



**Decoded Scan Engine
Software Programming
Guide
Version 1.60**



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Revision History

Version	Date	Description
1.0	11/07/16	Original Version
1.1	12/05/16	All Sections
1.2	11/16/17	Add illumination control cmds
1.3	12/04/18	Added Direct Commands
1.4	02/15/19	Update all sections
1.5	02/25/19	Name update, SNPE function code update
1.6	01/08/20	Commands to control aiming pointer added

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About this manual

This DSE Software Programming Guide is intended for programmers who have the need to programmatically configure the Diamond Technologies DSE based scanner family. This manual provides an overview on the programming Syntax and the codes needed to configure all aspects of the reader operation.

The DSE scanner family includes RS232, UART, and USB image based barcode readers. Some programming codes are specific to the DSE model you may have; as an example RS232 commands are specific to RS232 and UART model readers and USB commands are specific to USB model readers. The DSE family includes high performance image based readers which provide excellent reading on 1D, 2D barcodes including damaged and poorly printed codes. The readers have various configuration parameters and settings which can be modified before and during operation.

Current Diamond scanner model families supported by this guide include:

DSE4050
DSE0420
MIN-E
STUB-E
DSE425

Interface Selection

Since your scanner should have shipped with the correct interface (RS232 or USB), the interface type should already be defined. If you need to change the interface type, go to Table 1 below and scan the appropriate bar code in that section.

Each reader model will support one of the following sets of host interfaces:

RS232 and UART Models

1. RS232-STD Standard interface
2. RS232-WN Wincor-Nixdorf
3. RS232-OPOS OPOS/UPOS/Java POS

USB Models

1. USB-COM Simulate RS232
2. USB-OEM OPOS/UPOS/Java POS
3. USB-Composite USB KBD
4. USB-Keyboard ALT Alternate USB Keyboard
5. USB-KBD USB Keyboard standard key encoding
6. USB-KBD-APPLE Apple Keyboard

If your installation requires you to programmatically customize your reader, see Software Configuration Strings listed below.



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

Table 1. Available Interfaces

RS-232	FEATURES
<p>RS-232 standard interface</p>  <p>Select RS232-STD</p>	<p>Set RS-232 Interface Features</p>
 <p>Select RS232-WN</p> <p>RS-232 Wincor-Nixdorf</p>	
<p>RS-232 for use with OPOS/UPOS/JavaPOS</p>  <p>Select RS-232 OPOS</p>	

USB-COM		PAGE
USB COM to simulate RS-232 standard interface	 Select USB-COM-STD ^a	Set USB-COM Interface Features
USB-OEM		
 Select USB-OEM	USB-OEM (can be used for OPOS/UPOS/JavaPOS)	Set USB-OEM Interface Features
USB-COMPOSITE		
USB-Composite (combines USB-KBD emulation and USB-COM)	 Select USB-Composite	Set USB-COM Interface Features

KEYBOARD		FEATURES
USB Keyboard with alternate key encoding	 Select USB Alternate Keyboard	Set KEYBOARD Interface Features
 Select USB Keyboard	USB Keyboard with standard key encoding	
USB Keyboard for Apple computers	 Select USB-KBD-APPLE	

a. Download the correct USB Com driver from www.datalogic.com

Software Direct Commands

The DSE family of readers support several direct commands. These commands only require that you send the actual character to the reader to receive a response. These commands are used for various purposes including triggering the reader, enabling, disabling, and informational messages such as reader health. These commands and the reader response are summarized in the table below.

Command	ASCII Code	Meaning
X	88 (58h)	PRESS trigger
T	84 (54h)	RELEASE trigger
E	69 (45h)	Enable the reader
D	68 (44h)	Disable the reader
i	105 (69h)	Info scanner fw, bootloader ver, config, serial number, interface type
h	104 (68h)	Reader health
F	70 (46h)	Not on File Beep
B	66 (42h)	Single Beep
R	82 (52h)	Reader Reset



Press (trigger scanner on) and Release (trigger scanner off) events can be issued by way of either RS232, UART or USB communication port (COM emulation only).

Software Configuration Strings

RS232, UART, and USB models can be configured programmatically using the serial strings contained in this guide.

To configure RS232 and UART models by using the configuration strings:

1. Connect your RS232 reader to a PC RS232 port. In the case of UART you will need to connect to an appropriate UART interface or alternatively you can purchase a UART to RS232 connector board from Diamond Technologies. Set the PC serial port or UART interface to the default RS232 communication parameters (see Appendix A Standard Defaults).



To configure the reader using configuration strings you must enter Service Mode, which automatically sets the reader communication to 115200 baud rate. You must therefore set the host accordingly for RS232 communications. Upon exiting Service Mode, the programmed baud rate will be restored.

2. Send all the necessary command strings according to your application's requirements.

To configure USB models (only for USB-COM Interface) by using the configuration strings:



USB models by default have the USB-COM Interface selected. They can be easily configured by reading the barcodes in Table 1 of this manual.

1. Download and install the USB-COM driver from <https://www.diamonddt.com/products/barcode-reading-solutions/barcode-readers-oem-machine/dse0420/>.
2. Connect your reader to a PC USB port.
3. Change the interface to USB-COM by reading the barcode below.

USB-COM



4. Using a Terminal Emulation Program, send the Restore Current Interface (Custom) Default string to the reader using the syntax described on the next page.
5. Send all the necessary command strings according to your application's requirements.

Command Syntax

The following pages and examples provide an overview on the Command Syntax between the DSE reader and your Host PC.

1. Enter Service (Serial String Programming) Mode

$\$S<CR>$



This command automatically sets the reader communication to 115200 baud rate. Before continuing, please set the baud rate of the Terminal Emulation Program to 115200.

Alternatively you may use the B00 command which will keep the reader in it's current baud rate for programming. The sequence to send in this case would be $\$S,B00<CR>$

2. Send Command

\$	Command	Parameter	Value	<CR>
----	---------	-----------	-------	------

Where:

Command:	Description
HAXX	Interface Selection
AA	Enable All Symbologies
AD	Disable All Symbologies
R	Reset Reader
CXXXXXX	Write Single Configuration Item to RAM
Parameter:	
XXXX	A 4-character ASCII string See Serial Configuration Strings Table
Value:	
XX	A 2-character Hex string See Serial Configuration Strings Table

3. Apply and Save Configuration to FLASH (permanent memory) and Exit Service Mode

$\$Ar<CR>$

4. Note the reader will respond to the commands with either of the following:

- \$> Command was accepted and understood
- \$% Command data parameter was invalid
- \$? Command was invalid
- \$@ Command execution error occurred.

5. Apply and Save Configuration to FLASH (permanent memory) and Exit Service Mode



This command automatically returns to the programmed baud rate. Before continuing, please set the baud rate of the Terminal Emulation Program to the programmed baud rate.

Example 1:

1. **\$S<CR>**

Enter Service Mode.

2. **\$CLFCA02<CR>**

Write command "Convert to Lower Case" to current configuration.

3. **\$Ar<CR>**

Apply and Save Configuration to FLASH (permanent memory) and Exit Service Mode.

Each configuration parameter setting removes the condition previously active for that parameter.

Example 2:

1. **\$S<CR>**

Enter Service Mode.

2. **\$HA05<CR>**

Select RS232 Interface.

3. **\$Ar<CR>**

Apply and Save Configuration to FLASH (permanent memory) and Exit Service Mode.

Example 3:

1. **\$+\$!<CR>**

Read Application Software Release.

Example 4:

Some parameters (ex. Strings) need to insert all the characters (typically 20 Chrs). For example, to append an Character "STX" (0x02) Prefix to all transmitted data:

1. **\$S<CR>**

Enter Service Mode

INTERFACE SELECTION COMMANDS	
Description	Command
Restore Current Interface (Custom) Default Configuration	HA00
RS232-STD	HA05
RS232-OPUS	HA13
USB-COM	HA47
RS232-Wincor-Nixdorf	HA12
USB-OEM	HA45
USB-POS	HA44
USB-KBD	HA35
USB-KBD-ALT	HA2B
USB KBD-APPLE	HA2C



To read a particular parameter setting from the reader, send the read parameter command without any value. The reader will respond with its currently configured value.

The Read Application Software Release command is a direct command that does not require entering Service Mode.

RS-232 ONLY PARAMETERS			
Description		Parameter	Value
Baud Rate	1200	R2BA	00
	2400		01
	4800		02
	9600		03
	19200		04
	38400		05
	57600		06
	115200		07
Parity	none	R2PA	00
	even		01
	odd		02
Data Bits	7	R2DA	00
	8		01
Stop Bits	1	R2ST	00
	2		01
Handshaking Control	RTS	R2HC	00
	RTS/CTS	R2HC	01
	RTS/Xon/Xoff	R2HC	02
	RTS On/CTS	R2HC	03
	RTS/CTS Scan Control	R2HC	04

RS-232/USB-COM PARAMETERS			
Description		Parameter	Value
Intercharacter Delay	No delay or from 10 to 990 ms	R2IC	<i>a</i>
Disable Character	Host command character which disables the reader	R2DC	<i>b</i>
Enable Character	Host command character which enables the reader	R2EC	<i>b</i>
ACK/NAK Options	Disable	R2AE	00
	Enable for label transmission		01
	Enable for host command acknowledge		02
	Enable for label transmission and host command acknowledge		03
ACK Character	Selects character to be used as ACK	R2AC	<i>c</i>
NAK Character	Selects character to be used as NAK	R2NA	<i>c</i>
ACK/NAK Timeout Value	No timeout or from 200 to 15000 ms	R2AT	<i>d</i>
ACK/NAK Retry Count	From 0 to unlimited retries	R2AR	<i>e</i>
ACK/NAK Error Handling	Ignore errors detected	R2EH	00
	Process errors as valid ACK character		01
	Process errors as valid NAK character		02
Beep On ASCII BEL	Disable	R2BB	00
	Enable		01
Beep On Not-On-File	Disable	BPNF	00
	Enable		01
Indicate Transmission Failure	Disable	R2TF	00
	Enable		01

a = Hex value from 00 to 63 representing the decimal number (00 = no delay; all others x10 ms)

b = Hex value from 00 to FE representing the ASCII character

c = Hex value from 00 to FF representing the ASCII character

d = Hex value from 00 to 4B representing the decimal number (00 = timeout disabled; all others x200 ms)

e = Hex value from 00 to FF representing the number of retries (00 = no retries; 01-FE = 1- 254 retries; FF = unlimited retries)

USB-KBD / USB-KBD-ALT / USB-KBD-APPLE PARAMETERS			
Description		Parameter	Value
Keyboard Country Mode	*US	KBCO	00
	*Belgium		01
	*Britain		02
	Croatia		11
	Czechoslovakia		0E
	Denmark		03
	*France		04
	*Germany		05
	Hungary		0D
	*Italy		06
	Japanese (106 key)		0C
	Norway		07
	Poland		12
	Portugal		08
	Romania		10
	Slovakia		0F
	*Spain		09
*Sweden		0A	
Switzerland		0B	
Send Control Characters	CTRL + KEY	KBSC	00
	CTRL + SHIFT + KEY		01
	Special Function KEY		02
USB Keyboard Speed	1 ms	KBSP	01
	2 ms		02
	3 ms		03
	4 ms		04
	5 ms		05
	6 ms		06
	7 ms		07
	8 ms		08
	9 ms		09
	10 ms		0A

* = Valid for USB-KBD-APPLE

READING PARAMETERS			
Description		Parameter	Value
Double Read Timeout	10 to 2,550 milliseconds (2.55 seconds) in 10ms increments (1-255)	SNDR	<i>f</i>
Laser Aimer Control	Disable	TAAP	00
	Enable		01
Illumination Brightness		IPWL	<i>g</i>
	High Brightness	IPWL	0C
	Medium Brightness		06
	Low Brightness		03
Operating Modes	Illumination off		00
	Trigger Single	SNRM	00
	Trigger Hold Multiple		01
	Trigger Pulse Multiple		02
	Flashing		03
	Always On		04
Stand Mode Sensitivity	Stand Mode		05
	High Sensitivity	SMSE	02
	Medium Sensitivity		01
	Low Sensitivity		00
Timeout (Scan Active Time)	1 to 255 seconds in 1 second intervals.	SNET	<i>h</i>
Pick Mode	Disable	SNPM	00
	Enable		01
Mobile Phone Mode	Disable	SNPE	00
	Enable		01
Label Programming Mode	Disabled	FAPM	00
	Enabled		01

f = Hex value from **01** to **FF** representing the minimum time between same labels

g = Hex value from **03** to **13** representing the illumination level lowest to highest, 3 standard levels given

h = Hex value from **02** to **FF** representing the decimal number (*x20 ms*)

i = Hex value from **00** to **FE** representing the ASCII character

DATA FORMAT COMMANDS			
Description		Parameter	Value
Case Conversion	Disable	LFCA	00
	Upper Case		01
	Lower Case		02
Global Prefix (Header)	Any string of characters (max 20) between 00-FE	LFPR	<i>k</i>
Global Suffix (Terminator)	Any string of characters (max 20) between 00-FE	LFSU	<i>k</i>
Character Conversion	An 8-character string between 00-FF	LFCH	<i>m</i>
Transmit AIM IDs	Disable	AIEN	00
	Enable		01
Transmit Custom Label IDs	Disable	IDCO	00
	Prefix		01
	Suffix		02
GS1-128 AIM ID	Disable	U8AI	00
	Enable		01

k = Hex value from **00** to **FE** representing the ASCII character

m = 8 Hex values from **00** to **FF** representing the 8 ASCII characters (*FF* = no replacement or ignore)

Custom Code Identifiers	Any string of characters (max 3) between 00-FE		
UPC-A		ABID	<i>k</i>
UPC-E		EBID	<i>k</i>
EAN-8		8BID	<i>k</i>
EAN-13		3BID	<i>k</i>
UPC-A/P2		A2ID	<i>k</i>
UPC-A/P5		A5ID	<i>k</i>
UPC-E/P2		E2ID	<i>k</i>
UPC-E/P5		E5ID	<i>k</i>
EAN-8/P2		82ID	<i>k</i>
EAN-8/P5		85ID	<i>k</i>
EAN-13/P2		32ID	<i>k</i>
EAN-13/P5		35ID	<i>k</i>
ISBN		ISID	<i>k</i>
ISSN		INID	<i>k</i>
GTIN for EAN/UPC w/o Add-On		GBID	<i>k</i>
GTIN for EAN/UPC w P2		G2ID	<i>k</i>
GTIN for EAN/UPC w P5		G5ID	<i>k</i>
Code 39		C3ID	<i>k</i>
Code 32		P3ID	<i>k</i>
Code 128		C8ID	<i>k</i>
GS1-128		U8ID	<i>k</i>
ISBT 128		I8ID	<i>k</i>
Interleaved 2 of 5		I2ID	<i>k</i>
Standard 2 of 5		S2ID	<i>k</i>
Industrial 2 of 5		U2ID	<i>k</i>
IATA		IAID	<i>k</i>
Codabar		CBID	<i>k</i>
ABC Codabar		ACID	<i>k</i>
GS1 Databar 14 (Omnidirectional)		4BID	<i>k</i>
GS1 Databar Expanded		XBID	<i>k</i>
GS1 Databar Limited		LBID	<i>k</i>

k = Hex value from **00** to **FE** representing the ASCII character

Custom Code Identifiers	Any string of characters (max 3) between 00-FE		
Code 93		C9ID	k
MSI		MSID	k
Plessey		PLID	k

k = Hex value from 00 to FE representing the ASCII character

LED AND BEEPER INDICATORS			
Description		Parameter	Value
Power On Alert	Disable	BPPU	00
	Enable		01
Indicate Good Read	After Decode	BPIN	00
	After Transmit		01
	After CTS switch I/A		02
Good Read Beep Type	Mono Tone Beep	BPTY	00
	Bitonal Beep		01
Good Read Beep Volume	Off	BPVO	00
	Low		01
	Medium		02
	High		03
Good Read Beep Frequency	Low	BPFR	00
	Medium		01
	High		02
Good Read Beep Length	Time length from 10 to 2550 ms	BPLE	o
Power on Alert	No Indication	BPPU	00
	Power-up Beep		01
Good Read Led Duration	Time length from 0 to 25,500 ms	LAGL	f
Green Spot Duration	Disable	LSSP	00
	Short 300ms		01
	Medium 500ms		02
	Long 800ms		03

o = Hex value from 01 to FF representing the decimal number (x10 ms)

f = Hex value from 00 to FF representing the decimal number (00 = Disable; others x100ms)

CODE SELECTION			
Description		Parameter	Value
UPC-A			
UPC-A	Disable	ABEN	00
	Enable		01
Check Character Tx	Disable	ABCT	00
	Enable		01
Expand to EAN-13	Disable	AB3B	00
	Enable		01
Number System Tx	Disable	ABNS	00
	Enable		01
Coupon Control	Allow all coupon barcodes to be decoded	CPCL	00
	Enable only UPC-A coupon decoding		01
	Enable only GS1 Databar coupon decoding		02
UPC-E			
UPC-E	Disable	EBEN	00
	Enable		01
Check Character Tx	Disable	EBCT	00
	Enable		01
Expand to UPC-A	Disable	EBAB	00
	Enable		01
Expand to EAN-13	Disable	EB3B	00
	Enable		01
Number System Tx	Disable	EBNS	00
	Enable		01
EAN-13			
EAN-13	Disable	3BEN	00
	Enable		01
Check Character Tx	Disable	3BCT	00
	Enable		01
ISBN Conversion	Disable	3BIS	00

CODE SELECTION			
Description		Parameter	Value
	Enable		01
ISSN Conversion	Disable	3BIN	00
	Enable		01
Flag 1 Character	Disable	3BF1	00
	Enable		01
Coupon Control	Allow all coupon barcodes to be decoded	CPCL	00
	Enable only UPC-A coupon decoding		01
	Enable only GS1 Databar coupon decoding		02
EAN-8			
EAN-8	Disable	8BEN	00
	Enable		01
Check Character Tx	Disable	8BCT	00
	Enable		01
Expand to EAN-13	Disable	8B3B	00
	Enable		01
Add-Ons			
P2 Add-On	Disable	ADO2	00
	Enable		01
P5 Add-On	Disable	ADO5	00
	Enable		01
Optional Add-On Timer	Timer disabled or from 10 to 300 ms	ADOT	<i>p</i>

p = Hex value from 00 to 1E representing the decimal number (00 = Timer disabled; all others x10 ms)

CODE SELECTION			
Description		Parameter	Value
EAN/UPC Global Settings			
GTIN Format	Disable	GBEN	00
	Enable		01
Code 39			
Code 39	Disable	C3EN	00
	Enable		01
Code 39 Full ASCII	Disable	C3FA	00
	Enable		01
Code Length Control	Variable	C3LC	00
	Fixed		01
Set Length	Length 1 (or Min Length) from 1 to 50 characters	C3L1	<i>q</i>
	Length2(orMaxLength)0orfrom1to50characters	C3L2	<i>q</i>
Code 32 (Italian Pharma)	Disable	P3EN	00
	Enable		01
Code 32 Check Tx	Disable	P3CT	00
	Enable		01
Code 32 Start/Stop Tx	Disable	P3SS	00
	Enable		01
Check Options			
Check Calculation	Disable	C3CC	00
	Enable Standard Check		01
	Enable Mod-7 Check		02
	Enable Italian Post Check		04
	Enable Daimler Chrysler Check		08

q = Hex value from **00** to **32** representing the decimal number

CODE SELECTION			
Description		Parameter	Value
Code 39 Check Tx	Disable	C3CT	00
	Enable		01
Code 39 Start/Stop Tx	Disable	C3SS	00
	Enable		01
Decoding Options			
Quiet Zones	Quiet Zone on One Side	C3LO	01
	Quiet Zones on Two Sides		02
	Auto		03
	Virtual Quiet Zones on Two Sides		04
	Small Quiet Zones on Two Sides		05
Code 128 (GS1-128)			
Code 128	Disable	C8EN	00
	Enable		01
GS1-128 Enable	Enable (transmit labels in Code 128 data format)	U8EN	00
	Enable (transmit labels in GS1-128 data format)		01
	Disable		02
Code Length Control	Variable	C8LC	00
	Fixed		01
Set Length	Length 1 (or Min Length) from 1 to 80 characters	C8L1	s
	Length 2 (or Max Length) 0 or from 1 to 80 characters	C8L2	s

r = Hex value from **00** to **0A** representing the decimal number of the interdigit space/module ratio (*00 = any ratio*)

s = Hex value from **00** to **50** representing the decimal number

CODE SELECTION			
Description		Parameter	Value
Expand to Code 39	Disable	C8C3	00
	Enable		01
Check Options			
Check Tx	Disable	C8CT	00
	Enable		01
Function Character Tx	Disable	C8TF	00
	Enable		01
Quiet Zones	No Quiet Zones	C8LO	00
	Quiet Zone on One Side		01
	Quiet Zones on Two Sides		02
	Auto		03
	Virtual Quiet Zones on Two Sides		04
ISBT 128			
ISBT 128 Concatenation	Disable	I8CE	00
	Enable		01
Concatenation Mode	Static	I8CM	00
	Dynamic		01
Dynamic Concat. Timeout	From 50 to 2550 ms	I8DT	t
Chain 0 - Chain 15	Contact Datalogic		

t = Hex value from **05** to **FF** representing the decimal number (*x10 ms*)

CODE SELECTION			
Description		Parameter	Value
Interleaved 2 of 5 (I 2 of 5)			
I 2 of 5	Disable	I2EN	00
	Enable		01
Code Length Control	Variable	I2LC	00
	Fixed		01
Set Length	Length 1 (or Min Length) from 2 to 50 characters (only even numbers)	I2L1	v
	Length 2 (or Max Length) from 0 or from 2 to 50 characters (only even numbers)	I2L2	v
Check Options			
Check Calculation	Disable	I2CC	00
	Enable Standard(Mod 10)		01
	Enable German Parcel		02
	Enable DHL		04
	Enable Daimler Chrysler		08
	Enable Bosch		10
	Enable Italian Post		20
Check Tx	Disable	I2CT	00
	Enable		01

v = Hex value from **00** or **02** to **32** representing the decimal number

CODE SELECTION			
Description		Parameter	Value
Standard 2 of 5			
Standard 2 of 5	Disable	S2EN	00
	Enable		01
Code Length Control	Variable	S2LC	00
	Fixed		01
Set Length	Length 1 (or Min Length) from 1 to 50 characters	S2L1	v
	Length2(orMaxLength)0orfrom1to50characters	S2L2	v
Check Options			
Check Calculation	Disable	S2CC	00
	Enable		01
Check Tx	Disable	S2CT	00
	Enable		01
Industrial 2 of 5			
Industrial 2 of 5	Disable	U2EN	00
	Enable		01
Code Length Control	Variable	U2LC	00
	Fixed		01
Set Length	Length 1 (or Min Length) from 1 to 50 characters	U2L1	v
	Length2(orMaxLength)0orfrom1to50characters	U2L2	v
Check Options			
Check Calculation	Disable	U2CC	00
	Enable		01

v = Hex value from **00** or **02** to **32** representing the decimal number

CODE SELECTION			
Description		Parameter	Value
Check Tx	Disable	U2CT	00
	Enable		01
IATA			
IATA	Disable	IAEN	00
	Enable		01
Check Tx	Disable	IACT	00
	Enable		01

v = Hex value from 00 or 02 to 32 representing the decimal number

CODE SELECTION			
Description		Parameter	Value
Codabar			
Codabar	Disable	CBEN	00
	Enable		01
Code Length Control	Variable	CBLC	00
	Fixed		01
Set Length	Length 1 (or Min Length) from 3 to 50 characters	CBL1	v
	Length2(orMaxLength)0orfrom3to50characters	CBL2	v
ABC Codabar			
ABC Codabar	Disable	CBAB	00
	Enable		01
Concatenation Mode	Static	CBCM	00
	Dynamic		01
Dynamic Concat. Timeout	From 50 to 2550 ms	CBDT	t
Check Options			
Check Calculation	Disable	CBCC	00
	Enable AIM Standard Check		01
	Enable Mod-10 Check		02
Check Tx	Disable	CBCT	00
	Enable		01
Start/Stop Set	ABCD/TN*E	CBSC	00
	ABCD/ABCD		01
	abcd/tn*e		02
	abcd/abcd		03
Start/Stop Tx	Disable	CBSS	00
	Enable		01
Start/Stop Match	Disable	CBSM	00
	Enable		01
Decoding Options			

v = Hex value from **00** or **02** to **32** representing the decimal number

t = Hex value from **05** to **FF** representing the decimal number (*x10 ms*)

CODE SELECTION			
Description		Parameter	Value
Quiet Zones	Quiet Zone on One Side	CBLO	01
	Quiet Zones on Two Sides		02
	Auto		03
	Virtual Quiet Zones on Two Sides		04
	Small Quiet Zones on Two Sides		05
GS1 Databar Omnidirectional			
GS1 Databar Omnidirectional	Disable	4BEN	00
	Enable		01
GS1-128 Emulation	Disable	4BU8	00
	Enable		01
Omnidirectional Decoding Options			
GS1 Databar Expanded			
GS1 Databar Expanded	Disable	XBEN	00
	Enable		01
GS1-128 Emulation	Disable	XBU8	00
	Enable		01
Code Length Control	Variable	XBLC	00
	Fixed		01

r = Hex value from 00 to 0A representing the decimal number of the interdigit space/module ratio (00 = any ratio)

CODE SELECTION			
Description		Parameter	Value
Set Length	Length 1 (or Min Length) from 1 to 74 characters	XBL1	<i>w</i>
	Length2(orMaxLength)0orfrom1to74characters	XBL2	<i>w</i>
Expanded Decoding Options			
Coupon Control	Allow all coupon barcodes to be decoded	CPCL	00
	Enable only UPC-A coupon decoding		01
	Enable only GS1 Databar coupon decoding		02
GS1 Databar Limited			
GS1 Databar Limited	Disable	LBEN	00
	Enable		01
GS1-128 Emulation	Disable	LBU8	00
	Enable		01
Limited Decoding Options			
Code 93			
Code 93	Disable	C9EN	00
	Enable		01
Code Length Control	Variable	C9LC	00
	Fixed		01
Set Length	Length 1 (or Min Length) from 1 to 50 characters	C9L1	<i>v</i>
	Length2(orMaxLength)0orfrom1to50characters	C9L2	<i>v</i>
Check Options			
Check Calculation	Disable	C9CC	00
	Enable Check C		01
	Enable Check K		02
	Enable Check C and K		03
Check Tx	Disable	C9CT	00
	Enable		01
Decoding Options			

w = Hex value from **00** to **4A** representing the decimal number

v = Hex value from **00** or **02** to **32** representing the decimal number

CODE SELECTION			
Description		Parameter	Value
Quiet Zones	No Quiet Zones	C9LO	00
	Quiet Zone on One Side		01
	Quiet Zones on Two Sides		02
	Auto		03

	Virtual Quiet Zones on Two Sides		04
MSI			
MSI	Disable	MSEN	00
	Enable		01
Code Length Control	Variable	MSLC	00
	Fixed		01
Set Length	Length 1 (or Min Length) from 1 to 50 characters	MSL1	v
	Length2(orMaxLength)0orfrom1to50characters	MSL2	v
Check Options			
Check Calculation	Disable	MSCC	00
	Enable Mod 10		01
	Enable Mod 11/10		02
	Enable Mod 10/10		03
Check Tx	Disable	MSCT	00
	Enable		01
Decoding Options			

v = Hex value from **00** or **02** to **32** representing the decimal number

CODE SELECTION			
Description		Parameter	Value
Plessey			
Plessey	Disable	PLEN	00
	Enable		01
Code Length Control	Variable	PLLC	00
	Fixed		01
Set Length	Length 1 (or Min Length) from 1 to 50 characters	PLL1	v
	Length2(orMaxLength)0orfrom1to50characters	PLL2	v
Check Options			
Check Calculation	Disable	PLCC	00
	Standard		01
	Anker Calculation		02
	Standard and Anker Calculation		03
Check Tx	Disable	PLCT	00
	Enable		01
Decoding Options			

v = Hex value from **00** or **02** to **32** representing the decimal number

2D Codes

2D GLOBAL FEATURES			
Description		Parameter	Value
2D Max Decoding Time	10-2550 ms in 10ms intervals	DETM	<i>h</i>
2D Structured Append	Disabled	DESA	00
	Enabled		01
2D Normal/Inverse Symbol Control	Normal	IPNR	00
	Inverse		01
	Both Normal & Inverse		02

2D CODE SELECTION			
Aztec Code			
Aztec Code	Disabled	AZEN	00
	Enabled		01
Code Length Control	Variable	AZLC	00
	Fixed		01
Set Length	Length1 (Min for Variable) 1	AZL1	<i>q</i>
	Length2 (Max for Variable) 3832	AZL2	<i>q</i>
China Sensible Code			
China Sensible Code	Disabled	CSEN	00
	Enabled		01
Code Length Control	Variable	CSLC	00
	Fixed		01
Set Length	Length1 (Min for Variable) 1	CSL1	<i>r</i>
	Length2 (Max for Variable) 7827	CSL2	<i>r</i>
Data Matrix			
Data Matrix	Disabled	DMEN	00
	Enabled		01
Style	Square	DMDM	3FFF0BDF
	Rectangular		0000F420
	Both Square & Rectangular		3FFFFFFF
Code Length Control	Variable	DMLC	00
	Fixed		01

h = Hex value from **01-FF**

q = Hex value from **0001 - 0EF8**

r = Hex value from **0001 - 1E931**

Set Length	Length1 (Min for Variable) 1	DML1	t
	Length2 (Max for Variable) 3116	DML2	t
Maxicode			
Maxicode	Disabled	MXEN	00
	Enabled		01
Primary Message TX	Disabled	MXPT	00
	Enabled		01
Code Length Control	Variable	MXLC	00
	Fixed		01
Set Length	Length1 (Min for Variable) 1	MXL1	u
	Length2 (Max for Variable) 145	MXL2	u
PDF417			
PDF417	Disabled	P4EN	00
	Enabled		01
Code Length Control	Variable	P4LC	00
	Fixed		01
Set Length	Length1 (Min for Variable) 1	P4L1	v
	Length2 (Max for Variable) 2710	P4L2	v
Micro PDF417			
Micro PDF417	Disabled	MIEN	00
	Enabled		01
Code 128 GS1-128 Emulation	Micro PDF AIM ID and label type	MIU8	00
	Code 128 / EAN128 AIM ID and label type		01
Code Length Control	Variable	MILC	00
	Fixed		01
Set Length	Length1 (Min for Variable) 1	MIL1	w
	Length2 (Max for Variable) 366	MIL2	w
QR Code			
QR Code	Disabled	QREN	00
	Enabled		01
Code Length Control	Variable	QRLC	00
	Fixed		01

t = Hex value from **0001 - 0C2C** **u** = Hex value from **0001 - 0091** **v** = Hex value from **0001 - 0A96** **w** = Hex value from **0001 - 016E**

Set Length	Length1 (Min for Variable) 1	QRL1	x
	Length2 (Max for Variable) 7089	QRL2	x
Micro QR Code			
Micro QR Code	Disabled	MQEN	00
	Enabled		01
Code Length Control	Variable	MQLC	00
	Fixed		01
Set Length	Length1 (Min for Variable) 1	MQL1	y
	Length2 (Max for Variable) 35	MQL2	y
UCC Composite			
UCC Composite	Disabled	CMEN	00
	Enabled		01
Optional Composite Timer	Variable: 00=disabled, 100-3000ms in 100ms intervals	CMOT	i
Postal Codes			
Postal Code Selection		POEN	00
Postnet BB Control	Disabled	POBB	00
	Enabled		01

x = Hex value from **0001 - 1BB1** **y** =
Hex value from **0001 - 0023** **i** = Hex
value from **00 - 1E**

Appendix A Standard Defaults

The most common configuration settings are listed in the “Default” column of the table below. A column has also been provided for recording of your preferred default settings for these same configurable features.

Table 42. Standard Defaults

Parameter	Default	Your Setting
Host Commands — Obey/Ignore	Obey	
Baud Rate	9600	
Data Bits	8 Data Bits	
Stop Bits	1 Stop Bit	
Parity	None	
Handshaking Control	RTS	
Intercharacter Delay	No Delay	
Beep On ASCII BEL	Disable	
Beep On Not on File	Enable	
ACK NAK Options	Disable	
ACK Character	‘ACK’	
NAK Character	‘NAK’	
ACK NAK Timeout Value	200 ms	
ACK NAK Retry Count	3 Retries	
ACK NAK Error Handling	Ignore Errors Detected	
Indicate Transmission Failure	Enable	
Disable Character	‘D’	

Parameter	Default	Your Setting
Enable Character	'E'	
USB Keyboard		
Country Mode	U.S. Keyboard	
Send Control Characters	00	
Intercode Delay	100 ms	
Intercode Delay	No Delay	
Caps Lock State	Caps Lock OFF	
USB Keyboard Speed	1 ms	
USB Keyboard Numeric Keypad	Standard Keys	
USB-OEM Device Usage	Handheld	
Transmit Labels in Code 39 Format	IBM Standard Format	
Interface Options	Ignore Scanner Configuration Host Commands	
Global Prefix/Suffix	No Global Prefix Global Suffix = 0x0D (CR)	
Global AIM ID	Disable	
Set AIM ID Individually for GS1-128	Enable	
Label ID: Pre-Loaded Sets	USA Set	
Individually Set Label ID	Disable	
Case Conversion	Disable	
Character Conversion	No Char Conversion	

Parameter	Default	Your Setting
Reading Parameters		
Double Read Timeout	.6 Second	
Power On Alert	Power-up Beep	
Good Read: When to Indicate	After Decode	
Good Read Beep Type	Mono	
Good Read Beep Frequency	High	
Good Read Beep Length	80 ms	
Good Read Beep Volume	High	
Scanning Features		
Scan Mode	Trigger Single	
Laser Aimer	Enable	
Pick Mode	Disable	
Stand Mode Illumination off time	2 seconds	
Stand Mode Sensitivity	Medium	
Scanning Active Time	5 seconds	
Stand Illumination Control	Off	
Flash on Time	10=Flash is ON for 1 second	
Flash off Time	06=Flash is OFF for 600 ms	
Illumination Brightness	Enable	
Aiming Duration Timer	Aiming off after Decoding	

Parameter	Default	Your Setting
Green Spot Duration	300 ms	
Mobile Phone Mode	Enable	
Partial Label Reading Control	Enable	
Decode Negative Image	Disable	
Multiple Label Reading		
Multiple Labels per Frame	Disable	
Multiple Labels Ordering by Code Symbology	Random Order	
Multiple Labels Ordering by Code Length	Disable	
CODES SELECTION – 1D Symbologies		
Code EAN/UPC		
Coupon Control	Enable only UPCA coupon decoding	
UPC-A Enable/Disable	Enable	
UPC-A Check Character Transmission	Send	
Expand UPC-A to EAN-13	Don't Expand	
UPC-A Number System Character Transmission	Transmit	
UPC-A 2D Component	2D Component Not Required	
UPC-E Enable/Disable	Enable	
UPC-E Check Character Transmission	Send	
UPC-E 2D Component	2D Component Not Required	
Expand UPC-E to EAN-13	Don't Expand	
Expand UPC-E to UPC-A	Don't Expand	
UPC-E Number System Character Transmission	Transmit	

Parameter	Default	Your Setting
GTIN		
GTIN Formatting	Disable	
EAN 13 (Jan 13)		
EAN 13 Enable/Disable	Enable	
EAN 13 Check Character Transmission	Send	
EAN-13 Flag 1 Character	Transmit	
EAN-13 ISBN Conversion	Disable	
EAN-13 2D Component	2D Component Not Required	
ISSN		
ISSN Enable/Disable	Disable	
EAN 8		
EAN 8 Enable/Disable	Enable	
EAN 8 Check Character Transmission	Send	
Expand EAN 8 to EAN 13	Disable	
EAN 8 2D Component	2D Component Not Required	
UPC/EAN Global Settings		
UPC/EAN Price Weight Check	Disable	
UPC/EAN Quiet Zones	Two Modules	
Add-Ons		
Optional Add-ons	Disable P2, P5 and P8	
Optional Add-On Timer	70 ms	
Optional GS1-128 Add-On Timer	Disable	
Code 39		
Code 39 Enable/Disable	Enable	
Code 39 Check Character Calculation	Disable	
Code 39 Check Character Transmission	Send	
Code 39 Start/Stop Character Transmission	Don't Transmit	
Code 39 Full ASCII	Disable	
Code 39 Quiet Zones	Small Quiet Zones on two sides	
Code 39 Length Control	Variable	

Parameter	Default	Your Setting
Code 39 Set Length 1	2	
Code 39 Set Length 2	50	
Trioptic Code		
Trioptic Code Enable/Disable	Disable	
Code 32 (Italian Pharmaceutical Code)		
Code 32 Enable/Disable	Disable	
Code 32 Check Char Transmission	Don't Send	
Code 32 Start/Stop Character Transmission	Don't Transmit	
Code 39 CIP (French Pharmaceutical Code)		
Code 39 CIP Enable/Disable	Disable	
Special Codes		
Code 39 Danish PPT Enable/Disable	Disable	
Code 39 LaPoste Enable/Disable	Disable	
Code 39 PZN Enable/Disable	Disable	
Code 128		
Code 128 Enable/Disable	Enable	
Expand Code 128 to Code 39	Don't Expand	
Code 128 Check Character Transmission	Don't Send	
Code 128 Function Character Transmission	Don't Send	
Code 128 Quiet Zones	Small Quiet Zones on two sides	
Code 128 Length Control	Variable	
Code 128 Set Length 1	1	
Code 128 Set Length 2	80	
GS1-128		
GS1-128 Enable	Transmit in Code 128 Data Format	
GS1-128 2D Component	Disable	
ISBT-128		
ISBT 128 Concatenation	Disable	

Parameter	Default	Your Setting
ISBT 128 Force Concatenation	Disable	
ISBT 128 Concatenation Mode	Static	
ISBT 128 Dynamic Concatenation Timeout	200 msec	
Interleaved 2 of 5		
l 2 of 5 Enable/Disable	Disable	
l 2 of 5 Check Character Calculation	Disable	
l 2 of 5 Check Character Transmission	Send	
l 2 of 5 Length Control	Variable	
l 2 of 5 Set Length 1	6	
l 2 of 5 Set Length 2	50	
Interleaved 2 of 5 CIP HR		
Interleaved 2 of 5 CIP HR Enable/Disable	Disable	
Follett 2 of 5		
Follett 2 of 5 Enable/Disable	Disable	
Standard 2 of 5		
Standard 2 of 5 Enable/Disable	Disable	
Standard 2 of 5 Check Character Calculation	Disable	
Standard 2 of 5 Check Character Transmission	Send	
Standard 2 of 5 Length Control	Variable	
Standard 2 of 5 Set Length 1	8	
Standard 2 of 5 Set Length 2	50	
Industrial 2 of 5		
Industrial 2 of 5 Enable/Disable	Disable	
Industrial 2 of 5 Check Character Calculation	Disable	
Industrial 2 of 5 Check Character Transmission	Enable	
Industrial 2 of 5 Length Control	Variable	
Industrial 2 of 5 Set Length 1	1	
Industrial 2 of 5 Set Length 2	50	
Code IATA		
IATA Enable/Disable	Disable	

Parameter	Default	Your Setting
IATA Check Character Transmission	Enable	
Codabar		
Codabar Enable/Disable	Disable	
Codabar Check Character Calculation	Don't Calculate	
Codabar Check Character Transmission	Send	
Codabar Start/Stop Character Transmission	Transmit	
Codabar Start/Stop Character Set	abcd/abcd	
Codabar Start/Stop Character Match	Don't Require Match	
Codabar Quiet Zones	Small Quiet Zones on two sides	
Codabar Length Control	Variable	
Codabar Set Length 1	3	
Codabar Set Length 2	50	
ABC Codabar		
ABC Codabar	Disable	
ABC Codabar Enable/Disable	Disable	
ABC Codabar Concatenation Mode	Static	
ABC Codabar Dynamic Concatenation Timeout	200 msec	
ABC Codabar Force Concatenation	Disable	
Code 11		
Code 11 Enable/Disable	Disable	
Code 11 Check Character Calculation	Check C and K	
Code 11 Check Character Transmission	Send	
Code 11 Length Control	Variable	
Code 11 Set Length 1	4	
Code 11 Set Length 2	50	
GS1 DataBar Omnidirectional		
GS1 DataBar™ Omnidirectional Enable/Disable	Disable	
GS1 DataBar™ Omnidirectional GS1-128 Emulation	Disable	
GS1 DataBar™ Omnidirectional 2D Component	2D component not required	

Parameter	Default	Your Setting
GS1 DataBar Expanded		
GS1 DataBar™ Expanded Enable/Disable	Disable	
GS1 DataBar™ Expanded GS1-128 Emulation	Disable	
GS1 DataBar™ Expanded 2D Component	2D component not required	
GS1 DataBar™ Expanded Length Control	Variable	
GS1 DataBar™ Expanded Set Length 1	1	
GS1 DataBar™ Expanded Set Length 2	74	
GS1 DataBar Limited		
GS1 DataBar™ Limited Enable/Disable	Disable	
GS1 DataBar™ Limited GS1-128 Emulation	Disable	
GS1 DataBar™ Limited 2D Component	2D component not required	
Code 93		
Code 93 Enable/Disable	Disable	
Code 93 Check Character Calculation	Enable Check C and K	
Code 93 Check Character Transmission	Disable	
Code 93 Length Control	Variable	
Code 93 Set Length 1	1	
Code 93 Set Length 2	50	
Code 93 Quiet Zones	Small Quiet Zones on two sides	
MSI		
MSI Enable/Disable	Disable	
MSI Check Character Calculation	Enable Mod10	
MSI Check Character Transmission	Enable	
MSI Length Control	Variable	
MSI Set Length 1	1	
MSI Set Length 2	50	
Plessey		
Plessey Enable/Disable	Disable	

Parameter	Default	Your Setting
Plessey Check Character Calculation	Enable Plessey std. check char. verification	
Plessey Check Character Transmission	Enable	
Plessey Length Control	Variable	
Plessey Set Length 1	1	
Plessey Set Length 2	50	
CODE Selection – 2D Symbologies		
2D Maximum Decoding Time	350msec	
2D Structured Append	Disable	
2D Normal/Inverse Symbol Control	Normal	
Aztec Code Enable / Disable	Disable	
Aztec Code Length Control	Enable	
Aztec Code Length Control	Variable	
Aztec Code Set Length 1	1	
China Sensible Code Enable / Disable	Disable	
China Sensible Code Length Control	Variable	
China Sensible Code Set Length 1	1	
China Sensible Code Set Length 2	7,827	
Data Matrix Enable / Disable	Enable	
Data Matrix Square/Rectangular Style	Both Square and Rectangular style	
Data Matrix Length Control	Variable	
Data Matrix Set Length 1	1	
Data Matrix Set Length 2	3,116	
Maxicode Enable / Disable	Disable	
Maxicode Primary Message Transmission	Disable	
Maxicode Length Control	Variable	
Maxicode Set Length 1	1	
Maxicode Set Length 2	0145	
PDF417 Enable / Disable	Enable	
PDF417 Length Control	Variable	

Parameter	Default	Your Setting
PDF417 Set Length 1	1	
PDF417 Set Length 2	2,710	
Micro PDF417 Enable / Disable	Disable	
Micro PDF417 Code 128 GS1-128 Emulation	Micro PDF AIM ID and label type	
Micro PDF417 Length Control	Variable	
Micro PDF417 Set Length 1	1	
Micro PDF417 Set Length 2	0366	
QR Code Enable / Disable	Enable	
QR Code Length Control	Variable	
QR Code Set Length 1	1	
QR Code Set Length 2	7,089	
Micro QR Code Enable/Disable	Disable	
Micro QR Code Length Control	Variable	
Micro QR Code Set Length 1	0001	
Micro QR Code Set Length 2	0035	
UCC Composite Enable / Disable	Disable	
UCC Optional Composite Timer	Timer Disabled	
Postal Code Selection	Disable all Postal codes	
Postnet BB Control	Disable	

Appendix B ASCII Chart

ASCII Chart

ASCII Char.	Hex No.	ASCII Char.	Hex No.	ASCII Char.	Hex No.	ASCII Char.	Hex No.
NUL	00	SP	20	@	40	'	60
SOH	01	!	21	A	41	a	61
STX	02	"	22	B	42	b	62
ETX	03	#	23	C	43	c	63
EOT	04	\$	24	D	44	d	64
ENQ	05	%	25	E	45	e	65
ACK	06	&	26	F	46	f	66
BEL	07	'	27	G	47	g	67
BS	08	(	28	H	48	h	68
HT	09	)	29	I	49	i	69
LF	0A	*	2A	J	4A	j	6A
VT	0B	+	2B	K	4B	k	6B
FF	0C	,	2C	L	4C	l	6C
CR	0D	-	2D	M	4D	m	6D
SO	0E	.	2E	N	4E	n	6E
SI	0F	/	2F	O	4F	o	6F
DLE	10	0	30	P	50	p	70
DC1	11	1	31	Q	51	q	71
DC2	12	2	32	R	52	r	72
DC3	13	3	33	S	53	s	73
DC4	14	4	34	T	54	t	74
NAK	15	5	35	U	55	u	75
SYN	16	6	36	V	56	v	76
ETB	17	7	37	W	57	w	77
CAN	18	8	38	X	58	x	78
EM	19	9	39	Y	59	y	79
SUB	1A	:	3A	Z	5A	z	7A
ESC	1B	;	3B	[	5B	{	7B
FS	1C	<	3C	\	5C	|	7C
GS	1D	=	3D	]	5D	}	7D
RS	1E	>	3E	^	5E	~	7E
US	1F	?	3F	_	5F	DEL	7F