

# **IS4100 ScanQuest<sup>®</sup> Series**

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Laser Scan Engine

## **Installation and User's Guide**

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## INTRODUCTION

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Honeywell's IS4125 ScanQuest® Engines are compact laser bar code scanners designed to be integrated with OEM devices. The ScanQuest series provides fast, accurate, reliable scanning in a compact, lightweight package.

The IS4125 has built-in decoding for versatile OEM operations. The IS4125 has flash upgradeable firmware. The IS4110 non-decode engine is also available to be integrated with decode equipped OEM devices.

Note: The manufacturer of the end equipment must register with agencies such as the Food and Drug Administration (FDA). The specifications required for registration are not obtainable until the OEM manufacturer uses the ScanQuest Engine in its final configuration. Therefore, it becomes the responsibility of the manufacturer who incorporates the scan engine into their product to comply with all federal laser safety regulations. The manufacturer must submit a Laser Product Report for the FDA in the US or similar forms as required by other countries. Honeywell will assist its customers in complying with the necessary procedures.

## Theory of Operation

An object detection device is located behind the scanner window initiates the scanning process. The detection device is active as long as the unit is being powered. When the laser decodes a bar code, the scan engine transmits the data to the host system.

*If the same bar code stays in the field after successfully scanning*, the laser stays on for approximately four seconds and then turns off. This prevents unintentional reads of the same bar code. To read the same symbol more than once, remove the object from the scan field for approximately one second and then present the symbol again.

*If the bar code and object is removed* from the field during the scanning process, the laser turns off. In this stage, the scan engine's computer remains on "standby".

However, *if the object stays in the field*, the laser remains on for up to 2.5 seconds trying to detect the bar code. To reactivate the scanning sequence, remove the object.

The RS232 interface unit can be activated to scan by a command from the host. When the unit is configured this way, the object detection is disabled automatically.

## INTRODUCTION

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### Accessories

The following are available:

#### IS4125 **Decoded** Scan Engine Part Numbers

PN	DESCRIPTION	MANUFACTURE/PART No.
19-07092	Flex Ribbon 12 Pos x 70mm	Burndy BFC12X70A4
M-07102	Thru Hole 12 Pos ZIF Connector	Burndy FLWSLW125-1C7
M-07103	Flex Ribbon 12 Pos x 130mm	Burndy BFC12X30A4

#### IS4110 **Non-Decoded** Scan Engine Part Numbers

PN	DESCRIPTION	MANUFACTURE/PART No.
M-07104	Flex Ribbon 10 POS x 130mm	Burndy BFC10X130A4

## Components of the ScanQuest Scan Engine

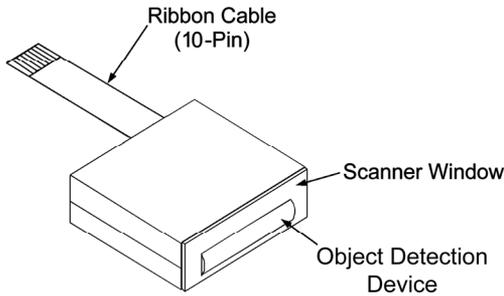


Figure 1: IS4110

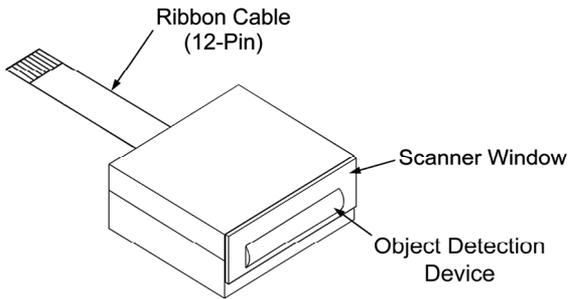


Figure 2: IS4125

<b>Scanner window:</b>	This aperture emits laser light.
<b>Object Detection Device:</b>	When a specified time has elapsed without any scanning, the unit will enter a “standby” mode. To reactivate the unit, present an object in front of the window.
<b>Ribbon Cables:</b>	This IS4110 has a 10-position FFC/FPC cable and the IS4125 has a 12-position FFC/FPC cable. Refer to <i>Scanner Termination</i> starting on page 18.

# INTRODUCTION

## Label Locations

The serial number label is located on the bottom of the unit. On the top of the unit is the “avoid exposure” and model number label.

The following are examples of these labels:

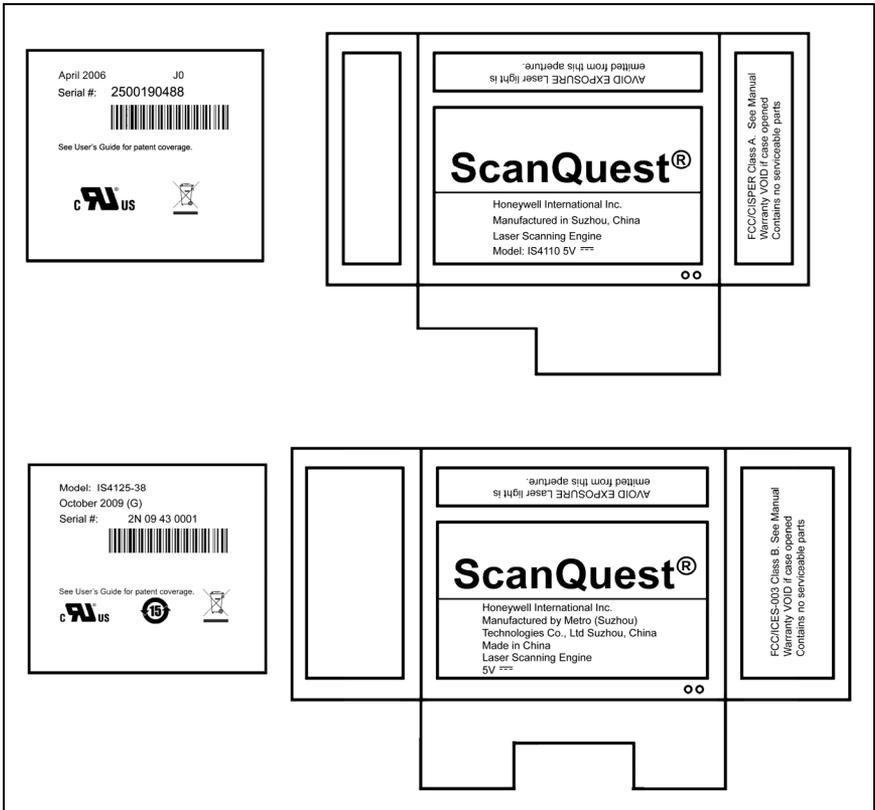


Figure 3: Labels

## Maintenance

Smudges and dirt on the unit's window can interfere with the unit's performance. If the window requires cleaning, use only a mild glass cleaner containing no ammonia. When cleaning the window, spray the cleaner onto a lint free, non-abrasive cleaning cloth then gently wipe the window clean.

## AUTOMATIC SCAN ACTIVATION

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An object detection device is located behind the scanner window initiates the scanning process. In short range mode the signal projects approximately 101.61 mm – 177.84 mm (4" – 7") beyond the output window. In long range mode the signal projects approximately 228.61 mm – 330.21 mm (9" – 13") beyond the output window. The object detection device remains active as long as the unit is powered.

When the unit remains dormant for a time, the laser will turn off. In this stage, the scan engine's computer is on "standby". To reactivate the unit, present an object within the scan field.

## APPLICATIONS AND PROTOCOLS

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The model number on each scan engine includes the scan engine number and communications protocol.

Unit	Communication Protocol(s)	Type
IS4110	Laser Data	Non-decode
IS4125-41 IS4125-76	RS232 and Light Pen Emulation (Flash Upgradeable Firmware)	Decode Standard
IS4125-47	Keyboard Wedge, Stand Alone Keyboard (Flash Upgradeable Firmware)	
IS4125-38	Low Speed USB Keyboard Emulation or Serial Emulation Mode	
IS4125-63	RS232 and Light Pen Emulation (Flash Upgradeable Firmware)	Decode High-Density
IS4125-163	TTL, RS232	

## DESIGN SPECIFICATIONS

OPERATIONAL		
	Light Source:	VLD 650 ± 10 nm
	CDRH/IEC:	Designed to be used in CDRH Class II and IEC Class 2 laser products
	UL:	UL recognized component for Canada and US
Depth of Field, UPC 100% (0.33 mm (13 mil) bar codes):	Standard:	25 mm to 200 mm (1" to 8")
	High Density:	10 mm to 175 mm (0.4" to 6.9")
	Scan Speed:	52 scan lines per second minimum
	Scan Pattern:	Single scan line
Resolution:	Standard:	0.173 mm (6.8 mil)
	High Density:	0.132 mm (5.2 mil)
	Roll, Pitch, Skew:	30°, 56°, 58° at 100 mm distance
	Sweep Angle:	60°
	Scan Width:	40 mm (1.57") @ Face; 280 mm (11.00") @ 200 mm (8.00")
	Print Contrast:	35% minimum reflectance difference
IS4125	Decode Capability:	All standard 1D symbologies including GS1 DataBar
	System Interfaces:	RS232C, Light Pen Emulation, Keyboard Wedge, Low Speed USB, RS232 TTL
MAINTENANCE		
	Window:	Clean Periodically

*Specifications are subject to change without notice.*

## DESIGN SPECIFICATIONS

MECHANICAL		
IS4125	Dimensions:	45.7 mm L x 40.6 mm W x 18.5 mm D (1.8" L x 1.6" W x 0.73" D)
	Weight:	53 g. (1.87 oz.)
	Termination:	Low profile ZIF 12-pin connector that accepts a 1 mm x 12 position FFC/FPC cable
IS4110	Dimensions:	45.7 mm L x 40.6 mm W x 14 mm D (1.8" L x 1.6" W x 0.55" D)
	Weight:	45 g. (1.774 oz.)
	Termination:	Low profile ZIF 10-pin connector that accepts a 1 mm x 12 position FFC/FPC cable
ELECTRICAL		
IS4125	Power:	0.6 watts
	Input Voltage:	5VDC $\pm$ 0.25V
	Operating Current:	120 mA typical @5VDC
	Sleep Current:	22 mA @ 5VDC – typical for RS232 C, TTL RS232 and Keyboard Wedge
	Suspend Current:	1 mA @ 5VDC – typical for USB
	Idle Current:	58 mA typical @ 5VDC
IS4110	Power:	0.375 watts
	Input Voltage:	5VDC $\pm$ 0.25V
	Operating Current:	75 mA typical @ 5VDC
	Standby Current:	1.7 mA typical @ 5VDC

*Specifications are subject to change without notice.*

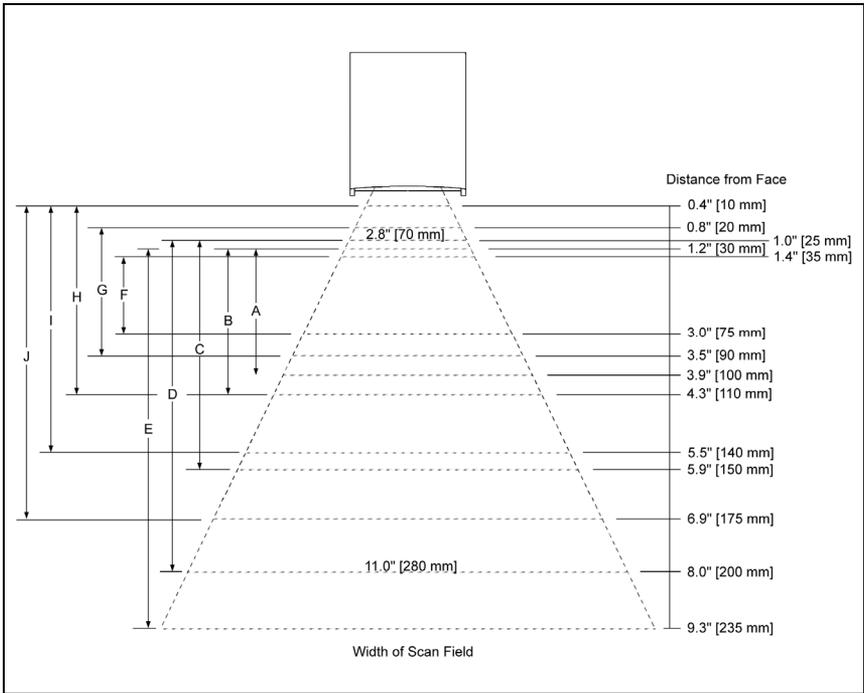
## DESIGN SPECIFICATIONS

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<b>ENVIRONMENTAL</b>		
IS4125	Operating Temperature:	-20°C to 50°C (-4°F to 122°F)
	Storage Temperature:	-40°C to 70°C (-40°F to 158°F)
	Humidity:	5% to 95% relative humidity, non-condensing
	Vibration:	7G over 10-500 Hz
	Light Levels:	Up to 60,000 Lux (5,574 footcandles)
<b>COMPLIANCE</b>		
	Laser Class:	Class 2; IEC 60825-1, EN 60825-1
	IS4110 EMC:	FCC Part 15, ICES-003, EN 5022 Class A
	IS4125 EMC:	FCC Part 15, ICES-003, EN 5022 Class B

*Specifications are subject to change without notice.*

# IS4125 DEPTH OF FIELD



Minimum Bar Code Element Width										
	Standard					High Density				
	A	B	C	D	E	F	G	H	I	J
mm	.17	.19	.25	.33	.53	.13	.16	.18	.25	.33
mil	6.8	7.5	10.4	13	21	5.2	6.1	7.2	10.4	13

Figure 4. Depth of Field

Specifications are subject to change without notice.

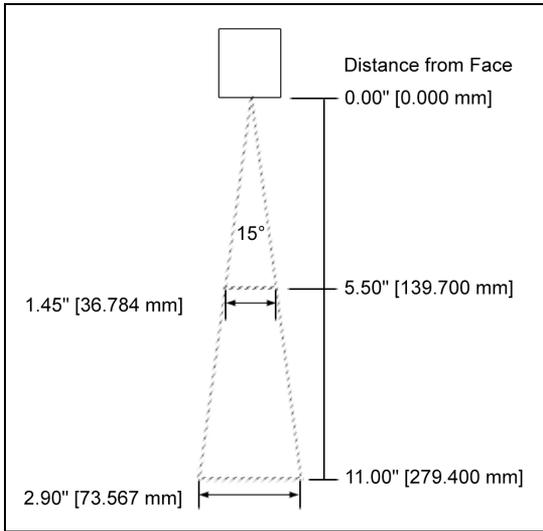


Figure 5. IS4125 Object Detection Field

Please note certain ambient light conditions may interfere with the object detection mechanism, resulting in false activation of the engine. To mitigate the problem, please try one of the following suggestions:

1. Avoid mounting the engine directly facing the ambient light source.
2. Avoid mounting the engine facing a light-colored or reflective surface.
3. Avoid mounting the engine towards a surface at a distance close to the long range (9" – 11") of object detection
4. Configure the object detection range to short (4" – 7").

## Specifications for the Supplemental Window

In applications where a secondary window is installed with the IS4125, the following recommendations should be followed in order to achieve the best performance. While these recommendations provide general guidelines for a successful integration and installation, it will take some testing to find exact parameters to optimize scan performance and auto detection in each application.

- The window should be tempered or chemically strengthened glass.
- The window should be of optical quality and have a transmission of 98% or greater between 600 nm – 700 nm.
- The window should be optically flat, clear, and free of inclusions, scratches and pits.
- The window should not have birefringence.
- The window should have an anti-reflective coating on both sides to minimize "ghost" images or reflections.
- The window should not be thicker than 2.0 mm.
- The window and the engine should be mounted in a way to avoid direct reflections of both the laser beam and LED of the object detection from hitting the scan engine.
- The angle between the window and the engine should be approximately 15° to 20°, but should be adjusted as needed. See Figure 6.

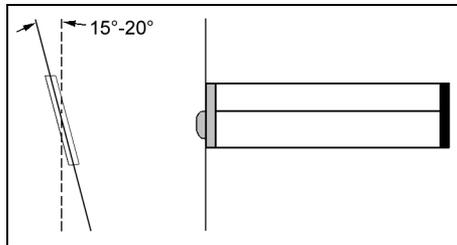


Figure 6. Supplemental Window Angle

In rare instances where a supplemental window was previously installed and the factory default long range is enabled, the new object detection mechanism may behave differently. If this occurs, scan the *Enable Short Range Object Detection* bar code below to configure the engine to short range object detection.

Enable Short Range Object Detection



## DEFAULT SETTINGS

Many functions of the IS4125 decode scan engine can be configured or enabled/disabled. The decode engine is shipped from the factory configured to a set of default conditions. The default parameter of the decode scan engine has an asterisk (\*) in the charts on the following pages. If an asterisk is not in the default column then the default setting is *OFF* or *disabled*. Every interface does not support every parameter. If the interface supports a parameter, a check mark (✓) will appear in interface column.

Parameter	Default	RS232 OR RS232 TTL	Light Pen	Keyboard Wedge	USB
Enter Configuration Mode, After Any Scan	*	✓	✓	✓	✓
Enter Configuration Mode, Only on First Scan		✓	✓	✓	✓
Short Range Activation		✓	✓	✓	✓
Long Range Activation	*	✓	✓	✓	✓
Normal Scan	*	✓	✓	✓	✓
Custom Scan		✓	✓	✓	✓
DTR Activation		✓			
DC2 Activation		✓			
Address Based Activation		✓			
"NOREAD" message Transmission		✓			
Turn on Green LED during "NOREAD" Transmit	*	✓			
Same Symbol Re-scan	*	✓	✓	✓	✓
Green LED Identical Symbol Re-Scan Indicator		✓	✓	✓	✓
1 Vs 2 Scan Buffers	1	✓	✓	✓	✓
2X Redundancy (MECCA)		✓	✓	✓	✓
Double Border Requirement (Large Intercharacter Space Requirement)		✓	✓	✓	✓
Alternate Beeper Tone 1		✓	✓	✓	✓
Alternate Beeper Tone 2	*	✓	✓	✓	✓
Alternate Beeper Tone 3		✓	✓	✓	✓
No Beeper tone		✓	✓	✓	✓
Two Second Timeout		✓			

## DEFAULT SETTINGS

Parameter	Default	RS232 OR RS232 TTL	Light Pen	Keyboard Wedge	USB
No Two Second Timeout	*	✓			
Razzberry Tone on Timeout		✓			
No Tone on Timeout	*	✓			
Three Beeps on Timeout		✓			
Beep Before Transmit	*	✓		✓	✓
Beep After Transmit		✓		✓	✓
Baud Rate	9600				
Parity	Space	✓			
8 Data Bits		✓			
7 Data Bits	*	✓			
RTS/CTS		✓			
Character RTS/CTS	*	✓			
Message RTS/CTS		✓			
ACK/NAK		✓			
XON/XOFF	*	✓			
No Intercharacter Delay		✓		✓	✓
1 Millisecond Intercharacter Delay		✓		✓	✓
5 Millisecond Intercharacter Delay		✓			
10 Millisecond Intercharacter Delay				✓	✓
25 Millisecond Intercharacter Delay		✓			
100 Millisecond Intercharacter Delay				✓	✓
DTR Input		✓			
DTR Scan Disable		✓			
“DE” Disable Command		✓			
LRC Calc+ Transmit RS232		✓			
Start LRC on first RS232 Byte		✓			
Start LRC on Second RS232 Byte	*	✓			
Carriage Return	*	✓		✓	✓
Line Feed	*	✓		✓	✓
STX Prefix		✓		✓	✓
ETX Suffix		✓		✓	✓
Tab Prefix		✓		✓	✓
Tab Suffix		✓		✓	✓

## DEFAULT SETTINGS

Parameter	Default	RS232 OR RS232 TTL	Light Pen	Keyboard Wedge	USB
Prefix ID for UPC/EAN		✓		✓	✓
Suffix ID for UPC/EAN		✓		✓	✓
Bars High	*		✓		
Spaces High			✓		
Transmit as Scanned	*		✓		
Transmit as code 39			✓		
Poll Light Pen 5 volts			✓		
No Poll Light Pen	*		✓		
Reverse Polarity Idle for Light Pen			✓		
UPC	*	✓	✓	✓	✓
EAN	*	✓	✓	✓	✓
Full ASCII code 39		✓	✓	✓	✓
Code 39	*	✓	✓	✓	✓
Codabar		✓	✓	✓	✓
Code 128	*	✓	✓	✓	✓
Code 93	*	✓	✓	✓	✓
Code 11		✓	✓	✓	✓
GS1 DataBar Enable		✓	✓	✓	✓
GS1 DataBar ID "je0"	*	✓	✓	✓	✓
GS1 DataBar App ID "01"	*	✓	✓	✓	✓
GS1 DataBar Check Digit	*	✓	✓	✓	✓
GS1 DataBar Expanded Enable		✓	✓	✓	✓
Expanded ID "je0"	*	✓	✓	✓	✓
GS1 DataBar Limited Enable		✓	✓	✓	✓
GS1 DataBar Limited ID "je0"	*	✓	✓	✓	✓
GS1 DataBar Limited App ID "01"	*	✓	✓	✓	✓
GS1 DataBar Limited Check Digit	*	✓	✓	✓	✓
Interleaved 2 of 5	*	✓	✓	✓	✓
Hong Kong Matrix 2 of 5		✓	✓	✓	✓
Airline 2 of 5		✓	✓	✓	✓
Minimum 1 Character Code Length		✓	✓	✓	✓
Minimum 3 Character Code Length	*	✓	✓	✓	✓
Minimum 6 character Code Length		✓	✓	✓	✓

## DEFAULT SETTINGS

Parameter	Default	RS232 OR RS232 TTL	Light Pen	Keyboard Wedge	USB
Set Minimum Character Length		✓	✓	✓	✓
Set Character Lock Length		✓	✓	✓	✓
Transmit UPC-A Number Sys	*	✓	✓	✓	✓
UPC-A Check Digit Transmit	*	✓	✓	✓	✓
Convert UPC-A to EAN-13		✓		✓	✓
Expand UPC-E		✓		✓	✓
UPC-E Check Digit Transmit		✓		✓	✓
UPC-E Leading 0 Transmit		✓		✓	✓
EAN-8 Check Digit Transmit	*	✓	✓	✓	✓
EAN-13 Check Digit Transmit		✓	✓	✓	✓
Convert EAN-8 to EAN-13		✓	✓	✓	✓
“\$” Prefix ID for UPC/EAN		✓	✓		
2 Digit Supplements (Scan)		✓	✓	✓	✓
5 Digit Supplements (Scan)		✓	✓	✓	✓
Bookland (Scan)		✓	✓	✓	✓
Supplement Required		✓	✓	✓	✓
Bookland to ISBN		✓	✓	✓	✓
Transmit ISBN CD		✓	✓	✓	✓
Mod 43 Check digit-Code 39		✓	✓	✓	✓
Transmit Mod 43 Check Digit Code 39	*	✓	✓	✓	✓
Transmit Start/Stop-Code 39		✓	✓	✓	✓
CLSI Editing (Enable)		✓	✓	✓	✓
ITF Check Digit		✓	✓	✓	✓
Transmit Mod 10 ITF Check Digit		✓	✓	✓	✓
2 of 5 Symbol Lengths	Variable	✓	✓	✓	✓
ISBN Reformatting		✓			
Coupon Code 128		✓	✓	✓	✓
JC1 Transmit Coupon C128		✓	✓	✓	✓
Coupon 128 Group Separator		✓	✓	✓	✓
Italian Pharmaceutical		✓	✓	✓	✓
Codabar Start & Stop Class		✓	✓	✓	✓
ITF Minimum Symbol Length Test		✓	✓	✓	✓
Matrix 2 of 5		✓	✓	✓	✓

## DEFAULT SETTINGS

Parameter	Default	RS232 OR RS232 TTL	Light Pen	Keyboard Wedge	USB
Matrix 2 of 5 Check Digit		✓	✓	✓	✓
Hong Kong Matrix 2 of 5		✓	✓	✓	✓
MSI-Plessey Test of Check Digit	*	✓	✓	✓	✓
Enable MSI-Plessey Mod 10 Check Digit		✓	✓	✓	✓
Enable MSI-Plessey Mod 10/10 Check Digit				✓	✓
Transmit MSI-Plessey Check Digit	*	✓	✓	✓	✓
UK Plessey		✓	✓	✓	✓
UK Plessey Check Digit		✓	✓	✓	✓
UK Plessey Special Format		✓	✓	✓	✓
A to X conversion (UK)		✓	✓	✓	✓
Scan Count Test Mode		✓		✓	✓
Scanability Test Mode		✓		✓	✓
Normal Scan/Operating Test Mode		✓		✓	✓
Default to ScanPal Communication parameters Code ID					
Code ID				✓	✓
Sanyo 635 ECR Protocol		✓			
Post Software ID characters		✓		✓	✓
"Newcode" Mode A		✓		✓	✓
"Newcode" Mode B		✓		✓	✓
SNI Beetle Mode		✓			
BIO DATA Mode		✓			
Enable Sineko Mode		✓			
Enable Caps Lock Mode (for MI951 external wedge)		✓			
Rochford Thompson Mode		✓		✓	✓
RTS Counter Toggle		✓			
Beep on BEL RS232		✓			

## DEFAULT SETTINGS

Parameter	Default	RS232 OR RS232 TTL	Light Pen	Keyboard Wedge	USB
Retransmit of Same Code		✓		✓	✓
1st Configurable Prefix ID		✓		✓	✓
2nd Configurable Prefix ID		✓		✓	✓
1st Configurable Suffix ID		✓		✓	✓
2nd Configurable Suffix ID		✓		✓	✓
Clear all Configurable Prefixes and Suffixes		✓		✓	✓
SNI Beetle Mode		✓		✓	✓
AT Keyboard	*			✓	
Type XT Keyboard				✓	
Type PS2 Keyboard				✓	
USA Keyboard	*			✓	
Belgium Keyboard				✓	
France Keyboard				✓	
Germany Keyboard				✓	
Spain Keyboard				✓	
Italy Keyboard				✓	
UK Keyboard				✓	
IBM KDB4700 Financial Keyboard				✓	
Alt Mode				✓	
Auto Detection or Caps Lock				✓	
User-Defined Caps Lock				✓	
F0H Break Code Transmission	*			✓	
800 Microsecond Delay-Enter Scan Code	*			✓	
15 Millisecond Delay-Enter Scan Code				✓	
7-5 Millisecond delay-Enter Scan Code				✓	

## SCANNER TERMINATIONS

### IS4125-47 Connector Pin Assignments

Honeywell provides a low profile ZIF 12-pin connector to connect to a 1 mm x 12 position FFC/FPC cable. The pin assignments are as follows:

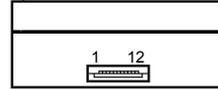


Figure 7

Pin	Signal Name	Function
1	VCC	<i>Input.</i> 5VDC ( $\pm 0.25V$ ) This requires 58 mA in standby and 120 mA peak.
2	Ground	Signal and power ground.
3	Receive	<i>Input.</i> Keyboard Wedge receive data from host.
4*	PC Data	PCData
5*	PCClock	PCClock
6*	KB Clock	KB Clock
7	Transmit	<i>Output.</i> RS232 transmit data from the scan engine.
8*	KB Data	KB Data
9	Good Read Indicator	<i>Output.</i> 5V high with a 2 kHz pulse. This drain is the pin of a PFET type transistor that can source approximately 100 mA of current. This output is the connection for an LED or other indicator ( <i>i.e.</i> beeper+). It is recommended that the indicator is terminated directly to ground.
10	Beeper -	<i>Input.</i> Collector of an NPN transistor that can sink approximately 100 mA of current. A current limiting pull-up resistor and Piezo type transducer (QMB- 111PXN or equivalent) is recommended.
11	Reserved Input	<i>Input.</i> Do not connect to this pin, Honeywell internal use only.
12	LED -	Negative connection for scan mode indicator. An external pull-up and LED are suggested. Maximum current is limited to 25 mA. This line is active low when the scanner is in the scanner mode ( <i>i.e.</i> scan line is present).

\* Pins 4, 5, 6 and 8 main function is to transmit scan codes between the Keyboard Wedge and PC.

## SCANNER TERMINATIONS

### IS4125-38 Connector Pin Assignments

Honeywell provides a low profile ZIF 12-pin connector to connect to a 1 mm x 12 position FFC/FPC cable. The pin assignments are as follows:

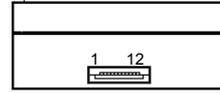


Figure 8

Pin	Signal Name	Function
1	VCC	<i>Input.</i> 5 VDC ( $\pm 0.25V$ ) This requires 58 mA in standby and 120 mA peak.
2	Ground	Signal and power ground.
3	Receive	<i>Input.</i> RS232 receive data from host. Nominal $\pm 12V$ signals.
4	DTR	Data terminal ready signal from host. Nominal $\pm 12V$ signals.
5	D-	USB D- Data Line
6	D+	USB D+ Data Line
7	Transmit	<i>Output.</i> RS232 transmit data from the scan engine. Nominal $\pm 12V$ signals.
8	+USB_V	+USB power from terminal defined per USB specification
9*	Good Read Indicator	<i>Output.</i> 5V high with a 2 kHz pulse. This drain is the pin of a PFET type transistor that can source approximately 100 mA of current. This output is the connection for an LED or other indicator ( <i>i.e.</i> beeper+). It is recommended that the indicator is terminated directly to ground.
10*	Beeper -	<i>Input.</i> Collector of an NPN transistor that can sink approximately 100 mA of current. A current limiting pull-up resistor and Piezo type transducer (QMB- 111PXN or equivalent) is recommended.
11	Reserved Input	<i>Input.</i> Do not connect to this pin, for Honeywell internal use only.
12	LED -	Negative connection for LED. An external pull-up and LED are suggested. Maximum current is limited to 25 mA. This line is active low when the laser diode is active.

\* Pins 9 and 10 can be used together to form a push-pull type circuit. Pin 9 becomes the Beeper + and Good - Read source whereas Pin 10 supplies the pathway to ground.

## SCANNER TERMINATIONS

### IS4125-41, IS4125-63 & IS4125-76 Connector Pin Assignments

Honeywell provides a low profile ZIF 12-pin connector to connect to a 1 mm x 12 position FFC/FPC cable. The pin assignments are as follows:

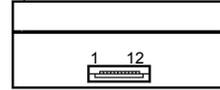


Figure 9

Pin	Signal Name	Function
1	VCC	<i>Input.</i> 5 VDC ( $\pm 0.25V$ ) This requires 58 mA in standby and 120 mA peak.
2	Ground	Signal and power ground.
3	Receive	<i>Input.</i> RS232 receive data from host. Nominal $\pm 12V$ signals.
4	Light Pen Source/DTR IN	<i>Input.</i> Either light pen source voltage (typical: +5VDC) when configured for wand emulation or RS232 Data Terminal Ready signal from host. Nominal $\pm 12V$ signals.
5	RTS	<i>Output.</i> RS232 Ready to send signal from the scan engine.
6	Light Pen DATA	<i>Output.</i> Wand emulation data, open collector output from the scan engine.
7	Transmit	<i>Output.</i> RS232 transmit data from the scan engine. Nominal $\pm 12V$ signals.
8	CTS	<i>Input.</i> RS232 Clear to send signal from host. Nominal $\pm 12V$ signals.
9*	Good Read Indicator	<i>Output.</i> 5V high with a 2 kHz pulse. This drain is the pin of a PFET type transistor that can source approximately 100 mA of current. This output is the connection for an LED or other indicator (i.e. beeper+). It is recommended that the indicator is terminated directly to ground.
10*	Beeper -	<i>Input.</i> Collector of an NPN transistor that can sink approximately 100 mA of current. A current limiting pull-up resistor and Piezo type transducer (QMB- 111PXN or equivalent) is recommended.
11	Reserved Input	<i>Input.</i> Do not connect to this pin. This pin is for Honeywell internal use only.
12	LED -	Negative connection for LED. An external pull-up and LED is suggested. Maximum current is limited to 25 mA. This line is active low when the laser diode is active.

\* Pins 9 and 10 can be used together to form a push-pull type circuit. Pin 9 becomes the Beeper + and Good - Read source whereas Pin 10 supplies the pathway to ground..

## SCANNER TERMINATIONS

### IS4125-163 Connector Pin Assignments

Honeywell provides a low profile ZIF 12-pin connector to connect to a 1 mm x 12 position FFC/FPC cable. The pin assignments are as follows:

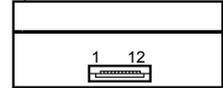


Figure 10

Pin	Signal Name	Function
1	VCC	<i>Input.</i> 5VDC ( $\pm 0.25V$ ) This requires 58 mA in standby and 120 mA peak.
2	Ground	Signal and power ground.
3	Receive	<i>Input.</i> RS232 receive data from host. Nominal $\pm 12V$ signals.
4	TTL Receive	<i>Input.</i> +5/0V
5	RTS	<i>Output.</i> RS232 Ready to send signal from the scan engine. Nominal $\pm 12V$ signals.
6	TTL Transmit	<i>Output.</i> +5/0V
7	Transmit	<i>Output.</i> RS232 transmit data from the scan engine. Nominal $\pm 12V$ signals.
8	CTS	<i>Input.</i> RS232 clear to send signal from host. Nominal $\pm 12V$ signals.
9*	Good Read Indicator	<i>Output.</i> 5V high with a 2 kHz pulse. This drain is the pin of a PFET type transistor that can source approximately 100 mA of current. This output is the connection for an LED or other indicator ( <i>i.e.</i> beeper+). It is recommended that the indicator is terminated directly to ground.
10*	Beeper -	<i>Input.</i> Collector of an NPN transistor that can sink approximately 100 mA of current. A current limiting pull-up resistor and Piezo type transducer (QMB- 111PXN or equivalent) is recommended.
11	Reserved Input	<i>Input.</i> Do not connect to this pin. This pin is for Honeywell internal use only.
12	LED -	Negative connection for LED. An external pull-up and LED are suggested. Maximum current is limited to 25 mA. This line is active low when the laser diode is active.

\* Pins 9 and 10 can be used together to form a push-pull type circuit. Pin 9 becomes the Beeper + and Good - Read source whereas Pin 10 supplies the pathway to ground.

## SCANNER TERMINATIONS

### IS4110 Connector Pin Assignments

Honeywell provides a low profile ZIF 10-pin connector that accepts an FPC/FFC cable with a 1.0 mm Pitch and a 0.3 mm end thickness. This cable is available from Honeywell in various lengths.

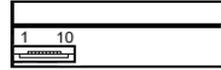


Figure 11

The pin assignments are as follows:

Pin	Signal Name	Function
1	VCC	+5V +/- .25V supplied from terminal (100 mA minimum supply)
2	Data Out	<i>Open collector output.</i> A black bar is indicated by a low signal. A 5K ohm pull-up resistor is recommended.
3	Range Select	<i>Open collector input.</i> A low on this line will put the scanner in long range (9" – 13") activation mode. This line may be left unterminated for short range (4" – 7") activation mode.
4	Scan Sense	<i>TTL output.</i> The signal pulses high once for each scan cycle ( <i>i.e.</i> one scan in each direction). There are 35 scan pulses per second.
5	Scan Mode Indicator	<i>Open collector active low output.</i> This pin will go low whenever the scan mode is activated. It is capable of sinking 15 mA and can be used to activate an indicator light.
6	Object Detection Enable	Do not connect to this pin.
7	Ground	Power ground
8	Object Detect	<i>TTL output.</i> A low signal indicates an object is within the scan field. The signal remains low until the object is removed.
9*	Scan Enable	<i>TTL low input.</i> A low signal applied to this pin will activate the scan mode. High or open deactivates the scan mode.*
10*	Scan Enable	<i>TTL high input.</i> A high signal applied to this pin will activate the scan mode. Low or open deactivates the scan mode.*

\* Use either pin 9 or pin 10 to activate the scan engine.

## IS4110 Timing Diagram

The SCAN SENSE pulse occurs once for each flip cycle. A flip cycle represents one scan in each direction (right to left then left to right from the scanner perspective). The HIGH to LOW transition of the SCAN SENSE signal initiates the start of the flip cycle.

The frequency of the SCAN SENSE pulses is dependent on the frequency of the internal flipper. This varies from unit to unit from 26 Hz to 30 Hz. Therefore, the period of the SCAN SENSE pulses will vary from 33 ms to 39 ms.

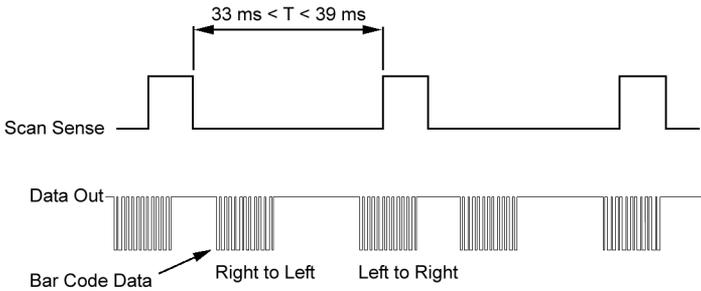


Figure 12: Timing Diagram

### Regulatory Requirements

The IS4100 Series ScanQuest Laser Scan engines are designed to meet the requirements of CDRH Class II and IEC Class 2 laser products. CDRH Class II/IEC Class 2 are defined as follows:

Emission Duration:	Greater than 0.25 seconds
Accessible Emission Limit:	Less than 0.001 W (1.0 milliwatts) average radiant power

The IS4100 series ScanQuest laser scan engine is registered with the Center for Devices and Radiological Health as a laser “component”. The addition of emission indicators, shut-down control, labeling and informational requirements are necessary to achieve compliance with the performance standard published in the Code of Federal Regulations (CFR), Title 21 Parts 1040.10 and 1040.11. Therefore, it is the responsibility of the manufacturer who incorporates the scan engine into their product to provide the additional performance, labeling and informational requirements necessary to comply with all federal laser safety regulations.

Federal law requires that all laser products introduced into commerce in the United States be registered with the CDRH, US Food and Drug Administration through submittal of a Laser Safety Report. The manufacturer of the end equipment must obtain approval and certification from agencies such as the FDA.

The specifications required for agency approval are not obtainable until the ScanQuest engine is used in its final configuration. Metrologic is unable to fulfill these requirements because the scan engine will operate differently depending upon where it is used as a component. The following information concerning the scan engine appears on the shipping label:

THIS DEVICE DOES NOT COMPLY WITH 21 CFR 1040.  
USE ONLY AS A COMPONENT.

Manufacturers incorporating unmodified ScanQuest engines into their product may reference the following accession number on items in their Laser Product Report that request information concerning features inherent in the ScanQuest engine design.

Accession Number: 8820576-14, -19

If the product is to be used in another country, they must fulfill the requirements for that country. Refer to one of the following sections *Europe* on page 25, *United States* on page 26 or *Canada* on page 27 for further explanation.

### Europe

The CE Mark is required on products with IS4110 and IS4125 Scan Engines if the products are to be imported into European Economic Area (EEA) countries. Use of the CE Mark requires compliance with Directives and standards dependent upon the type of product. Information may be found at "<http://europa.eu.int/comm/enterprise/newapproach/>".

### Laser Safety

*EN 60825-1:1994+A1+A2 "Safety of Laser products".*

*EN 60825-1: 2007 is required after September 1, 2010..*

Compliance with this standard is required for the product to bear the CE mark.

Note: Non EEA countries may impose additional testing/certification requirements.

### EMC

The IS4125 has been tested to meet Class B EMC Standards. The integrator is responsible to maintain proper EMC techniques to maintain this performance level.

Certain combinations of ScanQuest scan engines and associated electronics may require certification of compliance with the European EMC Directive. EMC compliance of finished products in Europe can be accomplished by the following method:

- The manufacturer may certify to the EC's Electromagnetic Compatibility Directive 2004/108/EC. Compliance is required for the product to bear the CE Mark.

Note: Non EEA countries may impose additional testing/certification requirements.

### Electrical Safety

The scan engines are built to conform to the European Low Voltage Directive 2006/95/EC.

## REGULATORY REQUIREMENTS AND WARNINGS

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### United States

#### Laser Safety

To assist with the FDA filing requirements (refer to *Regulatory Requirements* on page 24), Metrologic has registered the scan engine with the FDA as a component. Customers can contact CDRH at the following address:

Food and Drug Administration  
Center for Devices and Radiological Health  
Light Products Branch (HFX-312)  
Office of Compliance  
2098 Gaither Road  
Rockville, MD 20850  
Tel: 301-594-4654  
[www.fda.gov/cdrh](http://www.fda.gov/cdrh)

Requirements for laser products are described in CFR (Code of Federal Regulation) Title 21, part 1040.10 & 1040.11 from the Government Printing Office. Copies can be ordered by calling 202-512-1800, ordering on line from [www.access.gpo.gov/su\\_docs](http://www.access.gpo.gov/su_docs) or writing to:

Superintendent of Documents  
PO Box 371954  
Pittsburgh, PA 15250-7954

Note: State and local governments may regulate the use products containing lasers. The manufacturer should consult the applicable government regulations for more information.

#### EMC

The IS4125 has been tested to meet Class B EMC Standards. The integrator is responsible to maintain proper EMC techniques to maintain this performance level.

Certain combinations of scan engines and associated electronics may require testing to insure compliance with the following Federal Communications Commission regulation: 47 CFR Part 15

Note: When using the scan engine with RF equipment, modems, etc. may require examination(s) to the standard(s) for the specific equipment combination. It is the manufacturers' responsibility to comply with the applicable federal regulation(s).

## REGULATORY REQUIREMENTS AND WARNINGS

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### Canada

#### Laser Safety

The Radiation Protection Bureau currently accepts products meeting the FDA standards in Canada. For more information contact:

Radiation Protection Bureau  
775 Brookfield Road  
Ottawa, Ontario K1A 1C1

#### EMC

The IS4125 has been tested to meet Class B EMC Standards. The integrator is responsible to maintain proper EMC techniques to maintain this performance level.

Products meeting FCC 47 CFR Part 15 will meet Industry Canada interference-causing equipment standard for digital apparatus. Additional testing is not required.

A written notice indicating compliance must accompany the apparatus to the end user. The notice shall be in the form of a label that is affixed to the apparatus. The notice may be in the form of a statement included in the user's manual if, because of insufficient space or other restrictions, it is not feasible to affix a label to the apparatus.

### Warnings

#### United States

**WARNING:**

IS4110 scan engines do not include control circuitry and therefore do not incorporate a laser beam timeout. This feature is necessary for compliance to CDRH Class II and /or IEC Class 2 unless laser product modifications that change the requirement are made.

#### German

**WARNUNG:**

Die Scanner IS4110 verfügen über keinen Steuerungsschaltkreis und daher auch nicht über einen Timeout des Laserstrahls. Diese Eigenschaft ist jedoch nötig zur Konformität mit den Normen CDRH Class II und/oder IEC Class 2, außer es werdenn Modifikationen des Laserprodukts vorgenommen, die zugleich die Anforderungen erfüllen.

#### French

**AVERTISSEMENT:**

Comme les scanner IS4110 ne sont pas équipés d'un circuit de commande, il n'y a pas de temps imparti pour le faisceau du laser. La conformité aux normes CDRH ClassII et/ou IEC Class 2 exige cependant cette propriété, sauf si les produits laser sont modifiés de façon à ce que ces exigences shangent aussi.

#### Italian

**ATTENZIONE!**

Gli scanner IS4110 non dispongono di un circuito di regolazione e quindi neanche di un timeout del raggio laser. Tuttavia questa caratteristica è necessaria ai fini della conformità con le norme CDRH Class II e/o IEC Class 2, a meno che non vengano effettuate modifiche del prodotto laser che mutino a loro volta I requisiti da soddisfare.

## LIMITED WARRANTY

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Honeywell International Inc. ("HII") warrants its products and optional accessories to be free from defects in materials and workmanship and to conform to HII's published specifications applicable to the products purchased at the time of shipment. This warranty does not cover any HII product which is (i) improperly installed or used; (ii) damaged by accident or negligence, including failure to follow the proper maintenance, service, and cleaning schedule; or (iii) damaged as a result of (A) modification or alteration by the purchaser or other party, (B) excessive voltage or current supplied to or drawn from the interface connections, (C) static electricity or electro-static discharge, (D) operation under conditions beyond the specified operating parameters, or (E) repair or service of the product by anyone other than HII or its authorized representatives.

This warranty shall extend from the time of shipment for the duration published by HII for the product at the time of purchase ("Warranty Period"). Any defective product must be returned (at purchaser's expense) during the Warranty Period to HII factory or authorized service center for inspection. No product will be accepted by HII without a Return Materials Authorization, which may be obtained by contacting HII. In the event that the product is returned to HII or its authorized service center within the Warranty Period and HII determines to its satisfaction that the product is defective due to defects in materials or workmanship, HII, at its sole option, will either repair or replace the product without charge, except for return shipping to HII.

EXCEPT AS MAY BE OTHERWISE PROVIDED BY APPLICABLE LAW, THE FOREGOING WARRANTY IS IN LIEU OF ALL OTHER COVENANTS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, ORAL OR WRITTEN, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT.

HII'S RESPONSIBILITY AND PURCHASER'S EXCLUSIVE REMEDY UNDER THIS WARRANTY IS LIMITED TO THE REPAIR OR REPLACEMENT OF THE DEFECTIVE PRODUCT WITH NEW OR REFURBISHED PARTS. IN NO EVENT SHALL HII BE LIABLE FOR INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, AND, IN NO EVENT, SHALL ANY LIABILITY OF HII ARISING IN CONNECTION WITH ANY PRODUCT SOLD HEREUNDER (WHETHER SUCH LIABILITY ARISES FROM A CLAIM BASED ON CONTRACT, WARRANTY, TORT, OR OTHERWISE) EXCEED THE ACTUAL AMOUNT PAID TO HII FOR THE PRODUCT. THESE LIMITATIONS ON LIABILITY SHALL REMAIN IN FULL FORCE AND EFFECT EVEN WHEN HII MAY HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH INJURIES, LOSSES, OR DAMAGES. SOME STATES, PROVINCES, OR COUNTRIES DO NOT ALLOW THE EXCLUSION OR LIMITATIONS OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

All provisions of this Limited Warranty are separate and severable, which means that if any provision is held invalid and unenforceable, such determination shall not affect the validity of enforceability of the other provisions hereof. Use of any peripherals not provided by the manufacturer may result in damage not covered by this warranty. This includes but is not limited to: cables, power supplies, cradles, and docking stations. HII extends these warranties only to the first end-users of the products. These warranties are non-transferable.

The duration of the limited warranty for the IS4110 and IS4125 is two (2) year(s). The accessories have a 90 day limited warranty from the date of manufacture.

## PATENTS

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For patent information, please refer to [www.honeywellaidc.com/patents](http://www.honeywellaidc.com/patents).

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## Technical Assistance

If you need assistance installing or troubleshooting your device, please call your distributor or the nearest technical support office:

### North America/Canada

Telephone: (800) 782-4263

*E-mail: [hsmnasupport@honeywell.com](mailto:hsmnasupport@honeywell.com)*

### Latin America

Telephone: (803) 835-8000

Telephone: (800) 782-4263

*E-mail: [hsmlasupport@honeywell.com](mailto:hsmlasupport@honeywell.com)*

### Brazil

Telephone: +55 (21) 3535-9100

Fax: +55 (21) 3535-9105

*E-mail: [brsuporte@honeywell.com](mailto:brsuporte@honeywell.com)*

### Mexico

Telephone: (803) 835-8000

*E-mail: [hsmlasupport@honeywell.com](mailto:hsmlasupport@honeywell.com)*

### Europe, Middle East, and Africa

Telephone: +31 (0) 40 7999 393

Fax: +31 (0) 40 2425 672

*E-mail: [hsmeurosupport@honeywell.com](mailto:hsmeurosupport@honeywell.com)*

### Hong Kong

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Fax: +851-2511-3557

*E-mail: [aptechsupport@honeywell.com](mailto:aptechsupport@honeywell.com)*

### Singapore

Telephone: +65-6842-7155

Fax: +65-6842-7166

*E-mail: [aptechsupport@honeywell.com](mailto:aptechsupport@honeywell.com)*

### China

Telephone: +86 800 828 2803

Fax: +86-512-6762-2560

*E-mail: [aptechsupport@honeywell.com](mailto:aptechsupport@honeywell.com)*

### Japan

Telephone: +81-3-3839-8511

Fax: +81-3-3839-8519

*E-mail: [aptechsupport@honeywell.com](mailto:aptechsupport@honeywell.com)*

### Online Technical Assistance

You can also access technical assistance online at [www.honeywellaidc.com](http://www.honeywellaidc.com).

### **Product Service and Repair**

Honeywell International Inc. provides service for all its products through service centers throughout the world. To obtain warranty or non-warranty service, contact the appropriate location below to obtain a Return Material Authorization number (RMA #) before returning the product.

#### **North America**

Telephone: (800) 782-4263

*E-mail: [hsmnaservice@honeywell.com](mailto:hsmnaservice@honeywell.com)*

#### **Latin America**

Telephone: (803) 835-8000

Telephone: (800) 782-4263

Fax: (239) 263-9689

*E-mail: [laservice@honeywell.com](mailto:laservice@honeywell.com)*

#### **Brazil**

Telephone: +55 (21) 3535-9100

Fax: +55 (21) 3535-9105

*E-mail: [brservice@honeywell.com](mailto:brservice@honeywell.com)*

#### **Mexico**

Telephone: +52 (55) 5203-2100

Fax: +52 (55) 5531-3672

*E-mail: [mxservice@honeywell.com](mailto:mxservice@honeywell.com)*

#### **Europe, Middle East, and Africa**

Telephone: +31 (0) 40 2901 633

Fax: +31 (0) 40 2901 631

*E-mail: [euroservice@honeywell.com](mailto:euroservice@honeywell.com)*

#### **Hong Kong**

Telephone: +852-29536436

Fax: +851-2511-3557

*E-mail: [apservice@honeywell.com](mailto:apservice@honeywell.com)*

#### **Singapore**

Telephone: +65-6842-7155

Fax: +65-6842-7166

*E-mail: [apservice@honeywell.com](mailto:apservice@honeywell.com)*

#### **China**

Telephone: +86 800 828 2803

Fax: +86-512-6762-2560

*E-mail: [apservice@honeywell.com](mailto:apservice@honeywell.com)*

#### **Japan**

Telephone: +81-3-3839-8511

Fax: +81-3-3839-8519

*E-mail: [apservice@honeywell.com](mailto:apservice@honeywell.com)*

#### **Online Product Service and Repair Assistance**

You can also access product service and repair assistance online at [www.honeywellaidc.com](http://www.honeywellaidc.com).





**Honeywell Scanning & Mobility**

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Fort Mill, SC 29707

[www.honeywellaidc.com](http://www.honeywellaidc.com)



00-02257 Rev E  
May 2010