# OPL 7734

## Wireless Barcode Scanner

OPTICON

# Specifications Manual

All information subject to change without notice.

## Document History

| | | | |
|---|---|---|---|
| **Model Number:** | OPL 7734 | **Specification Number:** | SS08004 |
| **Edition:** | 2 | **Original Spec Number:** | SS07037 |
| **Date:** | 2008-02-08 | | |

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## Limited Warranty and Disclaimers

PLEASE READ THIS MANUAL CAREFULLY BEFORE INSTALLING OR USING THE PRODUCT.

## Serial Number

A serial number appears on all Opticon products. This official registration number is directly related to the device purchased. Do not remove the serial number from your Opticon device. Removing the serial number voids the warranty.

## Warranty

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## Packaging

The packing materials are recyclable. We recommend that you save all packing material to use should you need to transport your scanner or send it for service. Damage caused by improper packaging during shipment is not covered by the warranty.

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## SUPPORT

| USA | Europe |
|---|---|
| Phone: 800-636-0090 | |
| Email: support@opticonusa.com | Email: support@opticon.com |
| Web: www.opticonusa.com | Web: www.opticon.com |

# Contents

# Table of Figures

# 1. Abstract

This manual provides specifications for the OPL 7734 wireless barcode scanner.

# 2. Overview

The OPL 7734 is a wireless barcode scanner.

The use of a short-wavelength red laser beam enhances visibility when scanning lines. Press the trigger key without allowing the optical window of the scanner to touch the barcode.

Feature settings can be configured by scanning menu barcodes or by sending appropriate commands.

Scanned data can be transmitted to the host through wireless communication (complies with IEEE802.15.4) using a dedicated communication cradle. When the scanner is outside the wireless communication range, scanned data can be stored in the embedded memory.

The scanner's lithium-ion battery can be charged by setting the scanner in a dedicated cradle (CRD 7722 or CRD 7734).

The OPL 7734 complies with RoHS.

Supported symbologies:

**Linear (1D)**

| | |
|---|---|
| JAN/UPC/EAN (WPC), incl. add-on | Interleaved 2of5 |
| Chinese Post | ISBN-ISMN-ISSN |
| Codabar/NW-7 | Korean Postal Authority Code |
| Code 11 | Matrix 2of5 |
| Code 39 | MSI/Plessey–UK/Plessey |
| Code 93 | RSS |
| Code 128: EAN-128 | S-Code |
| Composite Codes: UCC/EAN-128 (incl. CC-A/B/C) | Telepen |
| IATA | Tri-Optic |
| Industrial 2of5 | |

# 3. Physical Features

## 3.1. Dimensions

W 55.0 x D 115.0 x H 150.0 mm

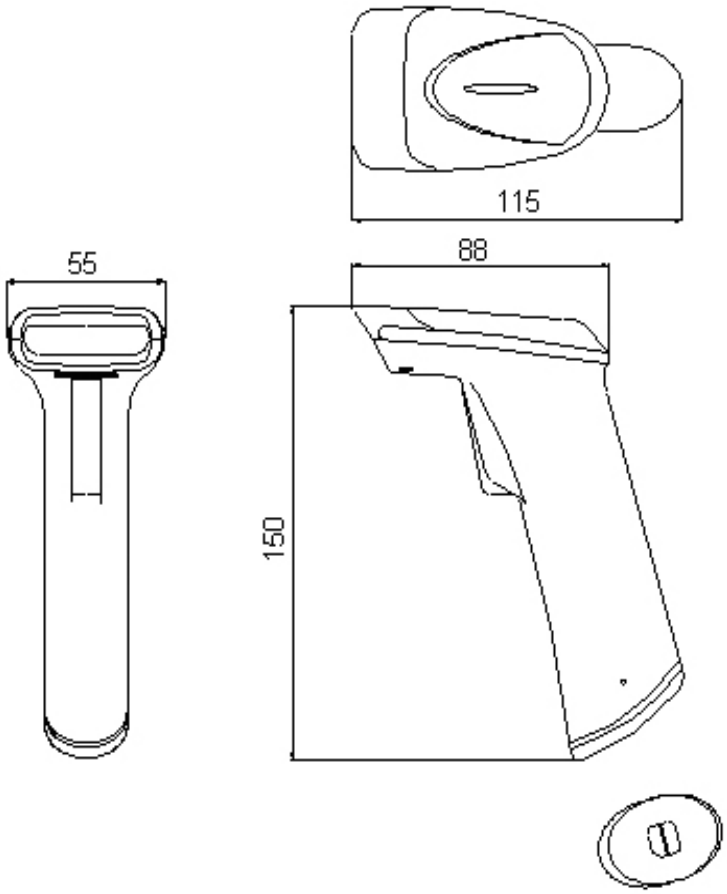


*Figure 1: Dimensions*

## 3.2. Weight

130 g (max.) including the battery

# 4. Detailed View

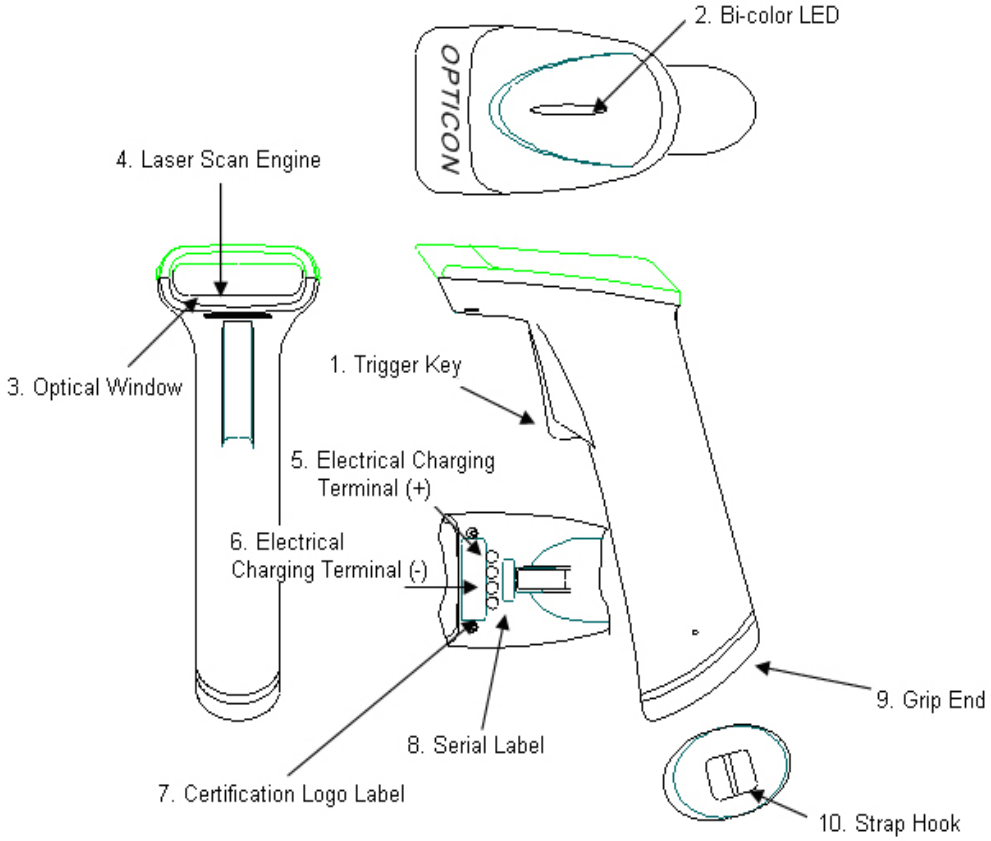


*Figure 2: Detailed view*

| Part Name | Functions |
|---|---|
| 1. Trigger key | To start scanning barcode |
| 2. Bi-color LED (red and green) | To display the status of barcode scanning, wireless communication, battery charge etc. |
| 3. Optical window | Optical window to scan barcodes using laser beam |
| 4. Laser scan engine | Scan engine to scan barcode |
| 5. Electrical charging terminal (+) | (+) terminal to charge the scanner |
| 6. Electrical charging terminal (-) | (-) terminal to charge the scanner |
| 7. Certification logo label | |
| 8. Serial label | To show the serial number barcode |
| 9. Grip end | To protect the scanner |
| 10. Strap Hook | To attach a hand strap. |

# 5. Environmental Specifications

## 5.1. Operating Temperature and Humidity

Temperature: 0 to 40° C

Humidity: 25 to 85%

## 5.2. Storage Temperature and Humidity

Temperature: -20 to 60° C

Humidity: 20 to 90%

## 5.3. Ambient Light Immunity

Decoding performance is guaranteed when the range of illumination on a barcode surface is between zero and the following values:

| | |
|---|---|
| Incandescent light | 3,000 lx |
| Fluorescent light | 3,000 lx |
| Sunlight | 50,000 lx |

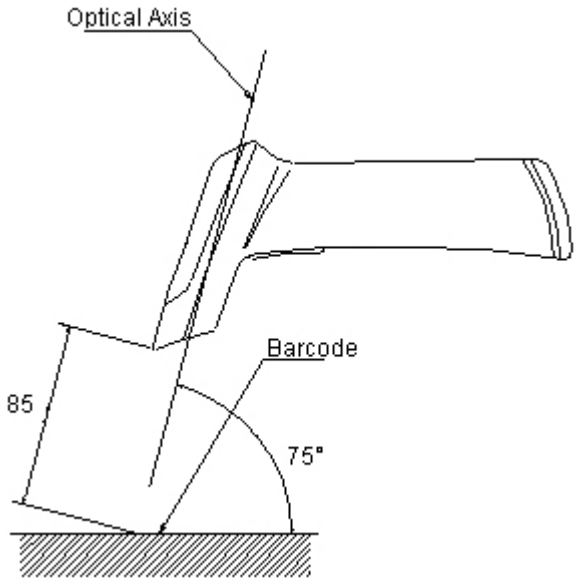


*Figure 3: Ambient light immunity*

### Conditions

Barcode Sample: OPTOELECTRONICS Test Sample

| | |
|---|---|
| PCS: | 0.9 |
| Resolution: | 0.25 mm |
| Symbology: | 8-digit Code 39 |
| Quiet zone: | 10 mm |
| N/W ratio: | 1:2.5 |
| Distance: | 150 mm |
| Angle (see note below): | α = 0° β = 15° γ = 0° |
| Curvature: | R = ∞ |

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

**Note:** α, β and γ respectively represent pitch, skew and tilt. Please see section 9 for how these values are defined.

## 6. Controls

| Item | Specifications | Notes |
|---|---|---|
| CPU | 16 bits CMOS CPU | |
| Clock frequency | 14.74 MHz | |
| External memory | FROM 256 KB<br>SRAM 32 KB (no backup) | for BIOS/AP/DATA<br>for WORK/DATA |
| Operation | Operation keys: 1 key (trigger and transmit)<br>Maximum scans: 500,000 times | |
| Display LED | Bi-color LED (red and green) | |

# 7. Electrical Specifications

## 7.1. Main Battery

The main battery is a lithium-ion battery.

Nominal capacity: 600 mAh

Nominal voltage: 3.7 V

## 7.2. Battery Life and Charging Time

| Parameter | Specification | Note |
|---|---|---|
| Battery life | 300 cycles of charge and discharge | Capacity 70% filled 1 C charge and discharge |
| Usable time | 50 hours or more | 1 scan/5 s<br>Barcode sample: 9-digit Code 39, PCS 0.9, Resolution: 0.25 mm |
| Current consumption | 1 mA or less<br>35 mA or less<br>125 mA or less | In standby state<br>In wireless communication<br>Max. consumption |
| Operating conditions | Temperature: +25°<br>Scan a barcode once in every 5 seconds<br>Barcode sample: 9-digit Code 39, PCS: 0.9, Resolution: 0.25 mm | |
| Charging time | 2 ½ hours | Time necessary to fully charge the battery at the operating temperature of 25° |

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

## 7.3. Buzzer and LED Indicator

The OPL 7734 uses an LED and buzzer to indicate its status.

| State | Color | Display | Operation State |
|---|---|---|---|
| Charging | Red | Lighting | When the scanner is set in the cradle, this LED shows that the scanner is being charged. |
| | Green | Lighting | The light changes to green from red when the charging operation is completed |
| Scanning | Green | Blinking | Shows the successful completion of scanning or data transmission. |
| | Red | Blinking | Shows that the data could not be transmitted. |
| | Orange | Blinking | Shows that the data is being stored in the memory. |
| Wireless Connection | Green | Lighting | Shows the completion of registration. |
| | Red | Lighting | Shows that the registration failed. |

# 8. Optical Specifications

## 8.1. Laser Scanning Specifications

| Parameter | Specification | Unit |
|---|---|---|
| Light-emitting element | Red laser diode | - |
| Emission wavelength | 650 ±10 (25° C) | nm |
| Light output | 1.0 or less | mW |
| Scanning method | Bi-directional scanning | - |
| Scanning speed | 100 ±20 | scans/s |
| Scan angle | Scan angle: 54 ±5 | ° |
| | Read angle: 44 (Min) | ° |

## 8.2. Laser Scan Standard

### 8.2.1. 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.

### 8.2.2. 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.

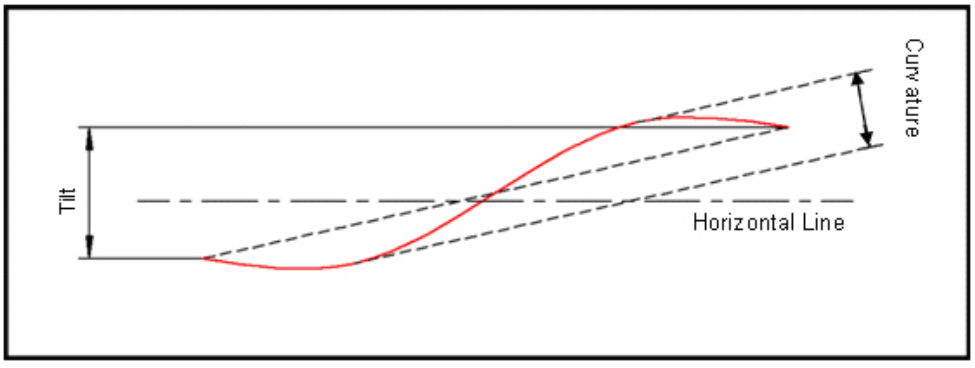


*Figure 4: Laser scanning tilt and curvature*

# 9. Technical Specifications

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

### Conditions

| | |
|---|---|
| Ambient temperature and humidity | Room temperature (5 to 35º C)<br>Room humidity (45% to 85% RH) |
| Ambient light | 500 to 900 lx |
| Background | Barcode = black<br>Space = white<br>Margin = white<br>Background of label = black |
| Decoding test | Approve the performance when decoding is successful in all ten tests.<br>(Decoding is deemed successful when completed in 0.5 seconds or less.) |

## 9.1. Print Contrast Signal (PCS)

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

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

Scanning performance may decline if dirt or scratches marks are on the optical window. Keep the optical window clean.

## 9.2. Minimum Resolution

0.15 mm

## 9.3. Scan Area and Resolution

### 9.3.1. Depth of Field

The depth of field is measured from the edge of the scanner. The scanning range is within the circular arc centered on the scan origin.

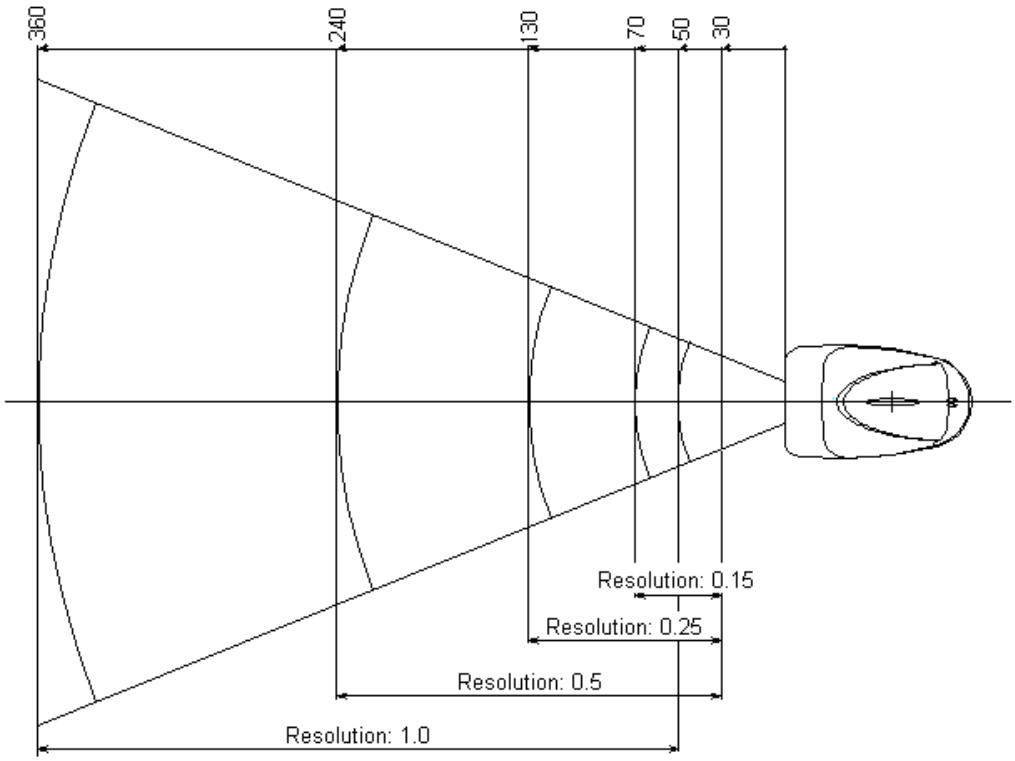


*Figure 5: Depth of field and resolution*

| PCS | Resolution (mm) | Quiet Zone | Decode Depth (mm) |
|---|---|---|---|
| 0.9 | 1.0 | 25 mm | 50–360 |
| | 0.5 | 18 mm | 30–240 |
| | 0.25 | 10 mm | 30–130 |
| | 0.15 | 7 mm | 30–70 |

**Conditions**

Barcode Sample: OPTOELECTRONICS Test Sample

| | |
|---|---|
| **N/W Ratio** | 1:2.5 |
| **Angle** | α = 0°, β = 15°, γ = 0° |
| **Curvature** | R = ∞ |

| Resolution | Symbology | Digits |
|---|---|---|
| 1.0 mm | Code 39 | 1 |
| 0.5 mm | Code 39 | 3 |
| 0.25 mm | Code 39 | 8 |
| 0.15 mm | Code 39 | 10 |

## 9.4. Pitch, Skew, and Tilt

### 9.4.1. Pitch Angle

Scanning performance is guaranteed when α = ±20°

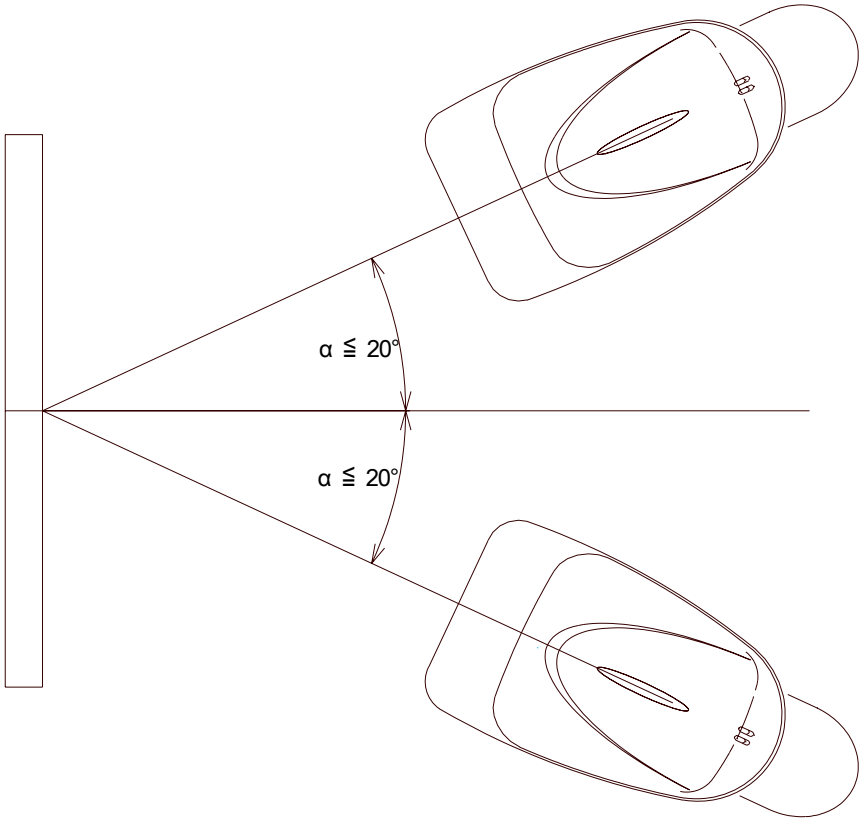


*Figure 6: Pitch*

### 9.4.2. Skew Angle and Dead Zone

Skew angle: β = ±50° (Excluding dead zone)

Dead zone: β = ±8° (There are some areas in which decoding fails due to specular reflection)

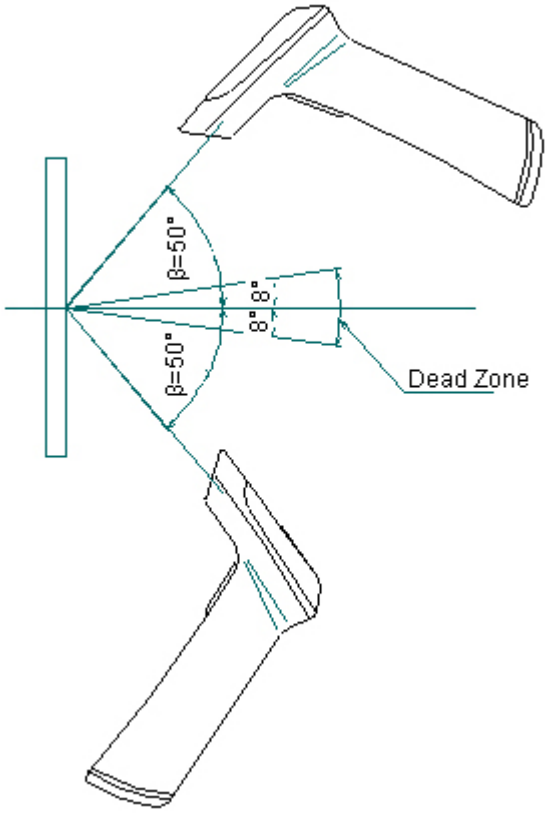


*Figure 7: Skew and dead zone*

### 9.4.3. Tilt Angle

Scanning performance is guaranteed up to γ < ±20° in the clockwise rotation and counterclockwise rotation.

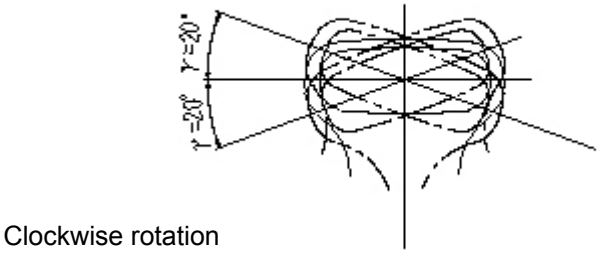


*Figure 8: Tilt angle*

**Conditions**

Barcode Sample: OPTOELECTRONICS Test Sample

PCS = 0.9, Resolution = 0.26 mm, Symbology = 13-digit JAN

## 9.5. Curvature

With 8-digit JAN/UPC/EAN barcodes, decoding performance is guaranteed when R≥15 mm.

With 13-digit JAN/UPC/EAN barcodes, decoding performance is guaranteed when R≥20 mm.

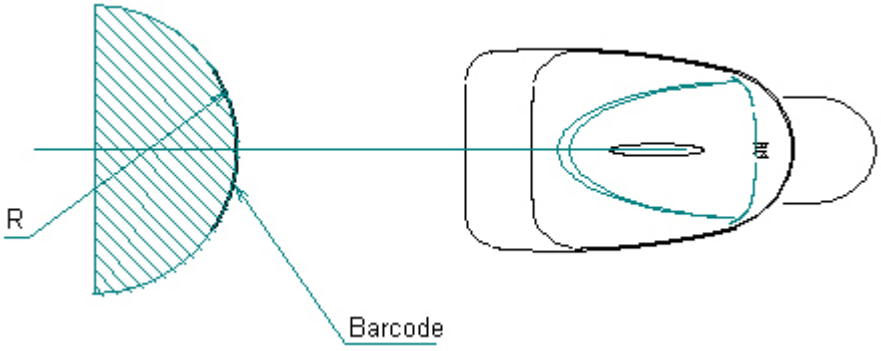


*Figure 9: Curvature*

**Conditions**

Barcode Sample: OPTOELECTRONICS Test Sample

PCS = 0.9, Resolution = 0.26 mm

## 9.6. Scan Width

Maximum scan width varies, depending on the depth of field.

# 10. Interface Specifications

## 10.1. Wireless Interface

| Item | Specification | Notes |
|---|---|---|
| Frequency | 2400 MHz to 2483.5 MHz | |
| Communication specification | IEEE 802.15.4 compliant | |
| Transmission power | 0 dBm or less | |
| Communication distance | 30 m | Depends on the environment. |
| Baud rate | 115.2 Kbps | |
| Antenna | 1/4λ surface-mounted type | |
| Communication configuration | 1 CRD 7734cradle to a maximum of 8 scanners | |
| Operation mode during wireless communication | Peer to peer | |
| Encryption | Encryption is available. | |

## 10.2. IEEE 802.15.4

### 10.2.1. Radio Equipment

The electromagnetic wave absorption (2.4 GHz) used by this product is also shared by various other devices. Therefore, baud rate and communication distance may be negatively impacted, or their communications may be disconnected, by other devices using the same absorption rate.

Baud rate and communication distance are affected by obstacles, wave conditions, or a device at the other end.

This product is equipped with an antenna. Bringing this product too close to a metallic object may affect communication. Anticipated interference distance is 10 m or less.

### 10.2.2. Frequency Band

This product uses the 2.4 GHz frequency band. Scientific, medical, and industrial devices, including microwaves, wireless security (camera) systems and W-LAN use the same frequency band as this scanner. Other radio stations also use this frequency for mobile object identification, including local private radio stations that require a license (for example, manufacturing lines at factories), specific power-saving radio stations requiring no license, and amateur radio stations.

Interference from other devices may affect the communication speed or communication range of this scanner or vice versa.

## 10.3. Configuration Using Menu Barcodes

Communication settings can be configured by scanning the appropriate menu barcodes. For further details regarding menu barcodes, please refer to the instruction manuals.

# 11. Default Settings

To make it easier to configure the reading and communication settings of the OPL 7734, a default setting set [U1] is available. OPL 7734 scanners are configured to [U1] when shipped.

## 11.1. Set Default Interface

Scan the following menu barcodes to return to the default settings.

### [U1] Settings: CRD 7734 Default Settings

| Functions | Menu labels | Menu codes |
|---|---|---|
| SET |  | ZZ |
| Default Setting: CRD 7734 connection |  | U1 |
| END |  | ZZ |

### [C02] Settings: OPA 1001 Default Settings

| Functions | Menu labels | Menu codes |
|---|---|---|
| SET |  | ZZ |
| Default Setting: OPA 1001connection |  | C02 |
| END |  | ZZ |

## 11.2. Default Settings 1: Readable Codes

| Symbology | Read | Transmit Code Length | Transmit CD | Calculate CD | Set Prefix | Set Suffix | Other |
|---|---|---|---|---|---|---|---|
| UPC-A | ■ | X | ■ | ■ | __ | CR | |
| UPC-A Add-on | X | X | ■ | ■ | __ | CR | |
| UPC-E | ■ | X | X | ■ | __ | CR | |
| UPC-E Add-on | X | X | X | ■ | __ | CR | |
| EAN-13 | ■ | X | ■ | ■ | __ | CR | |
| EAN-13 Add-on | X | X | ■ | ■ | __ | CR | |
| EAN-8 | ■ | X | ■ | ■ | __ | CR | |
| EAN-8 Add-on | X | X | ■ | ■ | __ | CR | |

| Symbology | Read | Transmit Code Length | Transmit CD | Calculate CD | Set Prefix | Set Suffix | Other |
|---|---|---|---|---|---|---|---|
| Codabar / NW-7 | ■ | X | X | X | __ | CR | Not transmit ST/SP |
| Code 39 | ■ | X | ■ | X | __ | CR | Not transmit ST/SP |
| Code 93 | X | X | X | ■ | __ | CR | |
| Code 128 | X | X | X | ■ | __ | CR | |
| EAN-128 | X | X | X | ■ | __ | CR | |
| IATA | X | X | ■ | X | __ | CR | |
| Industrial2of5 | ■ | X | ■ | X | __ | CR | |
| Interleaved2of5 | ■ | X | ■ | X | __ | CR | |
| MSI/Plessey | X | X | ■ | ■ | __ | CR | |

**Notes:**

In the “Reading” column, “■” means “Enable reading” and “X” means “Disable reading.”

In the “Transmit code length” column, “■” means “Transmit code length” and “X” means “Do not transmit code length.”

In the “Transmit CD” column, “■” means “Transmit check digit” and “X” means “Do not transmit check digit.”

In the “Calculate CD” column, “■” means “Calculate check digit” and “X” means “Do not calculate check digit.”

“— “ means “not supported.”

In the “Prefix” column, “—“ means “there is no prefix setting.”

## 11.3. Default Settings 2: Read Options, Trigger, Buzzer

| Item | Default Setting |
|---|---|
| Setting the number of characters | Fixed length OFF all codes |
| Read mode | Single read |
| Multiple read reset time | 500 ms |
| Add-on wait mode | 500 ms |
| Multiple column read | Disable |
| Redundancy | Read 3 times, redundancy = 2 |
| Intercharacter gap check | Within 1 character gap |
| Manual trigger | Enable |
| Read time | 2 seconds |
| Buzzer duration | 200 ms |
| Buzzer tone | 3 kHz + 2.5 kHz |
| Buzzer loudness | Loud (70 dBA or more at maximum loudness), 10 cm away from the front edge |
| Indicator duration | 200 ms |

## 11.4. Default Settings 3 Communication Settings

### 11.4.1. Cradle Registration

Scan the device address barcode printed on a label attached to the bottom of the communication cradle. It determines which cradle to communicate with. This registration needs to be done in order to transmit scanned data.

### 11.4.2. Wireless Adapter OPA-1001 Registration

Scan the device address barcode printed on a label attached to the bottom of the Wireless Adapter OPA 1001. It determines which cradle to communicate with. This registration needs to be done in order to transmit scanned data.

### 11.4.3. Wireless Communication Channel Settings: CH11–CH26

The wireless communication channel settings can be selected.

### 11.4.4. Data Memorizing Outside the Communication Range

Selecting “Data Memorizing Enabled” allows the scanner to read data outside the communication range and store the data in the memory of the OPL 7734. When the scanner returns to the communication range again, it will be re-connected and the temporary stored data will automatically be transmitted to the host.

**Note:** When selecting “Data Memorizing Disabled”, the scanner will not read data outside the range.

| Items | Settings |
|---|---|
| Cradle registration | Disable |
| Data memorizing settings | Enable |
| Wireless communication channel settings | CH15 |
| Encryption | Enable |

## 11.5. Default Settings 4: Communication Settings between the Cradle and Host via RS-232C

| Parameter | Setting | Menu Command |
|---|---|---|
| Baud rate | 9600 bps | K6 |
| Data bits | 8 bits | L1 |
| Parity | No parity | L2 |
| Stop bit | 1 stop bit | L5 |
| Handshaking | Busy/ready | P0 |
| ACK/NAK | No response | P5 |
| Flow control time out | Indefinitely | I0 |

# 12. Serial Number and Certifications

## 12.1. Serial Number Label

The serial number shown below is affixed to the scanner.


*Figure 10: Serial number*

## 12.2. Laser Class Label

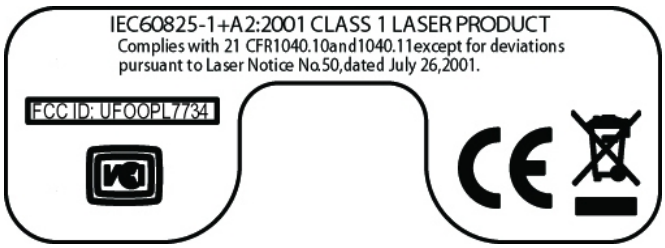


*Figure 11: Laser class label*

## 12.3. Certification Label

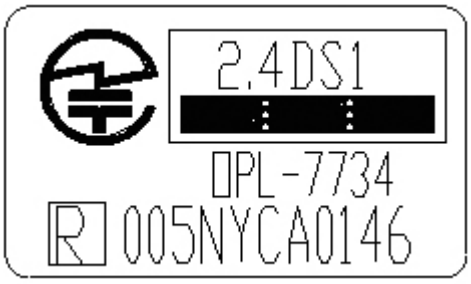


*Figure 12: Certification label*

# 13. Packaging Specifications

## 13.1. Individual Packaging Specification

Put the scanner in a protective foam bag and place it in an individual packing box.

Size of the package after assembly: (W) 245 x (D) 110 x (H) 80 mm

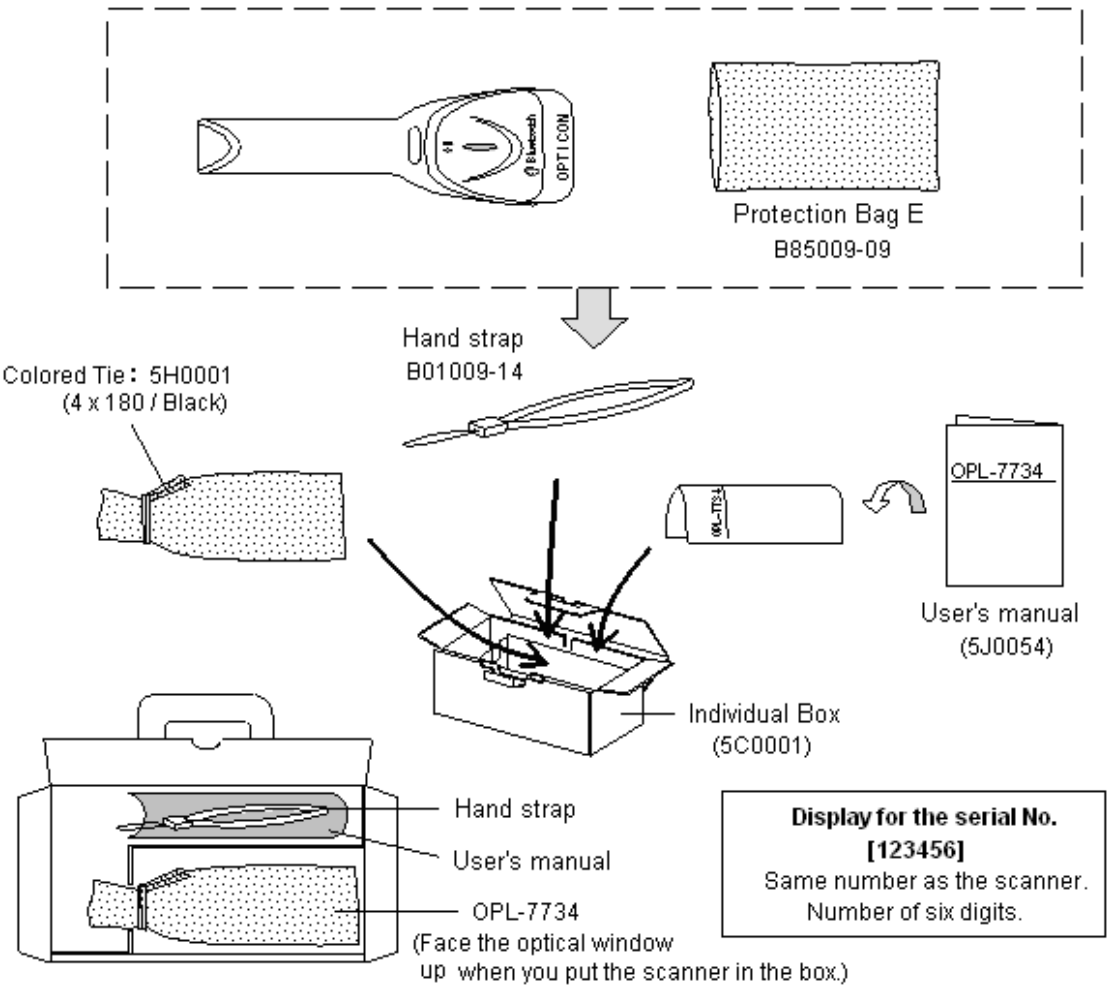


*Figure 13: Individual packaging*

## 13.2. Collective Packaging Specification

Size of the package after assembly: (W) 580 x (D) 505 x (H) 450 mm

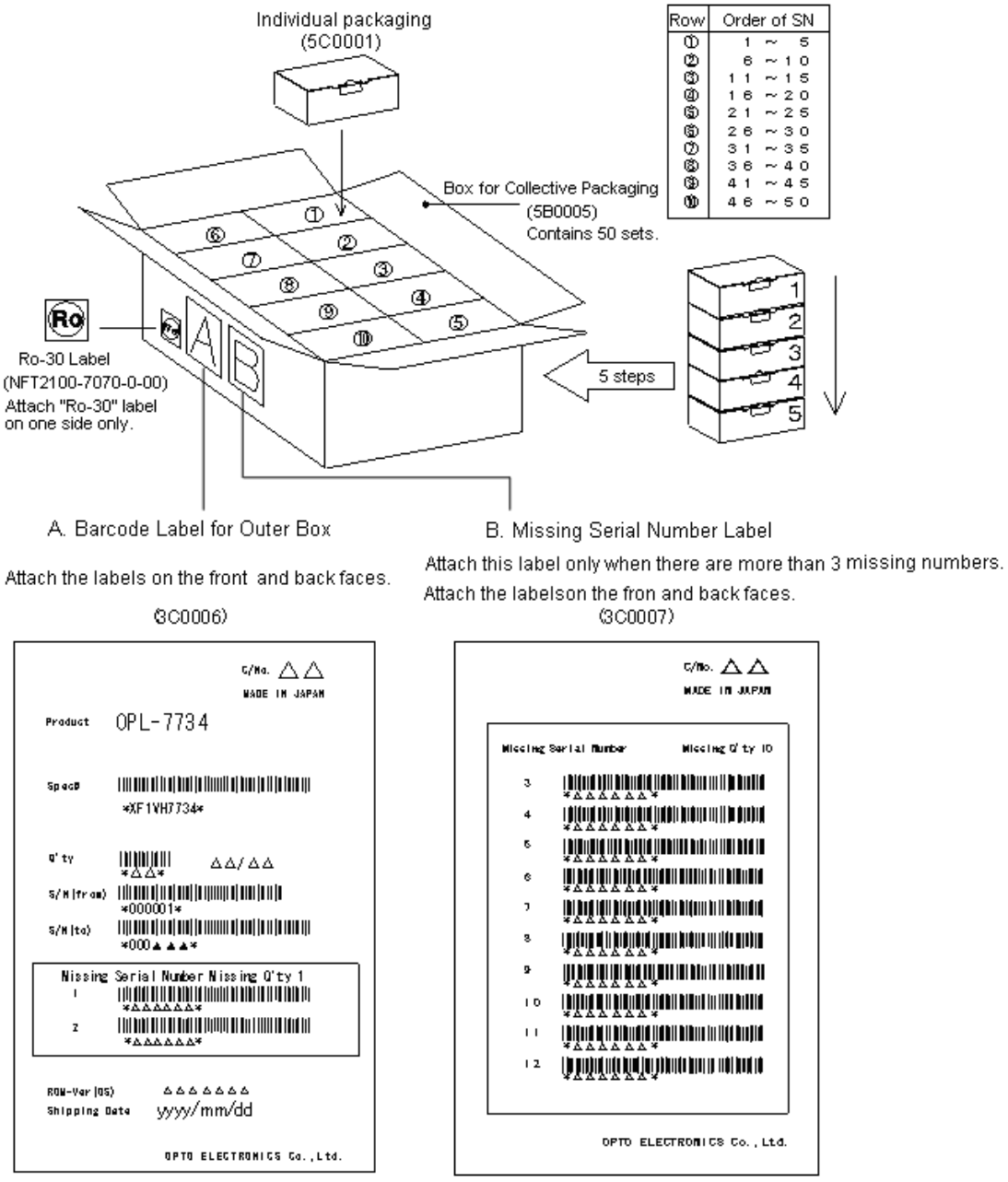


*Figure 14: Collective packaging*

**Note:** The “RO” mark labeled on the package tray or package box guarantees that the applicable product has passed our test of RoHS restrictions compliance (the restriction of the use of certain hazardous substances in electrical and electronic equipment, 2002/95 EC). However, this document does **not** have any legal weight in the European Union.

# 14. Durability

## 14.1. Static Electricity

| | |
|---|---|
| Air discharge: | ± 8 kV max. (No malfunction)<br>± 15 kV max. (No destruction) |
| Indirect discharge: | ± 8 kV max. (No malfunction) |
| Measurement environment: | Use electrostatic testing device compliant with IEC 61000-4-2 |

## 14.2. Shock

### 14.2.1. Drop Test

No malfunction occurred after the following drop test.

Drop Test: Drop the scanner from a height of 150 cm onto a concrete floor (three times in each of 6 sides).

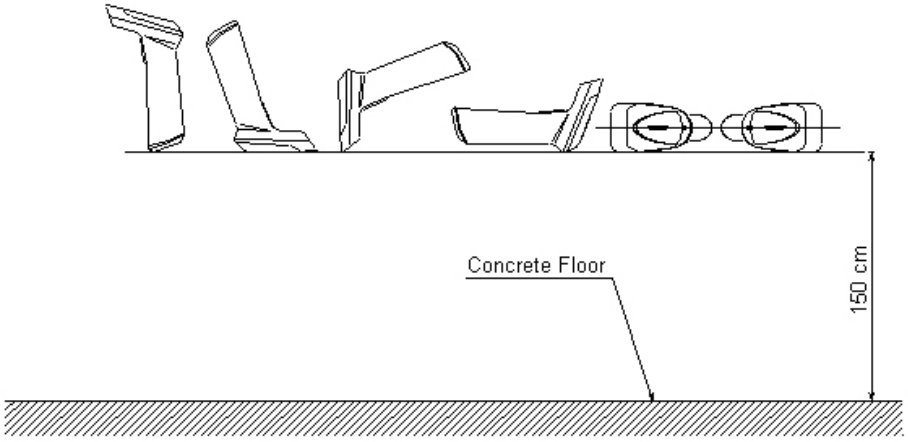


*Figure 15: Drop test*

Conditions of the drop test are as follows:

- The scanner passes this test even when it is found with minor dents or scratches.
- The scanner passes this test if grip end of the scanner has not fallen apart.

# 15. Reliability

MTBF (Mean Time Between Failures) of the part of this product that carries current full time is 90,300 hours.

The life cycle of the laser scan engine (without full-time energization) is 10,000 hours.

The life cycle of the trigger key is 500,000 uses.

The estimate of MTBF and product life cycle is based on standard operation of the product within the recommended temperature range and without extreme electronic or mechanical shock.

# 16. Regulatory Compliance

## 16.1. Laser Safety

The scanner emits laser beams.

JIS C6802: 2005: Laser class 1

FDA CDRH Laser class I. Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to laser notice No. 50 dated June 24, 2007.

## 16.2. EMC

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. Please install and use the equipment according to the instruction manual.

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.

Certification for Construction Design of Specified Radio Equipment

## 16.3. RoHS

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

## 16.4. R&TTE

This scanner conforms to the following standards of the Radio and Telecommunications Terminal Equipment (R&TTE) directive from the EU.

EN300 328

IEC60950-1

## 16.5. Radio Law

The 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. It does not have a radio station license in Japan.

The following activities are prohibited under the Radio Law:

- Remodeling and disassembly
- Peeling off the certificate label

## 16.6. State of California: Perchlorate Best Management Practices

The batteries on some Opticon products may contain Perchlorate. To comply with California Perchlorate Best Practice Regulations and the Law for the Promotion of Utilization of Recyclable Resources (Japan), products that may contain Perchlorate

materials should be properly labeled on the exterior of all outer shipping packages and/or in locations that otherwise satisfy the California Perchlorate Best Management Practices.

# 17. Safety

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

## 17.1. Shock

Do not throw or drop the scanner.

Do not place heavy objects on the cables.

## 17.2. Temperature Conditions

Do not use the scanner at temperatures outside the specified range.

Do not pour boiling water on the scanner.

Do not throw the scanner into the fire.

Do not forcibly bend the cables at low temperatures.

## 17.3. Foreign Materials

Do not immerse the scanner in liquids.

Do not subject the scanner to chemicals.

## 17.4. Other

Do not plug/unplug the connectors before disconnecting the power.

Do not disassemble this product.

Do not place the product near a radio or a TV receiver, as the scanner may cause reception problems.

The scanner may be damaged by voltage drops.

The scanner may not perform properly in environments when placed near a flickering light, such as a computer monitor, television, etc.

## 17.5. 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.