BOA

Next Generation Smart Camera Technology

Intelligent Vision System for Automated Machine Vision

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Fully Integrated Smart Camera

BOA is a fully integrated vision system in a compact "smart" camera format. Packaged complete with application software, BOA offers scalable vision solutions to satisfy a wide range of application needs from positioning robotic handlers to complete assembly verification. Specifically designed for harsh factory floor environments, BOA is a truly exceptional, all-in-one, intelligent vision system.

Multiple Processing Engines

BOA has an on-board Digital Signal Processor (DSP) combined with other processing elements to offer superior performance at very low power consumption. These multiple engines allow the partitioning of processing tasks such as algorithm optimization via DSP, application management via CPU and sensor functionality via FPGA. In addition, these flexible processing options offer opportunities for more complex, custom development. On-board resources include up to 256 MB of storage memory and 256 MB program memory.

Rapid Deployment

BOA is an inexpensive, easy to set up, optical inspection solution with ready-to-deploy functionality. BOA can be capturing images out-of-the-box in minutes, its point and click application development tools combined with its advanced on-board processing architecture provide a robust and adaptable platform for automated vision applications.

Versatile, Reliable, and Rugged

BOA's 360˚ mount ability, combined with its tiny mechanical footprint (one of the smallest form factors available), cool running operation, optional screw-on lens cover, and factory IP67 rating (dust-proof/jet-washable casing) make it ideal for tight-fit, factory environments, where space is at a premium.

BOA all-in-one Vision System for Industrial Machine Vision

- 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

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.

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Application Development Environment

BOA is supported by DALSA's intuitive iNspect machine vision software. iNspect's simple setup unleashes the knowledge and algorithms that have been honed in factory floor solutions around the world. This flexible application interface arms 1st-time and experienced users alike with the tools and capabilities to satisfy a diverse range of manufacturing needs.

No Software to Install

BOA comes fully loaded with the tools you need to deploy a vision application; there is no additional software installation, no worries about revision levels or software incompatibilities between the PC and the camera.

1. Easy connection by Ethernet wire between your network and the BOA Smart Camera

2. Fast setup using a web browser to launch our resident iNspect application

3. Once the initial setup is finished, the BOA can function as an autonomous system

Easy Web Browser Set Up

BOA vision systems are configured and monitored remotely using an Ethernet connection to a PC or factory network. An inspection can be quickly setup using a web browser portal (Internet Explorer 6 and higher) into the resident iNspect application. The web server provides a simple user interface for configuration and access to the iNspect application GUI

Offline Emulator

Included with iNspect is a fully functional emulator that allows users to develop or debug applications offline. Runtime Images can be saved to the offline PC using BOA's Ethernet interface. The emulator maximizes machine up time and simplifies support.

Control

iNspect supports standard protocols, such as Modbus and Ethernet/IP, for seamless connection to complementary devices. A scripting tool offers users greater control and integration flexibility. The script tool provides a suite of predefined functions for supporting user defined inline or background scripts.

iNspect also offers a Visual Basic API for advanced users wishing to develop custom operator interfaces.

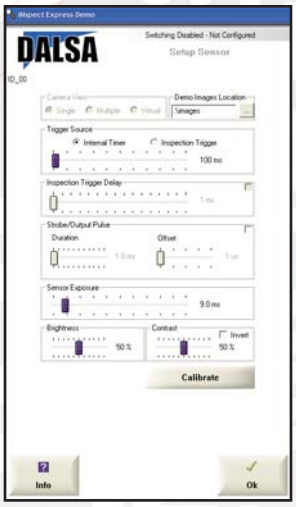
iNspect Features

The iNspect application has been carefully designed to offer a balance of simplicity and flexibility for all vision integrators:

- Intuitive setup
- Touch screen style design
- Full complement of tools
- Direct PLC support
- Language friendly
- Scripting
- Password control
- Runtime editing

Setup in 4 easy steps

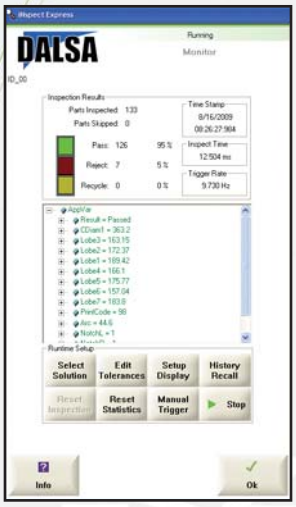
1. Get Image



2. Apply Tools

3. Integrate

4. Inspect



Flaw Detecting

- Surface scratch and crack detection
- Break in uniformity of texture
- Discoloration
- Burn detection
- Label Inspection

iNspect Image Analysis Tools

BOA's application development environment is powered by iNspect. iNspect allows users to setup and deploy solutions with little or no prior machine vision knowledge. It's logical step-by-step setup leverages advanced algorithms that have been field proven in thousands of factory applications. iNspect provides a full suite of vision tools and capabilities for performing the following inspection tasks:

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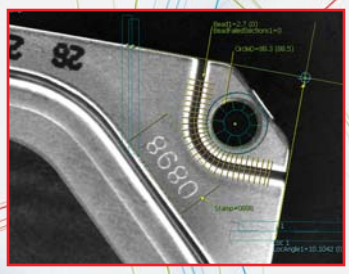
Identifying

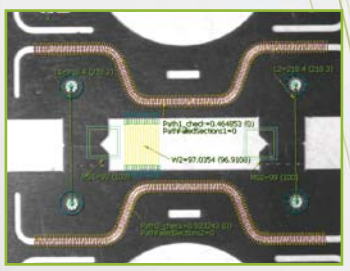
- Work in process inventory management – verify parts as they navigate through the fabrication process
- Cradle to grave part traceability
- Product verification assures 1D or 2D code matches printed text
- Product identification and sorting
- Date and lot code verification
- Code Verification. Detect problems with the marking system for preventive maintenance

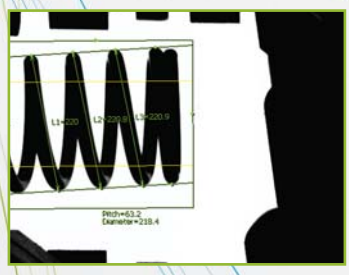
Positioning



- Locating part position for material handling
- Locating part feature for tool landmarking
- Verification of part or feature orientation
- Part counting
- Part sorting

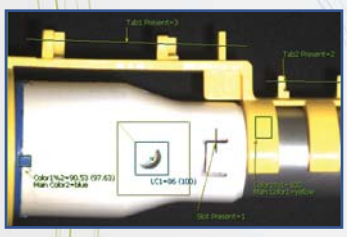
Measuring





- Presence/absence
- Dimensional accuracy and geometrical tolerances
- Thickness and uniformity of parts

Verifying



- Blister pack verification
- Molded part verification
- Solder joint verification
- Bottle cap and safety seal verification
- Print verification
- PCB assembly verification
- Cable wiring verification
- Package verification

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Factory Integration

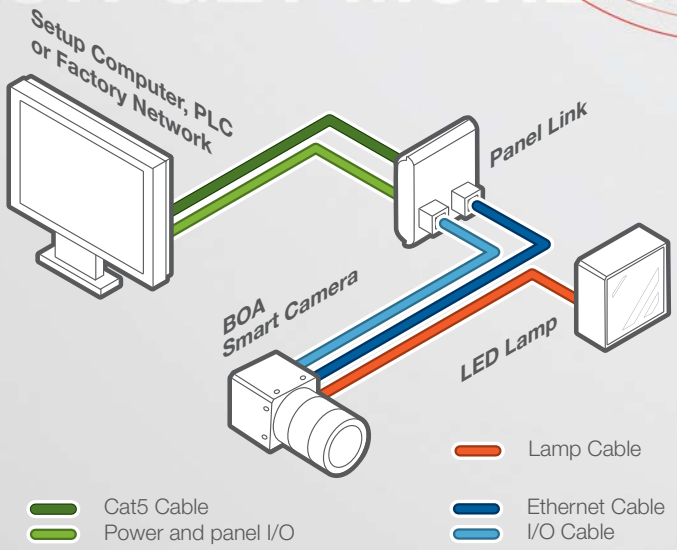
BOA has been engineered to simplify integration into the factory environment. Setting up communications with other devices, including inputs and outputs for discrete control, TCP/IP connections to the factory LAN, and/or IP or serial connections to PLCs is quick and intuitive through the iNspect setup interface.

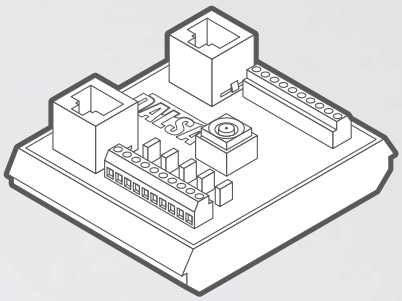
Lighting Control

BOA features a separate connector for interfacing and controlling LED lights. This makes it very easy to integrate a variety of standard lights in the application. The lights can be efficiently connected at the point of inspection – local control eliminates more wiring to the control panel. Power on the lamp connector is fed from the power input pins, so 12V lights can be supported by simply powering BOA from a 12V source.

Flexible Cabling Options

BOA supports standard low-cost M12 factory style cordsets. 8 pole connectors are provided for Ethernet and I/O, while a 5 pole configuration is used for external LED lamp control and RS-232 communication.





Panel Link Module

The PL-100 module is an optional module that provides a safe and convenient way to interface the camera. It provides an isolation layer between the factory and the camera, as well as supplying power via the Ethernet cable for single cable applications. The PL-100 also provides a manual trigger button and status lights for application debug.

Ethernet Only

BOA supports passive Power over Ethernet for applications that demand a single cable solution. In this configuration, the camera is controlled via Ethernet and the I/O is unavailable. This simplified cabling configuration greatly improves cost of deployment when compared to typical camera cabling setups.

Real-time, Operational Feedback

BOA provides operational feedback LEDs used on boot by the hardware and at runtime by the application. There are 3 functional LEDs:

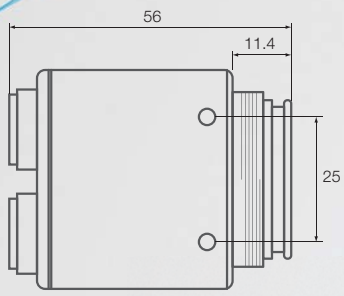
LAN (Network Status)

LED1 (Camera/Inspection Status)

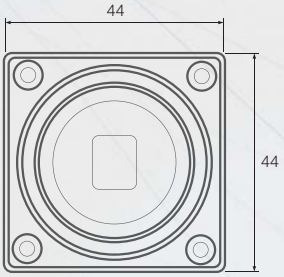
LED2 (Camera/Application Status)

Specifications

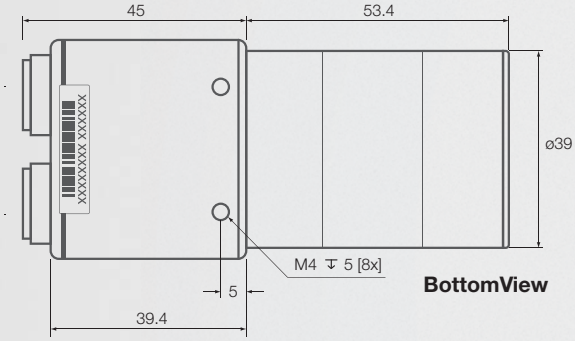
BOA Smart Camera



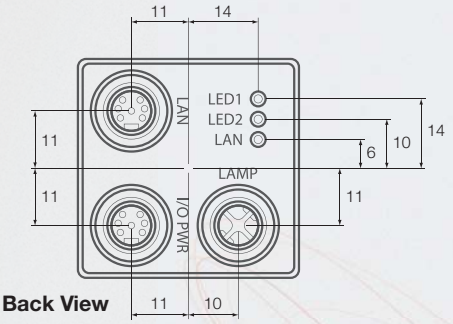
Side View



Front View

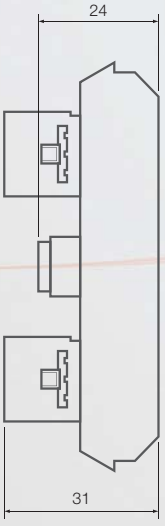


BottomView

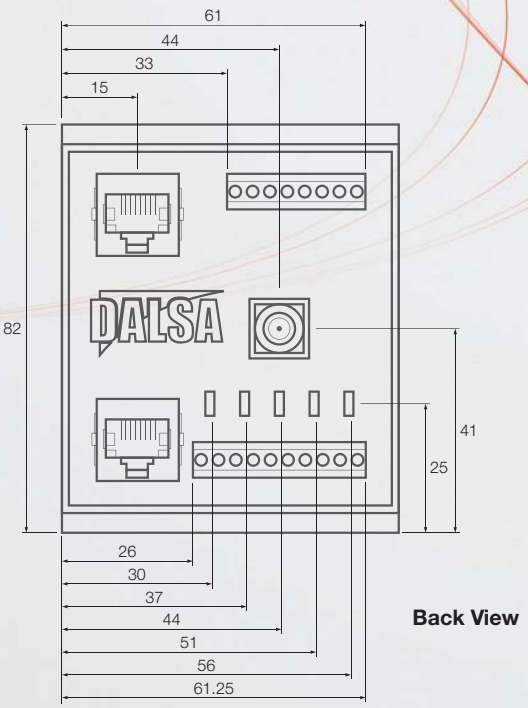


Back View

Panel Link Module



Side View



Back View

Voltage	ON OFF	12-36V 0-3V (12V nominal threshold)
Current	ON	18mA typ (24V applied)
Protection	Resistance Isolation	1238 Ohms 4000V RMS
Common Pin	I/O	PWR or GND
Switch Time	ON OFF	1 Microsecond 10 Microseconds
Latency	Trigger	62 Microseconds from trigger input to start of acquisition

Voltage	Load	24V maximum
Current	GPO[0:1]	100mA max
	STRB	200mA max
Protection	Fuse	PTC fuses to 100mA (GPO) & 200mA (STRB)
Common Pin	I/O	PWR or GND
Switch Time	ON	200 Microsecond
	OFF	200 Microseconds

Memory	Storage Program	256MB 256MB
Image	Sensor Pixel Resolution Type Exposure Acquisition Lens	1/3 Inch CCD size 7.4µm 640x480 Mono or Color Progressive Scan 22µs to 1000ms Async Reset, full-frame integration 60 f/s maximum (application dependent) C Mount
I/O	Trigger Inputs Outputs Strobe Status	1 opto-isolated input Software trigger via Ethernet or internal timer 1 General purpose opto-isolated Expandable via I/O module 2 General purpose opto-isolated Expandable via I/O module 1 dedicated strobe output for LED light source Network + 2 application assigned LEDs
Serial	RS-232	1 port
Network	Ethernet	10/100BaseT
Power	12-30V	Via Ethernet or I/O connectors (not PoE compliant)
MechanIcal	Material	Machined Aluminum with anodize/paint finish
	Mounting	8 x M4 plus optional mounting block
	Size	44mm x 44mm x 56mm (without lens cover)
Environment	Temp	0ºC (32°F) - 50°C (122°F) Operating
	Protection	IP67
	Shock	70G
Certification		FCC Class 8 and EU CE

BOA is a fully integrated vision system in a compact “smart” camera format specifically designed for industrial use.

BOA is packaged complete with application software, providing an easy-to-deploy automated inspection system for the factory floor.

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