

# VS70 Machine Vision Smart Camera

Completely customizable to meet unique quality inspection needs



From the factory floor to the control room, manufacturers are under intense pressure to meet increasing business demands. Every day, production lines strive to achieve consistent product quality and throughput quotas. Success requires a reliable and dependable process at every stage of production—a process that increases automation, reduces defects and validates assembly and tracking information.

Now, manufacturers can address it all with the Zebra VS70 Machine Vision Smart Camera<sup>1</sup>. The customizable VS70 is built to enable machine vision in the most complex processes and challenging environments. Whether you need a wide angle lens to capture large parts, a zoom lens to inspect a distant component or a specialized lens for precise measurements, the VS70 can do it all. Use any standard C-mount external lens to achieve the range, depth of field and field of view your application and environment require. And compatibility with virtually any external lighting solution ensures the capture of highly accurate and detailed images, even in low-contrast, curved and reflective areas.

The VS70 brings a new level of simplicity to machine vision solutions. It all starts with Zebra Aurora—a powerful and intuitive software platform that makes it exceptionally easy to set up, deploy and run the VS70 and Zebra's entire portfolio of Machine Vision Smart Cameras and Fixed Industrial Scanners. Zebra-exclusive features such as ImagePerfect+ reduce steps, training and management time and cost, as well as the need for external peripherals. And since you can add advanced tools at any time with a simple software license upgrade, the device you buy today can support new needs tomorrow.

Take your success to the next level with extraordinary visibility into your operational processes—with the VS70, only from Zebra.

## **Zebra Aurora™ Software**

### **A Single Unified Platform Across Zebra's Fixed Industrial Scanner and Machine Vision Portfolio**

Zebra Aurora brings a new level of simplicity to controlling enterprise-wide manufacturing and logistics automation solutions. This powerful interface makes it easy to set up, deploy and run all of Zebra's Fixed Industrial Scanners and Machine Vision Smart Cameras, while eliminating the need for different tools.

### **For Experts and Beginners**

Experienced and first-time users can easily navigate the highly intuitive modern interface, reducing training and deployment time. Experienced users will appreciate easy access to all functions and streamlined processes, while first-time users are guided through all the steps in the proper order. And if users need a little help, Learn-As-You-Go offers built-in tutorials, walk-throughs and videos on all aspects of the software and its comprehensive management toolset.

**The VS70—Enable performance. Inspire potential. Experience the difference with Zebra.**  
For more information, visit [www.zebra.com/vs70](http://www.zebra.com/vs70)

## Easy to Set Up

### Automatic setup with Auto-Tune

Just Auto-Tune and run for consistent, reliable inspections—right out of the box. With the press of one button, Auto-Tune dials in the perfect image for faster and more accurate set up.

### IoT Ready With Zebra Savanna™

The IoT-ready VS70 can send images to Zebra's subscription-based cloud service, Zebra Savanna—or any other cloud service—allowing you to meet industry regulations or store images for further analysis, all without the need to purchase and manage servers.

### Power it All Over Ethernet

Reduce setup complexity and cost with support for Power-over-Ethernet (PoE). This standard feature powers the VS70 and attached accessories right over the network, eliminating the cost of power drops and power supplies. Don't have a PoE infrastructure? No problem. You can also power the VS70 with a standard 24V DC power supply or even a standard USB-C port.

### Limitless Expansion Options With USB-C

Ready for a new level of flexibility? USB-C allows you to power your camera with a single cable and provides limitless accessory options. Seamlessly integrate with other Zebra devices, such as a printer or tablet. You can also backup your system or save images for future analysis by connecting external storage devices to the VS70.

### Create Tools Faster With QuickDraw

Simply draw right on an image to create a tool in fewer steps than most competitive systems require.

### Locate the Right Part Successfully—Every Time

Zebra takes a new approach to the creation of two key error-proofing tools—Object Locate and Pattern Matching. Zebra's optimized algorithms and carefully crafted default settings enable users to dependably create successful tools with fewer clicks, less trial and error, and less deployment time and effort.

## Easy to Deploy

### Address Complex Requirements

#### With Your Choice of Lens and Lighting

The VS70 supports any external C-mount lens and any external lighting solution—ideal when you need a specialty lens and lighting to meet

complicated application, environmental and installation requirements. From a wide angle lens to capture a barcode on large parts to a high-powered lens to capture a tiny barcode at a distance, the VS70 provides the complete flexibility you need to address it all.

### Programmable Input/Output (I/O) Ports

Get the ultimate in I/O flexibility. Up to nine digital I/O ports can be individually controlled to expand application functionality and improve error-proofing. Support additional peripherals, activate lights or trigger an action to more fully automate your processes.

### Ultra-Rugged and Ready for Industrial Spaces

Rely on dependable operation in the most demanding environments with an ultra-rugged design. The aluminum housing is chemical and oil resistant. IP65 and IP67 sealing ratings make the device dust tight and able to withstand high-power wash downs—or even total immersion in water.

### Operator Feedback/Status Indicators

With 360° LED lights, your operators can instantly see image and camera status. Workers can see at a glance if image capture was successful or unsuccessful—protecting product quality and traceability. Five built-in camera status LEDs—Power, Online/Run, Focus Warning, Error and Ethernet Status—make it easy to verify whether cameras are fully operational or in need of attention. In addition, a beeper with adjustable volume provides an audible cue of successful capture, so workers can keep their eyes on the job—instead of the device.

### Added Flexibility With the Zebra Aurora HMI dashboard

Give workers actionable intelligence right where they need it—at their station. Operators can see and interact with the Zebra Aurora Human Machine Interface (HMI) dashboard via any web browser or by directly connecting a monitor to the VS70. The need to install a PC at every workstation is eliminated, reducing hardware requirements and installation costs.

## Key Differentiators

The VS70 is loaded with class-leading features, including:

### The ultimate in customization

#### Supports any external C-mount lens and any external lighting

Ideal for complex application, environmental and installation requirements where wide-angle, zoom or other special lensing is needed.

### ImagePerfect+

#### Eliminate bypassed systems and false rejects with perfect images

In one trigger event, capture up to 16 different images, each with its own unique setting for focus, exposure, gain, illumination control and more.

### Golden Image Compare

#### Rapid troubleshooting for failed image capture

Compare any image to a golden 'perfect' image created at setup to immediately locate the source of the image degradation—such as a dirty lens, lighting issue or misalignment of the camera.

### Software Upgradeable

#### Add what you need, whenever you need it

Add support for new barcode symbologies, faster barcode capture and all the machine vision tools you need through simple software licensing.

### USB-C

#### Limitless expansion options

Easily connect all the peripherals you need—from a printer or tablet to an external drive and more.

### PoE+

#### Power it all over Ethernet

Power the VS70 right over your Ethernet cable—no more costly power drops and no more power supplies to purchase and manage.

### Simple, Easy and Fast Integration With Your Network Infrastructure

Built-in Ethernet/IP, PROFINET and other network protocols enable painless integration with any common PLC or host system. Network architecture is simplified and deployment time and cost are reduced.

### Easy to Run

### Eliminate Bypassed Inspections and False Rejects With ImagePerfect+

Uneven lighting and the need to read images at various distances can require additional cameras, external lights or complex custom code—additions that can substantially increase the total cost of ownership. Address it all with a groundbreaking new feature—ImagePerfect+. In one trigger event, this Zebra-exclusive feature captures up to 16 different images, each with its own unique setting for focus, exposure, gain, illumination control and more. The result? Perfect images that enable fast, flawless inspections. A significant reduction in solution complexity. And a lower total cost of ownership.

### Get The Features You Need Today— and Add the Features You Need Tomorrow

The modular architecture lets you select the Machine Vision (MV) toolset you need now, and add new functionality any time in the future. Just purchase licenses to upgrade to more advanced MV tools, allowing you to meet tomorrow's needs with the products you have today.

### First-Time Every-Time Barcode Capture

Need to capture barcodes? Zebra's exclusive PRZM Intelligent Imaging technology delivers the reliable data capture you need to keep your operations running at peak capacity. The system enables the simultaneous capture of multiple barcodes, extends read ranges and focal distances and allows a larger field of view to capture more information with less equipment. And PRZM Intelligent Imaging delivers first-time capture of virtually any 1D, 2D and DPM barcode on any surface, in practically any condition.

### Rapid Troubleshooting With Golden Image Compare

If any image capture or barcode reads fail, this Zebra-only tool allows you to quickly identify and resolve the issue by comparing any image to a golden 'perfect' image created at setup. Minimize downtime by immediately diagnosing and rapidly correcting the source of any degradation—from a dirty lens or a lighting problem to misalignment of the camera.

### Eliminate Production Delays With Dual Ethernet Connections

The VS70 is the only device in its class to offer dual Ethernet ports. Completely isolate the Controls Network to protect key production data and utilize a second Ethernet connection to send images to the cloud or local server for storage. Don't need a second Ethernet port? Just choose the single port configuration to pay only for what you need.

### Complete Support Service—Everything's Covered

Get the constant peak performance and device uptime today's businesses demand with Zebra OneCare™ Essential and Select Support Services. Unexpected disruptions and unbudgeted repair expenses are eliminated. Everything is covered—including normal wear and tear and accidental damage. You can customize your support plan with numerous options to get the service level your business needs, including next-day delivery of a replacement device, on-site support, cloud-based visibility into your contracts, repair data, tech support cases—and more.

## Introducing the Zebra Fixed Industrial Scanner and Machine Vision Portfolio



FS10



FS20/VS20



FS40/VS40



FS70/VS70

## Specifications

| Device Characteristics      |                                                                                                                                                                                                                                                                                                 |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dimensions                  | 2.5 in. H x 3.75 in. D x 2.5 in. W<br>63.0 mm H x 95.0 mm D x 65.0 mm W                                                                                                                                                                                                                         |
| Weight                      | 22.9 oz./650.0 g                                                                                                                                                                                                                                                                                |
| Power                       | External power supply: 10-30 VDC, 1.5 A max @ 24 VDC (36 W max)<br>PoE+ supply: Class 4, 25.5 W max<br>PoE supply: Class 3, 13 W max<br>USB-C host: 5 VDC, 3 A max (15 W max)                                                                                                                   |
| Configurable IO             | Four opto-isolated GPIO: GPIO0,1,2,3<br>Five non-isolated GPIO: GPIO4,5,6*,7*,8*<br>*Unavailable when External Light Mode is enabled                                                                                                                                                            |
| Color and Material          | Industrial green aluminum housing                                                                                                                                                                                                                                                               |
| Interface Ports             | Two M12 X-Coded 1000/100/10 Mbps Ethernet*<br>One M12 12-pin Power/GPIO/RS-232<br>One M12 5-pin External Light Power & Control/GPIO<br>One USB 3.0 SuperSpeed Type-C with DisplayPort Alt Mode<br>*Available with one or two Ethernet ports, PoE is only supported by the primary Ethernet port |
| Communication Protocols     | Ethernet/IP, PROFINET, Modbus TCP, TCP/IP, RS-232                                                                                                                                                                                                                                               |
| Keyboard Support            | Supports over 90 international keyboards                                                                                                                                                                                                                                                        |
| User Indicators             | 360° Degree Decode/Job Status LEDs, Power LED, Online/Run LED, Focus Warning LED, Error LED, Ethernet Status LED; Beeper                                                                                                                                                                        |
| Performance Characteristics |                                                                                                                                                                                                                                                                                                 |
| Image Sensor                | 2.3MP: 1/2.3 inch CMOS, global shutter<br>1920 x 1200 3.0 um square pixels<br>Monochrome                                                                                                                                                                                                        |
|                             | 5.1MP: 1/2.5 inch CMOS, rolling shutter<br>2592 x 1952 2.2 um square pixels<br>Monochrome                                                                                                                                                                                                       |
| Acquisition Rate            | 2.3MP: Up to 60 frames/second<br>5.1MP: Up to 30 frames/second                                                                                                                                                                                                                                  |
| Illumination                | Supports many standard external illumination systems while powered by 24VDC supply                                                                                                                                                                                                              |
| Imager Field of View        | Flexible; dependent upon C-mount lens selection                                                                                                                                                                                                                                                 |
| User Environment            |                                                                                                                                                                                                                                                                                                 |
| Operating Temp.             | 32° F to 113° F/0° C to 45° C (10-30VDC external power supply, duty cycle-dependent)<br>32° F to 113° F/0° C to 40° C (POE, duty cycle-dependent)                                                                                                                                               |
| Storage Temp.               | -40° F to 158° F/-40° C to 70° C                                                                                                                                                                                                                                                                |
| Environmental Sealing       | IP65 and IP67                                                                                                                                                                                                                                                                                   |
| Humidity                    | 5% to 90% RH, non-condensing                                                                                                                                                                                                                                                                    |
| Shock Resistance            | EN 60068-2-27, 30 g; 11 ms; 3 shocks on each axis                                                                                                                                                                                                                                               |
| Vibration Resistance        | EN 60068-2-6, 14 mm @ 2 to 10 Hz, 1.5 mm @ 13 to 55 Hz; 2 g @ 70 to 500 Hz; 2 hours on each axis                                                                                                                                                                                                |

| Supported Symbolologies <sup>2</sup>                                                                                                                                                                                                                                                                                      |                                                                                                                                                                           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1D                                                                                                                                                                                                                                                                                                                        | Codabar, Code 39, Code 93, Code 128, I 2 of 5, MSI Plessey, UPC/EAN                                                                                                       |
| 2D                                                                                                                                                                                                                                                                                                                        | Aztec, Data Matrix, DotCode, MaxiCode, PDF417, Micro PDF417, QR Code, Micro QR                                                                                            |
| OCR                                                                                                                                                                                                                                                                                                                       | Deep Learning-based OCR via an add-on license <sup>1</sup> . Supports Latin Letters (A-Z, a-z, digits or one of: !#\$%&()*+,-./:;<=>@[^_`{ }~""\€¥)                       |
| Software                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                           |
| Management                                                                                                                                                                                                                                                                                                                | Zebra Aurora                                                                                                                                                              |
| Decoder Packages                                                                                                                                                                                                                                                                                                          | Included in Standard and Advanced Machine Vision toolsets: 1D/2D Standard (5 FPS); 1D/2D Fast (60 FPS); 1D/2D DPM Full (60 FPS)                                           |
| Machine Vision (MV) Toolsets                                                                                                                                                                                                                                                                                              | Sensor, Standard, Advanced<br>(Available via a software license)                                                                                                          |
| Regulatory                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                           |
| Environmental                                                                                                                                                                                                                                                                                                             | EN 50581:2012; EN IEC 63000:2018                                                                                                                                          |
| Electrical Safety                                                                                                                                                                                                                                                                                                         | IEC 62368-1 (Ed.2); EN 62368-1:2014/A11:2017                                                                                                                              |
| LED Safety                                                                                                                                                                                                                                                                                                                | IEC 62471:2006 (Ed.1); EN 62471:2008                                                                                                                                      |
| EMI/EMS                                                                                                                                                                                                                                                                                                                   | EN 55032:2015/A11:2020 (Class A)<br>EN 55035:2017<br>EN 61000-3-2:2014 (Class A)<br>EN 61000-3-3:2013<br>47 CFR Part 15, Subpart B, Class A<br>ICES-003, Issue 7, Class A |
| EU Declaration of Conformity                                                                                                                                                                                                                                                                                              | 2014/30/EU; 2014/35/EU; 2011/65/EU. For more information visit: <a href="http://www.zebra.com/doc">www.zebra.com/doc</a>                                                  |
| Accessories                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                           |
| C-Mount lenses, C-mount filters, lens covers, external illumination, brackets, cables, power supplies                                                                                                                                                                                                                     |                                                                                                                                                                           |
| Warranty                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                           |
| Subject to the terms of Zebra's hardware warranty statement, the VS70 is warranted against defects in workmanship and materials for a period of Two (2) Years from the date of shipment. Complete Zebra hardware product warranty statement: <a href="http://www.zebra.com/warranty">www.zebra.com/warranty</a>           |                                                                                                                                                                           |
| Recommended Services                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                           |
| Zebra OneCare Select™; Zebra OneCare Essential™                                                                                                                                                                                                                                                                           |                                                                                                                                                                           |
| Footnotes                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                           |
| 1. Some features available in a future release. Contact your Zebra Partner or sales representative for more information.<br>2. Refer to Product Reference Guide for complete list of symbolologies.<br>3. Printing resolution, contrast, and ambient light dependent.<br>Specifications subject to change without notice. |                                                                                                                                                                           |

## Specifications

| Machine Vision (MV) Tools            |                                                                       |        |          |          |
|--------------------------------------|-----------------------------------------------------------------------|--------|----------|----------|
| Tool                                 | Description                                                           | Sensor | Standard | Advanced |
| Object Locate                        | Find high contrast features                                           | •      | •        | •        |
| Pixel Counter                        | Count pixels with a set/given grey level in a specific area           | •      | •        | •        |
| Brightness                           | Provide the average brightness for an area                            | •      | •        | •        |
| Contrast                             | Provide the average contrast for an area                              | •      | •        | •        |
| Edge Tool                            | Find edges for fixturing and presence/absence                         | •      | •        | •        |
| Distance Tool                        | Measure the distance between two existing tool results                | •      | •        | •        |
| Advanced Pattern                     | Find challenging features                                             |        | •        | •        |
| Blob                                 | Find, sort and count areas of joined pixels with a similar grey level |        | •        | •        |
| Optical Character Verification (OCV) | Inspects the quality of text or logos                                 |        | •        | •        |
| Find Circle                          | Find and measure circles                                              |        | •        | •        |
| Caliper Tool                         | Find and measure the distance between two edges                       |        | •        | •        |
| Filters                              | Enhance image quality for more robust inspection                      |        | •        | •        |
| 1D/2D/DPM                            | Read 1D, 2D and DPM barcodes                                          |        | •        | •        |
| Deep Learning OCR                    | Deep Learning-based OCR                                               |        |          | •        |



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