

Master Specifications	
Wireless Laser Barcode Scanner	
Product Name	OPR-3101
Publication No.	SS07028
Edition	Initial Release
Date of Publication	April 3, 2007
Original Doc. No.	SS07012

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Revision History

Specification No.: SS07028

Product name : OPR-3101

Revision	Date	Section	Description of Changes
Initial Release	2007/04/03		

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1. Abstract

This manual provides specifications for the OPR-3101 gun-type wireless laser barcode scanner.

2. Overview

The OPR-3101 scanner utilizes Bluetooth technology to carry out wireless transmission of scanned barcode data. Main features of the OPR-3101 are as follows:

- Laser beam scanning
The use of short wave-length red laser beam enhances the visibility of scanning lines.
- Customized ASIC for decoding
Utilization of high speed ASIC increases the data processing speed and improves the OPR-3101 reading performance of low-quality printed barcode.
- Rugged housing for heavy duties
The OPR-3101 is enclosed in a rugged housing sealed to IP-54 standards that withstands repeated drops of up to two meters onto concrete. This scanner is suitable for the use not only in office or shops but also in the warehouses.
- Bluetooth technology for wireless communication
The OPR-3101 supports Bluetooth with output power Class 2. It enables the data communication in the range as long as 10 meters.
- Rechargeable in the designated cradles.
It takes only about 5 hours to fully recharge the OPR-3101 in the designated cradle CHG-3101 or CRD-3101. CHG-3101 recharges the scanner while CRD-3101 offers both recharging and communication features. (It takes about 10 hours to recharge the battery using USB bus power.)
- Wide range of supported symbologies
EAN, JAN, UPC, Industrial 2of5, IATA, Interleaved 2of5, NW-7(Codabar), Code 39, Code 93, Code 128, MSI/Plessey, ISBN (13-digit JAN + 5-digit add on), RSS-14 Family, and MicroPDF417 are supported.
*Please refer to Chapter 10 of this document for details of the default setting.
- Complies with RoHS
OPR-3101 complies with RoHS.

3. Basic Specifications

Items		Specifications	Notes	
Control Section	ASIC	T6X53XBG	CPU: ARM7TDMI, Core: 48MHz	
	Flash ROM	4Mbits (256K × 16Bits) Flash Memory		
Wireless Communication	Frequency	2,400 MHz to 2,483.5 MHz		
	Specifications	Bluetooth Ver. 2.0	Protocol: SPP	
	Transmission Power	Class 2 (4 dBm or less)		
	Communication Range	10 m	It may differ depending on the environmental conditions.	
	Baud Rate	115.2 kbps		
	Antenna	1/4λ Surface-mounted Type Antenna		
Optical Section	Scan Method	Bi-directional	100 ±20 scan/sec	
	Light Emitting Element	Red laser diode	Wavelength: 650±10nm (at 25 deg. C)	
	Light Output	≤ 1.0 mW	Laser Class 2 Product	
Technical Specifications	Supported Symbologies	EAN, JAN, UPC, Industrial 2of5, IATA, Interleaved 2of5, NW-7(Codabar), Code 39, Code 93, Code 128, MSI/Plessey, ISBN (13-digit JAN + 5-digit add on), RSS-14Family, MicroPDF417 etc...		
	Minimum Resolution	0.127 mm		
	Curvature	Radius ≥ 15 mm (with 8-digit JAN) Radius ≥ 20 mm (with 13-digit JAN)		
	Scan Angle	Pitch: $\alpha \leq \pm 35^\circ$		
		Skew: $\beta \leq \pm 50^\circ$ (Excluding dead zone.)		
		Tilt: $\gamma \leq \pm 20^\circ$		
	DOF (mm)	Code 39	Resolution: 0.127	30 to 100
Resolution: 0.25			20 to 230	
Resolution: 1.0			40 to 720	
Minimum PCS	0.45 or higher		With over 70% reflectivity of space and quiet zone.	
Power Supply Sections	Main Battery	Spec.	Lithium-ion Secondary Battery Nominal Capacity: 1620 mAh Nominal Voltage: 3.7 V	
		Charge Time	About 5 hrs (using AC adaptor) About 10 hrs (using USB bus)	
	Current Consumption (at 3.7 V)	Peak	220 mA	When scan and decode
		Average	165 mA	When scan and decode
		Idle	30 mA (typ)	When idling (communication disconnected)
	Battery Hour	Idle	About 48 hours	Battery hour with a fully charged battery.
		In Use (1scan/5sec)	About 25 hours	

Items		Specifications	Notes		
Environmental Spec.	Temperature	Operating	-10 to 60 degrees C	When charging at 0 to 40degrees C	
		Storage	-20 to 60 degrees C		
	Humidity	Operating	5 to 95 % (no condensing)		
		Storage	5 to 95 % (no condensing)		
	Ambient Light Immunity	Fluorescent	up to 4,000 lx		
		Sunlight	up to 80,000 lx		
	Vibration	Increased the frequency of vibration from 10Hz to 100Hz at an accelerated velocity of 19.6m/s ² (2G) for 6 minutes each in X-direction, Y-direction and Z-direction. Repeated this test for 10 times in each directions.			
Drop	Dropped from a height of 200 cm onto a concrete surface. The drop test was done 18 times.				
Protective Structure	IP54				
Regulations and Safety	Laser Safety	JIS C 6802:2005 Class 2 IEC 60825-1+A2:2001 Class 2			
	EMI	VCCI Class B, EN55022 Class 2, FCC Part 15 Subpart C			
	Product Safety	IEC/EN 60950-1			
	Electromagnetic Compatibility (EMC)	EN61000-6-1 Class-B			
	Other Certifications	CE Marking			
		Certifications for Construction Design of Specified Radio Equipment			
Logo Certifications	Bluetooth Logo Certification				
Durability Tests	Resistance to Static Electricity	No destruction	Impressed static electricity of 15kV for 50 times on the surface of the scanner.)	IEC:61000-4-2 compliant test	
		No malfunction	Contact Discharge (direct/indirect): ± 6 kV Air Discharge (direct):± 8 kV		
	Amplitude Modulation (AM) caused by Radio Signal	Frequency	80 to 1000 MHz		IEC61000-4-3 compliant test
		Level	3 V/m		
		AM	80 %		
	Fast Transient	Voltage	Alternating-current Input Cable: ± 1 kV		IEC61000-4-4 compliant test
		Pulse	5 / 50 ns (Tr / Tw)		
		Frequency	5 kHz		
	Surge Voltage	Pulse	1.2 / 50 ns (Tr / Th)		IEC61000-4-5 compliant test
		Voltage	From L to P: ± 2 kV (closed-loop voltage)		
			From L to L: ± 1 kV (closed-loop voltage)		
	Radio Frequency Common Mode	Frequency	0.15 to 80 MHz		IEC61000-4-6 compliant test
		Level	3 V		
		AM	80 %		
Power Supply Frequency Magnetic Field	Frequency	50 and 60 Hz		IEC61000-4-8 compliant test	
	Level	3 A/m			
Voltage Dip, Momentary Voltage Drop etc...	Dip 1	Drop 30 %, 0.5 Cycles		IEC61000-4-11 compliant test	
	Dip 2	Drop 60 %, 5 Cycles			
	Momentary Drop	Drop 95 %, 250 Cycles			
Physical Spec.	Dimensions	68(W) × 155(D) x 165(H) mm			
	Weight	250 g		Excluding a 40-gram battery pack.	

4. Detailed View

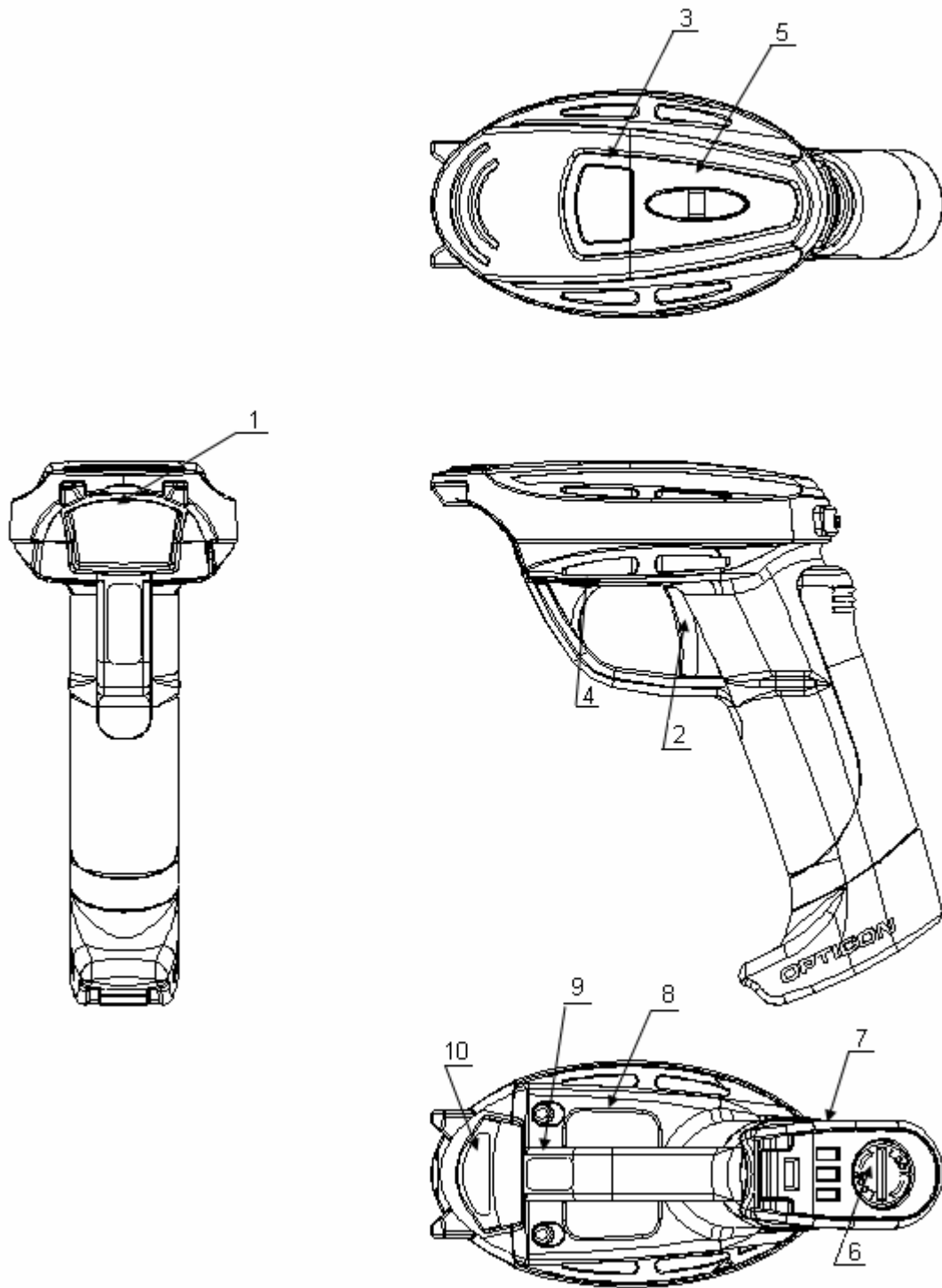


Figure 1: Detailed View of OPR-3101

1. **Plastic Mask**
The scanner emits a laser beam through its plastic mask while scanning a bar code. Specular light of the barcode comes in through the plastic mask. Keep the plastic mask clean.
2. **Trigger Switch**
To scan and decode a bar code, you need to press the trigger switch. After decoding, the data is sent to the host via Bluetooth wireless communication.
3. **Status LED**
The scanner LED lights up Blue when the scanner registers a successful read. If the scan fails, the LED lights up Red. LEDs are also used to alert users to the status of the wireless connectivity, data storage (data collection), remaining battery level and recharging time.
4. **Buzzer Holes**
Buzzer sounds through these holes. Buzzer cannot be heard when those holes are covered. Buzzer sounds upon the completion of scanning or data transmission. It also sounds when connecting or disconnecting wireless communication. Buzzer settings can be configured in various ways. You can enable or disable the buzzer as well as change the buzzer loudness or duration.
5. **Strap Hook**
Strap hook is used to prevent the users from dropping the scanner. Do not swing the scanner while connected to the strap hook or you may damage the scanner.
6. **Battery Cover**
To remove the battery cover, turn the battery cover lock counterclockwise with a coin and remove the cover. When refastening the cover, turn the cover lock clockwise until it is close-fitting. Always make sure the cover is locked correctly or the battery may fall out, or may cause the scanner to perform poorly due to the water intrusion.
7. **Battery Charging Terminals**
Battery charging terminals are used to supply power to the scanner from the designated cradle. Keep the terminals clean or it will degrade charging performance.
8. **Model Name Label**
This label shows certification logos, serial number and name of manufacturer of the unit.
9. **Laser Caution Label**
This label provides a caution mark and statements for laser safety.
10. **Serial Number Label**
This label shows the model name and serial number.

4-1. Buzzer and LED Display

OPR-3101 notifies its operation status with LED and buzzer.

Status	Color	Display	Operating Status	Buzzer
Charging	Red	Lighting	Shows that the scanner is being charged.	---
	Green	Lighting	The light changes to green from red when charging is completed.	
Scanning	Blue	Blinking	Shows a successful completion of scanning or data transmission.	<i>Trrr</i>
	Red		Shows a failure or error in data transmission.	<i>Pip</i>
	Green		Shows that the scanned data is being stored to the memory of the scanner.	<i>Pip</i>
Wireless Connection	Blue	Blinking	Shows that the scanner is making a connection to wireless communication line.	---
		Lighting	Shows a successful completion of making connection to wireless communication line.	<i>Trrr Pip</i>
	Red	Lighting	Shows a failure or error in making connection to wireless communication line.	<i>Pip Pip Pip</i>
Wireless Disconnected	Red	Lighting	Shows that the scanner has disconnected the wireless communication line.	<i>Trrr</i>
			Shows that the wireless communication is disconnected because the scanner is outside the communication range.	
Low Battery Level	Red	Blinking	Shows that the battery level is becoming very low. The scanner must be charged.	---

5. Electrical Specifications

5-1. Configuration

OPR-3101 consists of a laser scan engine, which converts scanned data into analog signals and outputs the data, a decode and communication section, which decodes the data and controls the system, a power supply section and an interface section.

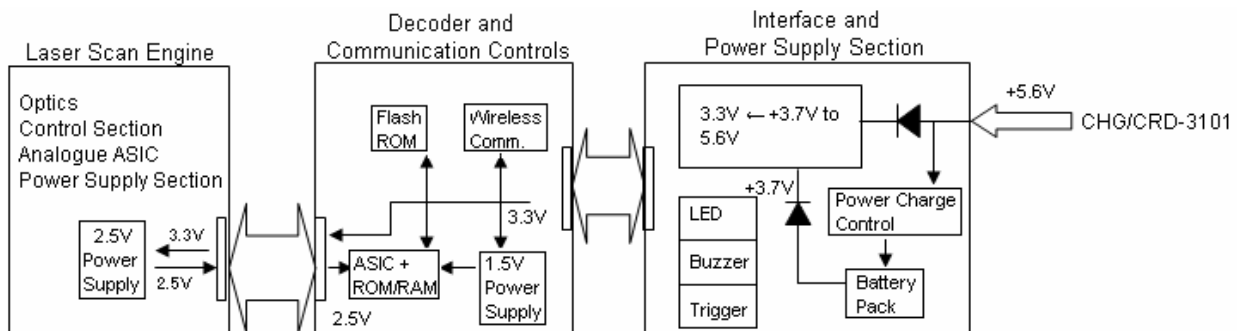


Figure 2: Configuration of OPR-3101

5-2. Current Consumption

Parameter	Specifications	Notes
Idle 1	30 mA (typ.)	Without connection to communication line.
Idle 2	35 mA (typ.)	With connection to communication line.
In Use (Ave.)	165 mA	When scanning, communicating, or lighting LEDs.
Maximum Consumption	220 mA	Maximum consumption in operating state.
Testing Conditions	- Power Supply Voltage: 3.7 V - Operating Temperature: 25 degrees C - Current consumption in operating state was measured while operating the scanner in test mode.	

5-3. Charging Current

<i>Parameter</i>	<i>Specification</i>	<i>Note</i>
CHG-3101 while Charging	500 mA or lower	AC adaptor (output: 6 V, 750 mA)
CRD-3101 while Charging	500 mA or lower	When connected to RS-232C (when using AC adaptor)
	200 mA or lower	When connected to USB. Bus power class: Hi-POWER / 500 mA Nominal charging current: 500 mA.
Testing Conditions	<ul style="list-style-type: none"> - Operating Temperature: 25 degrees C - Charging Temperature: 0 to 40 degrees C - Battery charging operation may be stopped when the scanner is charged at the temperature higher than 40 degrees C. - Battery charging operation may be stopped when the power supply voltage impressed to the charging terminals exceeds the range of 3 to 6 V. 	

Note: Model names of AC adaptors dedicated to CHG-3101 and CRD-3101.

- Model for OSE and OPTICON: GP-ACGN13T-K4-2
- Model for Japan and North America Market: GP-ACGN13U-K4-2

5-4. Battery Life and Charging Time

<i>Parameter</i>	<i>Specification</i>	<i>Note</i>
Battery Life	Idle 1	About 55 hours Without connection to communication line.
	Idle 2	About 48 hours With connection to communication line.
	In Use	About 25 hours Without connection to communication line and scanning once in every 5 seconds.
Charging Time	Charging Time 1	About 5 hours When using CHG-3101 or CRD-3101 and connected to RS-232C.
	Charging Time 2	About 10 hours When using CRD-3101 and connected to USB (bus power supply).

Note: Battery life may be shorter than specified above when the quality of the battery pack is degraded.

6. Optical Specifications

6-1. Laser Scanning Specification

<i>Parameter</i>	<i>Specification</i>	<i>Note</i>
Light-emitting Element	Red laser diode	
Emission Wavelength	650 ± 10 nm	at 25 degrees C
Light Output	≤ 1.0 mW	Class 2
Scan Method	Bi-directional	
Scan Rate	100±20 scan/sec	
Scan Angle	Scan Angle	54±5 deg
	Effective Scan Angle	44 (Min) deg

6-2. Laser Scanning Standard

6-2-1. Laser Scanning Tilt

Laser scanning tilt is the vertical difference between both ends of a laser scan line. Measure it in the middle of the laser scan line.

- Up to 1.2 degrees angle in vertical direction from the scan origin (mirror motor).
- Up to 3.1 mm at 150 mm from the scan origin.

6-2-2. Scanning Curvature

The maximum difference between the laser scan line and the line between both ends of the laser scan line. Measure it in the middle of the laser scan line.

- Up to 1.27 degrees angle in vertical direction from the scan origin (mirror motor).
- Up to 3.3 mm at 150 mm from the scan origin.

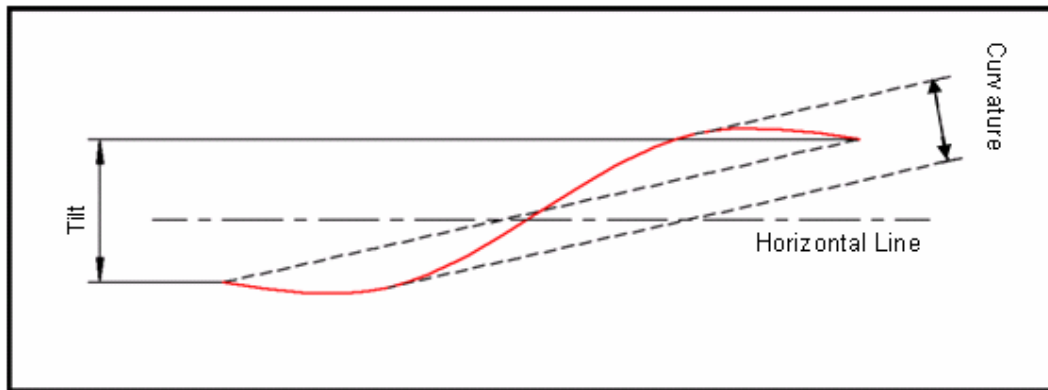


Figure 3: Laser Scanning Tilt and Curvature

7. Technical Specifications

The conditions for technical specifications are as follows, unless otherwise specified in each section.

Conditions

Ambient Temperature and Humidity	21 °C/70 °F, 60% RH
Ambient Light	500 to 900 lx
Background	Barcode = black, Space = white, Margin = white, Background of label = black
Power Supply Voltage	3.7 V
Decoding Test	Approve the performance when scanning is successful in all ten tests. (Scanning is deemed successful when completed in 0.5 second or less.)

7-1. Print Contrast Signal (PCS)

0.45 or higher (over 70% of reflectivity of space and quiet zone).

7-2. Depth of Field and Resolution

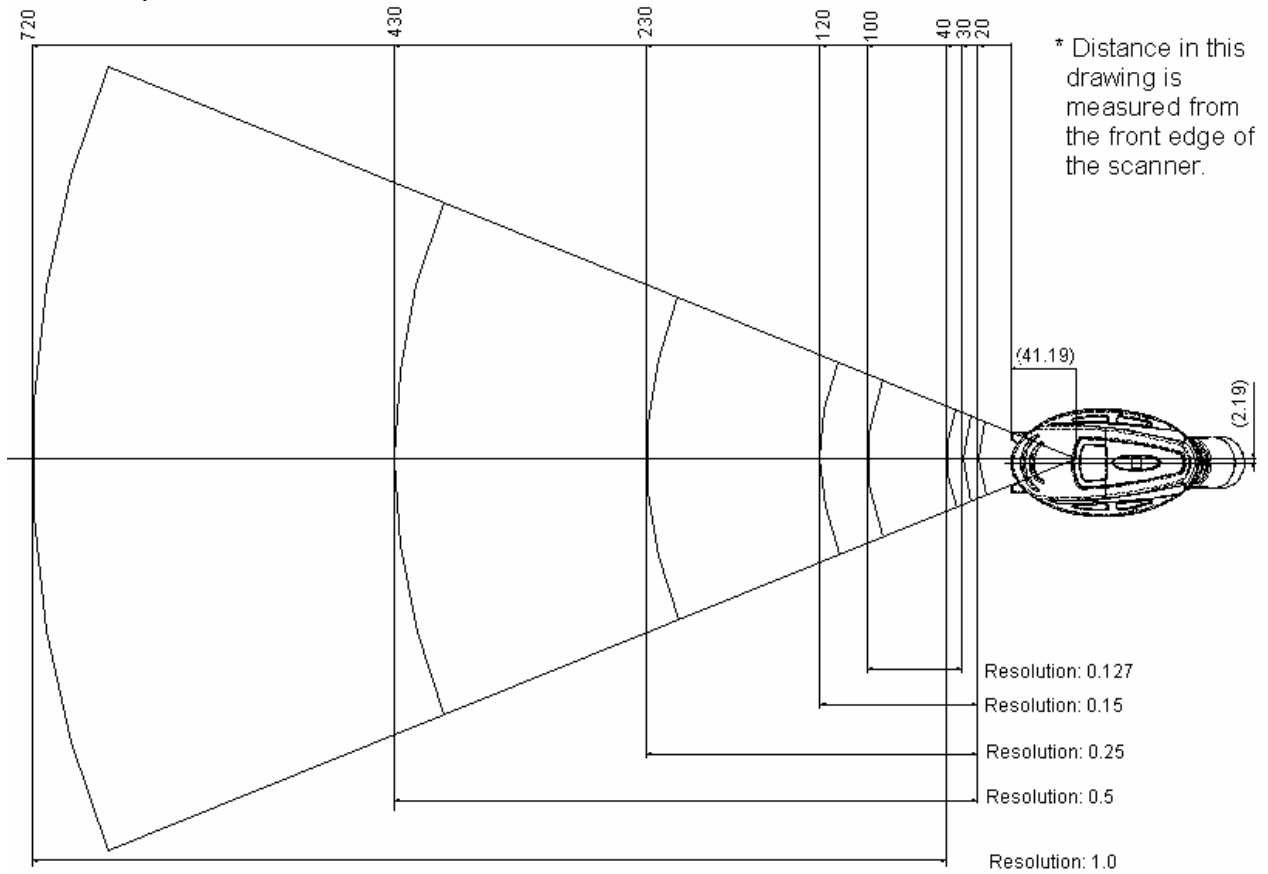


Figure 4: Depth of Field

Resolution	Symbology	PCS	Quiet Zone	Digits	Depth of Field
1.0 mm	Code 39	0.9	25 mm	1	40 to 720 mm
0.5 mm	Code 39	0.9	18 mm	3	20 to 430 mm
0.25 mm	Code 39	0.9	10 mm	8	20 to 230 mm
0.15 mm	Code 39	0.9	7 mm	10	20 to 120 mm
0.127 mm	Code 39	0.9	5 mm	4	30 to 100 mm

Conditions:

Barcode Sample: OPTOELECTRONICS Test Sample

N/W Ratio: 1:2.5

Angle: $\alpha = 0^\circ, \beta = 15^\circ, \gamma = 0^\circ$

Curvature: $R = \infty$

7-3. Pitch, Skew and Tilt

7-3-1. Pitch Angle

$\alpha \leq \pm 35^\circ$

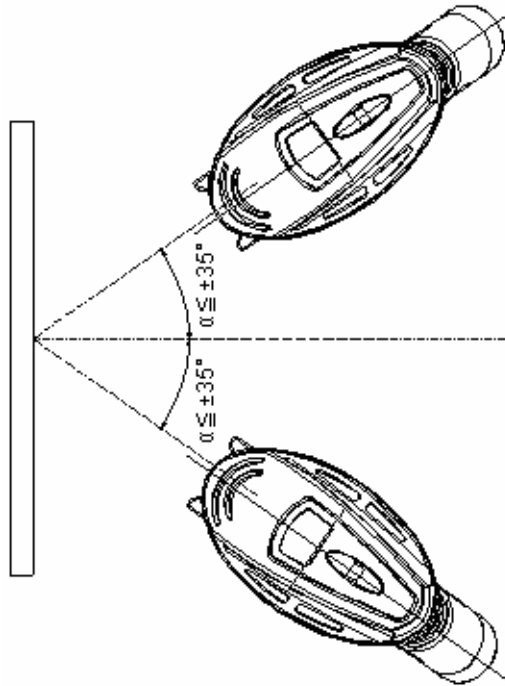


Figure 5: Pitch Angle

7-3-2. Skew Angle

$\beta \leq \pm 50^\circ$ (Excluding dead zone)

Dead Zone: $\beta \leq \pm 8^\circ$ (There are some areas in which decoding fails due to specular reflection.)

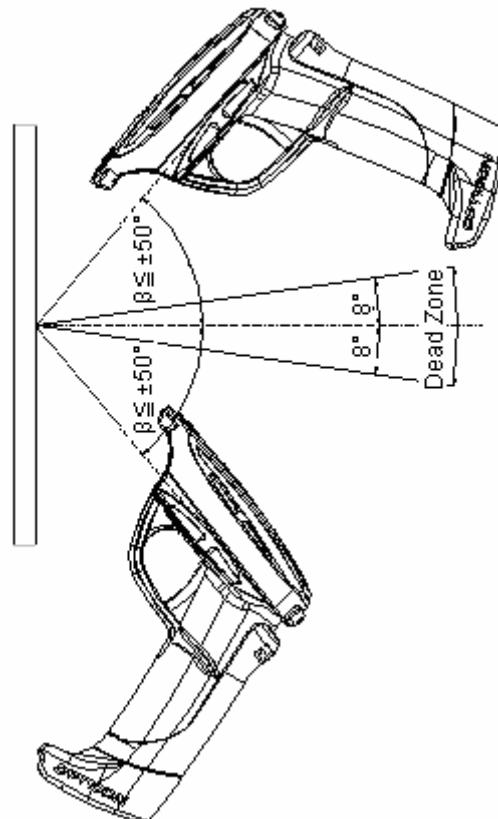


Figure 6: Skew Angle and Dead Zone

7-3-3. Tilt Angle
 $\gamma \leq \pm 20^\circ$

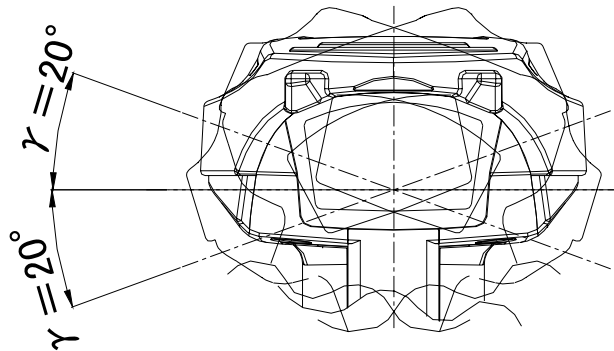


Figure 7: Tilt Angle

Conditions:

Barcode Sample: OPTOELECTRONICS Test Sample

Label: <Pitch Angle, Skew Angle, Dead Zone>
 PCS = 0.9, Resolution = 0.25 mm, Symbology = 9-digit Code-39,
 Quiet Zone = 10 mm, N/W Ratio = 1:2.5
 <Tile Angle>
 PCS = 0.9, Resolution = 0.26 mm, Symbology = 13-digit JAN,
 Quiet Zone = 10 mm

Distance: 60 mm from the edge of the scanner

Angle: <Pitch Angle > Skew Angle $\beta = +15^\circ$, Tilt Angle $\gamma = 0^\circ$
 <Tile Angle > Pitch Angle $\alpha = 0^\circ$, Skew Angle $\beta = +15^\circ$
 <Skew Angle, Dead Zone> Pitch Angle $\alpha = 0^\circ$, Tilt Angle $\gamma = 0^\circ$

Curvature: $R = \infty$

7-4. Curvature

With 8-digit JAN barcodes, decoding performance is guaranteed when $R \geq 15\text{mm}$.
 With 13-digit JAN barcodes, decoding performance is guaranteed when $R \geq 20\text{mm}$.

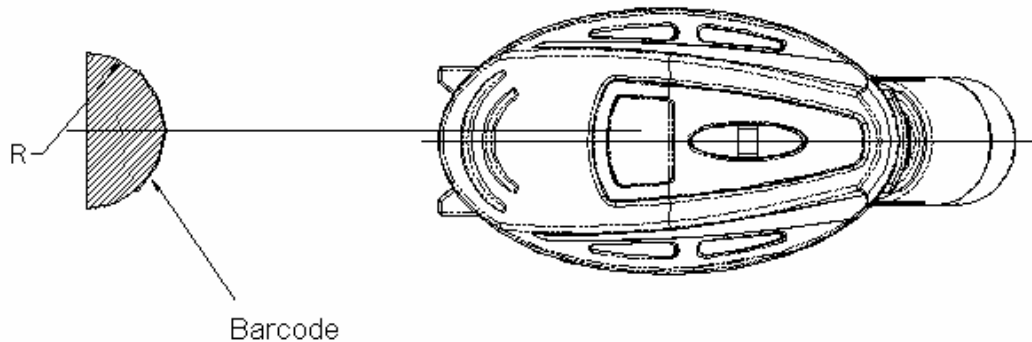


Figure 8: Curvature

Conditions:

Barcode Sample: OPTOELECTRONICS Test Sample

PCS = 0.9, Resolution = 0.26mm, 9-digit Code 39, Quiet Zone = 10mm

Distance: 60 mm from the edge of the scanner

Angle: Skew Angle $\beta = +15^\circ$

8. Wireless Connection

The wireless interface used by the OPR-3101 complies with Bluetooth Ver. 2.0. SPP (Serial Port Profile) is supported to enable OPR-3101 to communicate with other Bluetooth devices equipped with the same profile.

- Supported Protocol Stack
 - RF (Radio Frequency Protocol)
 - BB (Base Band Protocol)
 - LM (Link Manager Protocol)
 - L2CAP (Local Link Control and Adaptation Protocol)
 - RFCOMM (RS-232C Emulation)
- Supported Profile
 - GAP (Generic Access Profile)
 - SPP (Serial Port Profile)
- Connection Configuration
 - Connect one OPR-3101 to one host system
 - *Note: OPR-3101 does not support multiple channel communication.
- Operation Mode in Communication
 - Master: OPR-3101
 - Slave: CRD-3101 and other Bluetooth devices
- Low Power Mode
 - Sniff mode is not supported.
- Security and Encryption
 - Security and encryption settings are available.
- Communication Range
 - Approximately 10 meters.
 - *Note: The communication range of OPR-3101 may differ depending on the environmental conditions. Especially, when there is an obstacle between the OPR-3101 and host, the communication range of OPR-3101 may be shortened.

9. Default Settings

The OPR-3101 units are set to the following default settings [SO] at the time of shipment.

Default Setting 1: Readable Codes

Code type	Reading	Transmit code length	Transmit CD	Calculate CD	Prefix settings	Suffix settings	Transmit others
UPC-A	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>	---	CR	
UPC-A Add-on	X	X	<input type="checkbox"/>	<input type="checkbox"/>	---	CR	
UPC-E	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>	---	CR	
UPC-E Add-on	X	X	<input type="checkbox"/>	<input type="checkbox"/>	---	CR	
EAN-13	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>	---	CR	
EAN-13 Add-on	X	X	<input type="checkbox"/>	<input type="checkbox"/>	---	CR	
EAN-8	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>	---	CR	
EAN-8 Add-on	X	X	<input type="checkbox"/>	<input type="checkbox"/>	---	CR	
Code 39	<input type="checkbox"/>	X	<input type="checkbox"/>	X	---	CR	Not transmit ST/SP
Code 39 Trioptic	<input type="checkbox"/>	X	---	---	---	CR	Not transmit ST/SP
NW-7(Codabar)	<input type="checkbox"/>	X	<input type="checkbox"/>	X	---	CR	Not transmit ST/SP
Industrial2of5	<input type="checkbox"/>	X	<input type="checkbox"/>	X	---	CR	
Interleaved2of5	<input type="checkbox"/>	X	<input type="checkbox"/>	X	---	CR	
Code 93	<input type="checkbox"/>	X	X	<input type="checkbox"/>	---	CR	
Code 128	<input type="checkbox"/>	X	X	<input type="checkbox"/>	---	CR	
EAN-128	X	X	X	<input type="checkbox"/>	---	CR	
S-Code	<input type="checkbox"/>	X	<input type="checkbox"/>	X	---	CR	
MSI/Plessey	<input type="checkbox"/>	X	<input type="checkbox"/> CD1	<input type="checkbox"/> CD1	---	CR	
UK/Plessey	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>	---	CR	
Telepen	<input type="checkbox"/>	X	X	<input type="checkbox"/>	---	CR	
Matrix2of5	X	X	<input type="checkbox"/>	X	---	CR	
Chinese Post Matrix2of5	X	X	<input type="checkbox"/>	X	---	CR	
IATA	<input type="checkbox"/>	X	<input type="checkbox"/>	X	---	CR	
RSS-14	X	X	<input type="checkbox"/>	<input type="checkbox"/>	---	CR	
RSS-limited	X	X	<input type="checkbox"/>	<input type="checkbox"/>	---	CR	
RSS-expanded	X	X	<input type="checkbox"/>	<input type="checkbox"/>	---	CR	
PDF417	X	X	---	---	---	CR	
MicroPDF417	X	X	---	---	---	CR	
Code 11	X	X	X	<input type="checkbox"/>	---	CR	
Korean Postal Code (Code 3of5)	X	X	X	<input type="checkbox"/>	---	CR	

Notes:

- 1) In the Reading column, “” means Enable Reading and “X” means Disable Reading.
- 2) In the Transmit Code Length column, “” means Transmit Code Length and “X” means “Do Not Transmit Code Length.”
- 3) In the Transmit CD column, “” means Transmit Check Digit and “X” means Do Not Transmit Check Digit.
- 4) In the Calculate CD column, “” means Calculate Check Digit and “X” means Do Not Calculate Check Digit.
- 5) In the Prefix Settings column, “” means No Prefix Setting.

Default Setting 2: Read options, trigger options and buzzer options

Item	Default Setting
Setting the number of characters	Fixed length OFF all codes
Read mode	Single read
Multiple read reset time	500 msec
Add-on wait mode	500 msec
Multiple read	Disable multiple read
Multiple columns read	Disable multiple columns read
Redundancy ^{*1}	Read 1 time, redundancy = 0
Trigger switch	Enable trigger
Trigger repeat	Disable trigger repeat
Auto trigger	Disable auto trigger
Read time	2 seconds
Margin check	Margin check normal
Buzzer durations	50 msec
Buzzer tone	3 kHz (single tone)
Buzzer loudness	Maximum
Buzzer timing	Buzzer before transmission
Startup buzzer	Enable startup buzzer
Indicator duration	200 msec

*1: Redundancy

The following codes will be set to “read 2 times, redundancy = 1” when the number of digits are less than following:

Code	Digits
Code 39	5 and less
NW-7(Codabar)	All
IATA	8 and less
Industrial2of5	8 and less
Interleaved2of5	8 and less
MSI/Plessey	4 and less
Code 11	5 and less

Default Setting 3-1: Wireless options

Item		Setting
Wireless Options	Default Bluetooth connection	RS-232C cradle connection
	Data memorizing	Disabled
	Trigger connection options	Disabled
	Press trigger switch time to connect	Disabled
	Press trigger switch time to disconnect	Disabled
	Auto disconnect	Disabled
	Auto reconnect	5 minutes
	ACK/NAK	No response
	ACK/NAK timeout	100 ms
	PIN-code label	4 last digits of Bluetooth device address
Bluetooth Options	Bluetooth address auto connect	Enabled
	Authentication	Enabled (automatically done)
	Encryption	Enabled

- * The default interface between the CRD-3101 and host is set to RS-232C.
- * When using USB connection between the CRD-3101 and host, connection must be made to the USB-HID of the cradle.
- * Do not connect to [CNPC] when using OPR-3101 and CRD-3101.

Default Setting 3-2: Settings to connect the CRD-3101 to host via RS-232C (cabled)

Item	Setting
Baud rate	9600 bps
Parity bit	No parity
Data length	8 bits
Stop bit	1 bit
Handshaking	No handshake
ACK/NAK	No ACK/NAK
Flow Control time out	Indefinitely
Intercharacter delay	No delay

Default Setting 3-3: Settings to connect the CRD-3101 to host via USB (cabled)

Item	Setting
Keyboard language	USA
Key code output	Full key code
Caps Lock Control	No Caps Lock
Intercharacter delay	No delay

10. Serial Label, Serial No., Regulations

10-1. Serial Label

These labels shown below are affixed to the scanner.

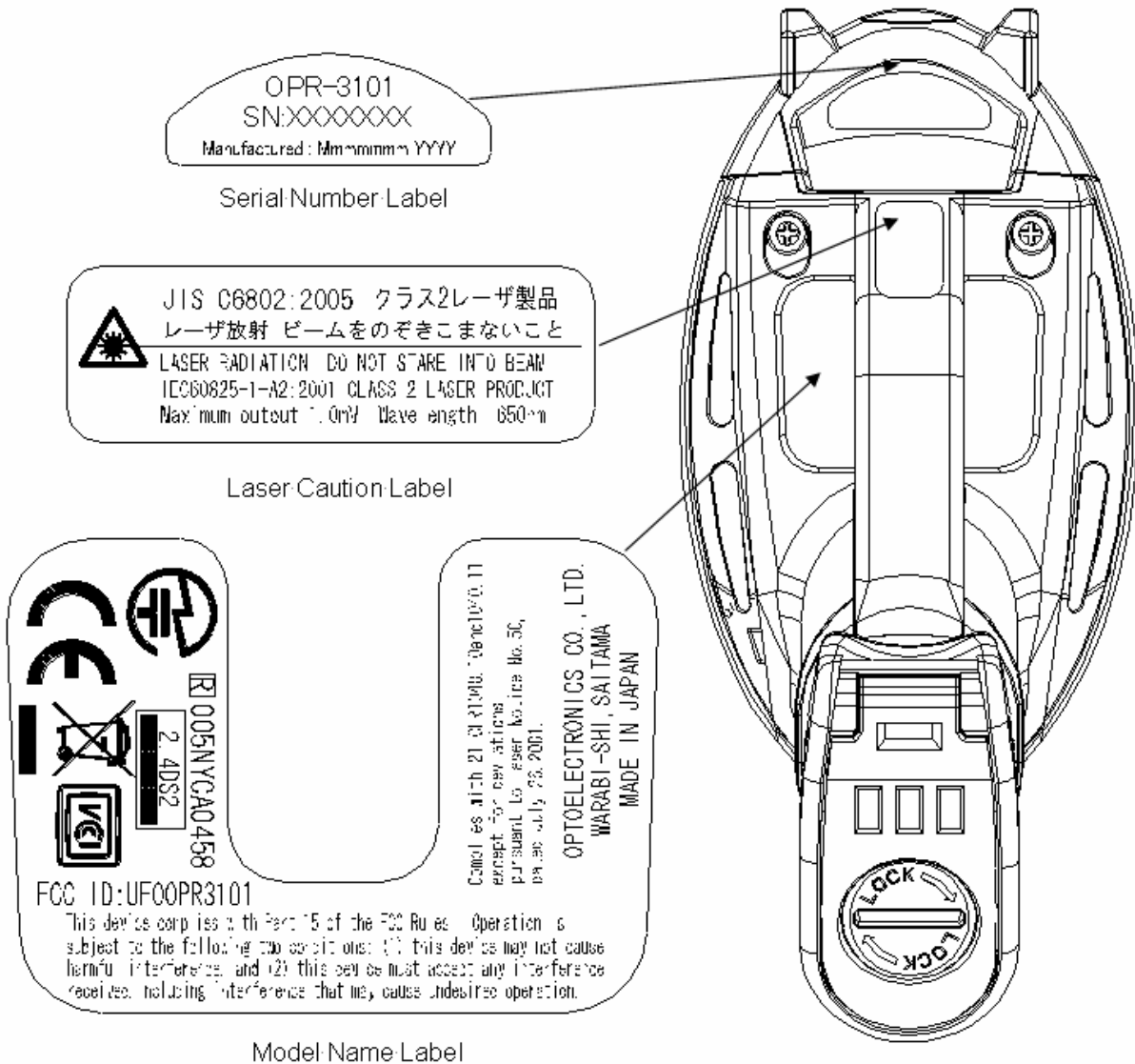


Figure 9: Product Labels

- Serial Number Label: Product name, serial number and date of manufacture
- Laser Caution Label: This product is a laser class 2 product.
- Model Name Label: Information of all the certifications, logos and ID numbers

10-2. Accessories

The following items are packaged with OPR-3101 at the time of shipment.

- User's manual
- Designated battery pack (1UR18500F-OEL)

11. Packaging Specifications

Put the OPR-3101 and the battery pack in separate protective plastic bags and put them into an individual packaging box. 20 individual boxes can be contained in a collective packaging box.

Note: The "Ro" mark on inner and outer packaging is to notify that this product does not use any material, components, or parts which are restricted under RoHs. However, this document does not have any legal weight in EU.

11-1. Individual Packaging Specifications

Dimensions: 246 x 156 x 83 (mm)

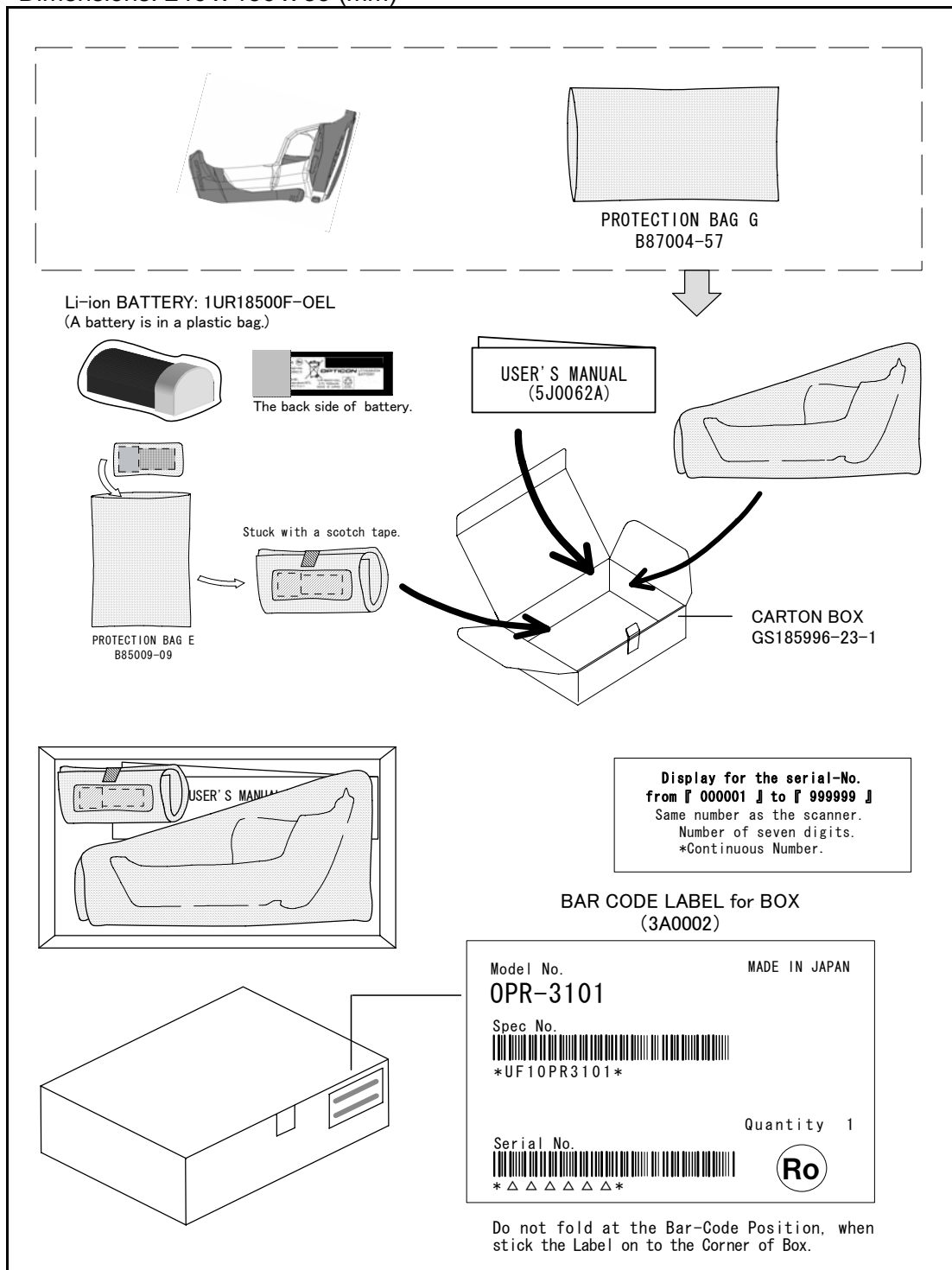
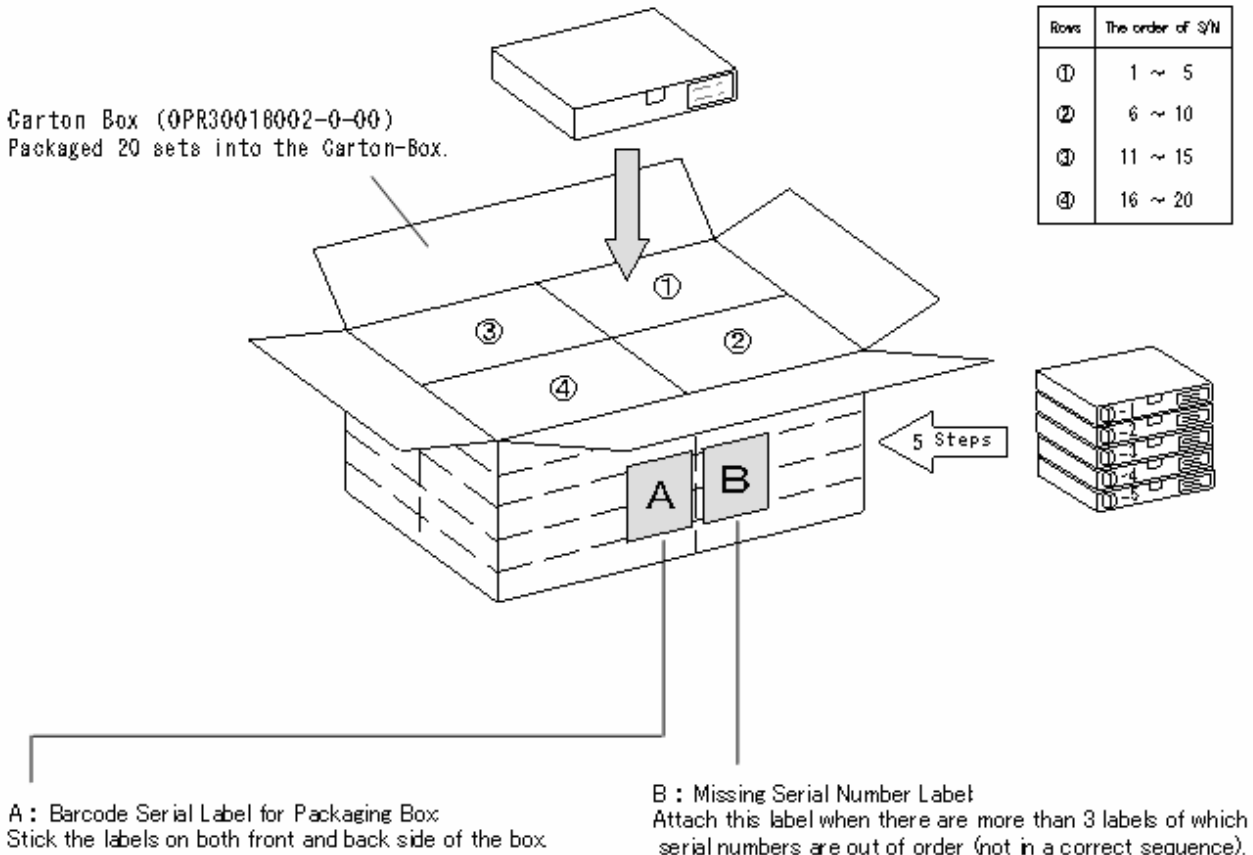


Figure 10: Individual Packaging Specifications


11-2. Collective Packaging Specifications
 Dimensions: 507 x 324 x 435 (mm)
 Internal Dimensions: 497 x 317 x 417 (mm)



(3C0006)

UNIVERSAL C/No. $\triangle\triangle$
 MADE IN JAPAN


Product OPR-3101



PD# 
 * $\triangle\triangle\triangle\triangle\triangle\triangle$ *


Spec#JPN 
 UF10PR3101

Spec#EUR

Q'ty  S/N (from) 
 * $\triangle\triangle$ *

$\triangle\triangle/\triangle\triangle\triangle$ S/N (to) 
 *000 $\triangle\triangle\triangle$ *

Missing Serial Number	Missing Q'ty \triangle
1	 * $\triangle\triangle\triangle\triangle\triangle\triangle$ *
2	 * $\triangle\triangle\triangle\triangle\triangle\triangle$ *










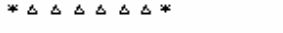
ROM-Ver. TMO3Y $\triangle\triangle$ 

Shipping Date 2007/ $\triangle\triangle$ / $\triangle\triangle$

OPTO ELECTRONICS Co., Ltd.

(3C0007)

UNIVERSAL C/No. $\triangle\triangle$
 MADE IN JAPAN

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3	 * $\triangle\triangle\triangle\triangle\triangle\triangle$ *
4	 * $\triangle\triangle\triangle\triangle\triangle\triangle$ *
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8	 * $\triangle\triangle\triangle\triangle\triangle\triangle$ *
9	 * $\triangle\triangle\triangle\triangle\triangle\triangle$ *
10	 * $\triangle\triangle\triangle\triangle\triangle\triangle$ *
11	 * $\triangle\triangle\triangle\triangle\triangle\triangle$ *
12	 * $\triangle\triangle\triangle\triangle\triangle\triangle$ *

OPTO ELECTRONICS Co., Ltd.

Figure 11: Collective Packaging Specifications

12. Environmental Specifications

12-1. Operating Temperature and Humidity

-10 to 60 degrees C (0 to 40 degrees C while charging the battery)
 5 to 95 % RH (non condensing)

* Battery charging operation may be stopped when the scanner is charged at the temperature higher than 40 degrees C.

12-2. Storage Temperature and Humidity

-20 to 60 degrees C
 5 to 95 % RH (non condensing)

12-3. Ambient Light Immunity

The scanning performance is guaranteed when the range of luminance on a barcode surface is between zero and the following values.

Incandescent Light	4,000 lx
Fluorescent Light	4,000 lx
Sunlight	80,000 lx

Conditions:

Barcode Sample: OPTOELECTRONICS Test Sample
 PCS = 0.9, Resolution = 0.25mm, Symbology = 9-digit Code-39,
 Quiet Zone = 10mm, N/W Ratio = 1:2.5

Distance: 100 mm from the edge of the scanner

Angle: $\alpha = 0^\circ$, $\beta = 15^\circ$, $\gamma = 0^\circ$

Curvature: $R = \infty$

Power Supply Voltage: 3.7 V

Direct light or specular reflection light from a source should be prevented from entering the acceptance area.

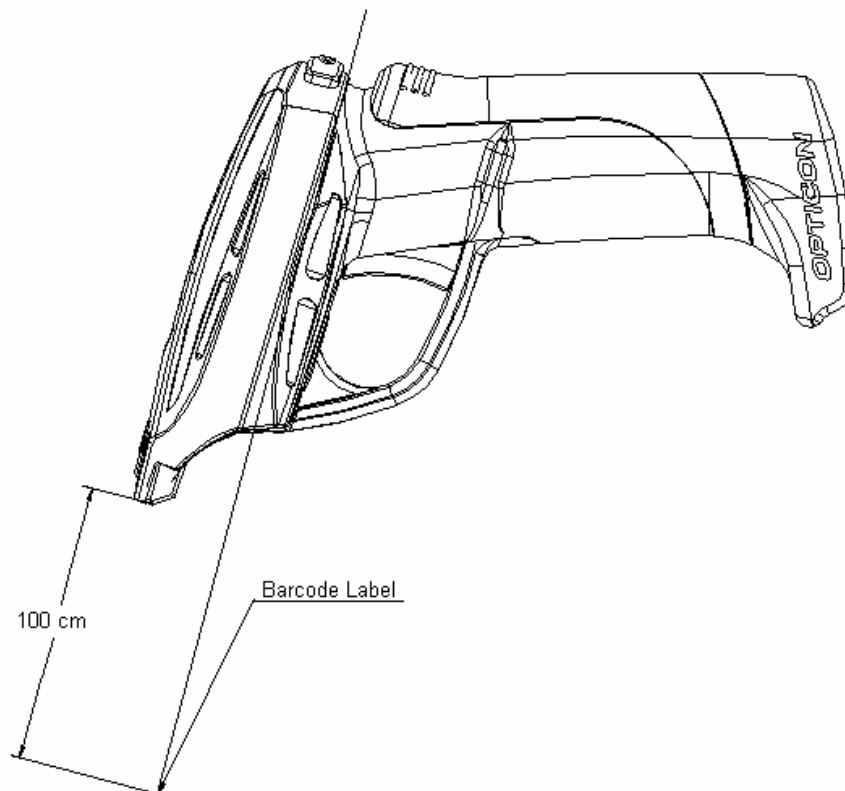


Figure 12: Ambient Light Immunity

12-4. Dust and Drip proof

OPR-3101 complies with IEC IP-54

12-5. Electrical Characteristics

- Withstand Voltage: AC 1500 V/ per 60 seconds, 10mA or less
- Insulation Resistance: DC 500 V, 2 MΩ or higher
- Current Leakage: 250 μA or less / AC 250 V 60 Hz
- Power Line Noise Immunity: ± 1kV and higher
- Static Electricity Noise Immunity:
 - No destruction found: ± 15kV (air or direct discharge)
 - No malfunction found: ± 8kV (air or direct discharge), ±6kV (contact, direct or indirect discharge)

Note: Testing method complies with IEC-61000-4-2.

12-6. Drop Test

No defect occurred to the scanner after the following drop test.

Drop Test: Drop the scanner from the height of 200 cm on to the concrete floor (three times in each of 6 angles).

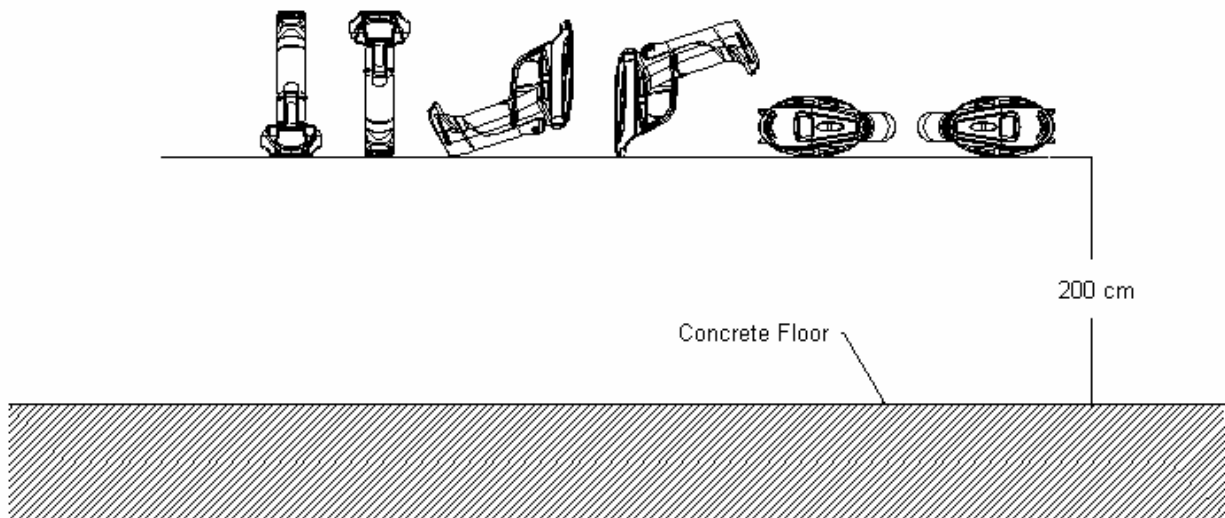


Figure 13: Drop Test

12-7. Drop Test (with individual packaging)

No defect occurred to the scanner after the following drop test.

Drop Test: Drop an individually packaged scanner from a height of 150 cm onto a concrete floor once on its 1 corner, 3 edges and 6 sides. (10 drop tests in total.)

12-8. Vibration Test

No malfunctions occurred to scanner's performances after the following vibration test.

Vibration Test: Put the scanner in non-operating state. Increase the frequency of the vibration from 10 to 100 Hz with accelerated velocity 19.6m/S^2 (2G) and sweep for 6 minutes. Repeat this routine for 10 times in each X, Y, Z direction (total hours of vibration test: 180 minutes).

13. Reliability

MTBF: 48,000 hours (OPR-3101 excluding its laser scan engine)
10,000 hours (laser scan engine used for OPR-3101)

Note: Foregoing MTBF values are calculated based on the idea of operating OPR-3101 in guaranteed environments without subjecting it to electric or mechanical shocks.

Note: Foregoing MTBF values does not include the average MTBF of the battery pack used for OPR-3101.

14. Warranty

14-1. Warranty period

OPTOELECTRONICS Co., Ltd. warrants that this product is free of defects or malfunctions for a period of twelve (12) months from its shipment. In case of having defects or malfunctions caused by normal usage in accordance with this specification during the foregoing warranty period, OPTOELECTRONICS shall repair or adjust the product free of charge.

Any repair or replacement of the product after the foregoing warranty period shall be charged at regular repair rates.

If defects or malfunctions were caused by customer mishandling, product repairs or replacement will be charged at regular repair rates, even during the foregoing warranty period.

14-2. Delivery

Products for maintenance or repair shall be sent back to OPTOELECTRONICS. The sender is responsible for all shipping costs.

14-3. Repair Timeframe

Repaired products shall be shipped back to the customer within 20 days after acceptance by OPTOELECTRONICS.

Expedited repairs may be available, subject to terms agreed to by OPTOELECTRONICS and the customer.

14-4. Maintenance Period

The maintenance period of this product is 5 years after its shipment.

OPTOELECTRONICS may discontinue maintenance for this product during the 5-year maintenance period if a satisfactory replacement product or maintenance solution is agreed to.

14-5. Other

Any additional warranty issues must be discussed with OPTOELECTRONICS on a case-by-case basis.

15. Regulatory Compliance

15-1. Laser Safety

JIS C 6802:2005 Class 2

IEC 60825-1+A:2001 Class 2

15-2. Product Safety

EN60950-1:2001/IEC60950-1:2001

15-3. EMC

EN55022/EN55024

FCC Part 15 Subpart C

This device complies with part 15 of the FCC Rules. Operation is subject To the following two conditions: (1) this device may not cause harmful Interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

VCCI Class B

This is a Class B product, to be used in a domestic environment, based on the Technical Requirement of the Voluntary Control Council for Interference from Information Technology Equipment (VCCI). If this is used near a radio or television receiver in a domestic environment, it may cause radio interference.

15-4. Others

Certification for Construction Design of Specified Radio Equipment

Bluetooth Logo Certification

16. Reduction of Environmental Loads

OPR-3101 complies with RoHS

RoHS: The restriction of the use of certain hazardous substances in electrical and electronic equipment, 2002/95/EC.

17. Precautions



17-1. Laser-related Caution

- Please do not look directly at the laser.
- Please do not point the laser at others' eyes.
- Please do not look directly at the beam of optical instruments.

These things have the potential to damage your eyes.

17-2. Handling

Handle this product carefully. Do not subject it to any of the following:

17-2-1. Shock

- Do not drop this device from a height greater than specified in this manual.
- Do not swing around the scanner.

17-2-2. Temperature Conditions

- Do not use the device at temperatures outside the specified range.
- Do not pour boiling water on the device.
- Do not expose the device to open flame.

17-2-3. Foreign Materials

- Do not put the device in water.
- Do not expose the device to chemicals.

17-2-4. Other

- Do not disassemble this product.
- Do not use the scanner near a radio or a TV. It may cause reception problems.
- The scanner may not perform properly when subjected to excessive static electricity..
- The scanner may not perform properly in environments when placed near a flickering light, such as a CRT (computer monitor, television, etc.).
- Do not rotate the battery cover with extreme force when fastening it.

17-3. Precautions on Radio Equipment

OPTOELECTRONICS has received Certification for Construction Design of Specified Radio Equipment for OPR-3101. Therefore, it is not necessary to acquire license of radio stations for its use in Japan.

Followings are prohibited under law.

- Modify or disassemble this product.
- Peel off the certification label from this product.

Do not use this product for following devices or in the following conditions:

- Safety device or medical equipment developed to protect human body.
- Environment where the outstanding damages may be caused to this scanner.

17-4. Export Administration Regulations

This product is subject to the strategically controlled exports regulated under "Foreign Exchange and Foreign Trade Laws". Therefore, export of this product may require an export permission of Japanese government.

17-5. Bluetooth

- Bluetooth is trademark owned by Bluetooth SIG, Inc., U.S.A. and licensed to

OPTOELECTRONICS.

- OPR-3101 supports Bluetooth wireless communication with other Bluetooth device which has the same profile.
- OPR-3101 complies with Bluetooth Ver. 2.0. However, its communication performance with equipments other than cradles or devices stated in this manual is not guaranteed.
- The frequency band (2.4 GHz) which is used by Bluetooth devices is also used by miscellaneous other equipments. The baud rate or the communication range of OPR-3101 may be degraded by the negative impacts of those other equipment.
- The baud rate or the communication range of OPR-3101 may be degraded by obstacles, radio wave conditions or the state of the device which OPR-3101 is communicating with.
- Communication performance of OPR-3101 may be degraded when there is a metal item extremely close to the back of the scanner.
- Expected interference distance is within 20 cm.

17-6. Frequency Band

The frequency band of 2.4 GHz is utilized by this scanner. Read carefully the followings before using this product.

In the frequency band of this scanner, scientific, medical and industrial devices including microwaves are used. Also other radio stations including local private radio station for mobile object identification requiring license for such as manufacturing lines at factories, specific power-saving radio station requiring no license and amatuer radio station are managed.

- Please make sure that “other radio stations” are not operated in the frequency band of 2.4 GHz before using this scanner.
- In case that radio interference occurs between this scanner and “other radio stations,” change the service space immediately, or stop transmitting radiowave to avoid the interference.
- If you have any questions or troubles, please contact our marketing group.

This information is subject to change without prior notice.

18. Auto Trigger

The OPR-3101 has optional read options stated as follows:

- (1) Manual mode: Press trigger key and scanning operation starts
- (2) Multiple read mode: Scanner will stay ON for a time as set and scanning can be done without pressing the trigger key.
- (3) Auto trigger mode: Scanner starts barcode reading automatically by using sensor detection. When enabling auto trigger, laser beam is emitted and points the auto trigger area. The scanner starts barcode reading after detecting reflection from the surface when the auto trigger is used.

Auto trigger distance is up to 40 mm from the edge of the scanner.

CONDITIONS:

Moving Speed:	100±10mm/s (the moving direction is not specified)
Angle:	Skew Angle excluding Pitch Angle and Dead Zone specified in 7-3. <i>Pitch, Skew and Tilt.</i>
Environmental Temperature and Humidity:	Room temperature and humidity
Environmental Illuminance:	500 to 900 lx
Conditions for the auto trigger:	1. Barcode sheet: OPTOELECTRONICS Test Sheet (white) Background: OPTOELECTRONICS Test Sheet (black) 2. Barcode sheet: OPTOELECTRONICS Test Sheet (black) Background: OPTOELECTRONICS Test Sheet (white)

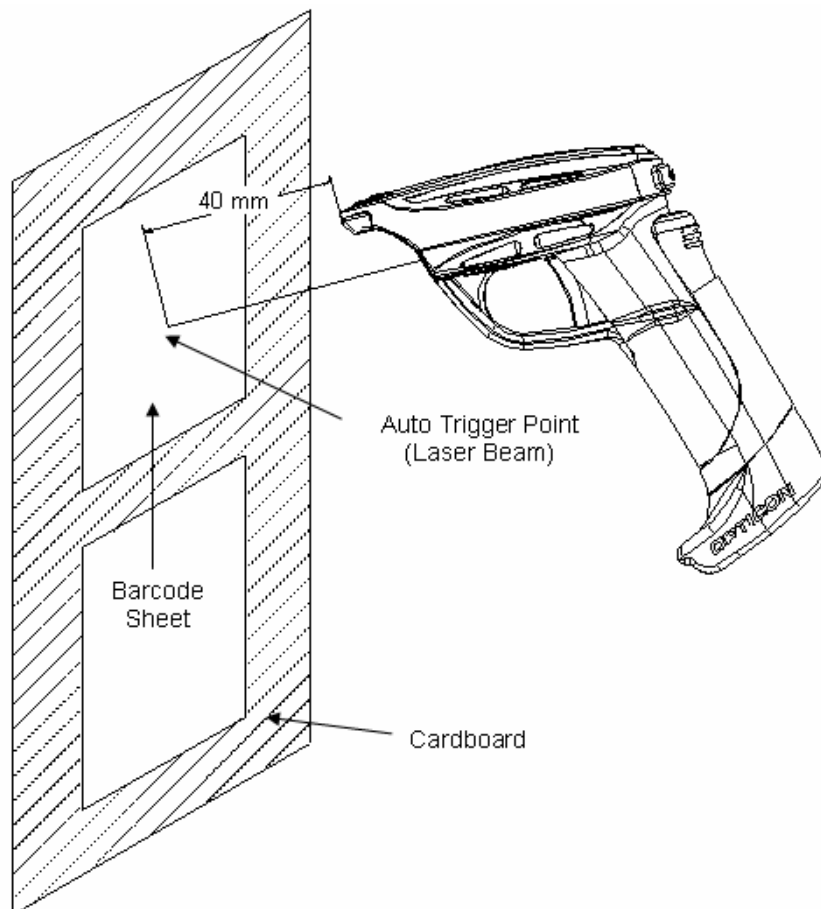


Figure 14: Auto Trigger Operation

Appendix: Mechanical Drawings

Dimensions: 165 (H) x 68 (W) x 155 (D)
(Excluding boss)

(millimeters)

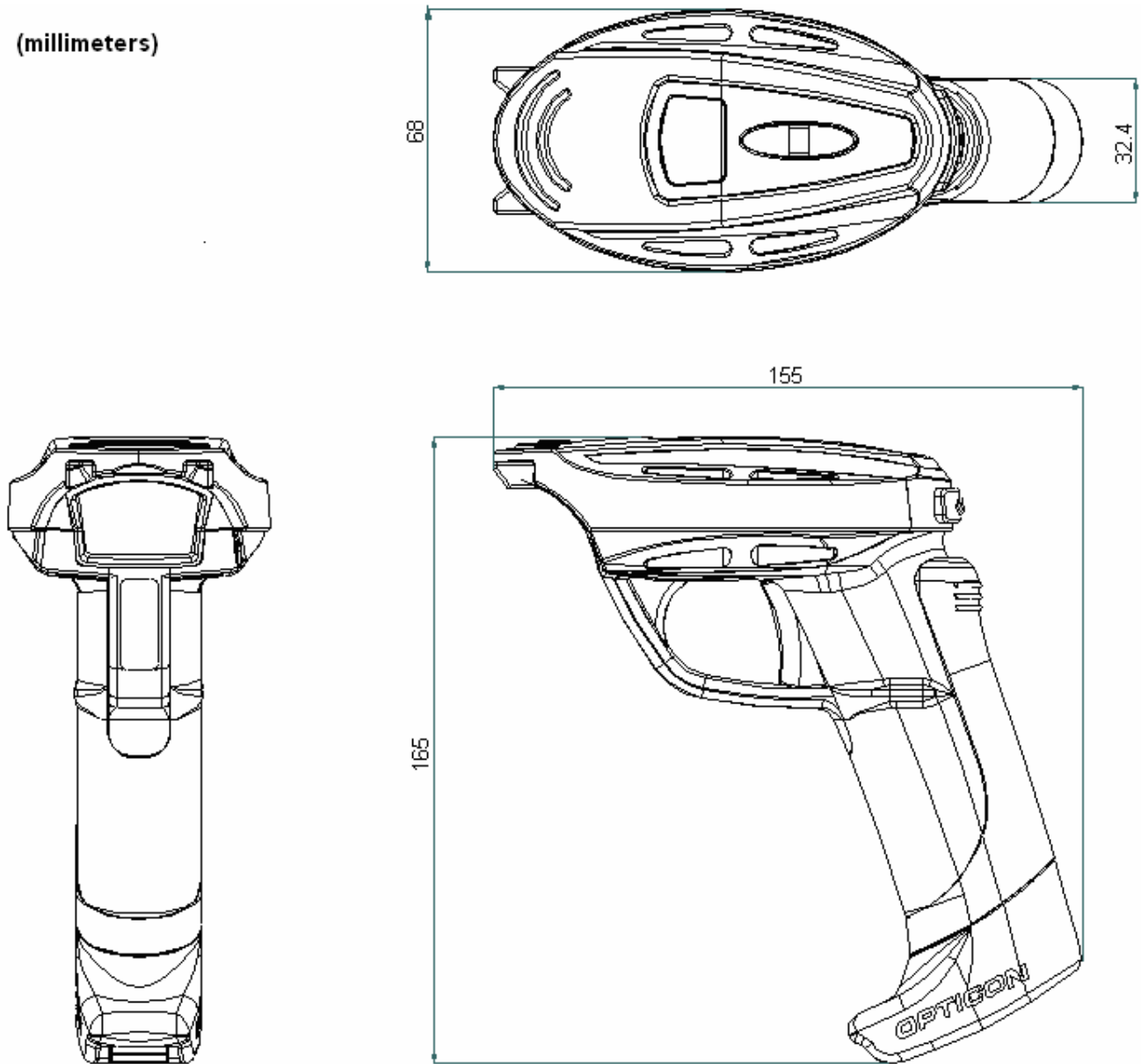


Figure 15: Mechanical Drawings