

Smart Factory Case Study

Video Recording Solution

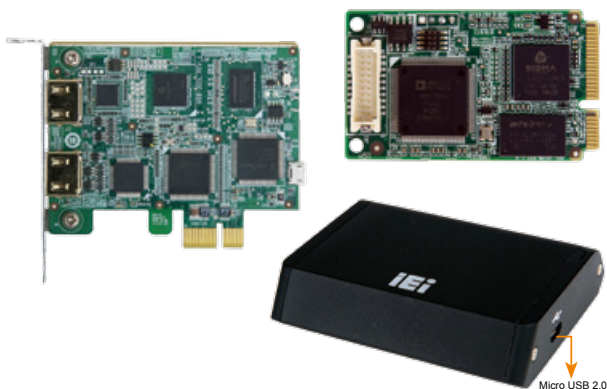
In Industry 4.0, apart from capturing data with barcode readers and RFID, real-time video monitoring and recordings are important data collection methods.

As full high definition (FHD, 1080p) video data is extremely huge, IEI equips the video capture solution with high-performance chips to ensure original system performance is unaffected while continuously recording. In addition, a wide variety of interfaces are provided for connection with current computer systems in the factory.

The video recording solution provides:

- One-port FHD PCIe Mini video capture card (HDC-301MS) for use with IEI embedded systems (models with PCIe Mini interface).
- One-port FHD USB 2.0 video capture box (HDB-301L) for use with IEI PPCs, embedded systems (models without PCIe or PCIe Mini interface), and notebook PCs.
- One-port FHD PCIe capture card (HDC-301EL), four-port FHD PCIe capture card (HDC-304E) for use with all kinds of controllers and servers (with PCIe interface).

The IEI video capture solution enables users to convert huge video data into smaller videos without reducing video quality to effectively reduce transfer bandwidth and storage space.



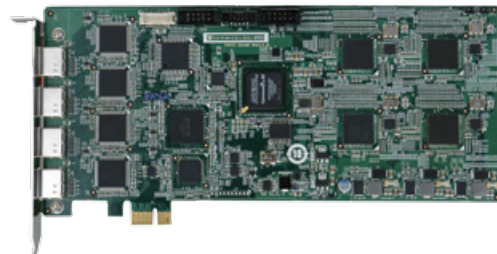
HDC-301MS/ HDB-301L/ HDC-301EL

- Compatible with Microsoft Windows® 7 for 32-bit & 64-bit
- Equipped with one HDMI input port
- Encode up to 1080p30 HD video
- Pass through for transmitting uncompressed video up to 1080p resolution
- SDK available for customer to create customized applications
- Record and stream video over networks or the Internet: VideoLAN VLC,
- AMCap and other DirectShow compatible software



Real-time video monitoring and recording enable effective remote machine troubleshooting. The multiparty access and replay functions allow different parties to shoot machine troubles at the same time to reduce losses from production line shutdown. Complete recording to the production process enables real-time problem diagnosis and provides a reference for subsequent production review.

At the cloud smart analysis management system, video data is processed, analyzed, and identified for the reference of anomaly alert and improvement. IEI's video capture solution is the only smart video solution enabling you to enter Industry 4.0.



HDC-304E

- Compatible with Windows® 8, Windows 7 and Linux
- Equipped with four HDMI input ports
- Encoding or decoding up to 1080p60 HD video
- Pass through for transmitting uncompressed video up to 1080p resolution
- Enables the system to support up to 8-channel input by adding multiple video capture cards
- SDK available for customer to create customized applications
- PCI Express interface provides higher bandwidth and great performance

Smart Factory Case Study

Machine Vision Solutions

Smart technology plays an important role in Industry 4.0 development. To go smart, it is necessary to equip different kinds of sensors in the entire control system to detect environmental parameters for making smart adjustments. Visual detection is among the most important sensors in automation. It helps to solve many automation problems due to significant environmental changes. It also reduces gauge utilization and enhance system flexibility to meet future scalability demand. To fulfill the demand for visual detection, IEI provides complete machine

vision solutions, including components and custom system integration for one-stop service. Machine vision components include industrial cameras, smart cameras, different kinds of lens, auxiliary light sources, image analysis software, and industrial grade controllers. Custom system integration service includes recommendation of appropriate components for customers, design and production of relevant gauges, and integration with peripheral automation systems.

HSC Industrial Camera

IEI industrial cameras are equipped with USB 3.0 SuperSpeed transfer interface for providing power to the camera which is better than other cameras that use other interfaces. IEI industrial cameras can stably transfer data to the back office while in continuous shooting, enabling it to become a reliable and high compatibility platform. With the IEI Vision SDK, users can easily configure cameras and run precision tests. Besides the raw image data, the algorithm independently developed by IEI enables users to implement additional processing of images from the camera to reduce the image processing workload at the back-office platform.

- Easy camera configuration with IEI Vision SDK
- Compact appearance with global shutter
- USB 3.0 SuperSpeed interface
- External topical insulation GPIO interface



- Max. resolutions: 752x480
- Max. frame rate: 90 fps
- Support AMCap and other DirectShow-compatible software

MSC Smart Camera

Motorcon's MSC Smart Camera Solutions integrate the latest image sensors and digital signal processors to provide 6-megapixel streaming at 30 fps or 1080p at 120 fps, and support up to 8-megapixel (4K Ultra HD) resolution. The additional embedded ARM CPU supports image analysis from the camera without connecting to a computer. Also, the flexible and independent modular design and the open API enable customers to integrate systems and develop extended functions more easily. Whether it is the PC, notebook, tablet, or smartphone, users can easily configure the camera over a browser (e.g. IE, Chrome, Firefox, and Safari) to comply with Industry 4.0. The built-in image analysis function effectively enhances image capture, processing, and output



speed to save online test setup. Therefore, the MSC provides simplified operation and various image processing algorithms to help equipment manufacturers to reduce development time and cost.

Advanced Functions

- Support full HD/6-megapixel resolutions
- Support 1080p@120fps/3072 x 2048@30fps max.
- Support H.264 SVC/High/Main/Baseline Profile & MJPEG
- Water-resistant industrial grade connectors
- PoE or DC12V power supply

Image Analysis Function

- Single point positioning
- Multiple cameras positioning
- 1D/2D barcode reading
- Text/object identification and verification
- Image edge test

HSC Industrial Camera	
Model No.	HSC-03M2-O
Max. resolution	752 x 480
Highest detection speed	90 fps
Pixel	0.3 mega
Saturation	B/W
Detector spec.	Aptina MT9V022
Detector type	CMOS
Detector format	1/3
Picture size	6.0 μm
Lens mount type	CS-mount
Bit depth	10 bit
Optical isolation	I/O connectors: one input and one output
Serial port	1 (RS-232)
Aux out	3.3 V, max. 100 mA
Interface	USB 3.0 (Micro B)
System Requirements	
CPU	Intel® Core™ i5 or higher
Memory	2 GB or above
OS	Microsoft Windows 7 32-bit & 64-bit
	Microsoft Windows 8.1 32-bit & 64-bit
Others	
Dimensions	58.9 mm x 29 mm x 29 mm
Weight	79 g
Ambient temperature	0°C ~ 45°C
Storage temperature	-30°C ~ 60°C
Operating humidity	20% ~ 80%
Ambient humidity	20% ~ 95%
Power supply	5 V, via external adapter of USB 3.0
Maximum power consumption	<3.5 W
Safety standards	CE, FCC

MSC Smart Camera		
Model No.:	MSC-200M	MSC-600M
Effective pixels	1920(H) x 1080(V), 2M	3072(H) x 2048(V), 6M
WB	Manual/Auto/Auto Trace	
Shutter speed	1 ~ 1 / 10000 seconds	
Network		
Interface	RJ-45, 10 / 100 / 1000 Mbps Ethernet	
Image compression	MJPEG / H.264 Baseline / Main Profile / High Profile	
Video streaming	Quadruple streaming	
Frame rate	Up to 1080P @ 120 fps	Up to 3072 x 2048 @ 30 fps
Protocol	IPv4/v6, TCP/IP, UDP, RTP, RTSP, HTTP, HTTPS, ICMP, FTP, SMTP, DHCP, PPPoE, UPnP, IGMP, SNMP, QoS, ONVIF	
Safety protection	HTTPS / IP Filter / IEEE 802.1x	
Alarm input/output	5V 10kΩ Pull Up / SSR MOSFET Output 300V DC/AC	
Alarm notification	HTTP / FTP / SMTP	
Web Browser	IE 10, Chrome, Firefox (max. 5 users, one setup, four browsing)	
Mechanism		
Lens mount	C Mount	
Ports	Network	RJ-45, 10/100/1000 Mbps Ethernet
	Input/Output Terminal Connectors**	Digital Input x (1+6) / Digital Output x (1+5) / RS-232 x (1+1) / RS-485 x 1 / *BNC Output
Others		
Operating temperature	-10 ~ 50°C	
Humidity	10% ~ 90%, no condensation	
Product Specifications	90 x 50 x 48 mm	
Weight	210 g	
Power Supply	PoE & DC 12V	
Input/Output Terminal		
Power Supply	Power Adapter (12V, 1A)	
Input/Output Interface**	Digital Input x (1+6) / Digital Output x (1+5) / RS-232 x (1+1) / RS-485 x 1 / *BNC Output	
Light Source		
Coaxial Light Source	54 x 45 x 38 mm, diameter: 22.5 mm	
Surface Light Source	110 x 63 x 21 mm, range: 83 x 61 mm 123 x 110 x 21 mm, range: 83 x 121 mm	
Ring-shaped Light Source	109 x 80 x 90 mm, Φ 87 / Φ 55	