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# Hewlett-Packard SmartWand Bar Code Reader

## Technical Data

**HBSW-8000 Series  
Polycarbonate or Metal  
Housing**

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### Features

- **Automatically Decodes 9 Bar Code Symbolologies**
  - Code 39 – Standard or Extended
  - Int. 2 of 5      Code 128
  - UPC A, E      EAN 8, 13
  - Codabar      Code 11
  - MSI Code      Code 93
- **LED Feedback**
- **Low Current Draw**
- **Programmable Either by Bar Code Labels or by Escape Sequences**
- **Configuration Stored in Non-Volatile Memory**
- **CMOS/TTL Interface**
  - Output 0 to 5 volts
  - Input up to  $\pm 15$  volts
- **Manufacturing - ISO 9002 Certified**
- **Full One Year Warranty**

### Description

The Hewlett-Packard SmartWand Bar Code Reader is a bar code scanning wand with an integrated decoder. It transmits data to a computer via an asynchronous serial port, using CMOS level signals, at user definable baud rates. The SmartWand Reader's configuration may be changed by scanning special bar code menus, or by sending escape sequences to the wand from the host. The



configuration is stored in non-volatile memory, allowing the SmartWand Reader to retain the configuration when the power is turned off. A Configuration Display option sends a summary of the configured options to the screen.

In its default configuration, the SmartWand Reader can automatically recognize and decode 9 standard bar code symbolologies. Configurable options include: symbology selection, checksum verification, length checking, message editing, LED feedback control, Code 39

digital wand emulation mode, serial port configuration, and various I/O protocols such as single read modes, Xon/Xoff pacing and no-read recognition.

The polycarbonate-cased SmartWand Readers (HBSW-8000,8200,8400) have an LED near the tip that flashes after a good read. The LED also flashes during bar code menu programming and to signal any self-test failures after power-up.

All SmartWand Readers have an enhanced software version of Hewlett-Packard's proven

decoding algorithm. The SmartWands are also very suitable for portable computer or terminal applications due to its low current draw.

### Visual Feedback LED

The SmartWand Readers with polycarbonate-cases have an easy-to-see Feedback LED near the scanner tip that acknowledges a good read. This is useful in a noisy environment or where silence is required. Since the state of the LED can be controlled by escape sequences, the host processor can turn the LED on or off at any time.

### SmartWand Reader Configuration

The SmartWand Reader can be configured by scanning special bar code labels or by receiving escape sequence commands from the host. This allows decoding options and interface protocols to be tailored to a specific application. Configuration labels and a list of escape sequences are printed in the SmartWand User's Manual (P/N: HBSW-8997). The SmartWand Reader can display its current configuration on the host's screen. See sample.

### Programmable Features

Bar code selection and decoding options  
Check character verification and transmission  
Serial port parameters and I/O protocols  
Message editing  
Header and terminators  
LED operator feedback  
Label length checking  
No Read recognition  
Digital wand Code 39 emulation

### Wand Specifications

Scan Speed ..... 7.6 to 127 cm/s  
(3 to 50 in/s)  
Tilt Angle ..... 5° to 40°  
Minimum Contrast ..... 45%  
Color ..... Black  
Wand Diameter ... 23 mm (0.9 in)  
Wand Length .... 160 mm (6.3 in)  
Weight:  
Aluminum ..... 153 g (5.4 oz)  
Polycarbonate ... 140 g (4.9 oz)  
Tip ..... Sapphire

### Environmental

#### Temperature:

Operating:  
-20°C to 70°C (-4°F to 158°F)

Storage:  
-40°C to 70°C (-40°F to 158°F)

**Humidity** (Non-condensing):  
95% at 40°C (104°F) max.

#### Ambient Light:

100,000 lux (maximum)

#### Rain:

MIL-STD-810, Method 506,  
Procedure II (Polycarbonate)

#### Dust:

MIL-STD-810, Method 510

#### Shock:

Ten drops to sealed concrete  
(random orientation) from  
1.2 m (4 ft)

### Configuration Display

CONFIGURATION DISPLAY							
--- Version 12.5 ---				(c) Hewlett-Packard 1986-1992			
CODE	READ	CHECK CHAR	LENGTH	CODE ID	OTHER CONFIG. SETTINGS		
		verif_xmit	min_max	xmit:[off]	-----		
Code 39	[yes]	[no]	yes [1] [32]	[a]	Extended: [no]		
Int. 2/5	[yes]	[no]	yes [4] [32]	[b]	Length: [variable]		
Codabar	[yes]	[no]	no [1] [32]	[d]	Include start/stop: [yes]		
Code 128	[yes]	yes	no [1] [32]	[e]			
Code 11	[yes]	[1]	yes [2] [32]	[f]			
MSI Code	[yes]	yes	yes [3] [32]	[g]			
Code 93	[yes]	yes	no [1] [32]	[h]			
UPC/EAN	[yes]	yes	fixed	[c]	[+ none]		
E:[0]					EAN:[yes] ID chars:[off]		
--- MESSAGE COMPONENTS (control character = ^ + letter) -----							
Header: [ ]				No-read: [ ]			
Trailer: [^M^J]				Message Ready: [^F]			
Reader Address: [ ]				Message Not Ready: [^U]			
-- SERIAL PORT ----- PACING ----- MISCELLANEOUS -----							
Baud Rate: [9600]		XON/XOFF Protocol: [off]			No-Read Recognition: [off]		
Parity: [0's]		Single Read Mode: [off]			Scanner: [enabled]		
Stop Bits: [1]		----- FEEDBACK: [on] -----			Buffering: [None]		
[20ms]Delay: [off]		LED: [flashes] Active: [high]			ROM/RAM Self Test: [off]		

All items within the square brackets [ ] are configurable.

## Electrical Interface

V <sub>CC</sub> Limits (V)	Min.	Max.
Operating	4.5	6.0
Absolute Rating	-0.3	6.0
Supply Ripple	100 mV peak to peak	

## Typical Current Draw - I<sub>CC</sub> (mA)

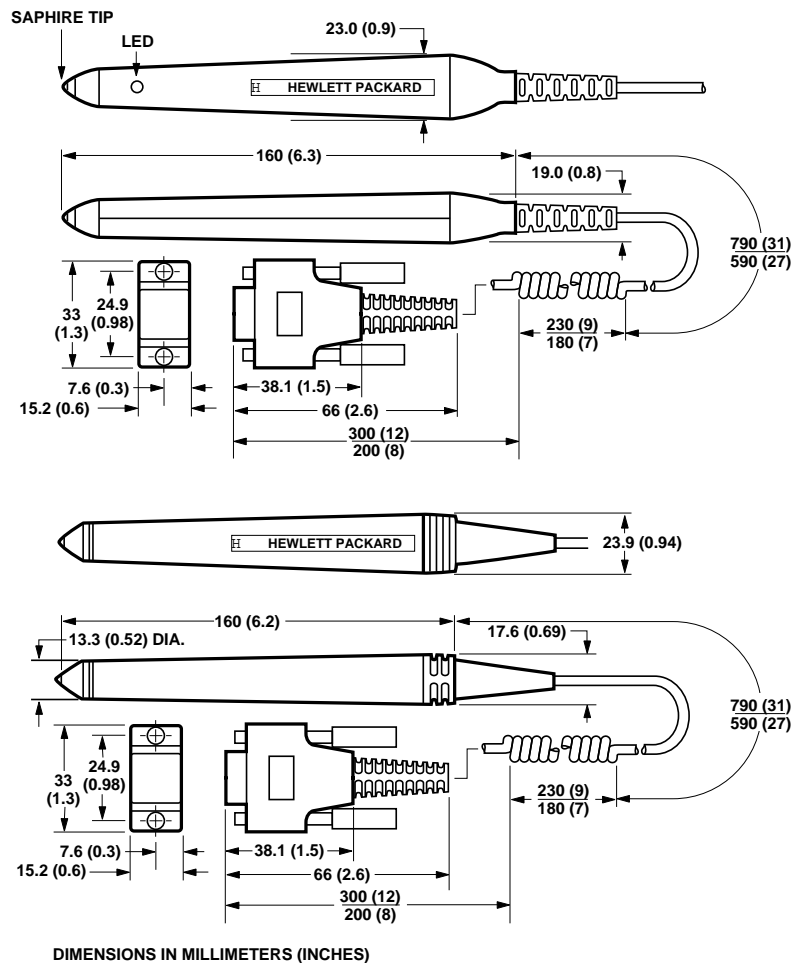
Mode	V <sub>CC</sub>		
	4.5	5.0	6.0
Idle	8	9	12
Scanning	16	18	24
With LED on	25	29	38

## FCC Certification

HP's SmartWand Readers have received FCC certification for their standard configuration only. Any customer purchasing the product with stripped and tinned leads or a connector without adequate shielding has the responsibility to comply with FCC regulations. Moreover, if the HP SmartWand Reader is purchased without a connector, the product becomes defined as a sub-assembly and the FCC Identification number no longer applies. HP assumes no responsibility or liability for users of the HP SmartWand Readers without connectors that fail to comply with FCC regulations.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to 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.

## General Mechanical Specifications



Model	FCC Identification
HBSW-8XXX Series	FCC ID: B94KDRZ



The CE Mark demonstrates compliance with EC directives on EMC.

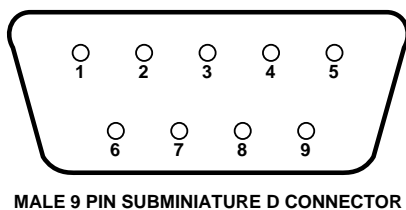
## Connector

The standard connector is a 9 pin male D connector. There is also an option for the cable to have stripped and tinned wires.

## Pin Diagram

Pin #	Wire Color	Function
1	-	N/C
2	White	TxD Transmitted Data (from the Reader)
3	Green	RxD Received Data (to the Reader)
4, 5, 6	-	N/C
7	Black	Ground
8	-	N/C
9	Red	V <sub>CC</sub>
Shell	Braid	Shield

Shield and ground are tied together in the connector.



## Pin Description

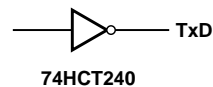
**Pin 2 TxD** - The data output signal TxD obeys standard serial asynchronous data formats, but uses zero to five volts CMOS logic levels. It can be described as CMOS level RS-232. The TxD output circuit is shown in the figure below. It will drive TTL, LSTTL, CMOS, HC, and HCT inputs.

## TxD Output Specifications

(V<sub>CC</sub> = 4.5 V, T<sub>A</sub> = 25°C)

	Min.	Max.
V <sub>OH</sub>	4.4 V @ 20 $\mu$ A 3.8 V @ 6 mA	
V <sub>OL</sub>		0.10 V @ -20 $\mu$ A 0.33 V @ -6 mA
I <sub>OL</sub>		35 mA

## TxD Circuit



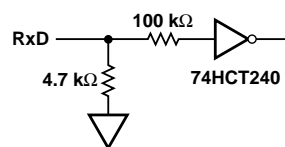
**Pin 3 RxD** - The received data signal RxD expects the standard asynchronous serial data format. It will accept either CMOS level or true RS-232 level signals. The figure below shows the equivalent input circuit.

## RxD Input Specifications

(V<sub>CC</sub> = 5.0 V, T<sub>A</sub> = 25°C)

V <sub>IH</sub>	2.0 V 500 $\mu$ A
V <sub>IL</sub>	0.8 V @ 1 $\mu$ A

## RxD Circuit



**Note:** If the part is purchased with stripped and tinned wires, or if the connector is removed, the ground and shield wires must be connected together for proper operation.

## Ordering Information

Part Number	Housing	Resolution	LED Wavelength
HBSW-8000*	Polycarbonate	Low – 0.33 mm (0.013 in)	655 nm
HBSW-8100*	Metal		
HBSW-8200	Polycarbonate	Medium – 0.19 mm (0.0075 in)	655 nm
HBSW-8300	Metal		
HBSW-8400*	Polycarbonate	High – 0.13 mm (0.005 in)	820 nm
HBSW-8500*	Metal		

\* Low and High Resolution SmartWand Readers are built to order devices.

## SmartWand Kits

### HBSW-8205 - Polycarbonate SmartWand Kit

Includes: HBSW-8200 General Purpose Reader  
HBSW-8997 User's Manual  
HBCS-2998 Black Wand Holder

### HBSW-8305 - Metal SmartWand Kit

Includes: HBSW-8300 General Purpose Reader  
HBSW-8997 User's Manual  
HBCS-2998 Black Wand Holder

## SmartWand Accessory Part Numbers

HBSW-8997 User's Manual  
HBCS-2998 Wand Holder (black polycarbonate )  
HBSW-8991 Replacement Polycarbonate Case with LED Window and Tip  
HBCS-4999 Replacement Tip for Metal Case  
HBCS-A990 Plastic Case Replacement Tool

## Warranty and Service

The Hewlett-Packard SmartWand Bar Code Reader is warranted for a period of one year from date of purchase covering defects in material and workmanship.

Hewlett-Packard will repair or, at its option, replace products that prove to be defective in material or workmanship under proper use during the warranty period.

HEWLETT-PACKARD MAKES NO WARRANTY OF ANY KIND WITH REGARD TO THIS MATERIAL, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.