

WelchAllyn[®]

SCANTEAM[®] 6180 WAND

Serial Interface/RS-232
Decoded Out Wand



Technical Manual

STATEMENT OF AGENCY COMPLIANCE

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Class B Compliance Statement

This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or television technician for help.

Caution: Any changes or modifications made to this device that are not expressly approved by Welch Allyn, Inc. may void the user's authority to operate the equipment.

Note: To maintain compliance with FCC Rules and Regulations, cables connected to this device must be *shielded* cables, in which the cable shield wire(s) have been grounded (tied) to the connector shell.

Canadian Notice

This equipment does not exceed the Class B limits for radio noise emissions as described in the Radio Interference Regulations of the Canadian Department of Communications.

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de la classe B prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.



The CE mark on the product indicates that the system has been tested to and conforms with the provisions noted within the 89/336/EEC Electromagnetic Compatibility Directive and the 73/23/EEC Low Voltage Directive.

European Contact: European Regulatory Manager
Welch Allyn Ltd.
28 Sandford Office Park
Foxrock, Dublin 18
Ireland

or

Welch Allyn Ltd.
The Lodge, Tanners Lane
Warrington, Cheshire WA2 7NA
England

Welch Allyn shall not be liable for use of our product with equipment (i.e., power supplies, personal computers, etc.) that is not CE marked and does not comply with the Low Voltage Directive.

Disclaimer

Welch Allyn[®] reserves the right to make changes in specifications and other information contained in this document without prior notice, and the reader should in all cases consult Welch Allyn to determine whether any such changes have been made. The information in this publication does not represent a commitment on the part of Welch Allyn.

Welch Allyn shall not be liable for technical or editorial errors or omissions contained herein; nor for incidental or consequential damages resulting from the furnishing, performance, or use of this material.

This document contains proprietary information which is protected by copyright. All rights are reserved. No part of this document may be photocopied, reproduced, or translated into another language without the prior written consent of Welch Allyn, Incorporated.

© 1999 Welch Allyn, Inc. All rights reserved.

Data Collection Web Address: <http://dcd.welchallyn.com>

Limited Warranty

Welch Allyn, Inc., hereby warrants its standard Decoded Output Scanner to be functional and free from manufacturing defects at the time of delivery. Welch Allyn, Inc. further warrants that it will replace or repair, at its option, any unit that fails to perform according to Welch Allyn's published specifications during a period of five (5) years from the time of shipment by Welch Allyn, Inc. to the user or the time it is purchased from any of Welch Allyn Inc.'s Authorized Distributors. Any attempt on the part of the user to disassemble or service the wand, except for tip replacement, shall void the warranty.

This warranty does not apply to products which have been damaged by improper handling, shipping or misuse. The warranty does not apply if, in the sole opinion of Welch Allyn, Inc., the unit has been damaged by accident, misuse, neglect, improper shipping or handling. Since the unit is sensitive to static discharges and electricity, the responsibility to protect it from static damage is solely that of the user. The warranty is valid only if the wand has not been tampered with, or serviced by any party unauthorized by Welch Allyn, Inc. as a repair facility.

THE WARRANTIES SET FORTH HEREIN ARE IN LIEU OF ANY AND ALL OTHER WARRANTIES EXPRESSED OR IMPLIED INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE BUYER ACKNOWLEDGES THAT NO OTHER REPRESENTATIONS WERE MADE OR RELIED UPON WITH RESPECT TO THE QUALITY AND FUNCTION OF THE SCANNER HEREIN SOLD.

In no event shall Welch Allyn, Inc. or its resellers be liable for any loss, inconvenience or damage whether direct, incidental, consequential or otherwise, and whether caused by negligence or other fault resulting from the breach of any express warranty except as set forth herein. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state or country to country.



Limited Warranty

TABLE OF CONTENTS

Statement of Agency Compliance Limited Warranty

Chapter 1 Introduction to the SCANTEAM 6180 Scanner

<i>Section</i>		<i>Page</i>
1.1	Introduction	1-1
1.2	Hardware Description	1-1
1.3	Software Description	1-2

Chapter 2 Operational Description

<i>Section</i>		<i>Page</i>
2.1	Chapter Objectives	2-1
2.2	Main Elements of the 6180 System	2-1
2.3	Operating Theory	2-2
2.4	Factors Affecting Scanner Performance	2-2
2.4.1	Scanner Illumination Source	2-2
2.4.2	Scanning Aperture	2-2
2.4.3	Depth of Field	2-3
2.4.4	Scanning Velocity	2-4
2.4.5	High/Low Density Bar Codes	2-4
2.4.6	Print Contrast	2-4
2.5	Interface Description	2-5
2.7	External Power	2-8

Chapter 3 Setup and Installation

<i>Section</i>		<i>Page</i>
3.1	Chapter Description	3-1
3.2	Preparation	3-1
3.3	Setup and Installation	3-1
3.4	Scanner Checks	3-2

Chapter 4 Programming the Scanner

<i>Section</i>	<i>Page</i>
4.1	Introduction 4-1
4.2	The Programming Menu 4-1
4.2.1	Programming Menu Pages 4-1
4.2.2	Bar Code Chart 4-3
4.3	Input/Output Parameters & Format Menu Page 4-6
4.4	Symbology Selection Menu Page 4-8
4.5	Message Format 4-9
4.6	Configuration Example 4-10
4.7	Configuring the 6180 Using WANDMENU 4-13
4.7.1	Installing WANDMENU 4-15
4.7.2	WANDMENU – Control Options 4-16
4.7.3	Programming Control 4-17
4.7.4	Making Menu Selections 4-18

Chapter 5 Maintenance and Troubleshooting

<i>Section</i>	<i>Page</i>
5.1	Scanner Maintenance and Service 5-1
5.2	Cleaning 5-1
5.3	Inspection 5-2
5.4	Troubleshooting 5-2
5.5	Obtaining Factory Service in the U.S. 5-3
5.6	Obtaining Factory Service in Europe 5-4
5.7	Obtaining Factory Service in Asia 5-4
5.8	Technical Support 5-5

Appendix

A Technical Specifications

A.1	Scanner Performance	B-1
A.2	Optical Specifications	A-1
A.3	Electrical Specifications	A-2
	Option 1: Powered by Host System	A-2
	Option 2: Powered by External Supply	A-3
	Option 3: Powered by External Supply	A-5
	Option 4: Powered by Host System	A-6
A.4	Environmental Specifications	A-7
A.5	Mechanical Specifications	A-7
A.6	Bar Code Symbol Specifications	A-9

Index

List of Illustrations

<i>Figure</i>		<i>Page</i>
Figure 1.1	SCANTEAM 6180 with External Power Plug	1-1
Figure 2.1	Aperture and Depth of Field	2-3
Figure 2.2	Range of Angle	2-4
Figure 2.3	SCANTEAM 6180 Input and Output Circuits	2-7
Figure 2.4	SCANTEAM 6180 Input and Output Circuit for the True RS-232 Scanner	2-7
Figure 4.1	Example of Programming Menu Page	4-2
Figure 4.2	Bar Code Chart	4-4
Figure 4.3	WANDMENU Screen	4-5

Preface

SCANTEAM 6180 Bar Code Wand Scanner is used in both retail and commercial environments. The retail environment includes point-of-sale uses, while the commercial environments include industrial type applications (e.g., time and attendance information gathering).

This technical manual is an extension of the SCANTEAM 6180 Programming Menu. The Programming Menu contains information and bar codes that you will use to set up your system to meet your needs. This manual provides you with additional, in-depth information about the options in the Programming Menu.

Chapter 1 provides a description of the 6180 scanner software and hardware.

Chapter 2 is an in-depth description of the operating system, explaining how the scanner works, and how it reads/decodes a bar code symbol. Scanner identification and scanning techniques are discussed.

Chapter 3 explains how to set up and install your scanner. Instructions to confirm scanner operation and to check bar code labels is provided.

Chapter 4 explains how to program your scanner to meet your specific needs. Refer to Chapter 4 for detailed information when you are using the 6180 Programming Menu. An optional programming technique using a Configuration Disk is described.

Chapter 5 explains how to maintain (clean and inspect), troubleshoot and obtain service and technical assistance for your 6180 scanner.

Appendix A is a guide to bar code basics and scanning techniques.

Appendix B provides information about scanner performance, optical, electrical, environmental, mechanical, and bar code label specifications.

Related Publications

Reading Between the Lines: An Introduction to Bar Code Technology

Craig K. Harmon and Russ Adams
© 1989 Helmers Publishing Inc.
174 Concord Street
Peterborough, NH 03458
(603) 924-9631

The Bar Code Book: Reading, Printing, and Specification of Bar Code Symbols

Roger C. Palmer
© 1989 Helmers Publishing Inc.
174 Concord Street
Peterborough, NH 03458
(603) 924-9631

Handbook of Bar Coding Systems

Harry E. Burke
© 1984 NCR Corporation
Van Nostrand Reinhold Company, Inc.
115 Fifth Avenue
New York, New York 10003

Automatic ID Resource Catalog

AIM USA Publications
634 Alpha Drive
Pittsburgh, PA 15238-2802
Fax: 412-963-8753
Phone: 412-963-8588

AIM "Guidelines on Symbology Identifiers," "Uniform Symbology Specifications" (USS), and other AIM resources from the address above.



INTRODUCTION TO THE SCANTEAM 6180 SCANNER

1

1.1 Introduction

The SCANTEAM 6180 Bar Code Wand Reader/Decoder is a convenient and cost effective way of adding bar code reading and decoding capability to bar code terminals and personal computers. The SCANTEAM 6180 has visible red illumination and a stainless steel housing.

The SCANTEAM 6180 reads and decodes nine (9) popular bar code symbologies and outputs the bar code data to any host having an RS-232 port using asynchronous serial ASCII format.

1.2 Hardware Description

The standard SCANTEAM 6180 unit consists of the wand body, a 6' (1.8m) coil (extended) or straight interface cord, and the 9-pin D metallized plastic shell terminating connector available with or without an external power plug.

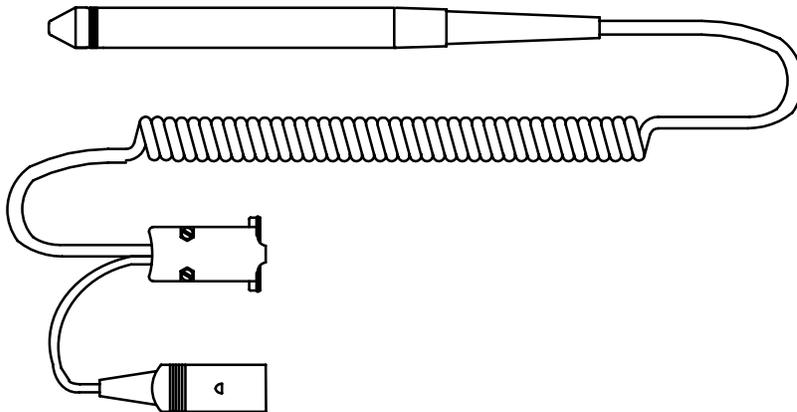


Figure 1.1 SCANTEAM 6180 with External Power Plug

The decoder output is designed so the wand will interface with any TTL logic level or RS-232 logic level asynchronous port. All 6180 wands are referred to as contact scanners since the tip of the scanner must be in or near contact with the bar code label in order to read.

The SCANTEAM 6180 may be ordered with high, medium or low resolution scanning optics to meet special requirements imposed by the label substrate and printing method or environmental factors that affect bar code label quality.

1.3 Software Description

The standard SCANTEAM 6180 is configured for specific user applications by scanning bar code symbols from the printed programming menu which is supplied with the unit.

The wand may also be programmed through a host download method which utilizes a PC based menu program. Software and instructions for implementing this optional programming technique are described in Section 4.6 of this manual.

The 6180 may be programmed to autodiscriminate among the following bar code symbologies and their variations: Codabar, Code 3 of 9, UPC, EAN/JAN, Interleaved 2 of 5, Code 2 of 5, MSI, Code 93, Code 128 and Code 11§.

In addition to the bar code symbology selections, certain input/output parameters, message format and communications protocol are programmable using the wand with the programming menu.

All programmable parameters are stored in a non-volatile memory resident in the wand where they are permanently retained in the event of power interruption to the decoder.

§ *This feature is not supported in all wand models/software revisions.*

2.1 Chapter Objectives

This chapter describes:

- Overview of how the SCANTEAM 6180 works, including scanning aperture, depth of field and scanning velocity.
- Reading and decoding a bar code symbol. Description of print contrast, high and low density bar code symbols.
- Discussion of RS-232 interface and external power options.

2.2 Main Elements of the 6180 Bar Code System

The major operational elements of the SCANTEAM 6180 include the scanner optics, the digitizing electronics and the decoding circuitry.

The key components of the scanner optical system are the illumination source (LED) and the illumination sensor (photodiode). Both the LED and photodiode are positioned directly behind a specially designed lens in the scanner body.

Cable connections are made directly to the board and exit the scanner body through a flexible strain relief at the end of the wand handle. The integral cable shield affords EMI and associated drain protection to output signals.

2.3 Operating Theory

The reading ability of the wand scanner is based on the detection of reflected illumination from the bars and spaces which form a bar code symbol.

During a typical scanning operation, the tip of the scanner is moved across the bar code symbol. Illumination from the LED is focused on the bar code symbol. This is absorbed by the dark colored bars and reflected by the lighter background.

The reflected portion re-enters the scanner through the lens where it is detected by the read sensor photodiode. The photodiode converts this into a series of analog pulses which are proportional in width to the bars and spaces in the symbol. These pulses are then digitized and sent to the microprocessor where they are decoded into the characters represented by the bar code symbol.

2.4 Factors Affecting Scanning Performance

The following factors influence reading performance and should be considered when selecting a contact scanner for a particular bar code application.

2.4.1 Scanner Illumination Source

Wand type scanners are equipped with a visible red (660nm) source. Red illumination is compatible with most printing inks including most thermal papers. Because it provides a visual indication to the operator that the scanner is functioning, red illumination is considered to be more user friendly. Visual feedback to the operator is an important consideration when making a scanner selection.

2.4.2 Scanning Aperture

Scanning performance is affected by the size of the scanning aperture and it is a significant factor to be considered when selecting a scanner. The scanning aperture defines the effective size of the area of the bar code symbol viewed by the scanner optics. It affects the relative ability of the scanning device to “see” or resolve bars and ignore printing defects.

Large aperture systems typically cannot resolve high density bar code or the small printing features (voids within bars or dark specs within the light areas) that small aperture systems would. Thus, they are more compatible with low density bar code and more tolerant of printing defects characteristic of poorly printed labels.

Small aperture systems (high resolution) are better able to resolve which makes them compatible with high density good quality symbol reading requirements.

The SCANTEAM 6180 is available with circular apertures ranging from 6 to 10 mil.

Most scanning applications can be satisfied with a 6 mil (high resolution) or a 10 mil (low resolution) aperture. When selecting an aperture, it is recommended that the aperture dimension be no less than 0.7 times the “X” (width of the narrowest bar code coding element) dimension to be read. An aperture size that is slightly smaller than the narrowest bar code element, 0.9 times “X,” provides optimum resolution of the bars and results in the generation of a digital signal which accurately represents the bar code. An 8 mil (0.2mm) aperture is often a good compromise when labels produced by different printing and label generation methods must be read with one scanner. In no case should the viewing aperture exceed 1.2 the “X” dimension.

Aperture	Depth of Field	X Dimension
6 mil	0 – .065 in. (0 – 1.6mm)	.0070 in. (.178mm)
8 mil	0 – .065 in. (0 – 1.6mm)	.0089 in. (.226mm)
10 mil	0 – .065 in. (0 – 1.6mm)	.0109 in. (.277mm)

Figure 2.1 Aperture and Depth of Field

2.4.3 Depth of Field

Depth of field is the maximum perpendicular distance from the scanner tip to the bar code symbol surface at which the scanner is capable of operating effectively. In general, most of the SCANTEAM 6180 scanners have a depth of field of 0.065 inches (1.65mm) with a symbol appropriate for the scanner.

In normal use, the wand is seldom held perpendicular to the surface of the bar code symbol. Rather, an operator tends to tilt the scanner. Useable scan angle is a function of tip geometry and depth of field. If the depth of field is too small, the scanner may fail to operate at extreme tilt angles (>35°).

Aperture	Range of Angle	X Dimension
6 mil	0 – 35°	.0070 in. (.178mm)
8 mil	0 – 35°	.0089 in. (.226mm)
10 mil	0 – 35°	.0109 in. (.277mm)

Figure 2.2 Range of Angle

2.4.4 Scanning Velocity

The wand will operate at scan velocities from 2 to 50 inches/second (5 to 127cm per second) when the minimum bar/space size exceeds 7 mils (0.18mm).

2.4.5 High Density vs Low Density Bar Code Symbols

Bar code density is a measure of the number of characters in a linear measure of bar code. The standard of measure is normally given in terms of the “X” dimension, the width of the narrowest bar code element. As bar code density increases, the width of the narrowest bar code element decreases. The scanning aperture should always be smaller than the narrowest element to assure optimum resolution and the generation of a digital signal which accurately represents the bar code.

2.4.6 Print Contrast

Print contrast is a measure of the relative difference in brightness between the bars and spaces of a symbol and is specified as the Minimum Reflectivity Difference (MRD). The MRD is the difference between the lowest minimum space reflectance value and the highest maximum bar reflectance value as measured across the entire symbol.

$$\text{MRD} = \text{Max} (R_b \text{ max}) - \text{Min} (R_s \text{ min})$$

where: $R_s \text{ min}$ = Minimum Space Reflectance
 $R_b \text{ max}$ = Maximum Bar Reflectance

The scanner will operate with a MRD as low as 37.5% with the proper aperture and appropriate symbol.

A complete description of bar code specifications for factors which affect overall bar code quality are provided in Appendix B.9.

2.5 Interface Description

The SCANTEAM 6180 transmits bar code data in a serial ASCII format (RS-232) and is designed to interface to any standard RS-232 asynchronous port.

The wand cable is offered with four (4) standard connector options. For Option 1, the interface cable will be terminated in a 9 pin D female connector. Power will be available on pin 9. If Option 2 is specified, the cable will be terminated in a 9 pin D female connector with a pigtailed 5 pin DIN female connector for power. For Option 3§, RTS/CTS lines are used and the interface cable will be terminated in a 9 pin D female connector. Power will be available on pin 9. If Option 4§ is specified, RTS/CTS lines are used and the cable will be terminated in a 9 pin D female connector with a pigtailed 5 pin DIN female connector for power. Pin assignments for each option are shown below. A complete wire color code/function description of the interface is provided in Appendix B.3.

Note: *Data bits and stop bits are not configurable on the 6180. The 6180 is always set up for data transmission at 7 data bits and 1 stop bit.*

§ *This feature is not supported in all wand models/software revisions.*

Option 1 – 9 Pin D:

Pin 2	Transmit (Data from the Wand)
Pin 3	Receive (Data sent to Wand)
Pin 5	Ground
Pin 9	+5VDC + 5%

Option 2 – 9 Pin D w/Pigtail Power Plug:

9 Pin D

Pin 2	Transmit (Data from the Wand)
Pin 3	Receive (Data sent to Wand)
Pin 5	Ground

Pigtail Power Plug

Pin 1	Ground
Pin 3	±5VDC+ 5%

Option 3§ – 9 Pin D, RTS/CTS:

9 Pin D

Pin 2	Tx: Transmit (Data from the Wand)
Pin 3	Rx: Receive (Data sent to Wand)
Pin 5	Ground
Pin 6	CTS
Pin 7	RTS
Pin 9	+5VDC + 5%

Option 4§ – 9 Pin D, RTS/CTS:

9 Pin D

Pin 2	Tx: Transmit (Data from the Wand)
Pin 3	Rx: Receive (Data sent to Wand)
Pin 5	Ground
Pin 6	CTS
Pin 7	RTS

Pigtail Power Plug

Pin 1	Ground
Pin 3	$\pm 5\text{VDC} + 5\%$

§ *This feature is not supported in all wand models/software revisions.*
Connector pin 2 is reserved for data transmitted from the wand to the host. It obeys RS-232 data formats, but uses 0 to +5V logic swings. It is in effect, TTL RS-232C logic. It is also available in true RS-232 levels.

Connector pin 3 is reserved for data sent to the wand. The wand can receive data either at RS-232 levels (-3V to -15V or +3V to +15V) or at logic levels (0 to +5V).

Schematic diagrams of the input and output circuits for the TTL logic (Pseudo RS-232) are shown in Figure 2.1.

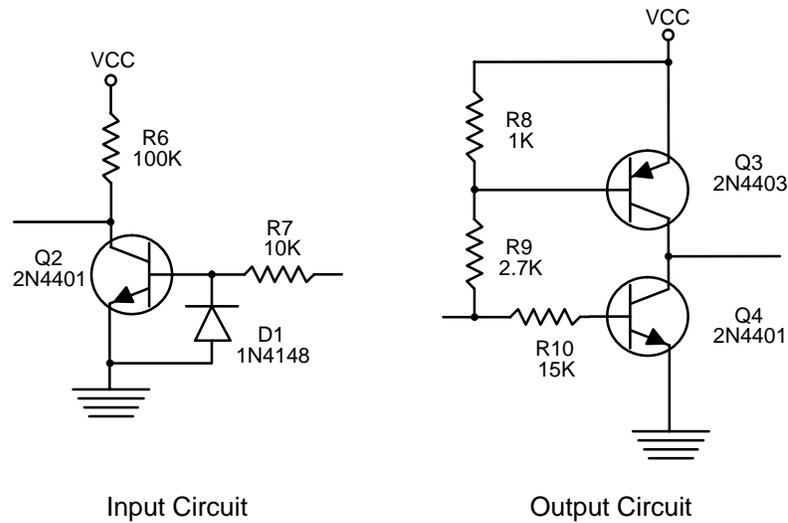


Figure 2.3 SCANTEAM 6180 Input and Output Circuits

Schematic diagrams of the input and output circuits for the true RS-232 levels are shown in Figure 2.2. The operation of the DS1275 chip is unique in that it “steals” current from the receive input when transmitting a negative swing. Since most serial communications ports remain in a negative state statically, using the receive signal for negative power greatly reduces current consumption.

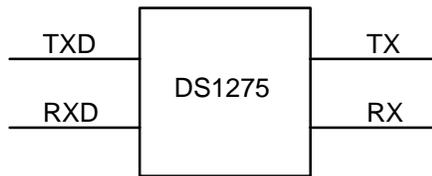


Figure 2.4 SCANTEAM 6180 Input and Output Circuit for the True RS-232 Scanner

2.6 External Power

Welch Allyn offers two options for supplying external power when it cannot be supplied by the host and the 9 pin D connector with pigtail power plug is ordered. A +5VDC transformer type power supply both with 5 Pin DIN male connectors that directly interface with the pigtail power plug may be ordered. The +5VDC power supply can be ordered to operate at 110VAC or 220VAC.

3.1 Chapter Description

This chapter describes:

- Unpacking the SCANTEAM 6180
- Connecting the SCANTEAM 6180
- Confirming scanner operation
- Checking bar code labels

3.2 Preparation

The SCANTEAM 6180 is shipped ready for use. Upon receipt, open the carton(s) and check the contents. Check the part numbers and confirm that each item on the packing list has been supplied.

Thoroughly inspect each component for possible shipping damage. Any damage should be reported immediately to the carrier who delivered the shipment. Damage claims due to handling during shipment should be placed directly with the carrier.

When all components have been identified and checked, prepare the wand for service using the following procedure.

3.3 Set-up And Installation

- 1) Position the host unit power switch to the “OFF” position.
- 2) Attach wand to host device.

If external power will be supplied by the host device, insert the wand 9-pin female D connector into the 9-pin RS-232 asynchronous port on the host system. Secure it in place by tightening the two retaining screws.

If an external power source is used, the 5-pin DIN connector (the pigtail) must be connected to the power source plug.

- 3) Restore power to the host unit by turning the power switch to the “ON” position.

3.4 Scanner Checks

1) Confirm Scanner Operation

The tip of the scanner should glow red indicating that the wand is operational.

2) Check Bar Code Labels

Before using any bar code scanner, make sure the label is of good quality and that the window area of your scanner is clean. This is very important because any dirt or specks in the bar code symbol or on the scanner optics may prevent it from reading accurately. Even a label that is smudged during printing or gets wrinkled when it is applied to an item can cause a reading problem.

This completes installation of the wand to the host system. The wand reader/decoder must now be configured to the particular decoding application.

Welch Allyn offers two programming methods. The standard programming technique involves using the wand to scan bar code symbols from a Programming Menu. An alternative programming method makes use of an optional Configuration Disk. The disk contains software (*WANDMENU*), which allows the user to select and download decoder parameters from the host using a PC menu program.

A description of all programmable parameters and the instructions for making decoder selections using these two programming methods are contained in Chapter 4.

4.1 Introduction

Before the SCANTEAM 6180 can be placed in operation it must be configured to the particular application. Either of two programming methods can be used.

The standard method supplied with the SCANTEAM 6180 unit makes use of the wand to scan bar code symbols from the Programming Menu. As programming sequences are decoded by the wand, the desired operating parameters and data format instructions which they represent are stored in non-volatile memory on the decoder printed circuit board.

An optional programming technique requires both the use of a special Configuration Disk available from Welch Allyn and a PC host to program the decoder. The disk contains software routines that permit the user to select and download decoder parameters from the host. The configuration program (*WANDMENU*) is driven by a PC. Operating parameters are selected using a menu displayed on the PC screen. *WANDMENU* software allows the user to simultaneously display the current status of all decoder parameters and to save a desired decoder configuration for use at a later time.

4.2 The Programming Menu

The complete SCANTEAM 6180 Programming Menu consists of three (3) pages: two Menu Pages and the Bar Code Chart. The two menu pages are labeled: INPUT/OUTPUT PARAMETERS & FORMAT and SYMBOLOGY SELECTIONS. These pages list the decoder parameters controlled from that menu page and indicate the scanning sequence required to make specific configuration selections. The symbols used to control the configuration process are printed on the Bar Code Chart.

4.2.1 Programming Menu Pages

The general operating parameters associated with each of the menu pages are listed below.

INPUT/OUTPUT PARAMETERS & FORMAT

Contains Baud rate, parity, message preamble/postamble definition, intercharacter delay, “Good Read” indication and append buffer

SYMBOLGY SELECTIONS

Contains both retail and industrial code selections and their variations. In addition, code variables such as maximum and minimum code length, check character, start/stop character and addenda/append options.

The Menu Page used to configure the decoder INPUT/OUTPUT PARAMETERS & FORMAT is shown in Figure 4.1.

SCANTEAM SRD-6180/SID-6280
Programming Menu

INPUT/OUTPUT PARAMETERS & FORMAT

scan



ENTER

scan



DEFAULT

scan



EXIT

USE THIS PAGE

- To select baud rate and parity.
- To add preambles, postambles, and/or code identification character to the bar code.
- To set intercharacter delay to a specific value.
- To control scanning indicator (blink).
- To enable the Append Buffer when Code 3 of 9 with append option is selected.
- To enable CTS handshake.

selections

variables

BAUD RATE	I	150	A	
		300	B	
		600	C	
		1200	D	
		2400	E	
		4800	F	
		9600	G*	
		19200	H	
PARITY	II	Mark	A	
		Space	B	
		Even	C*	
		Odd	D	
PREAMBLE (up to 5 chars)	III	STX	A	
		Code ID	B*	
		Other ASCII	C	00-7F
POSTAMBLE (up to 5 chars)	IV	ETX	A	
		CR	B*	
		LF	C*	
		Other ASCII	D	00-7F
INTERCHAR. DELAY (x5msecs)	V	No	A*	
		Yes	B	*00-99
APPEND BUFFER	VII	Enable		*Yes/No
RTS/CTS PROTOCOL	VIII			Yes/No*

NOTES:

(1) * Designates DEFAULT selections.

(2) See facing page for more information and examples.

Figure 4.1 Example of Programming Menu Page

Both Menu Pages follow a similar layout and list the selection of programmable parameters along with the parameter variables.

SELECTIONS/VARIABLES

These columns list the program–ming parameter Selections and identify the Variables which can be chosen to modify the default settings.

SCAN

These columns indicate which bar code symbol(s) on the Bar Code Chart (i.e., Roman Numeral, Letter or Number) that the user must scan in order to configure a particular decoder parameter to a desired value.

ENTER

At the top of each Menu Page is a symbol labeled ENTER which is unique to that Menu Page. The ENTER command “activates” that Menu Page, and must be scanned before configuring parameters shown on that page.

4.2.2 The Bar Code Chart

The SCANTEAM 6180 Bar Code Chart shown in Figure 4.2 is also part of the Programming Menu. It contains the printed bar code symbols which are scanned to program the desired selections.

BAR CODE CHART

USE THIS PAGE

- In combination with the adjoining menu pages to program the 6180.
- The bar codes on this page correspond to symbols in shaded areas on adjoining menu pages. SCAN these bar codes in the sequence indicated on menu page to program desired selections and variables.

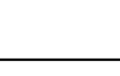
ROMAN NUMERALS	LETTERS	DIGITS	OTHERS
 I	 A	 0 (YES)	 ESCAPE
 XI	 B	 1 (NO)	 DEFAULT
 II	 C	 2	 W.A.
 III	 D	 3	
 IV	 E	 4	
 V	 F	 5	
 VI	 XV		
 VII	 XVI		

Figure 4.2 Bar Code Chart

Note that the chart contains symbol groupings that include ROMAN NUMERALS, LETTERS and NUMBERS. The sequence in which these symbols are scanned generates the programming instructions which enable or disable specific decoder functions.

The right hand column of the Chart contains three (3) bar code symbols labeled DEFAULT, ESCAPE and WA. When these symbols are scanned specific instructions are instantaneously sent to the wand.

The function of these commands is explained below.

DEFAULT

Scanning this symbol installs default values (indicated by *'s) at the active programming level. For example, if the DEFAULT symbol is scanned immediately following Page ENTER, it defaults the entire menu page. If it is scanned following a major category selection like Codabar, it will default that whole category. If DEFAULT is scanned following a subcategory selection such as Code 128/Minimum Length, it will default just that subcategory. Finally, if it is scanned immediately after scanning the WA symbol, all of the wand Selections and Variables (on both menu pages) will automatically default to those values indicated by the asterisk (*).

WA

As explained above, the WA symbol generates a global command. It is intended to be used in conjunction with the DEFAULT symbol to reset all wand decoder parameters to their default values. The sequence scan WA followed by scan DEFAULT will cause all Selections and Variables on both menu pages to reset to their default values.

EXIT

Scanning the EXIT symbol produces a command which can be used to terminate programming on either menu page. The EXIT symbol must be scanned before moving to or attempting to program on a different menu page. When it is scanned, all configuration instructions for parameters appearing on that page will be stored in memory.

ESCAPE

Scanning the ESCAPE symbol generates a command that will terminate a programming sequence before it is completed and without saving the configuration information. It can be used when a Selection and/or Variable has been scanned in error. The programming sequence must then be restarted.

4.3 INPUT/OUTPUT PARAMETERS & FORMAT Menu Page

This menu page is used to configure basic terminal operation. The scanning sequences described on this page permit the user to select baud rate and parity, specify message preamble(s) and/or postamble(s), set the value for intercharacter delay and enable the Append Buffer.

Baud Rate

Baud rate is a means of specifying data transmission speed. This programming selection permits the user to configure the wand for any of eight (8) values ranging from 150 to 19200 baud.

Parity

Parity provides a means of checking character bit patterns for validity. The wand can be configured to operate under Mark, Space, Even or Odd parity options.

Preamble

Preambles are assigned using the programming menu. When the Preamble selection is enabled, any combination of up to five identifiers are transmitted as a header immediately preceding scanned bar code data.

Preamble characters may include Start Transmission (STX), Code ID and the ASCII characters (00–7F). These characters will be transmitted in the order in which the selections are programmed. Both preamble and postamble menuing always start with a clean slate. Therefore, to clear all

preambles, it is necessary only to complete the programming sequence SCAN ENTER, SCAN III, SCAN EXIT.

If the Code ID is selected as a preamble, the wand will transmit a single lower case ASCII character to identify which symbology was decoded. For example, Code 3 of 9 is identified by a lower case “b,” while Code 128 is identified by a lower case “j.”

The code identifier for each bar code symbology is listed below and appears immediately following the symbology name on the Symbology Selection Menu Page.

SYMBOLGY	CODE ID
Codabar	a
Code 3 of 9	b
UPC	c
EAN	d
Interleaved 2 of 5	e
Code 2 of 5	f
MSI	g
Code 11	h
Code 93	i
Code 128	j

Note: *Code 11 is not supported in all wand models/software revisions.*

Postamble

Postamble(s) are programmable data identifiers which follow the bar code messages. Up to five (5) postambles including End Transmission (ETX), Carriage Return (CR), Line Feed (LF) and the ASCII characters (00– 7F) can be programmed. Postamble characters will be transmitted in the order in which they are selected. Since postamble selections also begin with a clean slate, the programming sequence SCAN ENTER, SCAN IV, SCAN EXIT will remove existing postambles from the decoder configuration.

Intercharacter Delay

An Intercharacter Delay may be assigned for outgoing messages. The delay is in milliseconds and can be set to any value between 1 and 99. If the Intercharacter Delay Variable “No” is programmed, the delay will be set to 0.

Append Buffer

This wand Selection controls the status of the Append Buffer. When enabled, the Append Buffer stores messages (for example from a “barboard”), until a) it overflows, or b) a symbol without Append or in a new symbology is scanned. When either of these events occur, the contents of the buffer are transmitted, followed by the most recent scan. The Append Buffer must be enabled (“Yes”), whenever the decoder is configured to read Code 93, Code 128 or Code 3 of 9 symbology with Append Option.

RTS/CTS Protocol

Note: *This feature is not supported in all wand models/software revisions.*

This selection enabled will require RTS/CTS Protocol for communications. Connector Option 3 or 4 must be selected to support this programming feature. Refer to page 2–7 or Appendix B.3 for information on Option 3 or 4.

4.4 SYMBOLOGY SELECTION Menu Page

This Menu Page is used to program decoding selections. The wand can be configured to recognize and decode up to nine (9) popular bar code symbologies by scanning the proper code enabling (Selection) symbols on this Programming Menu page. After a particular code has been enabled, scanning the associated (Variable) code(s) will further program that symbology’s decoding parameters.

Keep in mind that at power–up (or upon reset), the wand will automatically configure operating parameters to the last programmed values. Code options which are enabled (“Yes”) will become the active operating parameters unless they are changed by the proper configuration command. Code options with an asterisk (*) next to the (“No”) will automatically be disabled unless they are changed by the proper configuration command.

Note: *To obtain maximum security when scanning bar codes, it is recommended that only those symbologies actually being used be enabled. Symbologies not being used should be disabled. Additional data security can be achieved by programming the maximum and minimum character counts when they are known.*

Minimum Length

A two (2) number code which describes the minimum number of characters that will be permitted in the bar code message. The code length must always be represented by two digits. For lengths less than 10 characters, a zero (0) should be used as a filler (05).

Maximum Length

A two (2) number code which describes the maximum number of characters that will be permitted in the bar code message.

4.5 Message Format

The wand will transmit data automatically to the host as soon as a bar code symbol is scanned. Each data transmission consists of three main elements, 1) a *PREAMBLE*, 2) the *MESSAGE* consisting of the bar code data, and 3) a *POSTAMBLE*.

The actual content of the data transmission will depend upon the Preamble and Postamble characters and the decoded bar code information. The transmission format is shown below.

PREAMBLE *MESSAGE* *POSTAMBLE*

where: *PREAMBLE* = Assigned Preamble Character(s)

MESSAGE = Bar Code Data

POSTAMBLE = Assigned Postamble Character(s).

4.6 Configuration Example

The following example illustrates the proper programming sequence to configure wand parameters to specific operating values.

Example: Configure the SCANTEAM 6180 parameters to the following values:

Symbology:	Code 3 of 9 (Code 39)
Maximum Length:	14
Minimum Length:	8
Append Option:	Enabled
Start/Stop Character:	Included
Check Character:	Required
Check Character:	Transmit
Baud Rate:	4800
Parity:	Space
Preamble:	STX
	Code ID
Postamble:	ETX
Intercharacter Delay:	25 ms
Indicator Control:	Beep on Reset
	Beep on Good Read
Append Buffer:	Enabled

Refer to the Selections/Variables table on the INPUT/OUTPUT PARAMETERS & FORMAT and SYMBOLOGY SELECTIONS pages of the Programming Menu.

Program these operating parameters following the scanning sequence below.

FUNCTION	SELECTION	VARIABLE
Enter SYMBOLOGY SELECTION		
Menu Page	ENTER	
Set All Wand Parameters To DEFAULT Values	W.A.	DEFAULT

Scanning sequence continued on next page.

FUNCTION	SELECTION	VARIABLE
Enable Code 39	II	
Set Minimum Length		A
To 8		0
		8
Set Maximum Length		B
To 14		1
		4
Set S/S Characters		C
To Transmit		0 (Yes)
Set Check Character Required		D
To Yes		0 (Yes)
Set Transmit Check Character		E
To Yes		0 (Yes)
Set Append Option		G
To Yes		0 (Yes)
Disable CODABAR	I	1 (No)
Disable UPC	III	1 (No)
Disable EAN	IV	1 (No)
Disable Interleaved 2 of 5	V	1 (No)
Disable Code 2 of 5	VI	1 (No)
Disable MSI	VII	1 (No)
Disable Code 93	VIII	1 (No)
Disable Code 128	IX	1 (No)
Store programmed values by exiting the SYMBOLGY SELECTION		
Menu Page	EXIT	
Enter I/O PARAMETERS & FORMAT		
Menu Page	ENTER	
Set Baud Rate	I	
To 4800		F
Set Parity	II	
To Space		B

Scanning sequence continued on next page.

FUNCTION	SELECTION	VARIABLE
Set Preamble	III	
To include STX		A
To include Code ID		B
Set Postamble	IV	
To include ETX		A
Set Intercharacter Delay	V	
To Yes		B
To 25ms		2
		5
Set Indicator Control	VI	
Beep on Reset		A
To Yes		0 (Yes)
Beep on Good Read		B
To Yes		0 (Yes)
Set Append Buffer	VII	
To Enabled		0 (Yes)
Store programmed values by exiting the I/O		
PARAMETERS & FORMAT Menu Page	EXIT	

Note: *In the previous example, all desired operating parameters were scanned to illustrate the scanning process. In actual practice it would not be necessary to program those parameters which default to desired values (i.e., Append Buffer, Code ID, Transmit Start/Stop Characters, etc.).*

In addition, in order to maximize reading accuracy, all of the unused codes were disabled. When this protection is desired, it is necessary to disable each unused code, since all symbologies default to the “Yes” state.

Finally, note that ENTER and EXIT commands were used to initiate and terminate programming on each menu page.

4.7 Configuring the 6180 Using *WANDMENU*

The SCANTEAM 6180 can also be configured using the optional *WANDMENU* Programming Menu. This program can be run on any IBM/XT or IBM compatible PC which uses the DOS (Version 3.1 or later) system.

The *WANDMENU* Configuration Disk contains the software routines which enable the user to select from the same set of decoding parameters which appear on the SCANTEAM 6180 Bar Code Programming Menu.

The Configuration Disk contains the following files: **READ.ME**
WANDMENU.EXE **CODE39FA.EXE** **UNINSTAL.EXE**

Descriptions of the Configuration Disk files are given below.

READ.ME

Entering the command **C>A:TYPE READ.ME** from the DOS prompt will generate a display which explains the general use of each *.EXE file on the disk.

WANDMENU

This program allows you to accept, read, save and install desired configurations for the SCANTEAM 6180. Configuration data is transferred to the scanner through the PC's serial communication channel (COM1).

Command line options include: **/Bnn** – to set display background color (range = 0 to 7) **/Fnn** – to set display foreground color (range = 0 to 15) **/S** – to silence the key clicks. **/S/B** – to create monochromatic display and turn off the beep

The **/B** and **/F** options are useful for PC's that have a monochrome display which is able to emulate contrasting colors; for instance, an LCD display.

CODE39FA.EXE

This program installs a Full ASCII/Code 3 of 9 emulation program in the scanner. After CODE39FA.EXE has been run, the SCANTEAM 6180 will transmit any scanned label data (regardless of the symbology) in Code 3 of 9 format (the RS-232 data is inhibited). The CODE39FA.EXE program is transferred to the scanner through the PC's serial communication channel (COM1). To restore the original decoding protocol, the routine UNINSTAL.EXE must be run.

UNINSTAL.EXE

This program will remove the Full ASCII/Code 3 of 9 emulation capability from the scanner. When the UNINSTAL.EXE routine has been run, the SCANTEAM 6180 will revert to normal operation and transmit any scanned label data according to the designated symbology format(s). The UNINSTAL program is transferred to the scanner through the PC's serial communication channel (COM1).

XON/XOFF Feature

The SCANTEAM 6180 has an XON/XOFF capability that allows you to control data flow between the scanner and the PC using a software "handshake."

The command "DC1" (Hex 11) sent from the PC to the scanner will initiate communication and cause the scanner to transmit any buffered data and any data successfully decoded.

The command "DC3" (Hex 13) sent from the PC to the scanner will suspend the transmission of bar code data from the scanner.

4.7.1 Installing WANDMENU

To activate the **WANDMENU** Programming Menu, place the configuration disk in the “A” drive and from the DOS prompt initiate the program by entering:

C>A:WANDMENU <Return>

After a brief start-up, the Programming Menu shown in Figure 4.3 will be displayed on the screen.

```

***** SCANTEAM 6180 PROGRAMMING MENU 1.08 *****
WELCH ALLYN, INC., SKANEATELES FALLS, NY
LOAD_Settings  SAVE_Settings  READ_from_Wand  INSTALL_to_Wand  -EXIT-
BaudRate : 9600
Parity : SPACE
Preamble : [I.D.] -----
Postamble : <CR> <LF> -----
InterChrDelay : --NONE--
Indicators : Wake-Up_Blink ON      Good_Read_Blink ON      Blink_Scanner OFF
Features : AppendBufrr ON      PowersUp ON      Halt-on-Read OFF      Menuing ON

Codabar : ON      Length = 01-48      S/S INCL
Code 39 : ON      Length = 00-48      S/S INCL      CC NOT REQ'D      NORMAL      Apnd OFF
UPC Code : ON      (-A & -E)      UPC-E Compr's'd      #Sys INCL      CheckDigit INCL
EAN Code : ON      (-8 & -13)      <Both UPC&EAN>>>>      2-Dig_Addm ON      5-Dig_Addm ON
Intr 2/5 : ON      Length = 02-64      CheckDigit NOT_REQ'D
Reg 2/5 : ON      Length = 01-64
MSI Code : ON      Length = 04-48
Code 93 : ON      Length = 00-60
Code 128 : ON      (-All- Modes)      Length = 00-80      Leading <FNC1> NOT_REQ'D
Code 11 : ON      Length = 01-48      2 Check Digits      OFF      Xmit Check Char.      OFF

```

OPERATION: Use ▲ ► ▼ ◀ to MOVE Cursor, ◀ to CHANGE Entry.

Figure 4.3 WANDMENU Programming Menu Screen

Note: If you are using a monochromatic terminal, the LOAD option position on the menu display may not appear highlighted. If it is not, re-enter the **WANDMENU** command followed by \B as shown below:

C>A:WANDMENU/B <Return>

Note that the menu consists of two main sections. The upper section is the “control line.” It contains the five (5) menu control options: LOAD, SAVE, READ, INSTALL and EXIT which allow the user to set-up, save, and install a desired configuration, to display and save a wand’s own settings (even if they were set using the bar code Programming Menu) and to copy one wand’s setting to other wands.

The lower part of the screen displays the full set of programmable decoder selections. They include the same communications parameters and symbology/code options that are listed on the Bar Code Programming Menu. Using this menu, the user can enable or disable certain symbologies, add preambles and/or postambles to bar code data, specify message length/format and control wand indicators and operating features.

4.7.2 WANDMENU – Control Options

Control options are activated by using the (◀) and (▶) number pad keys to move the cursor left or right along the control line until the desired option is highlighted. The function of each menu control is explained below:

LOAD_Settings

This control allows the user to load a previously SAVED configuration onto the screen. When the LOAD Setting mode is highlighted and the ENTER key is first depressed, the user will be prompted for a file name (FILENAME =). To continue, the user should enter the file name or depress the ENTER key. LOADING the file named “DEFAULT” causes default settings to be loaded. Attempting to LOAD a non-existent file will result in an error message.

SAVE_Settings

This mode allows the user to save (store) a certain decoder configuration. When this control option is highlighted and the ENTER key is depressed the user will be prompted to enter a file name (FILENAME =) into which the configuration (those values displayed on the screen) will be saved.

READ_from_Wand

This mode allows the user to determine the existing Wand configuration. When this control option is highlighted and the ENTER key is depressed the value(s) of decoding parameters presently programmed in the Wand will be displayed in the appropriate menu location. You will be prompted to identify the serial port (COM1 or COM2) the 6180 is attached to.

INSTALL_to_Wand

This control mode is used to program the Wand to desired operating parameters. When this option is highlighted and the ENTER key is depressed, the Wand configuration will be programmed to the decoding selections and variables displayed on the Menu. You will be prompted to identify the serial port (COM1 or COM2) the 6180 is attached to.

-EXIT-

This command will terminate the *WANDMENU* routine. When EXIT is highlighted and the ENTER key is depressed, control of the Programming Menu will end and the DOS prompt will be displayed.

4.7.3 Programming Control

The programming menu is controlled from the PC keyboard using the (◀), (▶), (▲), (▼) arrows on the number pad and the ENTER key. The arrow keys move you around the screen and ENTER toggles through acceptable setting *except* in a few special cases which will be explained later in this section.

The active menu element, (the control option and the specific decoder parameter) is indicated by the position of the cursor. A decoder operating parameter (selection and variable) must be highlighted before it can be changed.

Arrow Keys

In addition to moving the cursor around the menu to the desired position, in certain positions, the (▲) and (▼) arrows control a counter which causes that particular menu field to increment through the range of acceptable programming selections.

For example, when the cursor is positioned so Minimum Code Length is highlighted, depressing the (▲) key will cause the menu to sequentially display the complete range of allowable minimum character values for that particular symbology.

ENTER Key

The ENTER Key also performs several functions. It is used to: 1) initiate the highlighted function, 2) toggle certain menu selections ON or OFF, and 3) cycle through a range of certain menu parameters.

Toggle – The ENTER key will “toggle” ON/OFF menu selections such as wand Indicators and Features, individual symbologies, and bar code variables such as start/stop and check characters.

Cycle – Depressing the ENTER key when the cursor is positioned at Baud Rate, Parity and Intercharacter Delay will cause the menu to cycle (increment) through the range of allowable values for those parameters.

Record – When a decoder selection has been made and the ENTER key is depressed the value displayed at the highlighted menu selection will be temporarily stored and the cursor will be freed to advance to the next menu selection.

For example, if a Preamble consisting of STX and Code ID characters has been specified, depressing the ENTER key will cause those values to be stored. The (▼) key can then be used advance the cursor to the next menu selection, Postamble.

4.7.4 Making Menu Selections

The following sections explains the functions of the ENTER and the four arrow keys as they relate to specific menu selections.

Start-Up

At start-up, the cursor will automatically default to the LOAD Settings control option and it will be highlighted. Depressing the (▼) once will move the cursor down the menu to the BaudRate position. Note that the Default value for baud rate is 9600.

Baud Rate

The following example explains the use of the ENTER key to increment menu Baud Rate selections and configure the Wand to operate at 2400 baud.

When the cursor has been positioned on the BaudRate menu line depressing the ENTER key will cause the baud rate to cycle through allowed values. For example, from the default setting of 9600 baud, depressing the ENTER key six (6) times will cause the rate to increment to 2400 baud.

To record this programmed value simply advance the cursor to the next menu line by depressing the (▼) key. The baud rate setting which is displayed can then be SAVED or INSTALLED in the wand by using the appropriate control option.

In a similar manner, the ENTER key is used to increment the menu selections Parity and Inter-Character Delay through their range of available values.

Preamble/Postamble

Just like configuring with the Bar Code Chart up to five (5) preamble and postamble characters may be added to bar code messages. The (▼) or (▲) keys are used to position the cursor on the desired menu line.

Note that the default value for the first Preamble character is Code ID, [ID] and that all the remaining preamble selections are vacant.

The ENTER key is used to specify which of the preamble or postamble characters will be programmed. Once a preamble/postamble position is “active,” the (▲) and (▼) keys are used to increment that preamble and postamble selection through the range of available values.

To change the default value or to program additional preamble characters depress the ENTER key. The first character, [ID], will be highlighted indicating it is an “active” element.

Depressing the (▲) or (▼) keys will increment the first preamble character through the full range of acceptable characters. When the desired value is displayed, move the cursor to the second preamble position (if a second preamble character is required) by depressing the ENTER key.

Both the first and second preamble character positions will now be highlighted. The second preamble character can now be selected by using the (▲) or (▼) keys to increment the characters until the desired value is displayed.

The remaining preamble characters (if desired) should be selected using the same technique. When the desired preamble is displayed, depressing the ENTER key will cause the recorded values to be displayed with vacant preamble positions indicated by (--).

When the preamble/postamble has been programmed, the cursor can be moved to a different menu line by depressing the (▲) or (▼) key.

Indicators

The following example explains the use of the ENTER to “toggle” decoder Indicator functions “Wake-Up Blink” and “Good Read Blink” ON and OFF. Both of these wand Indicator selections default to the ON state at start-up. Use the (▼) or (▲) key to position the cursor at the Indicator menu line.

The selection “Wake-Up Blink ON” will remain highlighted indicating it is the “active” menu element. Depressing the ENTER key once will cause the selection to “toggle” to Wake-Up Blink OFF, the disabled state. Depressing the (►) key will move the cursor to the “Good Read Blink” selection. This selection can also be “toggled” ON or OFF using the ENTER key. Remember, that the “Blink Scanner” selection must also be ON (enabled) whenever the “Wake Up” or “Good Read” indicator functions are desired.

When Indicator selections have been made, leave the Indicator menu line by depressing the (▼) key. The cursor will move down to the menu line labeled Features, and the selected indicator states will be displayed.

The same ENTER/“toggle” technique is used to configure Wand Features and the message format options such as Start/Stop CHAR, and Check CHAR, which are associated with each of the bar code symbologies.

Symbology and Code Option Selections

The Default setting for *all* bar code symbologies is ON. Individual symbologies can be toggled ON/OFF by depressing the ENTER key. In the case of UPC, EAN and Code 128, the ENTER key is used to cycle these symbologies ON/OFF through all acceptable combinations.

The (◀) and (▶) keys move the cursor left and right to the individual code option selections. The (▲) and (▼) keys are used to position the cursor on the desired symbology line and increment to minimum and maximum word length through the range of available values.

Code Length – When the cursor is positioned so the *complete* length option (i.e., Length = 01–48) is highlighted depressing the ENTER key once will cause the minimum character length to become active (highlighted). Use the (▲) and (▼) keys to increment to the desired value. Then depress the (▶) key to position the cursor at the maximum character length.

When this menu position is highlighted, depress the (▲) key to increment to the desired value. After the proper minimum and maximum code lengths are displayed, depress the ENTER key. The *complete* length option will again be highlighted and the programmed value will be retained. If additional code options are to be selected, move the cursor to the desired position using the (▶) key.

Code Options – All of the code options (such as S/S, CC, etc.) are selected by “toggling” them ON or OFF using the ENTER key. Movement between code options is accomplished using the (▶) and (◀) keys.



5.1 Scanner Maintenance And Service

All Welch Allyn SCANTEAM 6180 units are designed to provide reliable and efficient operation with a minimum of care. Although specific maintenance is not required, the following periodic checks will contribute significantly to dependable scanner operation.

5.2 Cleaning

All Welch Allyn SCANTEAM 6180 units are designed to provide reliable and efficient operation with a minimum of care. Although specific maintenance is not required, the following periodic checks will contribute significantly to dependable scanner operation.

The sapphire tip is designed to be maintenance free, but may be cleaned when necessary. The tip of the scanner must be kept clean to assure high first pass reading performance. Since a dirty tip can impair scanning performance, the tip should be examined whenever scanning performance begins to degrade or if the tip has become visibly dirty.

If the tip becomes dirty, it should be cleaned by wiping with a soft cloth or facial tissue that has been dampened with a mild detergent and water solution. The scanner enclosure can also be cleaned using the same procedure.

Note: *DO NOT use abrasive tissues or wipers as these will scratch the tip. NEVER use solvents (ie. alcohol or acetone) on the tip or to clean molded handle scanners since these may damage the finish.*

5.3 Inspection

Cords And Connectors

The scanner cord should be inspected periodically for wear and other signs of damage. A badly worn cord may interfere with the proper operation of the unit and may require replacement of the scanner. The scanner connector can be repaired/replaced by Welch Allyn.

Scanner Case

The scanner enclosure should also be routinely examined for signs of damage. A badly dented enclosure may contact internal components and result in damage to or malfunction of the unit.

5.4 Troubleshooting

If the scanner fails to operate properly, perform the following checks:

- 1) Check the scanner interface cable connection to make sure it is properly attached to the host P.C.
- 2) Confirm that the decoder is properly configured for the bar code symbology.
- 3) Inspect the quality of the bar code symbols that are being used. Symbols that are of a low contrast, scratched or otherwise defaced may cause scanning problems. To verify scanner operation, test the system with a high quality bar code symbol. As an additional check, verify the quality of bar code symbols with a bar code verifier such as the Quick Check, available from Welch Allyn.
- 4) Check the condition of the scanner tip. If the tip is scratched, the scanner may not read properly. If the tip is broken or cracked, the optics may also become damaged by dust or other foreign matter. Should either of these conditions be present, replace the scanner tip.

The tip can be removed by inserting a thin coin into the tip locking ring and prying it off the end of the scanner.

Do not touch or make contact with the exposed lens surface as permanent damage to the scanner optics may result.

Welch Allyn recommends keeping a supply of spare tips on hand. If replacing the tip does not correct the scanning problem, it may be necessary to replace the entire wand unit.

Note: *Other than the replaceable tip, the wand scanner contains no user serviceable parts and, therefore, the scanner case should not be opened. Opening the scanner voids the warranty.*

If proper wand operation cannot be obtained after performing these checks, factory service may be required.

5.5 Obtaining Factory Service in the United States

Welch Allyn provides service for all its products through a service center located at its manufacturing facilities in Skaneateles, New York. To obtain warranty or non-warranty service, return the unit to Welch Allyn (postage paid) with a copy of the dated purchase record attached.

Please contact the Welch Allyn Product Service Department at the address/telephone number listed below to obtain a Return Material Authorization number (RMA #).

Welch Allyn, Inc.

Data Collection Division
Product Service Department
4619 Jordan Road
P.O. Box 187
Skaneateles Falls, New York 13153-0187

Product Service Department
Telephone: (315) 685-4278 or 685-4360
Fax: (315) 685-4156

5.6 Obtaining Factory Service in Europe

For service in Europe, please contact your Welch Allyn representative (at appropriate address below) or your local distributor.

Welch Allyn, Ltd.

Block 1, Bracken Business Park
Sandyford
Co Dublin
Ireland

Telephone: Int+353-1295-0750

Fax: Int+353-1295-6353

U. K. Office

Dallam Court Dallam Lane
Warrington, Cheshire WA2 7LT
England

Telephone: Int+44 1925 240055

Fax: Int+44 1925 631280

5.7 Obtaining Factory Service in Asia

For service in Asia, please contact your Welch Allyn representative (at address below) or your local distributor.

Welch Allyn, Hong Kong Office

10/F Tung Sun Commercial Centre
194-200 Lockhart Road
Wanchai, Hong Kong

Telephone: Int+852-2511-3050 *or* 2511-3132

Fax: Int+852-2511-3557

5.8 Technical Support

If you need assistance installing or troubleshooting your scanner, please call your Distributor or the nearest Welch Allyn technical support office.

North America:

Telephone: (315) 685-2476 (8am to 6pm EST)
Fax: (315) 685-4960
E-Mail: dcd_techsupt@mail.welchallyn.com

Europe:

United Kingdom
Telephone: Int+44 1925 240055
Ireland
Telephone: Int+353-1216-0070

Asia:

Telephone: Int+852-2511-3050 *or* 2511-3132



TECHNICAL SPECIFICATIONS

A

A.1 Scanner Performance

Bar/Space Deviation:

While scanning appropriate bar code symbols, the first bar elongation and inner bar/space errors over the depth of field are defined as follows.

First Bar Elongation: $\leq +0.006$ inch (0.15mm)
 -0.002 inch (0.05mm)

Inner Bar/Space Error: $\leq +0.002$ inch (0.05mm)

A.2 Optical Specifications

Effective

Scanning Aperture: 6 – 10 mil

Light Source: Red LED (Wavelength = 660 nm)

Depth of Field:

Aperture	Depth of Field	X Dimension
6 mil	0 – .065 in. (0 – 1.6mm)	.0070 in. (.178mm)
8 mil	0 – .065 in. (0 – 1.6mm)	.0089 in. (.226mm)
10 mil	0 – .065 in. (0 – 1.6mm)	.0109 in. (.277mm)

Tilt Angle:

Aperture	Range of Angle	X Dimension
6 mil	0 – 35°	.0070 in. (.178mm)
8 mil	0 – 35°	.0089 in. (.226mm)
10 mil	0 – 35°	.0109 in. (.277mm)

A.3 Electrical Specifications

The scanner will function but may not operate within the specified tolerances if the operating voltages indicated below are exceeded.

Operating Voltage: 4.5 VDC – 5.5 VDC

Operating Current: Maximum 35 mA
Typical 30 mA

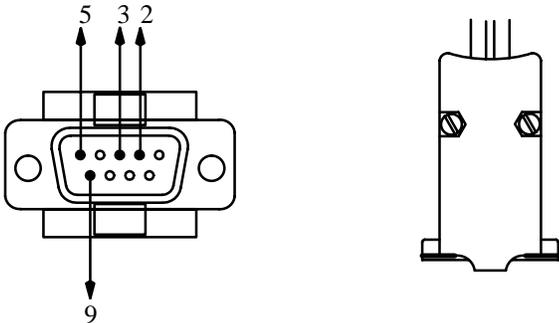
Power Supply

Noise Rejection: Withstands up to 100mV p-p noise and ripple

A.3 Electrical Specifications (continued)

Option 1: Power Supplied by Host System

Connector Size/Type: RS-232 Port 9 pin female
type D metallized plastic shell



Pin Assignments

Pin	Color Code	Signal	Function
1			Not Used
2	Blue	TX	Transmit Data
3	Black	RX	Receive Data
4			Not Used
5	White	GRND	Ground
6			Not Used
7			Not Used
8			Not Used
9	Red	+5VDC	Power to Scanner
Shell	Braid	Drain	Shield (EMI/RFI)◆

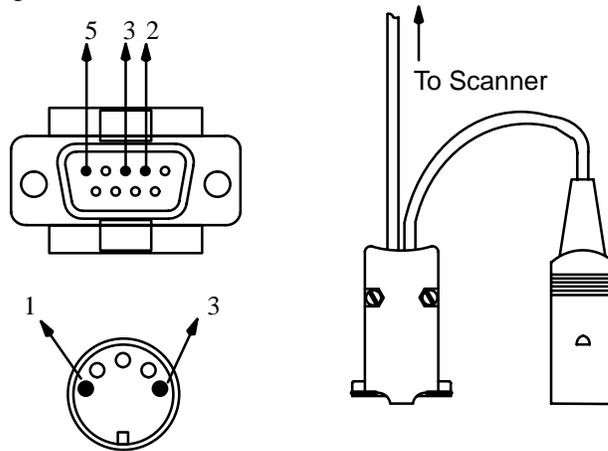
◆ **Shield Isolation:** The resistance between the shield and the power supply common termination exceeds 1 meg ohm. The flashover voltage exceeds 40VDC. A 10KHz AC signal with an amplitude of 1.0 pp can be placed between the shield and the common termination with no operational affect.

A.3 Electrical Specifications (continued)

Option 2: Power Supplied by External Supply

Connector Size/Type: RS-232 Port 9 pin female type D Metal shell with 5 pin DIN female

Pigtail



Pin Assignments

5 Pin DIN Connector

Pin	Color Code	Signal	Function
1	White	GRND	Ground
2			Not Used
3	Red	+5VDC	Power to Scanner
4			Not Used
5			Not Used
Shell	Braid	Drain	Shield

9 Pin D Connector Pin Assignments on next page.

A.3 Electrical Specifications, continued

Option 2 – continued

Pin Assignments

9 Pin D Connector

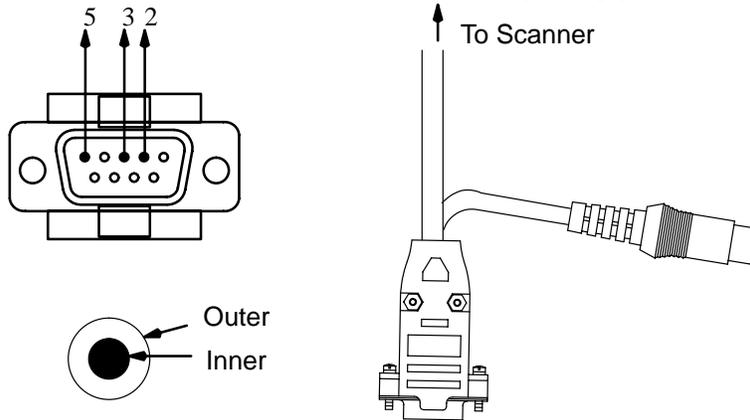
Pin	Color Code	Signal	Function
1			Not Used
2	Blue	TX	Transmit Data
3	Black	RX	Receive Data
4			Not Used
5	White	GRND	Ground
6			Not Used
7			Not Used
8			Not Used
9			Not Used
Shell	Braid	Drain	Shield (EMI/RFI)◆

◆ **Shield Isolation:** The resistance between the shield and the power supply common termination exceeds 1 meg ohm. The flashover voltage exceeds 40VDC. A 10KHz AC signal with an amplitude of 1.0 pp can be placed between the shield and the common termination with no operational affect.

A.3 Electrical Specifications, continued

Option 3: Power Supplied by External Supply

Connector Size/Type: RS-232 Port 9 pin female type D Metal shell with barrel connector power pigtail



Pin Assignments

Barrel Connector

Pin	Function
Inner	+5VDC
Outer	Ground

9 Pin D Connector

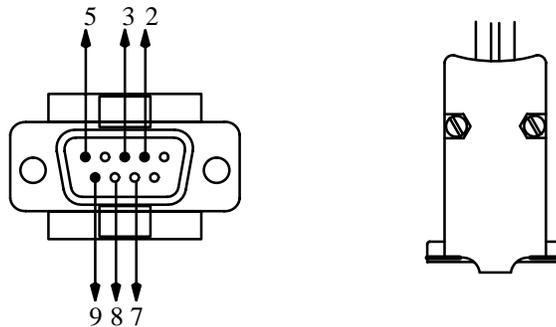
Pin	Color Code	Signal	Function
1			Not Used
2	Blue	TX	Transmit Data
3	Black	RX	Receive Data
4			Not Used
5	White	GRND	Ground
6			Not Used
7			Not Used
8			Not Used
9			Not Used
Shell	Braid	Drain	Shield (EMI/RFI)◆

◆ **Shield Isolation:** The resistance between the shield and the power supply common termination exceeds 1 meg ohm. The flashover voltage exceeds 40VDC. A 10KHz AC signal with an amplitude of 1.0 pp can be placed between the shield and the common termination with no operational affect.

A.3 Electrical Specifications (continued)

Option 4: Power Supplied by Host System

Connector Size/Type: RS-232 Port 9 pin female
type D metallized plastic shell



Pin Assignments

Pin	Color Code	Signal	Function
1			Not Used
2	Blue	TX	Transmit Data
3	Black	RX	Receive Data
4			Not Used
5	White	GRND	Ground
6			Not Used
7	Yellow	CTS	Clear to Send
8	Green	RTS	Request to Send
9	Red	+5VDC	Power to Scanner
Shell	Braid	Drain	Shield (EMI/RFI)◆

◆ **Shield Isolation:** The resistance between the shield and the power supply common termination exceeds 1 meg ohm. The flashover voltage exceeds 40VDC. A 10KHz AC signal with an amplitude of 1.0 pp can be placed between the shield and the common termination with no operational affect.

A.4 Environmental Specifications

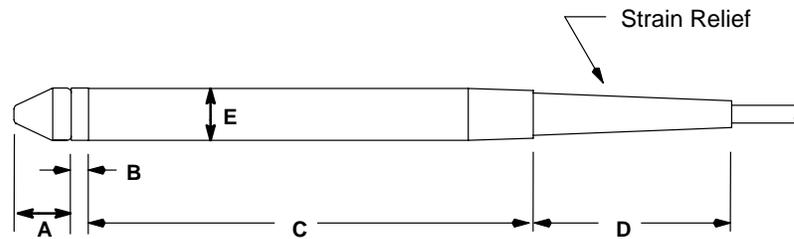
Operating Temperature:	-4° F to +122° F (-20° C to +50° C)
Storage Temperature:	-40° F to +158° F (-40° C to +70° C)
Relative Operating and Storage Humidity:	10% to 95% (non-condensing)
Shock:	Sustains 3 foot (91cm) drop to a non-yielding surface
ESD:	17.5 KV to any external surface
Ambient Illumination:	3,000 Lux fluorescent (maximum) 1,500 Lux incandescent (maximum)
Barometric Pressure:	101,000 to 69,000 Pascals (Sea level to 3000 meters)
Mean Time Between Failure (Ground Benign):	128,090 hrs.

A.5 Mechanical Specifications

Weight:	7 ounces (196 grams) with cord (max.)
Interface Cable:	6 foot (1.8m) coiled cord
Cord Flexure:	Cord-scanner strain relief withstands in excess of 1,000,000 flexures of +90 degree flexure while stressed with a weight of 6.7.
Interface Connector:	RS-232 Port 9 pin female type D metallized plastic shell
	External Power Source Connector:
	5 pin DIN female Pigtail
	9 pin D barrel connector Pigtail

A.4 Environmental Specifications (continued)

Scanner Dimensions:



Dimension Chart

A	.41 ± .01 in. (10.4 ± .3mm)
B	.11 ± .02 in. (.28 ± .05mm)
C	5.1 ± .1 in. (130 ± 3mm)
D	1.9 ± .2 in. (48 ± 5mm)
E	.5 ± .01 in. (12.7 ± .3mm)

A.6 Bar Code Symbol Specifications

All bar code symbols should satisfy the appropriate AIM Uniform Symbology Specification.

Background Substrate

The bar code symbol should be printed on material which is reflective and has a matte (not glossy) finish. A background diffuse reflectance of at least 70% to 80% is desirable for optimum contrast.

Ink Color and Type

The inked bars should not exceed 25% reflectance at the wavelength which is being used for reading, whether printed with black ink or colored ink. The reflectance value should not vary more than 5% within the same character. The type of ink should be compatible with the type of illumination in the optical scanner. If a scanner with an infrared light source is being used, the ink in the code must be IR absorptive (typically carbon based). Otherwise, the IR would “see through” the ink and be reflected to the sensor as if from a completely white surface.

VOIDS and Specks

The code should be printed clearly, free of voids, specks, blemishes and lines which could “fool” the scanner. Specks or blemishes in the white spaces, or false or missing bar sections could be interpreted by the reading equipment as part of the code. Generally, the width of such flaws is more serious than the height. Code symbols should be rejected if these defects are present.

Definition

The bars in the bar code symbol should be well defined. Their edges should not be rough or fuzzy, so that the bars and spaces have the proper widths intended for the bar code symbology used. Since a scanner’s aperture and resolution are chosen to comply with these widths, definition should be sharp and consistent.

Contrast

Background reflectance (that of the substrate on which the codes are printed) should always provide a good contrast relative to the ink reflectance (that of the code bars). The difference between the two should be at least 37.5% at the wavelength used for reading.

Tolerance

The ratio of the widths of bars and spaces in a bar code symbol must conform to the appropriate AIM bar code specifications and can cause problems if not correct throughout the bar code. Problems can occur when bar edges are smeared or rough, or when they exhibit voids.

INDEX

A

AIM Publications, v

B

Bar Code Symbol Specifications,
A-9

Background Substrate, A-9

Contrast, A-10

Definition, A-9

Ink Color and Type, A-9

Tolerance, A-10

Voids and Specks, A-9

Bar Code Symbology, 1-2

C

Cleaning, 5-1

E

Electrical Specifications, A-1

Connector Pin Assignments

Power from External Supply,
A-3, A-5

Power from Host, A-2, A-6

Operating Current, A-1

Operating Voltage, A-1

Power Supply Noise Rejection,
A-1

Environmental Specifications,
A-7, A-8

Ambient Illumination, A-7

Barometric Pressure, A-7

ESD, A-7

Humidity, A-7

Mean Time Between Failure,
A-7

Operating Temperature, A-7

Shock, A-7

Storage Temperature, A-7

External Power, 2-8

F

Factory Service, 5-3

See also Warranty Information

H

Hardware Description, 1-1

I

Inspection, 5-2

Cords and Connectors, 5-2

Scanner Case, 5-2

Interface Description, 2-5

Input and Output Circuits, 2-7

Option 1, 2-5

Option 2, 2-5

Option 3, 2-6

Option 4, 2-6

M

Main Elements of 6180, 2-1

Maintenance and Service, 5-1
See also Cleaning and Inspection

Mechanical Specifications, A-7
Cord Flexure, A-7
Interface Cable, A-7
Interface Connector, A-7
Scanner Dimensions, A-8
Weight, A-7

N

Non-Volatile Memory, 1-2, 4-1

O

Operating Theory, 2-2
Operational Description, 2-1
Optical Specifications, A-1
Depth of Field, A-1
Light Source, A-1
Tilt Angle, A-1

P

Programming Menu, 4-1
Bar Code Chart, 4-3
Configuration Example, 4-10
Input/Output Parameters &
Format, 4-6
Append Buffer, 4-8
Baud Rate, 4-6
Intercharacter Delay, 4-7
Parity, 4-6
Postamble, 4-7
Preamble, 4-6
Code ID, 4-7
RTS/CTS Protocol, 4-8
Message Format, 4-9

Programming Menu Pages, 4-1
Symbology Selection, 4-8
Maximum Length, 4-9
Minimum Length, 4-9
Programming the Scanner, 4-1

R

Related Publications, v

S

Scanner Checks, 3-2
Check Bar Code Labels, 3-2
Confirm Scanner Operation,
3-2
Scanner Dimensions. *See*
Mechanical Specifications
Scanner Performance, A-1
Scanning Performance Influences,
2-2
Depth of Field, 2-3
High Density Bar Codes, 2-4
Illumination Source, 2-2
Low Density Bar Codes, 2-4
Print Contrast, 2-4
Scanning Aperture, 2-2
Scanning Velocity, 2-4
Set-Up and Installation, 3-1
Software Description, 1-2

T

Technical Specifications, A-1
Troubleshooting, 5-2

W

WANDMENU Configuration
Disk, 4-13
File Listing, 4-13

WANDMENU program, 4-1,
4-13
Control Options, 4-16
Installation, 4-15
Making Menu Selections, 4-18

Programming Control, 4-17
Programming Menu Screen,
4-15
Warranty Information, i

WelchAllyn[®]

Data Collection Division
4619 Jordan Road
P.O. Box 187

Skaneateles Falls, New York 13153-0187

6180/TM Rev F