

OPTICON

Wireless Handheld 2D Scanner

OPI-3301



This manual provides specifications for the OPI-3301 rugged handheld 1D/2D imager scanner with auto-focus.

Specifications Manual

All information subject to change without notice.

Document History

Model Number:	OPI-3301	Specification Number:	SS11012
Edition:	1st	Original Spec Number:	SS10037
Date:	2011-07-15		

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Revision History

Specification No. : SS11012
Product name : OPI-3301

Edition	Date	Page	Section	Description of Changes
First	2011/07/15	-	-	Initial release

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1. Abstract

This manual provides specifications for the OPI-3301 rugged wireless handheld 1D/2D imager scanner.

2. Overview

The OPI-3301 scanner enables data transmission of linear (1D) and 2D symbologies using Bluetooth wireless technology. Main features of the OPI-3301 are as follows:

- High-speed scanning
A custom high-speed / high-sensitive CMOS image sensor with a maximum frame rate of 80 fps and the fastest shutter speed in the industry enable high speed scanning without being affected by hand movement.
- Auto-focus
Focus adjustment function using liquid lens enables reading of high resolution codes and long depth of field.
- Antimicrobial coating
Special antimicrobial treatment is applied to chassis, and alcohol can be used to wipe the scanner clean (except for the scanning window).
- Bluetooth interface
The specification of transmission output Class 2 enables communication range of approximately 10 meters.
- Full charge in 3 hours with a dedicated cradle
A communication cradle CRD-3301 with charging function can fully charge the OPI-3301 in 3 hours (it takes 6 hours with USB bus power).
- Wide range of supported symbologies
1D bar codes: WPC (EAN, JAN, UPC-A/UPC-E), Industrial 2 of 5, IATA, Interleaved 2 of 5, Codabar (NW-7), Code 39, Code 93, Code 128, MSI/Plessey, RSS codes are supported.
2D codes: PDF417, MicroPDF417, QR Code, Micro QR Code, DataMatrix (ECC 0 - 140 / ECC 200), MaxiCode (Modes 0 ~ 5), Aztec Code, Composite codes are supported.
For details, refer to Chapter 9 "Default Settings"
- RoHS compliance
The OPI-3301 is a RoHS compliant product, which is declared by Optoelectronics Co., Ltd.

3. Basic Specifications

Item		Specification		Note	
Control Section	ASIC	OEY-0603		CPU: ARM-1026EJ-S Core: 160 MHz	
	SDRAM	128 Mbits (1 M × 4 Banks × 32 Bits)		SDCLK: 80 MHz	
	Flash ROM	16 Mbits (1 M × 16 Bits) Flash Memory			
Wireless Section	Frequency	2402 MHz ~ 2480 MHz			
	Specification	Bluetooth V2.0 compliant			
	Transmission output	Class 2 (up to 4 dBm)			
	Communication distance	10 meters		It may be shorter depending on usage environment	
	Profile	SPP			
	Antenna	1/4λ surface-mount type			
Optical Section	Scanning method	SXGA (1.3-million-pixel) CMOS area sensor		Frame rate: 80 fps (fastest)	
	Scanning light source	InGaAIP 1 red LED			
	Effective pixels	0.46 million pixels (H: 900 x V: 512)			
	View angle	Horizontal: about 40° Vertical: about 23°			
Supported 1D Symbolologies	Symbologies	UPC-A, UPC-A Add-on, UPC-E, UPC-E Add-on, EAN-13, EAN-13 Add-on, EAN-8, EAN-8 Add-on, JAN-8, JAN-13, Code 39, Tri-Optic, Codabar (NW-7), Industrial 2 of 5, Interleaved 2 of 5, Code 93, Code 128, EAN-128, S-Code, MSI/Plessey, UK/Plessey, TELEPEN, Matrix 2 of 5, Chinese Post Matrix 2 of 5, IATA, Code 11, Korean Postal Authority code, GS1 DataBar, Postal Code		The GS1 DataBar is formerly called "RSS".	
	Minimum resolution	Code 39 : 0.0762 mm		PCS 0.9	
	Curvature	Radius ≥ 15 mm (8-digit JAN) Radius ≥ 20 mm (13-digit JAN)		PCS 0.9	
	Depth of field (mm)	Code 39	Resolution (0.127)	15 ~ 55	PCS 0.9
			Resolution (0.254)	15 ~ 200	
Resolution (1.0)			90 ~ 870		
Supported 2D Symbolologies	Symbologies	PDF417, MicroPDF417, QR Code , Micro QR Code, DataMatrix (ECC 0 - 140 / ECC 200), MaxiCode (Modes 2 to 5) , Aztec Code , EAN.UCC Composite bar code , Codablock F		Disable Code 128 when Codablock F is active.	
	Minimum resolution (mm)	QR Code:0.127 mm DataMatrix: 0.169 mm		PCS 0.9	
	Depth of field (mm)	PDF417	Resolution (0.127)	15 ~ 70	PCS 0.9
			Resolution (0.254)	20 ~ 210	
		QR Code	Resolution (0.339)	15 ~ 170	
		DataMatrix	Resolution (0.169)	15 ~ 40	
			Resolution (0.339)	15 ~ 100	
Micro QR	Resolution (0.212)	15 ~ 65			

Item		Specification	Note	
1/2 D Common	Scan angle	Pitch: $\pm 40^\circ$ (Skew $\beta = +15^\circ$)	Code: Code 39 Resolution: 0.254 mm Distance: 100 mm from the edge of the scanner *Curvature $R = \infty$	
		Skew: $\pm 50^\circ$		
Tilt: $\pm 180^\circ$ (Skew $\beta = +15^\circ$)				
*There are some areas in which scanning fails due to specular reflection.				
	Minimum PCS	0.45 or more	MRD: 32% or more	
Environmental Specifications	Temperature	Operating	-20 ~ 50°C	AC adapter: 0 ~ 40°C
		Storage	-25 ~ 60°C	
	Humidity	Operating	5 ~ 85% (no condensing, no frost)	
		Storage	5 ~ 85% (no condensing, no frost)	
	Ambient light immunity	Fluorescent	10,000 lx or less	Code 39 (Resolution: 0.25 mm) Optical axis angle: 75° DOF: 100 mm
		Sunlight	100,000 lx or less	
	Dust and drip proof		IP42	
Vibration		Increase the frequency of vibration from 10 Hz to 100 Hz at an accelerated velocity of 19.6 m/s ² (2G) for 60 minutes each in X, Y and Z-direction.		
Drop		Drop 3 times (18 times in total), at each 6 face, from a height of 150 cm onto a concrete surface.		
Regulatory (*)	LED safety		IEC 62471:2006 Exempt Risk Group	
	Laser safety		IEC 60825-1:2007 Laser Class 1, 21 CFR 1040.10 & 1040.11 (CDRH) Class 1	Peak wavelength: 650 nm
	EMI		VCCI Class-B / EN55022 Class-B / FCC Part15,C	Residential, commercial and light-industrial environments
	Safety standards		IEC/EN 60950-1	Information technology equipment
	Immunity standards		EN 61000-4-2, -4-3, -4-4,- 4-5, -4-6, -4-11 Class B	
	Product safety	CE Marking		R&TTE directive EN300 328 V1.6.1:2004 EN301 489-1 V1.5.1:2004 EN301 489-17 V1.2.1:2002
		Certification for Construction Design of Specified Radio Equipment		Radio Law 38-24-1
Logo certification		Bluetooth logo certification		

Item		Specification		Note	
Immunity Test (*)	ESD immunity	No destruction	15 kV (apply static electricity 50 times to the surface of the scanner)	Condition: IEC:61000-4-2 compliant	
		No malfunction	Contact discharge (direct / indirect): ± 6 kV Air discharge (direct): ± 8 kV		
	Radio-frequency electromagnetic field. Amplitude modulation	Frequency	80 ~ 1000 MHz		Condition: IEC61000-4-3 compliant
		Level	3 V/m		
		AM	80% (AM)		
	Fast transient	Voltage	Alternating-current input cable: ± 1 kV		Condition: IEC61000-4-4 compliant
		Pulse	5 / 50 ns (Tr / Tw)		
		Frequency	5 kHz		
	Surge	Pulse	1.2 / 50 μ s (Tr / Th)		Condition: IEC61000-4-5 compliant
		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 ~ 80 MHz		Condition: IEC61000-4-6 compliant
		Level	3 V		
		AM	80% (AM)		
	Power frequency magnetic field	Frequency	50, 60 Hz		Condition: IEC61000-4-8 compliant
Level		3 A/m			
Voltage dip, momentary voltage drop, fluctuation	Dip 1	Drop 30%, 0.5 cycles		Condition: IEC61000-4-11 compliant	
	Dip 2	Drop 60%, 5 cycles			
	Momentary drop	Drop > 95%, 250 cycles			
Physical Features	Dimensions		Approx. 56 × 113 × 137 (WDH mm)		
	Weight		Approx. 110 g		

(*) : Items in combination with the communication cradle are included.

4. Detailed View

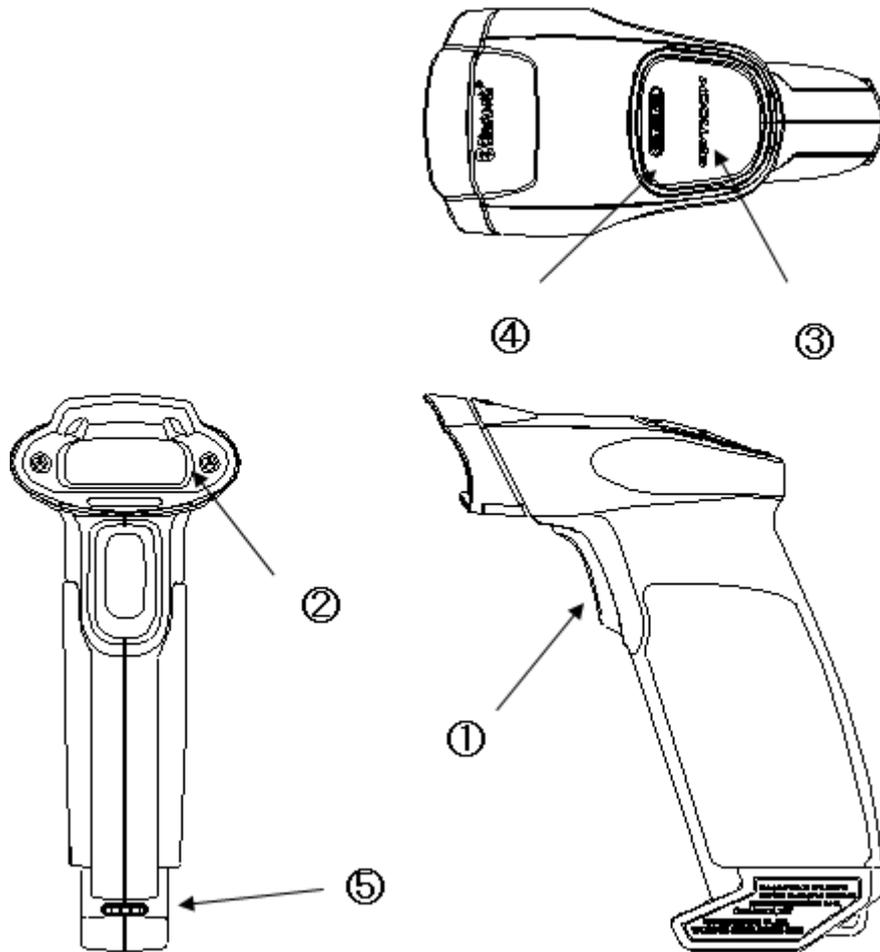


Figure 1: Detailed View of OPI-3301

No.	Name	Description
1	Trigger Key	Laser aiming light is emitted by pressing this key to read 1D/2D codes.
2	Scanning Window	The laser light is emitted through this window. Ensure that the lens is not exposed to dust and dirt before scanning.
3	Status LED	The operating status is indicated by each LED color (see 4.1. for details).
4	Buzzer Hole	A sound from a built-in buzzer comes out through these holes. When they are covered, the buzzer sound may not be able to be heard. The sound varies depending on the status (see 4.1. for details). Buzzer settings can be configured in various ways: enable or disable buzzer as well as change the loudness and duration.
5	Charging Contacts	The OPI-3301 is charged via these terminals when it is placed into the dedicated cradle (CRD-3301).

4.1. Status LED and Buzzer

The operating state is indicated by LED colors and buzzer sound.

State	LED Color	Indication	Description	Buzzer
Charging	Red	ON	Charging: When the scanner is placed on the cradle, the LED lights up to indicate the scanner is charged.	—
	Green	ON	Fully charged: LED color changes from Red to Green.	
Bar code Read	Blue	Blinking	Successful: Bar code reading / transmission has been done successfully.	Pi
	Red		Failed: Bar code data was not able to be transmitted.	Pi-pi-pi
	Green		Storing data: Bar code data is stored in the memory in the scanner.	Pi
Wireless Connection	Blue	Continuous Blinking	Connecting: The scanner is attempting to establish a wireless connection	—
		ON	Connected: The wireless connection has been established.	Pi-ro-pi
	Red	ON	Failed: The wireless connection was unable to be established.	Pi-pi-pi
Wireless Disconnection	Red	ON	Disconnected: The wireless connection is disconnected.	Pi-ro
			Lost: The wireless connection is lost due to out of the range of communication.	
Low Battery Power	Orange	ON	The remaining battery pack power level is low. Recharge is required.	—

5. Electrical Specifications

5.1. Configuration

The OPI-3301 consists of

- Camera Module section, where images are captured and output as analog data.
- Decode and Wireless Communication Control section, where the signals from the camera section are processed. This section also controls the whole system.
- Interface section that contains the user interface.
- Power supply section that contains the power supply and the battery charger.

The power is supplied from the battery pack or the CRD-3301.

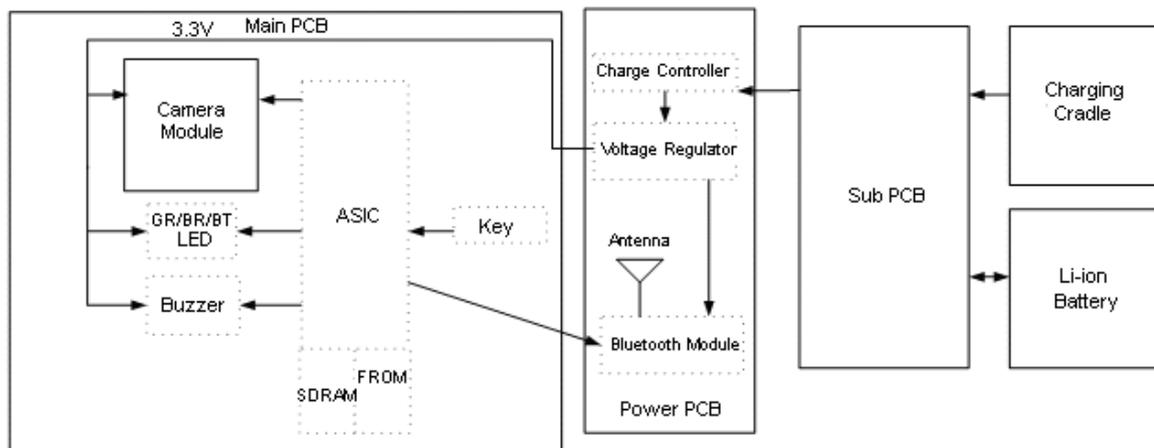


Figure 2: Block Diagram

5.2. Current Consumption

Item	Spec	Remarks
Standby	150 mA or less	With wireless connection
Sleep	1 mA or less	
Operating Current	300 mA or less	During reading, communication, LED ON
Measurement Condition Others	- Power supply voltage 3.7 V, 25 °C - The operating current is measured in Test mode.	

5.3. Charging Current

Item	Spec	Remarks
Charging CRD-3301	Approx. 600 mA	With RS-232C connection (AC adapter)
	Approx. 300 mA	With USB connection Bus-Power Class: Hi-POWER (500 mA)
Measurement Condition Others	- Measured at 25°C - Charging should be done at 0 ~ 40°C - When the temperature is over 40°C, the protection function start working and it may stop charging. - To protect the scanner when the power supply is abnormal, charging stops when the applied voltage to the charging contacts is not within about 5 ~ 6 V.	

5.4. Operating and Charging Time

Item		Spec	Remarks
Battery Life	Sleep	200 hours or more	
	Standby	Approx. 15 hours	With wireless connection
	Reading	Approx. 10 hours	1 scan / 5 sec with wireless connection
Charging Time	Charging time 1	Approx. 3 hours	When the cradle is connected with RS-232C.
	Charging time 2	Approx. 6 hours	When the cradle is connected with USB (Bus-Power supply)

The above specification may not be satisfied when the battery pack is degraded.

6. Optical Specifications

Item		Characteristics
Scan method	CMOS area sensor (white / black)	-
Number of effective pixel (*1)	(Column) × (Row)	900 × 512 dots
Image capture speed	Frame rate	80 fps
View angle	Horizontal	Approx. 40°
	Vertical	Approx. 23°
Auxiliary light source (LED)	InGaP red LED	-
	Peak wavelength	645 nm
	Directivity angle: 2Φ 1/2 (*2)	60°
	Maximum radiation output (*3)	5040 mcd
Light source for aiming / ranging (Laser diode)	Red laser diode	-
	Peak wavelength	650 nm
	Maximum radiation output (*4)	390 μW

Note:

*1: Readable pixel count: 1260 (column) × 1024 (row) dots.

*2: Reference value extracted from the datasheet.

*3: Reference value based on the datasheet (25°C, IF = 50 mA).

Class 1M compliant output: Refer to the Chapter 14 for further information.

*4: Class 1 compliant output: Refer to the Chapter 14 for further information.

7. Technical Specifications

Aim the laser light at the center of a code to scan it. For long distance scanning, ambient light entering the angle of view may affect the scanning performance. The conditions for technical specifications are as follows, unless otherwise specified in each section.

<Conditions>

Ambient Temperature and Humidity	Room temperature, room humidity
Ambient Light	1000 ~ 1500 lx (on code surface)
Angles	Pitch: $\alpha = 0^\circ$, Skew: $\beta = 15^\circ$, Tilt: $\gamma = 0^\circ$
Curvature	$R = \infty$
Power Supply Voltage	3.7 V
PCS (1D and 2D)	0.9 or higher
Reading Test	Judge within 2 seconds for every 2 scanning. Accept the performance with 70% or more success rate for 10 tries.
Barcode Test Sample (1D and 2D)	Specified below. Code 39 (resolution 0.1 and 0.127 mm) and JAN codes are OPTOELECTRONICS test samples. Others are printed by a normal printer. (NW ratio = 1 : 1.25)

Supported 1D symbology

<Code 39>

Resolution	Symbology	PCS	Size (mm)	No. of digits
0.0762 mm	Code 39	0.9	8 × 10	5
0.127 mm			11 × 10	4
0.254 mm			14 × 10	2
1.0 mm			56 × 30	

<JAN>

Resolution	Symbology	PCS	Size (mm)	No. of digits
0.260 mm	13-digit JAN	0.9/0.45	25 × 19	13
0.260 mm	8-digit JAN	0.9	17.5 × 15.5	8
0.330 mm	13-digit JAN	0.9	0.330	13

Supported 2D symbology

<PDF417>

Resolution	Error correction	PCS	Size (mm)	No. of characters
0.254 mm	Level-4	0.9	26 × 16.5	17
0.127 mm			13 × 8	

<QR Code: Model-2>

Resolution	Error correction	PCS	Size (mm)	No. of characters
0.381 mm	M	0.9	12 × 12	44
0.169 mm			5 × 5	
0.127 mm			4 × 4	

<Data Matrix>

Resolution	Model	PCS	Size (mm)	No. of characters
0.339 mm	ECC200	0.9	8 × 8	40
0.169 mm			4 × 4	
0.127 mm			3 × 3	

<MicroQR>

Resolution	Error correction	PCS	Size (mm)	No. of characters
0.212 mm	L	0.9	5 × 5	11

7.1. Scan Area and Depth of Field

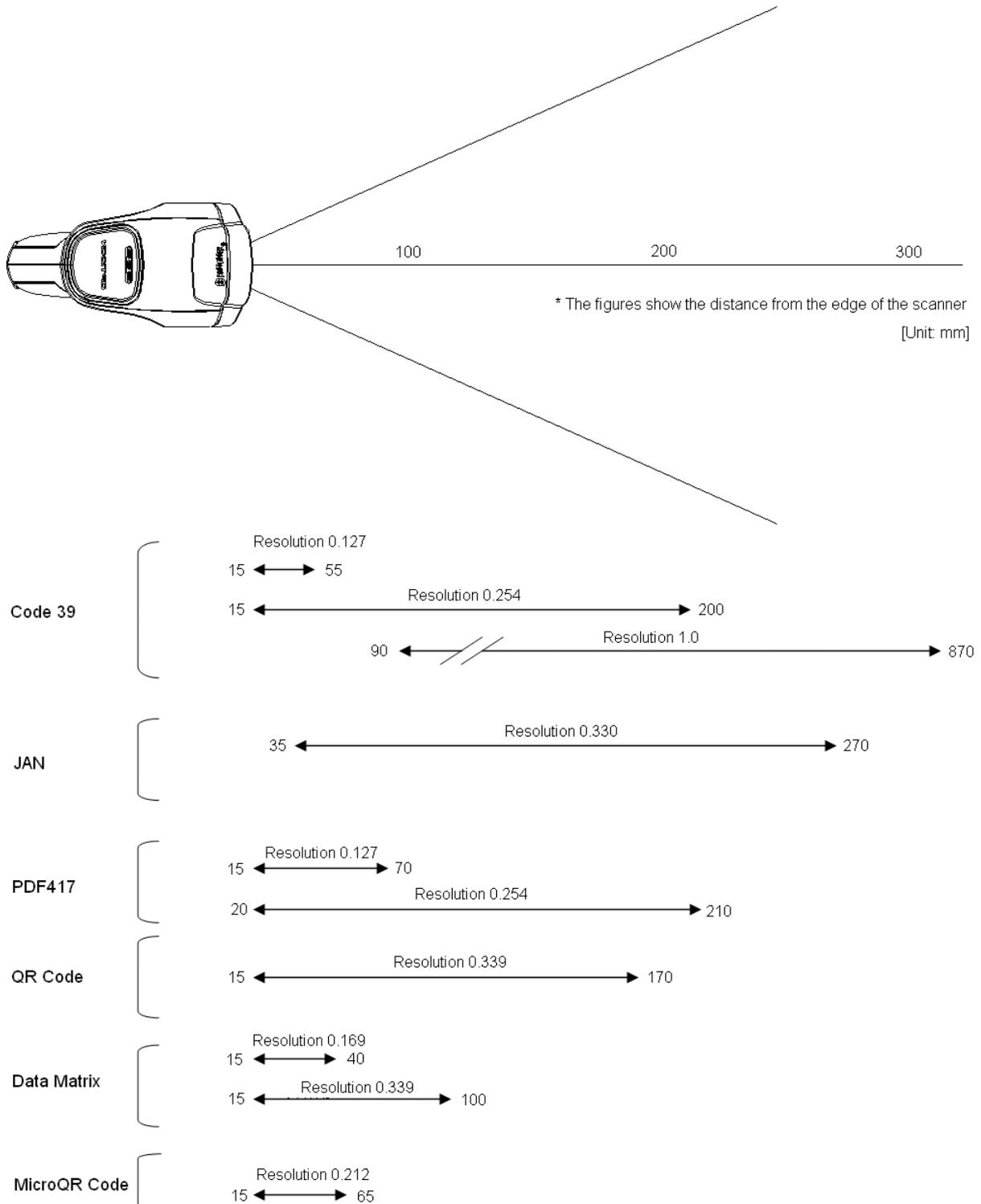


Figure 3: Scan Area and Depth of Field

7.2. Printed Contrast Signal (PCS)

0.45 or higher

<Conditions>

- MRD : 32% and higher (70% or higher reflectivity of space and quiet zone)
- Distance : 89 mm from the front edge of the scanner
- Barcode Sample : PDF417 (Resolution 0.254 mm, PCS 0.45) specified in Chapter 7
(1D and 2D) JAN (Resolution 0.260 mm, PCS 0.45) specified in Chapter 7

$$PCS = \frac{\text{Reflectance of white bar} - \text{Reflectance of black bar}}{\text{Reflectance of white bar}}$$

* Be sure to keep the optical window clean without dirt or scratches, or it may have a bad effect on the reading characteristics..

7.3. Minimum Resolution

- 0.0762mm : Code 39 (specified in Chapter 7)
- 0.127mm : PDF417 (specified in Chapter 7)
- 0.127mm : QR code, Data Matrix (specified in Chapter 7)

7.4. Pitch, Skew and Tilt

- Pitch angle $\alpha = \pm 40^\circ$
- Skew angle $\beta = \pm 50^\circ$
- Tilt angle $\gamma = 180^\circ$

<Conditions>

- Barcode Sample : Code 39 specified in Chapter 7
(1D and 2D) (Resolution 0.254 mm, PCS 0.9)
- Distance : 89 mm from the front edge of the scanner.
- Angle : Pitch angle measurement - set the skew angle $\beta = 15^\circ$ fixed.
Tilt angle measurement - set the skew angle $\beta = 15^\circ$ when pitch angle is 0° and rotate 1D/2D codes.
- Curvature : $R = \infty$

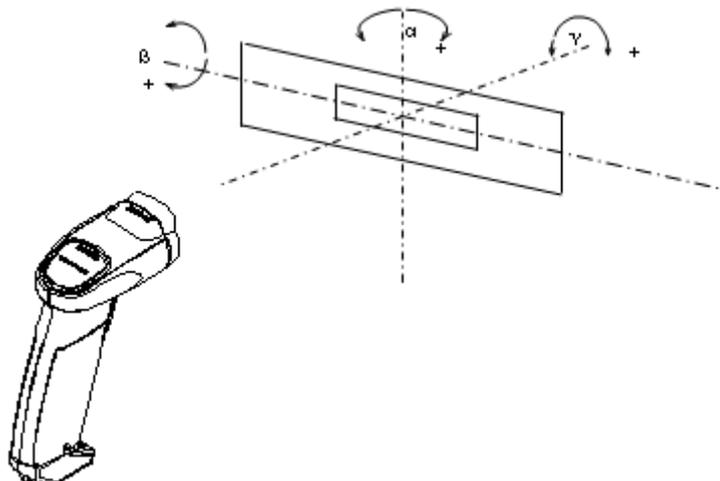


Figure4: Pitch, Skew and Tilt

7.5. Curvature

8-digit JAN : $R \geq 15$ mm
13-digit JAN : $R \geq 20$ mm

<Conditions>

Barcode Test Sample : PCS 0.9, Resolution 0.26 mm, Quiet Zone 10 mm
(1D and 2D) as specified in Chapter 7
Distance : 89 mm from the front edge of the scanner.
Angles : Skew: $\beta = 15^\circ$

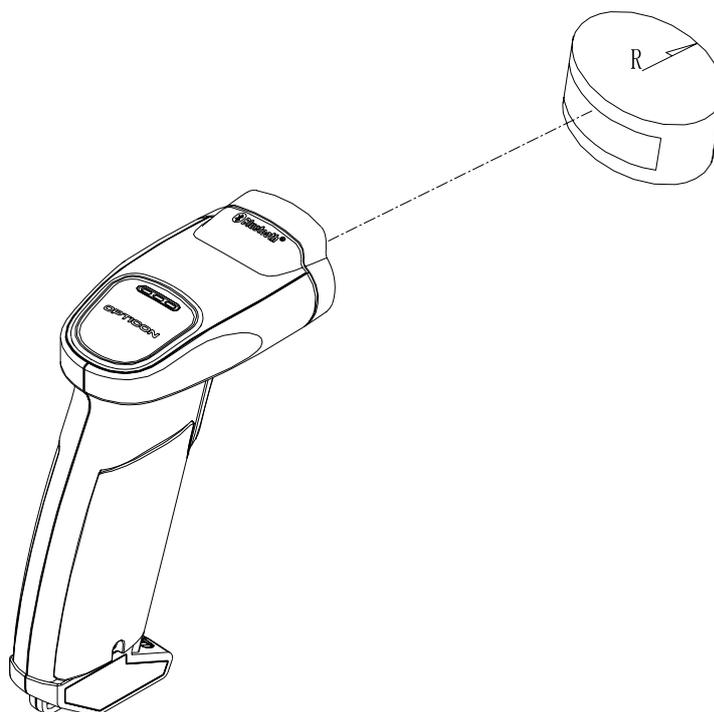


Figure 5: Curvature

Note: Scanning may fail due to the specular reflection of illumination LEDs when the reflectivity is high. In that case, scan the code tilting the scanner in the skew direction or set the illumination LED off so that the performance can improve. Make sure of the sufficient environmental illuminance (500 lx or more) when the illumination LED is off to keep the scanning performance. The ambient lights also may cause the reflection and the degraded scanning performance.

8. Bluetooth

OPI-3301 uses Bluetooth as a wireless interface: Compliant with Bluetooth specification version 2.0, supporting Serial Port Profile (SPP).

- **Implemented Profile**

SPP (Serial Port Profile)

- **Communication Configuration**

1 to 1

* 1 to N (Multiple-channel) is not supported.

- **Operating Mode in Communication**

Master : OPI-3301

Slave : CRD-3301 and other Bluetooth devices

- **Power saving**

Low-power sniff mode is not supported

- **Security and Encryption**

Authentication and Encryption are supported

- **Communication Distance**

Approx 10m

* The communication distance varies depending on usage environment. Especially when there are obstacles around, it may be shorter.

9. Default Settings

The OPI-3301 is set to the following factory default settings by reading menu code “SO”.

Default Settings 1: Readable Codes

Code type	Read	Transmit Code Length	Transmit CD	Calculate CD	Transmit Other	Set Prefix	Set Suffix
UPC-A	○	×	○	○		-	CR
UPC-A Add-on	×	×	○	○		-	CR
UPC-E	○	×	○	○		-	CR
UPC-E1	×	×	○	○		-	CR
UPC-E Add-on	×	×	○	○		-	CR
EAN-13	○	×	○	○		-	CR
EAN-13 Add-on	×	×	○	○		-	CR
EAN-8	○	×	○	○		-	CR
EAN-8 Add-on	×	×	○	○		-	CR
Code 39	○	×	○	×	Not transmit ST/SP	-	CR
Tri-Optic	○	×	-	-	Not transmit ST/SP	-	CR
Codabar (NW-7)	○	×	○	×	Not transmit ST/SP	-	CR
Industrial 2 of 5	○	×	○	×		-	CR
Interleaved 2 of 5	○	×	○	×		-	CR
Code 93	○	×	-	○		-	CR
Code 128	○	×	-	○		-	CR
EAN-128	×	×	-	○		-	CR
S-Code	○	×	○	×		-	CR
MSI/Plessey	○	×	○	○	Not transmit CD2	-	CR
UK/Plessey	○	×	○	○		-	CR
TELEPEN	○	×	×	○		-	CR
Matrix 2 of 5	×	×	○	×		-	CR
Chinese Post Matrix 2 of 5	×	×	○	×		-	CR
IATA	○	×	○	×		-	CR
Code 11	×	×	×	○		-	CR
Postal Code (JPN)	×	×	-	○		-	CR
Postal Code (USPS)	×	×	-	○		-	CR
Postal Code (POSTNET)	×	×	-	○		-	CR
Korean Postal Authority code	×	×	×	○		-	CR
PDF417	○	×	-	○		-	CR
QR Code	○	×	-	○		-	CR
Micro QR Code	○	×	-	○		-	CR
DataMatrix (ECC200)	○	×	-	○		-	CR
DataMatrix (ECC0-140)	×	×	-	○		-	CR
MaxiCode	○	×	-	○		-	CR
MicroPDF417	○	×	-	○		-	CR
Aztec Code	○	×	-	○		-	CR
Aztec Runes	×	×	-	○		-	CR
Codablock F	×	×	-	○		-	CR

Note: Disable Code 128 when enabling Codablock F. The scanner may incorrectly recognize a broken Codablock F as Code 128.

Default Settings 3: Wireless Communication Settings

	Item	"UB" Default Setting
Wireless communication settings	Set connection	Connect to RS-232C cradle
	Data memorizing	Disable
	Trigger connect / disconnect	Disable
	Trigger connect (time to press switch)	Disable
	Trigger disconnect (time to press switch)	Disable
	Auto disconnect	Disable
	Auto reconnect	5 minutes
	ACK/NAK	No control
	ACK/NAK time out	1 second
	Pin code	Set (connect to the last 4 digits of BD address)
Bluetooth settings	BT address auto connect	Enable
	Authentication	Enable (auto pairing)
	Encryption	Disable

- * The interface to connect the CRD-3301 and the host is RS-232C by factory default.
- * When USB is used to connect the CRD-3301 and the host, set to "Connect to USB-HID cradle".
- * Do not select "Connect to PC" in a combination of the OPI-3301 and the CRD-3301

Default Settings 4: Communication Settings between CRD-3301 and Host (RS-232C)

Item	"U2" Default Setting
Baud rate	9600 bps
Parity bits	No parity
Data length	8 bits
Stop bits	1 bit
Handshaking	No handshake
ACK/NAK	No control
CS time out	Indefinitely
Intercharacter delay	No delay

Default Settings 5: Communication Settings between CRD-3301 and Host (USB-HID)

Item	"SU"/"C01" Default Setting
Keyboard language	USA
Numpad	Do not use numpad (Full Key Code)
CAPSLOCK	No CAPSLOCK mode
Intercharacter delay	No delay

10. Product Labels

The labels shown below are attached to the scanner.

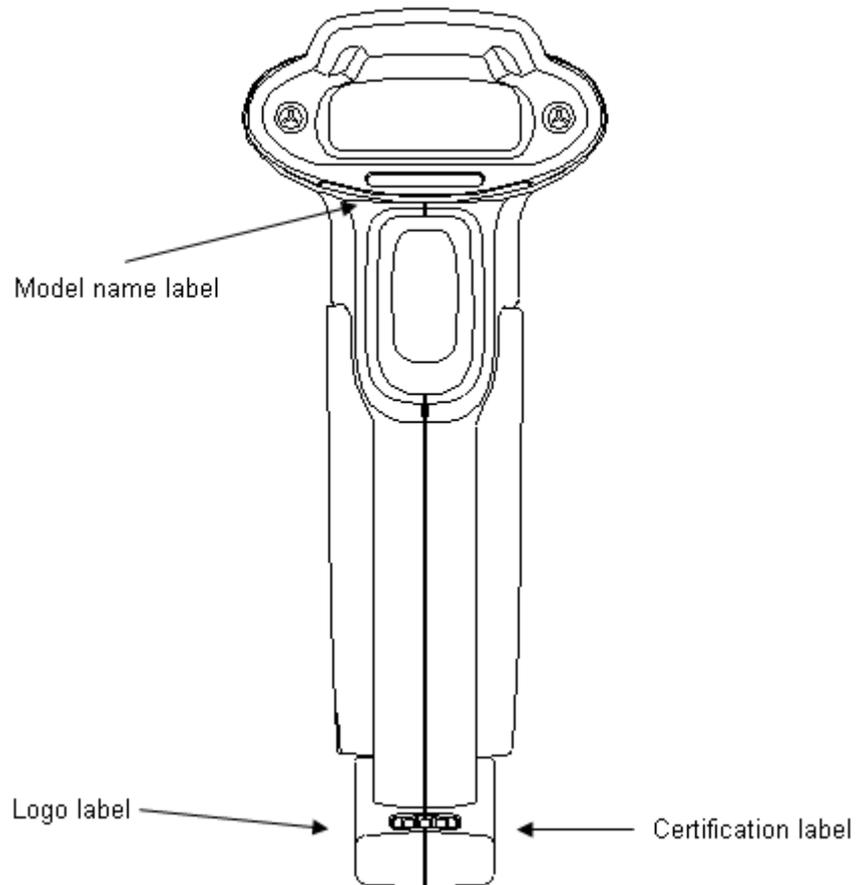


Figure 6: Product Labels

Model name label	Shows the product name, serial number, month and year of manufacture, laser caution and laser Class 1
Logo label	Shows certified standard logos.
Certification label	Shows the standards-compliant languages and certificate numbers.

<Product Label 1>

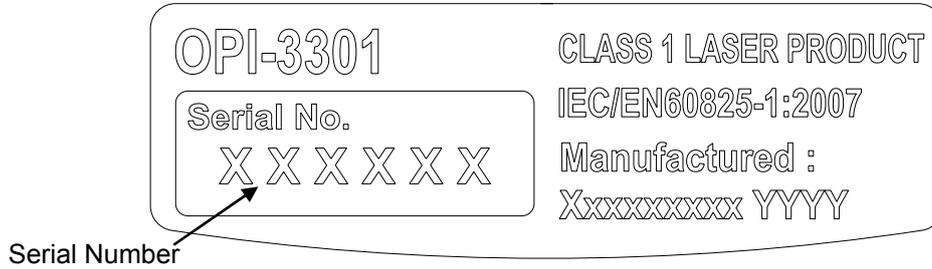


Figure 7: Model Name Label

<Product Label 2>

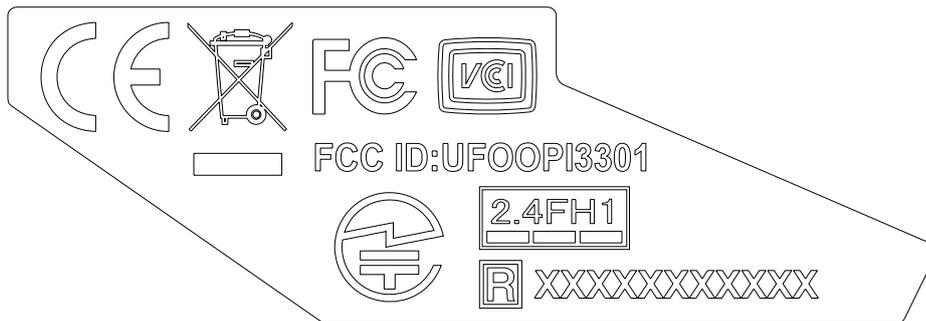


Figure 8: Logo Label

<Product Label 3>

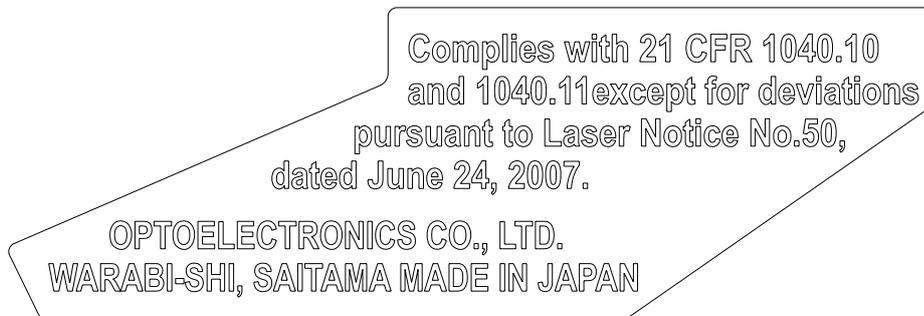


Figure 9: Certification Label

11. Packaging Specifications

11.1. Individual Packaging Specification

Assembled package size: 165 x 110 x 82 (WDH mm)

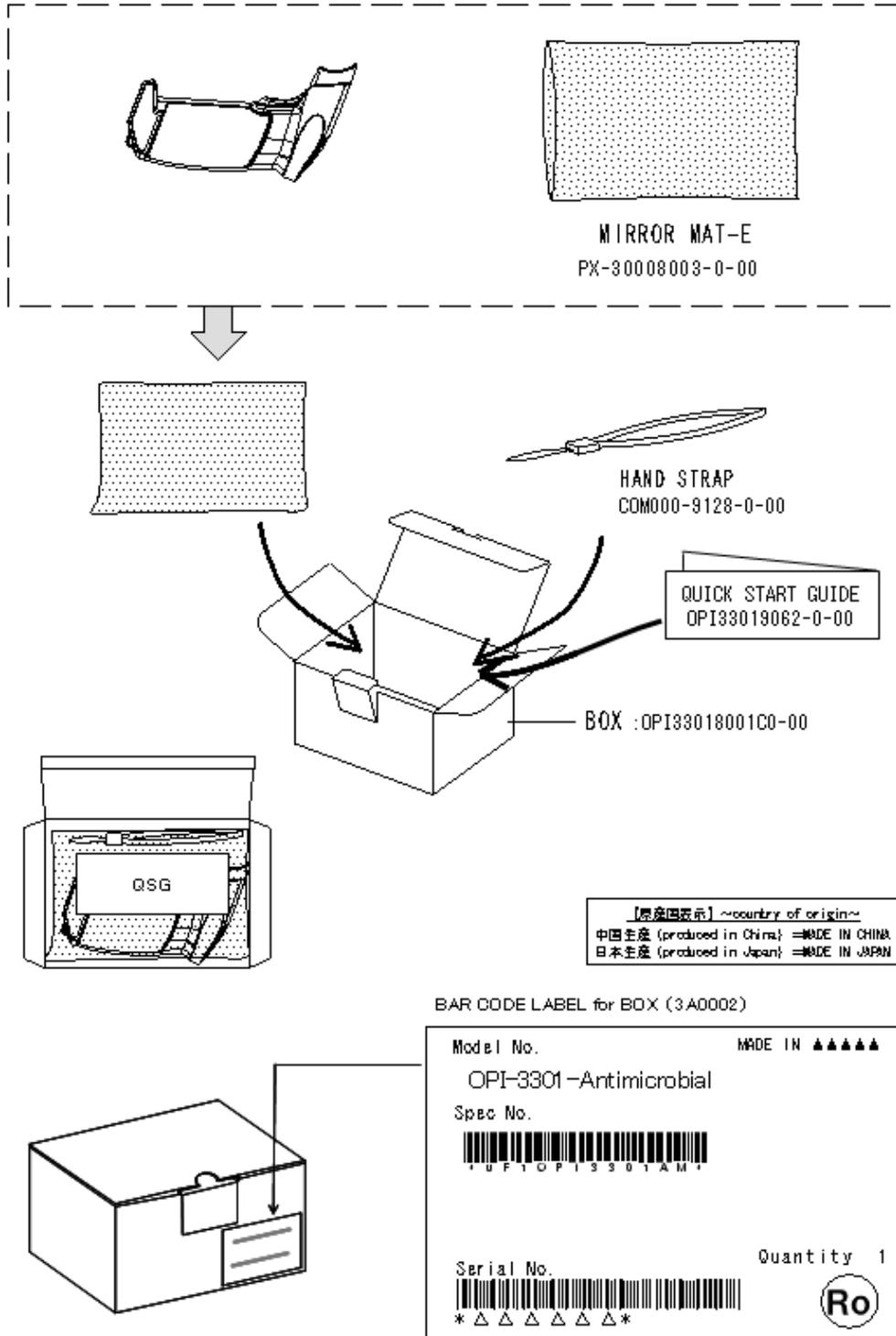
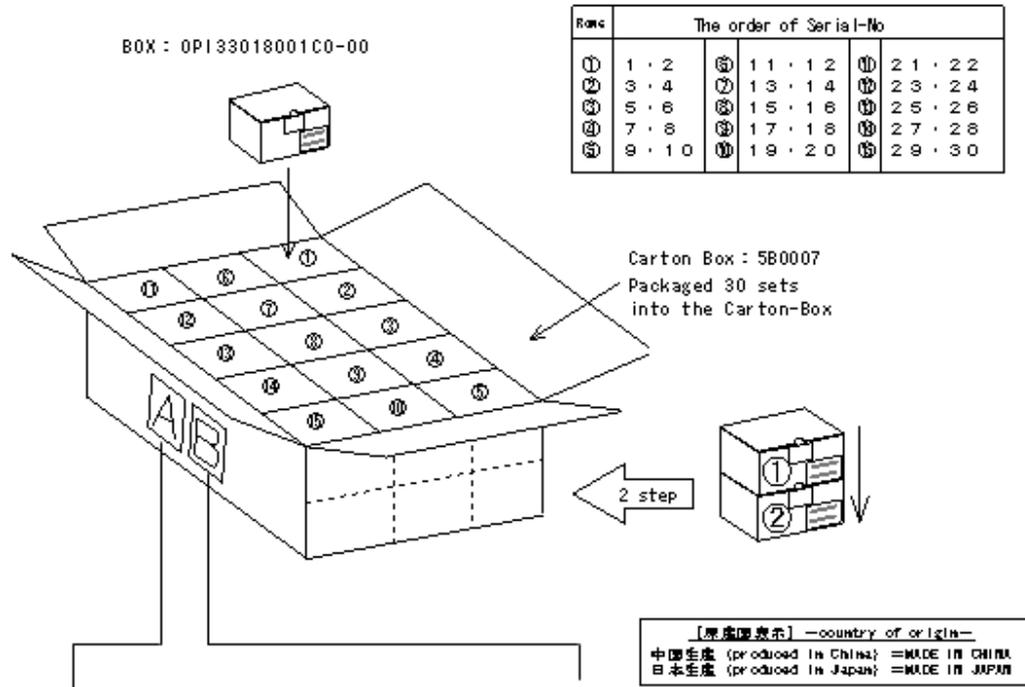


Figure 10: Individual Packaging

11.2. Collective Packaging Specification

Assembled package size: 585 x 520 x 200 (WDH mm)



A : Barcode Serial Label for Packaging Box
Stick the labels on both front and back side of the box.

(3C0006)

UNIVERSAL Q/No. △△
MADE IN ▲▲▲▲▲

Product OPI-3301-Antimicrobial

POB

Spec#JPH

Q'ty S/M (From)

△△/△△△ S/M (to)

Missing Serial Number	Missing Q'ty △
1	
2	

ROH-Ver. FL66J△△
Shipping Date 20△△/△△/△△

Ro

OPTOELECTRONICS CO., LTD.

B : Missing Serial Number Label:
Attach this label when there are more than 3 labels of which serial numbers are out of order (not in a correct sequence).

(3C0007)

UNIVERSAL Q/No. △△
MADE IN ▲▲▲▲▲

Missing Serial Number	Missing Q'ty △
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	

OPTOELECTRONICS CO., LTD.

Figure 11: Collective Packaging

Note: 'Ro mark' on the trays and the boxes for the product indicates that the product is RoHS compliant, which is declared by Optoelectronics Co., Ltd.

12. Environmental Specifications

12.1. Operating Temperature and Humidity

Temperature : -20 ~ 50°C (-0 ~ 40°C when charging)
Humidity : 5 ~ 85%RH (no condensation, no frost)

12.2. Storage Temperature and Humidity

Temperature : -25 ~ 60°C
Humidity : 5 ~ 85%RH (no condensation, no frost)

12.3. Ambient Light Immunity

Scanning performance is guaranteed when the range of illumination on a barcode surface is the following values.

Incandescent light : 0 ~ 10,000 lx
Fluorescent light : 0 ~ 10,000 lx
Sunlight : 0 ~ 100,000 lx

<Conditions>

Barcode Test Sample	OPTOELECTRONICS test chart Resolution 0.254 mm PDF417 specified in Chapter 7
Distance	89 mm from the front edge of the scanner.
Angles	Pitch: $\alpha = 0^\circ$, Skew: $\beta = 15^\circ$, Tilt: $\gamma = 0^\circ$
Curvature	$R = \infty$
Power Voltage	3.7 V

* Be sure that the direct light or specular reflection from the light source does not enter the light receiving section of the OPI-3301.

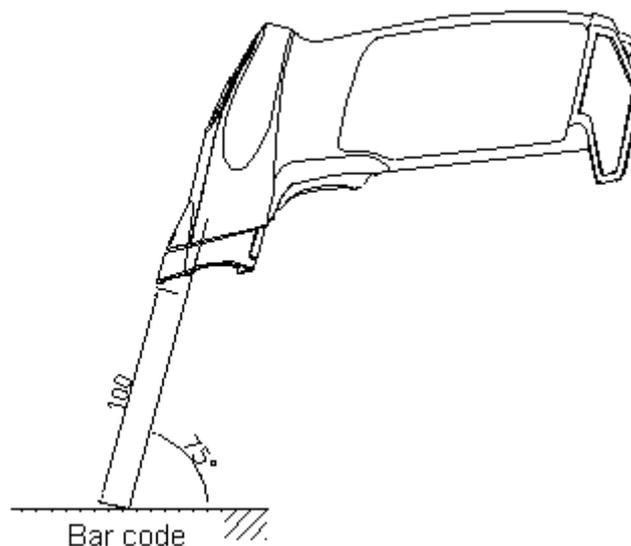


Figure 12: Ambient Light Immunity

12.4. Dust and Drip Proof

IEC IP42 equivalent

Protection against solid objects: Level 4

Protected against solid objects greater than 1.0 mm

Protection against liquids: Level 2 (JIS IPX2)

Protected against dripping water from the vertical when tilted up to 15°

12.5. Electrical Characteristics

The characteristics in combination with the communication cradle CRD-3301 is included.

Power Line Noise Immunity	: ±1 kV
Power Line Noise Immunity	: ±1 kV
Electrostatic Discharge Immunity	: <u>No destruction</u> ±15 kV (air or direct discharge) <u>No malfunction</u> ±10 kV (air or direct discharge), ± 6 kV (contact, direct or indirect discharge)

*Note: Testing method is compliant with IEC-61000-4-2. (150 pf, 330 ohm)

12.6. Drop Impact Strength (without packaging)

There shall be no sign of malfunction after the following drop test.

Drop test: Drop the scanner 3 times (18 times in total), at each 6 face, from a height of 150 cm onto a concrete floor as shown below.

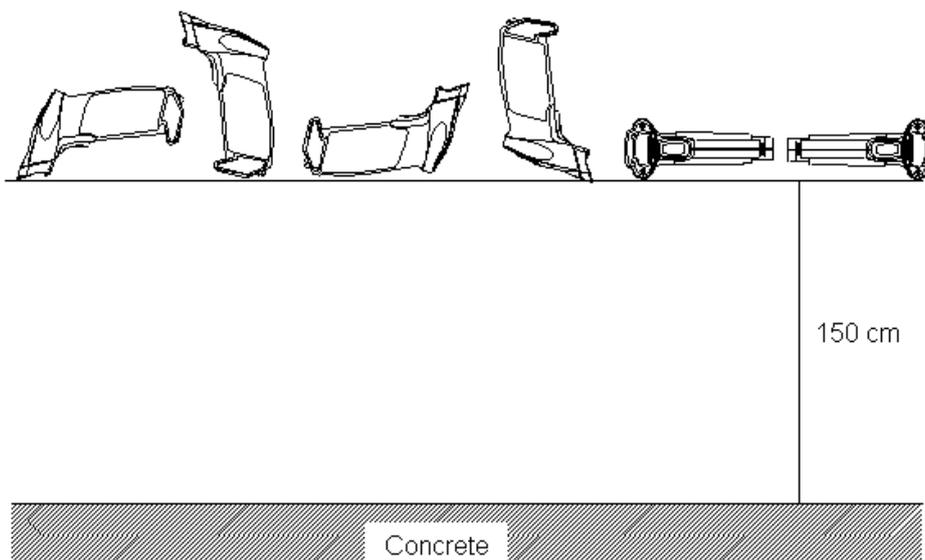


Figure 13: Drop Test

12.7. Drop Impact Strength (in individual packaging)

There shall be no sign of malfunction after the following drop test.

Drop test: Drop an individually packaged scanner 10 times in total, at any of 1 corner, 3 edges, and 6 faces, from a height of 150 cm onto a concrete floor.

12.8. Vibration Strength

There shall be no sign of malfunction after the following vibration test.

Vibration test: Increase the frequency of the vibration from 10 Hz to 100 Hz at an accelerated velocity of 19.6 m/s² (2.0 G) for 60 minutes in the non-operating state. Repeat this in each X, Y and Z direction.

13. Reliability

MTBF (Mean Time Between Failures) 40,000 hours (excluding the following parts)

Camera module 10,000 hours

* The value is based on the assumption of normal operation in the operating temperature range without excessive electrical / mechanical shock or impact.

* The battery pack is not included in the above value. The rate of deterioration rate of the battery pack differs depending on charging environment.

14. Regulatory Compliance

14.1. LED Safety

IEC 62471:2006 Exempt Risk Group

14.2. Laser Safety

IEC 60825-1:2007 Laser Class 1,
21 CFR 1040.10 & 1040.11 (CDRH) Class 1

14.3. Product Safety

IEC 60950-1:2005
EN 60950-1:2006/A11:2009

14.4. EMC

FCC Part 15 Subpart B Class B

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.

14.5. Others

Certification for Construction Design of Specified Radio Equipment (Radio Law 38-24-1)

Bluetooth logo certification

R&TTE Directive

EN 300 328

EN 301 489-1

EN 301 489-17

EN 55022:2006

15. RoHS

The OPI-3301 is compliant with RoHS.

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

16. Precautions

16.1. Precaution against Laser Light

*Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Caution - Do not stare into the laser light from a scanning window. It may harm your eyes.
Do not point the laser directly at others' eyes. It may harm your eyes.
Do not stare into the beam with optical instruments. It may harm your eyes.

16.2. Precaution against LED Light

Do not stare into the LED light from a scanning window. It may harm your eyes.

16.3. Handling

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

(1) Shock:

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

(2) Temperature Conditions:

- Do not use this product at temperatures outside the specified range.
- Do not pour boiling water on this product.
- Do not throw this product into a fire.

(3) Foreign Materials:

- Do not immerse this product in water or other liquid.
- Do not expose this product to chemicals.

(4) Others

- Do not disassemble this product.
- Do not use this product near a radio or a TV. It may cause reception problems.
- Excessive static electricity may cause this product to malfunction.
- This product may be affected by a momentary voltage drop caused by lightning.
- This product may not perform properly in environments when placed near a flickering light, such as a CRT (computer monitor, television, etc.).
- Do not use excessive force to turn the screw for the battery cover. Adjust it within indicated range.

16.4. Radio Low

This scanner qualifies as radio equipment for low-power radio stations (2.4 GHz band advanced data communication systems) as specified in the Radio Law 38-24-1. The scanner has obtained the Certification for Construction Design of Specified Radio Equipment. Therefore it does not need to have a radio station license in Japan.

The following activities are prohibited under the Radio Law:

- Remodeling and disassembly
- Peeling off the certificate label

Do NOT use the scanner under the following environment, as radio interference may affect other device and end up with causing physical or material damage.

- Safety apparatus and medical device for human body protection
- Environment where is concerned to cause serious damage

16.5. 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.

16.6. Bluetooth

- Bluetooth® is a registered trademark owned by its proprietor and used by OPTOELECTRONICS Co., Ltd. under license.
- To communicate via Bluetooth, the device that communicates with this scanner must support the same Bluetooth version and profile as this scanner’s.
- This scanner is compliant with Bluetooth standards. However, the communication performance with other Bluetooth devices which have not been tested is not guaranteed.
- Bluetooth devices use 2.4 GHz frequency band, and many other sorts of devices also use this frequency band. Interference from other devices may affect the communication speed or communication range of the scanner.
- The communication speed and range may differ due to the obstacles and radio wave conditions between this scanner and the device to connect and the conditions of the destination device.
- When any metallic object is present close to the upper posterior part of the scanner where an antenna is installed, the communication may be affected.
- An anticipated interference distance is 20 meters or less.

16.7. Frequency Band

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

In the frequency band of this product, 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 amateur radio station are managed.

1. Please make sure that “other radio stations” are not managed in the frequency band 2.4 GHz before using this product.
2. In case that radio interference occurs between this product and “other radio stations,” change the service space immediately, or stop transmitting radio wave to avoid the interference.
3. If you have any questions or troubles, please contact our sales office.

17. Auto Trigger

The OPI-3301 can be set to auto trigger mode. This means that the scanner starts scanning automatically when it detects a change in brightness that occurs when a bar code label is presented in front of it.

17.1. Outline of Operation

In auto trigger mode, the scanner captures a barcode image using the ambient light and detects the brightness of multiple bright / dark parts in the detection area of the image (a shaded area in the figure below). The scanner constantly monitors the areas to see if the brightness is changed. When the brightness variations at regular time intervals in either area is larger than the threshold value, the scanning operation (multiple read) starts. After the elapse of the specified read time, the scanning stops.

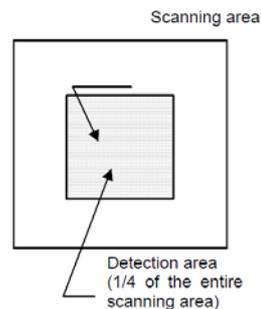


Figure 14: Detection Area

17.2. Specifications

Trigger is enabled when inserting a gray-colored paper on a black backing paper. Trigger is also enabled when inserting a black-colored paper on a gray backing paper.

<Conditions>

- Paper used : Black paper from Glory called as Black 010010016
Gray paper from Glory called as Silver-gray 010010016
- Ambient Light : 300 lx or more
- Background Size : Larger than the scanning area
- Detected Paper Size : Larger than the detecting area
- Moving Speed of Detected Paper : 105 mm/second or slower
- Ambient Temperature and Humidity : Room temperature and room humidity

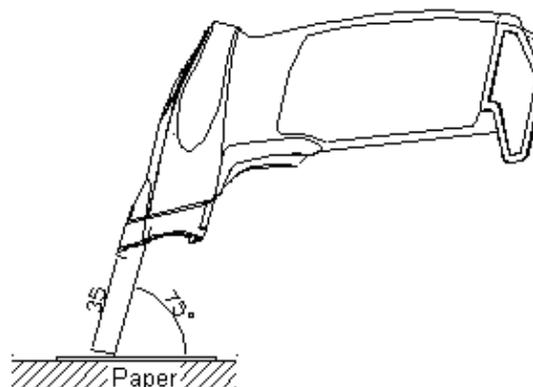


Figure 15: Auto Trigger

* When using the auto trigger function, it is recommended to fully confirm the performance under real operating conditions with bar codes, 2D codes, background and operating environments (ambient light etc.) that are actually used.

17.3. Settings

(1) Enable / Disable setting of auto trigger

Enable Auto Trigger



@MENU_OPTO@ZZ@+I@ZZ@OTPO_UNEM@

Disable Auto Trigger (default)



@MENU_OPTO@ZZ@+F@ZZ@OTPO_UNEM@

(2) Read time options

Set the read time after enabling the auto trigger. The read time is the length of period that the reader is ON after auto triggered. To configure the read time, read the menu labels “Set (ZZ)”, “Read time” and “End (ZZ)” listed in the table below. The default is 2 seconds. Selecting a read time of 0 seconds means that the reader will stay ON by pressing the trigger switch.

* Transition to a “waiting to scan” state

After a lapse of 30 seconds in scan state after auto triggered, the laser aiming will turn off and only the illumination LEDs will blink. However, the scan state continues all this time.

Functions	Manu bar code	Functions	Manu bar code
SET		6 seconds	
0 seconds		7 seconds	
1 second		8 seconds	
2 seconds		9 seconds	
3 seconds		Indefinitely	
4 seconds		Read time * 10	
5 seconds		END	

(3) Multiple read reset time options

This option allows you to configure the number of frames that the scanner should be pointed away from the label before it can decode the same label again.
To configure the multiple read reset time, read the menu labels “Set (ZZ)”, “Number of frames” and “End (ZZ)” listed in the table below. The default is 6 frames.

Functions	Manu bar code	Functions	Manu bar code
SET	 Z Z	5 frames	 A L
1 frame	 A H	6 frames	 A M
2 frames	 A I	7 frames	 A N
3 frames	 A J	Indefinitely	 A G
4 frames	 A K	END	 Z Z

(4) Auto trigger sensitivity options

This option allows you to configure the threshold level of the scanner to detect the dark pixels and light pixels.

High Sensitivity



@MENU_OPTO@ZZ@XMF
@ZZ@OTPO_UNEM@

**Normal Sensitivity
(default)**



@MENU_OPTO@ZZ@XMH
@ZZ@OTPO_UNEM@

Low Sensitivity



@MENU_OPTO@ZZ@XMJ
@ZZ@OTPO_UNEM@

* When using the auto trigger function, it is recommended to fully confirm the performance under real operating conditions with bar codes, 2D codes, background and operating environments (ambient light etc.) that are actually used.

***Note**

When scanning a barcode with low resolution from a distance, the scanner may be considerably affected by ambient lights other than the brightness of the barcode (brightness of detecting field) and start scanning.

17.4. Auto Trigger Activation Conditions

Auto trigger can be enabled in 2 different ways:

- Stand detection mode:
Auto trigger is activated automatically when the scanner is inserted into the stand.
- Normal auto trigger mode:
Auto trigger is activated all the time.

Both can be set in the following procedures.

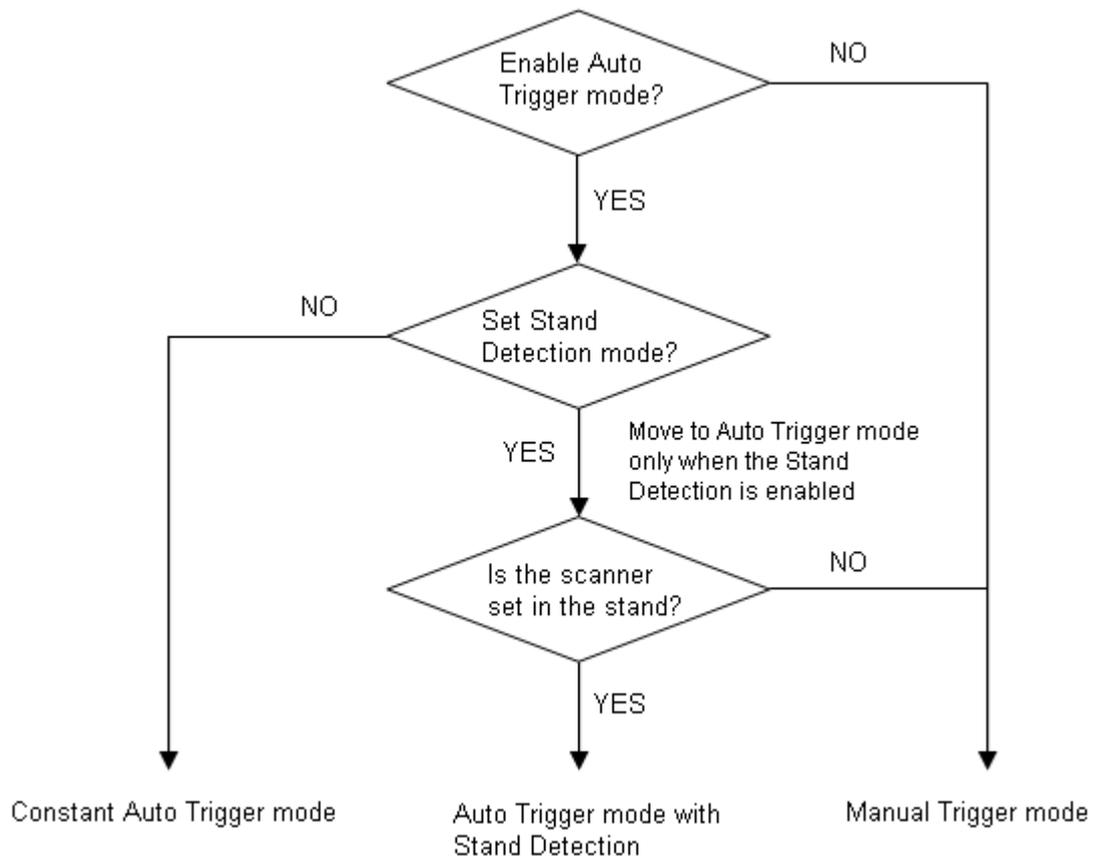


Figure 34: Auto Trigger Operation Flow

1. Auto Trigger with Stand Detection

When the scanner detects the stand when it is placed into it, the auto trigger is automatically enabled in this mode.

When the scanner is used without the stand, the auto trigger is disabled and only the manual trigger is enabled.



@MENU_OPTO@ZZ@+I@*4
@ZZ@OTPO_UNEM@

2. Use auto trigger constantly



@MENU_OPTO@ZZ@+I@*5
@ZZ@OTPO_UNEM@

2. Use manual trigger only (default)



@MENU_OPTO@ZZ@+F@*5
@ZZ@OTPO_UNEM@

* A hole device and a magnet are used for stand detection operation. Therefore, auto trigger may get activated when there is a magnetic substance near by.

Appendix 1: Mechanical Drawings

Dimensions: 137 × 56 x 113 (HWD mm, except protruding portion)

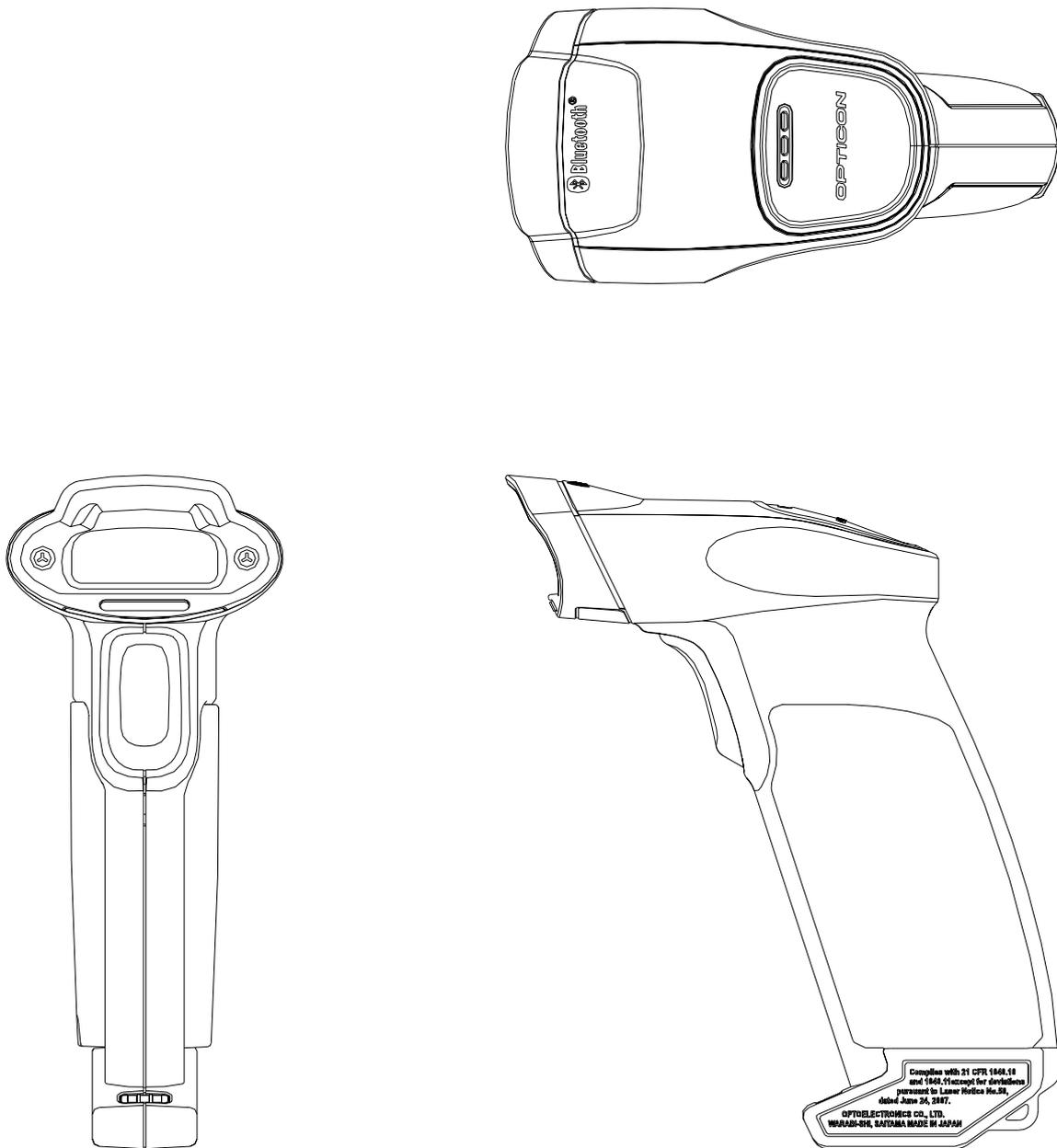


Figure 16: Mechanical Drawing