C, C#, or Visual Basic with Microsoft® Visual Studio®, .NET® or using Borland® C++ Builder™ and supports Windows® XP Professional, Windows Vista (32 / 64-bit), Windows 7 and Windows 2000 platforms.

Sapera Essential's **New Measurement Tool** is a video metrology tool for inspection applications that require positioning, identification and guidance. Key features include:

- Automatic simultaneous multiple measurements
 - Sub-pixel Accuracy
 - Measurement statistics for distances and angles.
 - Built-in calibration tools
 - Extensive set of markers: single or multiple points, lines, arcs and circles

KEY FEATURES

Image Acquisition

- Supports Area scan, Line scan and GigE Cameras
- Includes over 500 camera configurations files for various camera models
- Built-in powerful camera configuration

Image Processing and Analysis

- Application specific tools perform Search, OCR, 1D/2D barcode decoding and blob analysis
- Modular components help reduce application footprint and deployment costs

Performance

- Now supports multi-core and GPU platforms
- Delivers maximum performance using SSE4

Flexibility

- Hardware independent
- Supports both 32-bit and 64-bit Microsoft Windows platform
- Incorporates Trigger-to-Image Reliability—DALSA's proprietary engineering frame work to ensure reliability of the image acquisition process
- High-level C++ classes and .NET support simplifies application development on Windows XP and Vista platforms

POWERFUL IMAGE PROCESSING AND ANALYSIS

Sapera Essential processing libraries include highly optimized functions for morphology, filters, geometric, measurement, segmentation, point-to-point operations, transforms, and other processing functions with sub-pixel accuracy. Sapera Essential includes a powerful board configuration and camera setup utility plus a suite of image processing tools including a highly advanced, yet cost effective search package.

NEW!

SAPERA NITROUS

GPU/MULTI-CORE CPU OPTIMIZATION
Sapera Nitrous is a smart-set of add-on image processing functions optimized for GPU (graphical processing unit) and multi-core CPU platforms. Building on the field proven functionality of Sapera Essential, Nitrous leverages the GPU and multi-core optimization (MCO) in a seamless fashion. The GPU implementation of nitrous is based on Nvidia's Cuda rev 2.3 And the MCO is based on Intel's latest instruction set technology.

- ▼ Sapera Software Overview
Brochure: Sapera Essential
Interactive Product Tour



BOA™ is a fully integrated vision system in a compact "smart" camera format.

DALSA automated vision solutions are designed specifically for factory floor deployment. Our innovative vision appliances and smart cameras offer scalable solutions to satisfy a wide range of application needs, from positioning robotic handlers to complete assembly verification.

DESIGNED FOR ALL USERS

DALSA is committed to helping manufacturers improve product quality, lower costs and increase production yields by providing automated machine vision solutions that meet the diverse needs of industry and end user alike. Designed specifically for factory floor deployment, our innovative vision appliances and smart cameras offer scalable solutions that satisfy a wide range of application needs, from positioning robotic handlers to complete assembly verification.

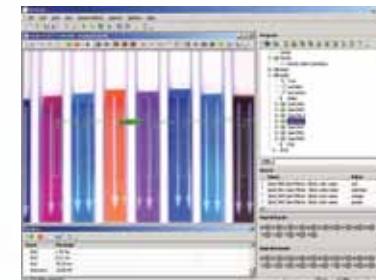
DALSA vision solutions are equipped with two distinct styles of application interface to accommodate the differing needs and experience of end users:

Sherlock™ software offers experienced vision integrators additional flexibility, together with a rich suite of capabilities and options that can be applied to the most challenging of applications. Sherlock provides advanced functionality in terms of scripting, customization and support for 3rd-party tools.

iNspec™ software allows experienced users and 1st-time adopters alike to setup and deploy solutions with little or no prior machine vision knowledge. iNspec's logical setup is built from the experience and algorithms that have been put to the test over the course of many years.

READY FOR ANY CHALLENGE

DALSA's vision systems are available in a range of cost-effective models to satisfy a broad variety of user requirements – from single 640 x 480 standard camera configurations to high-performance multi-camera models with 1600 x 1200 color resolution. In addition, Vision Appliances support DALSA line scan technology to address challenging large format or cylindrical vision applications.



- ✓ Vision Solutions Overview
- Brochure: BOA Overview
- Brochure: Vision Solutions
- Video Tour: BOA
- Primer: Machine Vision for the Factory Floor

SMART CAMERAS - BOA™

Single Point Inspection - BOA is a highly integrated vision system in a compact smart camera format engineered specifically for factory floor automation. With application software embedded, BOA offers new and experienced users alike, an easy-to-deploy, cost effective vision solution for single point industrial inspections.

The BOA vision system contains all the elements of an industrial machine vision solution:

- Sensor: monochrome or color VGA (640 X 480) 1/3" CCD image sensor - 60 fps
- Real-time Processing Engine: on-board digital signal processor.
- Inputs and Outputs: 2 on-board opto-isolated inputs and 2 opto-isolated highspeed outputs,
- Factory Communications: 10/100 BaseT Ethernet and RS-232, DHCP or static IP address, TCP/IP, Ethernet/ IP and direct support for standard PLC protocols
- Protective Enclosure: IP67 rated housing with M12 factory connectors
- Developer and Operator User Interfaces
- Integrated lighting control

BOA FEATURES

- Tightly integrated vision system
- Easy to use Embedded Software
- Multiple Processing Engines
- Factory Communications
- Industrial Enclosure
- 360° Direct Mounting
- Factory Style Connectors
- Ideal for single point inspections

EMBEDDED SOFTWARE

BOA comes bundled with DALSA's intuitive and versatile iNspect application software. iNspect offers a complete set of field proven tools that can be readily applied to a multitude of inspection tasks, such as positioning, identification, measurement, verification and flaw detection. The iNspect development interface and runtime engine is embedded within the BOA camera.



VISION APPLIANCES™

Multi Point Inspection - DALSA's Vision Appliances offer solutions for both single and multi point inspection. Packaged complete with application software, these systems comprise a centralized controller with expandable camera interfaces to deliver high performance processing with low deployment cost.

APPLICATION	VA15	VA30/31	VA40E/41	VA50E/51	VA61	
PROCESSING SCALE	Relative	1X	2X	4X/8X	4X/8X	8X
	Program	128 MB	512 MB	512 MB/1024MB	512 MB/1024 MB	512 MB/1024 MB
	Storage	64MB Flash	128 MB/4 GB Flash	80 GB	80 GB	80 GB
IMAGE	Sensor Type	Analog	Analog	Analog	CameraLink	GigE
	# Sensors	1	2	3	2	2 expandable
	Sensor Format	Area	Area	Area	Area/Line	Area/Line
	Color Support	No	No	No	Yes	Yes
	Sensor Size Min.	640x480	640x480	640x480	1024 x 1	640x480
	Sensor Size Max.	640x480	1600x1200	1600x1200	User Defined	User Defined
Sensor Speed	60 fps	60 fps	60 fps	User Defined	User Defined	
COMMUNICATION	USB	2 x (1.1)	2 x (2.0)	2 x (2.0)	2 x (2.0)	2 x (2.0)
	Ethernet (Mbps)	1000	1000	1000	1000	1000
	Serial (RS232)	1	1	1	1	1
	Visual (LEDs)	26	26	7	7	7
DISPLAY OPTIONS	Setup GUI	Remote	Remote/Local	Local	Local	Local
	Operator	Local	Local	Local	Local	Local
I/O	Access	Direct	Direct	Breakout	Breakout	Breakout
	Type	24V Opto	24V Opto	24V	24V Opto	24V
	# Inputs	10	10	8	12	8
	# Outputs	8	8	8	8	8
	Application	iNspect Lite	iNspect	iNspect	iNspect	iNspect
SOFTWARE			Sherlock (31 only)	Sherlock	Sherlock	Sherlock
	POWER	24V @ 1A	24V @ 1A	24V @ 2.5A	24V @ 2.5A	24V @ 2.5A
DIMENSIONS	Centimeters	9.5H x 16L x 5D	9.5H x 16L x 5D	7.6 x 20 x 21.5	7.6 x 20 x 21.5	7.6 x 20 x 21.5
APPROVALS		CE, RoHS	CE, RoHS	CE, RoHS	CE, RoHS	CE, RoHS

FULL RANGE OF VISION CAPABILITIES

DALSA vision solutions provide a full suite of vision tools and capabilities for performing the following inspection tasks:

01. POSITIONING

Guide robotic handlers or adjust vision tools for part movement

02. IDENTIFYING

Identify product for verification or traceability

03. VERIFYING

Verify parts for correctness, assembly or packaging

04. MEASURING

Measure parts for dimensional accuracy

05. FLAW DETECTING

Check part surfaces for scratches and other defects

