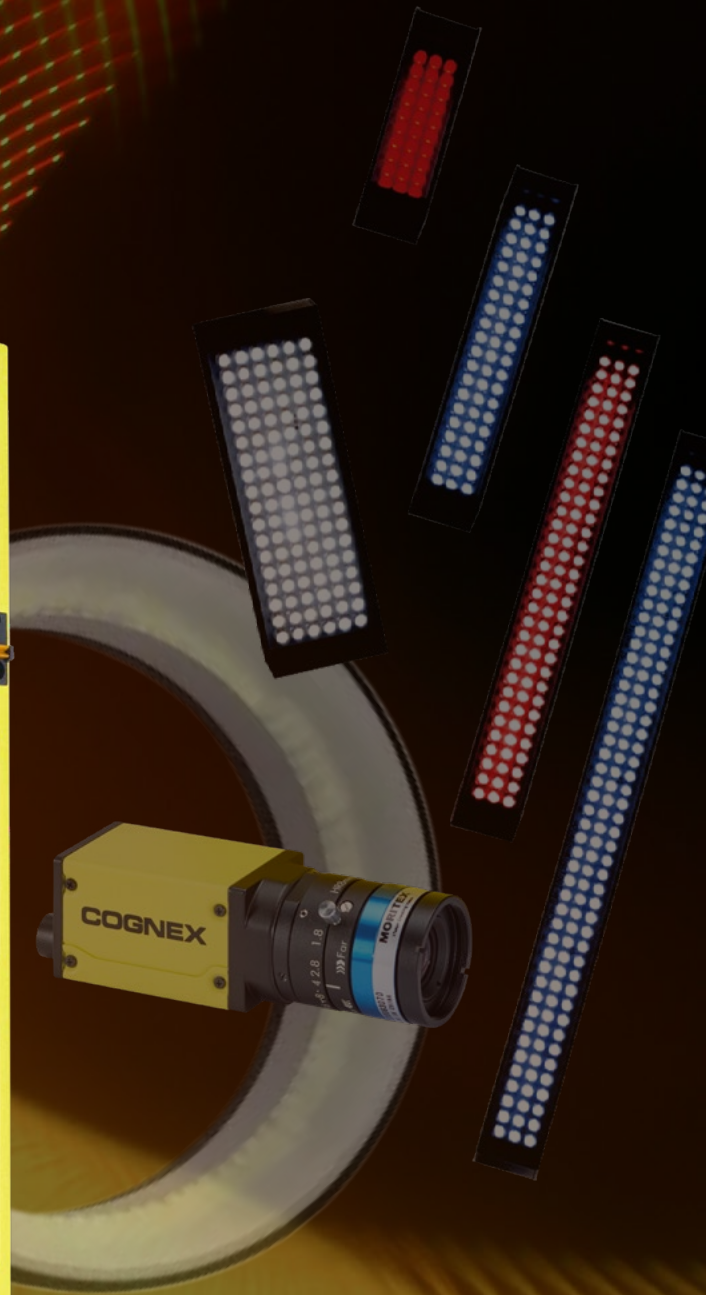


Modular AI vision controller for the most demanding applications

In-Sight 6900 Vision Controller



Customize setups, run Advanced AI models, and handle complex workloads

In-Sight® 6900 Vision Controller



Flexible hardware for complete customization

- Extensive resolution, sensor, and mounting options maximize flexibility across diverse environments and applications
- Expanded on-device memory and storage support high-complexity workloads
- Fully configurable architecture adapts to application-specific requirements

High-capacity processing, built for advanced AI

- Software-embedded vision controller with integrated GPU acceleration
- NVIDIA-based architecture optimized for high-throughput, low-latency AI inference
- Supports next-generation AI models, including transformer-based architectures

Consistent user experience, fully integrated portfolio

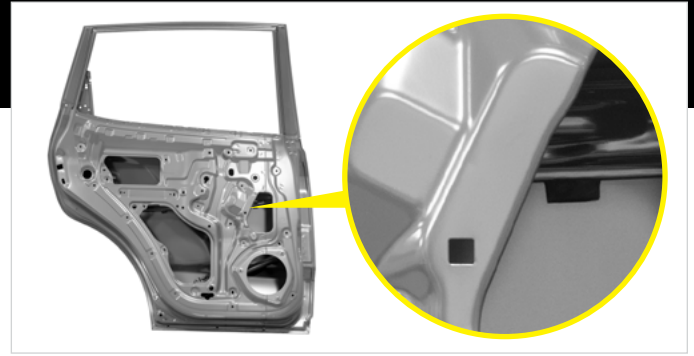
- Unified software streamlines integration across production lines and facilities
- Point-and-click setup and advanced programming offer flexible deployment options
- Industry's largest set of vision tools enables application-specific configuration

Key Features



Advanced AI Image Processing

Optimized for deployment of Advanced AI vision tools, delivering inspection capabilities beyond conventional controllers.



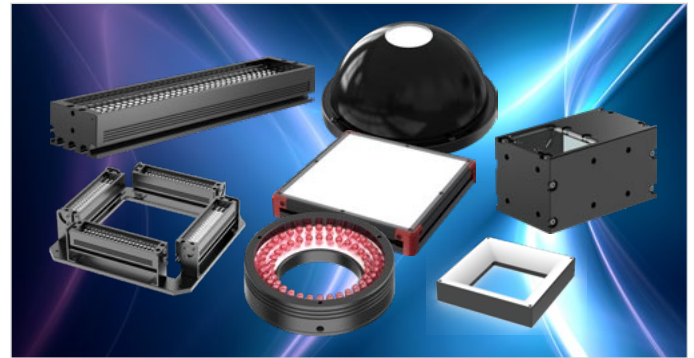
Up to 65 MP Resolution

Supports ultra-high-resolution sensors and expanded field-of-view (FOV) coverage to capture subtle details and defects across both small and large parts.



256 GB Onboard Storage

High-capacity memory handles larger image sets and more complex AI models than competitive systems, enabling robust dataset retention and advanced AI model refinement.



Smart Lighting

Plug-and-play design enables quick setup, easy connection, and immediate access to advanced lighting control, delivering reliable performance without complexity.



Native Factory-Ready Integration

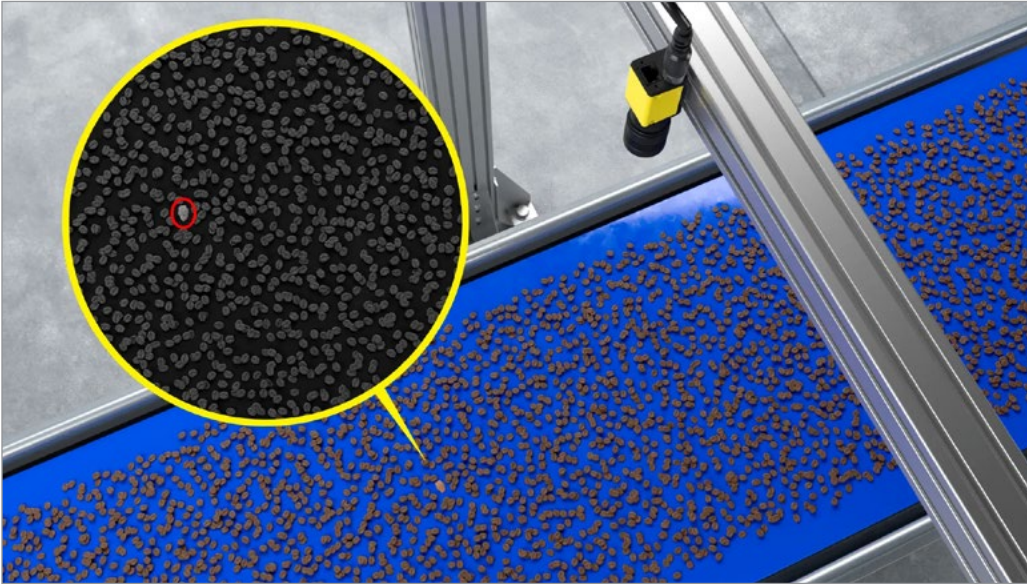
Supports leading industrial protocols for real-time synchronization with PLCs and motion controllers, simplifying integration into existing factory infrastructures.



High-Bandwidth Ethernet Ports

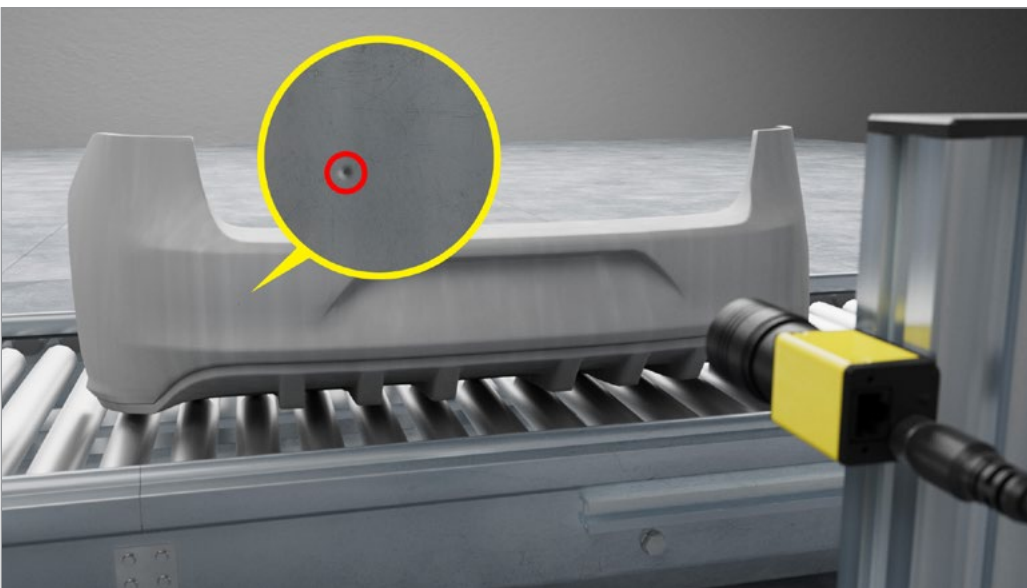
Multiple dedicated Ethernet ports provide real-time data transfer and image offloading, enabling high-resolution inspections and full-speed, high-throughput production.

Application Examples



Foreign Object Detection

Detect foreign objects among densely packed parts, products, and components, even with variable shapes, orientations, and positions on the production line.



Large-Area Defect Detection

Identify subtle surface defects across large parts and wide fields of view with extreme accuracy and consistency.

Adaptive Hardware for Any Industrial Challenge

A modular hardware architecture supports diverse industrial inspections, allowing systems to be precisely configured for application-specific requirements while scaling easily to meet evolving and future needs.

Cognex Accessories Ecosystem

Seamless compatibility across all In-Sight vision systems provides a consistent, intuitive user experience.

Industrial Cameras

- Broad portfolio of Cognex Industrial Cameras (CICs) in multiple resolutions and sensor formats
- Supports everything from standard inspections to advanced, high-detail applications

For a complete list of available cameras, [download the CIC Catalog](#)



Precision-Matched Optics

- Complete selection of C-mount lenses – standard, large-format, and telecentric
- Ensures resolution and field of view are optimized for each inspection



Specialized Lighting

- High-intensity industrial lighting for reflective, transparent, glossy, and low-contrast surfaces
- Maximizes contrast and feature detection in challenging environments

Smart Lighting

- Plug-and-play design for fast setup and easy integration
- Immediate access to advanced control options



Targeted AI for Advanced Inspections

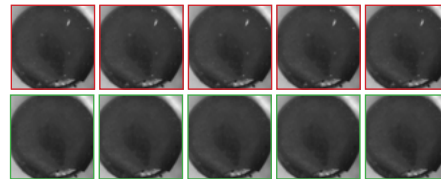
The In-Sight Vision Controller leverages Advanced AI tool modes to handle the most challenging vision tasks, even in environments with extreme variability. These modes eliminate the need for precise part positioning and lighting consistency, delivering reliable detection where traditional methods fail.

Few-Sample Classification

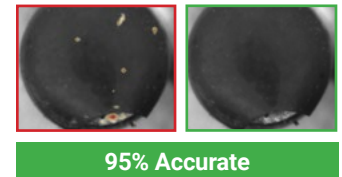
Transformer-based classification model enables accurate identification of part variants and defect classes using as few as 10-20 training images. A heatmap highlights important regions in the image, building confidence in the classification result.

Few-Sample Classification

Training dataset

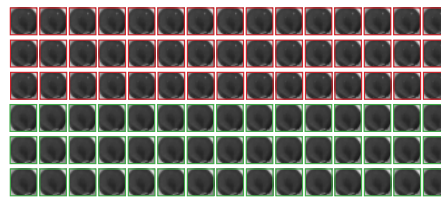


Results

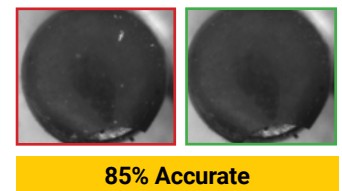


Legacy Classification

Training dataset

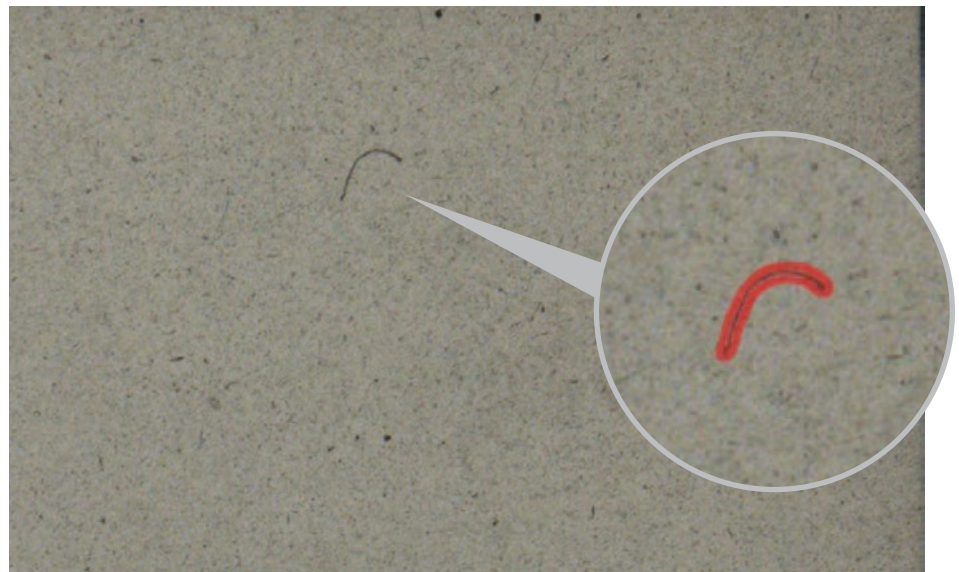


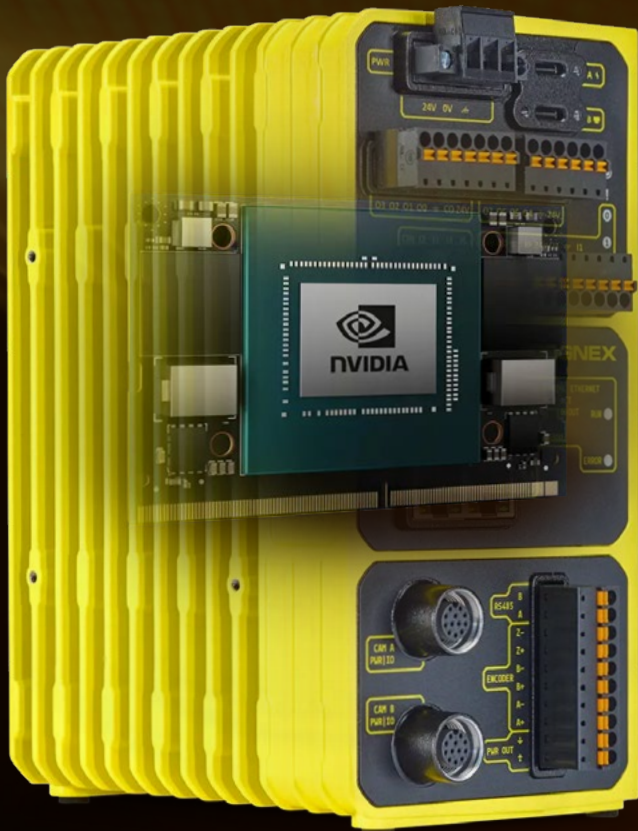
Results



Robust Segmentation

Pixel-level segmentation precisely isolates inspection regions from complex, noisy, or low-contrast backgrounds, ensuring only relevant features are analyzed.



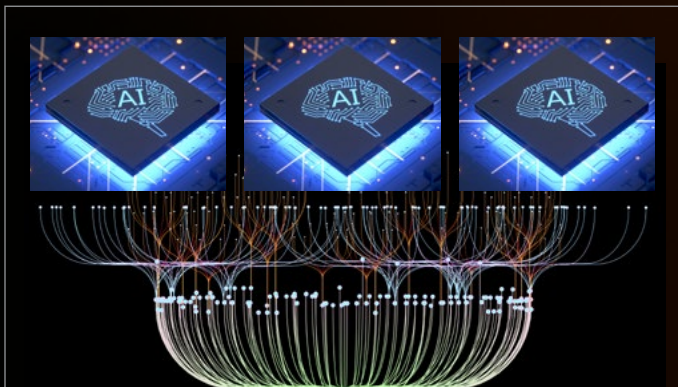


Powered by NVIDIA Jetson™

Next-Generation AI for Industrial Automation

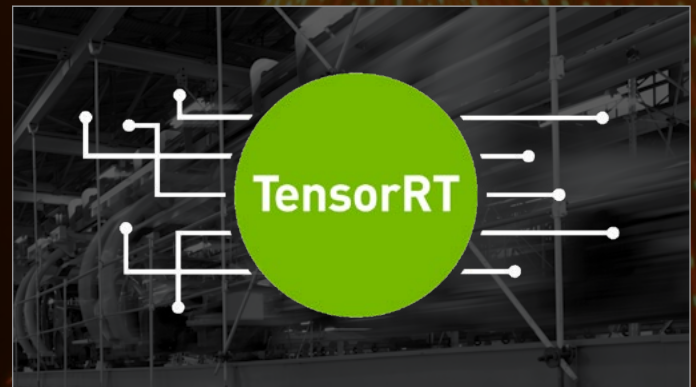
Delivering Advanced Edge Processing and AI Capabilities

By integrating the NVIDIA Jetson module, the In-Sight Vision Controller transforms from a standard image processor into a high-performance AI engine, executing complex neural networks directly at the edge with unprecedented speed and precision.



Embedded GPU Performance

Integrated GPU processing enables advanced AI model execution, supporting complex inspections without increasing cycle times.

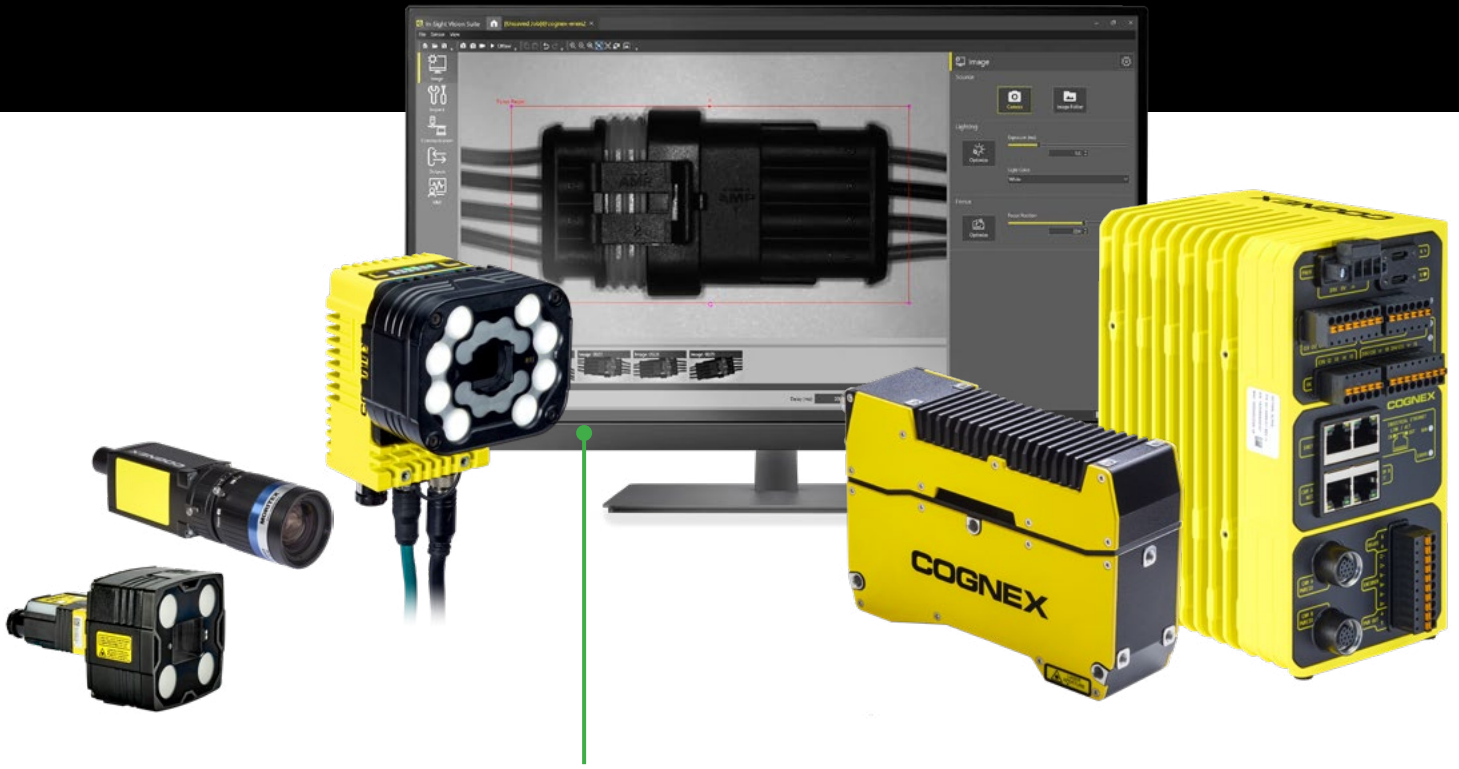


Real-Time Inference

Optimized TensorRT™ integration ensures that AI decision-making is synchronized with the microsecond timing of high-speed production lines, providing low-latency results.

Powerful, Scalable Vision Designed to Work Across Every Device and Application

The In-Sight portfolio provides a consistent user experience by integrating hardware and software into a single, future-proof platform. From setup to deployment, it offers unified software, flexible development and programming options, and a comprehensive suite of AI and rule-based tools, delivering scalable automation that grows with business needs.



Unified Software Architecture

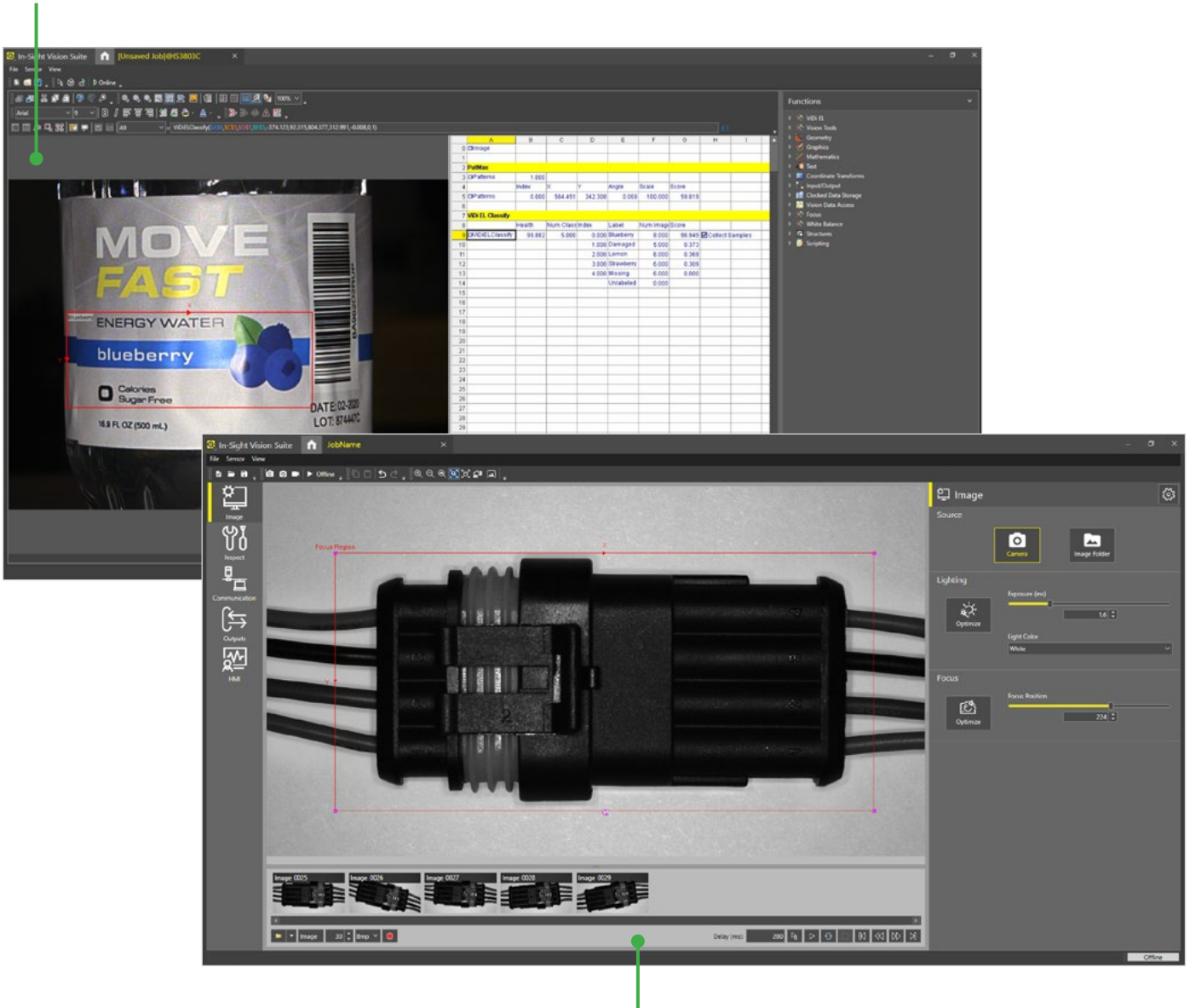
Standardized In-Sight Vision Suite

The In-Sight Vision Suite provides a universal software foundation across the entire In-Sight product line. A standardized development environment that simplifies deployment and enables manufacturers to scale quickly from basic inspections to complex, high-performance applications.

Spreadsheet Environment

Full Logic Customization and Control

A flexible, cell-based architecture for advanced developers who require precise control over inspection parameters. Fine-tune tools and communication triggers to support specialized factory integration.



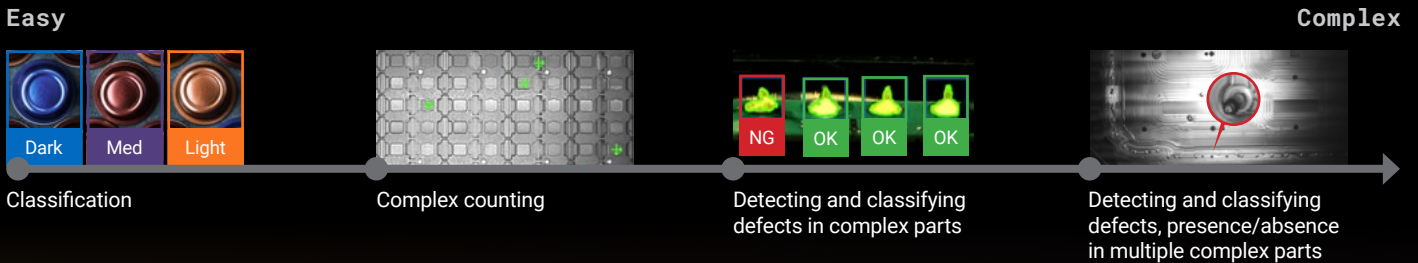
EasyBuilder® Environment

Intuitive, Step-by-Step Configuration

A streamlined, point-and-click interface enables rapid setup and high-speed deployment without the need for programming expertise.

More Application Coverage with Advanced AI

OneVision extends the capabilities of the In-Sight Vision Controller with access to Advanced AI tools, enabling it to solve a wider range of inspection applications than competitive solutions.



OneVision: Collaborative AI Vision, at Scale

OneVision brings model development, cross-site collaboration, and multi-device deployment together in a single development environment, allowing manufacturers to train centrally, adapt locally, and run high-performance AI inspections on any Cognex device.

Advanced AI, intuitive UI

Build powerful AI applications, without complexity

Collaborate effectively, get better results

Transform AI development from a siloed activity into a cross-team process

Scale fast, deploy anywhere

Ensure consistent performance across devices, lines, and sites



Cloud-to-Edge Architecture

Integrated AI Vision Development and Deployment

In-Sight Vision Suite, OneVision, and Cognex cameras form an integrated cloud-to-edge architecture that enables seamless development, deployment, and continuous improvement of AI-powered applications.

Advanced AI Training and Model Management

OneVision

- Train, validate, and optimize Advanced AI models in a secure environment
- Manage projects centrally, across different lines or sites



Application Development and Deployment

In-Sight Vision Suite

- Configure tools and applications
- Access OneVision for Advanced AI training



Image Acquisition and Edge Execution

Cognex cameras

- Capture images for application development
- Execute AI models and run inspections at production speed

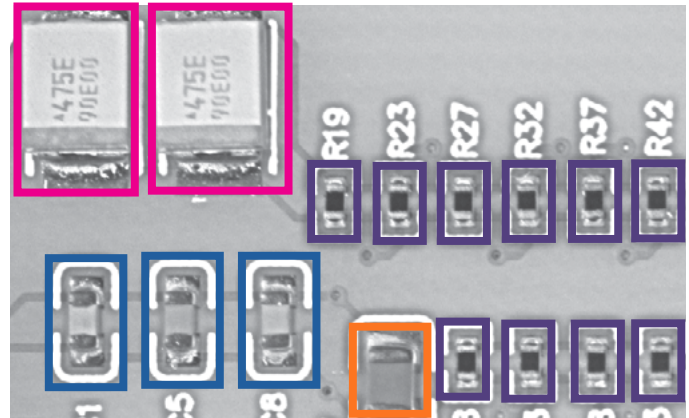


Comprehensive Vision Tool Library

The In-Sight Vision Controller offers the industry's largest set of AI and rule-based vision tools to meet a wide range of inspection needs. Tools can be used individually or chained together to handle all inspection types, while delivering consistent, repeatable results across production lines.

Edge AI Tools

Designed for fast, simple deployment, Edge AI tools use pre-trained models and minimal training images to perform standard inspections such as defect detection, classification, assembly verification, and OCR.

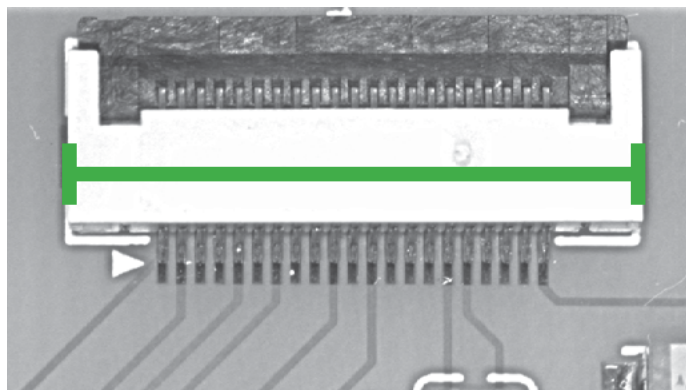


Advanced AI Tools*

Designed for customization and control, Advanced AI tools use configurable models and larger datasets to address complex inspections with high variability, subtle defects, and highly customized requirements.

Rule-Based Tools

A complete library of industry-proven, rule-based vision tools for precise, deterministic applications, including measurement, blob analysis, pixel count and pattern matching, 1D/2D code reading, robotic guidance, and math and logic.

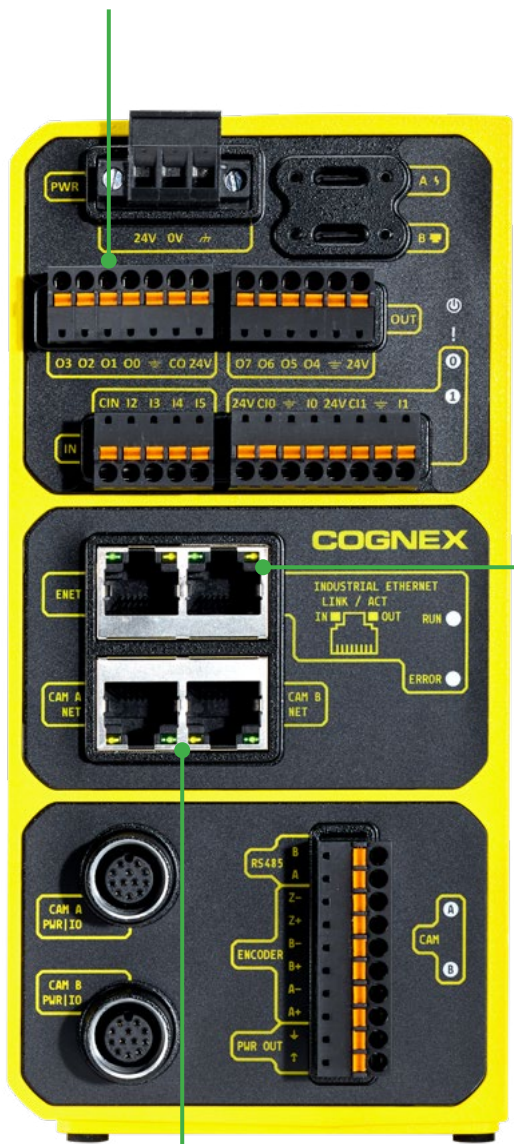


*Available on OneVision-enabled models

In-Sight Vision Controller Features

Flexible I/O: 4 inputs, 8 outputs, and 2 USB-C ports for expandable storage

256 GB SSD stores up to 50,000 5 MP images on device



Embedded NVIDIA GPU powers high-performance AI workloads

Wide range of high-resolution and high-speed acquisition options, up to 65MP color/mono at 5Gbps

Support for major industrial protocols, including PROFINET, EtherNet/IP, EtherCAT, and MQTT

In-Sight 6900 Vision Controller Specifications









For full technical specifications, refer to the In-Sight 6900 Reference Manual available on support.cognex.com.

Vision System	
Job Processing Memory	16 GB
Trigger	2 opto-isolated, acquisition trigger inputs
Discrete Inputs	4 general purpose inputs
Discrete Outputs	4 high-speed and 4 low-speed general purpose outputs
Status LEDs	Pass/Fail LED and Indicator Ring, Network LED and Error LED, EtherCAT Status LEDs
Job & Image Storage Memory	256GB non-volatile flash memory; unlimited storage via remote network device.
Image Processing Memory	Dynamic Allocation shared with Job Processing Memory
Network Communication	2x 5Gb Ethernet ports 1x 1Gb Port for Data Communication & Configuration 1x 1Gb Port for Industrial Ethernet IEEE 802.3 TCP/IP Protocol
Communication Protocols	Industrial Ethernet (PROFINET, EtherNet/IP, EtherCAT, SLMP, ModbusTCP) & Data Communication (MQTT, TCP/IP, (S)FTP, RS-232C)
Power Consumption	24 V DC \pm 10%, 6.0 A maximum.
Power Output	24 V DC at 1.6 A maximum to external light. 5 V DC at 1.5 A maximum to external light.
Material	Die-cast aluminum and zinc housing.
Finish	Painted.
Mounting	Four M3 threaded mounting holes. See Accessories for supported mounts. Pattern: 38.5 x 58.5 mm (1.52 x 2.60 in)
Weight	In-Sight Vision Controller with no accessories attached: 570 g (20.10 oz).
Ambient/Environment Temperature	0° C to 30° C (32° F to 86° F) 30° C to 40° C (86° F to 104° F) if airflow along cooling fins exceeds 0.5 m/s
Storage Temperature	-20° C to 80° C (-4° F to 176° F)
Humidity	<95% non-condensing
Protection	IP40, altitude: 2000 m, indoor use only, pollution degree II
Shock (Packaging)	IEC 60068-2-27: 30g over 18ms, half-sine, 3 shocks in each axis in each direction (18 shocks total).
	ISTA-1A Standardized Testing: 150 lbs or less
Vibration (Shipping and Storage)	EC 60068-2-6: vibration test in each of the three main axis for 10 cycles from 10Hz to 500Hz with 100m/s ² acceleration or 0.75mm amplitude. FedEx Vibration Testing: Packaged products 150 lbs or less
Regulations/Conformity	CE, FCC, KCC, TÜV SÜD NRTL, EU RoHS, China RoHS

Cognex Industrial Camera Specifications

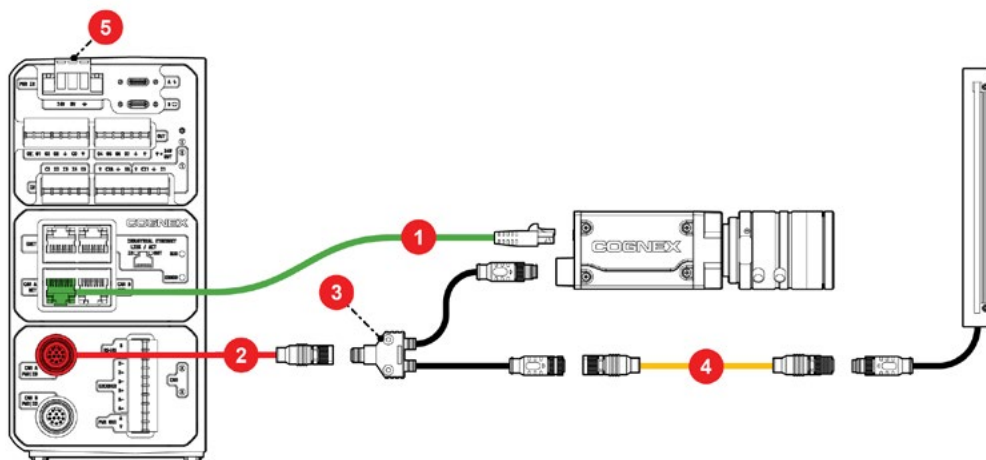
Product ID	Resolution	Mono / Color	Shutter Mode	Exposure Time	Lens Mount	Sensor Size	Pixel Size (µm)	Sensor Diagonal (mm)	Pixel Bit Depth	Power Requirements
Area Scan										
CIC-A023-MG-168-5G	2.3MP (1920 x 1200)	Mono	Global	21 - 10,000,000 µs	C	1/2.3"	3.45 x 3.45	7.9	8 bits	24 VDC
CIC-A023-CG-168-5G	2.3MP (1920 x 1200)	Color	Global	21 - 10,000,000 µs	C	1/2.3"	3.45 x 3.45	7.9	24 bits	24 VDC
CIC-A05-MG-105-5G	5 MP (2448 x 2048)	Mono	Global	10 - 10,000,000 µs	C	1/1.8"	2.74 x 2.74	8.8	8 bits	24 VDC
CIC-A05-CG-105-5G	5 MP (2448 x 2048)	Color	Global	10 - 10,000,000 µs	C	1/1.8"	2.74 x 2.74	8.8	24 bits	24 VDC
CIC-A12-MG-44-5G	12.3MP (4096 x 3000)	Mono	Global	13 - 10,000,000 µs	C	1/1.1"	2.74 x 2.74	14	8 bits	24 VDC
CIC-A12-CG-44-5G	12.3MP (4096 x 3000)	Color	Global	13 - 10,000,000 µs	C	1/1.1"	2.74 x 2.74	14	24 bits	24 VDC
CIC-A20-MG-27-5G	20.2MP (4504 x 4504)	Mono	Global	16 - 10,000,000 µs	C	1.1"	2.74 x 2.74	17.5	8 bits	24 VDC
CIC-A20-CG-27-5G	20.2MP (4504 x 4504)	Color	Global	16 - 10,000,000 µs	C	1.1"	2.74 x 2.74	17.5	24 bits	24 VDC
CIC-A25-MG-22-5G	24.4MP (5328 x 4608)	Mono	Global	16 - 10,000,000 µs	C	1.2"	2.74 x 2.74	19.3	8 bits	24 VDC
CIC-A25-CG-22-5G	24.4MP (5328 x 4608)	Color	Global	16 - 10,000,000 µs	C	1.2"	2.74 x 2.74	19.3	24 bits	24 VDC
CIC-A65-MG-17-T	65MP (9344 x 7000)	Mono	Global	16 - 15,000,000 µs	M58 x 0.75	2.3"	3.2 x 3.2	37.4	8 bits	24 VDC
CIC-A65-CG-17-T	65MP (9344 x 7000)	Color	Global	16 - 15,000,000 µs	M58 x 0.75	2.3"	3.2 x 3.2	37.4	8 bits	24 VDC

Components and Accessories

Lights		
	Product ID	Description
	CEL-BA	Bar Lights – Available lengths: 41-242 mm
	CEL-BL	Back Lights – Available lengths: 27-224 mm
	CEL-CX	Coaxial Lights – Available lengths: 20-50 mm
	CEL-DM3	Dome Lights – Available lengths: 80-285 mm
	CEL-DQH	Diffuse Square Lights – Available lengths: 48-120 mm
	CEL-DRW	Diffuse Ring Lights – Available length: 150 mm
	CEL-RH	Ring Lights – Available lengths: 42-210 mm
	CEL-RL	Low-Angle Ring Lights – Available lengths: 75-120 mm

Y-Cable and Lenses Compatibility			
Product ID	Y-Cable	Lens	Lens Adapter
CIC-A023-MG-168-5G	CCB-Y-AS-1	HR Series	N/A
CIC-A023-CG-168-5G	CCB-Y-AS-1	HR Series	N/A
CIC-A05-MG-105-5G	CCB-Y-AS-1	UR Series	N/A
CIC-A05-CG-105-5G	CCB-Y-AS-1	UR Series	N/A
CIC-A12-MG-44-5G	CCB-Y-AS-1	SR Series	N/A
CIC-A12-CG-44-5G	CCB-Y-AS-1	SR Series	N/A
CIC-A20-MG-27-5G	CCB-Y-AS-1	ZR Series	N/A
CIC-A20-CG-27-5G	CCB-Y-AS-1	ZR Series	N/A
CIC-A25-MG-22-5G	CCB-Y-AS-1	ZR Series	N/A
CIC-A25-CG-22-5G	CCB-Y-AS-1	ZR Series	N/A
CIC-A65-MG-17-T	CCB-Y-AS-2	FF Series	ML-TUBE-M58
CIC-A65-CG-17-T	CCB-Y-AS-2	FF Series	ML-TUBE-M58

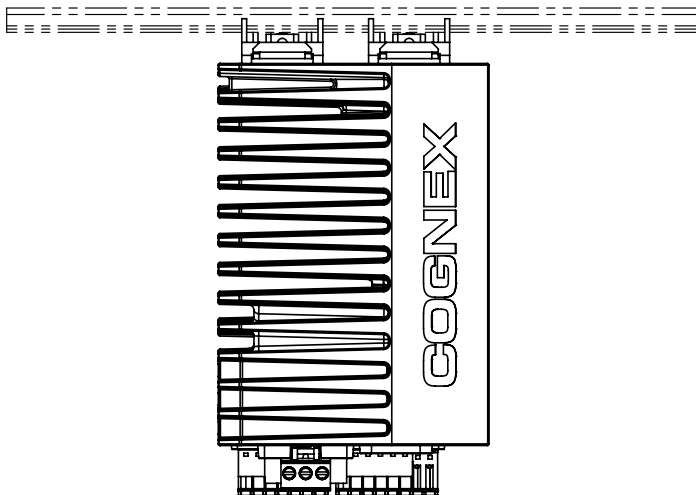
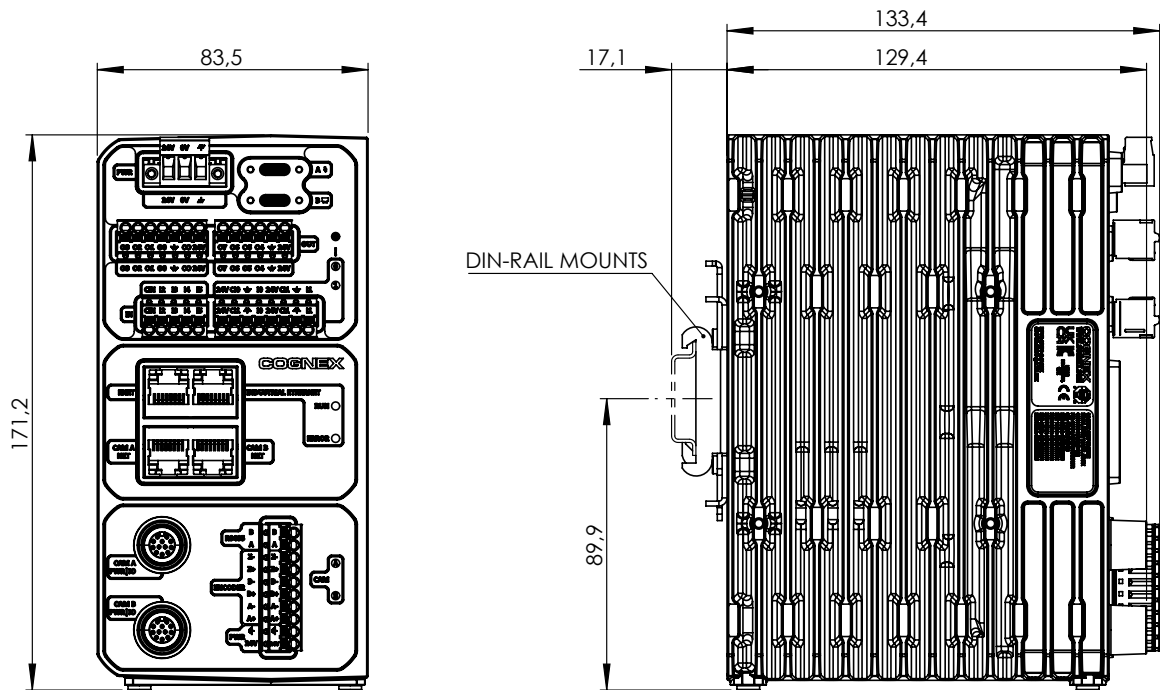
Wiring Diagram



Reference	Product ID	Description
1	CGE-CBL-FLEX-H-xx (xx specifies length: 5m, 10M, 20M)	Ethernet Cable, RJ45 to RJ45
2	CCB-M12-12P5P-xx (xx specifies length, 5M, 10M, 20M)	Camera IO Cable, Area scan
3	CCB-Y-AS-1 (for standard resolution cameras)	Y-Cable, Area Scan, M8 6-pin connector
	CCB-Y-AS-2 (for high-resolution cameras)	Y-Cable, Area Scan, Hirose HR10A 12-pin connector
4	CCB-M12-5P-x (xx specifies length, 1M, 5M)	Light Extension Cable
(Not shown in image)	ACC-QUINT-PS	Power Supply, 100-240VAC Input, 24VDC / 5 Amp Output, Din Rail Mountable

Dimensions

Get In-Sight Vision Controller CAD files in one place at support.cognex.com.



Cognex Product Portfolio

Vision Systems and Software

Optimize inspection processes with Edge and Advanced AI, ensuring accurate defect detection, assembly verification, text reading, and more.

www.cognex.com/machine-vision



Barcode Readers

Achieve end-to-end traceability across production and distribution, with flexible AI-powered readers and verifiers designed for ease of use and reliability.

www.cognex.com/barcodereaders



Industry Solutions

Tackle applications across a wide range of industries with powerful AI machine vision solutions that simplify manufacturing and logistics challenges.

www.cognex.com/solutions



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