

**OPTICON**

Handheld Laser Barcode Scanner

# OPL 7836



The OPL 7836 is a handheld laser barcode scanner.

## Specifications Manual

All information subject to change without notice.

## Document History

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## 1. Abstract

This manual provides specifications for the OPL 7836 barcode scanner.

## 2. Overview

The OPL 7836 is a handheld laser barcode scanner.

The OPL 7836 enhances visibility by using a short-wavelength red laser beam when scanning lines.

Supported symbologies:

<b>Linear (1D)</b>	<b>Postal</b>	<b>2D</b>
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		

The OPL 7836 outputs the scanned barcode image via an RS-232C, USB, or WEDGE interface according to its specification.

The OPL 7836 complies with RoHS.

### 3. Physical Features

#### 3.1. Dimensions

W 144.5 x D 113.0 x H 54.3 (mm)

#### 3.2. Weight

100 g max. (excluding cable)

### 4. Environmental Specifications

#### 4.1. Operating Temperature and Humidity

Temperature: -5 to +50° C

Humidity: 20 to 85% RH

#### 4.2. Storage Temperature and Humidity

Temperature: -20 to +60° C

Humidity: 10 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 3,000 lx
Fluorescent light	to 3,000 lx
Sunlight	to 50,000 lx

#### 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:	85 mm
Angle:	$\alpha = 0^\circ \beta = 15^\circ \gamma = 0^\circ$
Curvature:	$R = \infty$
Power Supply Voltage:	5.0 V

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

**Note:**  $\alpha$ ,  $\beta$  and  $\gamma$  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	V <sub>DD</sub>	4.5	5.0	5.5	V	
Operating current	I <sub>OP</sub>	-	85	150	mA	Buzzer Off
Rush current peak	I <sub>PEEK</sub>	-	450	500	mA	
Stand-by current	I <sub>PRE</sub>	-	35	70	mA	
Startup time	T <sub>D</sub>	-	100	-	ms	

#### 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 interface type and 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)	°

#### 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

Maximum tilt between both ends of a laser scan line.

Less than 1.2° upward tilt from the scan origin.

Maximum of 3.1 mm when measured at the point 150 mm away from the scan origin. (Measurement was done from the center of the scan line.)

**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 when measured at the point 150 mm away from scan origin.  
(Measured from the center of the scan line.)

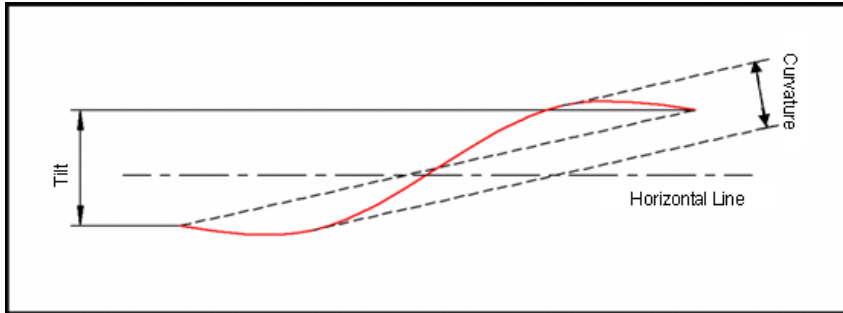


Figure 1: Laser scan tilt and curvature

**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 35° C) Room humidity (45% to 85% RH)
Ambient light:	500 to 900 lx
Background:	Barcode = black Space = white Margin = white Background of label = black
Power supply voltage:	5.0 V
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).

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

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.

X direction: Depth of field

Y direction: Laser scan widths within the depth of field

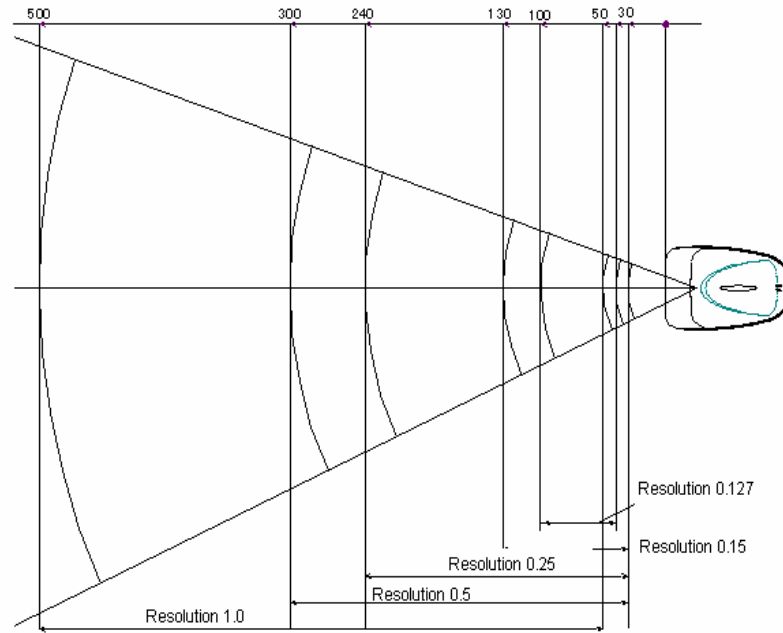


Figure 2: The depth of a decoding field measured from the edge of the scanner.

Symbology	Resolution	Depth of field (mm)	PCS
Code 39	1.0 mm	50–500	0.9
Code 39	0.5 mm	30–300	0.9
Code 39	0.25 mm	30–240	0.9
Code 39	0.15 mm	30–130	0.9
Code 39	0.127 mm	40–100	0.9

**Conditions**

Barcode Sample: OPTOELECTRONICS Test Sample

- N/W ratio: 1:2.5
- Angle:  $\alpha = 0^\circ, \beta = 15^\circ, \gamma = 0^\circ$
- Curvature:  $R = \infty$

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
0.127	Code 39	0.9	5 mm	4

**7.4. Pitch, Skew, and Tilt**

**7.4.1. Pitch Angle**

$\alpha = \pm 35^\circ$

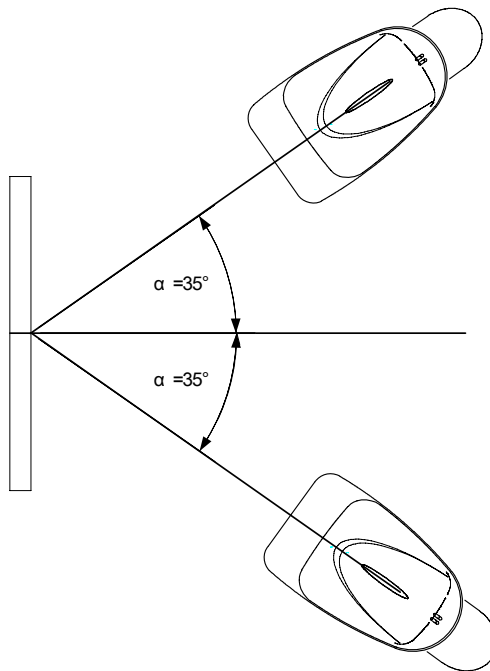


Figure 3: Pitch angle

#### 7.4.2. Skew Angle and Dead Zone

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

$\beta = \pm 8^\circ$  (There are some areas in which decoding fails due to specular reflection)

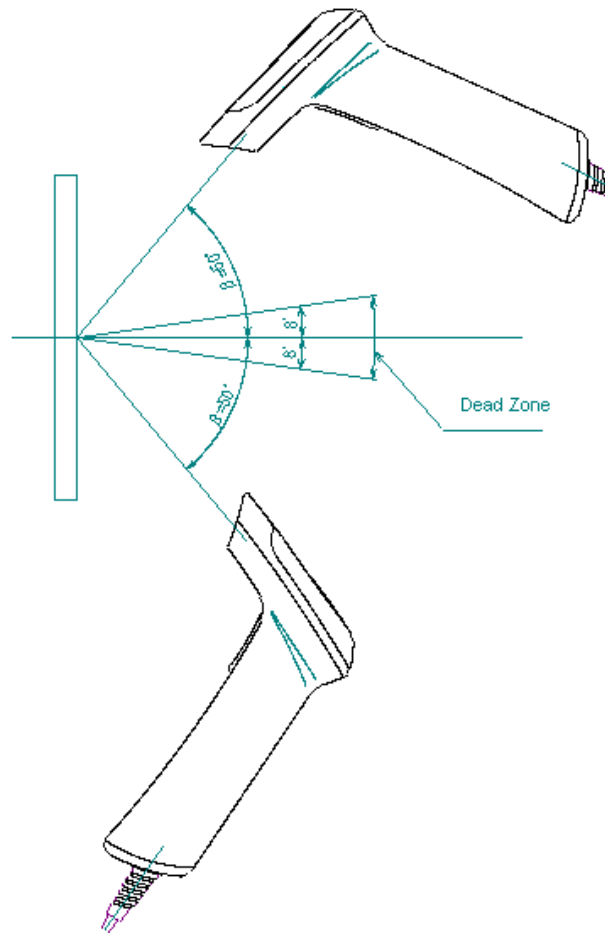


Figure 4: Skew angle and dead zone

7.4.3. Tilt Angle

$\gamma = \pm 20^\circ$

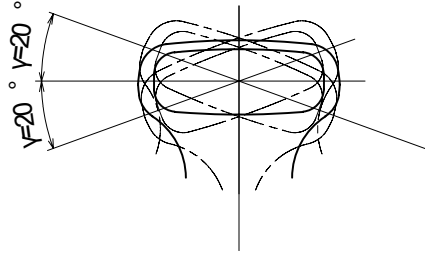


Figure 5: Tilt angle

Conditions

Barcode Sample: OPTOELECTRONICS Test Sample

Distance:	90 mm from the front edge of the scanner
Label:	<p><b>Pitch, Skew Angle, Dead Zone</b>                      PCS = 0.9, Resolution = 0.25 mm, Symbology = 9-digit Code-39,                      N/W Ratio = 1:2.5</p> <p><b>Tilt Angle</b>                      PCS = 0.9, Resolution = 0.26 mm, Symbology = 13-digit JAN,                      Quiet Zone = 10 mm</p>
Angle:	<p><b>At Pitch:</b> Skew angle <math>\beta = +15^\circ</math>, Tilt angle = <math>0^\circ</math></p> <p><b>At Tilt angle:</b> Pitch angle <math>\alpha = 0^\circ</math>, Skew angle <math>\beta = +15^\circ</math></p> <p><b>At Skew angle and dead zone:</b> Pitch angle <math>\alpha = 0^\circ</math>, Tilt angle <math>\gamma = 0^\circ</math></p>
Curvature:	$R = \infty$

**7.5. Curvature**

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

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

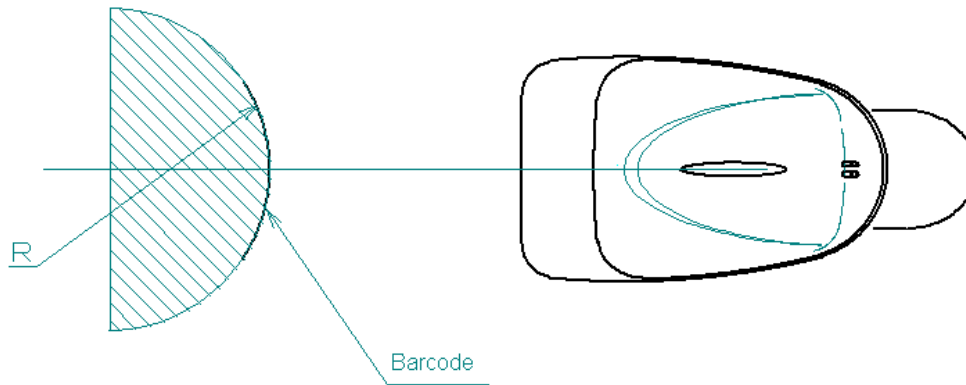


Figure 6: Curvature

**Conditions**

Barcode Sample: OPTOELECTRONICS Test Sample

PCS = 0.9, Resolution = 0.26 mm, Quiet Zone = 10 mm	
Distance:	90 mm from the edge of the scanner
Angle:	Skew Angle $\beta = +15^\circ$

## 8. Interface Specifications

### 8.1. RS-232C Interface

#### 8.1.1. Settings and Communication

Scan menu bar codes “ZZ” + “U2” + “ZZ” to initialize RS-232 interface.

Item	[U2] setting
Baud rate	9600 BPS
Start/stop bits	1 bit
Data bits	8 bits
Parity bits	No parity
Handshaking	No handshake
CTS waiting time	Infinite

You can change the communication condition using the menu barcode.

#### 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. Pin Assignment

Signals	Pin No.	Remarks
NC	1	No connection
TXD	2	
RXD	3	
-	4	6 pin and jumper
GND	5	
-	6	4 pin and jumper
CTS	7	
RTS	8	
NC	9	No connection
F.GND	Shell	Shield

Connector: Equipped with external power supply stereo jack (D-sub 9-pin female)

Power supply: Stereo jack



**8.1.4. Interface Circuit**

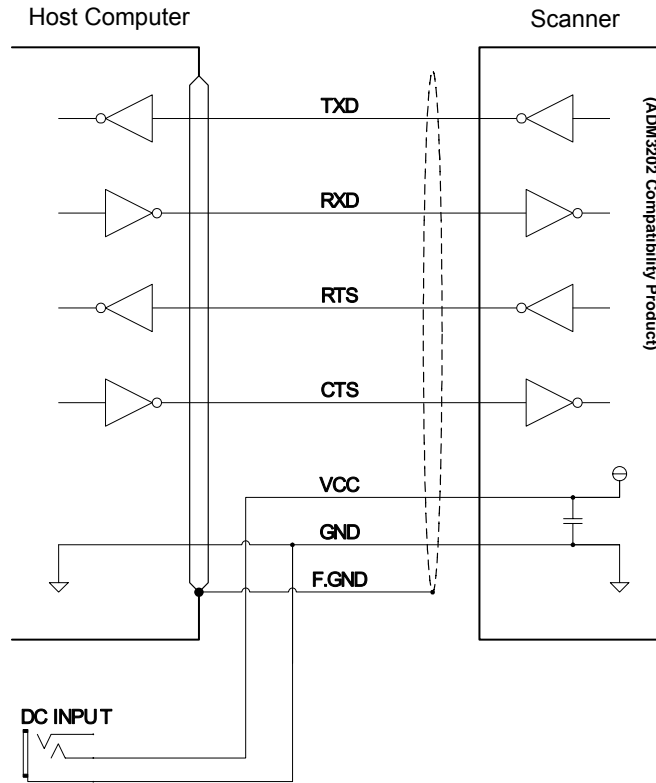


Figure 7: Interface circuit

**8.1.5. Character Format**

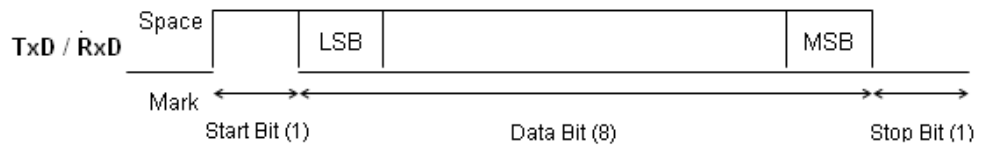


Figure 8: Character format (same for both sending and receiving)

**8.1.6. Communication Format**

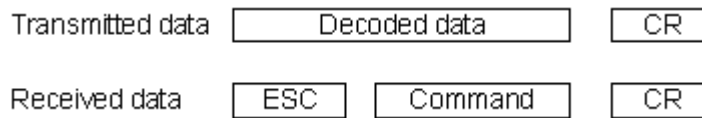


Figure 9: Communication format

### 8.1.7. Communication Control

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 10: 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.

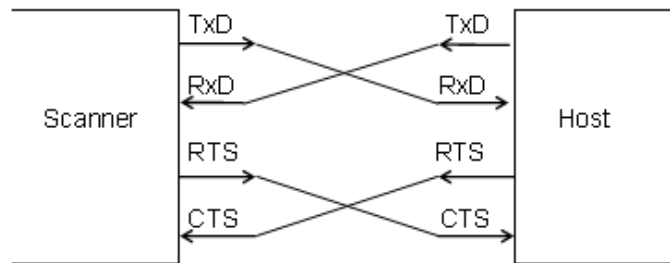


Figure 11: Busy/Ready communication

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

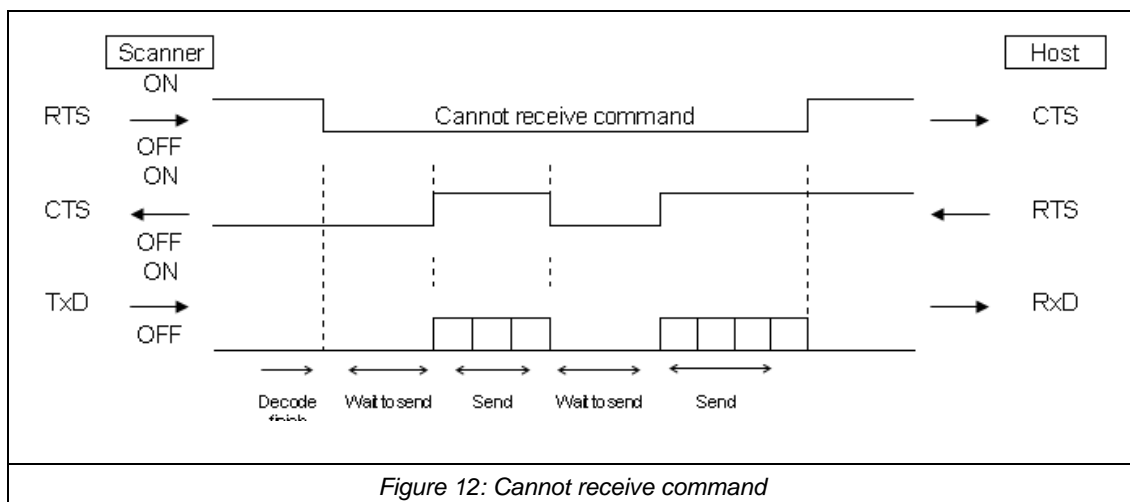


Figure 12: Cannot receive command

**CTS, TxD signals 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.

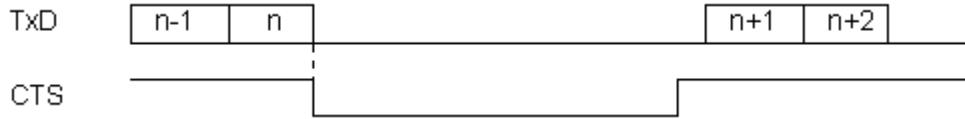


Figure 13: Signal timing

**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 CS line ON before transmitting data. Other processes are the same as BUSY/READY.

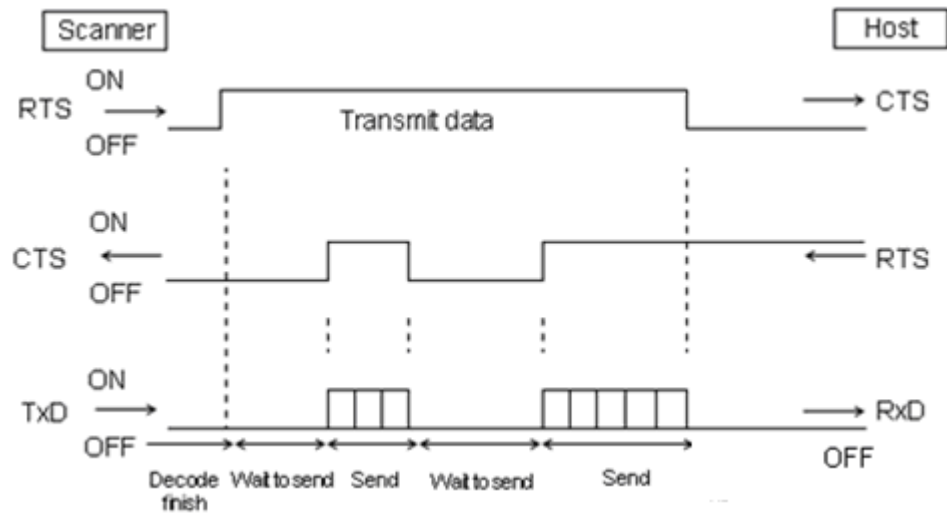


Figure 14: Modem transmit data

**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

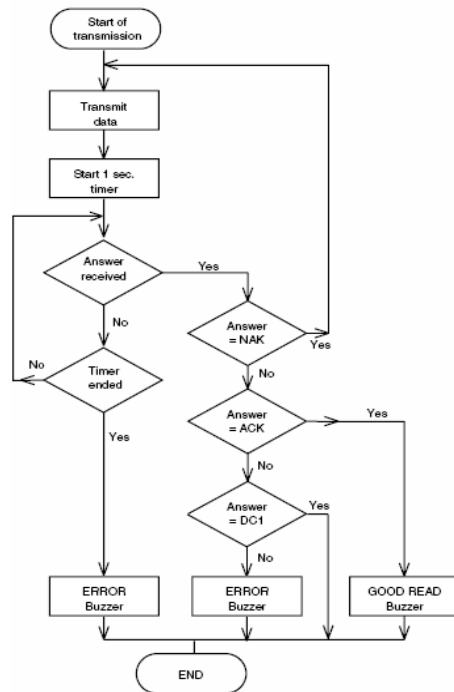


Figure 15: ACK/NAK

**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.

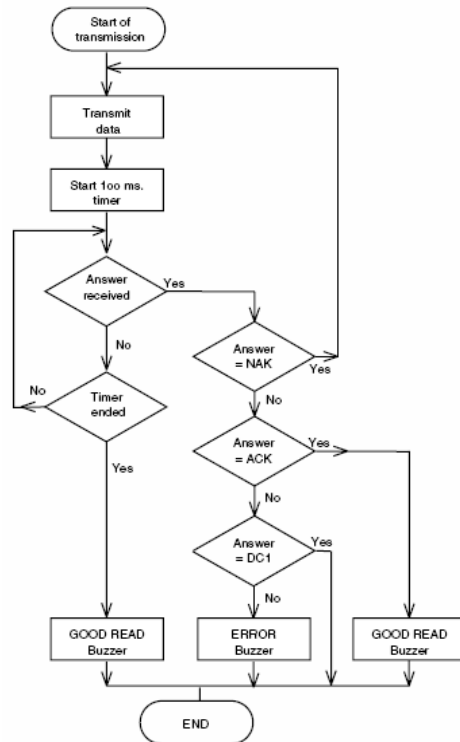


Figure 16: ACK/NAK—No response

## 8.2. USB Interface

### 8.2.1. Settings

Scan menu bar code "ZZ"+"SU"+"ZZ" to set USB interface.  
The OPL 7836 utilizes a full-speed USB interface.

### 8.2.2. Interface Circuit

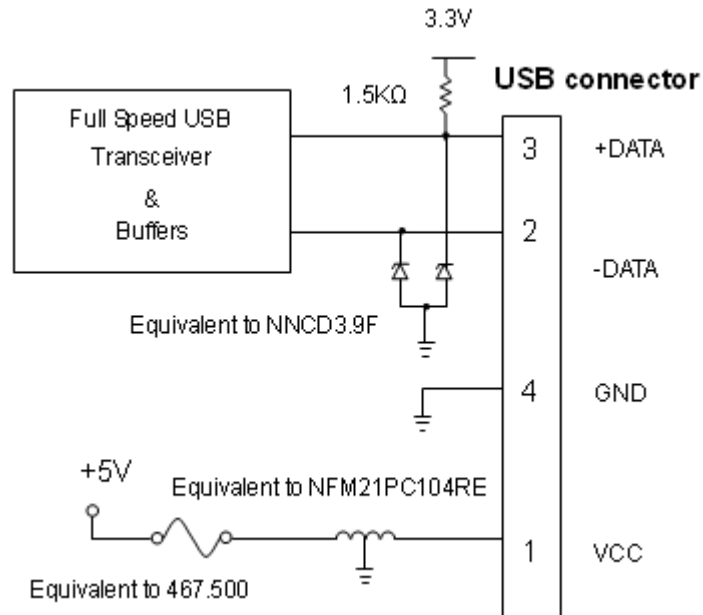


Figure 17: Interface circuit

Do not use the keyboard of the host during data transmission from the scanner to host. It may cause problems with the data transmission.

## 8.3. DOS/V Wedge Interface

### 8.3.1. Settings

#### a) Desktop type (used in combination with external keyboard)

Set by default; this procedure is only used when settings are changed.

Scan menu bar code "ZZ"+"UB"+"KM"+"ZZ" to set the DOS/V Wedge interface for desktop type.

#### b) Notebook type (without external keyboard)

Scan menu bar code "ZZ"+"UB"+"KL"+"ZZ" to set DOS/V Wedge interface for notebook.

## 9. Cable and Connector

### 9.1. RS-232C Cable

(Standard specification)

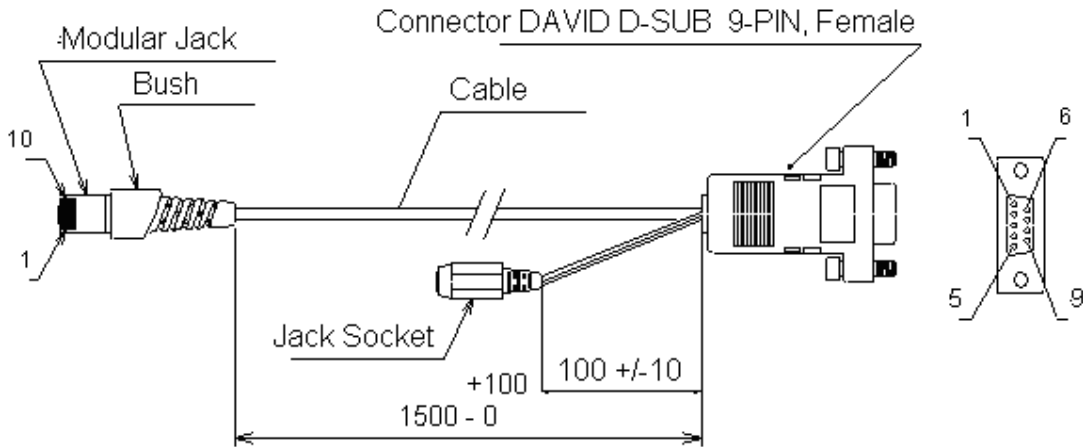


Figure 18: RS-232C cable

Type:	Straight cable
Diameter:	$\phi 3.8 \pm 0.5$ mm
Length:	$1500 \pm 50$ mm
Cores:	6 insulated wires, 1 conductive wire
Weight:	Approximately 40 g

### 9.2. USB Cable

(Standard specification)

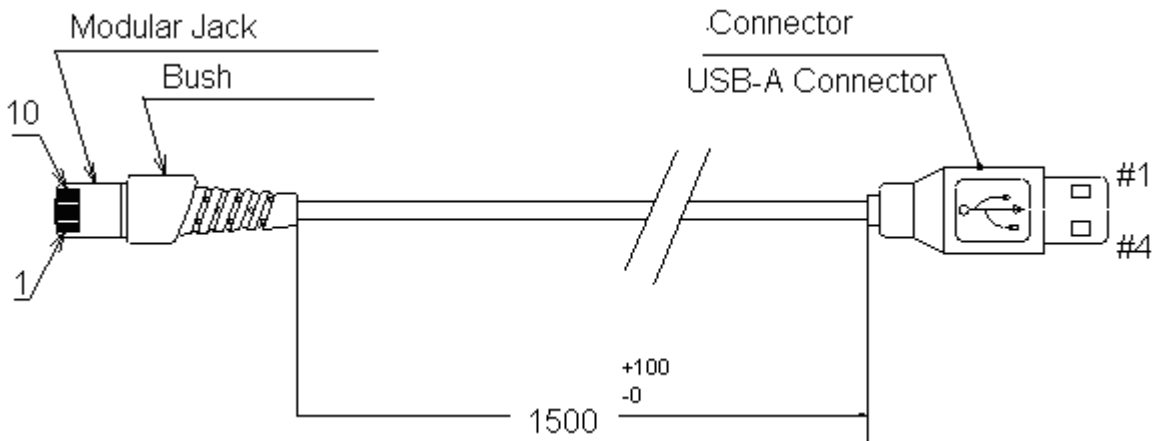


Figure 19: USB cable



Type:	Straight cable
Diameter:	$\phi 3.8 \pm 0.5$ mm
Length:	$1500 \pm 100$ mm
Cores:	4 insulated wires, 1 conductive wire
Weight:	Approximately 40 g

**9.2.1. Connector (USB interface)**

**a) USB "A" connector**

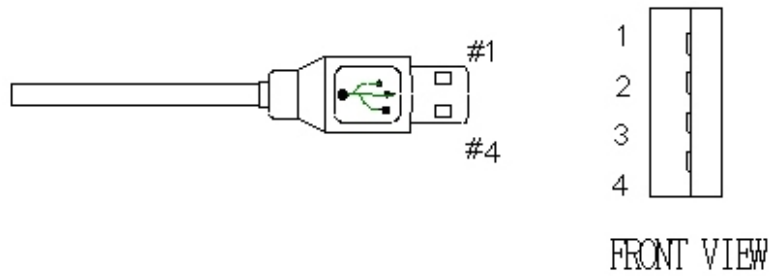


Figure 20: USB "A" connector

Contact Number	Signal Name
1	VCC
2	-DATA
3	+DATA
4	GND

**9.3. Wedge Cable**

(Standard specification)

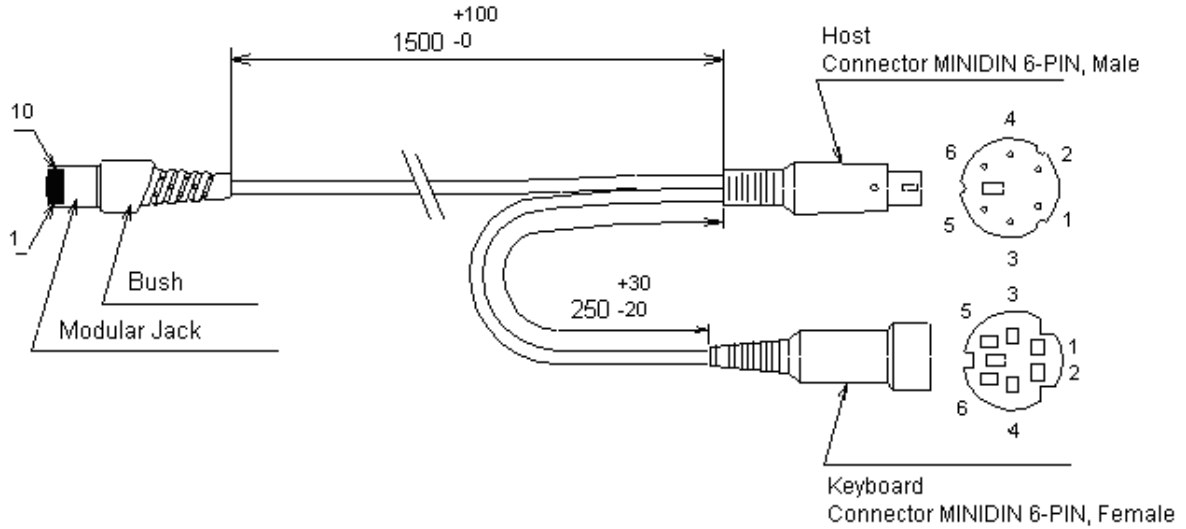


Figure 21: WEDGE cable

Type:	Y cable
Diameter:	$\phi 3.8 \pm 0.5$ mm
Length:	$1500 \pm 100$ mm
Cores:	6 insulated wires, 1 conductive wire
Weight:	Approximately 50 g

**9.3.1. Connector (Wedge interface)**

**a) DOS/V HOST Side**

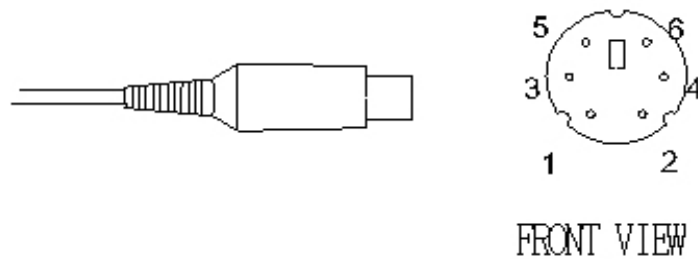


Figure 22: Front view

Contact Number	Signal Name
1	CPU_DATA
2	KEY_DATA

3	GND
4	VCC
5	CPU_CLK
6	KEY_CLK

**b) DOS/V KEYBOARD Side**

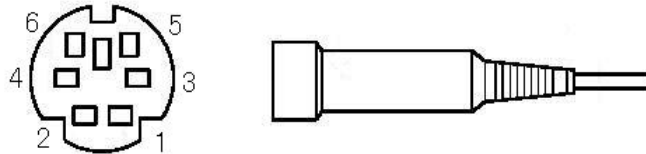


Figure 23: Front view

Contact Number	Signal Name
1	KEY_DATA
2	OPEN
3	GND
4	VCC
5	KEY_CLK
6	OPEN

Do not use the keyboard of host during data transmission from the scanner to host. It may cause problems with the data transmission.

**9.4. Connector Specification (for scanner)**

CN 1 (10-pin)




Pin No	RS-232C	USB	WEDGE
1	RTS	-	-
2	CTS	-	-
3	TXD	-	-
4	RXD	-	-
5	5V	5V	5V
6	GND	GND	GND
7	-	-DATA	KEY_CLK
8	-	+DATA	KEY_DATA
9	-	-	CPU_CLK
10	-	-	CPU_DATA

## 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
END		ZZ





#### USB-HID

Functions	Menu labels	Menu codes
SET		ZZ
USB-HID		SU
END		ZZ

#### Wedge (with external keyboard)

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

**Wedge (without external keyboard)**

Functions	Menu labels	Menu codes
SET		ZZ
AT-Wedge		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 Matrix 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
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	

Symbology	Read	Transmit Code Length	Transmit CD	Calculate CD	Set Prefix	Set Suffix	Other
Korean Postal Code	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	Single read
Multiple read reset time	500 ms
Add-on wait mode	500 ms
Redundancy	Read 4 times, redundancy = 3
Trigger switch	Enable
Trigger repeat	Disable
Auto trigger	Disable (refer to the Universal Menu Book for details)
Read time	2 seconds
Margin check	Normal
Buzzer duration	50 ms
Buzzer tone	Single tone (3 kHz)
Buzzer loudness	T1 (Loud)
Buzzer transmission	Before transmission
Startup buzzer	Enable
Good read LED	Indicator duration 200 ms

## 11. Serial Number and Labeling

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

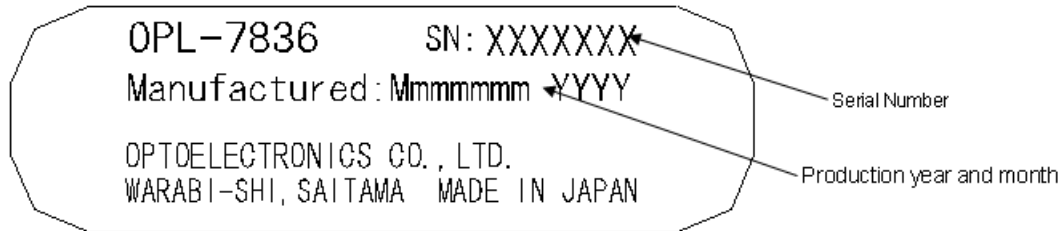


Figure 24: Serial number diagram

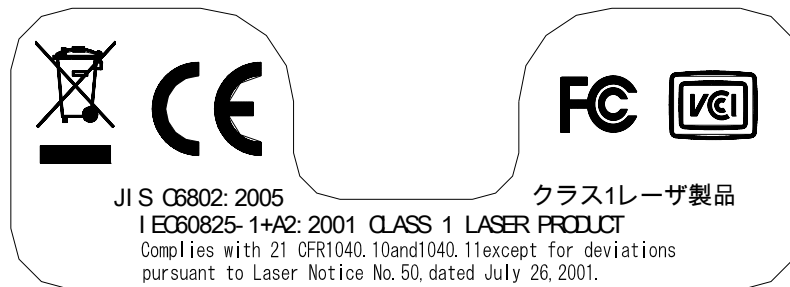


Figure 25: Caution label

## 12. Packaging Specifications

### 12.1. 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) 85 mm

### 12.2. Collective Packaging Specification

Place 50 individual boxes with scanners inside a box.

**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	90 mm
Angle	$\alpha = 0^\circ \beta = 15^\circ \gamma = 0^\circ$
Curvature	$R = \infty$
Power Supply Voltage	5.0 V

### 13.2. Static Electricity

Air discharge:	10kV Max (No malfunction) 15kV Max (No destruction)
Measurement environment:	Use electrostatic testing device compliant with IEC 61000-4-2
Discharge resistance:	330Ω
Capacitor charging:	150pF

### 13.3. Shock

#### 13.3.1. Drop Test (without packaging)

No malfunction occurred after the following drop test.

Drop Test: Drop the scanner from a height of 1.5 m onto a concrete floor (once in each of 5 directions). Perform the test for three sets of five repetitions.

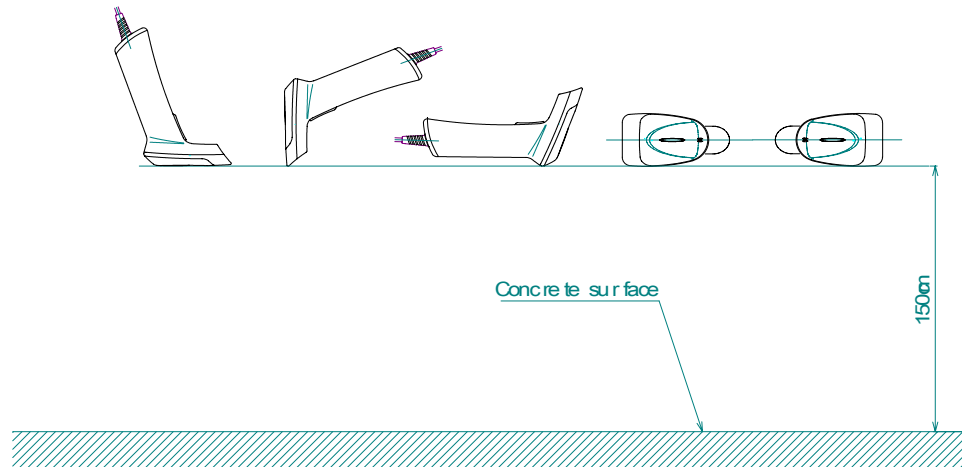


Figure 26: Drop test

#### 13.3.2. Drop Test (with individual packaging)

No malfunction occurred after the following drop test.

Drop Test: Drop an individually packaged scanner on one corner, three edges, and six planes to the concrete floor from the height of 1.5 meters. Repeated this test 10 times.

### 13.4. Vibration

#### 13.4.1. Vibration Strength (without packaging)

There was no sign of malfunction with the scanner's exterior appearance or its operation after the following vibration test: In the non-operating state, increased the frequency of the vibration from 10 Hz to 100 Hz with accelerated velocity 2.0 G (19.6 m/s<sup>2</sup>) for over 30 minutes (60 minutes for one cycle). Repeated this routine for X, Y and Z direction, respectively.

#### 13.4.2. Vibration Strength (individual packaging)

There was no sign of malfunction with the scanner's exterior appearance or its operation after the following vibration test: With the individual packaging, increased the frequency of the vibration from 10 Hz to 100 Hz with accelerated velocity 2.0 G (19.6 m/s<sup>2</sup>) for over 30 minutes (60 minutes for one cycle). Repeated this routine for X, Y and Z direction, respectively.

**13.5. Dust and Drip Proof**

IEC IP x2

**Water Prevention**

Level	Details
2	Vertically dripping water shall have no harmful effect when the enclosure is tilted at an angle up to 15° from its normal position.

**13.6. Cable Strength**

There was no sign of malfunction with the scanner's structure and its performance after the following static load test: With the scanner fixed, pulled the cable with static load 24.5 N (or 2.5 kgf) for a second. Repeated this routine 20 times.

**13.7. Cable Bending Test**

There was no sign of malfunction with the scanner's structure and its performance after the following flexing test: Applied load 4.9N (or 500gf) to the cable and flex it 60 degrees to the left and right as shown below. Repeated this routine one million times.

**Note:** Cable bending resistance is not warrantable.

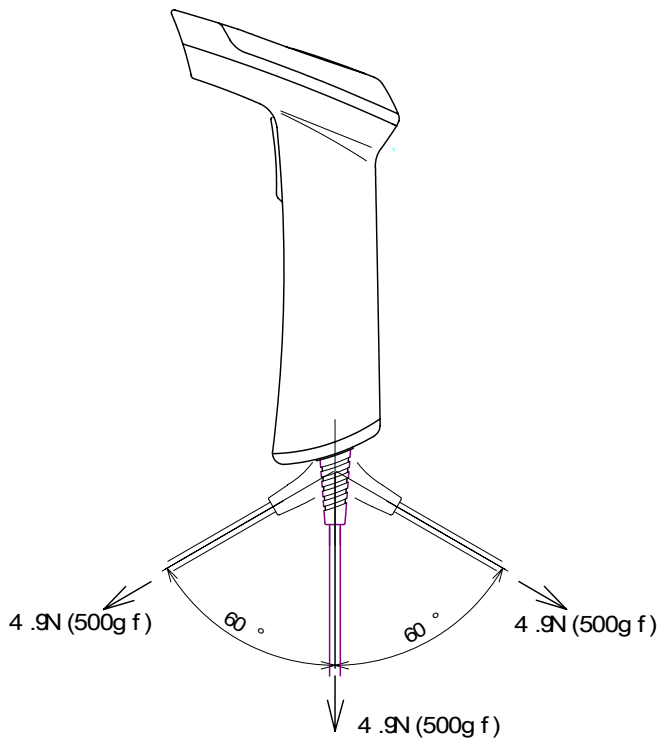


Figure 27: Cable bending test

**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 OPL 7836 has read and trigger settings as follows:

**15.1. Auto Trigger Options**

**15.1.1. Auto Trigger Sensor**

The product has an optional auto trigger setting, which starts barcode reading automatically by using sensor detection. The scanner starts barcode reading after detecting reflection from the surface when the auto trigger is used.

Auto trigger distance: 50 ±10 mm from the edge of the scanner.

**Conditions**

Moving speed:	100 ±10 mm/s
Angle:	Vertical to the edge of the scanner
Environmental temperature and humidity:	Room temperature and humidity
Environmental illuminance:	500 to 900 lx
Conditions for the auto trigger:	1. Barcode sheet: OPTOELECTRONICS Test Sheet (white) Background: OPTOELECTRONICS Test Sheet (black) 2. Barcode sheet: OPTOELECTRONICS Test Sheet (black) Background: OPTOELECTRONICS Test Sheet (white)

## 15.2. Auto Trigger Settings

### 15.2.1. 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

**Note:** Please configure the following **after** enabling the auto trigger.

## 16. Regulatory Compliance

### 16.1. 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.

### 16.2. Product Safety

EN60950-1: 2001

IEC60950-1: 2001

### 16.3. 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.

### 16.4. RoHS

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

## 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.

**18. Mechanical Drawing**

Dimensions: 144.5 x 113.0 x 54.3 (excluding cable connection)

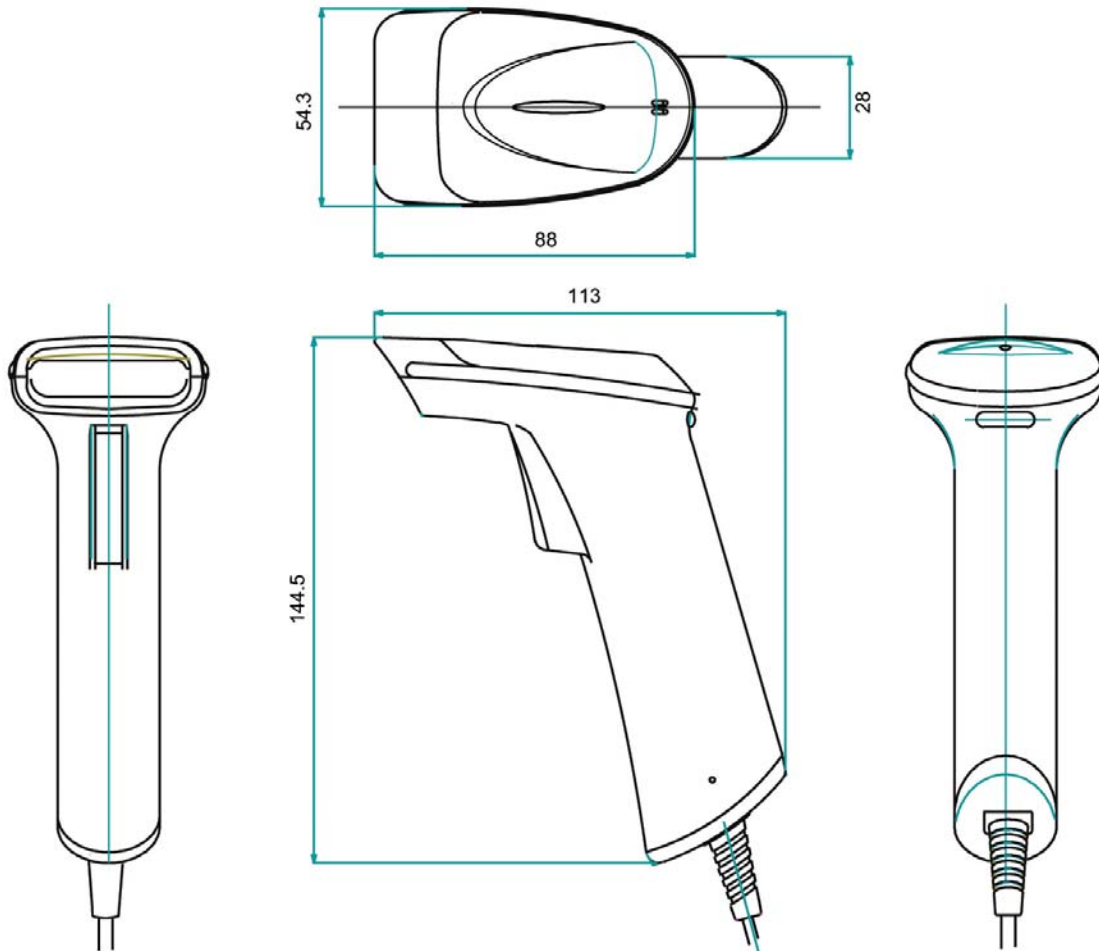


Figure 28: Mechanical drawing