COGNEX

PRODUCT GUIDE 2008

In-Sight 1720 Series wafer readers combine the highest read rates with ease-of-use and simple integration

1720 Series Wafer Readers

In-Sight Vision Systems

Wafer Tracking Throughout The Fab

As fab automation increases and wafers become more valuable, there is an increasingly vital need for consistently high read rates across all process steps. Centralized recipe management, reduced operator intervention, and automated profiling of reader performance are essential to maintaining high yields and minimizing defects.

Whether installed on new equipment or retrofitted onto existing process tools, In-Sight 1720 Series wafer readers offer everything needed to configure and control a network of readers from inside or outside the cleanroom. Cognex wafer ID readers make it easy to:

- Monitor readers from anywhere on the fab network
- Share and store recipes
- Upgrade firmware
- Save images and reading results for offline analysis

Breakthrough Code Reading

The most important aspect of wafer identification is read yield. Specialized lighting and advanced algorithms enable In-Sight 1720 Series wafer readers to achieve the highest read rates possible. This minimizes machine downtime, reduces operator errors, and makes fully automated wafer tracking possible.

Mixed lots, specialized films, and new production processes require a reader that can handle a range of unexpected conditions. The 1720 Series is powerful enough to handle new challenges as well as traditional requirements such as edge bead, CMP and scribing over the die pattern.

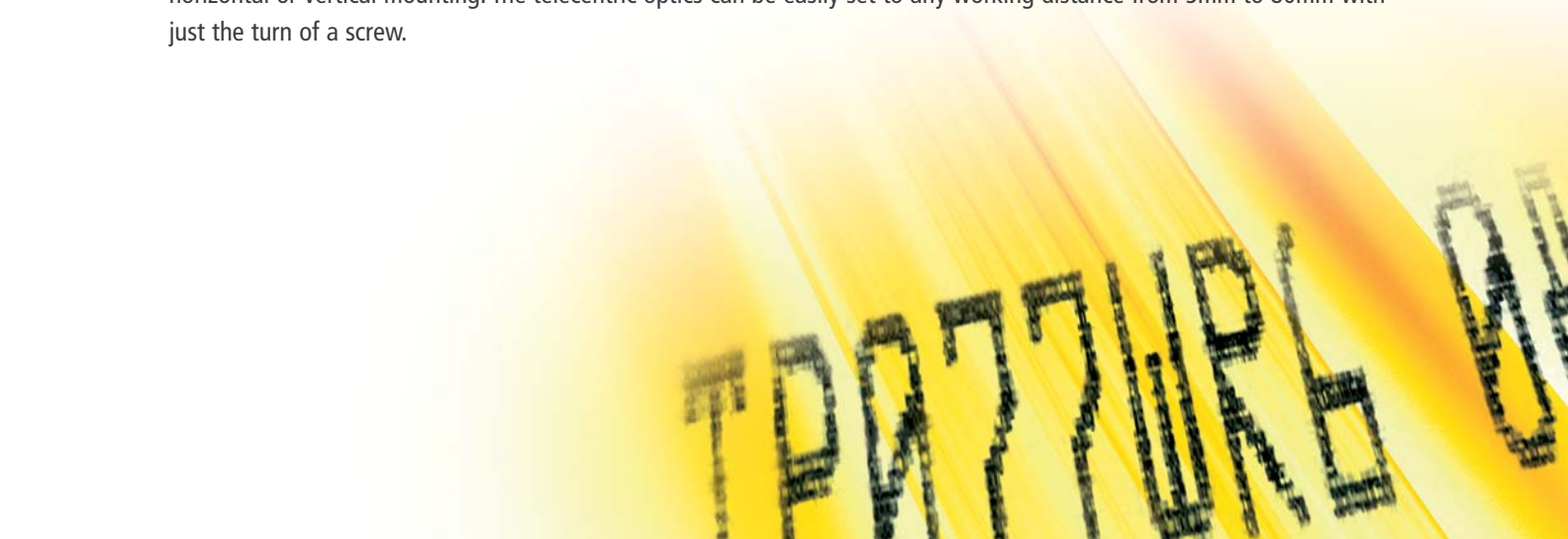
1720 Series optics are designed for 300mm code standards. The high resolution of these wafer readers provide the detail needed for T7 Data Matrix codes, while a large field of view facilitates reading wafer marks such as the SEMI M12 OCR mark shown above.

In-Sight 1720 Series wafer readers provide exactly what's needed for successful applications:

OCR, 2D and barcode algorithms specifically designed for wafer applications. The power and reliability of these algorithms could only come from Cognex, the company that has been the world's leading machine vision company for over 25 years. Included are powerful decoding of degraded scribes, custom compression formats, automatic fielding, and fab-specific codes.

Advanced optics and illumination with software-controlled bright and dark field lighting, infrared lighting for ultra-thin wafer coatings, and megapixel CCD sensors for high-resolution T7 Data Matrix codes on hard-to-image wafers. Proprietary tuning algorithms automatically select the best lighting, reducing the need for operator training.

Compact package with adjustable working distance. The 1720 Series readers share the same slim design for easy horizontal or vertical mounting. The telecentric optics can be easily set to any working distance from 5mm to 80mm with just the turn of a screw.

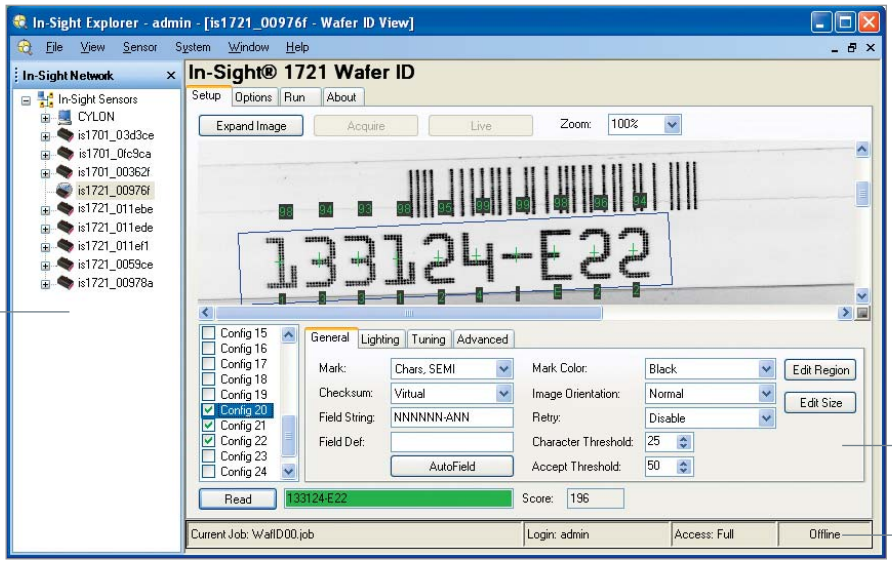


Simple, Yet Powerful

The 1720 Series offers the highest-performing wafer readers ever available to the semiconductor industry. With installed Cognex wafer readers totaling over 25,000, the 1720 Series delivers everything you need for simple and reliable wafer identification — without advanced operator training.

Automated parameter setup minimizes trial and error on even the most challenging scribes.

Navigation pane connects to readers throughout the fab



Intuitive setup

Reader status

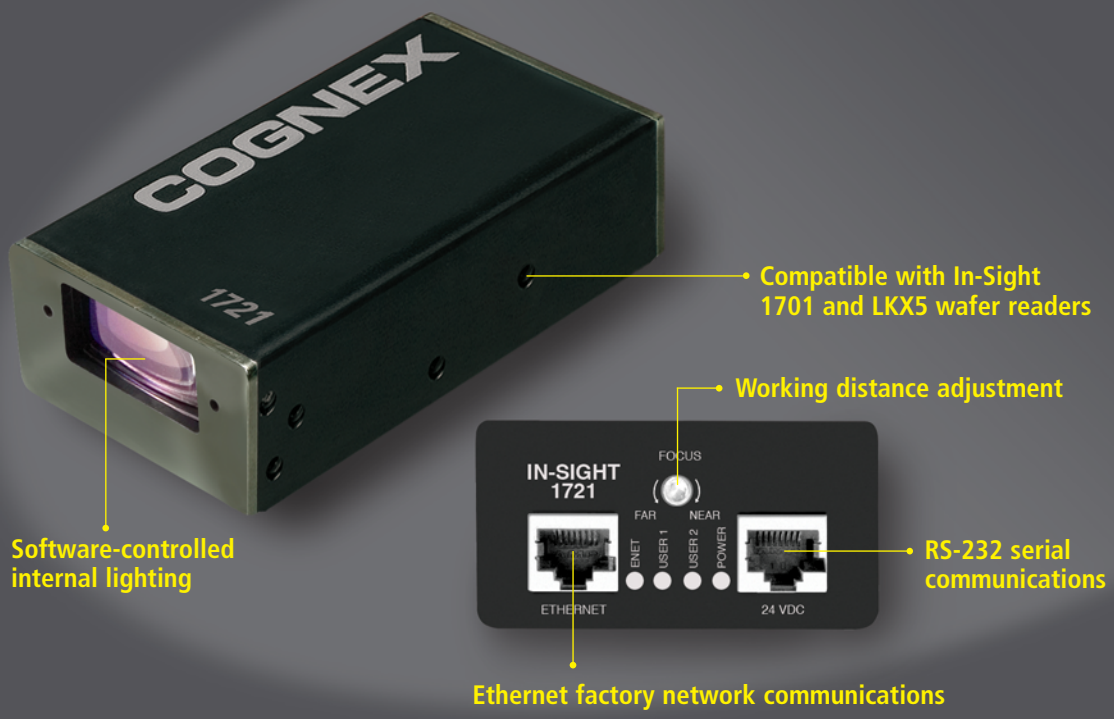
Specialized lighting dramatically improves reading performance, for even the most challenging scribes.

Process effects

Scribe over die

High-Performance Wafer Readers

In-Sight 1720 Series wafer ID readers provide semiconductor fabs and equipment with automated wafer identification, for 100 percent wafer traceability. Twenty-five years of Cognex wafer ID experience culminates in the In-Sight 1720 Series, enabling it to offer unprecedented lighting and imaging solutions in a common hardware and software package.



- In-Sight 1720 … powerful OCR and barcode reading in a standalone package, perfect for both new equipment and retrofits
- In-Sight 1721 … megapixel CCD and high-speed processor, specifically designed for 300mm wafers and T7 Data Matrix codes
- In-Sight 1722 … patent-pending infrared lighting for the newest ultra-thin oxide, nitride and polyimide wafer coatings

Specifications

READING CAPABILITY

Supported wafer marks		SEMI standards
OCR	SEMI font	M12, M13, M1.15
	IBM font	N/A
	Triple font	N/A
	OCR-A font	N/A
2D	Data Matrix (ECC 200, 8 x 32)	T7 and M1.15
Bar Code	BC 412	T1-95
	IBM 412	N/A

MEMORY

Job/program	32MB non-volatile flash memory; Unlimited storage via remote network device
Image/processing	32MB SDRAM

IMAGE

Sensor	**1720**	**1721/1722**
	1/3" CMOS (4.51x2.88mm), 5.35mm diagonal	1/3-inch CCD (5.80 x 4.92mm, 6mm diagonal)
	0.1 - 127.0 ms exposure time	
Acquisition	Rapid reset, progressive scan (supports partial scan), full-frame integration	
	256 grey levels (8 bits/sec)	
	Gain control by software	

LIGHTING/OPTICS

Illumination	**1720**	**1721**	**1722**
Area	29mm (W) x 19mm (H)	31mm (W) x 19mm (H)	31mm (W) x 19mm (H)
Light frequency	Red LEDs, 633nm wavelength	Red LEDs, 626nm wavelength	Infrared LEDs, 880nm wavelength
Depth of focus	+/- 3mm		
Illumination style	Bright Field and Dark Field		
Light intensity	Variable intensity controlled through software		

I/O

Trigger	One opto-isolated acquisition trigger input
	Remote software commands via Ethernet and RS-232
Discrete inputs	None built-in
	Eight inputs available using optional I/O expansion module
	Unlimited inputs using optional Ethernet I/O Module
Discrete outputs	None built-in
	Eight outputs using optional I/O expansion module
	Unlimited outputs using optional Ethernet I/O Module
Voltage	ON 20 to 28V (24V nominal)
	OFF 0 to 3V (12V nominal threshold)
Current	ON 2.0 to 2.9mA
	OFF <150mA
	Resistance ~10,000 Ohms
	For higher current add external resistor (for example, 2.2k , 0.5W for 12mA) across inputs
Delay	6ms latency between leading edge of trigger and start of acquisition. Input pulse should be minimum of 1 ms wide.
Status LEDs	Network, Power, User 1, User 2

COMMUNICATIONS

Network	1 Ethernet port, 10/100 BaseT, TCP/IP protocol. Supports DHCP (factory default) or static IP address.
Serial	1 RS-232C port (1200 to 115,200 baud rates)
Protocols	In-Sight, Native Mode and Electroglas, and LKx5

POWER

	24 ±10% VDC; 140mA (illumination off) to 200mA (illumination on)

MECHANICAL

Orientation	Vertical mount with optional horizontal mirror mount. M4 threaded holes, 4 each side
Working distance	
Vertical:	Up to 80mm working distance (adjustable)
Horizontal:	Up to 56mm working distance (adjustable)
Material	Black anodized aluminum extrusion, with nickel-plated black end caps
Weight	
1720	381.0g (13.4381 oz)
1721/1722	379.9g (13.4 oz)
Dimensions	38mm (1.5in)H x 72mm (2.8in)W x 124mm (4.9in)D

ENVIRONMENTAL

Operating temperature	0ºC to 45ºC (32ºF to 113ºF)
Operating humidity	10 to 90% (non-condensing)
Storage temperature	-10ºC to 65ºC (14ºF to149ºF)
Storage humidity	10 to 90% (non-condensing)
Protection	IP-65
Vibration	EN61373, including IEC 60068-2-6,60068-2-64 6.4, and 60068-2-27

CERTIFICATIONS

Regulatory compliance	CE, UL, CUL, RoHS, FCC, IEC 60825-1/A2:2001, EN 60825-1/A1:2002, CAN/CSA-E60825-1:2003 Class 1 LED Product
SEMI safety	This equipment conforms with the applicable requirements of SEMI S2-0703a

COGNEX

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