





Intermec



User's
Manual

9710 and 9720 Wedge Readers

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Manual Change Record

This page records the changes to this manual. The manual was released at Revision A. Please note that since the release of this manual, we have switched to a numbered revision system.

Revision	Date	Description of Change
B	8/91	Glossary, Index and information on multiple key remapping were added.
-001	12/93	A new parameter was added to UPC/EAN code. You can decode UCC/EAN 128 from Code 128 symbology. Some other minor changes were made to Chapter 3.
-002	7/95	Added one bar code (supplemental required) to the fourth parameter of the UPC/EAN symbology on page 3-34 and one correction to page 3-24.
-003	7/97	Added information about ISBT 128 bar code symbology. Also combined the 9710 and 9720 manuals into one manual.
-004	11/97	Corrected keyboard mapping tables in Appendix.



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Before You Begin

This section introduces you to standard warranty provisions, safety precautions, document formatting conventions, and sources of additional product information. A documentation roadmap is also provided to guide you in finding the appropriate information.

Warranty Information

To receive a copy of the standard warranty provision for this product, contact your local Intermec support services organization. In the U.S. call 1-800-755-5505, and in Canada call 1-800-688-7043. Otherwise, refer to the Worldwide Sales & Service list that ships with this manual for the address and telephone number of your Intermec sales organization.

Safety Summary

Your safety is extremely important. Read and follow all warnings and cautions in this book before handling and operating Intermec equipment. You can be seriously injured, and equipment and data can be damaged if you do not follow the safety warnings and cautions.

Do not repair or adjust alone Do not repair or adjust energized equipment alone under any circumstances. Someone capable of providing first aid must always be present for your safety.

First aid Always obtain first aid or medical attention immediately after an injury. Never neglect an injury, no matter how slight it seems.

Resuscitation Begin resuscitation immediately if someone is injured and stops breathing. Any delay could result in death. To work on or near high voltage, you should be familiar with approved industrial first aid methods.

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Energized equipment Never work on energized equipment unless authorized by a responsible authority. Energized electrical equipment is dangerous. Electrical shock from energized equipment can cause death. If you must perform authorized emergency work on energized equipment, be sure that you comply strictly with approved safety regulations.

About This Manual

This manual contains information necessary to install, operate, configure, troubleshoot, and maintain the 9710 and 9720 Wedge Readers.

What You Will Find in This Manual

This table summarizes the information in each chapter of this manual:

For Information On	Refer To
Installing the reader	Chapter 1, "Getting Started." This chapter tells you how to install the reader in your data collection system, configure the reader for your specific workstation, and check for communications.
Operating the reader	Chapter 2, "Operating the Reader." This chapter explains the commands you need to use to operate the reader.
Configuring the reader	Chapter 3, "Configuring the Reader." This chapter contains all of the configuration parameters that you can use to customize reader operation to meet your specific system needs.
Using the 9720 serial port	Chapter 4, "Configuring the 9720 Serial Port." This chapter describes how to use the serial port on the 9720 reader to communicate with a portable reader or a scale.
Using the Data Edit application	Chapter 5, "Data Edit Application." This chapter tells you how to use Data Edit to strip specific characters from a data record before transmitting that record to a workstation, portable reader, or scale.

Terms and Conventions

The following special terms and conventions occur throughout this manual.

Before You Begin




- “Wedge reader,” and “reader” refer to the 9710 and 9720 wedge readers. Unless specifically stated, all information in this manual applies to both reader models.
- “9710” refers to the 9710 Wedge Reader.
- “9720” refers to the 9720 Wedge Reader.
- “Workstation” refers to a personal computer or other computer that communicates with the reader.
- Commands and configuration parameters appear in the order you enter them into the reader with the following conventions:

Convention	Description
< >	Angle brackets enclose mnemonic representations of ASCII control characters. For example, <ETX> represents the ASCII “End of Text” control character.
<i>data</i>	Italic text represents variable data, which you must replace with a real value. For example, <i>n</i> signifies a variable for which you must designate a constant value.
Ctrl	Bold text represents a key on your keypad. For example, Ctrl represents the Ctrl key and M represents the letter M key.
Ctrl-C	When two keys are joined with a dash, press them simultaneously. For example, if you see the command Ctrl-C , press the two keys at the same time.

Format Conventions for Bar Codes

You can scan the bar codes listed in this manual to enter data or perform a command. The bar code labels in this manual are printed in the Code 39 symbology. Each bar code includes the name and human-readable interpretation. For example:

Change Configuration



————— *Name*

————— *Bar code (Code 39)*

\$+ ————— *Human-readable interpretation*

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The asterisks (*) at the beginning and end of the human-readable interpretation are the start and stop codes for a Code 39 bar code label. If you are creating bar code labels with a bar code utility, it may automatically supply the asterisks as the start and stop code, so that you only need to type the actual text of the command. You can also create and print configuration labels and reader command labels in Code 93, which has its own start and stop codes.

Other Intermec Manuals

The following manuals provide additional information about using the reader and working with bar codes.

Manual	Intermec P/N
<i>Data Communications Reference Manual</i>	044737
<i>The Bar Code Book</i> by Roger C. Palmer	051241
<i>9440/44/45 Trakker Operator's Guide</i>	053397
<i>9440/44/45 Trakker User's Manual</i>	049273
<i>9460 Trakker Operator's Guide</i>	053014
<i>9460 Trakker User's Manual</i>	053012
<i>9462 Trakker Operator's Guide</i>	053141
<i>9462 Trakker User's Manual</i>	053143
<i>Introduction to IRL Programming Manual</i>	045025
<i>IRL Programmer's Reference Manual</i>	048609

1

Getting Started

The 9710 and 9720 Wedge Readers connect between the computer workstation and the workstation keyboard. The wedge reader transmits information from the bar codes you scan to the computer workstation. The bar code data displays on the monitor in the same format as if it was entered from the workstation keyboard. The wedge reader translates all of the 128 ASCII characters into valid keystrokes.

Preparing for Installation

Your wedge reader package includes the following parts:

- 9710 or 9720 Wedge Reader
- Velcro fasteners

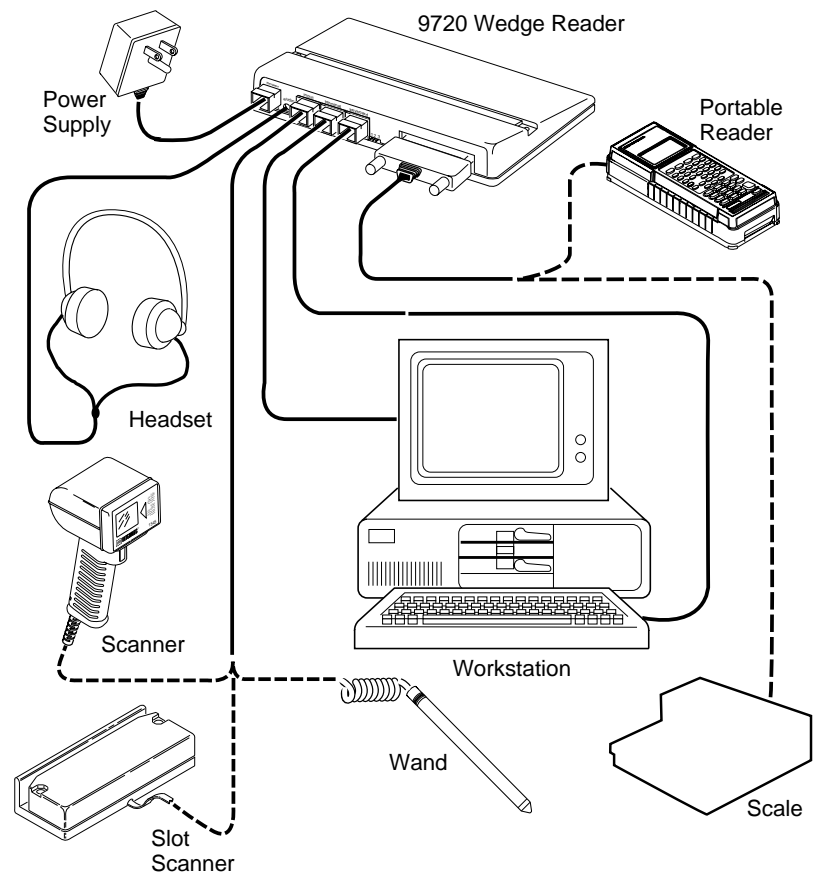
Unpack the shipping carton and verify the contents with the packing slip. Keep the packing box; it is the approved shipping container for the reader. Use this box if you need to return the reader to Intermec.

These items are packaged separately from the reader:

- Wand or scanner
- Adapter cable
- Power supply (if required)

The following figure shows a 9720 Wedge Reader installed in a typical data collection system. Only the 9720 Wedge Reader has a serial port that can connect to a portable reader or a scale.

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Connecting the Reader to the Workstation

There are two cables for connecting the reader to your workstation: a reader/keyboard cable that connects the keyboard to the reader and a reader/workstation cable that connects the reader to the workstation. Each cable has a ten-position modular connector to connect to the reader.

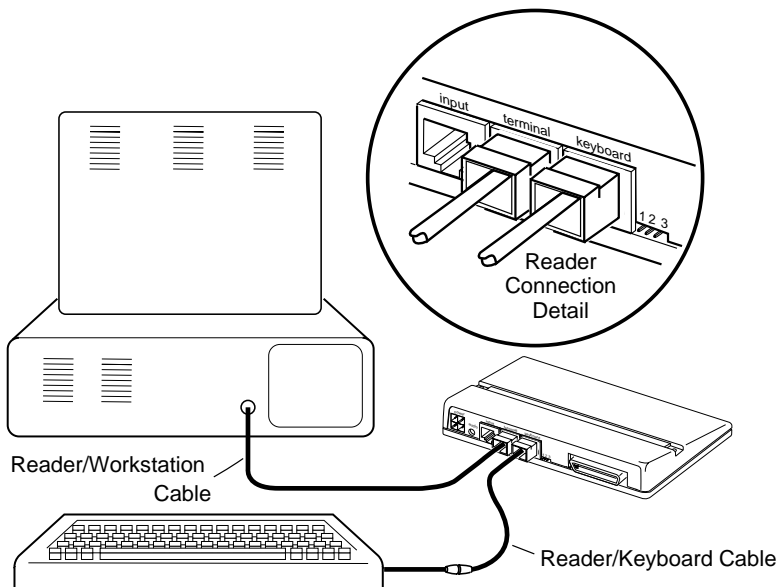
The cable package contains a Wedge Interface (WIF) guide that provides information on configuring the reader for your workstation. Retain the WIF guide for future reference.

Installing the Reader

1. Turn off the workstation and disconnect the keyboard cable from the workstation.
2. Connect the reader/workstation cable "PC/Terminal" connector to the keyboard connector on the workstation and connect the modular connector to the "terminal" connector on the reader.
3. Connect the reader/keyboard cable "Keyboard" connector to the workstation keyboard cable and connect the modular connector to the "keyboard" connector on the reader.

The cable connectors only fit one way. If the connector does not fit, do not force it or you may damage the connector. The following figure shows how the reader connects to your workstation.

Note: Do not use a cable extender with the reader cables. A cable extender will add noise to the line.



Connecting an Input Device

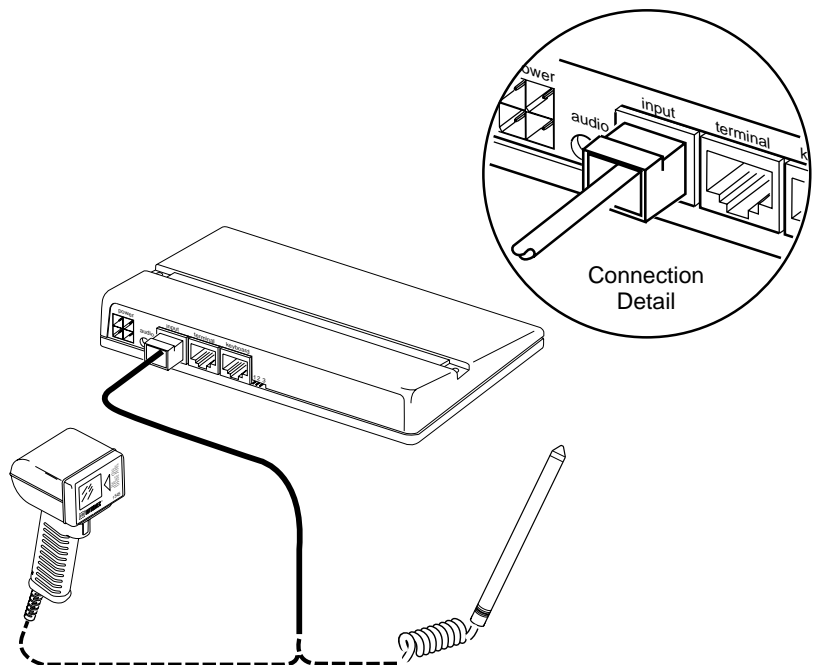
The reader can receive input from:

- 1260-series wands
- 1500-series scanners
- 1461 CCD scanners
- 1354 and 1355 bar code slot scanners

The wands and scanners require a special cable or an adapter cable to connect to the ten-position modular connector on the rear panel of the reader. If you do not have the correct cable, call your Intermec representative.

To connect a wand or scanner to the reader

- Connect the wand or scanner cable to the "input" modular connector on the reader rear panel. Make sure that the connector snaps into place securely.



Using a Power Supply

For most wand and scanner operations, the reader uses power from the workstation. If the workstation cannot supply the required power at +5V for the wand or scanner, the reader requires an additional power supply. Your WIF guide lists the workstations that require an external power supply.

If your workstation requires a power supply with the reader, continue reading this section. Otherwise, skip to “Checking Connections” on page 1-8.

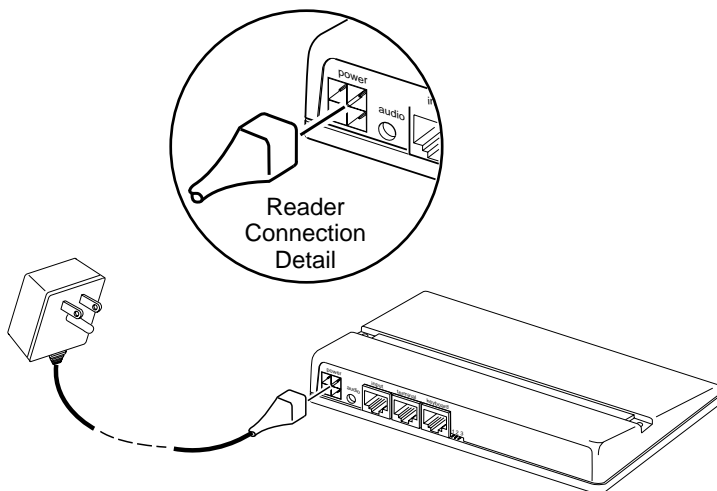
Is Additional Power Required?

Refer to the list below for part numbers of power supplies that support various voltage requirements.

Voltage	Part Number
~100V 50 to 60 Hz, -15% to +10%	054183
~120V 50 to 60 Hz, -15% to +10%	054182
~230V 50 Hz, -15% to +10%	054184

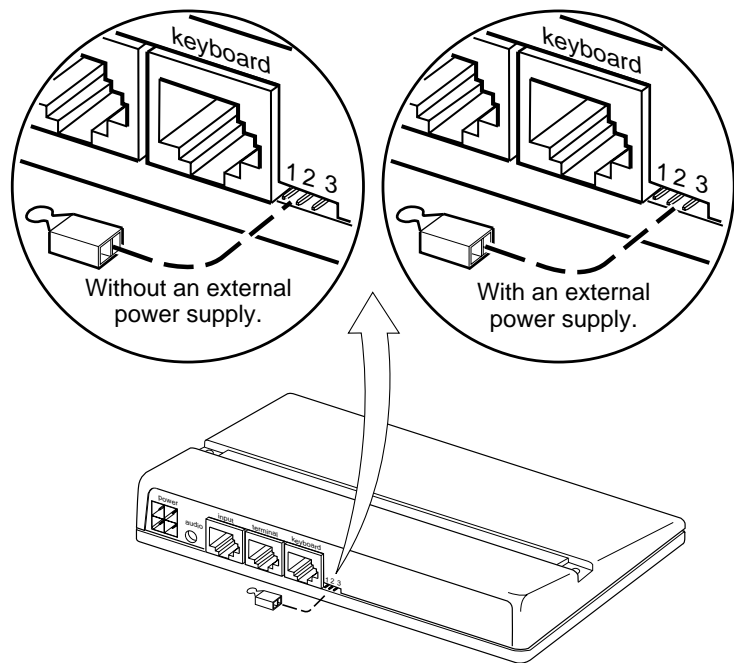
To connect a power supply

1. Attach the power supply connector to the power supply receptacle on the reader rear panel.



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2. Place the PCB jumper on pins 2 and 3.



Note: Do not plug the power supply into the wall outlet until the reader is connected to the workstation and the keyboard, and you are ready to turn on the workstation.

Checking Connections

You need to have the following items connected:

- The reader to the workstation and keyboard using the proper cables.
- The wand or scanner to the reader.
- The power supply, if required, to the reader. (Make sure the PCB jumper is set correctly.)

Applying Power

You are now ready to apply power to the system.

1. If you are using a power supply, plug it into an AC wall outlet.
2. Turn on the workstation.

Note: Do **not** enter data. The reader must be configured for your workstation type before you begin operating the reader.

Identifying the Workstation Type

The default workstation configuration is a null configuration. It is **very important** that you configure the reader for your particular workstation type before operating the reader with the workstation.

Locate your workstation type configuration bar code in the WIF guide and scan the bar code to configure the reader for your workstation. The reader emits four low beeps to indicate that the configuration was successful. The reader is now ready to read bar codes.

If the reader emits a low/high/low/high beep sequence, the reader failed the self-test. Scan the Null Configuration bar code. Verify that you are using the correct workstation configuration bar code and scan the bar code. If the reader emits the low/high/low/high beep sequence again, contact your Intermec representative.

Null Configuration



\$+TA3

If you are moving the reader to a different workstation, scan the Null Configuration bar code before moving the reader. After you install the reader, reconfigure the reader for that workstation.

Note: Attempting to read bar codes before the workstation type has been identified causes the reader to operate improperly. If this occurs, cycle the power to the workstation and scan the appropriate workstation configuration bar code.

Checking Communications

Now you are ready to scan the test bar codes to check communications. The reader emits one high beep each time it successfully translates a bar code. The workstation monitor displays the data with the cursor immediately following the data.

To check communications

1. Scan this bar code:

Test Label



TEST LABEL

The workstation monitor displays TEST LABEL.

2. Scan this bar code:

Test Label



123456789

The workstation monitor displays 123456789.

3. Advance the cursor using the cursor control key or tab key on your keyboard to make it easier to see the data.
4. Scan this bar code:

Test Label



97XX READER

The workstation monitor displays 97XX READER.

To further demonstrate the operation of the reader, scan any of the bar codes on the ASCII charts located at the back of this manual. These bar codes are in Code 39. The reader interprets the data and transmits it to the workstation monitor.

Troubleshooting

If you are unable to successfully transmit the test data, review the following checklist.

- ✓ Check workstation configuration. Cycle power and scan the bar code for the correct workstation type.
- ✓ Check the cable connections between the workstation and the reader and the reader and the input device.
- ✓ If you are using a power supply, check the power connection to the reader and the wall outlet.
- ✓ Verify that the PCB jumper on the reader is set correctly.
- ✓ Verify that the bar codes are good by scanning the bar codes with a reader that you know is good.

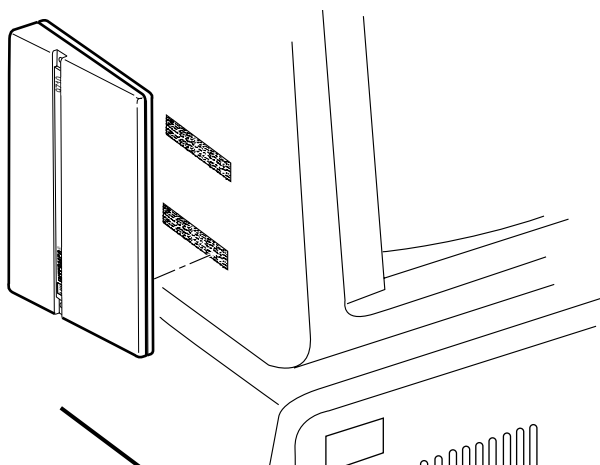
Mounting the Reader

You can mount the reader vertically or horizontally using Velcro strips or screws.

To mount the reader using Velcro strips

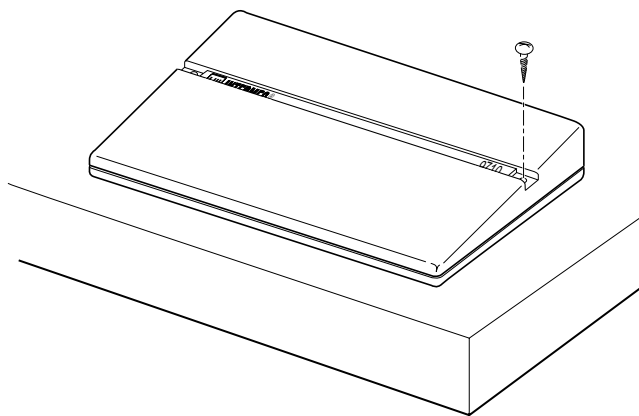
1. Take one set of Velcro strips (leave the set connected), remove the adhesive backing from one side, and apply the set to the reader. Repeat this process with the second set of Velcro strips.
2. Remove the backing from the exposed side of the strips and firmly press the reader to the mounting surface. A good mounting surface is the side of your workstation monitor.
3. Carefully remove the reader from the mounting surface by separating the Velcro strips. Ensure that all four strips are firmly attached to their respective surfaces before remounting the reader.

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To mount the reader using wood screws

- For a more permanent mounting, use two #10 wood screws to attach the reader to a mounting surface. Ensure that the surface you select can handle the alteration. **Do not** attach the reader to the workstation monitor using wood screws.



The wedge reader is now ready for operation.

2

Operating the Reader

The reader is easy to operate. To transmit bar code data to your workstation, you scan bar code labels that contain data, commands, or a combination of both. The data appears on your workstation monitor as if you entered it from the keyboard.

How to Use the Reader

The reader uses two operating states:

- Test and Service
- Standard Operation

Note: *Some terminal emulation or network hardware or software can affect the way the workstation operates. This may affect wedge operation.*

Test and Service Intermec customer service representatives (CSRs) use this mode to diagnose reader problems. The reader enters Test and Service mode automatically after a self-test failure. A self-test runs at power-on and after a reset. The reader emits a very low beep every 10 seconds to indicate it is in Test and Service mode.

If the reader enters Test and Service, scan the bar code below. The reader resets and executes a self-test. If the self-test fails, the reader returns to Test and Service and you need to contact your Intermec representative.

Reset Command



-.

Note: *You can configure the reader and run commands when the reader is in Test and Service mode.*

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Standard Operation The reader automatically enters Standard Operation after a successful self-test. Four low beeps indicates the reader is in Standard Operation mode. Standard Operation allows you to

- scan bar codes to enter data.
- read and decode various bar code symbologies.
- accumulate scanned data into one record.
- transmit accumulated data.
- add a preamble or a postamble to data.
- build a record or a command.
- configure serial port parameters (9720 only).

Reading Bar Codes

The reader can distinguish between two types of bar codes: regular and multiple-read.

Regular bar codes A regular bar code always takes the form *data*. Typically, the bar code data is transmitted as soon as you scan the bar code. The asterisks (*) are the start and stop characters and are not transmitted or shown on the workstation monitor. Only the reader uses the asterisks to indicate the beginning and the ending points of a bar code. For example, scanning a bar code with the data *TB123* transmits TB123 to the screen.

Multiple-read bar codes Multiple-read bar codes take the form *spacedata*, where "space" is an encoded space and data is the information you want to enter. Multiple-read bar codes are not transmitted to the workstation monitor immediately, but are held in the reader buffer until the reader receives a transmit command. Multiple-read bar codes allow a record or a command to be built from individual bar codes.

For example, scanning a bar code with the data * TB123* places TB123 in the reader buffer. The reader must receive a transmit command before the data is sent to the workstation. When you scan a transmit command (Enter), TB123 is transmitted to the workstation monitor. If you scan a regular bar code (like *456*), TB123456 is transmitted to the workstation.

Using Reader Commands

You use the reader to complete specific tasks by scanning bar codes that contain one or more commands. Commands are run in the order they are located in the command string. Command processing stops with the first invalid command or at the end of the string. You can use the following commands with your wedge reader:

Backspace (Destructive)

This command deletes the last character of an accumulated data record. If there is no accumulated data, the command is invalid.

Backspace



-+

Change Configuration

This command changes the reader configuration parameters. The Change Configuration command precedes one or more configuration commands in a command string or record. When this command runs, reader parameters are modified, the changes are saved in memory, and the reader is reset to allow the changes to take effect.

Change Configuration



\$+

Clear

This command deletes an entire accumulated data record. If there is no accumulated data, the command is invalid.

Clear



_~

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Default Configuration

This command returns the reader to the factory settings and performs a self-test. See Chapter 3 for a list of reader default settings.

Default Configuration



.+

Note: This command does not reset the workstation type.

Enter

This command transmits accumulated data as a data record to the workstation. The Enter command is implied when you scan regular bar codes (bar codes without a leading space). If data records are not accumulated or present in a regular bar code, then a null or empty data record is transmitted to the workstation.

Enter



**

Enter Accumulate

This command adds all subsequent scanned data to the current data buffer until the count exceeds 256 characters, an Enter bar code is scanned, or an Exit Accumulate bar code is scanned. Data exceeding 256 characters causes the reader to emit three low beeps and rejects the last bar code read.

Enter Accumulate



+/

Exit Accumulate

This command exits the accumulate feature, transmits the accumulated data, and clears the data buffer. The reader automatically exits Accumulate mode whenever the reader is reset.

Exit Accumulate



-/

Reset

This command runs the self-test process. Any commands in a command string that follow the Reset command are lost.

Reset



-.

Transmit Message

This command applies only to the 9720 and transmits the exact solicitation message (no characters are added) from the 9720 serial port. Refer to Chapter 4 for more information about the Solicitation Message parameter and the 9720 serial port.

Transmit Message



..\$.

External Headphone/Speaker Jack

If you use the reader in a noisy environment, you can use a miniature-plug headphone or an amplified, self-powered speaker to hear the reader status beeps. The headphone/speaker jack is labeled "audio" on the reader rear panel.

9720 Serial Port

The 9720 Wedge Reader has an RS-232 serial port on the rear panel. You can connect a portable reader or scale to the serial port and transfer data from the portable reader or scale through the reader to the workstation. Refer to Section 4 for information on transferring data and configuring the serial port.

Status Beeps

The reader speaker emits one or more beeps to indicate status conditions.

Beep	Status
L	Valid command or valid data accumulated
H	Valid data entered
HL	Keystroke not stored in EEPROM
LLL	Invalid command or data
HLH	I/O error
LLLL	Self-test passes
LHLH	Self-test fails
E	Test and service mode entered

H = high beep L = low beep E = extra low beep

3

Configuring the Reader

This chapter lists the factory set parameters, explains the parameters, and describes how to change these parameters.

Default Reader Configuration

The factory configuration of the reader provides efficient and effective operation; however, you may need to modify the configuration to optimize reader performance in your operating environment. Configuration parameters include identifying bar codes, setting timeout and intercharacter delay lengths, selecting trigger modes, and defining preambles and postambles.

The default reader configuration parameters are listed in the following table. An asterisk (*) indicates parameters that only apply to the 9720 Wedge Reader.

Parameter	Setting
Application Program	Standard Operation
Baud Rate*	9600
Beeper Volume	Loud beep
Caps Lock	Off
Command Processing	Enable all reader commands
Data Begin	No stripping
Data Bits*	7
Data End	No stripping
Data Identifiers	Disabled
Data Redirection*	Input device/serial port to workstation
Data Source	Scanner data
Echo*	Disabled
Flow Control*	XON/XOFF control
Intercharacter Delay (serial port)*	0 msec
Intercharacter Delay (wedge reader)	0 msec
Modify Look-Up Table	No modifications
Parity*	Even
Postamble	None

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Parameter	Setting
Preamble A	None
Preamble B	None
RXEOM*	Carriage return line feed
Scanner Mode	One-shot
Scanner Timeout	No timeout
Scanner Trigger Mode	Level
Solicitation Message*	No message
Stop Bits*	1
Terminal Type	Null
Timeout Delay*	2 sec
TXEOM*	Carriage return line feed
Voting	Disabled
Wait Character	Carriage return
Wait Time	No delay
Window	Serial port data
Bar Code Symbolologies	
Code 11	Disabled
Code 39	Full ASCII, no check digit
Code 49	Disabled
Code 49 Function 1	Disabled
Code 49 Function 2	CR LF
Code 93	Disabled
Code 128	Disabled
ISBT 128	Disabled
Code 16K	Disabled
Codabar	Disabled
Interleaved 2 of 5	Variable length with check digit
2 of 5 Code	Disabled
Plessey	Disabled
MSI	Disabled
UPC A and E; EAN 8 and 13; supplementals	Enabled

To set the reader to the factory default configuration

- Scan this bar code.

Default Configuration



.+

Before you begin configuring the reader, be sure you are using the correct terminal type configuration.

If you are unable to scan the bar code for your workstation type, you can build the workstation configuration command. Consult your WIF guide for the workstation configuration number or call your Intermec representative for the number.

To build the workstation configuration command

1. Scan this bar code.

Accumulate/Change Config/Workstation Type



+/\$+TA

2. Scan the number for your workstation type from the full ASCII chart at the back of this manual. For example, the IBM PC workstation configuration number is 1.
3. Scan this bar code.

Exit Accumulate



-/

Configuration Parameters

Some of the procedures in this chapter require that you scan a bar code from the Code 39 full ASCII chart located at the back of this manual. When entering data following a command, the data should be enclosed in quotes (as described on page 3-15). The quotes allow the reader to distinguish between data and reader commands.

The following parameters configure the reader to meet your needs. The dagger (†) indicates the factory default setting.

Beeper Volume

This parameter sets the beeper volume or turns it off.

Off



\$+BV0

Loud†



\$+BV3

Quiet



\$+BV1

Lower Beeper Volume



\$+BV8

Normal



\$+BV2

Raise Beeper Volume



\$+BV9

Caps Lock

This parameter enables or disables Caps Lock on the reader. When the Caps Lock setting for the workstation keyboard and the reader agree (both enabled or both disabled), the characters in a scanned bar code are transmitted to the workstation in the same case as they are printed on the label. If the Caps Lock settings do not agree, one of the following symptoms may occur:

- The reader transmits alpha characters to the workstation in the opposite case that prints on the label, or all characters appear as uppercase characters or lowercase characters.

- For Data Entry keyboards, letters are converted to numbers or numbers to letters. (A Data Entry keyboard produces uppercase characters when you press the letter keys and numbers or symbols when you press the **left Shift** and letter keys.) When using a Data Entry keyboard, use WL0 for alpha mode, and WL1 for numeric/symbol mode.
- Each time you scan a bar code, the workstation keyboard toggles Caps Lock mode.
- If the keyboard is in Caps Lock mode, the reader transmits Shift key press-and-release codes to produce uppercase alpha characters that slow down data transmission.

Disable†



\$+WL0

Enable



\$+WL1

Command Processing

This parameter disables or enables all reader commands except for the Change Configuration command. For example, you can disable multiple-read bar codes so they are treated as regular bar codes.

Disable All Reader Commands



\$+DC0

Enable All Reader Commands†



\$+DC1

To configure Command Processing

1. Scan this bar code.

Accumulate/Change Config/Command Processing



+/\$+DC

2. Scan this bar code.

Beginning of Data



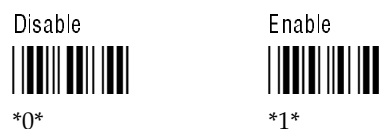
*!**

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3. Scan the bar code combination to build the reader command.

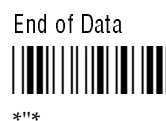


4. Disable/enable the reader command.



Repeat steps 3 and 4 if you are disabling/enabling more than one command.

5. Scan this bar code.



6. Scan this bar code.

Exit Accumulate



-/

Example: Disabling/Enabling Reader Commands

This example disables the default configuration command and special processing of multiple-read bar codes to prevent the reader from accidentally returning to the default configuration. Also, when you scan a multiple-read bar code, the data is sent to the workstation instead of being held in the reader buffer.

1. Scan this bar code to enable the accumulate feature and configure command processing.

Accumulate/Change Config/Command Processing



+/\$+DC

2. Scan this bar code.

Beginning of Data



3. Scan the Default Config bar code.

Default Config



.

+

4. Scan this bar code to disable the Default Configuration command.

Disable



0

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5. Scan this bar code.

Multiple-Read



* *

6. Disable the Multiple-Read command.
7. Scan this bar code to end Command Processing.

End of Data



''

8. Scan this bar code to exit the accumulate feature and modify the configuration.

Exit Accumulate



_/

To enable these commands, repeat the above steps, but scan the Enable bar code instead of the Disable bar code. If you want to enable all commands, scan the Enable All Reader Commands bar code. You can disable/enable any number of commands in one operation.

Data Redirection

This parameter applies only to the 9720 and defines the routing for information the reader receives. For example, one parameter routes serial port data to the workstation and input device data to the serial port. When the reader redirects data through the serial port, you should define the TXEOM parameter. See Chapter 4 for more information on configuring TXEOM.

Input Device and Serial Port Data Sent to Workstation †



\$+DR0

Input Device Data Sent to Serial Port; Serial Port Data Sent to Workstation



\$+DR1

Input Device Data Sent to Serial Port and Workstation;
Serial Port Data Sent to Workstation



\$+DR2

Input Device Data Sent to Serial Port Only (Workstation Unaffected)



\$+DR3

Wait Character

This parameter defines the wait character and works with the Wait Time parameter. For example, the default wait character is a Carriage Return (<CR>)—any time the reader sends a <CR> to the workstation, the reader waits a specified time (wait time) before it transmits the next character to the workstation.

To disable the wait character, set Wait Time to No Delay (see the following section, “Configuring the Wait Time”).

To configure the wait character

1. Scan this bar code.

Enter Accumulate Mode/Wait Character



+/\$+WK

2. Scan this bar code.

Beginning of Data



*!**

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3. Scan a wait character from the full ASCII bar code chart.
4. Scan this bar code.

End of Data



''

5. Scan this bar code.

Exit Accumulate Mode



_/

Wait Time

This parameter defines the time the wedge reader waits after receiving the wait character. You can choose No Delay or configure a wait time from 1 to 60 seconds.

No Delay†



\$+WJ0

To configure a wait time

1. Scan this bar code.

Enter Accumulate Mode/Wait Time



+/\$+WJ

2. Scan the number of seconds (1-60) for the wait time.



1



2



3



4



5



6



7



8



9



0

3. Scan this bar code.

Exit Accumulate Mode



_

Example: Wait Configuration

The following example defines a wait character and a wait time. After you scan the wait character, the reader inserts the wait time before transmitting the remaining data.

1. Scan this bar code to enable the accumulate feature and to configure a wait character.

Enter Accumulate Mode/Wait Character



+/\$+WK

2. Scan this bar code to configure the wait character.

Begin Wait Character



11

3. Scan the number 3 from the full ASCII chart. This is the wait character.
4. Scan this bar code to end the wait character configuration.

End Wait Character



11

5. Scan this bar code to exit the accumulate feature and modify the configuration.

Exit Accumulate Mode



_/

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6. Scan this bar code to configure the wait time.

Enter Accumulate Mode/Wait Time



+/\$+WJ

7. Scan these bar codes to configure the wait time for ten seconds.



1



0

8. Scan this bar code to to exit the accumulate feature and modify the configuration.

Exit Accumulate Mode



_

9. Scan this bar code.

123DATA



123DATA

When you scan this bar code, the workstation monitor displays 123, waits ten seconds, and then displays DATA directly following the 123.

Whenever you scan a 3, the reader waits 10 seconds before continuing data transmission to the workstation.

Intercharacter Delay

This parameter adds a time delay to the characters transmitted to the workstation. (The reader also uses a minimum, workstation-dependent, delay between all transmitted characters.)

0 msec†



\$+WI0

50 msec



\$+WI4

5 msec



\$+WI1

100 msec



\$+WI5

10 msec



\$+WI2

200 msec



\$+WI6

20 msec



\$+WI3

500 msec



\$+WI7

Preamble

This parameter precedes data you transmit to the workstation. The preamble can consist of any combination of characters on the full ASCII chart. Common preambles include a data location number or an operator number. The preamble characters are saved in EEPROM.

Note: Quotes (") are used to indicate the beginning and end of data strings within a command. If you want to include a quote as part of the data, you must enter the quote character twice. The double quote is interpreted by the reader as a character and not the end of the data string.

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Scan	Reader Interpretation
"test"	test
""test""	"test"
"test""test"	test"test

Disable Preamble A†



\$+AA

To define preamble A

1. Scan this bar code.

Accumulate/Change Config/Preamble A



+/\$+AA

2. Scan this bar code.

Beginning of Data



"

3. Scan 1 to 25 characters on the full ASCII chart to build preamble A.

4. Scan this bar code.

End of Data



"

5. Scan this bar code.

Exit Accumulate



-/

Disable Preamble B†



\$+AB

To define preamble B

1. Scan this bar code.

Enter Accumulate Mode/Preamble B



+/\$+AB

2. Scan this bar code.

Begin Preamble B Character



11

3. Scan 1 to 25 characters on the full ASCII bar code chart to build Preamble B.

4. Scan this bar code.

End Preamble B Character



11

5. Scan this bar code.

Exit Accumulate Mode



-/

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Example: Defining a Preamble

The following example creates a preamble containing the word TEST. When the reader transmits data to the workstation, the data will be preceded by the word TEST.

1. Scan this bar code to enable the accumulate feature and to configure preamble A.

Accumulate/Change Config/Preamble A



+/\$+AA

2. Scan this bar code to begin entering preamble data.

Beginning of Data



11

3. Scan the letters T E S T from the full ASCII chart at the end of this manual. This is preamble A that transmits with every data record.
4. Scan this bar code to end entering preamble A data.

End of Data



11

5. Scan this bar code to to exit the accumulate feature and modify the configuration.

Exit Accumulate



-/

6. Scan this bar code.



DATA

The workstation monitor displays TESTDATA.

Postamble

This parameter is added to the end of data you transmit to the workstation. The postamble can consist of any combination of characters from the full ASCII chart at the end of this manual. Common postambles include cursor controls like tabs or a carriage return and a line feed. The postamble characters are saved in EEPROM.

Note: If you are using quotes (") in your data string, refer to the note on page 3-15.

Disable†



\$+AC

To define the postamble

1. Scan this bar code.

Accumulate/Change Config/Postamble



+/\$+AC

2. Scan this bar code.

Beginning of Data



11

3. Scan 1 to 25 characters on the full ASCII chart to build the postamble.
4. Scan this bar code.

End of Data



11

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5. Scan this bar code.

Exit Accumulate



-/

Example: Defining a Postamble

The following example creates the postamble TEST. When the reader transmits data to the workstation, the record is followed by TEST.

1. Scan this bar code to enable the accumulate feature and to configure a postamble.

Accumulate/Change Config/Postamble



+/\$+AC

2. Scan this bar code to begin entering the postamble characters.

Beginning of Data



*!**

3. Use the full ASCII chart to scan the bar codes for the word TEST.
4. Scan this bar code to end the postamble data.

End of Data



*!**

5. Scan this bar code to exit the accumulate feature and modify the configuration.

Exit Accumulate



-/

6. Scan this bar code.



DATA

The workstation monitor displays DATATEST.

Scanner Trigger

This parameter sets the Triggering mode to level or edge.

Level triggering When you pull the scanner trigger, the laser turns on and stays on until you release the trigger.

Edge triggering When you pull the scanner trigger, the laser turns on and stays on. When you pull the trigger a second time, the laser turns off. If the laser is left on, the Scanner Timeout parameter turns the laser off. Edge triggering is often used for remote triggering.

Level†



\$+SC0

Edge



\$+SC1

Scanner Mode

This parameter sets the scanner to One-shot or Auto-trigger mode.

One-shot mode The laser scanner reads one bar code per trigger-event.

Auto-trigger mode The laser scanner reads multiple bar codes per trigger-event, beeps, and transmits the bar code data separately.

A trigger event occurs each time the laser is turned on.

One-shot†



\$+SB0

Auto-trigger



\$+SB1

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Scanner Timeout

This parameter defines the maximum length of time that the laser scanner stays on during a single triggering event. During normal operation, the scanner turns off if you do not scan a bar code within the selected length of time.

No timeout†



\$+SA0

To define the scanner timeout

1. Scan this bar code.

Accumulate/Change Config/Scanner Timeout timeout



+/\$+SA

2. Scan a number between 1 and 60 (seconds).



1



2



3



4



5



6



7



8



9



0

3. Scan this bar code.

Exit Accumulate



-/

Voting

This parameter defines the number of scans from the same bar code that must be decoded correctly for a “good read.” If you disable voting, the reader accepts the first “good read.” Intermec recommends that you disable voting if you are scanning good quality bar codes.

When you enable voting, the reader decodes the same bar code multiple times during a single-trigger event and compares the decoded information a specific number of times before signalling a “good read.”

To improve scanning performance (but increase the possibility of substitution errors), set the voting low to reduce the number of decodes. To provide extra data security (but slow performance especially on poor quality bar codes), set the voting high. The specific number of comparisons in low and high voting is defined in each bar code symbology.

For example, when you are scanning Code 39 with voting set to low, two successive matching decodes are required. When voting is set to high, three successive matching decodes are required.

Enabling voting is important when scanning poor quality bar codes that may cause substitution errors.

Note: This parameter applies only when using a laser scanner with the reader.

Disabled†



\$+SR0

High



\$+SR2

Low



\$+SR1

Bar Code Symbolologies

This section defines the parameters for the various bar code symbolologies the reader decodes. Some of the codes have more than one parameter. The dagger (†) indicates the default setting. For more information on bar code symbolologies, refer to *The Bar Code Book* (Intermec P/N 051241).

Code 11

The Code 11 character set includes ten digits and the dash symbol. This code is not self-checking; data security is obtained by using one or two check digits.

Disable†



\$+CG0

Two Check Digits



\$+CG2

One Check Digit



\$+CG1

Code 39

Code 39 is an alphanumeric code that is discrete, variable length, and self-checking. The Code 39 non-full ASCII character set includes 43 characters (a start/stop character, ten digits, the uppercase letters of the alphabet, space, and six symbols). The Code 39 full ASCII character set includes all 128 characters of the ASCII character set (listed in the Appendix). The Code 39 configuration has three parameters; the second and third parameters are optional.

The first parameter defines the check digit. Code 39 provides for a modulus 43 check digit. The weighted check digit is used for Automobile Industry Action Group (AIAG) bar codes. Enabling Health Industry Bar Code (HIBC) Code 39 automatically disables full ASCII and enables check digit transmission.

The second parameter determines whether the reader transmits the check digit to the workstation or discards the check digit. A check digit is used for performing a mathematical check to ensure the accuracy of the message.

The third parameter can be set to non-full ASCII, mixed full ASCII, or full ASCII.

The Code 39 character set can physically encode 43 data characters: A - Z, 0 - 9, %, \$, -, +, /, . (period), and the space character. In non-full ASCII Code 39, the reader interprets the bar code data character for character. For example, the reader interprets the bar code data "123+ABC" as "123+ABC".

Full ASCII Code 39 encodes all 128 ASCII characters by using \$, %, /, and +, along with an upper case letter, to represent a full ASCII character. For example, \$A = <SOH>, %A = <ESC>, /A = !, and +A = a. For a complete list of the full ASCII character set, see the ASCII Characters table on page A-7.

In full ASCII Code 39, the reader interprets the bar code data by substituting full ASCII characters for valid ASCII character pairs. For example, the reader interprets the bar code data "123+ABC" as "123aBC".

The following example shows the different ways the reader interprets the bar code data \$%a.

Some bar code printers encode \$%a as:



\$%+A

While other bar code printers encode \$%a as:



/D/E+A

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If you configure the reader for:

Non-full ASCII The output from the two bar code examples are the character in the bar code: \$%+A and /D/E+A, respectively. Use this configuration if you do not want the reader to evaluate any valid full ASCII character pairs.

Full ASCII The first bar code example will not decode because each character (with the exception of upper case letters and numbers) **must** be encoded with the appropriate full ASCII character pair. The second bar code example will output \$%a.

Use this configuration if you want the reader to:

- with full ASCII evaluate bar codes character pairs, and
- read only bar codes encoded with full ASCII character pairs (as in the second example).

Mixed full ASCII The reader evaluates both of the bar code examples as \$%a. Use this configuration if you want the reader to:

- evaluate bar codes with full ASCII character pairs, and
- read bar codes regardless of how the bar code is encoded.

Note: *If you want the reader to evaluate bar codes differently than the non-full ASCII configuration, mixed full ASCII is the most common choice.*

Note: *If you cannot determine how your bar codes are printed, configure the reader for mixed full ASCII. Mixed full ASCII decodes all Code 39 bar codes.*

Note: *If you are scanning bar codes on the Code 39 full ASCII chart and the workstation monitor displays incorrect characters (for example, +A instead of a), the reader is configured for Code 39 non-full ASCII. Configure the reader for Code 39 full ASCII or mixed full ASCII, to correctly decode all of the Code 39 full ASCII bar codes.*

Disable



\$+CB0

To configure Code 39

1. Scan this bar code.

Accumulate/Change Config/Code 39



+/\$+CB

2. Scan one of the bar code parameters.

Without Check

Digit†



1

Code 39 Check

Digit



2

HIBC Code 39



3

A|AG Check Digit



4

3. Scan the bar code parameter you want (optional).

Discard Check Digit



0

Retain/Transmit Check Digit†



1

4. Scan the bar code parameter you want (optional).

Non-Full ASCII



0

Full ASCII†



1

Mixed Full ASCII



2

5. Scan this bar code.

Exit Accumulate



-/

Example: Defining Code 39

The following example configures the reader to decode non-full ASCII Code 39 with a check digit and transmits the check digit and the data to the workstation.

1. Scan this bar code to enable the accumulate feature and configure Code 39.

Accumulate/Change Config/Code 39



+/\$+CB

2. Scan the Code 39 check digit bar code to decode bar codes with check digits.

Code 39 Check Digit



2

3. Scan the Retain/Transmit Check Digit bar code to keep the check digit when transmitting the data to the workstation.

Retain/Transmit Check Digit†



1

4. Scan the Non-Full ASCII bar code to keep the reader from decoding full ASCII code.

Non-Full ASCII



0

5. Scan this bar code to to exit the accumulate feature and modify the configuration.

Exit Accumulate



-/

Code 49

Code 49 is a multi-row symbology for high-density data. The last characters in each row are used for row checking, and the last two characters of the symbol are used for overall checking.

Disable Code 49 †



\$+CJ0

Enable Code 49



\$+CJ1

Using Function Codes With Code 49

Function codes signal predefined data string placement in a Code 49 bar code. When a wedge reader encounters a function code, the reader replaces the function code with the defined string before transmitting the data to the workstation. This ability allows a single Code 49 symbol to contain several different variable length data fields.

Function Code 1 Use this function code to identify a data system.

Disable Function Code 1 †



\$+CK

To configure Function Code 1

1. Scan this bar code.

Enter Accumulate Mode/Function Code 1



+/\$+CK

2. Scan one to two characters from the full ASCII bar code chart.
3. Scan this bar code.

Exit Accumulate Mode



-/

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Function Code 2 Use this function code to indicate the end of a data field. The default setting is <CR><LF> (Carriage Return Line Feed).

Disable Function Code 2



\$+CL

To configure Function Code 2

1. Scan this bar code.

Enter Accumulate Mode / Function Code 2



+/\$+CL

2. Scan one to two characters from the full ASCII bar code chart.
3. Scan this bar code.

Exit Accumulate Mode



-/

Code 93

The Code 93 character set supports the 128 character full ASCII set.

Disable†



\$+CF0

Enable



\$+CF1

Code 128 and ISBT 128

Code 128 This symbology encodes the full ASCII character set of 128 characters.

If you select

- enable standard, all Code 128 symbols are decoded (including UCC/EAN 128) and the Function 1 character is ignored.
- enable UCC/EAN 128 (and a Function 1 character immediately follows the Code 128 start character), the symbols are decoded per UCC/EAN 128 specifications. That is, the Function 1 character that follows the start character is translated to the symbology identifier "JC1" and all subsequent Function 1 characters are translated to an ASCII <GS>.
- enable UCC/EAN 128 (and a Function 1 character does not immediately follow the Code 128 start character), all Function 1 characters are ignored and the symbols are decoded as if they were Code 128.

Note: Since the <GS> character is not a valid keyboard key, the reader substitutes a default character from the keyboard. See "Customizing ASCII to Keyboard Equivalents" later in this chapter.

ISBT 128 This symbology is a variation of Code 128 that was developed by the International Society of Blood Transfusion (ISBT) for the bar code labeling of whole blood and blood products. ISBT 128 supports concatenation (linking) of two bar codes. Pairs of concatenated ISBT 128 bar codes can be decoded from a single scan of a laser scanner or wand. ISBT 128 has two configurable options.

The first option enables ISBT 128 concatenation with or without a symbology identifier at the beginning of the decoded output.

If the symbology identifier feature is enabled:

JC0 indicates a non-concatenated read of an ISBT 128 bar code.

JC4 indicates that ISBT 128 concatenation is enabled and that a concatenated bar code has been read.

If the symbology identifier feature is **not** enabled, **JCx** is not sent to the host. Valid bar codes must contain an appropriate ISBT 128 data identifier in either case.

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The second option configures the read priority of a laser scanner to decode non-concatenated bar codes:

High sets the scanner to ignore non-concatenated bar codes four times before reading the code.

Low sets the scanner to ignore non-concatenated bar codes two times before reading the code.

Disable sets the scanner to read a non-concatenated bar code on the first pass.

Note: Any time a successful read of a concatenated bar code occurs while the scanner is discarding non-concatenated bar code reads, the concatenated data will be sent to the host. When using a wand, concatenated or non-concatenated bar code data will always be sent to the host.

Note: When any form of ISBT 128 decoding is enabled, conventional Code 128 bar codes are not decoded.

Disable



\$+CH0

Enable ISBT 128 With Concatenation †



\$+CH3

Enable Standard Code 128



\$+CH1

Enable ISBT 128 With Concatenation and
Symbology Identifier



\$+CH4

Enable UCC/EAN 128



\$+CH2

ISBT 128 Voting Options

High†



\$+CH5

Disable



\$+CH7

Low



\$+CH6

Code 16K

Code 16K has up to 16 rows of characters in one symbol. Each row starts and ends with a single character identifying that particular row and scan direction. There are two overall symbol check characters.

Disable Code 16K†



\$+CP0

Enable Code 16K With Function Code 1



\$+CP2

Enable Code 16K



\$+CP1

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Codabar

Codabar is a variable length, discrete, self-checking code. This character set is limited to 16 data characters. American Blood Commission (ABC) Codabar requires that start/stop code representations are retained. As a result, configuration CD10 is an illegal configuration option. Codabar has two parameters.

To define Codabar

1. Scan this bar code.

Accumulate/Change Config/Codabar



+/\$+CD

2. Scan one of the bar code parameters.

Disable†



0

American Blood Commission (ABC)



1

Standard



2

Concatenated



3

3. Scan one of the bar code parameters.

Discard Start/Stop



0

Retain ABCD Start/Stop



1

Retain DC1-DC4
Start/Stop



2

4. Scan this bar code

Exit Accumulate



-/

Example: Defining Codabar

The following example configures the reader to decode concatenated Codabar with four stop/start characters designated as A, B, C, and D. Concatenate combines two bar code labels into one data record.

1. Scan this bar code to enable the accumulate feature and to configure Codabar.

Accumulate/Change Config/Codabar



+/\$+CD

2. Scan this bar code to enable concatenation.

Concatenated



3

Concatenation causes the reader to read two bar codes and combine them into one data record. The stop code of the first bar code must be the same as the start code of the second bar code.

3. Scan the Retain ABCD Start/Stop bar code to decoded bar codes that have start/stop characters designated as A B C D.

Retain ABCD Start/Stop



1

4. Scan this bar code to prompt the reader to exit the accumulate feature and modify the configuration.

Exit Accumulate



-/

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Interleaved 2 of 5 Code

Interleaved 2 of 5 (I 2 of 5) Code uses both bars and spaces to encode numbers only. The code is continuous, self-checking, variable length, and must contain an even number of digits. Enabling Interleaved 2 of 5 Code automatically disables 2 of 5 Code.

Note: Using the variable length without a check digit configuration can cause substitution errors.

Disable



\$+CA0

Case Code (6 or 14 Digits)



\$+CA98

Variable Length Without a Check Digit



\$+CA97

Variable Length With Modulus 10
Check Digit†



\$+CA99

To configure fixed length I 2 of 5 Code from 2 to 32 (even numbers).

1. Scan this bar code.

Accumulate/Configure/I 2 of 5



+/\$+CA

2. Scan an even number between 2 and 32.



1



2



3



4



6



8



0

3. Scan this bar code.

Exit Accumulate



-/

2 of 5 Code

2 of 5 Code uses the bars to encode information and the spaces to separate the individual bars. This code is discrete and self-checking. Decoding for 2 of 5 code can only be enabled if decoding for the I 2 of 5 code is disabled. If I 2 of 5 is enabled, 2 of 5 code is automatically disabled. 2 of 5 code has two parameters.

Disable†



\$+CC00

To define 2 of 5 code

1. Scan this bar code.

Accumulate/Change Config/2 of 5 Code



+/\$+CC

2. Scan one of the bar code parameters.

Three Bar Start/Stop†

Two Bar Start/Stop



0

1

3. Scan a two digit number from 01 to 32 to specify the label length.



1



2



3



4



5



6



7



8



9



0

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4. Scan this bar code.

Exit Accumulate



-/

Example: Defining 2 of 5 Code

This example configures the reader to decode 2 of 5 Code encoding twelve digits with a two bar start/stop code.

1. Scan this bar code to configure 2 of 5 Code.

Accumulate/Change Config/2 of 5 Code



+/\$+CC

2. Scan the Two Bar Start/Stop bar code to decoded bar codes that have a two bar combination that designate the start and stop of the bar code.

Two Bar Start/Stop



1

3. Scan bar codes 1 and 2 to decode bar codes that encode twelve digits.



1



2

4. Scan this bar code to exit the accumulate feature and modify the configuration.

Exit Accumulate



-/

Plessey Code

Plessey Code is pulse width modulated. The code includes a start character, data characters, an eight-bit cyclic check digit, a termination bar and usually a reverse start character. The code is continuous and not self-checking. Plessey code has two parameters.

Parameter 1

Disable†



\${CI00}

Plessey With Reverse Start Code



\${CI10}

Parameter 2

Retain Check Digit



\${CI30}

Discard Check Digit



\${CI31}

MSI Code

MSI Code uses the same principle as Plessey code. The MSI code includes a start pattern, data characters, one or two check digits, and a stop pattern. MSI code requires two parameters.

To define MSI Code

1. Scan this bar code.

Accumulate/Change Config/MSI Code



+/\$+CN

2. Scan one of the bar codes parameters.

Disable†



0

Without Check Digit



1

One Modulus 10 Check Digit



2

Two Modulus 10 Check Digits



3

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3. Scan one of the bar code parameters.

Discard Check Digit



0

Retain Check Digit



1

4. Scan this bar code.

Exit Accumulate



-/

Example: Defining MSI Code

This example configures the reader to decode MSI Code with two modulus 10 check digits that the reader discards before transmitting the data to the workstation.

1. Scan this bar code to configure MSI Code.

Accumulate/Change Config/MSI Code



+/\$+CN

2. Scan this bar code to decode bar codes that have two modulus 10 check digits.

Two Modulus 10 Check Digits



3

3. Scan this bar code to discard the two modulus 10 check digits before transmitting the data to the workstation.

Discard Check Digit



0

4. Scan this bar code to modify the configuration.

Exit Accumulate



-/

Universal Product (UPC)/European Article Numbering (EAN) Codes

Universal Product (UPC)/European Article Numbering (EAN) Codes are fixed length, numeric, continuous symbologies that use four element widths. An EAN configured reader can decode UPC, but the reverse is not true. UPC code is a subset of EAN code. The UPC/EAN codes have seven parameters.

To define UPC/EAN Code

1. Scan this bar code.

Accumulate/Change Config/UPC/EAN Code



+/\$+CE

2. Scan one of the bar code parameters.

Disable UPC A/EAN 13



0

Enable UPC A/EAN 13



1

Enable UPC A Only



2

3. Scan one of the bar code parameters.

Disable UPC E



0

Enable UPC E†



1

4. Scan one of the bar code parameters.

Disable EAN 8



0

Enable EAN 8†



1

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5. Scan one of the bar code parameters.

No Supplemental Allowed



0

Supplementals Allowed†



1

Supplemental Required



2

6. Scan one of the bar code parameters.

Discard Check Digit



0

Retain Check Digit†



1

7. Scan one of the bar code parameters.

Discard Number System



0

Retain Number System†



1

8. Scan one of the bar code parameters.

Do Not Insert UPC A Leading Zero



0

Insert UPC A Leading Zero†



1

9. Scan this bar code.

Exit Accumulate



-/

Example: Defining UPC/EAN

This example configures the reader to decode UPC A/EAN 13, with supplementals, inserts a leading zero in front of the UPC A bar code, and disables the reader from decoding UPC E/EAN 8.

1. Scan this bar code to configure UPC/EAN.

Accumulate/Change Config/UPC/EAN Code



+/\$+CE

2. Scan this bar code to decode UPC A. UPC A encodes twelve digits and EAN 13 encodes thirteen digits.

Enable UPC A/EAN 13



1

3. Scan this bar code to disable the reader from decoding UPC E which encodes six digits.

Disable UPC E



0

4. Scan this bar code to disable the reader from decoding EAN 8 which encodes eight digits.

Disable EAN 8



0

5. Scan this bar code to decode supplementals which encode two or five digits. One use of this code is to designate the month or week of publication for magazines.

Supplementals Allowed†



1

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6. Scan this bar code to discard the check digit before transmitting the data to the workstation.

Discard Check Digit



0

7. Scan this bar code to discard the number system or flag digit(s) before transmitting the data to the workstation.

Discard Number System



0

One digit is discarded from the beginning of a UPC A, UPC E, or EAN 8 bar code. Two digits are discarded from the beginning of an EAN 13 bar code. If more than two digits need to be discarded, use the Window command. For more information, see Chapter 5.

8. Scan this bar code to place a leading zero in front of the bar code, if necessary. (This parameter is only necessary when both UPC A and EAN 13 are enabled.)

Insert UPC A Leading Zero †



1

9. Scan this bar code to exit the accumulate feature and modify the configuration.

Exit Accumulate



-/

Customizing ASCII to Keyboard Equivalents

The reader ships with internal software that includes definitions of the keystrokes that are invoked when you scan ASCII characters. Common keyboard keystrokes are listed in the keyboard equivalency tables in the Appendix.

The following instructions describe how to display the default ASCII keycode equivalent for any key pressed on the keyboard. The ASCII keycode equivalent is displayed in decimal form. If the key is not supported in the reader, the workstation displays **-128**.

To display default ASCII keycode equivalents

1. Scan these bar codes.



..-.



41

2. Press the key on the workstation keyboard that you want to display. The workstation monitor displays the ASCII equivalent in decimal form.
3. Check the ASCII character table in the Appendix for the binary or hexadecimal equivalent for the character.
4. Repeat steps 2 and 3 for the keys you want.
5. Scan these bar codes to exit the keycode display.



S



99

6. The reader beeps within 10 seconds. If the reader does not beep, turn the workstation off and then on again.

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Example: Determining Keycode Equivalents

The following example shows how to find the ASCII keycode equivalent for **a** and **A**.

1. Scan this bar code to enable the keycode display routine.



...



41

2. Press **A** on your workstation keyboard to display 97 on the screen.
3. Look up 97 in the ASCII character table in the Appendix. The decimal value 97 has an ASCII character value of "a".
4. Press **Shift-A**. The workstation displays 65 on the screen.
5. Look up 65 in the ASCII character table in the Appendix. The decimal value 65 has an ASCII character value of "A".
6. Scan this bar codes to exit the keycode display routine.



5



99

If the reader does not beep within 2 to 10 seconds after scanning the bar codes, cycle power to the workstation.

The **a** key character is standard for most keyboards. However, there may be some key characters that do not have a readily evident ASCII character equivalent (for example, a function key or a control key).

The ASCII-to-keystroke translation settings can be customized for a specific workstation by changing the default keystrokes of the reader to other keyboard characters. Up to four keystrokes can be mapped to an ASCII character.

The 9710 reader can store twelve keystrokes in EEPROM and the 9720 reader can store 36 keystrokes in EEPROM. The reader sounds one high beep followed by four low beeps after it stores the keystrokes in EEPROM and passes the self-test.

If you map more than 12 keystrokes on the 9710 reader or 36 keystrokes on the 9720 reader, the additional keystrokes are not stored in EEPROM and will be lost after a power cycle. After you enter the maximum number of keystrokes, the reader emits a high/low beep sequence after each additional alteration to indicate that these are temporary alterations. If you redefine the workstation configuration, the look-up table modifications are deleted.

Note: *With some workstations, keypad and/or function keys cannot be remapped.*

When multiple keys are assigned to one ASCII character:

- You have ten seconds to press the first key, but only one second to press each following key.
- The **Shift** key does not count as a keystroke if it is held down while hitting another key. The shift key only counts as a keystroke if it is pressed and released before pressing another key.
- When multiple keystrokes are mapped to an ASCII character, scanning that ASCII bar code sends the remapped keystrokes as if the keys were all held down at the same time. For example, if you remap the keystroke sequence **Ctrl Alt Delete** by pressing and releasing each key individually, when the assigned ASCII character is scanned, the sequence is sent to the workstation as if all three keys were pressed at once: **Ctrl-Alt-Delete**.

If you are using a Wyse terminal, note the following differences:

- Only one key is allowed to be pressed at a time.
- The shift key does not count as a keystroke when followed by another key. For example, pressing and releasing **Shift** then **A** would be considered one keystroke (A).

Note: *With some workstations, the number of keystrokes that can be remapped to an ASCII character are reduced when mixing uppercase and lowercase.*

If a replacement keystroke is already associated with another ASCII character, that keystroke is active in both places.

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To alter one or more ASCII to keystroke equivalents

1. Scan this bar code.

Modify Look-Up Table



\$+WM

2. Scan the ASCII character on the full ASCII chart that you wish to redefine.
3. Press the keystroke combination you are mapping to the bar code.

You must enter the bar code character and keystroke combination within 10 seconds after you scan the Modify Look-Up Table bar code.

To return to normal keystroke settings

- Scan your workstation configuration bar code in the WIF guide.

Example: Modifying Your Keyboard

This example configures the reader to transmit a space whenever you scan an S.

1. Scan this bar code to modify the keyboard keystrokes.

Modify Look-Up Table



\$+WM

2. Scan the letter S bar code on the full ASCII chart at the end of this manual.
3. Press the spacebar on your keyboard to remap the S to a space.

The reader modifies the keyboard configuration and emits one high beep indicating that the modification was successful.

4. Scan this bar code.



* *

The workstation monitor displays a space.

5. Scan this bar code.



S

The workstation monitor displays a space.

4

Configuring the 9720 Serial Port

This chapter applies only to the 9720 Wedge Reader and describes how to install and configure the wedge reader for use with a scale or portable reader.

Connecting to the Serial Port

The 9720 serial port can be used to receive data from a portable reader or a counting or weighing scale. Data can also be transmitted out the serial port. The serial port is designed to receive data using an RS-232 interface and Point-to-Point protocol.

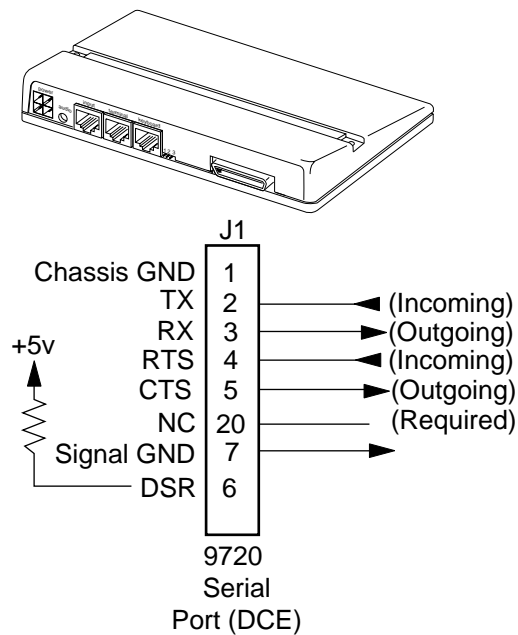
The table below lists the default serial port configuration parameters.

Parameter	Setting
Baud Rate	9600
Parity	Even
Data Bits	7
Stop Bits	1
Intercharacter Delay (serial port)	0 msec
Timeout Delay	2 sec
Echo	Disabled
Flow Control	XON/XOFF control
TXEOM	Carriage return line feed
RXEOM	Carriage return line feed
Solicitation Message	No message

Before connecting a portable reader or scale to the 9720 wedge reader, it is necessary to connect the wedge reader to the workstation and configure the wedge reader operating parameters. Wedge reader installation is described in Chapter 1.

The serial port connector is located on the wedge reader rear panel. The following figure shows the pin assignments for the 25-pin connector.

Wedge Reader Serial Port Connector Pin Assignments



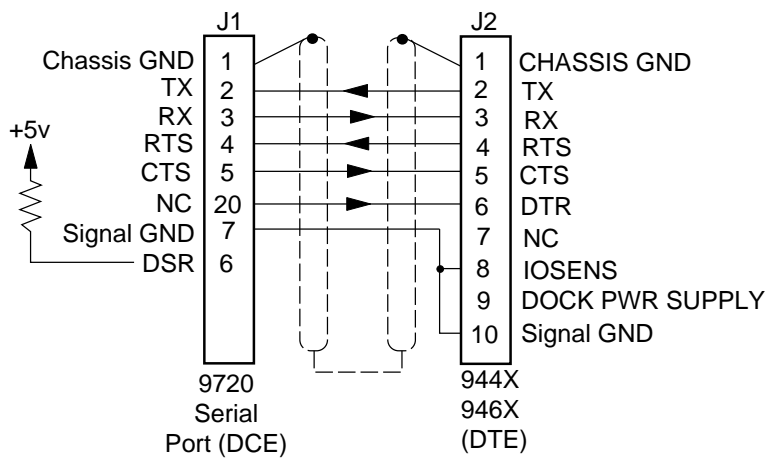
Connecting a Portable Reader

The following Intermec portable readers can be connected to the 9720 Wedge Reader:

- 9440 TRAKKER Portable Reader
- 9444 TRAKKER Scanner
- 9445 TRAKKER Scanner
- 9460 TRAKKER Portable Reader
- 9462 TRAKKER Portable Reader

Connect the portable reader to the wedge reader at the serial port connector located on the wedge reader rear panel. RS-232 cable connector pin assignments are shown in the following figure.

944X and 946X Portable Reader Cable Connectors (P/N 048864)



Connecting a Scale

You can connect a counting or weighing scale to the 9720 Wedge Reader at the RS-232 serial port and transfer scale data through the reader to the workstation. Operating with a scale does not change your workstation operation or the operation of the accessories you have connected to the wedge reader.

Connect the scale to the wedge reader at the serial port connector located on the wedge reader rear panel. Refer to the figure of the pin assignments for the wedge reader serial port and the installation and operation manuals for your scale for specific information about the type of connector you need to operate your scale with an RS-232 interface.

Note: The serial port connector on the 9720 is configured as DCE.

Uploading Data

When possible, the portable reader or scale should be configured for the default settings of the wedge reader serial port. By carefully configuring and monitoring the portable reader/scale and configuring the wedge reader, you can successfully control the transmission of serial port data through the wedge reader to the workstation. Some applications may require operator interaction to prevent data loss due to slow or unpredictable host or application responses.

Characters received by the wedge reader are held in a buffer until an end of record occurs. End of record is defined by one of the following conditions:

- 256 characters are received.
- Characters are not received within the configured timeout period.
- An end of message (EOM) is received.

Each data record from a scale/portable reader must have an EOM. Typically the EOM is a Carriage Return (<CR>) or a Line Feed (<LF>). The wedge reader searches the transmission for the EOM as a check for a complete transmission. When the wedge reader receives the EOM, the data record is sent to the workstation. See your scale/portable reader user's manual or inspect a scale/portable reader transmission to identify the EOM.

The wedge reader strips defined characters and appends any configured preambles and postambles to the scale/portable reader transmission before sending it to the workstation.

If an error occurs when receiving data through the serial port (for instance, a configured timeout occurs before an EOM is received), the wedge reader beeps and continues operation.

Uploading Data From a Portable Reader

There are three common ways to start data transmission for the portable reader:

- Press a key combination on the portable reader. Refer to your portable reader user's manual for instructions on transmitting data.

- The portable reader receives a command to transmit from the wedge reader. Refer to page 4-14 for information about defining the solicitation message.
- Transmit from an IRL program.

For more information on programming the portable reader and preparing for data collection, see “Other Intermec Manuals” in the front of this book.

Note: Do not scan information or enter data from the keyboard when you are transmitting data from the portable reader. To do so interferes with the transmission and data may be altered.

Configure the portable reader for the Point-to-Point protocol settings listed below.

Parameter	Setting	Parameter	Setting
CTS Checking	No	XON	DC1
Baud Rate	9600	XOFF	DC3
Parity	Even	Timeout Delay	10 sec
Data Bits	7	Intercharacter Delay	0 ms
Stop Bits	1	Turnaround Delay	0 ms

Uploading Data From a Scale

There are three common ways to command the scale to send data through the RS-232 line:

- The operator presses a key (PRINT) on the scale.
- A switch, external to the scale but wired to it, is closed.
- The scale receives a command through the RS-232 serial line from the wedge reader.

The first two transmission commands are initiated by the operator. For the third command, the wedge reader solicits the scale requesting transmission of data. You must define the solicitation message and transmit the message to the scale by scanning a command bar code.

Serial Port Configuration Parameters

The following tables define various configuration parameters for the wedge reader's serial port. The dagger (†) indicates the factory default setting.

Baud Rate

This parameter defines the rate at which data is transmitted/received by the serial port.

110



\$+IA0

2400



\$+IA4

300



\$+IA1

4800



\$+IA5

600



\$+IA2

9600†



\$+IA6

1200



\$+IA3

19200



\$+IA7

Parity

This parameter defines the number of 1s in a data block. Parity is used for error checking in data transmission. The number of 1s in a data block are counted and a 0 or 1 (parity bit) is added so the data block has the correct parity before transmission.

Configuring the 9720 Serial Port

4

Disabled



\$+IB0

Mark



\$+IB3

Even†



\$+IB1

Space



\$+IB4

Odd



\$+IB2

Data Bits

This parameter defines the number of bits in the data record received by the serial port.

7†



\$+II7

8



\$+II8

Stop Bits

This parameter defines the number of additional characters sent with the data transmission to indicate the end of data.

1†



\$+IC1

2



\$+IC2

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Timeout Delay

This parameter defines how long the wedge reader waits between characters when receiving data. The timeout is enabled with the receipt of the first character in the message. If data stops arriving before an EOM character is received, the wedge reader waits the specified timeout period. When the timeout period expires, the data is transmitted to the workstation and the buffer count (the count of the incoming message) resets to zero.

0 sec



\$+IE8

10 sec



\$+IE4

5 msec



\$+IE0

20 sec



\$+IE5

100 msec



\$+IE1

40 sec



\$+IE6

500 msec



\$+IE2

60 sec



\$+IE7

2 sec†



\$+IE3

Echo

This parameter echoes any data sent to the serial port back to the device that is transmitting data (normally not used).

Disabled†



\$+IM0

Enabled



\$+IM1

Flow Control

This parameter controls the data transmission for the serial port. The wedge reader is a DCE device.

Clear to Send/Request to Send (CTS/RTS) is a hardware signal flow control. The reader checks RTS before transmission of each character. The reader uses CTS to control incoming data flow.

XON/XOFF response specifies that the wedge reader responds to XON/XOFF characters received while transmitting. XON/XOFF control specifies that XON/XOFF characters are transmitted by the wedge reader to control data flow. XON/XOFF response and control specifies the wedge reader responds to and transmits XON/XOFF characters.

None



\$+IL0

XON/XOFF Control†



\$+IL3

CTS/RTS Checking and Control



\$+IL1

XON/XOFF Response and Control



\$+IL4

XON/XOFF Response



\$+IL2

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RXEOM

This parameter defines the receive end of message (RXEOM) for the serial port. An EOM is sent by the portable reader/scale to indicate the end of a data record. The wedge reader strips the EOM before transmitting data to the workstation. Carriage Return Line Feed (<CR><LF>) is the default configuration.

Note: If you are using quotes (") in your data string, refer to the note on page 3-15.

Disabled



\$+PJ

To define the RXEOM

1. Scan this bar code.

Accumulate/Change Config/RXEOM



+/\$+PJ

2. Scan this bar code.

Beginning of Data



11

3. Scan 1 to 2 characters on the full ASCII chart to build the RXEOM.
4. Scan this bar code.

End of Data



11

5. Scan this bar code.

Exit Accumulate



-/

TXEOM

This parameter defines the transmit end of message (TXEOM) for the serial port. The serial port sends an EOM to indicate the end of a data record when transmitting data from the reader. Carriage Return Line Feed (<CR><LF>) is the default setting.

Note: If you are using quotes (") in your data string, refer to the note on page 3-15.

Disabled



\$+PI

To define TXEOM

1. Scan this bar code.

Accumulate/Change Config/TXEOM



+/\$+PI

2. Scan this bar code.

Beginning of Data



''

3. Scan 1 to 2 characters on the full ASCII chart to build the TXEOM.

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4. Scan this bar code.

End of Data



''

5. Scan this bar code.

Exit Accumulate



-/

Solicitation Message

This parameter defines the solicitation message for the serial port. The message can be sent from the wedge reader to the portable reader or scale at any time by scanning the transmit message command. The solicitation message commands the portable reader/scale to transmit data through the RS-232 interface to the wedge reader. Your scale service manual or portable reader user's manual contains a list of such commands with the ASCII character equivalents.

Solicitation messages are stored in EEPROM and remain defined until you change them.

Note: If you are using quotes (") in your data string, refer to the note on page 3-15.

Solicitation Message Cleared †



\$+WS

To define the solicitation message

1. Scan this bar code.

Accumulate/Change Config/Solicitation Message



+/\$+WS

2. Scan this bar code.

Beginning of Data



"

3. Scan 1 to 15 characters using the bar codes on the full ASCII chart to build the solicitation message.

4. Scan this bar code.

End of Data



"

5. Scan this bar code.

Exit Accumulate



*-/

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Example: Defining a Solicitation Message

The following example describes how to define a solicitation message for the portable reader.

1. Scan this bar code to configure a solicitation message.

Accumulate/Change Config/Solicitation Message



+/\$+WS

2. Scan this bar code to define the solicitation message.

Beginning of Data



11

3. Scan the following bar codes on the full ASCII chart at the end of this manual: % % A <CR> <LF>.

<CR> is the CR bar code and <LF> is the LF bar code on the full ASCII chart. The % % characters tell the reader to transmit data. The A character specifies the file name. <CR><LF> are the EOM characters.

4. Scan this bar code to end the configuration of the solicitation message.

End of Data



11

5. Scan this bar code to exit the accumulate feature and modify the configuration.

Exit Accumulate



-/

When the solicitation message is transmitted to the portable reader, the portable reader begins transmitting File A.

5

Data Edit Application

This chapter provides information on using the Data Edit application for stripping specific characters from a data record.

Running Data Edit

Note: The information in this chapter **does not** apply to the 9710X01 Wedge Reader. To verify the type of reader you are using, look at the label on the base of the reader for a number similar to 9710X02. This number specifies the following information: (1) the reader type (9710 or 9720), (2) the revision letter (E, F, G, etc.), and (3) the version number (01 or 02).

With Data Edit running, the reader can:

- Search the incoming data record for the pre-defined data.
- Strip control characters, status words, or checksums from the data record.
- Strip characters from the beginning and/or end of a data record.

Using Data Edit Configuration Parameters

You can configure the reader to manipulate data from a scanner, the serial port, or both at the same time. The Window and Data Source parameters define the source of the data and Data Identifier, Data Begin, and Data End define how to modify the data.

You can run Data Edit upon power-on, in place of Standard Operation mode, or you can run Data Edit by scanning the Run Program command.

Application Program

This parameter determines the application that is run on power-up: Standard Operation or Data Edit. If you configure the reader for Data Edit, the reader resets before running Data Edit. To return to Standard Operation, scan the Standard Operation bar code.

Standard Operation+



\$+GA0

Data Edit



\$+GA1

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If you want to run Data Edit temporarily, scan the Run Program command.

Run Program



//

Note: You need to configure the reader before scanning the Run Program command. Any type of reset (for example, scanning the reset command or configuring a parameter) exits Data Edit and returns the reader to Standard Operation.

The following parameters define the data source (scanner or serial port) and the characters to strip from data records that the reader receives. You can configure these parameters running Standard Operation or Data Edit, but the parameters only *function* when the Data Edit application is running.

Window

This parameter defines the source of the data records. Use Window to strip a specified number of characters from the beginning and end of a data record. Window is run before the Data Identifier parameter.

Window Disabled



\$+WH0

Window Serial Port Data †



\$+WH2

Window Scanner Data



\$+WH1

Window Scanner and Serial Port Data



\$+WH3

Data Begin and Data End

These parameters strip characters from data records the reader receives. For example, these parameters are useful when you use the Window parameter for a scale connected to the reader serial port. Scales send several types of information, such as count, weight, and data that typically goes to a printer. As a result, the data records contain non-printing control characters as well as data. Configure Data Begin and Data End to strip these non-printing control characters from the data record before sending the data to the workstation.

Data Begin This parameter defines the number of characters that are stripped from the beginning of a data record. The characters are stripped before the addition of preambles and the information is sent to the workstation. This parameter is typically used with scales.

No Stripping†



\$+WB0

To strip characters from the beginning of the data record

1. Scan this bar code.

Accumulate/Change Config/Data Begin



+/\$+WB

2. Scan a number between 1 and 99.



1



2



3



4



5



6



7



8



9



0

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3. Scan this bar code.

Exit Accumulate



-/

Data End This parameter defines the number of characters that are stripped from the end of a data record. The characters are stripped before the addition of postambles and the information is sent to the workstation.

No Stripping†



\$+WE0

To strip characters from the end of the data record

1. Scan this bar code.

Accumulate/Change Config/Data End



+/\$+WE

2. Scan the number of characters, between 1 and 99, you want to strip.



1



2



3



4



5



6



7



8



9



0

3. Scan this bar code.

Exit Accumulate



-/

Data Source

This parameter defines the source of the data records. Data Source is used with Data Identifier which searches for a set pattern in the data record and passes the data record or strips the pattern before passing the data record.

Note: Window takes precedence over Data Source.

Data Source Disabled



\$+DH0

Data Source Serial Port Data



\$+DH2

Data Source Scanner Data†



\$+DH1

Data Source Scanner and Serial Port Data



\$+DH3

Data Identifier

This parameter defines the pattern that the reader searches for in a data record and how to process the data. The pattern can be a space, an alpha character, or a user-defined pattern. The reader can strip the pattern, pass the data record unmodified, or reject the data record if the pattern is not found.

Disable†



\$+DI0

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To define the data identifier

1. Scan this bar code.

Accumulate/Change Config/Data Identifier



+/\$+DI

2. Scan one of the bar codes below to define the data identifier pattern.

Pattern 1 A space in positions 2 through 5 of a data record defines a pattern of all characters up to and including the first space.



1

For example, there are two data records: 12 345 and A 3 45. The pattern for the first data record is 1, 2 and the space. The pattern for the second data record is A and the space.

Pattern 2 An alpha character in position 1 through 4 of a data record defines a pattern of all characters up to and including the first alpha character. (A space immediately following the alpha character is included.)



2

For example, there are two data records: 12ABC and A 3B45. The pattern for the first data record is 1, 2 and A. The pattern for the second data record is A and the space.

Pattern 3 This pattern is user-defined and stored in reader memory. Refer to the next section, "User-Defined Pattern," for information on creating and using a user-defined pattern.



3

3. Scan one of the bar codes below to define data handling:

- Pattern present—strip pattern and transmit data. Pattern not present—reject data record.



0

- Pattern present—transmit data record unmodified. Pattern not present—reject data record.



1

- Pattern present—strip pattern and transmit data. Pattern not present—transmit data record unmodified.



2

4. Scan this bar code.

Exit Accumulate



/

User-Defined Pattern

This parameter defines a pattern to find in the data record. Reader memory has space for up to 32 patterns, with a maximum of 5 characters in each pattern. The characters can be numeric, uppercase alpha, or wild card characters @, #, and ?.

Wild card characters represent a character type:

@ is any uppercase alpha character.

is any numeric character.

? is any character.

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To delete the user-defined patterns from memory, you must scan the Default Configuration command listed in Chapter 2.

Note: *If you are using quotes (") in your data string, refer to the note on page 3-15.*

To define a pattern

1. Scan this bar code.

Accumulate/Change Config/User-defined Pattern



+/\$+DI4

2. Scan this bar code.

Beginning of Data



"

3. Scan 1 to 5 characters from the full ASCII chart. The characters can be numeric, uppercase alpha, @, #, or ?.

4. Scan this bar code.

End of Data



"

5. Scan this bar code.

Exit Accumulate



*-/

Example: Applying a User-Defined Pattern

This example defines a user-defined pattern consisting of a capital A, a numeric character, and a character of any type, and explains how to configure the reader to manipulate the data.

Note: You must configure the reader for the correct data source and run Data Edit for Data Identifier and User-Defined Pattern parameters to function.

1. Scan this bar code to configure the user-defined pattern:

Accumulate/Change Config/User-defined Pattern



+/\$+DI4

2. Scan this bar code.

Beginning of Data



1

3. Scan A, # and ? from the full ASCII chart at the end of this manual.
4. Scan this bar code.

End of Data



1

5. Scan this bar code to exit the accumulate feature and modify the configuration.

Exit Accumulate



-/

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You have configured a user-defined pattern. Next, you will apply the user-defined pattern for stripping characters from a data record.

6. Scan this bar code to configure the data identifier:

Accumulate/Change Config/Data Identifier



+/\$+DI

7. Scan this bar code to use the pattern stored in reader memory:

Pattern 3 (User-Defined)



3

8. Scan this bar code to find a user-defined pattern in the data record:

Strip Pattern and Transmit Data



2

9. Scan this bar code to exit the accumulate feature and modify the configuration.

Exit Accumulate



-/

When you scan data, the reader strips the pattern consisting of an A, a numeric character, and another character and transmits the remaining data to the workstation. If the pattern is not found in the data string, the reader transmits the data unmodified.



Specifications



Mechanical Specifications

Dimensions: Length: 6.6 inches (184 mm)
 Width: 4.4 inches (112 mm)
 Height: 1.1 inches (28 mm)
Weight: 7 ounces (200 grams)

Environmental Specifications

Operating Temperature: +32° to +122°F (0° to +50°C)
Storage Temperature: -4° to +158°F (-20° to +70°C)
Humidity: 10% to 90% non-condensing

Keyboard Equivalent Tables

The following tables list the ASCII equivalent for the PC/workstation, twinax/coax terminal, and ASCII terminal keyboard keystrokes. The alpha characters and numeric characters are standard for all three tables (keystroke A's ASCII equivalent is A, keystroke 1's ASCII equivalent is 1, etc.); therefore, they are not listed in the tables. Refer to the tables when customizing your keyboard as described in Chapter 3.

PC/Workstation Keyboard Mapping

A PC is a personal computer; it is a stand-alone unit which does not need to be connected to a host in order to operate.

ASCII Char.	Keystroke	ASCII Char.	Keystroke
NUL	Num +	SP	Spacebar
SOH	Num Lock	!	!
STX	Scroll Lock	" (quote)	" (quote)
ETX	-	#	#
EOT	Ins	\$	\$
ENQ	Del	%	%
ACK	Sys Req	&	&
BEL	N/A	' (apostrophe)	' (apostrophe)
BS	← Alt GR	((
HT	→ | (tab)))
LF	Caps Lock	*	*
VT	|← (tab)	+	+
FF	Alt	, (comma)	, (comma)
CR	↵ (Enter)	- (dash)	- (dash)
SO	Ctrl	. (period)	. (period)
SI	↑ (shift)	/	/
DLE	F1	:	:
DC1	F2	;	;
DC2	F3	<	<
DC3	F4	=	=
DC4	F5	>	>
NAK	F6	?	?
SYN	F7	@	@
ETB	F8	[[
CAN	F9	\	\
EM	F10]]
SUB	Home	^	^
ESC	Esc	_ (underline)	_ (underline)
FS	PgUp	` (accent)	` (accent)
GS	PgDn	{	↑
RS	PrtSc	|	↓
US	End	}	←
DEL	← (bksp del)	~	«

Twinax/Coax Terminal Keyboard Mapping

A twinax/coax terminal connects to the host using a cable with a twinax/coax connector.

ASCII Char.	Keystroke	ASCII Char.	Keystroke
NUL	CMD/PF17	SP	Space
SOH	CMD/PF18	!	!
STX	CMD/PF19	" (quote)	" (quote)
ETX	CMD/PF20	#	#
EOT	CMD/PF21	\$	\$
ENQ	CMD/PF22	%	%
ACK	CMD/PF23	&	&
BEL	CMD/PF24	' (apostrophe)	' (apostrophe)
BS	Field + /PA1	((
HT	→ | (tab)))
LF	␣ (Enter)	*	*
VT	← | (tab)	+	+
FF	Alt/Cmd	, (comma)	, (comma)
CR	CR	- (dash)	- (dash)
SO	Field Exit/PA2	. (period)	. (period)
SI	↑ (shift)	/	/
DLE	CMD/PF1	:	:
DC1	CMD/PF2	;	;
DC2	CMD/PF3	<	<
DC3	CMD/PF4	=	=
DC4	CMD/PF5	>	>
NAK	CMD/PF6	[↑
SYN	CMD/PF7	\	\
ETB	CMD/PF8]	↓
CAN	CMD/PF9	^	Play
EM	CMD/PF10	_ (underline)	_ (underline)
SUB	CMD/PF11	` (accent)	` (accent)
ESC	CMD/PF12	{	Attn
FS	CMD/PF13	|	Erase/Input/EOF
GS	CMD/PF14	}	Rst, Error/Rst
RS	CMD/PF15	~	Dup
US	CMD/PF16	DEL	← (bksp del)

ASCII Terminal Keyboard Mapping

An ASCII terminal sends ASCII characters to the host.

ASCII Char.	Keystroke	ASCII Char.	Keystroke
NUL	F1	SP	Spacebar
SOH	F2	!	!
STX	F3	" (quote)	" (quote)
ETX	F4	#	#
EOT	F5	\$	\$
ENQ	F6	%	%
ACK	F7	&	&
BEL	F8	' (apostrophe)	' (apostrophe)
BS	F12	((
HT	→ | (tab)))
LF	␣ (Enter)	*	*
VT	|← (tab)	+	+
FF	Ctrl	, (comma)	, (comma)
CR	CR	- (dash)	- (dash)
SO	Lock	. (period)	. (period)
SI	↑ (shift)	/	/
DLE	F10	:	:
DC1	F14	;	;
DC2	Help	<	<
DC3	DO	=	=
DC4	Select	>	>
NAK	F18	?	?
SYN	F19/Left Alt	@	@
ETB	F20/Right Alt]	[[
CAN	Compose Char	\	\
EM	Prev Screen]]
SUB	Next Screen	^	^
ESC	F11	_ (underline)	_ (underline)
FS	PF1	` (accent)	` (accent)
GS	PF2	{	↑
RS	PF3	|	↓
US	PF4	}	←
DEL	delete	~	«

ASCII Characters Table

The following table lists the ASCII characters and their binary, hexadecimal, and CODE 39 equivalent. Refer to this table when displaying the default ASCII keycode equivalent for your keyboard (see Chapter 3).

FULL ASCII											
Binary ⁰	Hex ¹	Dec ²	C39 ³	Char ⁴	Binary	Hex	Dec	C39	Char	Control ⁵	Character Definitions
00000000	00	00	%U	NUL	01000000	40	64	%V	@	NUL	Null, or all zeroes
00000001	01	01	\$A	SOH	01000001	41	65	A	A	SOH	Start of Heading
00000010	02	02	\$B	STX	01000010	42	66	B	B	STX	Start of Text
00000011	03	03	\$C	ETX	01000011	43	67	C	C	ETX	End of Text
00000100	04	04	\$D	EOT	01000100	44	68	D	D	EOT	End of Transmission
00000101	05	05	\$E	ENQ	01000101	45	69	E	E	ENQ	Enquiry
00000110	06	06	\$F	ACK	01000110	46	70	F	F	ACK	Acknowledgement
00000111	07	07	\$G	BEL	01000111	47	71	G	G	BEL	Bell
00001000	08	08	\$H	BS	01001000	48	72	H	H	BS	Backspace
00001001	09	09	\$I	HT	01001001	49	73	I	I	HT	Horizontal Tab
00001010	0A	10	\$J	LF	01001010	4A	74	J	J	LF	Line Feed
00001011	0B	11	\$K	VT	01001011	4B	75	K	K	VT	Vertical Tab
00001100	0C	12	\$L	FF	01001100	4C	76	L	L	FF	Form Feed
00001101	0D	13	\$M	CR	01001101	4D	77	M	M	CR	Carriage Return
00001110	0E	14	\$N	SO	01001110	4E	78	N	N	SO	Shift Out
00001111	0F	15	\$O	SI	01001111	4F	79	O	O	SI	Shift In
00010000	10	16	\$P	DLE	01010000	50	80	P	P	DLE	Data Link Escape
00010001	11	17	\$Q	DC1	01010001	51	81	Q	Q	DC1	Device Control 1 (XON)
00010010	12	18	\$R	DC2	01010010	52	82	R	R	DC2	Device Control 2
00010011	13	19	\$S	DC3	01010011	53	83	S	S	DC3	Device Control 3 (XOFF)
00010100	14	20	\$T	DC4	01010100	54	84	T	T	DC4	Device Control
00010101	15	21	\$U	NAK	01010101	55	85	U	U	NAK	Negative Acknowledge
00010110	16	22	\$V	SYN	01010110	56	86	V	V	SYN	Synchronous Idle
00010111	17	23	\$W	ETB	01010111	57	87	W	W	ETB	End Transmission Block
00011000	18	24	\$X	CAN	01011000	58	88	X	X	CAN	Cancel
00011001	19	25	\$Y	EM	01011001	59	89	Y	Y	EM	End of Medium
00011010	1A	26	\$Z	SUB	01011010	5A	90	Z	Z	SUB	Substitute
00011011	1B	27	%A	ESC	01011011	5B	91	%K	[	ESC	Escape
00011100	1C	28	%B	FS	01011100	5C	92	%L	\	FS	File Separator
00011101	1D	29	%C	GS	01011101	5D	93	%M	]	GS	Group Separator
00011110	1E	30	%D	RS	01011110	5E	94	%N	^	RS	Record Separator
00011111	1F	31	%E	US	01011111	5F	95	%O	_	US	Unit Separator
00100000	20	32	\$P	SP ⁶	01100000	60	96	%W	`	SP	Space
00100001	21	33	/A	!	01100001	61	97	+A	a	DEL	Delete
00100010	22	34	/B	"	01100010	62	98	+B	b		
00100011	23	35	/C	#	01100011	63	99	+C	c		
00100100	24	36	/D	\$	01100100	64	100	+D	d		
00100101	25	37	/E	%	01100101	65	101	+E	e		
00100110	26	38	/F	&	01100110	66	102	+F	f		
00100111	27	39	/G	'	01100111	67	103	+G	g		
00101000	28	40	/H	(	01101000	68	104	+H	h		
00101001	29	41	/I	)	01101001	69	105	+I	i		
00101010	2A	42	/J	*	01101010	6A	106	+J	j		
00101011	2B	43	/K	+	01101011	6B	107	+K	k		
00101100	2C	44	/L	,	01101100	6C	108	+L	l		
00101101	2D	45	/M	-	01101101	6D	109	+M	m		
00101110	2E	46	/N	.	01101110	6E	110	+N	n		
00101111	2F	47	/O	/	01101111	6F	111	+O	o		
00110000	30	48	/P	0	01110000	70	112	+P	p		
00110001	31	49	/Q	1	01110001	71	113	+Q	q		
00110010	32	50	/R	2	01110010	72	114	+R	r		
00110011	33	51	/S	3	01110011	73	115	+S	s		
00110100	34	52	/T	4	01110100	74	116	+T	t		
00110101	35	53	/U	5	01110101	75	117	+U	u		
00110110	36	54	/V	6	01110110	76	118	+V	v		
00110111	37	55	/W	7	01110111	77	119	+W	w		
00111000	38	56	/X	8	01111000	78	120	+X	x		
00111001	39	57	/Y	9	01111001	79	121	+Y	y		
00111010	3A	58	/Z	:	01111010	7A	122	+Z	z		
00111011	3B	59	%F	;	01111011	7B	123	%P	{		
00111100	3C	60	%G	<	01111100	7C	124	%Q	|		
00111101	3D	61	%H	=	01111101	7D	125	%R	}		
00111110	3E	62	%I	>	01111110	7E	126	%S	~		
00111111	3F	63	%J	?	01111111	7F	127	%T ⁸	■ ⁹		

Notes

- 0 Bit positions are 76543210
- 1 Hexadecimal value
- 2 Decimal value
- 3 Code 39 character(s)
- 4 ASCII character
- 5 Hold Ctrl and press key in Char column
- 6 SPACE character
- 7 Code 39 characters /P through /Y may be interchanged with the numbers 0 through 9
- 8 May be interchanged with %X or %Y or %Z
- 9 DELETE character

ASCIIx10



Glossary

2 of 5 Code

A bar code symbology that is fixed length, discrete, and self-checking. It requires loose printing tolerances. It is used for warehouse sorting systems, photofinishing envelopes, and sequentially numbered airline tickets. The character set is 0 - 9. The maximum density is 7.7 characters per inch.

Accumulate Mode

Operating mode in which the reader stores scanned information in the buffer until a transmit command is received.

Alphanumeric

A set that contains letters, numbers, and usually other characters such as punctuation marks.

ASCII

The acronym for American Standard Code for Information Interchange. A standard seven bit code almost always transmitted with a parity bit for a total of eight bits per character. ASCII was established by the American National Standards Institute to achieve compatibility between various types of data communication equipment. ASCII is the most commonly used code for non-IBM equipment.

Bar

In bar code symbology, it refers to the darker element of a printed bar code symbol.

Bar Code

An automatic identification technology which encodes information into an array of varying width parallel rectangular bars and spaces.

Buffer

An area of storage used to hold data being transferred from one device to another.

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Character Set

Refers to specific letters, numerals, and symbols that support a particular language (French, US, ASCII).

Check Digit

A character included in a bar code whose value is used to do a mathematical check on the value of the decoded bar code to retain accuracy.

Codabar

A bar code symbology that is variable length, discrete, and self-checking. It requires close printing tolerances. It is used in department store price labeling, libraries, medicine, photofinishing envelopes, air bills, and American Blood Commission blood tags. The character set is 0 - 9, dollar sign (\$), colon (:), period (.), slash (/), plus (+), and minus (-). Its maximum density is 12.8 characters per inch.

Code 11

A bar code symbology that is variable length, discrete, and not self-checking. It requires moderate printing tolerances and one or two check digits. It is widely used in labeling telecommunications equipment. The character set is 0 - 9 and minus (-). Its maximum density is 15 characters per inch.

Code 128

A bar code symbology that is variable length, continuous, and weakly self-checking code. It requires loose printing tolerances. Its high density makes it useful when printing data in a limited space. The character set is all 128 ASCII characters. Its maximum density is 12.1 alphanumeric characters per inch or 24.2 numeric characters per inch.

Code 16K

A bar code symbology that is a multi-row, continuous code that has loose printing tolerances. It requires a check digit and the character set includes all 128 ASCII characters. This symbology is suitable for labeling small objects because it can encode more data in less area than many other codes.

Code 39

A bar code symbology that is discrete, variable length, and self-checking. It requires loose printing tolerances. It is used in manufacturing, government agencies, and health care. The character set is A - Z uppercase, 0 - 9, dollar sign (\$), period (.), slash (/), percent (%), space (), plus (+), and minus (-). It can be extended to full 128 character ASCII by use of a two-character encoding scheme (see Full ASCII). Its maximum density is 9.8 characters per inch.

Code 49

A bar code symbology that is multi-row, fixed length, and continuous. It requires loose printing tolerances. It is suitable for labeling small objects because it can encode more data in less area than other codes. The character set is all 128 ASCII characters. Its maximum density is 93.3 alphanumeric characters per inch or 154.3 numeric characters per inch.

Code 93

A bar code symbology that is discrete, variable length, and self-checking. It requires loose printing tolerances. It can be used interchangeably with Code 39 when higher density printing is required. The character set is the same as Code 39: A - Z uppercase, 0 - 9, dollar sign (\$), period (.), slash (/), percent (%), space (), plus (+), and minus (-). It can be extended to full 128 character ASCII by use of a four-character encoding scheme (see Full ASCII). Its maximum density is 14.8 characters per inch.

Concatenated Code

Two bar codes that are read into one data record.

Configuration

The settings that determine the operating characteristics of the reader.

Continuous Code

Characteristics of a bar code symbology where all spaces within the symbol are parts of characters. There is no intercharacter gap in a continuous code. It is the opposite of discrete.

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Clear to Send/Request to Send (CTS/RTS)

A type of hardware flow control. The 9720 reader signals the serial port device when the reader is ready to receive data (CTS). The 9720 reader checks with the serial port device when the reader is ready to send data (RTS).

Data Begin/Data End

Two Data Edit parameters that strip a set number of characters from the beginning and end of incoming data. You use this parameter with the Window parameter.

Data Identifier

A Data Edit parameter that searches incoming data for a predefined pattern to strip the pattern, reject the data containing the pattern, or accept the data containing the pattern. You use the parameter with the Data Source parameter.

Data Source

A Data Edit parameter that defines the source of the data: wand/scanner, serial port, or both. You use this parameter with the Data Identifier parameter.

Discrete Code

Characteristic of a bar code symbology in which the intercharacter gap is not part of the code and is allowed to vary dimensionally within wide tolerance limits. Opposite of continuous.

Echo

A communications parameter that configures the 9720 reader to repeat to the serial port data received by the serial port.

EOM

End of message character. Typically it is a carriage return or a line feed.

Fixed Length

Characteristic of a bar code symbology in which the number of characters per symbol is predetermined. Opposite of variable length.

Flow Control

A method for controlling the flow of data between the reader and the 9720 serial port. It stops the transmitting device from sending data when the receiving device buffer fills up and starts it again when the buffer empties. This can be done through software (XON/XOFF) or hardware (CTS/RTS).

Full ASCII

An operating mode that sets the reader to properly decode Code 39 or Code 93 labels containing data that may include any of the 128 ASCII characters.

HIBC

Health Industry Bar Code standard. It uses Code 39 symbology and specifies the format of the data.

Human-Readable

A character, number, or symbol printed in a font that can be read by a human; as opposed to bar code symbology that can only be read by a machine.

Input Device

A wand or laser scanner that scans bar code information into the reader.

Intercharacter Delay

A communication parameter that causes the reader to delay a set time between characters when sending data to the workstation.

Intercharacter Gap

The space between the last element of one character and the first element of the adjacent character of a discrete bar code symbol.

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Interleaved 2 of 5 Code

A bar code symbology that is fixed length (it requires an even number of characters), continuous, and self-checking. It requires loose printing tolerances. It is used in warehousing, heavy industry, the automotive industry, and UPC standard shipping labels. The character set is 0 - 9. Its maximum density is 18 numeric characters per inch.

ISBT 128 Code

This bar code symbology is a variation of Code 128. It was developed by the International Society of Blood Transfusion (ISBT) for the bar code labeling of whole blood and blood products. This symbology supports concatenation (linking) of two ISBT 128 bar codes. Pairs of concatenated ISBT 128 bar codes can be decoded from a single scan of a laser scanner or wand.

Keyboard Equivalent

The keycode sent by the keyboard to the workstation representing the pressed key. The reader has a table of ASCII characters that correspond to the keys on the keyboard. When an ASCII character is scanned, the reader transmits the keycode to the workstation.

Label Format

The design of a bar code label; the arrangement of the text, lines and bar codes on a label.

MSI Code

A bar code symbology that is a modified version of Plessey code. It is fixed length, continuous, and non self-checking. This code is used to mark retail shelves for inventory reordering. The character set is 0 - 9 plus additional symbols.

Multiple-Read Bar Code

Refers to a bar code that takes the form: start code space data stop code. Multiple-read bar codes are stored in the reader's buffer until a command to transmit is received or until a regular bar code (a bar code with no leading space) is scanned. See regular label.

Parameters

The operating limits of the reader.



Plessey Code

A bar code symbology that is fixed length, continuous, and not self-checking. It is used extensively in libraries. The character set is 0 - 9 plus six additional symbols.

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Preamble

Predefined data that is automatically appended to the beginning of transmitted data.

Postamble

Predefined data that is automatically appended to the end of transmitted data.

Regular Bar Code

Refers to a bar code that takes the form: start code data stop code. Regular bar codes are transmitted as soon as they are scanned. See multiple-read bar code.

RS-232

Widely recognized protocol standard for serial binary data interchange. The standard covers the physical, electrical, and functional characteristics of the interface.

Scanner

An electronic device that converts printed bar code into electrical signals.

Scanner Trigger Mode

A parameter that allows you to decide between pulling the trigger every time you want to scan labels or pulling the trigger and having the scanner remain on for a set amount of time.

Scanner Mode

A parameter that allows you to decide between pulling the trigger every time you want to scan a label or pulling the trigger to scan many labels.

Scanner Timeout

A parameter that lets you set the amount of time a scanner remains on after the trigger is pulled.

Self-Checking

Characteristic of a bar code symbology that, without the use of a check digit, allows the bar code to be decoded without an error.

Self-Test

The search for malfunctions in the electrical or mechanical systems of a device by its own actions.

Serial

A communication scheme in which the bits of a byte are transferred one-at-a-time.

Solicitation Message

A predefined message sent by the wedge reader to initiate data transmission from the device connected to the wedge reader serial port.

Space

The lighter element of a bar code usually formed by the background between bars.

Start and Stop Characters

Specified characters at the beginning and end of a bar code symbol that provides “direction of read” information to the reader decoding logic.

Symbology

A scheme for encoding data as bar code. Code 39, Interleaved 2 of 5, and Codabar are examples of different symbologies.

Timeout Delay

The specified time the reader waits between receiving characters from the serial port, before transmitting the data already received onto the workstation (if no EOM is received).

Quiet Zone

The area immediately preceding the start character and following the stop character that contains no markings. This area is usually ten times the width of the narrow bar.

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UPC/EAN Code

Universal Product Code (UPC) is a subset of the European Article Numbering (EAN). The EAN code is also referred to as World Product Code (WPC) and International Article Numbering (IAN). It is used in marking items for retail sale. This code is fixed length, continuous, and weakly self-checking. It requires close printing tolerances. The character set is 0 - 9. Its maximum character density is 13.8 numeric characters per inch.

Variable Length

A type of symbology in which the number of characters per symbol is not restricted. It is opposite of fixed length.

Voting

A laser scanner parameter that takes more than one (low setting) or more than two (high setting) matching scans from the same label to yield a good read. This is useful when scanning poor quality labels that may cause substitution errors. This is for laser scanning only.

Wait Character

A predefined character that delays the reader a set time (wait time) before the reader sends the next set of data to the workstation.

Window

A Data Edit parameter that delays the reader a set time (wait time), before sending the next set of data to the workstation.

XON/XOFF

A type of software flow control for communication between digital devices. It stops the host from sending data when the device buffer fills up (XOFF) and starts it again when the buffer empties (XON).



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To correctly scan and interpret full ASCII bar codes, the reader must be in Code 39 Full ASCII or Mixed-full ASCII mode.

Full ASCII Bar Code Chart

ACK	ETX	VT	[	\	E	U	k
BEL	FF	!	.	Space	F	V	j
BS	FS	,	°	0	G	W	m
CAN	GS	"	<	1	H	X	n
CR	HT	-	|	2	I	Y	o
DC1	LF	#	=	3	J	Z	p
DC2	NAK	.	}	4	K	a	q
DC3	NUL	\$	>	5	L	b	r
DC4	RS	/	~	6	M	c	s
DEL	SI	%	?	7	N	d	t
DLE	SO	'	[	8	O	e	u
EM	SUB	*	@	9	P	f	v
ENQ	SYN	(	&	A	Q	g	w
EOT	SOH	+	)	B	R	h	x
ESC	STX	^	;	C	S	i	y
ETB	US	]	{	D	T	j	z

Non-Full ASCII Bar Code Chart

To correctly scan and interpret non-full ASCII bar codes, the reader must be in Code 39 Mixed-full ASCII or Non-full ASCII mode.

A 	L 	W 	7 
B 	M 	X 	8 
C 	N 	Y 	9 
D 	O 	Z 	+ 
E 	P 	0 	- 
F 	Q 	1 	\$ 
G 	R 	2 	/ 
H 	S 	3 	. 
I 	T 	4 	Space 
J 	U 	5 	% 
K 	V 	6 