OPTICON

Rugged Handheld Laser Scanner

OPR 3001

The OPR 3001 is a rugged handheld laser barcode scanner with protection against dust and splashing water to ensure reliable operation in harsh environments

Specifications Manual

All information subject to change without notice.

Document History

Model Number:	OPR 3001	**Specification Number:**	SS06106
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1. Abstract

This manual provides specifications for the OPR 3001 handheld laser barcode scanner.

2. Overview

The OPR 3001 is a rugged handheld laser barcode scanner with protection against dust and splashing water to ensure reliable operation in harsh environments. The OPR 3001 is enclosed in a rugged housing sealed to IP-54 standards that withstands repeated drops of up to two meters onto concrete.

Short-wavelength red laser beams enhance the visibility of scanning lines for easier aiming under adverse lighting conditions. The OPR 3001 is available in USB, RS-232C, and Wedge interfaces.

Supported symbologies:

Linear (1D)	Postal	2D
JAN/UPC/EAN, incl. add-on	Chinese Post	Composite codes
Codabar/NW-7	Korean Postal Authority Code	MicroPDF417
Code 11		PDF417
Code 39		
Code 93		
Code 128		
GS1-128 (EAN-128)		
GS1 Databar (RSS)		
IATA		
Industrial 2of5		
Interleaved 2of5		
ISBN-ISMN-ISSN		
Matrix 2of5		
MSI/Plessey		
S-Code		
Telepen		
Tri-Optic		
UK/Plessey		

3. Physical Features

3.1. Dimensions

W 68 X D 150 X H 155 mm (except protruding portion)

3.2. Weight

230 g max (excluding cable).

4. Environmental Specifications

4.1. Operating Temperature and Humidity

Temperature: -10 to +60° C

Humidity: 5 to 90% RH

4.2. Storage Temperature and Humidity

Temperature: -30 to +70° C

Humidity: 5 to 90% RH

4.3. 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	to 4,000 lx
Fluorescent light	to 4,000 lx
Sunlight	to 80,000 lx

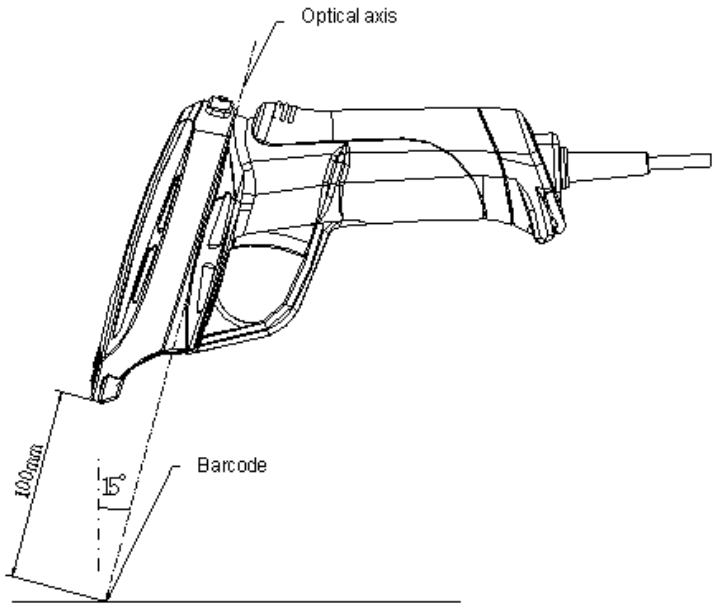

Figure 1: Ambient light immunity

Conditions

Barcode Sample: OPTOELECTRONICS Test Sample

PCS:	0.9
Resolution:	0.25 mm
Symbology:	9-digit Code-39
Quiet Zone:	10 mm
N/W Ratio:	1:2.5
Distance:	100 mm from the edge of scanner
Angle:	α = 0° β = 15° γ = 0°
Curvature:	R = ∞
Power supply voltage:	6.0 V

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

Note: α, β and γ respectively represent pitch, skew and tilt. Please see section 7 for how these values are defined.

5. Electrical Specifications

5.1. Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Power supply voltage		5.4	6.0	6.6	V	RS-232C
		4.5	5.0	5.5	V	USB and Wedge
Operating current	I_{OP}	—	96	130	mA	RS-232C when emitting
		—	90	125	mA	USB and Wedge when emitting laser
Rush current	I_{PEEK}	—	400	600	mA	RS-232C
		—	300	500	mA	USB and Wedge
Stand-by current	I_{PRE}	—	35	60	mA	RS-232C
		—	30	55	mA	USB and Wedge

Conditions:

- Connect 1Ω resistance to a power supply line in series and measure the current by the voltage between both ends of resistance.
- Power supply voltage is measured at a connector terminal area.
- The current value depends on the host computer to which the device is connected.

6. Optical Specifications

6.1. Laser Scan 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)	°
Auto-trigger IR detection area	40	mm

Notes:

Refer to chapter 15, “Trigger and Read Options,” to read about the scan modes.

Refer to chapter 7, “Technical Specifications,” to read about scanning performance.

6.1.1. Tilt of Laser Scan Line

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.

Maximum tilt between both ends of laser scan line: Less than 1.2° upward tilt from the scan origin.

Maximum of 3.1 mm when measured at a point 150 mm away from the scan origin. (The skew angle of this measurement was zero degrees.)

6.1.2. Curvature of Scan

Maximum gap between the straight line connecting both ends of the laser scan line and the actual laser scan line: Less than 1.27° curvature from the scan origin.

Maximum of 3.3 mm curvature when measured at a point 150 mm away from the scan origin. (The skew angle of this measurement was zero degrees.)

- Measurement was done from the center of the scan origin.

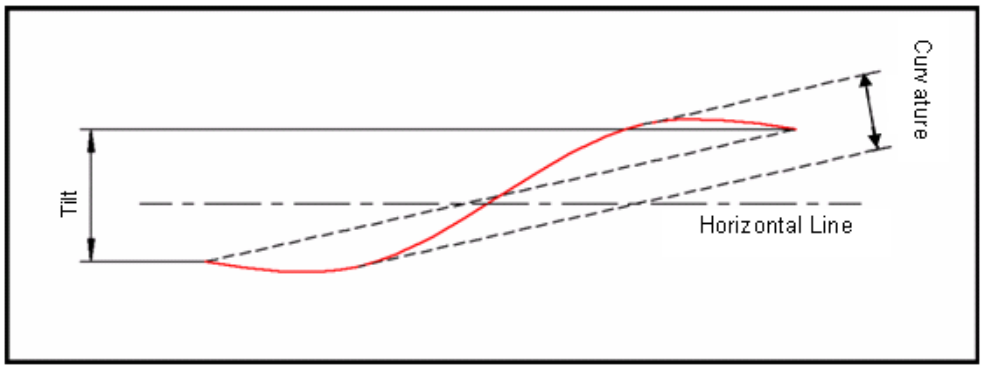

Figure 2: Laser scanning tilt and curvature

7. Technical Specifications

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

Conditions

Ambient temperature and humidity:	Room temperature (5 to 35º C) Room humidity (45% to 85% RH)
Ambient light:	500 to 900 lx
Angles:	Omni-scanning mode: Pitch: α = 0°, Skew: β = 0–10°, Tilt: γ = 0° Mobile mode: Pitch: α = 0°, Skew: β = 0°, Tilt: γ = 0°
Background:	Barcode = black Space = white Margin = white Background of label = black
Power supply voltage:	6.0 V (RS-232C) / 5.0 V (USB and Wedge)
Decoding test:	Approve the performance when decoding is successful in all ten tests. (Decoding is deemed successful when completed in 0.5 seconds or less.)

7.1. 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 mar the optical window. Keep the optical window clean.

7.2. Minimum Resolution

0.127 mm

7.3. Scan Area and Resolution

7.3.1. 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.

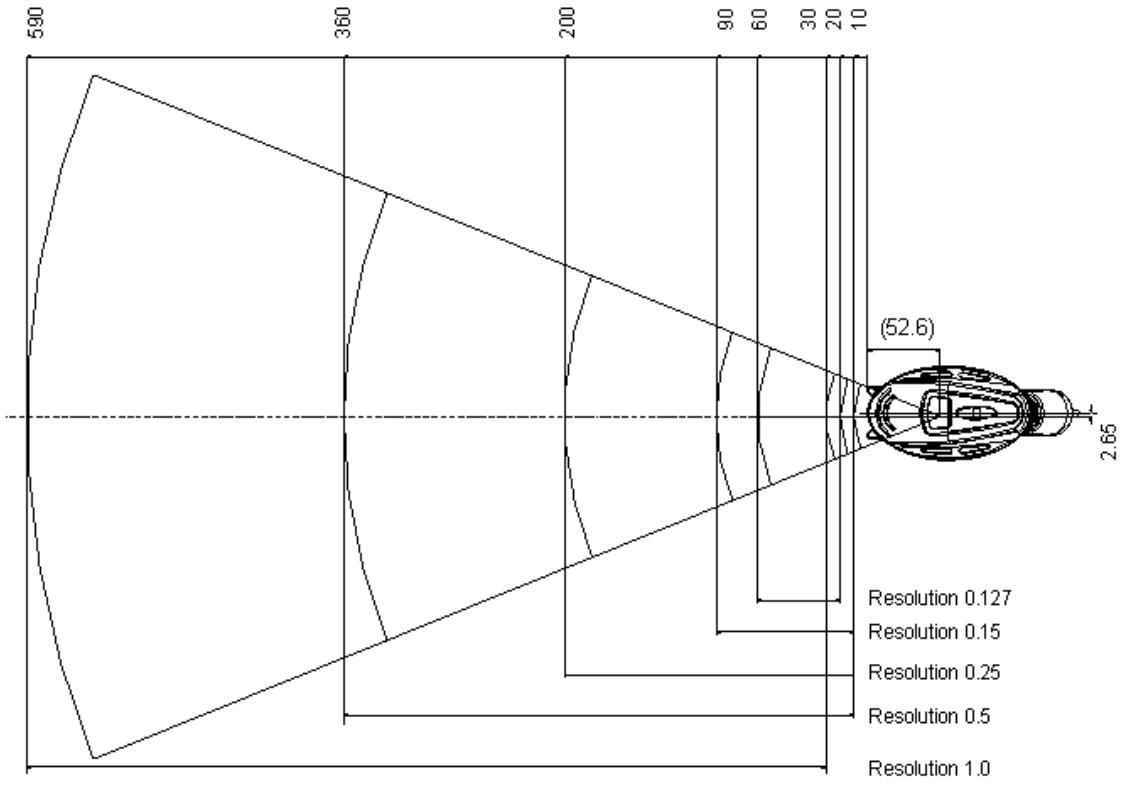

Figure 3: Scan area and resolution (in mm)

Symbology	Resolution	Decode depth (mm)	PCS
Code 39	1.0 mm	30–590	0.9
Code 39	0.5 mm	10–360	0.9
Code 39	0.25 mm	10–200	0.9
Code 39	0.15 mm	10–90	0.9
Code 39	0.127 mm	20–60	0.9

Conditions:

Barcode Sample: OPTOELECTRONICS Test Sample

N/W Ratio: 1:2.5

Angle: α = 0°, β = 15°, γ = 0°

Curvature: R = ∞

Resolution	Symbology	PCS	Quiet Zone	Digit
1.0 mm	Code 39	0.9	25 mm	1
0.5 mm	Code 39	0.9	18 mm	3
0.25 mm	Code 39	0.9	10 mm	8
0.15 mm	Code 39	0.9	7 mm	10

7.4. Pitch, Skew, and Tilt

7.4.1. Pitch Angle

α = ±35°

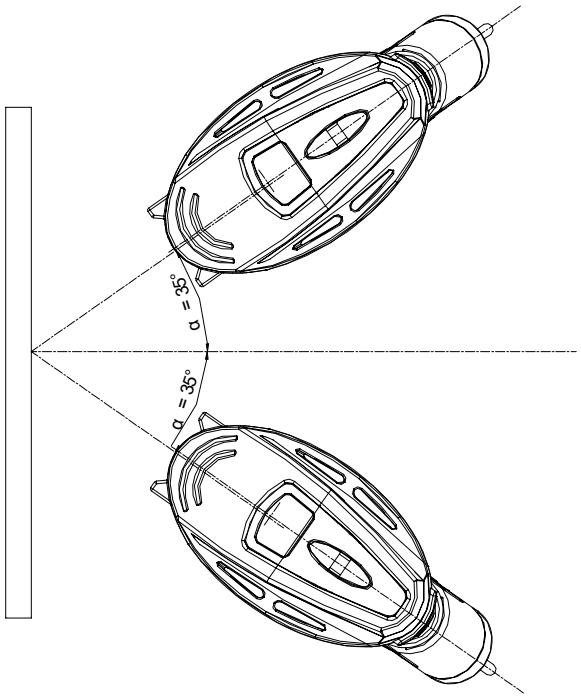

Figure 4: Pitch angle

7.4.2. 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)

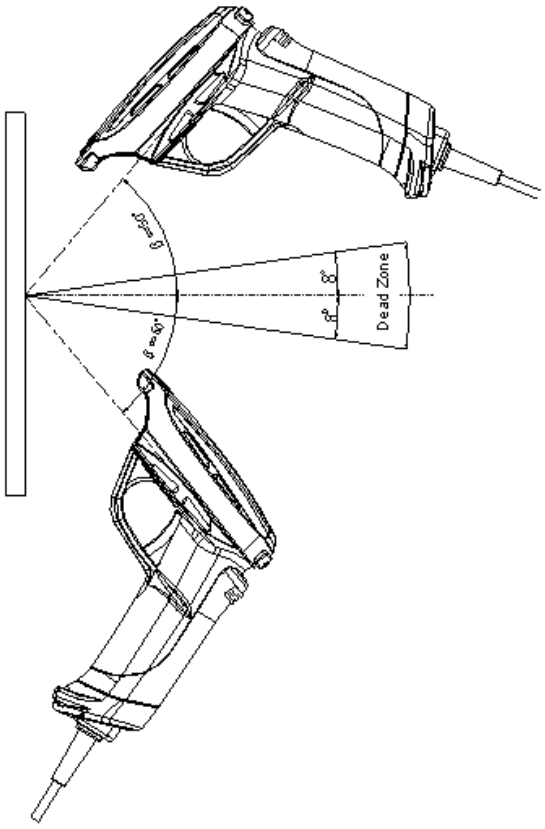

Figure 5: Skew angle and dead zone

7.4.3. Tilt Angle

γ = ±20°

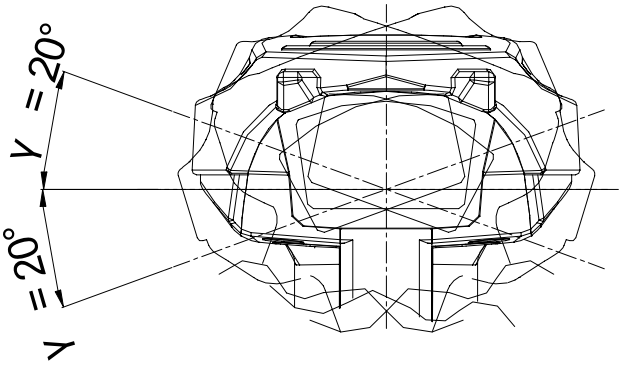

Figure 6: Tilt angle

Conditions

Barcode Sample: OPTOELECTRONICS Test Sample

Distance:	60 mm from the edge of the scanner
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 **Tilt Angle** PCS = 0.9, Resolution = 0.26 mm, Symbology = 13-digit JAN, Quiet Zone = 10 mm
Angle:	**Pitch Angle:** Skew Angle β = +15°, Tilt Angle γ = 0° **Tilt Angle:** Pitch Angle α = 0°, Skew Angle β = +15° **Skew Angle, Dead Zone:** Pitch Angle α = 0°, Tilt Angle γ = 0°
Curvature:	R = ∞

7.5. 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.

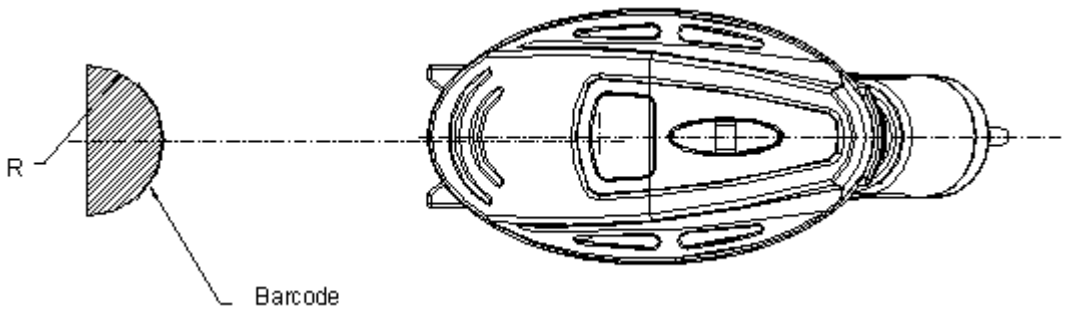

Figure 7: Curvature

Conditions

Barcode Sample: OPTOELECTRONICS Test Sample

PCS = 0.9, Resolution = 0.26 mm, Quiet Zone = 10 mm	
Distance:	60 mm from the edge of the scanner
Angle:	Skew Angle β = +15°

8. Interface Specifications

8.1. RS-232C Interface Specification

8.1.1. Settings and Communication

Reading the menu barcodes in section 10.1 can set the RS-232C interface default.

Parameter	[U2] setting
Baud rate	9600 bps
Start/stop bits	1 bit
Data bits	8 bits
Parity bits	No parity
Handshaking	No handshake
Flow control time out	Indefinitely

Communication settings can be configured by scanning corresponding menu barcodes.

8.1.2. Signal Level

Signal Name	I/O	RS-232C Level (V)	
		Mark/OFF	Space/ON
TxD	OUT	-5 to -15	+5 to +15
RxD	IN	-3 to -15	+3 to +15
RTS	OUT	-5 to -15	+5 to +15
CTS	IN	-3 to -15	+3 to +15

8.1.3. Interface Circuit

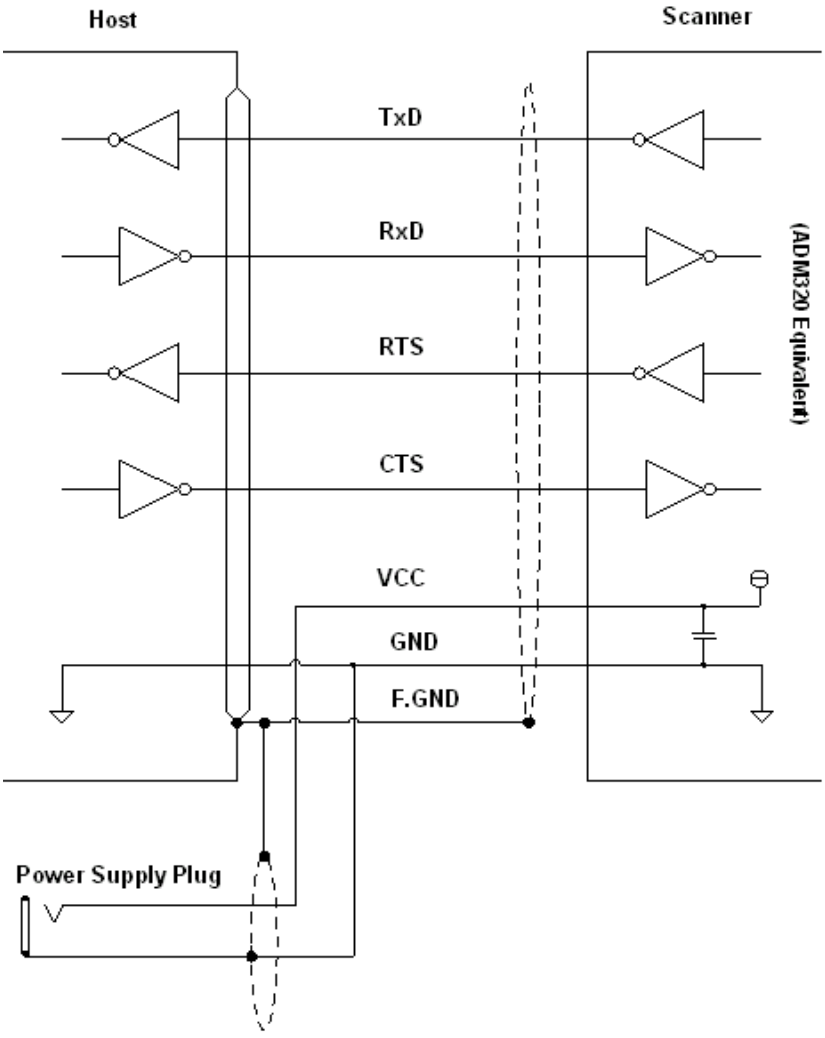

Figure 8: Interface circuit

8.1.4. Character Format

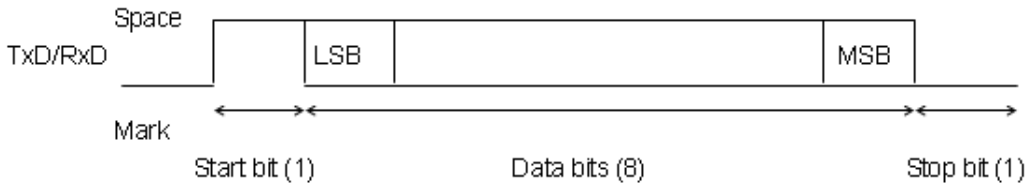

Figure 9:Character format (same for both sending and receiving)

8.1.5. Communication Format

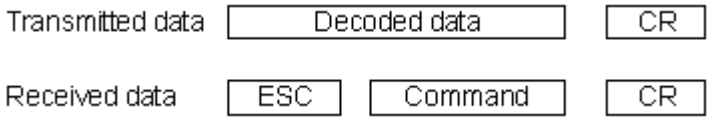

Figure 10: Communication format

8.1.6. Handshaking

Select handshaking options using the menu or command listed below.

Handshaking	Menu/Command
No handshake	P0
BUSY/READY	P1
MODEM	P2
ACK/NAK	P3
ACK/NAK NO RESPONSE	P4

a) No Handshaking

The scanner attempts the communication regardless of the state of the host computer.

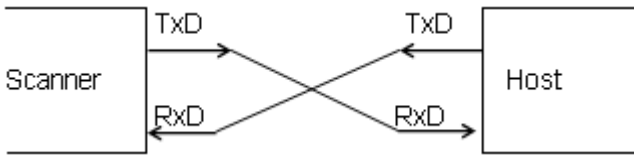

Figure 11: No handshaking

b) BUSY/READY

The scanner and the host computer notify each other of their state and whether they can receive data with BUSY/READY through an RTS line. They can communicate state to each other through a CTS line when connected as in the following figure.

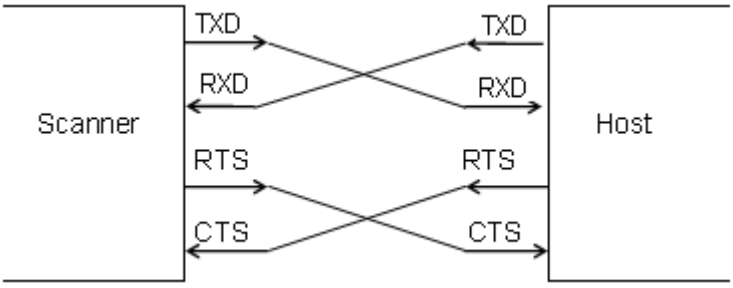

Figure 12: Busy/Ready communication

The scanner stays ON (is able to receive data) except during certain parts of the process, such as receiving data (buzzer command execution), transmitting data, and menu processing. The scanner checks the CTS line before transmitting data. When it is ON, the scanner transmits data. When it is OFF, the scanner waits for it to turn ON within a set time. The scanner will abort transmission with an error indication (buzzer) when the CTS line is not ON within a specified period. The Flow Control time-outs are as follows, and the default setting is “indefinitely“ (I0).

Flow Control Time Out	Menu/Command
Indefinitely	I0
100 ms	I1
200 ms	I2
400 ms	I3

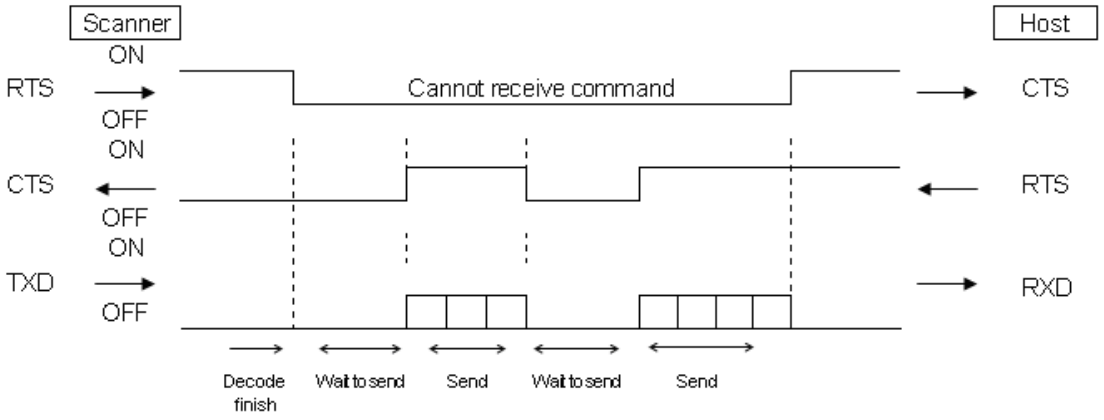

Figure 13: Cannot receive command

CTS, TXD signal timing

When the CTS line (RTS signal of the host) is turned OFF while sending a TxD signal, the scanner transmits one character and waits. When the CTS signal is turned ON while transmitting a character, the character will be transmitted.

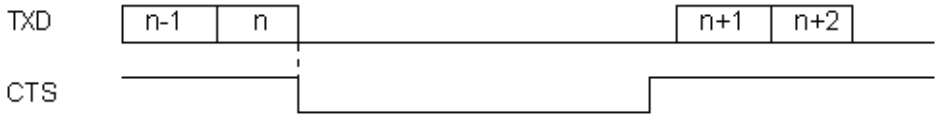

Figure 14: Signal timing

Note: When using loopback (wire connection) for RTS, CTS line of the scanner in this setting, *No handshake* is not enabled.

c) MODEM

The scanner turns CTS line ON before transmitting data. Other processes are the same as BUSY/READY.

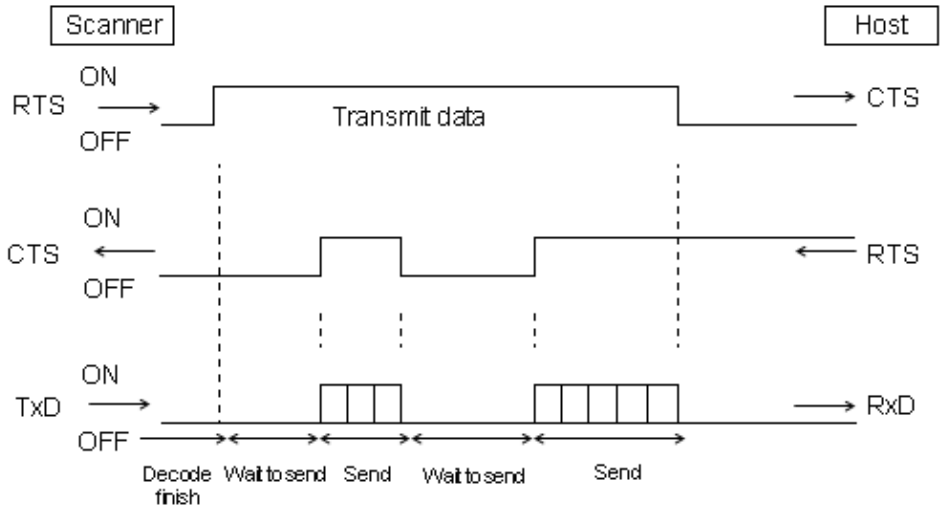

Figure 15: Modem transmit data

d) ACK/NAK

After data has been transmitted, the scanner expects to receive one of the following responses from the host:

ACK response—Action: The scanner completes transmission with the good-read buzzer and returns to the initial state.

NAK response—Action: The scanner sends the data again and waits for the response from the host.

DC1 response—Action: The scanner returns to waiting for the trigger, if it has a trigger (the initial state).

None response—Action: The scanner sounds the error buzzer and returns to the initial state.

ACK/NAK timeout can be set as follows using the menu or commands.

ACK/NAK timeout	Menu / Command
Indefinitely (default)	XI4
100 ms	XI5
500 ms	XI6
1000 ms	XI7

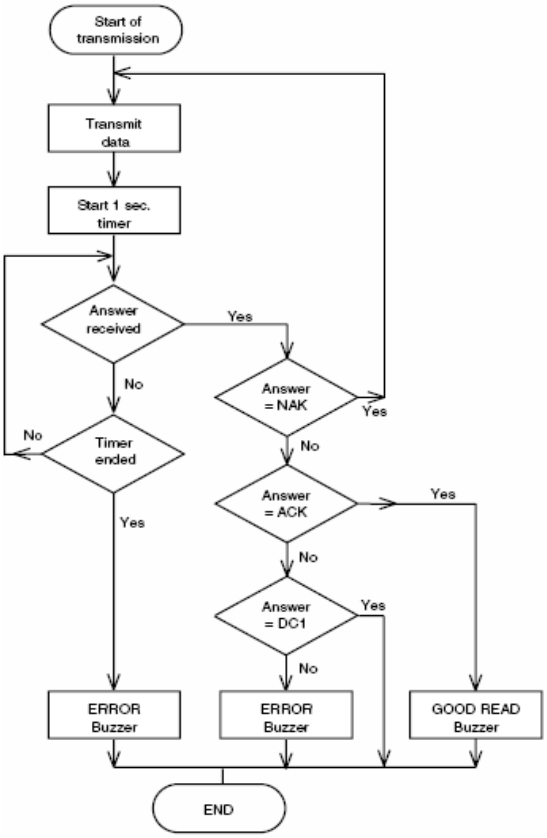

Figure 16: ACK/NAK

e) ACK/NAK NO RESPONSE

When no response from the host is received within the setting time, the scanner assumes an ACK response, and returns to the initial state without the error buzzer. The other actions are the same as ACK/NAK.

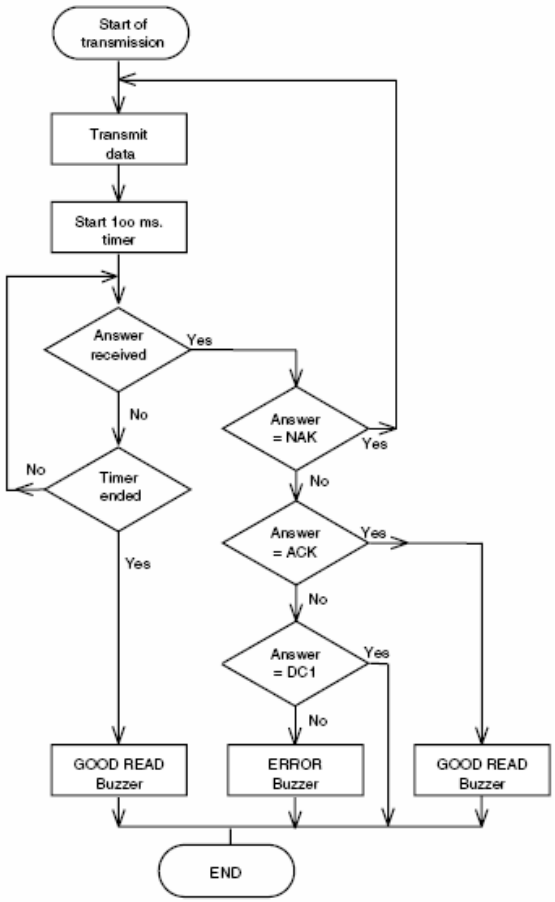

Figure 17: ACK/NAK—No response

8.2. USB-HID and USB-VCP Interface Specifications

8.2.1. Settings

Reading the menu barcodes in section 10.1 can set the USB interface default. The interface is full-speed USB (12 Mbps).

8.2.2. Interface Circuit

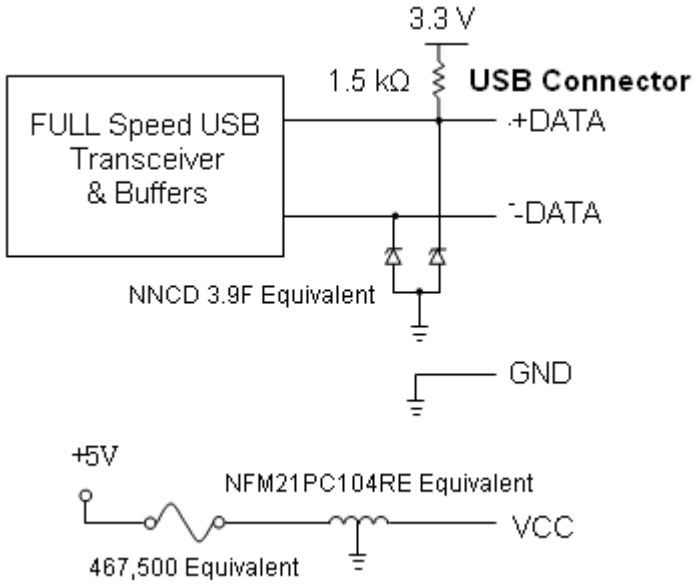

Figure 18: USB interface circuit

Do not operate the keyboard while the scanner is transmitting the data to the host; it may cause data transactions to fail.

8.3. DOS/V Wedge Interface Specification

Reading the menu barcodes in section 10.1 can set the DOS/V Wedge interface default.

Do not operate the keyboard while the scanner is transmitting the data to the host; it may cause data transactions to fail.

9. Cable and Connector

9.1. RS-232C Cable

(Standard specification)

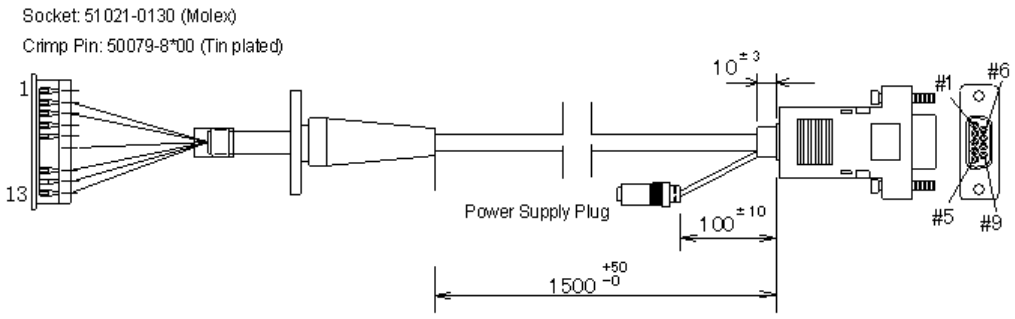

Figure 19: RS-232C cable

Type:	Straight
Diameter:	Φ4.8 ±0.5 mm
Length:	1500 ±50 , -0 mm
Cores:	8 insulated wires, 1 conductive wire
Weight:	Approximately 80 g

9.1.1. Pin Assignment

Pin No	Signal Name	Notes
1	NC	Open (not assigned)
2	TXD	
3	RXD	
4	—	Pin no. 6 and jumper
5	GND	
6	—	Pin no. 4 and jumper
7	CTS	
8	RTS	
9	NC	Open (not assigned)

Connector: A connector with a plug for external power supply (D-sub, 9-pin, female)

Power Supply: φ4.0 (inside diameter: φ1.7)

Exterior electrode of the plug is GND and interior electrode is +.

9.2. USB Cable

(Standard specification)

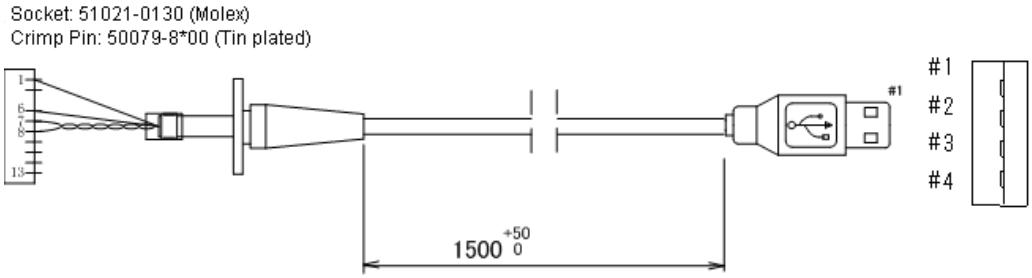

Figure 20: USB cable

Type:	Straight
Diameter:	Φ4.8 ±0.5 mm
Length:	1500 ±50, -0 mm
Cores:	4 insulated wires, 1 conductive wire
Weight:	Approximately 60 g

9.2.1. Pin Assignment

Pin	Signal
1	VCC
2	-DATA
3	+DATA
4	GND

9.3. Wedge Cable

(Standard specification)

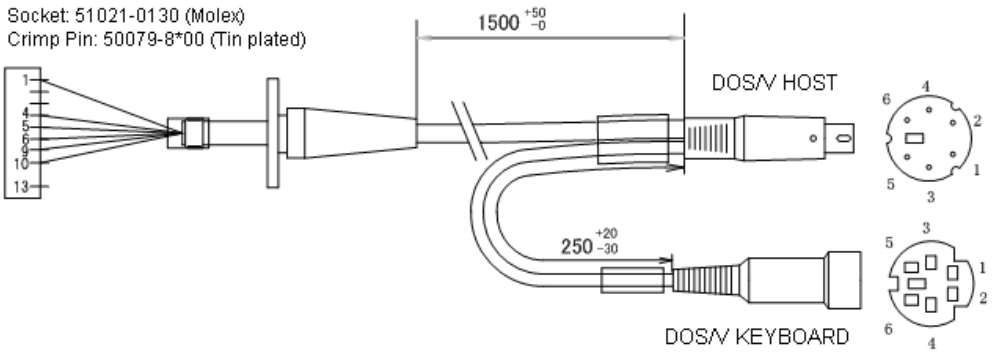

Figure 21: Wedge cable

Type:	Y cable
Diameter:	Φ4.8 ±0.5 mm
Length:	1500 ±50 , -0 mm
Cores:	8 insulated wires, 1 conductive wire
Weight:	Approximately 80 g

9.3.1. Pin Assignment

DOS/V Host Side			DOS/V Keyboard Side	
Pin No	**Signal Name**		**Pin No**	**Signal Name**
1	CPU_DATA		1	KEY_DATA
2	—		2	—
3	GND		3	GND
4	VCC		4	VCC
5	CPU_CLK		5	KEY_CLK
6	—		6	—

9.4. Connector Specification (Scanner Side)

CN801 (13-pin)

Pin Number	**Signal Name**		
	RS-232C	**USB**	**Wedge**
1	NC	VCC	VCC
2	R×D	NC	NC
3	T×D	NC	NC
4	NC	NC	CPU_CLK
5	NC	NC	CPU_DATA
6	GND	GND	GND
7	NC	USB+	NC
8	NC	USB-	NC
9	NC	NC	KB_DATA
10	NC	NC	KB_CLK
11	CTS	NC	NC
12	RTS	NC	NC
13	VCC	NC	NC

10. Default Settings

10.1. Set Default Interface

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

RS-232C

Functions	Menu labels	Menu codes
SET		ZZ
RS-232C		U2
Single tone buzzer: 3 kHz*		W1
Buzzer duration: 50 ms*		W7
Read mode options: Single read*		S0
END		ZZ

* If you are using software version TS01Y04 or later, it is not necessary to configure the foregoing settings.

USB-HID Default

Functions	Menu labels	Menu codes
SET		ZZ
USB default		SU
END		ZZ

USB-VCP

Functions	Menu labels	Menu codes
SET		ZZ
USB-VCP		C01
END		ZZ

Wedge Default (with external keyboard)

Functions	Menu labels	Menu codes
SET		ZZ
AT Wedge default		UB
Keyboard layout: with keyboard		KM
END		ZZ

Wedge Default (without external keyboard)

Functions	Menu labels	Menu codes
SET		ZZ
AT Wedge default		UB
Keyboard layout: without keyboard		KL
END		ZZ

10.2. 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	■	■	—	CR	
UPC-E Add-on	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	
Chinese Post 2of5	X	X	■	X	—	CR	
Codabar / NW-7	■	X	■	X	—	CR	Not transmit ST/SP
Code 11	X	X	X	■	—	CR	
Code 39	■	X	■	X	—	CR	Not transmit ST/SP

Symbology	Read	Transmit Code Length	Transmit CD	Calculate CD	Set Prefix	Set Suffix	Other
Code 93	■	X	X	■	—	CR	
Code 128	■	X	X	■	—	CR	
GS1-128 (EAN/UCC-128)	X	X	X	■	—	CR	
GS1 DataBar (RSS) (all, incl. CC-A/B); Limited/ Expanded	X	X	■	■	—	CR	
IATA	■	X	■	X	—	CR	
Industrial2of5	■	X	■	X	—	CR	
Interleaved2of5	■	X	■	X	—	CR	
Korean Postal Code (Code 3of5)	X	X	X	■	—	CR	
Matrix2of5	X	X	■	X	—	CR	
MicroPDF417	X	X	—	—	—	CR	
PDF417	X	X	—	—	—	CR	
MSI/Plessey	■	X	■CD1	■CD1	—	CR	
S-Code	■	X	■	X	—	CR	
Telepen	■	X	X	■	—	CR	
Trioptic	■	X	—	—	—	CR	Not transmit ST/SP
UK/Plessey	■	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.”

10.3. Default Settings 2: Read Options, Trigger, Buzzer

Item	Default Setting
Setting the number of characters	Fixed length OFF all codes
Read mode	Multiple read
Multiple read reset time	500 ms
Add-on wait mode	500 ms
Multiple label read	Disable
Multiple column read	Disable
Redundancy	Read 1 times, redundancy = 0
Trigger switch	Enable
Trigger repeat	Disable
Auto trigger	Disable
Read time	2 seconds (when trigger enabled)
Margin check	Normal
Buzzer duration	50 ms
Buzzer tone	Single tone (3 kHz)
Buzzer loudness	Maximum
Buzzer timing	Before transmission
Startup buzzer	Enable
Good read LED	Indicator duration 200 ms

11. Serial Number

The serial number as shown below is affixed to the scanner.

Figure 22: Serial number diagram

12. Packaging Specifications

12.1. Individual Packaging Specification

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

The scanner shown is an RS-232C unit. Descriptions on an individual packaging box label differ, depending on the interface type. The “RO” mark may be indicated on the upper side of the individual packaging box label.

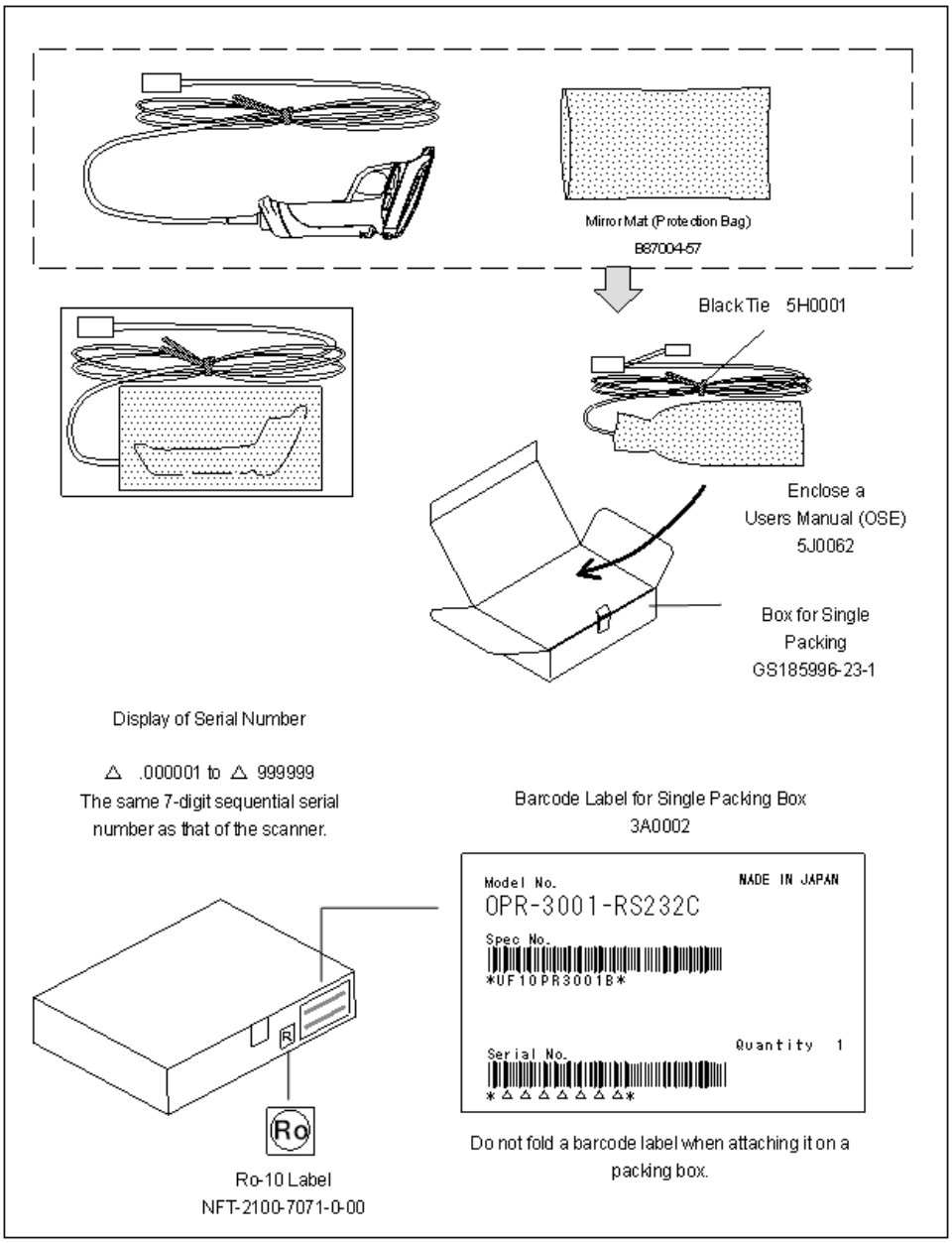

Figure 23: Individual packaging

12.2. Collective Packaging Specification

The scanner shown is an RS-232C unit. Descriptions on a collective packaging box label differ, depending on the interface type. The “RO” mark may be indicated on the upper side of the individual packaging box label.

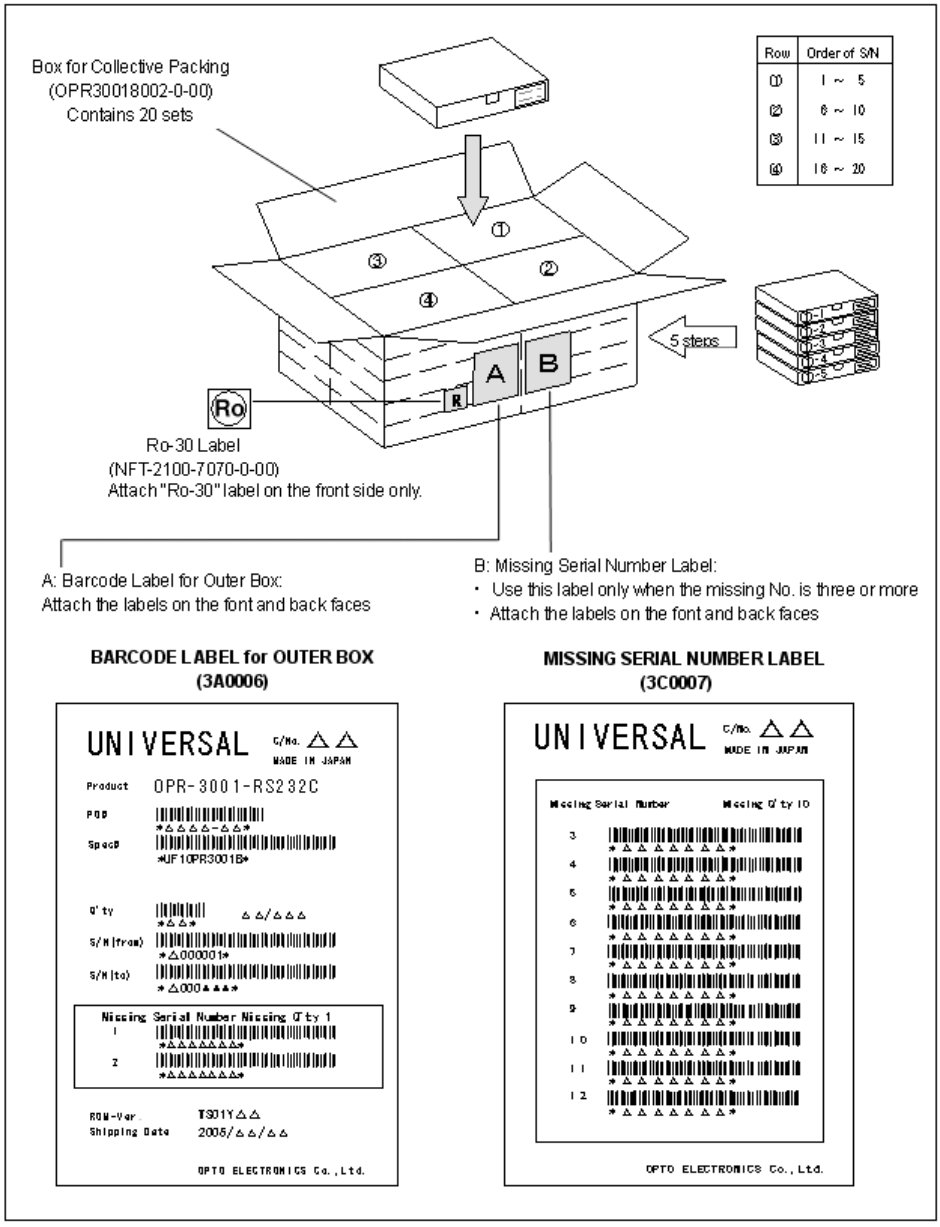

Figure 24: Collective packing

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.

13. Durability

13.1. Electrical Noise

No malfunction occurred when sinusoidal electrical noise (10 Hz–100 kHz, < 0.1 Vp-p) was added to the power supply line.

Conditions

Barcode Sample: OPTOELECTRONICS Test Sample

PCS	0.9
Resolution	0.25 mm
Symbology	9-digit Code 39
Quiet Zone	10 mm
N/W Ratio	1:2.5
Distance	100 mm
Angle	α = 0° β = 15° γ = 0°
Curvature	R = ∞
Power Supply Voltage	6.0 V (RS-232C) / 5.0 V (USB and Wedge)

13.2. Static Electricity

Air discharge:	8 kV max (No malfunction) 15 kV max (No destruction)
Contact discharge:	6 kV Contact discharge at the hook and the screw
Measurement environment:	Use electrostatic testing device compliant with IEC 61000-4-2
Discharge resistance:	330 Ω
Capacitor charging:	150 pF

13.3. Shock

13.3.1. Drop Test (without packaging)

No malfunction occurred after the following drop test.

As shown below, drop the scanner from 200 centimeters above the concrete floor (three times from each of 6 angles).

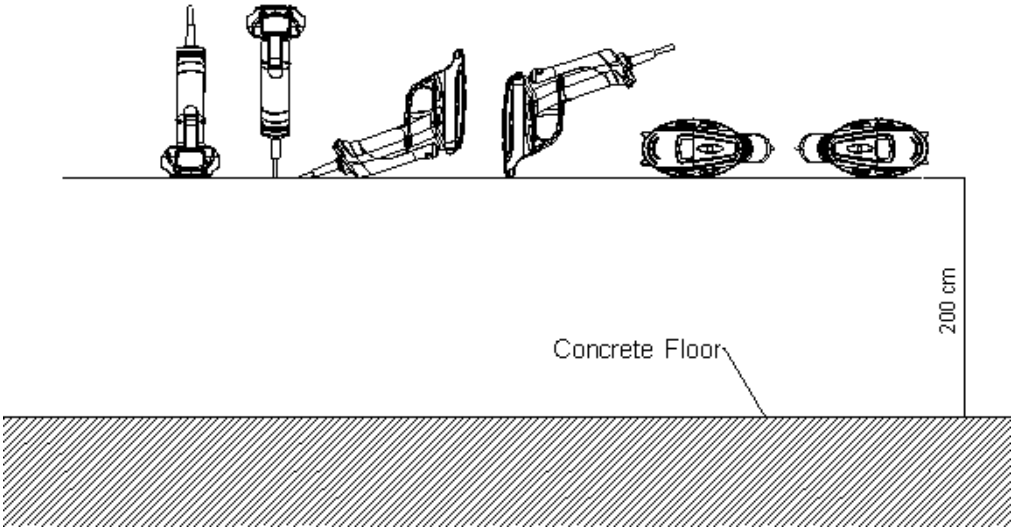

Figure 25: Product drop test

13.3.2. Drop Test (with individual packaging)

No malfunction occurred after the following drop test.

Drop the individual package box from 150 centimeters above the concrete floor (ten times from random angles: on its top, bottom, front, back, left, right, top-left, top-right, bottom-left, bottom-right)

13.3.3. Vibration (without packaging)

Swept with 10 Hz to 100 Hz, acceleration 19.6 m/s^2 (2.0G). Added a vibration to each X, Y and X direction for 30 minutes (1 cycle = 60 minutes) under non-operational conditions. Observed no abnormality in either appearance or performance.

13.3.4. Vibration (individual packaging)

Swept with 10 Hz to 100 Hz, acceleration 19.6 m/s^2 (2.0G). Added a vibration to each X, Y and X direction for 30 minutes (1 cycle = 60 minutes) with individual packaging. Observed no abnormality in either appearance or performance.

13.4. Dust and Drip Proof

IEC IP54

Dust Prevention

Level	Details
5	Ingress of dust is not entirely prevented, but it must not enter in sufficient quantity to interfere with the satisfactory operation of the equipment; complete protection against contact.

Water Prevention

Level	Details
4	Water splashing against the enclosure from any direction shall have no harmful effect.

13.5. Cable Strength

Affixed the scanner to an immovable object and pulled it using a force of 49N (5.0 kgf) for 1 minute. Observed no abnormality in either structure or performance.

13.6. Cable Bending Test

As shown below, added a load of 4.9N (500 g) to a cable then bent it at an angle of 90 degrees to both right and left. Count 1 time by bending to either side; repeated this 3 million times on RS-232C and Wedge cables and repeated 1 million times on USB cable. Observed no abnormality in either structure or performance. Note: Cable bending resistance is not warrantable.

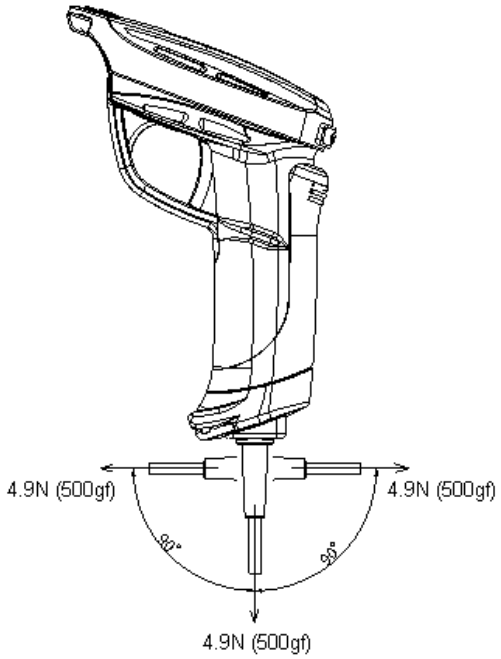

Figure 26: Cable bend strength

14. Reliability

MTBF (Mean Time Between Failures) of this product except for the laser diode and the mirror motor scan unit is 30,000 hours.

Life cycle of the laser diode is 10,000 hours and that of the mirror motor scan unit is also 10,000 hours.

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.

15. Trigger and Read Options

The OPR 3001 has an optional auto trigger setting, which starts barcode reading automatically by using sensor detection. When auto trigger is enabled, a laser beam is emitted and points to the auto trigger area. The scanner starts barcode reading after detecting reflection from the surface when the auto trigger is used.

Auto trigger distance: 40 mm from the edge of the scanner.

15.1. Trigger Modes

Disabled: When this option is selected, the reader will stay on all the time.

Enabled: After receiving a trigger signal, the barcode reader will turn on and the read cycle starts. The reader will stay on for a time as set in 'Read time options'. The trigger signal can be initiated in the following ways:

Auto trigger mode: The read cycle automatically starts when a trigger signal is received via sensor detection.

15.2. Auto Trigger Options

15.2.1. Auto Trigger Sensor

Auto trigger mode is enabled by scanning a part of scan area with infrared. The scanner will start scanning after the embedded CMOS sensor detects a change in reflection from the object.

Conditions

Moving Speed:	100 ±10 mm/s
Angle:	Skew angle, excluding pitch angle and dead zone
Environmental Temperature and Humidity:	Room temperature and humidity
Environmental luminance:	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)

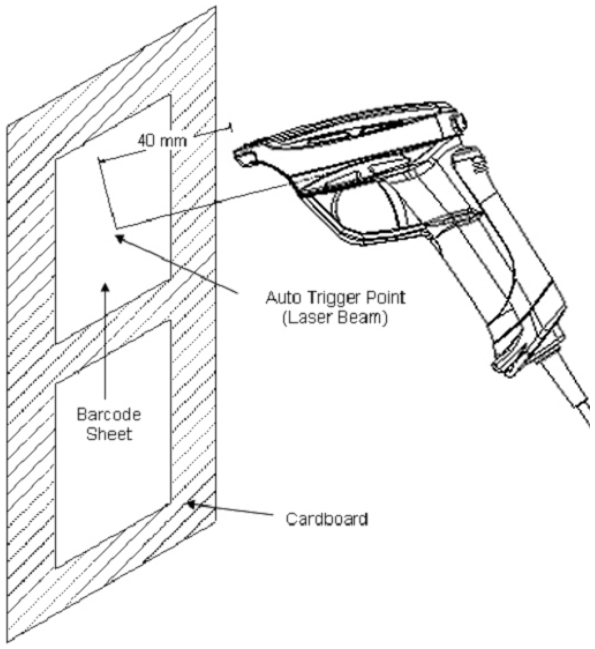

Figure 27: Auto trigger detection area

16. Trigger and Read Settings

16.1. Auto Trigger Settings

16.1.1. Enable/Disable Settings

Use the following settings to enable or disable the auto trigger. (Auto trigger is disabled by default).

To enable auto trigger, scan “ZZ”, “+I” and “ZZ” in that order.

To disable auto trigger, scan “ZZ”, “+F” and “ZZ” in that order.

Functions	Menu labels	Menu codes
SET		ZZ
Disable auto trigger		+F
Enable auto trigger		+I
END		ZZ

17. Regulatory Compliance

17.1. Laser Safety

The scanner emits laser beams.

JIS C6802: 2005: Laser class 2

IEC 825-1/EN 60825-1: Laser class 2

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

Class II laser devices are not considered to be hazardous when used for their intended purpose. Avoid staring into the laser beam.

17.2. Product Safety

EN60950-1: 2001

IEC60950-1: 2001

17.3. EMC

EN55022

EN55024

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.

17.4. RoHS

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

18. Safety

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

18.1. Shock

Do not throw or drop the scanner.

Do not place heavy objects on the cables.

18.2. 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.

18.3. Foreign Materials

Do not immerse the scanner in liquids.

Do not subject the scanner to chemicals.

18.4. 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.

19. Mechanical Drawing

Dimensions: 3 W 68 X D 150 X H 155 (mm) (except protruding portion)

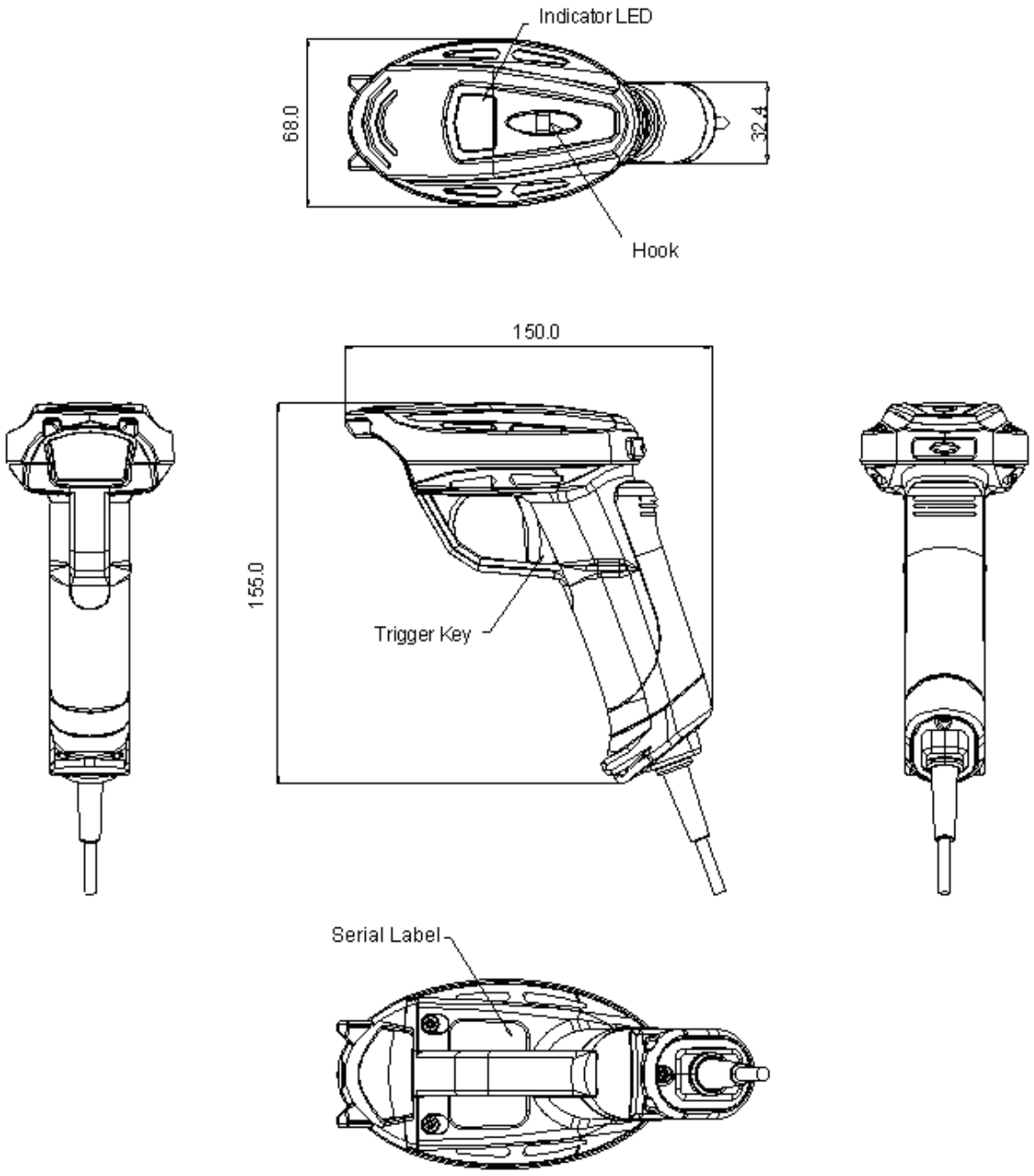

Figure 28: Mechanical drawing