

Magellan™ 1100i OEM

Presentation Omnidirectional Bar Code Reader



Integration Manual

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NOTES

Section 1

Introduction

This document gives instruction, mechanical details, and design considerations to integrate the Magellan 1100i OEM model (designated as “scanner” or “OEM scanner” in this manual) specifically into equipment-integrated scanning applications.

Overview

The OEM scanner is a compact, decoded, omni-directional imaging scanner for fixed position OEM integration, such as price verifiers, kiosks, vending machines, point-of-sale (POS) terminals, and other equipment-integrated scanning applications. The new proprietary imaging technology excels at capturing hard-to-read bar codes in omni-direction orientation.

A typical system using the scanner consists of a host system such as a price verifier or kiosk. The host system interfaces with the scanner and receives decoded bar code data produced by the scanner. The illumination LED's in the scanner emit visible light as well as invisible infrared light. When a bar code passes through the scan volume area, light is reflected off the bar code. The scanner collects this reflected light, processes it into a digital signal and decodes it into data that can be used by the host system. The scanner has different operational modes which can be selected via special programming bar codes.

Resources in other documents

The OEM scanner contains versions of the scan engine, electrical components, software, and configuration programming options as those available on standard Magellan 1100i scanner models. This document is meant to give instruction, mechanical details, and design considerations to integrate the OEM scanner model only.

Details on the Electrical Interface, Configuration Settings, and Programming are found in the Magellan 1100i Product Reference Guide.

Unpacking the Scanner

The scanner is shipped in custom packaging. Carefully open the package, and inspect for the following:

- scanner
- power supply (if ordered)
- interface cable (if ordered)

If any parts are damaged or you need additional hardware, please contact [Technical Support](#).

Scanner Care

The scanner contains sensitive components which require special handling. Datalogic may not warrant damage due to improper handling.

- Do not open the scanner's case. Doing so will void the warranty.
- Avoid touching the front window. Fingerprints will degrade the scanner's performance.
- Only clean the scan window when visual inspection reveals dirt or residue. Remove lint or foreign material present with filtered compressed air. Remove fingerprints or other residue using clean, cotton-tipped applicators dipped in isopropyl alcohol, or with soft tissues dipped in high-quality lens or eyeglass cleaner. Do not reuse cotton-tipped applicators or tissues.
- Do not scrub the window.
- Never wipe the window with a dry tissue or applicator.

Technical Support

Datalogic Website Support

The Datalogic website (www.scanning.datalogic.com) is the complete source for technical support and information for Datalogic products. The site offers product support, product registration, warranty information, product manuals, product tech notes, software updates, demos, and instructions for returning products for repair.

Telephone Technical Support

If you do not have internet or email access, you may contact Datalogic technical support at (541) 349-8283 or check the back cover of your manual for more contact information.

Section 2

Mounting the Scanner

This section describes how to design the mounting for optimum scanner performance.

General Considerations

A typical system uses the scanner mounted inside a host enclosure, with an opening for the scanning pattern to exit and read bar codes. The opening should be the size of the scanner window at a minimum, but only exposing as much of the scanner as necessary.

Although the scanner has been designed to be impact-resistant, it is important to consider the effect of the environment on the scanner. In particular, mounting should minimize the possibility of foreign objects coming into contact with the window's surface. Such contact will damage the window over time and reduce the scanner's performance. Consideration should also be given to the clearances needed for the scanner's interface cable (reference the following section, [Cable Routing](#)).

Mounting

System integration is made easy with the OEM scanner's mounting features. The primary method of mounting to the host enclosure is to attach the scanner using the bottom mounting features. Two threaded mounting features are located on the bottom of the scanner for use with size M4 screws (4 mm x 0.7 pitch) of your required length. One additional threaded mounting feature is located at the rear of the scanner which is intended for host enclosures previously designed to integrate the VS800 scanner. The maximum installation torque for all mounting screws is 2.3 N-m [20 in-lb]. [Appendix B, Mechanical Specifications](#), contains mechanical drawings of the scanner including the position of the mounting features. Host enclosure mounting holes should be 4.3mm [0.17"] in diameter.

The scanner can be mounted upside down with no loss in scanning performance.

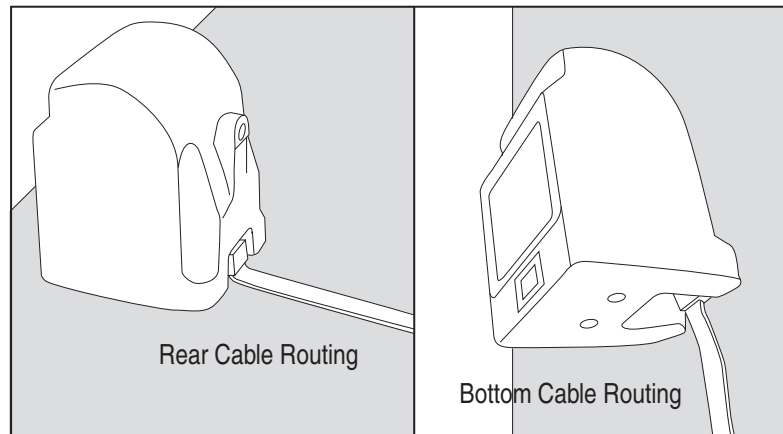
Mounting the Scanner Standalone

The OEM scanner is not intended for use in a standalone application. This model is intended to be integrated inside a host enclosure. Standard Magellan 1100i models should be used when a standalone application is required.

Cable Routing

The mounting design should also take into consideration the clearances needed for the interface cable. This cable should be routed internal to the host enclosure as much as possible. It is recommended to use a flat cable or round cable without a large strain relief so that the cable can be routed away from the scanner in one of the following directions. As shown in [Figure 2-1](#), the interface cable can be routed out the rear or bottom surfaces of the scanner.

Figure 2-1. Cable Routing



Scanner Ventilation

When mounting the scanner inside a secondary enclosure, it is important to have proper ventilation to ensure that the scanner temperature does not exceed the maximum range as listed in [Appendix A, Technical Specifications](#). The reliability of the scanner may be compromised if the temperature range is not maintained.

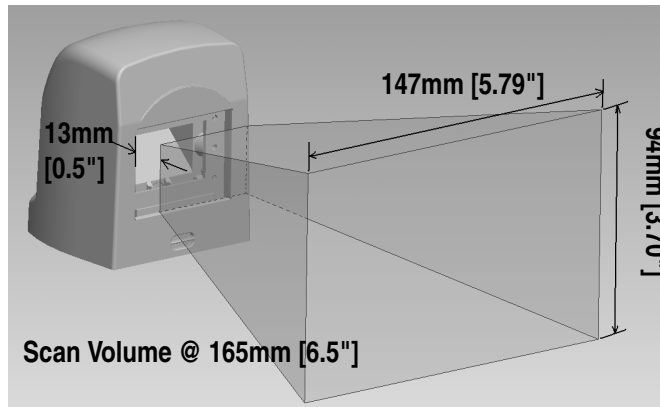
Integrating the Scanner to Read at the Proper Distance

When deciding how to mount the OEM scanner, there are many criteria that must be considered. First, there are minimum and maximum distances that the bar code can be from the front of the scanner to be properly read, depending on the size of the bar code. These distances, or depth of field, are specified in [Appendix A, Technical Specifications](#).

Note that the depth of field begins 13mm [0.5"] from the front of the scanner. This means that bar codes may not be read if they are within the range of 0-13mm [0-0.5"] from the front of the scanner. To ensure that a bar code can not be placed too close to the scanner, it is recommended that the scanner is mounted at least 13mm [0.5"] from the outer surface of the host enclosure, to ensure that bar codes will be within the scan volume.

Second, the scanner must be positioned so that the scan volume and illumination light will cover the entire bar code. The scan volume is shown in [Figure 2-2](#). The combination of the Scan Volume and the illumination light is called the Field of View. Designing around the scanner Field of View is explained more in the following section, [Design of the Scanner Opening](#).

Figure 2-2. Scanning Volume



Design of the Scanner Opening

A typical system uses the scanner mounted inside a host enclosure with an opening for the scanner Field of View to exit the scanner window and read bar codes. If the scanner is flush against the opening, it should be the size of the scanner window at a minimum, but only exposing as much of the front surface of the scanner as necessary. Additional clearance in the opening can also be considered for the speaker opening.

The design and placement of the scanner opening within a host enclosure is critical for optimum system performance. Use the detailed dimensions shown in [Appendix B, Mechanical Specifications](#), to design the host enclosure and scanner opening along with the following guidelines.

- The opening must not block any of the outgoing illumination light, described by dimensions of the scanner Field of View.
- Ensure that there are no reflective surfaces around the area of the scanner opening.
- The minimum opening size must increase as the distance between the scanner and the window increases. This is necessary to accommodate the width and height of the scan volume.
- The opening or other parts of the host enclosure must not enter the Field of View in order to allow the bar code image to be captured by the scanner.



NOTE

If all the red illumination LED's remain on when the scanner is installed in the host enclosure, then something is blocking the Field of View.

Integrating the Scanner Behind a Window



CAUTION

It is **not recommended** to place any type of additional window between the scanner and the bar code to be read. The addition of a host enclosure window will significantly degrade scanner performance. This is due to the additional optical reflective surfaces that will cause interference with the imaging technology.

It is recommended to conduct scan performance testing with any additional window to determine if the performance level is acceptable for the application.

- Window material should be transparent with $\geq 92\%$ transmission to wavelength 625nm and 850nm.
- Flat window only.
- The window should be as thin as possible (thickness less than 2mm).
- The window should be as close to the LED baffle or original window as possible to avoid LED ghost image.

Performance degradation may include:

- The scan module will not read very low contrast labels.
- Red LEDs flash or red LEDs are always on. In this case, the scanner module's near field and far field switching thresholds may need to be adjusted.
- The scan module will not be able to wake up especially in low ambient light (typically $< 100\text{Lux}$). In this case, the scan module may need its wakeup sensitivity setting increased

ESD Protection

The host enclosure design must provide adequate ESD protection for the scanner. Ideally, static discharge should not be allowed to discharge to the scanner. The preferred method to prevent static discharge is to provide a long discharge path to all circuits. The scanner is intended to be mounted inside a host enclosure. Only the front surface should be exposed in order to read bar codes. This is to protect the rear interface connector area which can be susceptible to static discharge. Interface cables should also not be powered up when inserted into the scanner. It is also recommended that any metal mounting surfaces for the scanner must be electrically grounded.

Static discharge (ESD) testing is recommended for the entire system integration to ensure proper ESD protection.



ESD

Proper ESD protection should be used at the time of installation and servicing of the scanner or the host equipment.

Appendix A

Technical Specifications

Optical and Read Performance Parameters

Parameter	Specification	
Scan Volume	1147 cm ³ / 70 in ³	
Scan Pattern	136 scan lines	
Scan Rate	1760 Digital Scan Lines/second	
Minimum Resolution	5 mil	
Depth of Field (100% UPC Labels)	Code Size	Depth of Field
	5 mil	25.4 - 57.2mm / 1.0 - 2.25"
	7.5 mil	12.7 - 69.9mm / 0.5 - 2.75"
	10 mil	12.7 - 139.7mm / 0.5 - 5.5"
	13 mil	12.7 - 165.1mm / 0.5 - 6.5"
	20 mil	12.7 - 184.2mm / 0.5 - 7.25"
Minimum Print Contrast Ratio	25%	
Skew (Yaw)	± 75°	
Pitch	± 65°	
Roll	Between 0 and 360°	

Electrical Parameters

Parameter	Specification
Operating Voltage	Input voltage 4.5 to 14 VDC
Input Current	
Operating (idle)	<350mA
Operating (label read)	<450 mA
Surge Current (<30 ms)	<600 mA

Environmental Parameters

Parameter	Specification
Mechanical Shock	Multi 1.0m drops
Contaminants Water and Dust	IP52
Temperature Ranges: Operating Storage	32° F to +122° F (0° C to +50° C) -104° F to +158° F (-40° C to + 70°C)
Ambient Light Indoor	0 - 6000 lux
Ambient Light Outdoor	0 - 86,100 lux
Humidity	5 to 95% non-condensing
Beeper/Speaker	70-85dBA at a distance of 3'-3" (1 meter)
Vibration	Retail/Office Sine: 3.0 g pk, 5 Hz to 500 Hz Random: 0.030 g ² /Hz, 5 Hz to 1000 Hz

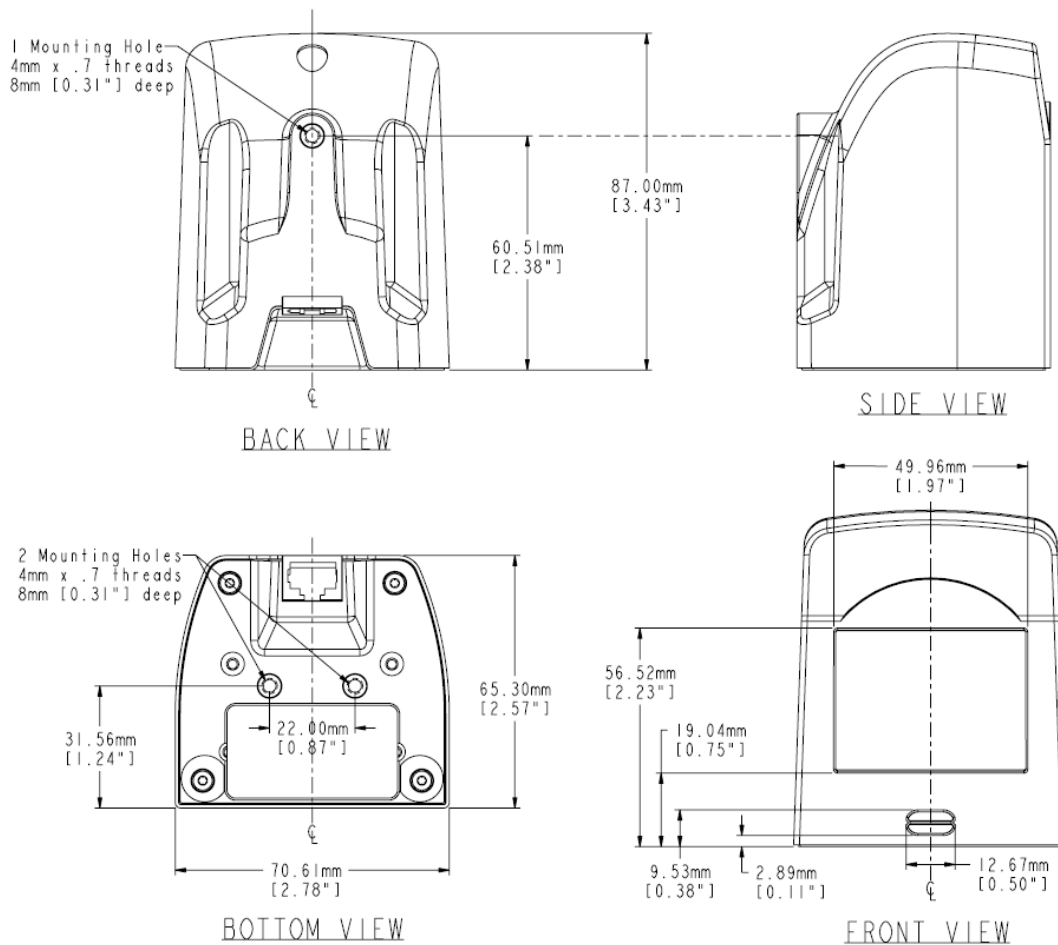
Appendix B

Mechanical Specifications

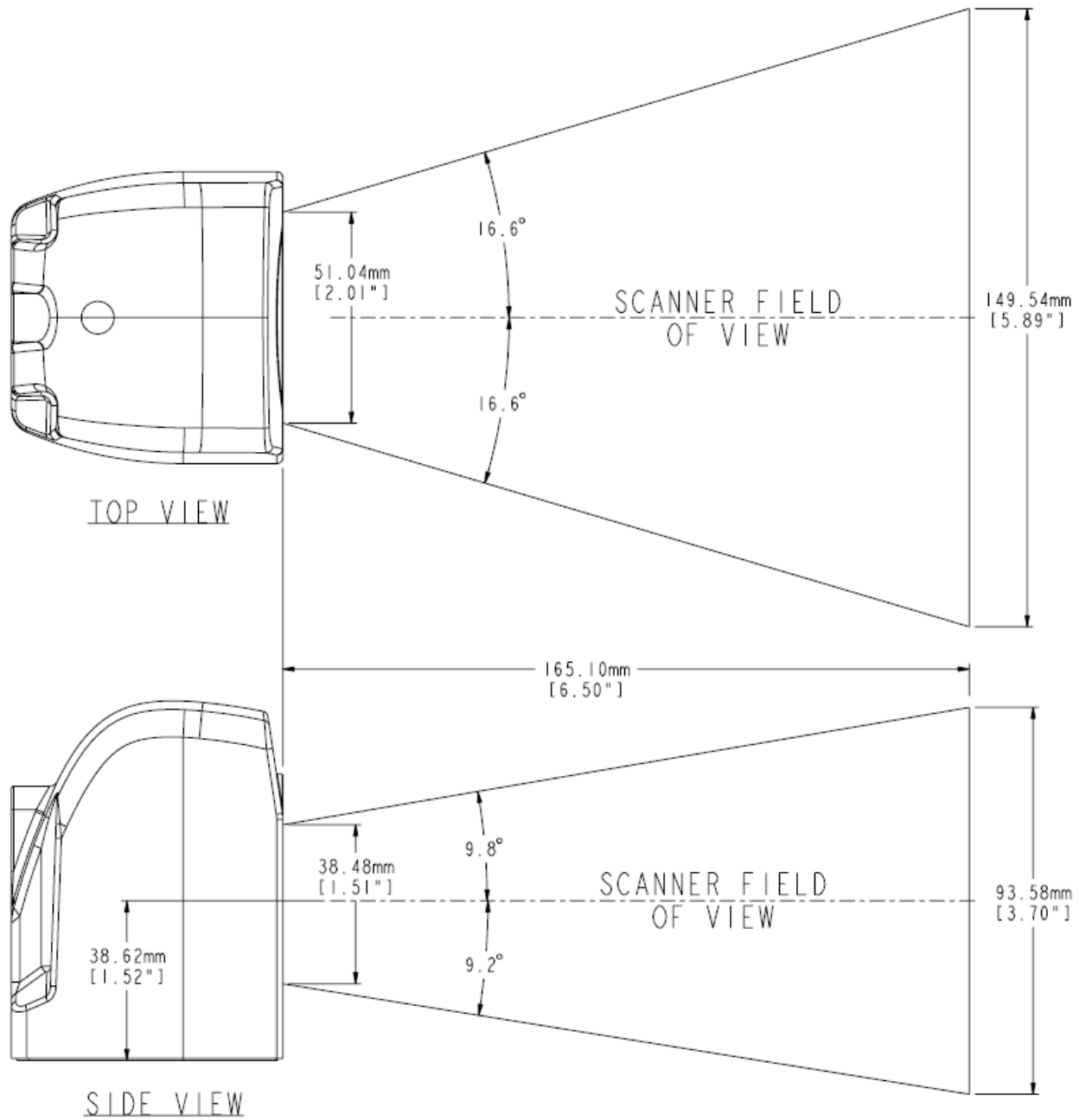
Physical Properties

Parameter	Specification
Dimensions	86.4 mm x 71.1 mm x 66.0 mm (3.4" x 2.8" x 2.6")
Weight	~ 198 g / 7.0 oz.

Scanner Dimensions



Clearance Required for Integration



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