I-O 4440 BarCode Interface
for
Parallel/Serial Specialty Printers such as
Bar Code Label Printers and Card Embossers

User's Guide

Version AA3

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1 INTRODUCTION

The I-O 4440 BarCode Interface is a powerful yet easy-to-operate printer interface. The interface contains a multitude of features. It includes specialized software to enable it to print its self test and diagnostic such as buffer dumps on selected bar code printers from ZEBRA, DATAMAX, SATO, TEC, INTERMEC, or MICROCOM, as well as using a generic CR/LF format.

The I-O 4440 interface is a twinax/coax interface which enables most ASCII parallel or serial bar code printers as well as other specialty printers, to directly attach to an IBM AS/400 or System/3X twinax host system, or IBM 3270-type coax host system. The interface automatically adjusts to the host environment by sensing which host adapter cable has been attached.

The interface comes in either a Centronics compatible parallel or RS-232 serial configuration. Its low power consumption (less than 80 mA) allows the interface to be used with no external power supply when connected to a parallel printer with +5volts on pin #18.

Unpacking

Check the packaging for water or physical damage, and notify the carrier immediately if any damage is evident. Keep the original packaging in case the interface needs to be moved or shipped. The package should include the following:

- I-O 4440 BarCode Interface (either serial or parallel)
- Auto-terminating 9-pin twinax V-cable or coax adapter cable
- I-O 4440 BarCode Interface User's Guide
- Wall mount power supply (5V DC output)*

* Since the I-O 4440P (parallel) can draw its operating power from pin 18 from a properly equipped printer, the power supply may not need to be installed.

INTRODUCTION

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2 INSTALLATION

Before connecting the I-O 4440 BarCode Interface to the printer, verify that the printer functions properly by performing a printer self-test. Consult the printer's user's guide for instructions on how to start and evaluate the printer self-test. If the printer functions properly, proceed with the installation of the I-O 4440 interface.

1. Power off the printer.

2. Attach the interface to the printer's parallel or serial port (depending on the interface model).

    Note: If you are using a serial TEC or Microcom printer, you will need to obtain a Null Modem M/F gender changer. This inexpensive device must be installed between the I-O 4440's serial connector and the printer's serial port.

3. Attach the 9-pin twinax or coax cable adapter to the interface's connector. Do not attach the host cable(s) at this time.

4. Check the table below to see if the I-O 4440 BarCode Interface offers special support for your printer. If not, you should skip steps 5 through 9 and proceed directly to step 10.

5. To configure the interface for the attached printer, turn the interface's Setup Switch to position C.

6. Power on the printer and (if required) connect the power supply to the I-O 4440 interface. The interface's LED will begin blinking in a three (3) flash pattern.

7. Referring to the table below, turn the interface's Setup Switch to the position corresponding to the attached printer type.

INSTALLATION

Switch Setting	Printer Type
0	Generic CR/LF - ASCII Text only*
1	Zebra (ZPL)
2	Datamax (Fargo) DMX
3	Sato
4	TEC
5	Intermec
6	Microcom
7	Avery Dennison/Novexx
8	Ring/Autonics
9	Eltron
A	UBI
B-F	Reversed for furture use

* Factory default setting

8. After approximately 30 seconds the interface will store the selected value in the non-volatile memory. The LED will display a rapid one (1) flash pattern.

9. Power off the printer (and remove the power connector from the interface).

10. Attach the host cable(s) to the I-O cable adapter.

11. TWINAX: Set the desired twinax device address by turning the Setup Switch to position 0-6. Then power on the printer (and connect the power supply to the interface). The LED will be on.
    COAX: Turn the Setup Switch to position A (operating mode). Then power on the printer (and connect the power supply to the interface). The LED will be on.

The I-O 4440 is now ready to operate. Send a test job from the IBM host to verify proper installation.

3 CONFIGURATION - TWINAX

Host Configuration

Before operating the interface in twinax mode, you must configure the IBM host with a cable address and device ID for the printer. See your system operator or system manuals for details. <u>You must also set the twinax address on the I-O 4440 BarCode Interface</u>.

The table below shows the recommended emulation and device ID on the different host systems.

Host System	Printer Used	Emulation	Device ID
AS/400, S/38, S/36, (S/34)	Bar code label printer	5256*	5256(P)

* For alternate applications, 5224, 5225, or 4214 emulations may also be selected.

Setup Switch

The interface can be configured through the Setup Switch or by sending download commands from the host.

The following table shows the functions associated with the various Setup Switch positions. Please note that positions 9, B, and C are "dual function" positions. They are read at initial power up and must be followed by a secondary switch setting to define the desired value. Tables 1, 2, and 3 list these secondary settings.

CONFIGURATION - TWINAX

Switch No.	Function at power up	Function after power up
0-6	Twinax host address	No function
7	Self-test printout on label printer	No function
8	Restore factory defaults and print self-test on label printer	No function
9	Code Page selection and twinax printer emulation - See table 1 for secondary settings	EBCDIC Hex Dump mode
A	Normal Operation	Normal operation
B	Host default language - See table 2 for secondary settings	No function
C	Attached bar code printer type - See table 3 for secondary settings	No function
D	Configuration without printing	No function
E	Diagnostic test - <u>Remove all host cables prior to selection</u>	No function
F	ASCII printer (80-column) self-test	No function

Secondary Switch Settings

If the Setup Switch is in the 9, B, and C position when the I-O 4440 is powered up, a secondary selection is required. After the power-up, the interface's LED will blink in a three (3) flash pattern for approximately 30 seconds. During this time the Setup Switch must be changed to the appropriate secondary setting (see tables below). Simply turn the Setup Switch to the desired secondary setting and wait until the 30 second interval expires. At that time the LED will permanently save the information. The LED will briefly flicker during the saving process and then

display a rapid one (1) flash pattern indicating that the interface is not in an operating mode. If an invalid selection was made, the LED will not display the one (1) flash pattern.

Table 1 - Secondary Settings for Position 9

Secondary switch settings of position "9" during the three (3) flash pattern. This selects the twinax printer emulation as well as the ASCII code page (character set) used. If both printer emulation and code page need to be changed, the process needs to be done twice.

Switch Setting	Value Selected
0	IBM 5256 Printer Emulation
1	IBM 5224 Printer Emulation
2	IBM 5225 Printer Emulation
3	IBM 4214 Printer Emulation
4	No Change
5	Code Page 437
6	Code Page 850
7-F	Invalid Selection

CONFIGURATION - TWINAX

Table 2 - Secondary Settings for Position B

Secondary switch settings of position "B" during the three (3) flash pattern. This is used to select the Host Default Language.

Switch Setting	Twinax Value
0	Multinational
1	US/Canada
2	Austrian/Germany
3	Belgium
4	Brazil
5	French Canadian
6	Norway/Denmark
7	Finland/Sweden
8	France
9	Italy
A	Japan (English)
B	No-Change
C	Portugal
D	Spain
E	Spanish speaking
F	United Kingdom

Table 3 - Secondary Settings for Position C

Secondary switch settings of position "C" during the 3 flash pattern. This is used to select the bar code printer language to be used.

Switch Setting	Value Selected
0	Generic CR/LF - ASCII Text only
1	Zebra ZPL
2	Datamax (Fargo) DMX
3	Sato
4	TEC
5	Intermec
6	Microcom
7	Avery Dennison/Novexx
8	Ring/Autonics
9	Eltron
A	UBI
B-F	Reserved for future use

Twinax Host Download Commands

By sending download commands to the I-O 4440 BarCode Interface, all available configuration parameters can be changed. Setup Switch position "D" can be used to send Host Download commands to the interface, when no printing is desired, or the interface is not connected to a printer. In Setup Switch position "D" all data is processed for commands, but nothing is sent to a printer.

Host download commands are placed in a host document or on the screen. The commands take effect when the print job or screen print is sent to the interface. Whether the incoming print job is a screen print, a word processing document, or label format, the interface will recognize the Host Download command. The command itself will not be printed if it was entered correctly. If any part of the command is printed, the interface did not recognize the command because of a problem in the format. Check the syntax of the command and send it again.

Host Download commands sent to the Interface take effect immediately (unless otherwise noted) and stay only in the interface's active memory. To save the changed configuration permanently, the Host Download command Z99,0 must be sent after the other Host Download commands.

CONFIGURATION - TWINAX

Note: You may want to save the Host Download commands in a separate file. If the interface needs to be reconfigured at a later time or if you need to configure another interface, just "print" the file containing the Host Download commands.

Take the following steps to enter a Host Download command.

1.   Type the Command Pass-Thru™ delimiter &% (or alternate CPT start delimiter as described later) in the document at the point where the command is to take effect.

2.   Type an upper case "Z".

3.   Type the command number for the command to be used, as shown in the table below.

4.   Type a comma.

5.   Type the option value. No spaces are allowed. A space or invalid character in a command causes the interface to ignore the command and resume printing from the point the error occurred.

   For example, to change the Baud Rate (Command 72) from the default 9,600 baud (value 2) to 19,200 (value 1), enter:

   &%Z72,1

6.   Multiple commands can be chained together by using a slash (/) or backslash (\) to separate the commands (no spaces allowed). For example, to set the Baud Rate (Command 72) to 19,200 baud (value 1) and save current settings permanently, type:

   &%Z72,1/Z99,0

Twinax Host Download Commands - Overview

The following table shows the Twinax Host Download commands that effect bar code printing and their command number in alphabetical order.

Host Download Command	Command Number
Alt CPT End Delimiters	02
Alt CPT Start Delimiters	01
Buffer Print	42
Carriage Cmds	25
Overwrite EBCDIC Translation Table	70
Restores Factory Defaults	98
Save All Current Settings	99
Serial Out Stop Bits	74
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Configuration Options

Asterisks (*) identify factory default settings. Invalid commands are ignored.

CONFIGURATION - TWINAX

COMMAND 01: ALTERNATE CPT START DELIMITER

Creates an alternate Command Pass-Thru™ (CPT) start delimiter in addition to &% that is always active. Also works as an alternate Host download delimiter. May be either one or two characters. The first character may be any printable character other than "&." Only one alternate CPT start delimiter is allowed.

VALUE	DESCRIPTION
New characters	Alternate CPT start delimiter
Two spaces	Deletes alternate CPT start delimiter

Example: &%Z01,#* creates the alternate CPT start delimiter to #*.

COMMAND 02: ALTERNATE CPT END DELIMITER

Creates an alternate CPT end delimiter as above. This delimiter does not effect the Host Download delimiter.

VALUE	DESCRIPTION
New characters	Alternate CPT end delimiter
Two spaces	Deletes the alternate delimiter

Example: &%Z02,$ defines $ as the alternate CPT end delimiter.

COMMAND 04: USER DEFINED STRINGS

Creates up to ten user-defined strings to send to the printer later. (See page 5-3 for description.) Place the ASCII hex codes representing the desired printer command inside the parentheses (up to 25 hex pairs). Spaces between hex pairs are allowed to aid in readability. Consult the printer's user's guide for proper hex codes. The user-defined strings are stored in the interface's memory under a selected value number (0 to 9). To send a string, place a &%Ux (where x is the string number) in the format.

VALUE	DESCRIPTION
0 to 9(hex codes)	Assigns the hex command to a one digit number (0-9)
0 to 9( )	Deletes the specified user-defined string from memory

Example: &%Z04,3(021B) - defines &%U3 to send 02 1B to the printer.

COMMAND 11: TWINAX PORT INITIALIZATION

Enters an initialization string (in hex code, up to 25 characters) which is sent to the printer when the interface is powered up.

VALUE	DESCRIPTION
0 (hex codes)	Stores the hex commands as a twinax port initialization string

Example: &%Z11,0(7B 4A 43) forces a Zebra Stripe printer to measure the label length and recalibrate the media and ribbon sensors.

COMMAND 22 AND 23: DEFAULT PRINT QUALITY

These commands are not applicable to bar code label printing.

COMMAND 25: CARRIAGE CMDS

Manipulates the IBM motion command.

VALUE	DESCRIPTION
*0	Use form feeds when possible (default)
1	Form feeds by line feeds only
2	Ignore form feeds
3	No CR/LF/FF

Example: &%Z25,3 sets the interface to delete the normal motion commands CR LF and FF and not send them to the bar code printer.

CONFIGURATION - TWINAX

COMMAND 26: TRUNCATE/WRAP

This command is not applicable to bar code label printing.

COMMAND 42: BUFFER PRINT

Printer goes into buffer print (EBCDIC Hex Dump) mode. All data is printed in EBCDIC hex code, which allows debugging of the format coming from the host. To end buffer printer mode, simply power down the I-O interface.

VALUE	DESCRIPTION
*0	No action taken (default)
1	Yes, start buffer print

Example: &%Z42,1 starts buffer print

COMMAND 70: OVERWRITE EBCDIC TRANSLATION TABLE

Custom substitutions defined by this command and stored in permanent memory are written into the EBCDIC to ASCII translation table.

VALUE	DESCRIPTION
XX	EBCDIC character to be changed (in hex)
YY	The substitute ASCII character (in hex) for the EBCDIC character above

Notes: Previously stored substitutions are automatically changed to the new selection when the same hex location is specified in the EBCDIC table.

Previously stored substitutions are cancelled when the ASCII character set is changed through the Setup Switch.

Command Z99,0 must be used to store the substitutions in permanent memory for them to be effective when the interface is next turned on.

The active EBCDIC translation table prints out on the 80-column ASCII self-test (Setup Switch "F").

Example: &%Z70,7B,40/Z99,0

Prints a 40 ASCII hex (a @ symbol) when the interface receives an EBCDIC 7B (a # symbol). The command is followed by a command Z99,0 which stores the active setup selections in permanent memory.

COMMAND 72: SERIAL OUT BAUD RATE

Selects the Baud Rate for data sent from the interface to the printer. A new setting will not be effective immediately. To activate the new setting cycle power on the interface.

VALUE	DESCRIPTION
0	38,400 baud
1	19,200 baud
*2	9,600 baud (default)
3	4,800 baud
4	2,400 baud
5	1,200 baud
6	600 baud
7	300 baud

Example: &%Z72,0 sets the outgoing baud rate to 38,400.

COMMAND 73: SERIAL OUT WORD LENGTH

Selects the Word Length of data sent from the interface to the printer. A new setting will not be effective immediately. To activate the new setting cycle power on the interface.

VALUE	DESCRIPTION
7	7 Bits
*8	8 Bits (default)

Example: &%Z73,7 sets the outgoing word length to 7 bits.

CONFIGURATION - TWINAX

COMMAND 74: SERIAL OUT STOP BITS

Selects the number of Stop Bits in the data stream sent from the interface to the printer. A new setting will not be effective until power is cycled on the interface.

VALUE	DESCRIPTION
*1	1 Bit (default)
2	2 Bits

Example: &%Z74,2 sets the number of Stop Bits to 2.

COMMAND 75: SERIAL OUT PARITY

Selects the Parity of the data stream sent from the interface to the printer. A new setting will not be effective immediately. To activate the new setting cycle power on the interface.

VALUE	DESCRIPTION
*0	None (default)
1	Odd
2	Even

Example: &%Z75,2 sets the outgoing parity to even.

COMMAND 84 through 89: GENERIC EMULATION STRINGS

These commands are not applicable to bar code label printing.

COMMAND 98: RESTORE FACTORY DEFAULTS

VALUE	DESCRIPTION
0	Restore Factory Default
1	Print Active Configuration Parameters (Self-Test)
2	Restore Settings Previously Defined by User

Example: &%Z98,1 prints the active configuration parameters.

Note: The following parameters are not changed when factory defaults are restored:

- Twinax Address
- IBM Printer Emulation
- Character Set (Code Page)
- Output Printer Type

COMMAND 99: SAVE ALL CURRENT SETTINGS

VALUE	DESCRIPTION
0	Save all current settings

Example: &%Z99,0 saves all current settings to permanent memory.

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4 CONFIGURATION - COAX

Setup Switch

The following table shows the functions associated with the various Setup Switch positions. Please note that positions 9, B, and C are "dual function" positions. They are read at initial power up and must be followed by a secondary switch setting to define the desired value. Tables 1, 2 and 3 list these secondary settings.

Switch No.	Function at power up	Function after power up
0-6	Time delay before an Intervention Required is sent to the host 0 = No IR sent 1 = 2 1/2 minutes 2 = 5 1/2 minutes 3 = 8 minutes 4 = 10 1/2 minutes 5 = 13 1/2 minutes 6 = 16 minutes	No function
7	Self-test printout on label printer	No function
8	Restore factory defaults and print self-test on label printer	No function
9	Code Page selection and coax buffer size - See table 1 for secondary settings	EBCDIC Hex Dump mode
A	Normal Operation	Normal operation
B	Host default language - See table 2 for secondary settings	No function
C	Attached bar code printer type - See table 3 for secondary settings	No function
D	Configuration without printing	No function
E	Diagnostic test - Remove all host cables prior to selection	No function
F	ASCII printer (80-column) self-test	No function

CONFIGURATION - COAX

Secondary Switch Settings

If the Setup Switch is in the 9, B, and C position when the I-O 4440 is powered up, a secondary selection is required. After the power-up, the interface's LED will blink in a three (3) flash pattern for approximately 30 seconds. During this time the Setup Switch must be changed to the appropriate secondary setting (see tables below). Simply turn the Setup Switch to the desired secondary setting and wait until the 30 second interval expires. At that time, the LED will permanently save the information. The LED will briefly flicker during the saving process and then display a rapid one (1) flash pattern indicating that the interface is not in an operating mode. If an invalid selection was made, the LED will not display the one (1) flash pattern.

Note: The configuration parameters accessible through the Setup Switch can also be changed using Host Download Commands. Please refer to the Coax Host Download Command section later in this chapter.

Table 1 - Secondary Settings for Position 9

Secondary switch settings of position "9" during the three (3) flash pattern. This selects the coax buffer size as well as the ASCII code page (character set) used. If both coax buffer size and Code Page need to be changed, the process needs to be done twice.

Switch Setting	Twinax Value
0	960 byte coax buffer
1	1920 byte coax buffer
2	2560 byte coax buffer
3	3440 byte coax buffer
4	3564 byte coax buffer
5	Code Page 437
6	Code Page 850
7-F	Invalid Selection

Table 2 - Secondary Settings for Position B

Secondary switch settings of position "B" during the three (3) flash pattern. This is used to select the Host Default Language (LU1).

Switch Setting	Twinax Value
0	US/Canada
1	Invalid selection
2	Aus./German
3	Belgium
4	Brazil
5	French Can
6	Norway/Den
7	Nor/Den Alt.
8	Finland/Swe.
9	Fin./Swe. Alt
A	French
B	No-Change
C	Aus./Ger. Alt
D	Multinational
E	Italian
F	Japan-Eng.

Note: The LU1 language can also be selected through Host Download Command 08.

Table 3 - Secondary Settings for Position C

Secondary switch settings of position "C" during the three (3) flash pattern. This is used to select the bar code printer language to be used.

CONFIGURATION - COAX

Switch Setting	Twinax Value
0	Generic CR/LF - ASCII Text only
1	Zebra ZPL
2	Datamax (Fargo) DMX
3	Sato
4	TEC
5	Intermec
6	Microcom
7	Avery Dennison/Novexx
8	Ring/Autonics
9	Eltron
A	UBI
B-F	Reserved for future use

Coax Host Download Commands

By sending download commands to the I-O 4440 BarCode Interface, all available configuration parameters can be changed. Setup Switch position "D" can be used to send Host Download commands to the interface, when no printing is desired, or even when no printer is connected. In Setup Switch position "D" all data is processed for commands, but nothing is sent to a printer.

Note: Host Download commands may override switch settings, just as switch settings may override Host Download commands. The interface will always use the latest configuration instructions sent to it (either via Host Download command or via Setup Switch).

Host Download commands are placed in a host document or on the screen. The commands take effect when the print job or screen print is sent to the interface. Whether the incoming print job is a screen print, a word processing document, the interface will recognize the Host Download command. The command itself will not be printed if it was entered correctly. If any part of the command is printed, the interface did not recognize the command because of a problem in the format. Check the syntax of the command and send it again.

Host Download commands sent to the interface take effect immediately (unless otherwise noted) and stay only in the interface's active memory while

it is powered on. To save the changed configuration, the Host Download command Z99,0 must be sent after the other Host Download commands have been sent.

Note: You may want to save the Host Download commands in a separate file. If the interface needs to be reconfigured at a later time or if you need to configure another interface, just "print" the file containing the Host Download commands.

Take the following steps to enter a host download command.

1.   Type the Command Pass-Thru™ delimiter &% (or alternate CPT start delimiter as described later) in the document at the point where the command is to take effect.

2.   Type an upper case "Z".

3.   Type the command number for the command to be used, as shown in the table.

4.   Type a comma.

5.   Type the command. No spaces are allowed. A space or invalid character in a command causes the interface to ignore the command and resume printing from the point the error occurred.

   For example, to change the Form Length (Command 05) size from the default of 66 lines (value 66) to 10 lines (value 10), enter:

   &%Z05,60

6.   Multiple commands can be chained together by using a slash (/) or backslash (\) to separate the commands (no spaces allowed). For example, to set Form Length (Command 05) to 10 lines (Value 10), and save current settings permanently, type:

   &%Z05,10/Z99,0

CONFIGURATION - COAX

Coax Host Download Commands -Overview

The following table shows the Coax Host download commands that effect bar code printing and their command number in alphabetical order.

Host Download Command	Command Number
Action at End of Job	20
Alternate Command ID Characters	41
Buffer Hex Dump	42
CPT Beginning Delimiter Characters	40
CPT Ending Delimiter Characters	39
CR at MPP + 1	15
Custom User Strings	55
Empty Forms	26
FF After Timeout	27
FF At End of Print	18
FF Valid Position	19
Form Feed Usage	25
Form Length	5
Intervention Required Time Out	34
LU1 Language	08
NL at MPP + 1	16
Override Format	30
Overwrite DSC (LU3) Translation Table	71
Overwrite EBCDIC (SCS/LU1) Translation Table	70
Restore Factory Defaults	98
SCS Translate	45
Serial Out Baud Rate	72
Serial Out Parity	75
Serial Out Stop Bits	74

CONFIGURATION - COAX

Host Download Command	Command Number
Serial Out Word	73
Store Configuration in Permanent Memory	99
Suppress IBM Control Codes	36
Text After FF	17
Truncate/Wrap Select	31
Vertical Channel	37

Configuration Options

Asterisks (*) identify factory default settings. Invalid commands (such as selecting 2 LPI) are ignored and the last valid setting will be unchanged.

COMMANDS 02, 03, 04: LPI, CPI, SPACING

These commands are not applicable to bar code label printing.

COMMAND 05: FORM LENGTH

Selects default Form Length (MPL = Maximum Print Lines).

VALUE	DESCRIPTION
000	No form length control
001	Set form length in number of lines
to	
255	
*66	Factory Default

Note: The 000 value enables the front panel selection on the printer to control the form length when Command 25 is set to value 0.

Example: &%Z5,70   Sets form length to 70 lines for A4 paper.

COMMAND 08: LU1 LANGUAGE

Selects default LU1 language.

[08] LU1 Language

*01 - English (US)	13 - Austria/Gr (alt)
03 - Austrian/German	14 - International
04 - Belgian	15 - Italian
05 - Brazilian	16 - Japan (English)
06 - Canadian/French	19 - Spanish
07 - Danish/Norway	20 - Spanish (alt)
08 - Danish/Nor (alt)	21 - Spanish Speaking
09 - Finish/Swedish	22 - English (U.K.)
10 - Finish/Swe (alt)	28 - Portuguese
11 - French	

Notes: This command, along with command Z99,0, changes the default
LU1 language selection in the permanent memory of the interface.

The command value should match the language number used in
IBM CU configuration sequence number 121.

Example: &%Z8,11   Sets LU1 language to French.

COMMAND 15: CR at MPP + 1

Sets the printer in accordance with the RPQ installed in the control unit.

VALUE	DESCRIPTION
*0	First print position (PP) of next line
1	First PP of current line

Notes: To use this function, the RPQ should be:
IBM 3268 RPQ SC9501
IBM 3287 RPQ S30219
IBM 4214 OPT 15=1

Available only in LU3 (non-SCS) operation

Example: &%Z15,1   Prints first PP of current line as the next PP
when a CR is received at MPP+1.

CONFIGURATION - COAX

COMMAND 16: NL at MPP + 1

Sets the printer in accordance with the RPQ installed in the control unit.

VALUE	DESCRIPTION
*0	First PP of current line + 2 lines
1	First PP of next line

Notes: To use this function, the RPQ should be:
    IBM 3268 RPQ SC9502
    IBM 3287 RPQ S30219
    IBM 4214 OPT 15=1

    Available only in LU3 (non-SCS) operation.

Example: &%Z16,1   Performs first PP of next line as the next PP
    when an NL is received at MPP+1.

COMMAND 17: TEXT AFTER FF

Sets the printer in accordance with the RPQ installed in the control unit.

VALUE	DESCRIPTION
*0	Second print position of first line on next form
1	First print position (PP) of first line on next form

Notes: For the Value 1 selection, the RPQ would be:
    IBM 3268 RPQ SC9503
    IBM 3287 RPQ N/A
    IBM 4214 OPT 16=2

    Available only in LU3 (non-SCS) operation.

Example: &%Z17,1   Performs first PP of first line on next form as
    the next PP when a valid FF is not positioned at
    the end of an IBM print buffer.

COMMAND 18: FF AT END OF PRINT

Sets the printer in accordance with the RPQ installed in the control unit

VALUE	DESCRIPTION
0	First PP of second line on next form
*1	First PP of first line on next form

Notes: To use this function, the RPQ should be:
      IBM 3268 RPQ SC9504
      IBM 3287 RPQ SC3749
      IBM 4214 OPT 17=2

      Available only in LU3 (non-SCS) operation.

Example: &%Z18,1   Performs first PP of first line on next form as
                               the next PP when a valid FF is received at the
                               end of an IBM print buffer.

COMMAND 19: FF VALID POSITION

Sets the printer in accordance with the RPQ installed in the control unit

VALUE	DESCRIPTION
*0	FF is valid only at the first print position or at position MPP+1.
1	FF is valid anywhere it occurs.

Notes: To use this function, the RPQ should be:
      IBM 3268 RPQ SC9506
      IBM 3287 RPQ SC3739
      IBM 4214 OPT 19=1

      Available only in LU3 (non-SCS) operation.

Example: &%Z19,1 Makes FF valid anywhere it occurs

CONFIGURATION - COAX

COMMAND 20: ACTION AT END OF JOB

Sets the printer in accordance with the RPQ installed in the control unit.

VALUE	DESCRIPTION
*0	Auto new line
1	Auto form feed

Notes: To use this function, the RPQ should be:
IBM 3268 RPQ SC9507
IBM 3287 RPQ SC3740
IBM 4214 OPT 20=2

Available only in LU3 (non-SCS) operation.

Do not press the form feed or line feed buttons on the front of the printer. This will cause the host and printer to lose synchronization of paper position. This command reduces the need to advance the paper.

Example: &%Z20,1   Sets the printer to issue a FF automatically at the end of the print buffer.

COMMAND 25: FORM FEED USAGE

Enables a Forms Feed from the host system to be converted to the required number of line feeds (beneficial when forms length is controlled by the interface).

VALUE	DESCRIPTION
*0	Obey all
1	Form feeds by line feed
2	Ignore form feeds

Example: &%Z25,1   Sets the printer to count the lines specified in Command 5.

COMMAND 26: EMPTY FORMS

Suppresses blank printout pages caused by form feed commands that occur at the top of a form.

VALUE	DESCRIPTION
*0	No, do not suppress empty forms
1	Yes, suppress empty forms

Notes: If selected, the interface ignores form feed commands located at the top of form position.

This command affects printing in both DSC and SCS modes. This differs from the IBM 3287, which suppresses form feed only in DSC mode.

Example: &%Z26,1   Sets the interface to suppress empty forms

COMMAND 27: FF AFTER TIMEOUT

Sends a form feed if unprinted data remains in the print buffer for the specified coax timeout interval in Command 51.

VALUE	DESCRIPTION
*0	No extra FF is sent
1	Yes, send FF after timeout value

Notes: In most cases, the host application generates a termination FF and there is no need to change this command from the default.

Example: &%Z27,1   Sends a FF after time delay selected by command 51 (default = 10 seconds) when unprinted data remains in the print buffer.

CONFIGURATION - COAX

COMMAND 30: OVERRIDE FORMAT

Enables the printer's front panel selections to control how a job is printed.

VALUE	DESCRIPTION
*0	Disable
1	Enable

Notes: When active, this command sends no formatting commands to the printer only the data received.

A reset command is sent to the printer before a coax print job in order to restore the printer's front panel default selections.

This command has no effect on the special features such as Command Pass-Thru™, user strings, initialization strings and coax host RPQs.

Example: &%Z30,1   Sets override of formatting commands

COMMAND 31: TRUNCATE/WRAP SELECT

Selects whether the interface truncates or wraps the text if the maximum print position is exceeded.

VALUE	DESCRIPTION
*0	Wrap
1	Truncate text beyond the maximum print position

Example: &%Z31,1   Causes text that exceeds the maximum print position to be truncated (not printed).

COMMAND 34: INTERVENTION REQUIRED TIMEOUT

Sets the time interval before an intervention required signal is sent to the host after a printer error occurs. This can also be set from the Setup Switch.

VALUE	DESCRIPTION
000	Never send an IR
001	Send IR after the VALUE times 5 seconds after to printer error occurs
*120 x 5	Default, send IR after ten minutes.

Example: &%Z34,036 Sets IR time interval to 3 minutes.

COMMAND 36: SUPPRESS IBM CONTROL CODES

This function is used to select suppression of all or some IBM control codes sent from the host system.

VALUE	DESCRIPTION
*0	No, obey all IBM control codes
1	Suppress all IBM control codes
2	Suppress CPI and LPI control codes
3	Suppress CPI control code
4	Suppress LPI control code
5	Suppress print quality specified in the PPM command

Notes: If this command is set to 1, documents need to be formatted by sending transparent control codes to the printer using Command Pass-Thru or SCS mode transparent data.

If value 2 is selected, the SCS pitch (CPI), line density (LPI), SHF (MPP), and SVF (MPL) commands will be suppressed (not sent to the printer).

Example: &%Z36,2   No CPI or LPI commands are sent to the printer.

CONFIGURATION - COAX

COMMAND 37: VERTICAL CHANNEL

Specifies vertical channel select (VCS) emulation. Functions similarly to a vertical tab, except the 3287 does LF only.

VALUE	DESCRIPTION
0	3287 VCS emulation
*1	3268/4214/4224 VCS emulation

Example: &%Z37,0   Selects 3287 VCS emulation

COMMAND 39: CPT ENDING DELIMITER CHARACTERS

Specifies the two characters to be used for the ending delimiter characters for Command Pass-Thru.

VALUE	DESCRIPTION
XXYY	XX is the ASCII hexadecimal value of the first character and YY is the ASCII hexadecimal value of the second character.

Notes: If an ending delimiter is not selected with this command, the delimiter selected with Command 40 will be used as a default.

The default delimiter will no longer be active if the command is used to change it. If Command 39 and Command 40 are both entered, Command 39 must be sent after Command 40 to be active.

One delimiter character can be specified instead of two by entering the hex code for the character followed by two zeros (e.g., &%Z39,2500 selects "&" as the delimiter).

A hex code that starts with 00 is invalid.

Example: &%Z39,253F   Specifies the %? characters as the alternate ending delimiter characters (% ASCII hex value is 25 and ? ASCII hex value is 3F).

COMMAND 40: CPT BEGINNING DELIMITER CHARACTERS

Specifies the two characters to be used for the beginning delimiter characters for Command Pass-Thru.

VALUE	DESCRIPTION
XXYY	XX is the ASCII hexadecimal value of the first character and YY is the ASCII hexadecimal value of the second character

Notes: Host download commands use the CPT beginning delimiter characters as well. The new character(s) replace the &% in front of the Z.

If you do not select an ending delimiter with Command 39, the delimiter selected with this command will be used as the default ending delimiter.

The default beginning delimiter will no longer be active if you use this command to change it.

One delimiter character can be specified instead of two by entering the hex code for the character followed by two zeros (e.g., &%Z40,2500 selects "&" as the delimiter).

A hex code that starts with 00 is invalid.

Example: &%Z40,253F Specifies the %? characters as the beginning delimiter characters (% ASCII hex value is 25 and ? ASCII hex value is 3F).

COMMAND 41: ALTERNATE COMMAND ID CHARACTERS

Specifies a character (in addition to Z) that can be used for the command identifier that follows the delimiter characters.

VALUE	DESCRIPTION
00	Deletes the previously selected alternate character
ZZ	ZZ is the ASCII HEX value of the command ID character

CONFIGURATION - COAX

Note: The character selected must not be a hex value (0 through 9 or A through F, L, P, or U).

Example: &%Z41,59   Specifies "Y" as the alternate command ID character

COMMAND 42: BUFFER HEX DUMP

After receiving a start command the coax interface, starting with the next buffer received, sends all host data directly to the printer as hexadecimal printing until a stop command is received or the interface is powered off.

VALUE	DESCRIPTION
1	Yes, start buffer hex dump
*2	No, stop buffer hex dump

Notes: This command enables the user to print only the section of the document that is in question in buffer hex dump format.

Hex printing starts with the cable buffer after the start command and stops with the cable buffer after the stop command.

Examples: &%Z42,1   Starts buffer hex dump printing
&%Z42,2   Stops buffer hex dump printing

COMMAND 45: SCS TRANSLATE

Specifies how transparent data sent using SCS code 35 is handled.

SCS transparent mode (SCS TRN code 35) provides a method for transparent data transmission when operating in LU1 mode. To use this method, you must be connected to a system using SNA protocol and be operating as a Logical Unit Type 1.

An SCS TRN sequence begins with a one-byte binary count immediately following the TRN code. The count indicates the number of bytes, not including the count byte, of transparent data to follow. Up to 256 bytes of transparent data can be sent in each sequence.

SCS TRN data is user-defined and is not scanned for SCS control codes. However, to emulate the characteristics of the IBM 3287, non-printable characters (i.e., control characters) are converted to hyphens. Data is translated to ASCII with undefined characters printed as hyphens. The interface offers a configurable option to emulate the IBM 3287 or to pass the data without translation.

VALUE	DESCRIPTION
0	Binary Transfer
*1	Emulate 3287

Notes: Value 1 causes valid graphic characters to be printed normally (i.e., converted from EBCDIC to ASCII), while control codes and invalid graphics are printed as hyphens, and normal page formatting is maintained.

Value 0 causes the 8-bit binary codes to be sent directly to the printer just as they are received from the host.

SCS code 36 functions the same as code 35.

Available in SCS (LU1) mode only.

Example: &%Z45,0   All SCS Code 35 data is sent to the printer as binary codes without translation.

COMMAND 51: COAX TIMEOUT

Selects the time interval that the interface waits for receipt of additional data from the host before issuing a form feed to the printer. (see Command 27)

VALUE	DESCRIPTION
04	Time interval in number of seconds
to	
60	
*10	Factory default is 10 seconds

Example: &%Z51,20   Sets the timeout interval to 20 seconds

CONFIGURATION - COAX

COMMAND 55: CUSTOM USER STRINGS

Allows the user to define up to six custom user strings, of up to 25 bytes each, which are stored in the memory of the interface and sent to the printer whenever the character delimiter, letter U, and number of the string appears in the text of the document (i.e. &%U3).

VALUE	DESCRIPTION
0-5	Following the value number, enter a parenthesis, followed by up to 25 ASCII hex bytes to be included in the user string, and then a parenthesis to end.

Notes: To aid in readability, a single space is allowed between hex bytes, but is not included in the string.

The strings could specify a special font selection command or other custom command to be sent directly to the printer.

This command, if placed as the first printable data at the top of the page (position 1, line 1), will be sent to the printer prior to the data.

To change a custom user string, simply input the new custom user string values; the old string is automatically erased.

Example: &%Z55,3(02) This defines that a Start of Text (STX=02) character is sent to the printer whenever &%U3 appears thereafter.

COMMAND 70:   OVERWRITE EBCDIC (SCS/LU1) TRANSLATION TABLE

Custom substitutions defined by this command and stored in permanent memory are written into the EBCDIC (SCS/LU1) to ASCII translation table.

VALUE	DESCRIPTION
XX	The EBCDIC character to be changed (in hex)
YY	The substitute ASCII character for the EBCDIC character above

Notes: Previously stored substitutions are automatically changed to the new selection when the same hex location is specified in the EBCDIC table.

Previously stored substitutions are cancelled if an ASCII hex sequence of 00 is specified.

Command Z99,0 must be used to store the substitutions in permanent memory for them to be effective when the printer is next turned on.

The active EBCDIC (SCS/LU1) translation table prints out at the end of the interface self-test summary.

Example: &%Z70,7B,40/Z99,0 Prints a 40 ASCII hex (a @ symbol) when the interface receives an EBCDIC 7B (a # symbol). The command is followed by a command Z99,0 which stores the active setup selections in permanent memory.

COMMAND 71: OVERWRITE DSC (LU3) TRANSLATION TABLE

Custom substitutions defined by this command, and stored in the permanent memory, are overwritten into the DSC (LU3) to ASCII translation table.

Notes: This command functions similarly to Command 70 except the substitutions are applicable to the DSC (LU3) translation table. Refer to the Command 70 instructions.

The active DSC (LU3) translation table prints out at the end of the interface self-test summary.

COMMAND 72: SERIAL OUT BAUD RATE

Selects the Baud Rate for data sent from the interface to the printer. A new setting will not be effective immediately. To activate the new setting cycle power on the interface.

CONFIGURATION - COAX

VALUE	DESCRIPTION
0	38,400 baud
1	19,200 baud
*2	9,600 baud
3	4,800 baud
4	2,400 baud
5	1,200 baud
6	600 baud
7	300 baud

Example: &%Z72,0   Sets the outgoing baud rate to 38,400

COMMAND 73: SERIAL OUT WORD LENGTH

Selects the Word Length of data sent from the interface to the printer. A new setting will not be effective immediately. To activate the new setting cycle power on the interface.

VALUE	DESCRIPTION
7	7 Bits
*8	8 Bits

Example: &%Z73,7   Sets the outgoing word length to 7 bits.

COMMAND 74: SERIAL OUT STOP BITS

Selects the number of Stop Bits of a data stream sent from the interface to the printer. A new setting will not be effective immediately. To activate the new setting cycle power on the interface.

VALUE	DESCRIPTION
*1	1 Bit
2	2 Bits

Example: &%Z74,2   Sets the number of Stop Bits to 2.

COMMAND 75: SERIAL OUT PARITY

Selects the Parity of a data stream sent from the interface to the printer. A new setting will not be effective immediately. To activate the new setting cycle power on the interface.

VALUE	DESCRIPTION
*0	None
1	Odd
2	Even

Example: &%Z75,2   Sets the outgoing parity to even.

COMMAND 98: RESTORE FACTORY DEFAULTS

Restores the factory default configuration selections, prints out a copy of the active configuration selections, or restores the permanent memory selections to the active setup status.

VALUE	DESCRIPTION
*0	Restores the factory setup
1	Prints out the active setup selections (Self-Test)
2	Restores the setup selections stored in the permanent memory to active status

Notes: The following parameters are not changed when factory defaults are restored:

- IR Required Time Out
- Coax Buffer Size
- Character Set (Code Page)
- Output Printer Type

If a document is printed using temporary host download commands (commands not stored using the &%Z99,0 command), value 2 will restore the permanent memory selections.

CONFIGURATION - COAX

Put a &%Z98,2 at the end of the document to restore the standard setup parameters for the next user of the printer.

The active setup and permanent memory setup selections are the same after a Command &%Z99,0 or a Command &%Z98,2 is sent to the printer.

Example: &%Z98,1   Prints out the active setup selections for review

COMMAND 99:   STORE CONFIGURATION IN PERMANENT MEMORY

Send this command after all desired host download configuration commands have been sent to the interface. It stores the active setup in the permanent memory of the interface so it will be in effect whenever the printer is powered on. Otherwise, active configuration commands are lost when the printer is turned off.

VALUE	DESCRIPTION
0	To complete the command, the value 0 must be used

Notes: Host download selections followed by a Command &%Z99,0 will be stored in permanent memory and active when the printer is turned on.

Only use Command &%Z99,0 when the host download selection needs to be permanently stored in the memory of the interface.

Example: &%Z99,0   Stores the currently active setup selections in the permanent memory of the interface.

5 OPERATION

Power Up Processing

When the I-O 4440 BarCode Interface is powered up it does the following:

1. It checks for a proper 9-pin host attachment cable (Twinax or Coax) to auto-detect which mode of operation is desired. If none is found, the interface waits for a proper cable to be attached and the LED displays double blinking.

2. The interface examines the Setup Switch to see if a configuration selection is being requested.

3. The interface then looks for the output printer to be ready before beginning operation (a single blinking of the LED). However, Setup Switch settings can be made without a printer attached and download commands also can be received without a printer attached by using position "D".

Parallel Printing

The interface looks for a parallel status of online, no paper out, no faults and not busy before proceeding. The interface is programmed to function in a busy only handshake manner.

Serial Printing

When printing to a serial printer, verify the Serial Out settings. They are: baud rate, word length, stop bits, and parity. The interface does not offer handshaking settings. However, it honors both hardware and software handshaking. It examines the CTS(DTR pin #20) signal before sending each byte, as well as checking the XON/XOFF status. Note: The serial output port must see CTS(DTR) before it will output data or allow line sync to be established. The I-O 4440 BarCode Interface will receive XON and XOFF for software handshaking, as well as receive DTR/DSR for hardware handshaking.

OPERATION

Character Set (Code Page)

By default, the interface uses the Code Page 437 character set. You also have the option to select the Code Page 850 character set. Please be aware that Code Page 437 has 41 fewer characters than Code Page 850.

For the convenience of bar code printers, the default character sets used by the I-O 4440 BarCode Interface have two changes from the basic character sets. The IBM "logical-not" (¬) symbol is replaced by the circumflex "^" (this is to assist ZEBRA, Microcom and other printers), and both vertical lines ("¦" and "|") are printed as the pipe character " ¦ " (this is to assist TEC and other printers). If the normal logical not and vertical line characters are needed, they can be defined by using the Host Download command #70.

Advanced Features

Command Pass-Thru™

The Command Pass-Thru™ feature allows access to all of the built-in features of the printer, even if these features aren't normally available through the host software. Command Pass-Thru lets you place printer-specific command sequences into the data sent to the printer. The interface recognizes these special sequences and "passes the command through" to the printer. The steps below describe how to use Command Pass-Thru.

1. Find the command for the print feature in the printer's user's guide.

2. Convert the printer command to ASCII hexadecimal.

3. Place **&%** or the alternate CPT start delimiter, in the document at the point where the feature is to take effect. This signals the start of the print feature.

   Enter the printer command in hex, then enter **&%** or the alternate CPT end delimiter. A space may be entered between hexadecimal code pairs to make the command easier to read, but do not put spaces between the delimiters and the hexadecimal characters.

4. Move the cursor to the next point in the text that you want to define a printer command. Enter **&%** or the alternate CPT start delimiter, followed by the printer command and then **&%** or the alternate CPT end delimiter again, into the document.

Only characters from 00 to FF are recognized (alphabetic characters must be in upper case). Errors in the Command Pass-Thru sequence will cause the interface to ignore the command and printing will resume at the point the error occurred.

Command Pass-Thru may invalidate horizontal spacing.

Although the command is displayed on the screen, the interface treats it as a command and does not print it. If part of the command sequence is printed, an error has been made entering the codes. Check the document and make sure the correct format and hexadecimal characters are being used.

Example: Start of text (02 hex) and end of text (03 hex) commands are commonly used with bar code printers. To send data to the bar code printer enclosed by STX and ETX, can be done as follows:

&%02&%This is example data&%03&%

User-Defined Command Strings

To avoid keying-in frequently used printer commands (which would appear in the document as hex values imbedded in Command Pass-Thru delimiters), you can take advantage of the User-Defined Strings feature.

Using Host Download command 04 in Twinax, or command 55 in Coax, you can assign up to 10 strings in Twinax (0-9) or six in Coax (0-5) to frequently used printer command strings.

After a command string has been defined, activate it by typing the delimiter (&% or alternate CPT start delimiter) followed by the string number (U0 through U9 or 6) into the document or on the screen. When the document or screen is printed, the interface will recognize the &%U and send the command assigned to the string number to the printer.

OPERATION

For example, your bar code printer may require you to start a line with a CR (carriage return), LF (line feed), STX (start of text), and ESC (escape). To ease your programming, the hexadecimal string 0D 0A 02 1B could be defined as User String #1 in Twinax by &%Z04,1(0D0A021B) or Coax by &%Z55,1(0D0A021B). This saves the command string in "string location 1". It can be re-called by simply inserting &%U1 into the label format.

The 80-column ASCII interface self-test (power-up Setup Switch position F) prints out a list of command numbers and the command strings assigned to them to a standard ASCII printer. Note: If the I-O 4440 BarCode Interface is using power from the printer (no external supply) the ASCII printer will also need to supply the power or the optional power supply will be needed.

6 PROBLEM RESOLUTION

This chapter provides instructions for performing diagnostic tests on the I-O 4440 BarCode Interface, and a problem resolution guide that describes common problems with the interface or the printer and their solutions. If you are unable to solve a problem by following the procedures outlined in this chapter, contact your supplier.

Before calling, verify that the interface is installed correctly, that the interface configuration settings are correct, perform the appropriate diagnostic tests outlined in this chapter, and have the following information ready:

- Printer and interface self-test printouts
- Model number and serial number of the interface
- Model number of the printer
- Description of the problem
- Results of diagnostic tests
- Type of host system or controller

You may also need to print a "hex dump" or "buffer print" by enabling the Buffer Print option on the Setup Switch. This causes all printing to be in hexadecimal code, just as it's received from the host, to help in tracing problems.

If it becomes necessary to ship the interface, use the original carton and packaging to prevent damage.

Interface Self-Test

Interface Self-Test on Supported Label Printer

If the I-O 4440 BarCode Interface is configured for a supported Label Printer (Setup Switch Position C), follow the instructions below.

Verify proper installation and configuration of the interface by performing an interface self-test. The self-test prints out the current software version, memory condition (RAM and ROM), and the current configuration selections. Follow the steps below to start the self-test from the interface's Setup Switch.

PROBLEM RESOLUTION

1. Make sure the proper 9-pin host adapter is attached.

2. Verify that the interface is connected properly to the printer.

3. Power off the printer and the interface.

4. Select position 7 on the Interface's Setup Switch, power on the printer and the interface. A self test should print.

5. Return the Setup Switch to position A (or the correct twinax address) and cycle power when done.

The self-test can also be started through Host Download command. Use Host Download command &%Z98,1 to start the self-test.

A short self test-label format is sent to the printer (as shown below). If there is no printing, several things may not be set properly. e.g.

1. Improper bar code language selected. This is corrected by Setup Switch position "C" (see Installation on page 2-1).

2. Insufficient power for the interface. The I-O 4440 BarCode Interface requires +5volts at 80ma from its optional external power supply, or pin #18 on the parallel connector, or pin #14 on the serial connector.

Sample Interface Self-Test Printouts

TWINAX Bar Code INTERFACE COPYRIGHT: T (c) 1996 SDE SOFTWARE Rev 1.02 RAM OK ROM OK Twinax Address - 0 Host Language = 01 - U.S./Canada Character Set = 2 - CP 437 (PC set 2) IBM Emulation = 0 - 5256	COAX Bar Code INTERFACE COPYRIGHT: T (c) 1996 SDE SOFTWARE Rev 1.02 ROM OK RAM OK Buffer Size = 1920 Host Language = 01 IR Timeout = 120 * 5 secs.

Many configuration items do not print on the si-mple self test format. A complete 80-column self-test printout can be obtained by connecting the interface to a standard ASCII printer (H.P., Epson, Oki, or other) and setting the Setup Switch to position "F". When power is applied, two self-test pages will print displaying all possible configuration settings. The self-test pages also display the translation tables. (See samples on the following pages)

If the test does not print, the interface failed the self-test. Contact your supplier for more information.

TWINAX Bar Code INTERFACE
COPYRIGHT (c) 1996 SDE
SOFTWARE Rev 1.02
RAM OK
ROM OK

Twinax Setup Selections:

```
Bar Code Language  . . . . . . . . . . . . . . . . . .:   Generic
00 - Twinax Device Address  . . . . . . . . . . . .:   0
01 - Alt. CPT Start Delimiters . . . . . . . . . . .:   &% - 50 6C
02 - Alt. CPT End Delimiters  . . . . . . . . . . .:   &% - 50 6C
05 - Language . . . . . . . . . . . . . . . . . . . . . . .:   01 - U.S./Canada
17 - Character Set . . . . . . . . . . . . . . . . . . . .:   2 - CP 437 (PC set 2)
22 - 4214 Default Print Quality . . . . . . . . . .:   0 - DRAFT
23 - PPDS Fast Draft for Draft  . . . . . . . . . .:   0 - Off
24 - IBM Printer Emulated  . . . . . . . . . . . . .:   3 - 4214
25 - Form Feed Usage . . . . . . . . . . . . . . . . .:   0 - Form Feeds Allowed
26 - Truncate text at 8 inches   . . . . . . . . . .:   0 - Off
60 - ASCII Printer Mode . . . . . . . . . . . . . . .:   9 - GENERIC
66 - Output Port  . . . . . . . . . . . . . . . . . . . . .:   0 - Parallel
72 - Serial Out Baud Rate . . . . . . . . . . . . . .:   2 - 9600
73 - Serial Out Bit Length . . . . . . . . . . . . . .:   8
74 - Serial Out Stop Bits . . . . . . . . . . . . . . .:   1
75 - Serial Out Parity  . . . . . . . . . . . . . . . . .:   0 - NONE
```

11 - Twinax Port Initialization:

84 - Generic Emulation 6LPI String:

85 - Generic Emulation 8LPI String:

86 - Generic Emulation 10CPI String:

87 - Generic Emulation 15CPI String:

88 - Generic Emulation 12CPI String:

89 - Generic Emulation 16.7CPI String:

04 - User Defined Strings:
    U0:
    U1:
    U2:
    U3:
    U4:
    U5:
    U6:
    U7:
    U8:
    U9:

EBCDIC to ASCII Translate Table

```
     40 50 60 70 80 90 A0 B0 C0 D0 E0 F0
0:   20 26 2D 9B 9D F8 E6 5E 7B 7D 5C 30    &-øØ°µ^{}\0
1:   20 82 2F 90 61 6A 7E 9C 41 4A 20 31    é/Éaj~£AJ 1
2:   83 88 B6 D2 62 6B 73 BE 42 4B 53 32    âêÂÊbks¥BKS2
3:   84 89 8E D3 63 6C 74 FA 43 4C 54 33    äëÄËclt·CLT3
4:   85 8A B7 D4 64 6D 75 9F 44 4D 55 34    àèÀÈdmuƒDMU4
5:   A0 A1 B5 D6 65 6E 76 F5 45 4E 56 35    áíÁÍenv§ENV5
6:   C6 8C C7 D7 66 6F 77 F4 46 4F 57 36    ãîÃÎfow¶FOW6
7:   86 8B 8F D8 67 70 78 AC 47 50 58 37    åïÅÏgpx¼GPX7
8:   87 8D 80 DE 68 71 79 AB 48 51 59 38    çìÇÌhqy½HQY8
9:   A4 E1 A5 60 69 72 7A F3 49 52 5A 39    ñßÑ`irz¾IRZ9
A:   BD 21 7C 3A AE A6 AD 5B 2D FB FD FC    ¢!|:«ª¡[-123
B:   2E 24 2C 23 AF A7 A8 5D 93 96 E2 EA    .$,#»º¿]ôûÔÛ
C:   3C 2A 25 40 D0 91 D1 EE 94 81 99 9A    <*%@ðæÐ¯öüÖÜ
D:   28 29 5F 27 EC F7 ED F9 95 97 E3 EB    ()_'ý Ý¨òùÒÙ
E:   2B 3B 3E 3D E8 92 E7 EF A2 A3 E0 E9    +;>=ÞÆþ'óúÓÚ
F:   B3 AA 3F 22 F1 CF A9 F2 E4 98 E5 20    |^?"±¤ _õÿÕ
```

COAX Bar Code INTERFACE
COPYRIGHT (c) 1996 SDE
SOFTWARE Rev 1.02
ROM OK

Coax Setup Selections:

Bar Code Language: Generic

```
#01 - Buffer Size (Characters) . . . . . . . . . . . . . .:  2 1920
#02 - Lines Density (LPI) . . . . . . . . . . . . . . . . .:  6
#03 - Characters Density (CPI) . . . . . . . . . . . . .:  0
#04 - Line Spacing  . . . . . . . . . . . . . . . . . . . . . .:  1 Single (6 or 8 LPI)
#05 - Form Length (MPL) . . . . . . . . . . . . . . . . .:  066
#06 - Maximum Print Position (MPP) . . . . . . . .:  132
#07 - Print Case . . . . . . . . . . . . . . . . . . . . . . . . .:  1 Dual
#08 - LU1 Language . . . . . . . . . . . . . . . . . . . . .:  01 English (US)
#12 - FF Before Local Screen Copy . . . . . . . . . .:  0 No
#13 - FF After Local Scrren Copy . . . . . . . . . . .:  0 No
#14 - Lu3 Print Image (Non-SCS Mode) . . . . . .:  0 LU3 and Local Copy Null line suppress
#15 - CR at MPP +1 . . . . . . . . . . . . . . . . . . . . .:  0 Nextline
#16 - NL at MPP +1 . . . . . . . . . . . . . . . . . . . . .:  0 Current line  + 2
#17 - Valid FF Followed by Data . . . . . . . . . . . .:  0 2nd PP
#18 - Valid FF at End of Job  . . . . . . . . . . . . . . .:  0 NL
#19 - FF Valid Location . . . . . . . . . . . . . . . . . . .:  0 FF valid at 1st PP or MP + 1
#20 - Auto Function at End of Job . . . . . . . . . . .:  0 NL
#21 - Print Quality (Fast Draft)  . . . . . . . . . . . . .:  0 DP = Fast Draft, Text = Draft
#25 - IBM Motion Commands . . . . . . . . . . . . . .:  0 Use FF
#26 - Suppress Empty Forms . . . . . . . . . . . . . . .:  0 No
#27 - Form Feed After TimeOut  . . . . . . . . . . . .:  0 No
#30 - Override of Formatting Cmds . . . . . . . . . .:  0 Disabled
#31 - Truncate/Wrap select  . . . . . . . . . . . . . . . .:  0 Wrap text beyond MPP
#34 - Interv Required (IR) Timeout . . . . . . . . . .:  120 Times 5 Seconds
#36 - Suppress IBM Control Codes . . . . . . . . . .:  0 No control codes suppressed
#37 - Vertical Channel Select (VCS)  . . . . . . . . .:  1 3268/4224
#39 - CPT End Delimiter (ASCII) . . . . . . . . . . .:  2625 (&%)
#40 - CPT Start Delimiter (ASCII)  . . . . . . . . . .:  2625 (&%)
#41 - ALT Command ID Char (ASCII)  . . . . . . .:  5A (Z)
#45 - SCS TRN Translate  . . . . . . . . . . . . . . . . .:  1 3287 emulation emulat, SCS cod 35
#51 - Host Port Timeout  . . . . . . . . . . . . . . . . . .:  08 Seconds
#60 - Output Printer Protocol . . . . . . . . . . . . . . .:  9 Generic
#65 - Character Set Selection . . . . . . . . . . . . . . .:  3 PC Set 2
#72 - Serial Out Baud Rate  . . . . . . . . . . . . . . . .:  2 9600 Baud
#73 - Serial Out Word Length  . . . . . . . . . . . . . .:  8 Bits
#74 - Serial Out Stop Bits  . . . . . . . . . . . . . . . . .:  1 Bit
#75 - Serial Out Parity . . . . . . . . . . . . . . . . . . . .:  0 None
#57 - Host Port Init String:
#55 - Custom User Strings:
      U0:
      U1:
      U2:
      U3:
```

PROBLEM RESOLUTION

U4:
U5:

#84 - Generic 6 LPI String . . . .:
#85 - Generic 8 LPI String . . . .:
#86 - Generic 10 CPI String . . . .:
#87 - Generic 15 CPI String . . . .:
#88 - Generic 12 CPI String . . . .:
#89 - Generic 16.7 CPI String . . . .:

```
        SCS (LU1) EBCDIC to ASCII Translate Table

EBCDIC  40 50 60 70 80 90 A0 B0 C0 D0 E0 F0  456789ABCDEF
     0  20 26 2D 9B 9D F8 E6 5E 7B 7D 5C 30   &-½Î^{}\0
     1  20 82 2F 90 61 6A 7E 9C 41 4A 20 31   /aj~AJ 1
     2  83 88 B6 D2 62 6B 73 BE 42 4B 53 32  ÑØbksƒBKS2
     3  84 89 8E D3 63 6C 74 FA 43 4C 54 33  Æclt°CLT3
     4  85 8A B7 D4 64 6D 75 9F 44 4D 55 34  ñådmuDMU4
     5  A0 A1 B5 D6 65 6E 76 F5 45 4E 56 35   Àçøenv¾ENV5
     6  C6 8C C7 D7 66 6F 77 F4 46 4F 57 36  óúæfow¶FOW6
     7  86 8B 8F D8 67 70 78 AC 47 50 58 37  Ägpx~GPX7
     8  87 8D 80 DE 68 71 79 AB 48 51 59 38  ßhqy¨HQY8
     9  A4 E1 A5 60 69 72 7A F3 49 52 5A 39  ÊÃË`irzµIRZ9
     A  BD 21 DD 3A AE A6 AD 5B F0 D5 FD FC  §!ï:ÛÎÙ[Þí»■
     B  2E 24 2C 23 AF A7 A8 5D 93 96 E2 EA  .$,#£Ï´]ãõ
     C  3C 2A 25 40 D0 91 D1 EE 94 81 99 9A  <*%@ÅîŸ
     D  28 29 5F 27 EC F7 ED F9 95 97 E3 EB  ()_'š¼ÚªÐŠ
     E  2B 3B 3E 3D E8 92 E7 EF A2 A3 E0 E9  +;>=ÒÓÿÂÈÁÕ
     F  7C AA 3F 22 F1 CF A9 F2 E4 98 E5 20  |^?"þü`·ðÍ


        DSC (LU3) DBC to ASCII Translate Table

DBC  00 10 20 30 40 50 60 70 80 90 A0 B0  0123456789AB
  0  00 20 30 26 85 84 B7 8E 61 71 41 51   0&ñaqAQ
  1  00 3D 31 2D 8A 89 D4 D3 62 72 42 52   =1-åÆbrBR
  2  00 27 32 2E 8D 8B DE D8 63 73 43 53   '2.ßÄcsCS
  3  00 22 33 2C 95 94 E3 99 64 74 44 54   "3,ÐdtDT
  4  00 2F 34 3A 97 81 EB 9A 65 75 45 55   /4:ŠeuEU
  5  00 5C 35 2B C6 83 C7 B6 66 76 46 56   \5+óúÑfvFV
  6  00 7C 36 AA E4 88 E5 D2 67 77 47 57   |6^ðÍØgwGW
  7  00 DD 37 EE 98 8C 59 D7 68 78 48 58   ï7ŸYæhxHX
  8  3E 3F 38 F8 85 93 41 E2 69 79 49 59   >?8½AãiyIY
  9  3C 21 39 00 8A 96 45 EA 6A 7A 4A 5A   <!9 EõjzJZ
  A  5B 24 E1 5E 82 A0 45 B5 6B 91 4B 92   [$Ã^ EçkK
  B  5D BD F5 7E 8D 82 49 90 6C 9B 4C 9D   ]§¾~IlL
  C  29 9C 23 F9 95 A1 4F D6 6D 86 4D 8F   )#ªÀOømM
  D  28 BE 40 60 97 A2 55 E0 6E 87 4E 80   (ƒ@`ÂUÁnN
  E  7D FA 25 EF 81 A3 59 E9 6F 3B 4F 3B   }°%ÿÈYÕo;O;
  F  7B CF 5F F7 87 A4 43 A5 70 2A 50 2A   {ü_¼ÈCËp*P*
```

Buffer Print

The interface can be set up to print the buffer in hexadecimal code. This can be useful for a programmer to debug problems with the application software, interface, or the printer.

The EBCDIC hex data is printed on a grid corresponding to the data's position in the buffer. If the hex data represents a printable character, that character is printed to the right of the grid.

Start the buffer hex dump from the interface's Setup Switch as follows:

7. Make sure the proper 9-pin host adapter is attached.

8. Verify that the printer is connected properly to the interface.

9. Power on the printer and wait for it to go to "READY" mode.

10. Before sending the print job, put the Setup Switch in position 9.

11. Send the print job from the host. The job will print in a "Buffer Dump" format showing all host hex codes.

12. After printing is complete, return the Setup Switch to position "A" or the valid twinax address for normal operation.

To start the buffer hex dump through Host Download:

1. Use the "&%Z42,1" command to activate the buffer print.

2. To stop the buffer hex dump, the "&%Z42,2" command can be used in Coax, but you must power-off in Twinax.

HINT: To conserve valuable label stock, and possibly make the buffer print more readable, do the following. Connect the interface to a standard ASCII printer. Temporarily, use Switch "C" then "0" to select generic mode. Then following the instructions above use Switch position "9" to print the buffer print to the ASCII printer. Remember to restore the bar code language when you are done.

PROBLEM RESOLUTION

Self-Diagnostics (Twinax Only)

The interface can be set up to perform a complete analysis of its functions. The interface transmits data to itself and then analyzes how that data is processed. In Twinax, if an error is detected, an error message is printed on the printer.

Follow the steps below to perform interface self-diagnostics.

1. Disconnect the host cable(s) from the 9-pin host adapter but leave the host adapter connected to the interface.

2. Verify that the printer is connected properly to the interface and that the interface is powered off.

3. Select Setup Switch position "E".

4. Power on the printer and interface.

    Each successful pass will print the following:

        TEST SEQUENCE COMPLETE

5. Power off the interface and reset the Setup Switch to position "A" or the valid twinax address to end the self-diagnostics program.

Any error messages are printed between the "TEST SEQUENCE COMPLETE" messages and indicates a failure of the test. Consult your Suppliers Customer Service.

LED Flash Patterns

This listing describes what the different flashing patterns of the LED are indicating:

1. Single flash pattern - The printer is not ready and the interface is waiting for the printer. Also after a rotary switch selection, the LED flashes to indicate that power should be cycled before proceeding.

2. Double flash pattern - There is not a proper host adapter cable installed. Please attach the cable.

3. Triple flash pattern - A rotary switch selection has been made that requires a secondary setting. There will be a 30 second delay to make the secondary selection.
4. Rapid flashing - The interface is saving a configuration to the Non-volatile memory. This could be a restore factory defaults, a host download selection, or a rotary switch selection.

5. The LED is on - Line sync has been established with the Host.

Problem Resolution Guide

The following is a general guide to resolve common problems that may occur. Please refer to this guide before contacting customer support.

PROBLEM RESOLUTION

Problem or Message	Probable Cause	Action
"Printer not ready" message at host	Printer not in a ready status	Make sure printer is on line, has paper, etc.
Host line sync LED not on	Host is not configured for a printer at the address specified	Make sure the host is properly configured for the printer.
	Configuration or address is incorrect	Make sure the host is configured for the printer at the proper address.
	Host is not operating	Check Host system.
	Damaged or improper cabling	Check host cabling for damage or improper connection.
	Twinax cable improperly terminated	Make sure the prior device is not terminated (some PC emulator cards may terminate mid-line).
Host Line Sync LED comes on then goes off	Address conflict with another twinax device on the cable	Make sure no other devices on this cable have the same adress.
	Damaged or improper host cables	Check host cabling for damage or improper connection.
Host LED on but not print output	Printer fault, such as paper out, paper jam, etc.	Make sure the printer has paper, is clear of jams, etc.
	Damaged or loose printer cable	Check printer cable for damage or improper connection.
Printer loses host communication (drops off line)	Improper or damaged cabling	Check host cabling for improper connections or damage.

APPENDIX A - Parallel Output Port

The I-O 4440 BarCode Interface uses a standard 36 pin centronics connector, this allows the interface to plug directly into the attached printer's parallel port.

The following describes the internal connectors on the interface and the pin assignment on the centronics connector .

Table A-1 Parallel Port Pinouts

Int. 2 x 18 Hdr	Cent	Signal Desc	Int. 2 x 18 Hdr	Cent	Signal Desc
1	1	out, STB'	2	19	Logic Ground
3	2	out, D0	4	20	Logic Ground
5	3	out, D1	6	21	Logic Ground
7	4	out, D2	8	22	Logic Ground
9	5	out, D3	10	23	Logic Ground
11	6	out, D4	12	24	Logic Ground
13	7	out, D5	14	25	Logic Ground
15	8	out, D6	16	26	Logic Ground
17	9	out, D7	18	27	Logic Ground
19	10	in, ACK'	20	28	Logic Ground
21	11	in, BUSY	22	29	Logic Ground
23	12	in, PE	24	30	Logic Ground
25	13	in, SEL	26	31	out*, INIT'
27	14	out*, Auto Feed'	28	32	in, FLT'
29	15	nc	30	33	Logic Ground
31	16	Logic Ground	32	34	nc
33	17	Chassis Ground	34	35	nc
35	18	VCC+5volts to J3	36	36	out*, Selctin'
		* (note: Auto Feed', Init', and Selectin' signals are not actively driven. Auto Feed' and Init' are pulled high, and Selctin' is grounded.)			

APPENDIX A

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APPENDIX B - Serial Output Port

The I-O 4440 BarCode Interface uses a standard, RS-232-C, 25-pin male serial connector for its connection to a serial printer. The Interface 25 connection and internal pin assignments are:

Int. 2 x 7 Hdr	DB 25 Pin # Signal Desc	Int. 2 x 7 Hdr	DB 25 Pin # Signal Desc
1	(1) Chassis Ground	2	(14) +5volts to J3
3	(2) Receive Data-in	4	(15) nc
5	(3) Transmit Data-out	6	(16) nc
7	(4) Printer RTS-nc	8	(17) nc
9	(5) Printer CTS- +V	10	(18) nc
11	(6) Printer DSR-out	12	(19) nc
13	(7) Logic Ground	14	(20) Printer DTR-in

APPENDIX B

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Manufacturer's One Year Limited Warranty
(United States)

The following warranty applies only to products purchased and operated within the United States.

I-O Corporation (I-O) warrants this product against defects in material and workmanship for a period of one year commencing from date of purchase by the original customer, when operated and maintained in accordance with I-O's published specifications. I-O's liability shall be limited, at its option and expense, to refund to buyer the actual amount paid by buyer or to repair or replace any defective or nonconforming product or part thereof, F.O.B. I-O's authorized repair depot. Buyer may obtain a replacement product by meeting the terms of the I-O Customer On-Site Exchange Repair Policy in effect at the time of the request.

THE EXPRESS WARRANTY SET FORTH ABOVE IS IN LIEU OF ALL OTHER EXPRESS OR IMPLIED WARRANTIES. OTHERWISE, THE PRODUCTS ARE SOLD AS IS WITHOUT FURTHER OBLIGATION OR LIABILITY ON THE PART OF I-O. I-O EXPRESSLY EXCLUDES ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

EXCEPT AS EXPRESSLY SET FORTH HEREIN, IN NO EVENT SHALL I-O BE LIABLE FOR ANY CLAIMS OR DAMAGE ARISING DIRECTLY OR INDIRECTLY FROM THE FURNISHING OR FAILURE TO FURNISH PRODUCTS, SPARE OR REPLACEMENT PARTS, INFORMATION OR SERVICES HEREUNDER.   UNDER NO CIRCUMSTANCES SHALL I-O BE LIABLE IN ANY WAY FOR INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, INCLUDING, BUT NOT LIMITED TO LOST BUSINESS OR PROFITS, WHETHER OR NOT FORESEEABLE AND WHETHER OR NOT BASED ON BREACH OF WARRANTY, CONTRACT, OR NEGLIGENCE.

WARRANTY INFORMATION

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Customer On-Site Exchange Repair Policy
Terms, Conditions, and Limitations
Effective May 1, 1994[a]

For products covered by the I-O Corporation (I-O) Manufacturer's Limited Warranty (United States), I-O's Customer On-Site Exchange (COE) Repair Policy provides customers with a replacement unit for a defective product, subject to the following terms and conditions:

Call Customer Support

- If a product fails call I-O Customer Support for assistance at (801) 972-1446.

Verify Product Failure

- I-O will verify the product serial number, warranty coverage and product failure.

* You are responsible for assisting in verifying the product failure.

- When I-O Customer Support verifies a product failure they will issue a Return Merchandise Authorization (RMA) number for the failed product.

Replacement Units

- Replacement units are shipped from I-O's stock of refurbished units, subject to availability.

- Replacement units carry the same warranty as remaining on the original product.

- I-O's COE Repair Policy applies only to warranted product failures. Buyer guarantees payment for non-warranted product repairs or replacement.

Customer On-Site Exchange Repair Policy
(Continued)

Return Your Failed Unit

- When you return the failed product it must be shipped freight prepaid. Always note the RMA number on the outside of the package.

Install the Replacement Unit

- You are responsible for installing the replacement unit.

- After receiving the replacement unit please call I-O Customer Support if any assistance is required.

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[a] I-O reserves the right to change the terms and conditions of this policy without notice.

Manufacturer's One Year Limited Warranty
(International)

The following warranty applies only to products purchased or operated outside the United States.

I-O Corporation (I-O) warrants this product against defects in material and workmanship for a period of one year commencing from date of purchase by the original customer, when operated and maintained in accordance with I-O's published specifications. I-O's liability shall be limited, at its option and expense, to refund to buyer the actual amount paid by buyer or to repair or replace any defective or nonconforming product or part thereof, F.O.B. I-O's authorized repair depot. Buyer may obtain warranty service by meeting the terms of the I-O Return-to-Depot Repair Policy in effect at the time of the request.

THE EXPRESS WARRANTY SET FORTH ABOVE IS IN LIEU OF ALL OTHER EXPRESS OR IMPLIED WARRANTIES. OTHERWISE, THE PRODUCTS ARE SOLD AS IS WITHOUT FURTHER OBLIGATION OR LIABILITY ON THE PART OF I-O. I-O EXPRESSLY EXCLUDES ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

EXCEPT AS EXPRESSLY SET FORTH HEREIN, IN NO EVENT SHALL I-O BE LIABLE FOR ANY CLAIMS OR DAMAGE ARISING DIRECTLY OR INDIRECTLY FROM THE FURNISHING OR FAILURE TO FURNISH PRODUCTS, SPARE OR REPLACEMENT PARTS, INFORMATION OR SERVICES HEREUNDER. UNDER NO CIRCUMSTANCES SHALL I-O BE LIABLE IN ANY WAY FOR INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, INCLUDING, BUT NOT LIMITED TO LOST BUSINESS OR PROFITS, WHETHER OR NOT FORESEEABLE AND WHETHER OR NOT BASED ON BREACH OF WARRANTY, CONTRACT, OR NEGLIGENCE.

WARRANTY INFORMATION

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Return-to-Depot Repair Policy
Terms, Conditions, and Limitations
Effective May 1, 1994a

For products covered by the I-O Corporation (I-O) Manufacturer's Limited Warranty (International), I-O's Return-to-Depot (RTD) Repair Policy provides customers with warranty service for a defective product, subject to the following terms and conditions:

Call Customer Support

- If a product fails call I-O Customer Support for assistance at:

  (801) 972-1446 for all locations outside the United States.

Verify Product Failure

- I-O will verify the product serial number, warranty coverage and product failure.

- You are responsible for assisting in verifying the product failure

- When I-O Customer Support verifies a product failure they will issue a Return Merchandise Authorization (RMA) number to authorize return of the failed product.

Select Your Preferred Repair Location

- I-O's Customer Support Representative will assist you in identifying the nearest I-O authorized repair depot.

- I-O's Customer Support Representative will provide you with an RMA transmittal form referencing the assigned RMA number and the authorized repair depot address.

WARRANTY INFORMATION

Return-to-Depot Repair Policy
(Continued)

Return Your Failed Unit

- Return the failed product to the I-O authorized repair depot previously identified, enclosing the RMA transmittal form. When you return the failed product it must be shipped freight prepaid.

- I-O's RTD Repair Policy applies only to warranted product failures. Buyer guarantees payment for non-warranted product repairs.

Install Your Repaired Unit

- I-O's authorized repair depot will service the faulty unit and return it to you, freight prepaid.

- You are responsible for installing the returned unit.

- After receiving the repaired unit please call I-O Customer Support if any assistance is required.

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[a] I-O reserves the right to change the terms and conditions of this policy without notice.

Manufacturer's One Year Limited Warranty
(European Area)

The following warranty applies only to products purchased and operated within the European Area.

I-O Corporation (I-O) warrants this product against defects in material and workmanship for a period of one year commencing from date of purchase by the original end-user, when operated and maintained in accordance with I-O's published specifications. I-O's liability shall be limited, at its option and expense, to refund to original end-user the actual amount paid by original end-user or to repair or replace any defective or nonconforming product or part thereof, F.O.B. I-O's authorized repair depot. Original end-user may obtain a replacement product by meeting the terms of the I-O Customer On-Site Exchange Repair Policy in effect at the time of the request.

THE EXPRESS WARRANTY SET FORTH ABOVE IS IN LIEU OF ALL OTHER EXPRESS OR IMPLIED WARRANTIES. OTHERWISE, THE PRODUCTS ARE SOLD AS IS WITHOUT FURTHER OBLIGATION OR LIABILITY ON THE PART OF I-O. I-O EXPRESSLY EXCLUDES ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

EXCEPT AS EXPRESSLY SET FORTH HEREIN, IN NO EVENT SHALL I-O BE LIABLE FOR ANY CLAIMS OR DAMAGE ARISING DIRECTLY OR INDIRECTLY FROM THE FURNISHING OR FAILURE TO FURNISH PRODUCTS, SPARE OR REPLACEMENT PARTS, INFORMATION OR SERVICES HEREUNDER.   UNDER NO CIRCUMSTANCES SHALL I-O BE LIABLE IN ANY WAY FOR INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, INCLUDING, BUT NOT LIMITED TO LOST BUSINESS OR PROFITS, WHETHER OR NOT FORESEEABLE AND WHETHER OR NOT BASED ON BREACH OF WARRANTY, CONTRACT, OR NEGLIGENCE.

WARRANTY INFORMATION

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Customer On-Site Exchange Repair Policy

Terms, Conditions, and Limitations
Effective June 1, 1997[a]

For products covered by the I-O Corporation (I-O) Manufacturer's Limited Warranty (European Area), I-O's Customer On-Site Exchange (COE) Repair Policy provides original end-users with a replacement unit for a defective product, subject to the following terms and conditions:

Call Customer Support

- If a product fails call I-O Customer Support for assistance at 44(0) 1908 567722.

Verify Product Failure

- I-O will verify the product serial number, warranty coverage and product failure.

- You are responsible for assisting in verifying the product failure.

- When I-O Customer Support verifies a product failure they will issue a Return Merchandise Authorization (RMA) number for the failed product.

I-O Ships Replacement Unit

- Replacement units are shipped from I-O's stock of refurbished units, subject to availability.

- I-O will invoice you for full retail value of the replacement unit upon shipment from I-O.

- Replacement units carry the same warranty as remaining on the original product.

- I-O's COE Repair Policy applies only to warranted product failures. You must pay for non-warranted product repairs or replacement.

WARRANTY INFORMATION

Customer On-Site Exchange Repair Policy
(Continued)

Return Your Failed Unit

- When you return the failed product it must be shipped freight prepaid. To insure proper tracking always note the RMA number on the outside of the package.

- I-O will issue you a credit (reversing the replacement unit invoice amount) when the failed product is received by I-O.

- If you do not return the failed product (or pay the replacement unit invoice) within 14 calendar days of the date the replacement unit is shipped from I-O, your warranty coverage and service will be suspended on all I-O products you own.

Install the Replacement Unit

- You are responsible for installing the replacement unit.

- After receiving the replacement unit please call I-O Customer Support if any assistance is required.

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[a] I-O reserves the right to change the terms and conditions of this policy without notice.

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DECLARATION OF CONFORMITY

EUROPEAN COMMUNITY COMPLIANCE STATEMENT:

> This product is in conformity with the protection requirements of EC Council Directives 72/23/EEC, and 89/336/EEC on the approximation of the laws of the Member States relating to: Standard EN60950 (Safety of Information Technology Equipment); Standard EN50082-1 (Generic Immunity Standard for Residential, Commercial, and Light Industrial Products); and Standard EN55022 (Limits and Methods of Measurement of Radio Interference from Information Technology Equipment).

WARNING: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

DECLARATION OF CONFORMITY

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