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PowerScan™ PD9531-AR

Industrial Corded Handheld
Auto Range Area Imager
Bar Code Reader



Quick Reference Guide

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PowerScan™ PD9531-AR

Description

The PowerScan™ 9531-AR is a feature-rich and rugged area imager scanner with auto range reading capability, due to the implementation of autofocus system.

General Features

Omni-directional Operating	To read a symbol or capture an image, you simply aim the scanner and pull the trigger. Since the PowerScan™ PD9531-AR is a powerful omni-directional reader, the orientation of the symbol is not important.
Decoding	Thanks to powerful algorithms, PowerScan™ PD9531-AR reliably decodes all major 1D (linear) barcodes, 2D stacked codes (such as PDF417), 2D matrix symbols (such as DataMatrix), postal codes (such as POSTNET, PLANET). The data stream — acquired from decoding a symbol — is rapidly sent to the host. The reader is immediately available to read another symbol.
Formatting and Concatenating	The string of a decoded code may be processed according to either a simple or advanced data formatting and be concatenated.
Imaging	PowerScan™ PD9531-AR can also function as a camera by capturing entire images or image portions of labels, signatures, and other items.
Flash Memory	Flash technology allows you to upgrade the PowerScan™ PD9531-AR scanner as new symbologies are supported or as improved decoding algorithms become available.

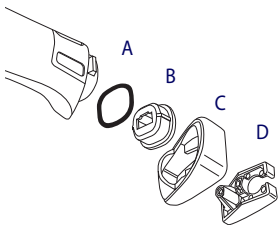
Setting Up the Reader

Follow the steps below to connect and get your reader up and communicating with its host.

1. Connect the Cable to the reader and the Host, shown on [page 2](#).
2. Configure the Interface (see [page 4](#)).
3. Configure the Reader starting on [page 14](#) (optional, depends on settings needed).

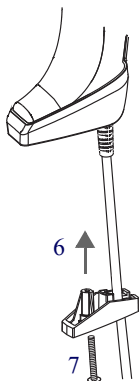
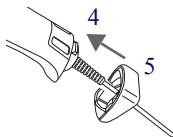
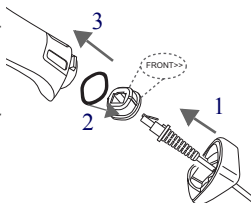
Connect the PowerScan™ by plugging directly into the host device as shown. The power can also be supplied through an external power supply via the Interface Cable supplied with a power jack.

Connecting the Cable



- A. Rubber gasket
- B. Cable Holder
- C. Cover
- D. Connector Holder

1. Slip the cable through the Cover.
2. Push the Rubber Gasket onto the Cable Holder.
3. Push the Cable Holder and gasket into the handle. Ensure that the 'Front' marking on the Cable Holder is facing out, with the arrow pointing towards the front of the scanner.
4. Insert the end of the cable into the socket of the Cable Holder.
5. Push the Cover along the cable towards the reader, and hook it over the yellow 'tooth' on the back of the handle.
6. Insert the cable through the Connector Holder, and push it up into the Cover.
7. Insert and tighten the screw to affix the cable assembly to the reader handle.



Using the PowerScan™ PD9531-AR

The PowerScan™ PD9531-AR normally functions by capturing and decoding 1D and 2DS codes. The intelligent aiming system indicates the field of view which should be positioned over the code. The reader is equipped with an aiming system which helps to aim the target.

Figure 1- Aiming System



If enabled, a partial trigger press produces a red spot, which should be aimed over the code center to get the best reading performance. By completely pressing the trigger the illumination area appears and the code scanning starts.

Aiming Pointer

Scan the following symbols to enable or disable the aiming pointer.



Aiming Pointer = disable



Aiming Pointer = enable

The field of view indicated by the aiming system and the illumination area will be smaller when the reader is closer to the code and larger when it is farther from the code. Symbologies with smaller bars or elements (mil size) should be read closer to the unit. Symbologies with larger bars or elements (mil size) should be read farther from the unit.

If the entire code is within the aiming field, you will get a good read. Successful reading is signaled by an audible tone plus a good-read green spot LED indicator.

Refer to the PowerScan™ 9531-AR Family Product Reference Guide (PRG) for more information about this feature and other programmable settings.

Selecting the Interface Type

Upon completing the physical connection between the reader and its host, proceed directly to the paragraph Interface Selection below for programming the interface type the reader is connected to (RS-232, Keyboard Wedge, USB). Scan the appropriate code to select your system's correct interface type.

Interface Selection

All models are multi-interface and support RS-232, USB and Keyboard Wedge.

Information and programming options for each interface type are provided in this section. For defaults and additional information associated with each interface, proceed to the corresponding chapter in the PowerScan™ 9501-AR Family PRG.

Configuring the Interface

Scan the appropriate programming 2D code to select the interface type for your system.



NOTE

Unlike some other programming features and options, interface selections require that you scan only one programming label. DO NOT scan an ENTER/EXIT code prior to scanning an interface selection code.

Some interfaces require the scanner to start in the disabled state when powered up. If additional scanner configuration is desired while in this state, pull the trigger and hold for 5 seconds. The scanner will change to a state that allows programming with 2D codes.

RS-232

RS-232 standard interface



RS-232

RS-232 Wincor-Nixdorf



RS232-WN

RS-232 for use with OPOS/UPOS/JavaPOS






RS-232 OPOS

USB

USB Com to simulate RS-232 standard interface



USB-COM^a

<div>USB (continued)</div> <div><div>USB-OEM (can be used for OPOS/UPOS/JavaPOS)</div><div></div><div>USB-OEM</div><div>a. Download the correct USB Com driver from www.datalogic.com</div></div>
<div>USB Keyboard with standard key encoding</div> <div><div></div><div>USB-KBD</div></div>
<div>USB Keyboard with alternate key encoding</div> <div><div></div><div>USB-KBD-ALT</div></div>

Keyboard Interface

KEYBOARD WEDGE

IBM AT or PS/2 PCs
Standard Key Encoding



KBD-AT

IBM AT or PS/2 PCs
Standard Key Encoding without external keyboard



KBD-AT-NK

IBM AT or PS/2 PCs
w/Alternate Key



KBD-AT-ALT

IBM AT or PS/2 PCs
Alternate Key Encoding without external keyboard



KBD-AT-ALT-NK

Scancode Tables

Refer to the PowerScan™ 9501-AR Family PRG for information about control character emulation for keyboard interfaces.

Country Mode

This feature specifies the country/language supported by the keyboard. This option is usable only with USB-KBD and Keyboard Wedge interface without the "Alternate Key" mode.

COUNTRY MODE


ENTER/EXIT PROGRAMMING MODE


Country Mode = U.S.


Country Mode = Belgium


Country Mode = Britain


Country Mode = Croatia*

*Supports only the interfaces listed in the Country Mode feature description

COUNTRY MODE (continued)



Country Mode = Czech*



Country Mode = Denmark*



Country Mode = France



Country Mode = French Canadian*



Country Mode = Germany



Country Mode = Hungary*

*Supports only the interfaces listed in the Country Mode feature description

COUNTRY MODE (continued)



Country Mode = Italy



Country Mode = Japanese 106-key*



Country Mode = Lithuanian*



Country Mode = Norway*



Country Mode = Poland*



Country Mode = Portugal*

*Supports only the interfaces listed in the Country Mode feature description

COUNTRY MODE (continued)



Country Mode = Romania*



Country Mode = Spain



Country Mode = Sweden



Country Mode = Slovakia*



Country Mode = Switzerland*

*Supports only the interfaces listed in the Country Mode feature description

Caps Lock State

This option specifies the format in which the reader sends character data. This applies to keyboard wedge interfaces. This does not apply when an alternate key encoding keyboard is selected.



ENTER/EXIT PROGRAMMING MODE



Caps Lock State = Caps Lock OFF



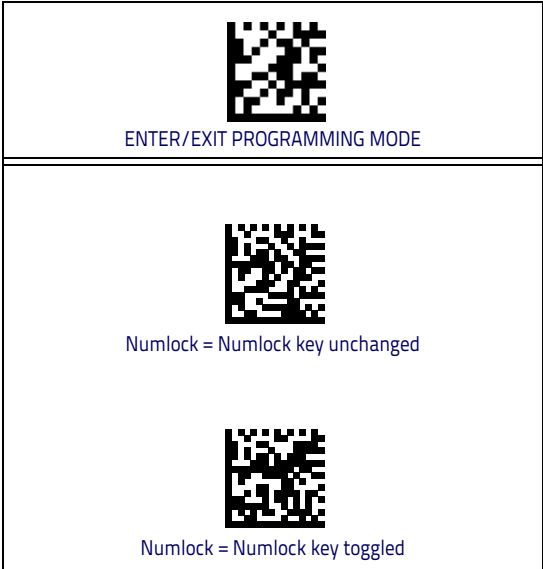
Caps Lock State = Caps Lock ON



Caps Lock State = AUTO Caps Lock Enable

Numlock

This option specifies the setting of the Numbers Lock (Numlock) key while in keyboard wedge interface. This only applies to alternate key encoding interfaces. It does not apply to USB keyboard.



Programming

The reader is factory-configured with a set of standard default features. After scanning the interface 2D code from the Interfaces section, select other options and customize your reader through use of the programming 2D codes available in the PowerScan™ 9501-AR Family PRG. Check the corresponding features section for your interface, and also the Data Editing and Symbolologies chapters of the PRG.

Using Programming 2D Codes

This manual contains codes which allow you to reconfigure your reader. Some programming labels, like the "Reset Default Settings" on page 15, require only the scan of that single label to enact the change.

Other codes require the reader to be placed in Programming Mode prior to scanning them. Scan an ENTER/EXIT code once to enter Programming Mode; scan the desired parameter settings; scan the ENTER/EXIT code again to accept your changes, which exits Programming Mode and returns the reader to normal operation.

Configure Other Settings

Additional programming 2D codes are available in the PRG to allow for customizing programming features. If your installation requires different programming than the standard factory default settings, refer to the PRG.

Resetting Product Defaults

If you aren't sure what programming options are in your reader, or you've changed some options and want your custom factory settings restored, scan the code below to reset the reader to its initial configuration. Reference the PRG for other options, and a listing of standard factory settings.



NOTE

Factory defaults are based on the interface type. Be sure your reader is configured for the correct interface before scanning this label. See "Selecting the Interface Type" on page 4 for more information.



Reset Default Settings

Reading Parameters

Move the reader toward the target and center the aiming and illumination system to capture and decode the image. See [Using the PowerScan™ PD9531-AR on page 3](#) for more information.

The aiming system will briefly switch off after the acquisition time, and if no code is decoded will switch on again before the next acquisition. The illuminator will remain on until the symbol is decoded.

As you read code symbols, adjust the distance at which you are holding the reader.

Good Read Green Spot Duration

Successful reading can be signaled by a good read green spot. Use the 2D codes that follow to specify the duration of the good read pointer beam after a good read.



ENTER/EXIT PROGRAMMING MODE



Disabled



♦ Short (300 ms)



Medium (500 ms)



Long (800 ms)

Operating Modes

Scan Mode

The imager can be set to operate in one of several scanning modes. See the PRG for more information and settings for any of the options:

Trigger Single (Default) — This mode is associated with typical handheld reader operation. When the trigger is pulled, illumination is turned on and the scanner attempts to read a label. Scanning is activated until one of the following occurs:

- the programmable 'maximum scan on time"¹ has elapsed
- a label has been read
- the trigger is released

Trigger Pulse Multiple — Scanning begins when the trigger is pulled and continues after the trigger is released, until the trigger is pulled again or until the programmable 'maximum scan on time"¹ has elapsed. Reading a label does not disable scanning. Double Read Timeout¹ prevents undesired multiple reads while in this mode.

Trigger Hold Multiple — When the trigger is pulled, scanning starts and the product scans until the trigger is released or 'maximum scan on time"¹ has elapsed. Reading a label does not disable scanning. Double Read Timeout¹ prevents undesired multiple reads in this mode.

Always On — The illuminator is always ON and the reader is always ready for code reading. Double Read Timeout¹ prevents undesired multiple reads.

Flashing — The reader illuminator flashes on and off regardless of the trigger status. Code reading takes place only during the Flash On² time. Double Read Timeout¹ prevents undesired multiple reads.

1. See the Product Reference Guide (PRG) for these and other programmable features
2. Controlled by Flash On Time and Flash Off Time. Use the PRG to program these options.

Scan Mode



ENTER/EXIT PROGRAMMING MODE



◆ Scan Mode = Trigger Single



Scan Mode = Trigger Pulse Multiple



Scan Mode = Trigger Hold Multiple



Scan Mode = Flashing



Scan Mode = Always On

Pick Mode

Specifies the ability of the reader to decode labels only when they are close to the center of the aiming pattern. Pick Mode is a Decoding and Transmission process where codes that are not within the configurable distance from the center of the aiming pattern are not acknowledged or transmitted to the host. It is active only while the scanner is in Trigger Single mode. If the scanner switches to a different Read Mode, Pick Mode is automatically disabled.



NOTE

This feature is not compatible with Multiple Labels Reading in a Volume. See the PRG for more information.



ENTER/EXIT PROGRAMMING MODE



◆ Pick Mode = Disable



Pick Mode = Enable

Multiple Label Reading

The reader offers a number of options for multiple label reading. See the PRG or software configuration tool for descriptions of these features and programming labels.

Technical Specifications

The following table contains Physical and Performance Characteristics, User Environment and Regulatory information.

Item	Description
Physical Characteristics	
Dimensions	Height: 212 mm Length: 110 mm Width: 74 mm
Weight (without cable)	400 gr (without cable)
Electrical Characteristics	
Voltage & Current	
Input Voltage	4,5 to 30 Vdc
Input Current	
Operating (max):	500 mA
Idle/Standby (typical)	120 mA

Performance Characteristics	
Light Source	LED
Roll (Tilt) Tolerance	± 180°
Pitch Tolerance	± 80°
Skew (Yaw) Tolerance	± 60°
Field of View	14° x 10.5° up to 1m. Over 3m: 14.4° x 10.8°
Print Contrast Minimum	15% minimum reflectance
Resolution	Max resolution 1D 3 mils Max resolution 2D 4 mils
Depth of Field (Typical) ^a	
Symbology	
Code 39	10 mils: 15 - 160 cm 40 mils: 50 - 1100 cm 55 mils: 70 - 1150 cm 100 mils: up to 2300 cm
EAN 13	mag. 1: 20 - 290 cm
Code 128	15 mils: 30 - 330 cm 40 mils: 60 - 850 cm 100 mils: up to 2000 cm
DataMatrix	10 mils: 20 - 85 cm 55 mils: 30 - 550 cm 100 mils: 30 - 880 cm 200 mils: up to 2000 cm

a. All labels grade A,300 lux ambient light, 20°C, label inclination 10°

Decode Capability	
1D Bar Codes GS1 Databar linear codes, UPC/EAN (A,E,13,8), UPC/EAN with P2/P5 Addons, UPC/EAN Coupons, ISBN, Code128, EAN128, ISBT128, Code39, Code39 Full ASCII, Code39 CIP, Code 32, Codabar, Inter-leaved 2 of 5, IATA, Industrial 2 of 5, Standard 2 of 5, Code11, MSI, Plessey, Code 93, Follet 2/5	
2D / Stacked Codes DataMatrix, MaxiCode and QR Codes(QR, Micro QR and Multiple QR codes), Aztec - Postal codes including: Australian Post, China Post, Japanese Post, KIX Post, Planet Code, Postnet, Royal Mail Code(RM45CC), IMB - stacked codes including EAN/JAN Composites; GS1 Databar Composites, GS1 Databar Expanded Stacked; GS1 DataBar Stacked; GS1 DataBar Stacked Omnidirectional; MacroPDF; Micro PDF417; PDF417; UPC A/E Composites, French CIP13, Grid Matrix(Chinese) code	
Interfaces Supported	RS-232, Keyboard Wedge, and USB. See page 4 for a listing of available interface options.
User Environment	
Operating Temperature	-4° to 122° F (-20° to 50° C)
Storage Temperature	-40° to 158° F (-40° to 70° C)
Humidity	0 to 95% non-condensing
Drop Specifications	Scanner withstands up to 50 times 6.5' (2 m) drops to concrete
Ambient Light Immunity	100,000 Lux
Contaminants: Spray/rain, Dust/particulates	IP65
ESD Level	20 KV
Beeper/Speaker	>= 80 dB @ 10 cm
Regulatory	See Regulatory Addendum

LED and Beeper Indications

The reader's beeper sounds and its LED illuminates to indicate various functions or errors on the reader. An optional 'Green Spot' also performs useful functions. The following tables list these indications. One exception to the behaviors listed in the tables is that the reader's functions are programmable, and so may or may not be turned on. For example, certain indications such as the power-up beep can be disabled using programming code labels.

Indicator	Description	LED	Beeper
Power-up Beep	The reader is in the process of powering-up.	N/A	Reader beeps four times at highest frequency and volume upon power-up.
Good Read Beep	A label has been successfully scanned by the reader.	LED behavior for this indication is configurable via the feature 'Good Read: When to Indicate' (see the PRG for information.)	The reader will beep once at current frequency, volume, mono/bi-tonal setting and duration upon a successful label scan.
ROM Failure	There is an error in the reader's software/programming	Flashes	Reader sounds one error beep at highest volume.
Limited Scanning Label Read	Indicates that a host connection is not established.	N/A	Reader 'chirps' six times at the highest frequency and current volume.
Reader Active Mode	The reader is active and ready to scan.	The LED is lit steadily ^a	N/A
Reader Disabled	The reader has been disabled by the host.	The LED blinks continuously	N/A

Indicator	Description	LED	Beeper
Green Spot ^a flashes momentarily	Upon successful read of a label, the software shall turn the green spot on for the time specified by the configured value.	N/A	N/A
Image Capture	When ready to capture image	Blue light flashes 2 times when updating	N/A

^aExcept when in sleep mode or when a Good Read LED Duration other than 00 is selected

Programming Mode - The following indications ONLY occur when the reader is in Programming Mode.

INDICATION	DESCRIPTION	LED	BEEPER
Label Programming Mode Entry	A valid programming label has been scanned.	LED blinks continuously	Reader sounds four low frequency beeps.
Label Programming Mode Rejection of Label	A label has been rejected.	N/A	Reader sounds three times at lowest frequency and current volume.
Label Programming Mode Acceptance of Partial Label	In cases where multiple labels must be scanned to program one feature, this indication acknowledges each portion as it is successfully scanned.	N/A	Reader sounds one short beep at highest frequency and current volume.
Label Programming Mode Acceptance of Programming	Configuration option(s) have been successfully programmed via labels and the reader has exited Programming Mode.	N/A	Reader sounds one high frequency beep and 4 low frequency beeps followed by reset beeps.
Label Programming Mode Cancel Item Entry	Cancel label has been scanned.	N/A	Reader sounds two times at low frequency and current volume.

Error Codes

Upon startup, if the reader sounds a long tone, this means the reader has not passed its automatic Selftest and has entered FRU (Field Replaceable Unit) isolation mode. If the reader is reset, the sequence will be repeated. Press and release the trigger to hear the FRU indication code.

The following table describes the LED flashes/beep codes associated with an error found.

Number of LED Flashes/Beeps	Error	Corrective Action
1	Configuration	Contact Helpdesk for assistance
2	Interface PCB	
6	Digital PCB	
11	Imager	

Cleaning

Exterior surfaces and scan windows exposed to spills, smudges or debris require periodic cleaning to ensure best performance during scanning.



Use a soft, dry cloth to clean the product. If the product is very soiled, clean it with a soft cloth moistened with a diluted non-aggressive cleaning solution or diluted ethyl alcohol.



CAUTION

Do not use abrasive or aggressive cleansing agents or abrasive pads to clean scan windows or plastics.

Do not spray or pour liquids directly onto the unit.

Datalogic Limited Factory Warranty

Warranty Coverage

Datalogic warrants to Customer that Datalogic's products will be free from defects in materials and workmanship for a period of one year from product shipment. Datalogic ("Datalogic") hardware products are warranted against defects in material and workmanship under normal and proper use. The liability of Datalogic under this warranty is limited to furnishing the labor and parts necessary to remedy any defect covered by this warranty and restore the product to its normal operating condition. Repair or replacement of product during the warranty does not extend the original warranty term. Products are sold on the basis of specifications applicable at the time of manufacture and Datalogic has no obligation to modify or update products once sold.

If Datalogic determines that a product has defects in material or workmanship, Datalogic shall, at its sole option repair or replace the product without additional charge for parts and labor, or credit or refund the defective products duly returned to Datalogic. To perform repairs, Datalogic may use new or reconditioned parts, components, subassemblies or products that have been tested as meeting applicable specifications for equivalent new material and products. Customer will allow Datalogic to scrap all parts removed from the repaired product. The warranty period shall extend from the date of shipment from Datalogic for the duration published by Datalogic for the product at the time of purchase (Warranty period). Datalogic warrants repaired hardware devices against defects in workmanship and materials on the repaired assembly for a 90 day period starting from the date of shipment of the repaired product from Datalogic or until the expiration of the original warranty period, whichever is longer. Datalogic does not guarantee, and it is not responsible for, the maintenance of, damage to, or loss of configurations, data, and applications on the repaired units and at its sole discretion can return the units in the "factory default" configuration or with any software or firmware update available at the time of the repair (other than the firmware or software installed during the manufacture of the product). Customer accepts responsibility to maintain a back up copy of its software and data.

Warranty Claims Process

In order to obtain service under the Factory Warranty, Customer must notify Datalogic of the claimed defect before the expiration of the applicable Warranty period and obtain from Datalogic a return authorization number (RMA) for return of the product to a designated Datalogic service center. If Datalogic determines Customer's claim is valid, Datalogic will repair or replace product without additional charge for parts and labor. Customer shall be responsible for packaging and shipping the product to the designated Datalogic service center, with shipping charges prepaid. Datalogic shall pay for the return of the product to Customer if the shipment is to a location within the country in which the Datalogic service center is located. Customer shall be responsible for paying all shipping charges, duties, taxes, and any other charges for products returned to any other locations. Failure to follow the applicable RMA policy, may result in a processing fee. Customer shall be responsible for return shipment expenses for products which Datalogic, at its sole discretion, determines are not defective or eligible for warranty repair.

Warranty Exclusions

The Datalogic Factory Warranty shall not apply to:

- (i) any product which has been damaged, modified, altered, repaired or upgraded by other than Datalogic service personnel or its authorized representatives;
- (ii) any claimed defect, failure or damage which Datalogic determines was caused by faulty operations, improper use, abuse, misuse, wear and tear, negligence, improper storage or use of parts or accessories not approved or supplied by Datalogic;
- (iii) any claimed defect or damage caused by the use of product with any other instrument, equipment or apparatus;
- (iv) any claimed defect or damage caused by the failure to provide proper maintenance, including but not limited to cleaning the upper window in accordance with product manual;
- (v) any defect or damage caused by natural or man-made disaster such as but not limited to fire, water damage, floods, other natural disasters, vandalism or abusive events that would cause internal and external component damage or destruction of the whole unit, consumable items;
- (vi) any damage or malfunctioning caused by non-restoring action as for example firmware or software upgrades, software or hardware reconfigurations etc.;
- (vii) the replacement of upper window/cartridge due to scratching, stains or other degradation and/or
- (viii) any consumable or equivalent (e.g., cables, power supply, batteries, keypads, touch screen, triggers etc.).

No Assignment

Customer may not assign or otherwise transfer its rights or obligations under this warranty except to a purchaser or transferee of product. No attempted assignment or transfer in violation of this provision shall be valid or binding upon Datalogic.

DATALOGIC'S LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, ORAL OR WRITTEN, STATUTORY OR OTHERWISE, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NONINFRINGEMENT. DATALOGIC SHALL NOT BE LIABLE FOR ANY DAMAGES SUSTAINED BY CUSTOMER ARISING FROM DELAYS IN THE REPLACEMENT OR REPAIR OF PRODUCTS UNDER THE ABOVE. THE REMEDY SET FORTH IN THIS WARRANTY STATEMENT IS THE CUSTOMER'S SOLE AND EXCLUSIVE REMEDY FOR WARRANTY CLAIMS. UNDER NO CIRCUMSTANCES WILL DATALOGIC BE LIABLE TO CUSTOMER OR ANY THIRD PARTY FOR ANY LOST PROFITS, OR ANY INCIDENTAL, CONSEQUENTIAL IN-DIRECT, SPECIAL OR CONTINGENT DAMAGES REGARDLESS OF WHETHER DATALOGIC HAD ADVANCE NOTICE OF THE POSSIBILITY OF SUCH DAMAGES.

Risk of Loss

Customer shall bear risk of loss or damage for product in transit to Datalogic. Datalogic shall assume risk of loss or damage for product in Datalogic's possession. In the absence of specific written instructions for the return of product to Customer, Datalogic will select the carrier, but Datalogic shall not thereby assume any liability in connection with the return shipment.

Ergonomic Recommendations



In order to avoid or minimize the potential risk of ergonomic injury follow the recommendations below. Consult with your local Health & Safety Manager to ensure that you are adhering to your company's safety programs to prevent employee injury.

- Reduce or eliminate repetitive motion
- Maintain a natural position
- Reduce or eliminate excessive force
- Keep objects that are used frequently within easy reach
- Perform tasks at correct heights
- Reduce or eliminate vibration
- Reduce or eliminate direct pressure
- Provide adjustable workstations
- Provide adequate clearance
- Provide a suitable working environment
- Improve work procedures.

Support Through the Website

Datalogic provides several services as well as technical support through its website. Log on to www.datalogic.com and click on the SUPPORT link which gives you access to:

- **Downloads** by selecting your product model from the dropdown list in the Search by Product field for specific Data Sheets, Manuals, Software & Utilities, and Drawings;
- **Repair Program** for On-Line Return Material Authorizations (RMAs) plus Repair Center contact information;
- **Customer Service** containing details about Maintenance Agreements;
- **Technical Support** through email or phone.

NOTES

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