

# ISG LightWise FireWire™ Intelligent Cameras



**IEEE-1394 IIDC DCAM Spec. Ver. 1.3.1 Fully Compliant**  
**On-Board FPGA & Processor for Easy Customization**  
**Low Cost, Designed for OEM Applications & Field Upgradeable**

**Area & Line Scan Cameras**  
**Global and Synchronous/Rolling Shutter Options**  
**Very high frame rates in reduced Regions of Interest (Windows)**

The new LightWise smart cameras combine ISG Imaging technology and the FireWire™ standard to give a low-cost, high performance solution to machine vision applications. These compact cameras shorten the typical integration time associated with vision systems and offer flexibility for OEM solutions. Fully compliant with the IEEE-1394 IIDC DCAM Specification Version 1.3, these cameras can be used with compatible programs such as NI LabVIEW™, Norpix StreamPix™, Aphelion, ImageWarp, Matrox Mil™, MVTec, and other 3<sup>rd</sup> Party Software packages. All camera controls are done through software, which includes a fully programmable dynamic range/gamma control LUT for any desired response curve. An on-board image buffer is also featured in these cameras. All cameras offer opto-isolated programmable I/O for triggering and strobe control capabilities. User-programmable controls include integration time, gain adjustments, offset, bit depth and data rate. Cameras with a global shutter are available for applications that involve objects in high-speed motion. Global shutter cameras feature multiple slope integration for extended dynamic range. The area cameras feature Digital Pan & Zoom hardware or Motion-JPEG as an option. The 1024 pixel version offers rates up to 10K lines per second at 14-bit resolution and is ideal for machine vision, spectroscopy, edge detection and bar code reading requirements. The 2048 pixel units can perform at rates up to (60 MHz/SLIS & 40MHz/PE) Pixel Clocking and 12-bit resolution strongly suited for machine vision, metrology, sorting and edge detection.

These cameras come packaged with 1394 drivers, ISG GUI Control software and a user's manual. Support for **Windows 2000 & XP & LINUX**.

**All cameras are compatible with National Instruments IMAQ IEEE-1394 driver, Vision Assistant, Vision Builder for Automated Inspection, and the Compact Vision System (CVS).**

**Applications include:**

**Security & Surveillance**  
**Sorting**  
**Machine Vision Systems**  
**Spectroscopy**

**Internet Monitoring**  
**Automated Inspection Systems**  
**Encoding and Positioning**  
**Edge Detection**

**High Speed High Resolution Scanning**  
**Bar Code reading**  
**Web Inspection**  
**Metrology**

## Area Array Camera Specifications

## Line Scan Camera Specifications

	<b>LW-WVGA-G-1394</b>	<b>LW-1.3-S-1394</b>	<b>LW-1.3-G-1394</b>	<b>LW-3-S-1394</b>	<b>LW-1.3-S-1394-Ethernet</b>	<b>LW-5-S-1394</b>	<b>LW-6.6-S-1394</b>		<b>LW-ELIS-1024a-1394</b>	<b>LW-SLIS-2048a-1394</b>	<b>LW-PE-2048-1394</b>
<b>Imaging Device:</b>	Wide-VGA 752 x 480 CMOS M9V022	1.3 Megapixel CMOS MT9M001	1.3 Megapixel CMOS IBIS-5a	3.1 Megapixel CMOS MT9T001	1.3 Megapixel CMOS MT9M001	5.1 Megapixel CMOS MT9P001	6.6 Megapixel CMOS IBIS4-6600	<b>Imaging Device:</b>	Linear CMOS	Linear CMOS	Linear Perkin Elmer CCD
<b>Sensing Area:</b>	4.55mm x 2.97mm (1/3"format)	6.7mm x 5.3mm (1/2"format)	8.6mm x 6.9mm (2/3"format)	6.6mm x 4.9mm (1/2"format)	6.7mm x 5.3mm (1/2"format)	5.7mm x 4.28mm (1/2.5"= 1/2" format)	10.5mm x 7.74mm (1"format)	<b>Sensing Area:</b>	8.0 mm x 125 microns (1/2"format)	14.3 mm x 7.0 microns (1"format)	28.7 mm x 14 microns (~35mm format)
<b>Pixel Size:</b>	6.0 micron square	5.2 micron square	6.7 micron square	3.2 micron square	5.2 micron square	2.2 micron square	3.5 micron square	<b>Pixel Size:</b>	7.8 micron x 125 micron Rectangular	7.0 micron x 7.0 micron square	14 micron x 14 micron square
<b>Pixels (H x V):</b>	752 x 480	1280 x 1024	1280 x 1024	2048 x 1536	1280 x 1024	2592 x 1944	3002 x 2210	<b>Pixels (H x V):</b>	1024 x 1	2048 x 1	2048 x 1
<b>Pixel Depth:</b>	10 / 30 bit (mono / color)	10 / 30 bit (mono / color)	10-bit (mono)	Up to 30-bit (color)	10 / 30 bit (mono / color)	Up to 36-bit (color)	Up to 30-bit (color)	<b>Pixel Depth:</b>	14-bit	12-bit	12-bit
<b>On-Board Image Buffer</b>	16MB for mono & 32MB for color	16MB for mono & 32MB for color	16MB for mono	32MB for color	16MB for mono & 32MB for color	32MB for all	32MB for all	<b>On-Board Image Buffer</b>	16 Megabytes	16 Megabytes	16 Megabytes
<b>Camera Control:</b>	Via Software	Via Software	Via Software	Via Software	Via Software	Via Software	Via Software	<b>Camera Control:</b>	Via Software	Via Software	Via Software
<b>Frame Rate:</b>	72 fps full resolution W-VGA	30fps (1280x1024), 90+fps VGA	27fps (1280x1024), 90+fps VGA	12fps (2048x1536), 90+fps VGA	30fps (1280x1024), 90+fps VGA	12fps (2592x1944), 30fps VGA	5fps (3002x2210), 90+fps VGA	<b>Line Scan Rate:</b>	10K lines per second	27K lines per second	18K lines per second
<b>Exposure Control:</b>	Fully programmable	Fully programmable	Fully programmable	Fully programmable	Fully programmable	Fully programmable	Fully programmable	<b>Pixel clock:</b>	10 MHz	60 MHz	40 MHz
<b>Shutter:</b>	Global	Synchronous Rolling	Global	Synchronous Rolling	Synchronous Rolling	Synchronous Rolling	Synchronous Rolling				
<b>Synchronization:</b>	External or via software	External or via software	External or via software	External or via software	External or via software	External or via software	External or via software	<b>Synchronization:</b>	External or via software	External or via software	External or via software
<b>Dynamic Range:</b>	> 60 db normal - 80 to 100db w/High DR	> 62 db	> 64 db and 100 db in High/DR	> 61 db	> 62 db	> 66 db	> 61 db	<b>S/N Ratio:</b>	> 80 db	> 63 db	> 63 db
<b>Video Output:</b>	FireWire™ IEEE-1394	FireWire™ IEEE-1394	FireWire™ IEEE-1394	FireWire™ IEEE-1394	10/100 Ethernet and NTSC	FireWire™ IEEE-1394	FireWire™ IEEE-1394	<b>Video Output:</b>	FireWire™ IEEE-1394	FireWire™ IEEE-1394	FireWire™ IEEE-1394
<b>Lens Mount:</b>	C or CS-Mount	C or CS-Mount	C or CS-Mount	C or CS-Mount	C or CS-Mount	C or CS-Mount	C or CS-Mount	<b>Lens Mount:</b>	C or CS-Mount	C or CS-Mount	F-Mount
<b>Mounting:</b>	Via ¼-20 mounting adapter	Via ¼-20 mounting adapter	Via ¼-20 mounting adapter	Via ¼-20 mounting adapter	Via ¼-20 mounting adapter	Via ¼-20 mounting adapter	Via ¼-20 mounting adapter	<b>Mounting:</b>	Via ¼-20 mounting adapter	Via ¼-20 mounting adapter	Via ¼-20 mounting adapter
<b>Power Requirement:</b>	Via FireWire™ 1394 Cable	Via FireWire™ 1394 Cable	Via FireWire™ 1394 Cable	Via FireWire™ 1394 Cable	Via external 12V power supply	Via FireWire™ 1394 Cable	Via FireWire™ 1394 Cable	<b>Power Requirement:</b>	Via FireWire™ 1394 Cable	Via FireWire™ 1394 Cable	Via FireWire™ 1394 Cable
<b>Vibration (9-2K Hz):</b>	7G	7G	7G	7G	7G	7G	7G	<b>Vibration (9-2K Hz):</b>	7G	7G	7G
<b>Shock:</b>	70G	70G	70G	70G	70G	70G	70G	<b>Shock:</b>	70G	70G	70G
<b>Dimensions (HxWxL):</b>	38mm x 51mm x 72mm	38mm x 51mm x 72mm	38mm x 51mm x 72mm	38mm x 51mm x 72mm	38mm x 51mm x 72mm	38mm x 51mm x 72mm	38mm x 51mm x 72mm	<b>Dimensions(HxWxL):</b>	38mm x 51mm x 72mm	38mm x 51mm x 72mm	60mm x 66mm x 117mm
<b>Weight:</b>	210g	210g	210g	210g	210g	210g	210g	<b>Weight:</b>	210g	210g	300g
<b>Operating Temp.:</b>	-10 <sup>o</sup> C to 65 <sup>o</sup> C	-0 <sup>o</sup> C to 60 <sup>o</sup> C	-0 <sup>o</sup> C to 60 <sup>o</sup> C	-0 <sup>o</sup> C to 60 <sup>o</sup> C	-0 <sup>o</sup> C to 60 <sup>o</sup> C	-10 <sup>o</sup> C to 65 <sup>o</sup> C	-0 <sup>o</sup> C to 50 <sup>o</sup> C	<b>Operating Temp.:</b>	-0 <sup>o</sup> C to 55 <sup>o</sup> C	-10 <sup>o</sup> C to 55 <sup>o</sup> C	-10 <sup>o</sup> C to 55 <sup>o</sup> C
<b>Monochrome:</b>	Yes	Yes	Yes	No, but can be operated in mono	Yes	No, but can be operated in mono	Yes				
<b>Color:</b>	Yes	Yes	No	Yes	Yes	Yes	Yes				
<b>Pricing:</b>	Call ISG or Edmund Optics	Call ISG or Edmund Optics	Call ISG or Edmund Optics	Call ISG or Edmund Optics	Call ISG or Edmund Optics	Call ISG or Edmund Optics	Call ISG or Edmund Optics	<b>Pricing:</b>	Call ISG or Edmund Optics	Call ISG or Edmund Optics	Call ISG or Edmund Optics
					<b>Coming Soon</b>						