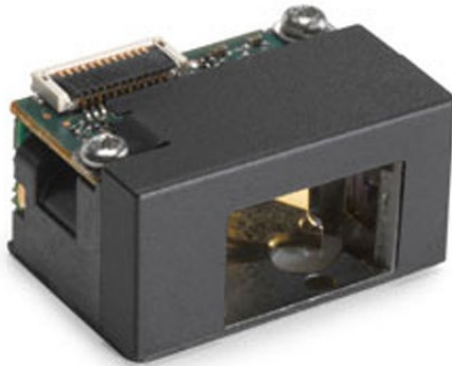


# Zebra SE960-HP/SE965-HP

## Mid to long-range miniature 1D bar code scan engine

The SE960-HP/SE965-HP is the benchmark in 1D scanning. It packs the largest feature set into one of the smallest engines available, creating an engine that offers best-in-class scanning performance, range, application flexibility, reliability and durability. Our patented Adaptive Scanning technology automatically toggles between a wide and narrow scan angle until a bar code is detected, allowing users to zoom in on bar codes as far as 17 ft./5.1 m and zoom out to capture bar codes at near contact—the widest working range in this class. Enhanced Aim enables workers to see the scan line at longer distances.\* Low power consumption helps your products conserve battery power for extended use. And the ability to continuously scan with a single trigger pull is ideal for conveyor belt and pick-list applications.\* The result is an engine that can increase the performance and functionality of your existing product line and open the door for the development of new products, applications and markets.



### Best-In-Class 1D Scanning Performance and Scanning Range

#### Help Your Customers Increase the Productivity of Their Workforce

Adaptive Scanning, aggressive scanning performance and a wide working range work hand-in-hand to enable the rapid and accurate scanning of bar codes workers need to improve productivity.

Workers enjoy first time every time dependable scanning on any 1D bar code, regardless of lighting.

### Easy Integration Into Your OEM Products

Since the tiny SE960-HP/SE965-HP is the size of a sugar cube, it can fit into the most space constrained products for superior product design flexibility. In addition, you can cost-effectively upgrade your products to offer better 1D scanning performance over a much greater range—you can easily swap existing SE-950/SE-955 scan engines with the new SE960-HP/SE965-HP, without changing your existing opto-mechanical or electrical design. We also provide a suite of tools to assist you with integration, from a detailed Integration Guide to Developers Kits. And for many OEM customers, the regulatory process will be shorter, thanks to built-in fault protection mechanisms and laser safety testing that has already been performed.\*\*

### Unmatched Durability and a Lifetime Warranty

A unique combination of features provides worry-free scanning capability for you and your customers while your products remain in the field, providing a low total cost of ownership (TCO) for your customers. The patented Liquid Polymer scan engine is frictionless and will not wear out. The patented die cast chassis delivers the industry's best rating for reliability—dependable operation, even after a shock as great as 2,000G. And we're so confident that we've built the SE960-HP/SE965-HP to last, we offer a lifetime warranty on the motor, protecting your margins and your profitability.

For more information on how you can put world-class flexible 1D scanning into your product designs and reduce your time and development cost, visit [www.zebra.com/se96x](http://www.zebra.com/se96x)

### **Proven Technology You Can Count On**

When you choose the SE960-HP/SE965-HP, you get the peace of mind that comes from choosing superior, well-tested technology. Every day, all around the world, our OEM products power millions of devices in thousands of applications across industries. You enjoy award-winning data capture technology, ease of integration, high reliability and superior performance you need to enable the rapid yet cost-effective design of high-quality solutions that meet the needs of your customers—and improve your margins.

## **Features**

### **Large Working Range From Near Contact to 17 ft./5.1 m**

Meets the needs of a wide range of markets and applications.

### **Small and Lightweight**

Easy integration into product designs; fits in the smallest and most space constrained products.

### **Adaptive Scanning**

Automatically optimizes scanning parameters to create an extraordinary extended working range for easy scanning of bar codes that are near and far.

### **104 Scans Per Second**

Aggressive performance and accurate capture of all barcodes—even damaged and poor quality; increases productivity and accuracy in customer applications.

### **Patented Liquid Polymer Scan Element With Lifetime Warranty**

Eliminates friction and wear for superior durability and reliability.

### **Die Cast Zinc Chassis and Single Board Construction**

Shock rating of 2,000G for outstanding durability.

### **Programmable Scan Angle**

Provides additional flexibility—easily and cost-effectively customize products for specific applications and customers.

### **Low Power Consumption**

Increases battery life in mobile devices; helps achieve full shift use with a single battery charge.

### **Bright Scan Line and Enhanced Aim Mode**

Provides intuitive easy scanning across the entire working range.

### **Flash Upgradeable**

Easy to upgrade software; extends the lifecycle of your products.

### **Built-In Remote System Performance Monitoring**

Provides remote access to scan engine statistics for easy remote management.

# Specifications

Physical Characteristics	
<b>Dimensions</b>	0.46 in. H x 0.85 in. W x 0.61 in. D 11.75 mm H x 21.6 mm W x 15.5 mm D
<b>Weight</b>	0.27 oz./7.6 g
<b>Configuration</b>	Undecoded (SE960-HP) Decoded (SE965-HP)
<b>Interface</b>	SE960-HP: DPB and I <sup>2</sup> C control on a 10-pin ZIF connector SE965-HP: SSI Control over TTL Serial on a 12-pin ZIF connector

Performance Characteristics	
<b>Scan Angle</b>	Wide (default): 47° (typical) Medium: 35° (typical) Narrow: 10° (typical) Note: The SE960-HP/SE965-HP scan engine does not require margin on either side of the bar code to decode. The 47° scan line provides identical scanning performance to older scan engines with a scan line of 53°.
<b>Skew Tolerance</b>	±40° from normal
<b>Pitch Tolerance</b>	±65° from normal
<b>Roll Tolerance</b>	±35° from normal
<b>Specular Dead Zone</b>	±8°
<b>Optical Resolution</b>	0.005 in. minimum element width
<b>Scan Repetition Rate</b>	104 (± 12) scans/sec (bidirectional)
<b>Print Contrast</b>	Minimum 25% absolute dark/light reflectance measured at 650 nm

User Environment	
<b>Amibent Lighting Tolerance</b>	Tolerant to typical artificial indoor and natural outdoor (direct sunlight) lighting conditions. Fluorescent, Incandescent, Mercury Vapor, Sodium Vapor LED <sup>2</sup> : 450 Ft Candles (4,844 Lux) Sunlight: 8000 Ft Candles (86,111 Lux)
<b>Operating Temperature</b>	-22° F to 140° F/-30° C to 60° C
<b>Storage Temperature</b>	-40° F to 158° F/-40° C to 70° C
<b>Humidity</b>	95% RH, non-condensing
<b>Shock Rating</b>	2000 G
<b>Power</b>	SE-960HP-I200R: Input Voltage: 3.3 VDC +/- 0.3 VDC Input Current: 76 mA typical Standby Current: 12 µA typical Vcc Noise Level: 100 mV peak to peak max SE-965HP-I200R/SE-965HP-E200R: Input Voltage: 3.3 VDC +/- 0.3 VDC Input Current: 78 mA typical Standby Current: 25 µA typical Vcc Noise Level: 100 mV peak to peak max

<b>Power</b>	SE-965HP-I205R/SE-965HP-E205R: Input Voltage: 5 VDC +/- 0.5 VDC Input Current: 93 mA typical Standby Current: 60 µA typical Vcc Noise Level: 100 mV peak to peak max SE-965HP-I300R/SE-965HP-E300R: Input Voltage: 3.3 VDC +/- 0.3 VDC Input Current: 60 mA typical Standby Current: 165 µA typical Vcc Noise Level: 100 mV peak to peak max SE-965HP-I305R/SE-965HP-E305R: Input Voltage: 5 VDC +/- 0.5 VDC Input Current: 62 mA typical Standby Current: 234 µA typical Vcc Noise Level: 100 mV peak to peak max
<b>Laser Power (at 650 nm)</b>	Scanning mode: 1.7 mW (nominal peak power) Aiming mode: 0.67 mW

SE960-HP/SE965-HP Decode Distances in Adaptive Mode <sup>2,4</sup>	
Symbol Density/Bar Code Type/W-N Ratio (Barcode Content/Contrast <sup>1</sup> )	Near/Far
<b>5.0 mil Code 128 (1234 80% MRD)</b>	1.2 in./3.05 cm to 7.7 in./19.56 cm
<b>5.0 mil Code 39; 2.5:1 (ABCDEFGH 80% MRD)</b>	1.2 in./3.05 cm to 12.5 in./31.75 cm
<b>7.5 mil Code 39; 2.5:1 (ABCDEF 80% MRD)</b>	1.1 in./2.79 cm to 18.5 in./46.99 cm
<b>10 mil Code 128 (1234 80% MRD)</b>	1.2 in./3.05 cm <sup>3</sup> to 19 in./48.26 cm
<b>13 mil 100% UPC (12345678905 90% MRD)</b>	1.6 in./4.06 cm to 27 in./68.58 cm
<b>15 mil Code 128 (1234 80% MRD)</b>	1 in./2.54 cm <sup>3</sup> to 29.5 in./74.93 cm
<b>20 mil Code 39; 2.2:1 (123 80% MRD)</b>	1.4 in./3.56 cm <sup>3</sup> to 52 in./132.08 cm
<b>55 mil Code 39; 2.2:1 (CD 80% MRD)</b>	3.4 in./8.64 cm <sup>3</sup> to 100 in./254 cm
<b>100 mil Code 39; 3.0:1 reflective (123456 80% MRD)</b>	2 ft./60.96 cm <sup>3</sup> to 17 ft./518.16 cm

## Markets and Applications

### Retail

- Handheld computers
- Lottery terminals
- Robotics

### Transportation and Logistics

- Robotics
- Handheld computers

### Healthcare

- Medical instruments
- Diagnostic equipment

# Specifications

## Regulatory

<b>Laser Classification</b>	Intended for use in CDRH Class II/IEC Class 2 devices
<b>Electrical Safety</b>	UL 60950-1; EN/IEC 60950-1; EN/IEC 60825-1
<b>EMI/RFI</b>	EMI-FCC Part 15 Class B, ICES-003 Class B, CISPR Class B, Japan VCCI Class B
<b>Environmental</b>	RoHS Compliant

## Warranty

Subject to the terms of Zebra's hardware warranty statement, the SE960-HP/SE965-HP is warranted against defects in workmanship and materials for a period of 15 months from the date of shipment. For the complete Zebra hardware product warranty statement, go to: [www.zebra.com/warranty](http://www.zebra.com/warranty)

## Footnotes

\*SE965-HP only.

\*\*The SE-965HP will meet the requirements for a Class 2 laser product to IEC/EN60825-1 under all operating and single-fault failure conditions when the end product meets the labeling and user information requirements called out in IEC/EN60825-1.

1. CONTRAST measured as Mean Reflective Difference (MRD) at 650 nm.
2. Working range specifications at ambient temperature (23°C), Photographic quality symbols, pitch=10°, roll=0°, skew=0°, ambient light < 150 ft-candles using Symbol or equivalent decoder.
3. Dependent on width of bar code.
4. Distances measured from front edge of chassis.
5. LED lighting with high AC ripple content can impact scanning performance.



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