

LS6800 Scanner



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Holtsville, N.Y. 11742-1300
<http://www.symbol.com>

Patents

This product is covered by one or more of the following U.S. and foreign Patents:

U.S. Patent No. 4,593,186; 4,603,262; 4,607,156; 4,652,750; 4,673,805; 4,736,095; 4,758,717; 4,760,248; 4,806,742; 4,816,660; 4,845,350; 4,896,026; 4,897,532; 4,923,281; 4,933,538; 4,992,717; 5,015,833; 5,017,765; 5,021,641; 5,029,183; 5,047,617; 5,103,461; 5,113,445; 5,130,520; 5,140,144; 5,142,550; 5,149,950; 5,157,687; 5,168,148; 5,168,149; 5,180,904; 5,216,232; 5,229,591; 5,230,088; 5,235,167; 5,243,655; 5,247,162; 5,250,791; 5,250,792; 5,260,553; 5,262,627; 5,262,628; 5,266,787; 5,278,398; 5,280,162; 5,280,163; 5,280,164; 5,280,498; 5,304,786; 5,304,788; 5,306,900; 5,324,924; 5,337,361; 5,367,151; 5,373,148; 5,378,882; 5,396,053; 5,396,055; 5,399,846; 5,408,081; 5,410,139; 5,410,140; 5,412,198; 5,418,812; 5,420,411; 5,436,440; 5,444,231; 5,449,891; 5,449,893; 5,468,949; 5,471,042; 5,478,998; 5,479,000; 5,479,002; 5,479,441; 5,504,322; 5,519,577; 5,528,621; 5,532,469; 5,543,610; 5,545,889; 5,552,592; 5,557,093; 5,578,810; 5,581,070; 5,589,679; 5,589,680; 5,608,202; 5,612,531; 5,619,028; 5,627,359; 5,637,852; 5,664,229; 5,668,803; 5,675,139; 5,693,929; 5,698,835; 5,705,800; 5,714,746; 5,723,851; 5,734,152; 5,734,153; 5,742,043; 5,745,794; 5,754,587; 5,762,516; 5,763,863; 5,767,500; 5,789,728; 5,789,731; 5,808,287; 5,811,785; 5,811,787; 5,815,811; 5,821,519; 5,821,520; 5,823,812; 5,828,050; 5,848,064; 5,850,078; 5,861,615; 5,874,720; 5,875,415; 5,900,617; 5,902,989; 5,907,146; 5,912,450; 5,914,478; 5,917,173; 5,920,059; 5,923,025; 5,929,420; 5,945,658; 5,945,659; 5,946,194; 5,959,285; 6,002,918; 6,021,947; 6,029,894; 6,031,830; 6,036,098; 6,047,892; 6,050,491; 6,053,413; 6,056,200; 6,065,678; 6,067,297; 6,082,621; 6,084,528; 6,088,482; 6,092,725; 6,101,483; 6,102,293; 6,104,620; 6,114,712; 6,115,678; 6,119,944; 6,123,265; 6,131,814; 6,138,180; 6,142,379; 6,172,478; 6,176,428; 6,178,426; 6,186,400; 6,188,681; 6,209,788; 6,209,789; 6,216,951; 6,220,514; 6,243,447; 6,244,513; 6,247,647; 6,308,061; 6,250,551; 6,295,031; 6,308,061; 6,308,892; 6,321,990; 6,328,213; 6,330,244; 6,336,587; 6,340,114; 6,340,115; 6,340,119; 6,348,773; D305,885; D341,584; D344,501; D359,483; D362,453; D363,700; D363,918; D370,478; D383,124; D391,250; D405,077; D406,581; D414,171; D414,172; D418,500; D419,548; D423,468; D424,035; D430,158; D430,159; D431,562; D436,104.

Invention No. 55,358; 62,539; 69,060; 69,187 (Taiwan); No. 1,601,796; 1,907,875; 1,955,269 (Japan); European Patent 367,299; 414,281; 367,300; 367,298; UK 2,072,832; France 81/03938; Italy 1,138,713
rev. 03/02

Introduction

The LS 6800 hands-free scanner provides a raster scanning pattern specifically designed to scan PDF417 (two dimensional) bar codes, as well as raster and linear patterns for decoding standard 1-D bar codes. Its flexible mounting arrangement provides for both attended and unattended operation.

The LS 6800 is based on the Visible Laser Diode, and can read color bar codes and symbols printed on virtually any substrates. There are two LED indicators: red indicates laser on and alignment of the scanner with the bar code, and green indicates a successful decode.

There are several ways to activate the scanner: hardwired trigger, photo-sensor, footswitch, RS-232C command, an external object sensor, continuous, or blinking laser mode. The scanner indicates a successful decode through a beep and decode LED.

Host Interface

Each LS 6800 model provides full host system compatibility through RS-232C single port cables or Synapse™ “Smart Cables”, with programmable options in each case.

Host interface consists of an appropriate RS-232C cable or Synapse™ “Smart Cable” set.

Mounting Fixtures

Through use of the proper mounting fixture, the LS 6800 may be mounted on a wall, desk, or other desirable surface.

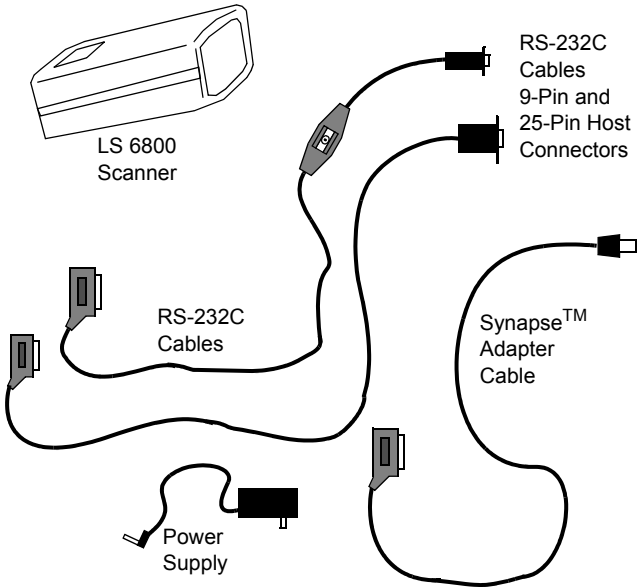


Setup

System Components

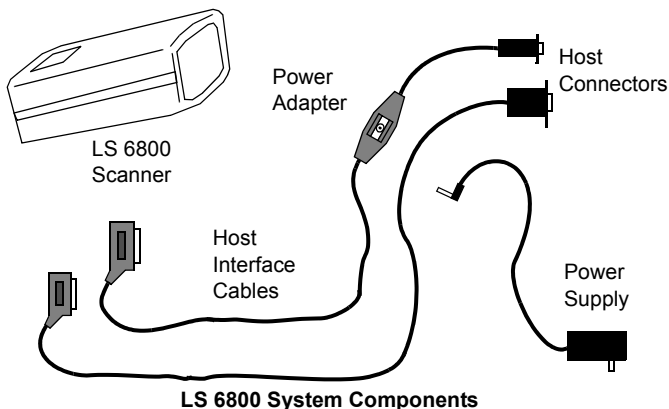
The system includes one scanner, one power supply, and one interface cable (both general types are illustrated below).

Depending on mounting preferences, there is a stand for desk-mounting and a bracket for wall-mounting.



LS 6800 System Components

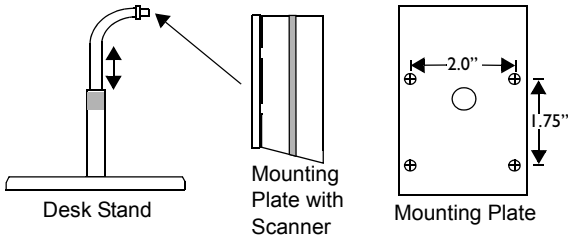
Installation: LS 6800 with RS-232C



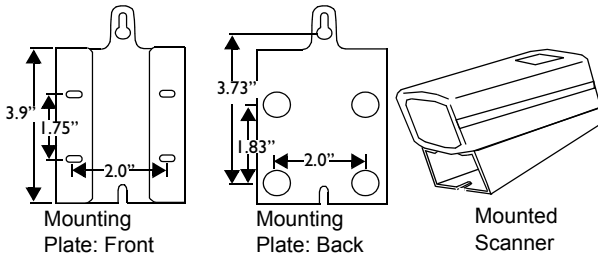
1. Switch off all devices to be connected to the LS 6800 scanning system.
2. Mount the scanner in the selected fixed location. For a desk-mount, affix the scanner to the mounting plate and the mounting plate to the stand. See the *LS 6800 Product Reference Guide* for detailed instructions.

Place the scanner's stand in the desired location.

LS 6800 Scanner



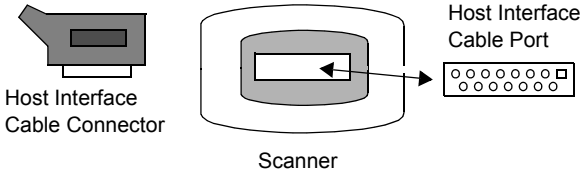
If the scanner is to be mounted on the wall, use the wall-mount bracket.



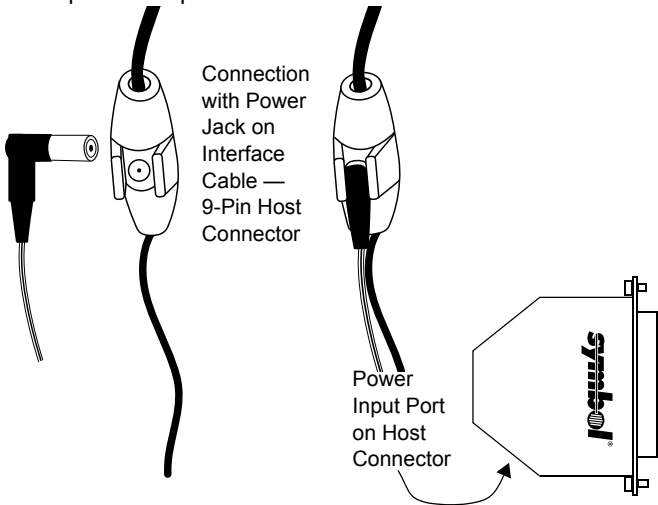
- The bottom plate of the fixture has mounting holes for 6-32 screws.
- If mounting on a wall or other surface, use these mounting holes to attach it to the mounting surface. Screws and bolts are provided by the customer.

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3. Connect the host interface cable to the port at the rear of the scanner's casing, as the diagram below indicates.



4. Connect the power supply to the host interface cable's power input port. For 25-pin connectors, this port is on the side of the host interface cable's host connector. For 9-pin connectors, the port is either on the side of the host connector or on a power adapter on the cable itself.



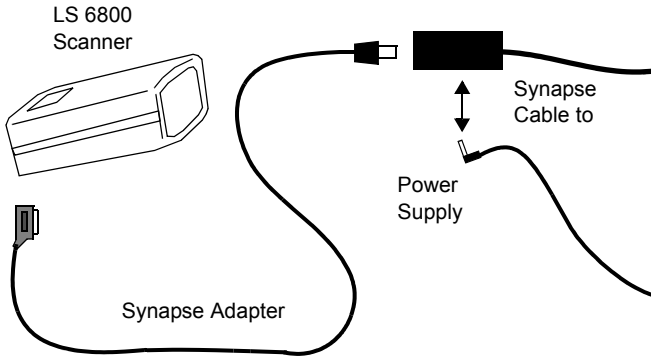
5. Connect the other end of the power supply into a receptacle supplying AC power of the proper voltage level.



Power may also be supplied by the host system. Contact Symbol's Custom Products Group for more information.

6. Plug the host interface cable's host connector into the receiving port on the host system.
7. Program all desirable host interface, decode, and communications parameters. Parameter descriptions and bar code menus for programming them are in the *LS 6800 Product Reference Guide*.
8. Power up the host.

Installation: LS 6800 with Synapse



LS 6800 System Components

1. Switch off all devices to be connected to the LS 6800 scanning system.
2. Mount the scanner in the selected fixed location. For a desk-mount, place the scanner's stand in the desired location and

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place the scanner in that stand. If the scanner is to be mounted on the wall, use the wall-mount bracket.

3. Connect the LS 6800 Synapse Adapter Cable into the port at the end of the scanner's casing.
4. Plug the other end of the Synapse Adapter Cable into the Synapse cable.
5. Follow additional instructions in the *Synapse Interface Guide*. Power is supplied by the Synapse cable interface.



Scanning with the LS 6800

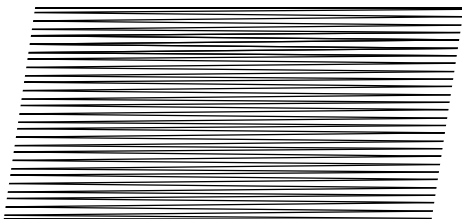
Depending on how it is programmed, the LS 6800 may work in one of these ways:

- **Smart Raster:** The scanner emits a raster pattern dynamically adjusted to the particular PDF417 bar code's height.
- **Slab Only Raster:** Scanner activation creates a slab raster pattern which does not open vertically, regardless of bar code type.
- **Always Raster:** The LS 6800 directly opens to a full raster pattern or to the user-programmed size whenever the scanner is activated.
- **Programmable Raster:** The user programs the height of the raster pattern and the rate at which it expands. Scanner activation creates the slab raster pattern which only opens for PDF417 bar codes.
- **Line Only:** Scanner activation creates a single scan line, similar to a 1D scan line, which never opens to a raster pattern.

"Slab" Raster Pattern



Open Raster



Trigger Modes

The LS 6800 trigger modes that follow enable the scanner to be set up to scan with (attended mode) or without (unattended mode) operator intervention.

In *attended mode*, the operator may present the bar code to a scanner in Blinking Laser Mode, or may physically trigger the scanner using Hardware Trigger Mode.

In *unattended mode*, the scanner activates when bar codes automatically move into its scan path through Continuous Mode or Software Trigger Command. For unattended mode, the system must be set up so that bar codes and scanning patterns properly align and triggering occurs when the bar code is in the proper position for scanning (see [2. Scan: Alignment or Orientation on page 10](#)).

Hardware Trigger

To install an external triggering switch, plug the trigger switch into the flying lead of the host D-connector (9-pin or 25-pin) of the interface cable. You may use a standard, off-the-shelf stereo mini-plug, such as those used for portable cassette or CD players.

In the host cable mode, the scanner triggers if the interface line is pulled to ground.

Software Trigger Command (RS-232C)

In this mode, the LS 6800 scans when commanded by the host. The user must program the host to invoke scan attempts when desired.

Blinking Laser Mode

In Blinking Laser Mode, the laser blinks at approximately a 50% duty cycle to conserve laser life. This is the default operating mode.

This mode may be programmed through bar code menus in the *LS 6800 Product Reference Guide*.



Continuous Mode

In Continuous Laser Mode, the scanner continuously attempts to decode a bar code. This mode may be necessary for medium-speed conveyor belts or other time-critical applications.

Scanning 1-D or 2-D Bar Codes: Attended Mode

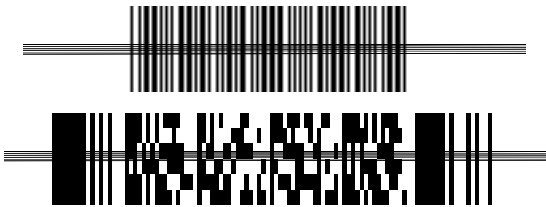
Make sure all connections are secure.

1. Present

Make sure the symbol to be scanned is within the scanning range (3 to 8 inches in blinking mode; otherwise refer to *LS 6800 Decode Zones* in the *Product Reference Guide*). To scan, present the symbol in the path of the scan pattern.

2. Scan: Alignment or Orientation

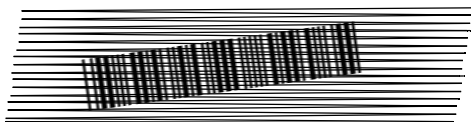
To scan, present the symbol in the direct path of the scan pattern. For proper orientation, position the bar code so that the aiming pattern centers itself on the bar code, as illustrated below.



Slab Raster Pattern

Q u i c k R e f e r e n c e

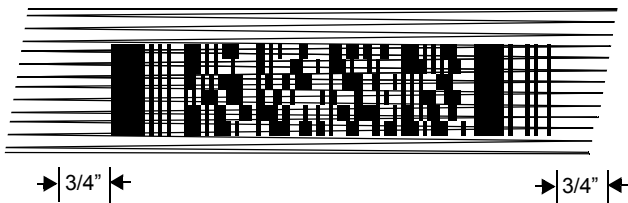
For a 1-D symbol, the slab raster pattern reads the bar code. A full raster pattern also reads a 1-D bar code so aggressively that scan pattern alignment does not have to be precise.



Full Raster Pattern on 1-D Bar Code

For a 2-D symbol, the pattern spreads vertically to cover the symbol if it is parallel to the symbol's rows. Keep the bar code in the same horizontal plane as the scan pattern.

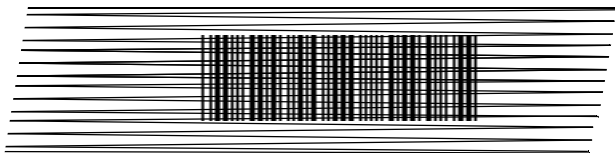
If the pattern does not cover the top and bottom of the 2-D symbol, pull the bar code back until it does. Make sure the scan pattern extends at least *three quarters of an inch* beyond the edges of the bar code. Practice shows what works best.



Raster Pattern Expanding over PDF417 Symbol



In Always Raster mode, the raster pattern spreads fully over the bar code.



Always Raster Pattern on 1-D Bar Code

If the symbol is held in a position which makes it unreadable, the red LED blinks to indicate that condition.

3. Successful Decode

The green LED and a short, high-tone beep indicate a successful decode. The laser turns off.

After a successful decode, remove the symbol from the scan path. If the symbol does not decode, remove the symbol from the scan path and try again. Make sure the bar code is on a clean, white, non-reflective surface.

4. Output

Decoded data is transmitted to the host device. Make sure that the RS-232C parameters (e.g., baud rate, parity, etc.) are set properly. Communication parameters are described in the *Product Reference Guide*.

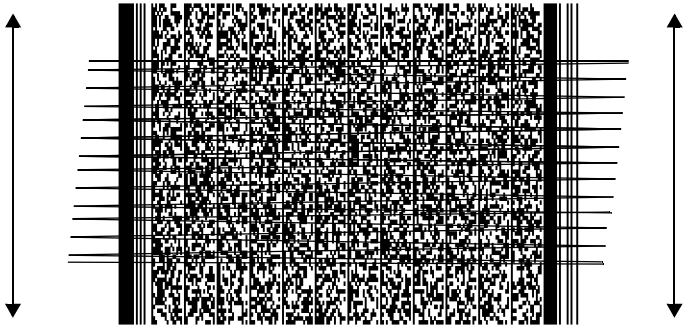
“Tall” PDF Bar Codes

If the PDF417 symbol is “tall,” the vertical scan pattern may not be high enough to cover it.

In this case, try a slow “up and down” scanning motion. With the raster pattern open, try to move the bar code slowly down so the scan pattern goes down to the bottom of the symbol, keeping the

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beam horizontal to the rows, and then slowly back upward toward the top.



Moving Scan Pattern Upward and Downward on "Tall" PDF Symbol

The scan beam does not have to be *perfectly* parallel with the top and bottom of the symbol (up to a 4° tilt will work).

Specular Reflection

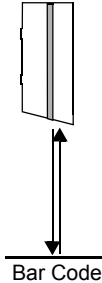
When laser beams reflect *directly* back into the scanner from the bar code, they can "blind" the scanner and make decoding difficult. This is specular reflection.

To avoid this, scan the bar code at a slight angle so that the beam does not bounce *directly* back. But don't scan at too oblique an angle; the scanner needs to collect scattered reflections from the scan to make a successful decode. Practice shows what tolerances to work within.

For scanning a 1-D bar code, there is only a small specular dead zone to avoid ($+ 2^{\circ}$ from the direct laser beam). The specular dead zone is larger for scanning PDF417 ($+ 9^{\circ}$ from the direct laser beam). At the same time, the scanner is not effective if its beams

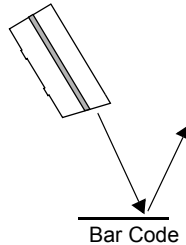
hit the bar code's surface at an angle greater than 30° from the normal to that surface; see the diagrams below.

Specular reflection:
Reflected beam
interferes.



Tilt Back At Slight Angle (Up to 30°)

No specular
reflection.
Decode can
occur.



Maintenance

The LS 6800 scanner and power supply are designed to provide reliable service over an extended period of time with virtually no maintenance.

For the scanner, the only maintenance required is periodic cleaning of the exit window.

- Do not allow any abrasive material to touch the window.
- Remove any dirt particles with a damp cloth.
- Wipe the window using a tissue moistened with ammonia/water.
- Do not spray water or other cleaning liquids directly into the window.

What If...

Nothing happens when you follow the operating instructions?

- Check the system power.
- Make sure you are using the correct interface cable for the host device.

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- Check for loose cable connections.
- Make sure the scanner is programmed to read the symbology you are trying to read. See the Product Reference Guide.
- Check the bar code to make sure it is not severely defaced.
- Try scanning a test symbol of the symbology you are trying to read.

Your terminal operates but scanned data is not displayed correctly?

- Check the system power.
- Check for loose cable connections.
- Check that the communication parameters (baud rate, parity, stop bits, etc.) are set properly for the receiving device.

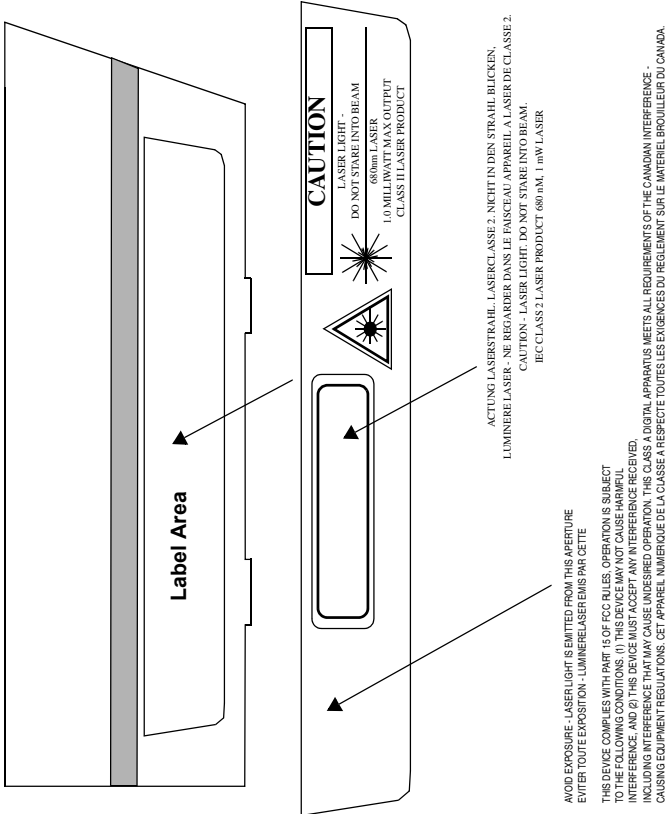
Your terminal is operative but scanned data is not displayed? Or is displayed improperly on the screen?

- If you're working with a Synapse cable, refer to your *Synapse Interface Guide*.
- If you're operating in RS-232C single-port mode, check that the following parameters have been programmed correctly:
 - > Baud Rate> Stop Bits > Parity > Bits per Character

The laser does not activate, followed by a beep sequence?

- You may be scanning in an inappropriately hot environment. Remove the scanner from the environment, or allow the laser to cool down. If the condition persists, contact the Symbol Support Center.

Regulatory Information Scanner Labeling



Regulatory Information

All Symbol devices are designed to be compliant with rules and regulations in locations they are sold and will be labeled as required.

Any changes or modifications to Symbol Technologies equipment, not expressly approved by Symbol Technologies, could void the user's authority to operate the equipment.



Laser Devices

Symbol devices using lasers comply with US 21CFR1040.10, and IEC825-1:1993, EN60825-1:1994+A11:1996. The laser classification is marked on one of the labels on the device.

Class 1 Laser devices are not considered to be hazardous when used for their intended purpose. The following statement is required to comply with US and international regulations:

Caution: Use of controls, adjustments or performance of procedures other than those specified herein may result in hazardous laser light exposure.

Class 2 laser scanners use a low power, visible light diode. As with any very bright light source, such as the sun, the user should avoid staring directly into the light beam. Momentary exposure to a Class 2 laser is not known to be harmful.

Radio Frequency Interference Requirements

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful



interference in which case the user will be required to correct the interference at his own expense.

Radio Frequency Interference Requirements - Canada

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.



Marking and European Economic Area (EEA)

Statement of Compliance

Symbol Technologies, Inc., hereby declares that this device is in compliance with all the applicable Directives, 89/336/EEC, 73/23/EEC. A Declaration of Conformity may be obtained from <http://www2.symbol.com/doc/>

Q u i c k R e f e r e n c e

/In accordance with Clause 5, IEC 0825 and EN60825, the following information is provided to the user:



ENGLISH CLASS 1 CLASS 2	HEBREW CLASS 1 LASER PRODUCT LASER LIGHT DO NOT STARE INTO BEAM CLASS 2 LASER PRODUCT	מוצר לייזר רמה 1	רמה 1
DANISH KLASSE 1 KLASSE 2	KLASSE 1 LASERPRODUKT LASERLYF SE IKKE IND I STRÅLEN KLASSE 2 LASERPRODUKT	אור לייזר אין להביט אל תוך הזרם מוצר לייזר רמה 2	רמה 2
ITALIAN CLASSE 1 CLASSE 2	AL LASER DI CLASSE 2 LASERLYF SE IKKE IND I STRÅLEN KLASSE 2 LASERPRODUKT	PRODOTTO AL LASER DI CLASSE 1 LUCE LASER NON FISSARE IL RAGGIOPRODOTTO	
DUTCH KLASSE 1 KLASSE 2	KLASSE-1 LASERPRODUKT LASERLICHT NIET IN STRAAL STAREN KLASSE-2 LASERPRODUKT	NORWEGIAN KLASSE 1 KLASSE 2	LASERPRODUKT, KLASSE 1 LASERLYS IKKE STIRR INN I LYSSTRÅLEN LASERPRODUKT, KLASSE 2
FINNISH LUOKKA 1 LUOKKA 2	LUOKKA 1 LASERTUOTE LASERVALO ÄLÄ TUJUTA SÄDETTÄ LUOKKA 2 LASERTUOTE	PORTUGUESE CLASSE 1 CLASSE 2	PRODUTO LASER DA CLASSE 1 LUZ DE LASER NÃO FIXAR O RAIOS LUMINOSOS PRODUTO LASER DA CLASSE 2
FRENCH CLASSE 1 CLASSE 2	PRODUIT LASER DE CLASSE 1 LUMIÈRE LASER NÉ PAS REGARDER LE RAYON FIXEMENT PRODUIT LASER DE CLASSE 2	SPANISH CLASSE 1 CLASSE 2	PRODUCTO LASER DE LA CLASE 1 LUZ LASER NO MIRE FIJAMENTE EL HAZ PRODUCTO LASER DE LA CLASE 2
GERMAN KLASSE 1 KLASSE 2	LASERPRODUKT DER KLASSE 1 LASERSTRAHLEN NICHT DIREKT IN DEN LASERSTRAHL SCHAUEN LASERPRODUKT DER KLASSE 2	SWEDISH KLASS 1 KLASS 2	LASERPRODUKT KLASS 1 LASERLJUS STIRRA INTE MOT STRÅLEN LASERPRODUKT KLASS 2



Test Symbols



CODE 128

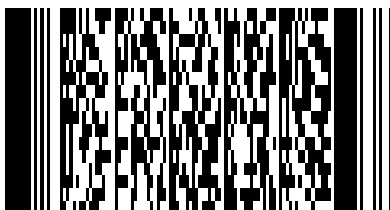
5012345248



13 MIL UPC



PDF417



PDF417

Warranty

Symbol Technologies, Inc. ("Symbol") manufactures its hardware products in accordance with industry-standard practices. Symbol warrants that for a period of twelve (12) months from date of shipment, products will be free from defects in materials and workmanship.

This warranty is provided to the original owner only and is not transferable to any third party. It shall not apply to any product (i) which has been repaired or altered unless done or approved by Symbol, (ii) which has not been maintained in accordance with any operating or handling instructions supplied by Symbol, (iii) which has been subjected to unusual physical or electrical stress, misuse, abuse, power shortage, negligence or accident or (iv) which has been used other than in accordance with the product operating and handling instructions. Preventive maintenance is the responsibility of customer and is not covered under this warranty.

Wear items and accessories having a Symbol serial number will carry a 90-day limited warranty. Non-serialized items will carry a 30-day limited warranty.

Warranty Coverage and Procedure

During the warranty period, Symbol will repair or replace defective products returned to Symbol's manufacturing plant in the US. For warranty service in North America, call the Symbol Support Center at 1-800-653-5350. International customers should contact the local Symbol office or support center. If warranty service is required, Symbol will issue a Return Material Authorization Number. Products must be shipped in the original or comparable packaging, shipping and insurance charges prepaid. Symbol will ship the repaired or replacement product freight and insurance prepaid in North America. Shipments from the US or other locations will be made F.O.B. Symbol's manufacturing plant.

Symbol will use new or refurbished parts at its discretion and will own all parts removed from repaired products. Customer will pay for the replacement product in case it does not return the replaced product to Symbol within 3 days of receipt of the replacement product. The process for return and customer's charges will be in accordance with Symbol's Exchange Policy in effect at the time of the exchange.

Customer accepts full responsibility for its software and data including the appropriate backup thereof.

Repair or replacement of a product during warranty will not extend the original warranty term.

Symbol's Customer Service organization offers an array of service plans, such as on-site, depot, or phone support, that can be implemented to meet customer's special operational requirements and are available at a substantial discount during warranty period.

General

Except for the warranties stated above, Symbol disclaims all warranties, express or implied, on products furnished hereunder, including without limitation implied warranties of merchantability and fitness for a particular purpose. The stated express warranties are in lieu of all obligations or liabilities on part of Symbol for damages, including without limitation, special, indirect, or consequential damages arising out of or in connection with the use or performance of the product. Seller's liability for damages to buyer or others resulting from the use of any product, shall in no way exceed the purchase price of said product, except in instances of injury to persons or property. Some states (or jurisdictions) do not allow the exclusion or limitation of incidental or consequential damages, so the preceding exclusion or limitation may not apply to you.

Service Information

Before you use the unit, it must be configured to operate in your facility's network and run your applications.

If you have a problem running your unit or using your equipment, contact your facility's Technical or Systems Support. If there is a problem with the equipment, they will contact the Symbol Support Center:

United States ¹	1-800-653-5350 1-631-738-2400	Canada	905-629-7226
United Kingdom	0800 328 2424	Asia/Pacific	337-6588
Australia	1-800-672-906	Austria/Österreich	1-505-5794-0
Denmark/Danmark	7020-1718	Finland/Suomi	9 5407 580
France	01-40-96-52-21	Germany/Deutschland	6074-49020
Italy/Italia	2-484441	Mexico/México	5-520-1835
Netherlands/Nederland	315-271700	Norway/Norge	+47 2232 4375
South Africa	11-8095311	Spain/España	91 324 40 00 Inside Spain
Sweden/Sverige	84452900		+34 91 324 40 00 Outside Spain
Latin America Sales Support	1-800-347-0178 Inside US +1-561-483-1275 Outside US		
Europe/Mid-East Distributor Operations	Contact local distributor or call +44 118 945 7360		

¹Customer support is available 24 hours a day, 7 days a week.

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