

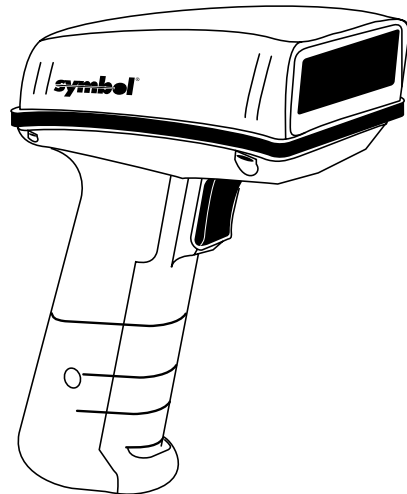
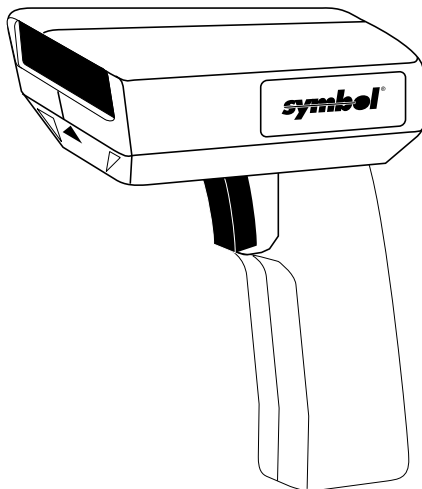
## *Chapter 1 User's Guide*

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### **Scanning Made Easy**

The LS 2050MX/LS 3050MX is Symbol's new family of interface scanners designed specifically for a variety of POS terminals with OCIA (Optically Coupled Interface Adapter) interfaces. The LS 2050MX suits most retail environments, while the LS 3050MX is ideal for more demanding settings. Unless there are specific differences in the two models, this guide will refer to them collectively as the "50MX."

The 50MX hand-held scanner is based on Symbol's unique "MX" advanced mylar™ technology scan engine. This state-of-the-art technology gives the scanner excellent reliability and consistent outstanding scanning performance. This scanner reads most code symbologies, densities, and colors, produced by a wide range of printing techniques.



# Set Up

## Unpacking

Remove the 50MX from its packing and inspect the scanner for evidence of physical damage. If the scanner was damaged in transit, call the *Symbol Support Center* at the telephone number listed on page 1-10.

**KEEP THE PACKING.** It is the approved shipping container and should be used if you ever need to return your equipment for servicing.

## Connecting the Cable to the Scanner...

### LS 2050MX

- Plug the modular connector into the base of the scanner.

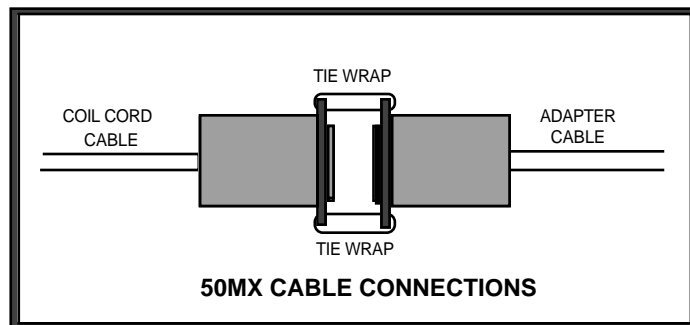
### LS 3050MX

- Slide collar down over cable
- Plug in modular connector
- Slide collar up into keys
- Twist to snap in place

## Connecting the Scanner to a Portable Data Terminal

Before connecting the scanner, power down the POS terminal.

- Plug the 25-pin, D-connector at the end of the adapter cable into the 50MX coil cord connector.
- Plug the other end of the adapter cable into the appropriate port in the host device. Check that both connections are secure.
- Secure the mated 25-pin, D-connectors with the tie wraps. Do this by looping the tie wraps through thumb-screw holes in the flanges. Tighten each to secure the connection. (Refer to diagram below)
- Connect the power supply. The coil cord connector has a power supply input receptacle on the side. Insert the power supply connector into this receptacle. Then plug the other end of the cable into an appropriate AC outlet.
- Power-up the host terminal. Your 50MX is ready to scan as soon as you pull the trigger.



Now you can program the scanner. *A POS Terminal Type must be selected before data can be transmitted.*

## Programming the System

An 50MX scanner is programmed by scanning sequences of bar codes. Consult *Chapter 2*.

# Ready, Test, Scan

## 1. Ready

Make sure connections are secure.

## 2. Test

Aim the scanner away from you and press the trigger. When you press the trigger, the scanning beam is energized. The duration of on time is programmable.

## 3. Scan

Make sure the symbol you want to scan is within the scanning range. See the *50MX Decode Zone* diagram on page 1-7.

Aim and press the trigger.

- The scan beam and red SCAN LED will light until the programmed on time limit is reached, or until a successful decode.

The scanner has read the symbol when:

- You hear a short, high tone beep (if the beeper is enabled).
- The green DECODE LED lights.

The DECODE LED stays lit until the next trigger pull.

# Aiming

## Hold at an Angle

Do not hold the scanner directly over the bar code. In this position, light can bounce back into the scanner's exit window and prevent a successful decode.

## Scan the Entire Symbol

- Your scan beam must cross every bar and space on the symbol.
- The larger the symbol, the farther away you should hold the scanner.
- Hold the scanner closer for symbols with bars that are close together.
- A short high-tone beep indicates a good decode.



## What If...

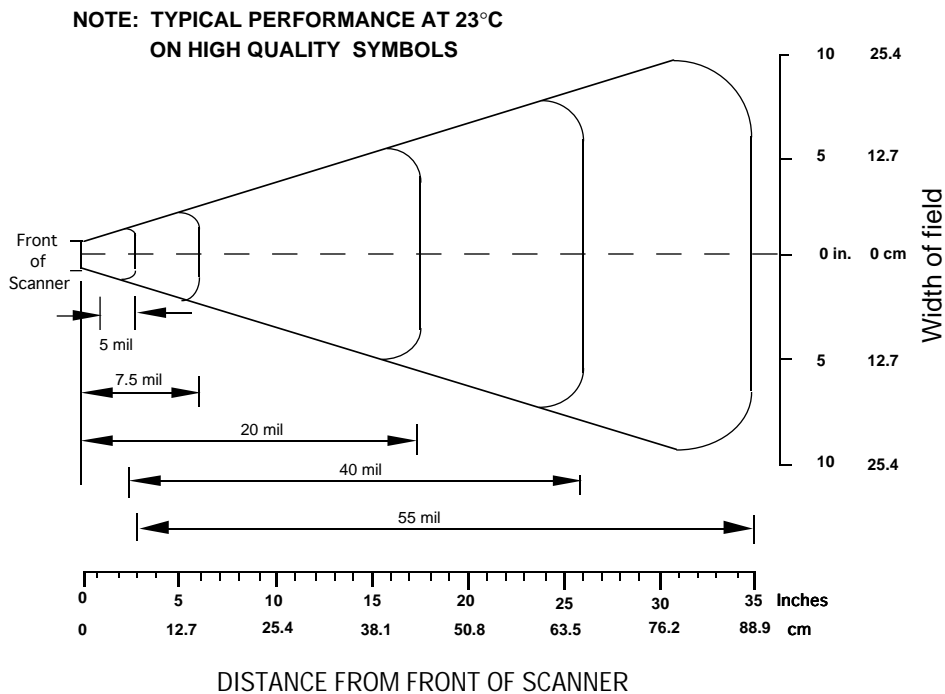
**Nothing happens when you follow the operating instructions.**

## You Should

- Check that you are using the correct interface cable.
- Check for loose cable connections.
- Make sure the scanner is programmed to transmit to the correct type of host terminal. Refer to the *Chapter 2*.
- Make sure the symbol is not defaced.
- Try scanning test symbols of the same code type.

**Note:** If after performing these checks the symbol still does not scan, contact your distributor or call the *Symbol Support Center*. See page 1-10 for the telephone number.

## 50MX Decode Zone



## Maintenance

Cleaning the exit window is the only maintenance required. A dirty window may affect scanning accuracy.

- Do not allow any abrasive material to touch the window.
- Remove any dirt particles with a damp cloth.
- Wipe the window using a damp cloth, and if necessary, a non-ammonia based detergent.
- Do not spray water or other cleaning liquids directly into the window.



## Factory Service

If you have a problem, contact the *Symbol Support Center* at the telephone number on page 1-10.

Before calling, have the model number and several of your bar code symbols at hand.

Call the Support Center from a phone near the scanning equipment so that the service person can try to talk you through your problem. If the equipment is found to be working properly and the problem is symbol readability, Support will request samples of your bar codes for analysis at our plant.

If your problem cannot be solved over the phone, you may need to return your equipment for servicing. If that is necessary, you will be given specific directions.

**Note:** Symbol Technologies is not responsible for any damages incurred during shipment if the approved shipping container is not used. Shipping the units improperly can possibly void the warranty. If the original shipping container was not kept, contact Symbol to have another sent to you.

## **Symbol Support Center**

In the U.S.A., for service information, warranty information or technical assistance call:

### **SYMBOL SUPPORT CENTER**

**1-800-653-5350**

If you purchased your Symbol product from a Symbol Business Partner, contact that Business Partner for service.

### **Canada**

Mississauga, Ontario  
Canadian Headquarters  
(905) 629-7226

### **Europe**

Wokingham, England  
European Headquarters  
01734-771-222 (Inside UK)  
+44-1734-771222 (Outside UK)

### **Asia**

Singapore  
Symbol Technologies Asia, Inc.  
337-6588 (Inside Singapore)  
+65 337-6588 (Outside Singapore)

# Accessories

## Required Accessories

50MX scanners are sent as a package with required accessories, listed in the *Product Ordering Guide*. Optional accessories are available at extra cost.

## Optional Accessories

Optional accessories, listed in the *Product Ordering Guide*, include various stands and holders, which are supplied at extra cost. Additional units of standard accessories listed above may also be purchased at extra cost.

## Technical Specifications

Item	Description	
<b>Power Requirements</b>	8 VDC; 250 mA (Typical)	
<b>Decode Capability</b>	Code 39, UPC/EAN Code 128, I 2 of 5	
<b>Beeper Operation</b>	User-selectable: enabled/disabled	
<b>Scan Repetition Rate</b>	36 ( $\pm$ 3) scans/sec (bidirectional)	
<b>Skew Tolerance</b>	$\pm 65^\circ$ from normal	
<b>Pitch Angle</b>	$\pm 55^\circ$ L/R of normal	
<b>Decode Depth of Field</b>	Maximum typical working distance is 35 in. (88.9 cm); minimum element width resolution is 5.0 mils.	
<b>Print Contrast Minimum</b>	25% absolute dark/light reflectance differential, measured at 675 nm.	
<b>Ambient Light Immunity</b>		
<b>Artificial Lighting</b>	450 ft. candles	4845 lux
<b>Sunlight</b>	8000 ft. candle	86112 lux (@8 in. on low density bar codes)
<b>Operating Temperature</b>	32° to 104°F	0° to 40°C
<b>Storage Temperature</b>	-40° to 140°F	-40° to 60°C
<b>Humidity</b>	5% to 95% (non-condensing)	
<b>Coil Cord Cable Length</b>	8-ft.	244 cm

Item	Description	
<b>Durability</b>		
<b>LS 2050MX</b>	4-ft. drop to concrete	
<b>LS 3050MX</b>	6-ft. drop to concrete	
<b>Dimensions</b>		
<b>LS 2050MX</b>		
<b>Height</b>	5.8 in.	14.7 cm
<b>Length</b>	4.9 in.	12.4 cm
<b>Width</b>	2.6 in.	6.6 cm
<b>LS 3050MX</b>		
<b>Height</b>	6.3 in.	16 cm
<b>Length</b>	5 in.	12.7 cm
<b>Width</b>	2.8 in.	7.1 cm
<b>Laser Classification</b>	CDRH Class II IEC 825 Class 1 IEC 825 Class 2	

## Glossary

**ASCII** - American Standard Code for Information Interchange. A 7 bit-plus-parity code representing 128 letters, numerals, punctuation marks, and control characters. It is a standard data transmission code in the U.S.

**BIT** - Binary digit. One bit is the basic unit of binary information. Generally, eight consecutive bits compose one byte of data. The pattern of 0 and 1 values within the byte determines its meaning.

**BYTE** - On an addressable boundary, eight adjacent binary digits (0 and 1) combined in a pattern to represent a specific character or numeric value. Bits are numbered from the right, 0 through 7, with bit 0 the low-order bit. One byte in memory can be used to store one ASCII character.

**CDRH** - Center for Devices and Radiological Health. A federal agency responsible for regulating laser product safety. This agency specifies various laser operation classes based on power output during operation.

**CDRH CLASS I** - This is the lowest power laser class. Class 1 lasers are safe when used in accordance with the user instructions. They are inherently safe (so that the maximum permissible exposure level cannot be exceeded under any condition), or are safe by virtue of their engineering design.

**CHECK DIGIT** - A digit used to verify a correct symbol decode. The scanner inserts the decoded data into an arithmetic formula and checks that the resulting number matches the encoded check digit. Check digits are required for UPC but are optional for other symbologies. Using check digits decreases the chance of substitution errors when a symbol is decoded.

**CODABAR** - A discrete self-checking code with a character set consisting of digits 0 to 9 and six additional characters: (- \$ : / , +).

**CODE 128** - A high density symbology which allows the controller to encode all 128 ASCII characters without adding extra symbol elements.

**CODE 3 OF 9 (CODE 39)** - A versatile and widely used alphanumeric bar code symbology with a set of 43 character types, including all uppercase letters, numerals from 0 to 9, and 7 special characters (- . / + % \$ and space). The code name is derived from the fact that 3 of 9 elements representing a character are wide, while the remaining 6 are narrow.

**CODE 93** - An industrial symbology compatible with Code 39 but offering a full character ASCII set and a higher coding density than Code 39.

**CONTINUOUS CODE** - A bar code or symbol in which all spaces within the symbol are parts of characters. There are no intercharacter gaps in a continuous code. The absence of gaps allows for greater information density.

**DECODE** - To recognize a bar code symbology (e.g., UPC/EAN) and then analyze the content of the specific bar code scanned.

**DECODE ALGORITHM** - A decoding scheme that converts pulse widths into data representation of the letters or numbers encoded within a bar code symbol.

**DISCRETE CODE** - A bar code or symbol in which the spaces between characters (intercharacter gaps) are not part of the code.

**DISCRETE 2 OF 5** - A binary bar code symbology representing each character by a group of five bars, two of which are wide. The location of wide bars in the group determines which character is encoded; spaces are insignificant. Only numeric characters (0 to 9) and START/STOP characters may be encoded.

**EAN** - European Article Number. This European/International version of the UPC provides its own coding format and symbology standards. Element dimensions are specified metrically. EAN is used primarily in retail.

**HOST COMPUTER** - A computer that serves other terminals in a network, providing such services as computation, database access, supervisory programs, and network control.

**IEC** - International Electrotechnical Commission. This international agency regulates laser safety by specifying various laser operation classes based on power output during operation.

**IEC CLASS I (IEC 825 Class I)** - This is the lowest power IEC laser classification. Conformity is ensured through a software restriction of 120 seconds of laser operation within any 1000 second window and an automatic laser shutdown if the scanner's oscillating mirror fails.

**INTERCHARACTER GAP** - The space between two adjacent bar code characters in a discrete code.

**INTERLEAVED BAR CODE** - A bar code in which characters are paired together, using bars to represent the first character and the intervening spaces to represent the second.

**INTERLEAVED 2 OF 5** - A binary bar code symbology representing character pairs in groups of five bars and five interleaved spaces. Interleaving provides for greater information density. The location of wide elements (bar/spaces) within each group determines which characters are encoded. This continuous code type uses no intercharacter spaces. Only numeric (0 to 9) and START/STOP characters may be encoded.

**LASER** - An acronym for Light Amplification by Stimulated Emission of Radiation. The laser is an intense light source. Light from a laser is all the same frequency, unlike the output of an incandescent bulb. Laser light is typically coherent and has a high energy density.

**LASER DIODE** - A gallium-arsenide semiconductor type of laser connected to a power source to generate a laser beam. This laser type is a compact source of coherent light.

**PARAMETER** - A variable that can have different values assigned to it.

**PROGRAMMING MODE** - The state in which a scanner is configured for parameter values. See SCANNING MODE.

**QUIET ZONE** - A clear space, containing no dark marks, which precedes the start character of a bar code symbol and follows the stop character.



**SCANNER** - An electronic device used to scan bar code symbols and produce a digitized pattern that corresponds to the bars and spaces of the symbol. Its three main components are:

1. Light source (laser or photoelectric cell) - illuminates a bar code.
2. Photodetector - registers the difference in reflected light (more light reflected from spaces).
3. Signal conditioning circuit - transforms optical detector output into a digitized bar pattern.

**SCANNING MODE** - The scanner is energized, programmed, and ready to read a bar code.

**SCANNING SEQUENCE** - A method of programming or configuring parameters for a bar code reading system by scanning bar code menus.

**SELF-CHECKING CODE** - A symbology that uses a checking algorithm to detect encoding errors within the characters of a bar code symbol.

**START/STOP CHARACTER** - A pattern of bars and spaces that provides the scanner with start and stop reading instructions and scanning direction. The start and stop characters are normally to the left and right margins of a horizontal code.

**SYMBOL** - A scannable unit that encodes data within the conventions of a certain symbology, usually including start/stop characters, quiet zones, data characters, and check characters.

**SYMBOLOGY** - The structural rules and conventions for representing data within a particular bar code type (e.g. UPC/EAN, Code 39).

**UPC** - Universal Product Code. A relatively complex numeric symbology. Each character consists of two bars and two spaces, each of which can be any of four widths. The standard symbology for retail food packages in the United States.