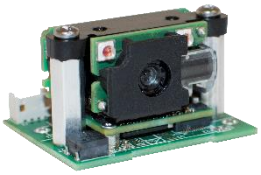

Advanced DExx Software Command Reference Guide

Version 1.45

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Version	Date	Description
1.0	10/15/20	Original Version
1.10	11/05/20	All Sections
1.20	10/04/21	Updated DECWIN commands, DECWIN diagram, added SHWWIN command
1.30	1/11/22	Updated Commands – All Sections
1.40	1/27/22	Updated to include DE02
1.41	1/28/22	Minor Grammatical and Formatting Updates
1.42	10/27/22	Updated SHOTGN0 Command
1.43	12/8/22	Clarified CODE ID and AIM ID
1.44	4/5/23	Updated Operating Mode PAP Commands to TRGMOD Commands and Added Creo to list of Supported Scanners
1.45	6/2/23	Updated to include DE03 and DE33 models

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About this manual

This Advanced DExx Software Command Reference Guide is intended for programmers who have the need to programmatically configure the Diamond Technologies Creo and DExx advanced embedded scan modules. This manual provides an overview on the programming Syntax and the codes needed to configure all aspects of the reader operation. Note that the Creo and DExx advanced readers may also be programmed using barcode programming labels. Some of these labels are provided in this manual for easy initial setup.

The DExx advanced scanners include RS232, UART, and USB image based barcode readers. Some programming codes are specific to the DExx 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 Creo and DExx advanced barcode readers include high performance image based sensors which provide excellent reading on 1D, 2D barcodes including damaged and poorly printed codes. The Creo and DExx readers can also provide image data to the host system. 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:

Product	Supported Models
DE02	DE02 Embedded scanner all models
DE03	DE03 Embedded scanner all models
DE05	DE05 Embedded scanner all models
DE06	DE06 Embedded scanner all models
DE07	DE07 Embedded scanner all models
DE15	DE15 Enclosed Embedded scanner all models
DE16	DE16 Enclosed Embedded scanner all models
DE17	DE17 Enclosed Embedded scanner all models
DE23	DE23 Enclosed Embedded scanner all models
DE26	DE26 Enclosed Embedded scanner all models
DE27	DE27 Enclosed Embedded scanner all models
DE33	DE33 Enclosed Embedded scanner all models
Creo	FHM-003, FHM-004

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, the codes below can be scanned to configure the scanner to your desired interface type.

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

RS232 and UART Models

1. RS232-STD Standard interface (default). RS232 also allows for configuration of specific communication parameters.

USB Models

1. USB Serial Simulate RS232 (Default)
2. USB Keyboard PC
3. USB Keyboard Apple Keyboard
4. USB HID

If your installation requires you to programmatically customize your reader interface, see interface configuration barcodes listed below.

RS232 Interface Parameters

The default RS232 communications parameters are 115,200 baud, 8 Data Bits, 1 Stop bit, No Parity. If the application requires different parameters the following codes can be used.

Baud Rate

Scan the following barcodes to set the desired baud rate. The * indicates the default in each category.

300 Baud

232BAD0.

600 Baud

232BAD1.

1200 Baud

232BAD2.

2400 Baud

232BAD3.

4800 Baud

232BAD4.

9600 Baud

232BAD5.

19200 Baud

232BAD6.

38400 Baud

232BAD7.

57600 Baud

232BAD8.

115200 Baud *

232BAD9.

Data Bits, Stop bits, and Parity

Scan the following barcodes to set the desired Data bits, Stop bits, and Parity.

7 Data, 1 Stop, Parity Odd

232WRD6.

7 Data, 1 Stop, Parity Even

232WRD3.

7 Data, 1 Stop, Parity

232WRD0.

7 Data, 2 Stop, Parity Odd

232WRD7.

7 Data, 2 Stop, Parity Even

232WRD4.

7 Data, 2 Stop, Parity

232WRD1.

8 Data, 1 Stop, Parity Odd

232WRD8.

8 Data, 1 Stop, Parity Even

232WRD5.

8 Data, 1 Stop, Parity None *

232WRD2.

ACK/NAK Mode

RS232 ACK/NAK mode allows for after transmitting data, the scan engine waits for an ACK character (hex 06) or a NAK character (hex 15) response from the host. If ACK is received, the communications cycle is completed and the scan engine looks for more bar codes. If NAK is received, the last set of bar code data is re-transmitted and the scan engine waits for ACK/NAK again. Turn on the ACK/NAK protocol by scanning the ACK/NAK On barcode below. To turn off the protocol, scan ACK/NAK Off.

ACK/NAK On

232ACK1.

ACK/NAK Off *

232ACK0.

USB Interface

The following barcodes can be used to set the desired USB operating interface. USB Serial programs the readers USB interface to emulate an RS232 serial port. USB HID programs the readers USB interface to the host as a HID input device.

USB Serial

TERMID130.

USB HID

TERMID131.

USB Keyboard PC *

PAP124.

USB Keyboard Apple

PAP125.

ACK/NAK Mode

USB ACK/NAK mode allows for after transmitting data, the scan engine waits for an ACK character (hex 06) or a NAK character (hex 15) response from the host. If ACK is received, the communications cycle is completed and the scan engine looks for more bar codes. If NAK is received, the last set of bar code data is re-transmitted and the scan engine waits for ACK/NAK again. Turn on the ACK/NAK protocol by scanning the ACK/NAK On barcode below. To turn off the protocol, scan ACK/NAK Off.

ACK/NAK on

USBACK1.

ACK/NAK off *

USBACK0.

Operating Modes

The DExx advanced scanners can operate in various modes called operating modes. The two basic operating modes are Manual Trigger mode, Presentation mode. In Presentation Mode the scanner is always ways looking for barcodes and will decode a barcode as it is presented to the scanner. In Manual Trigger mode the scanner will turn on and attempt to read barcodes when the hardware trigger is activated or when a serial trigger is sent to the scanner. There are two basic options for manual trigger mode these are normal and enhanced. Normal mode offers good scan speed and the longest working ranges (depth of field). Enhanced mode will give you the highest possible scan speed but slightly less range than Normal mode. Enhanced mode is best used when you require a very fast scan speed and don't require a long working range.

Presentation Mode

TRGMOD3.

Manual Trigger Mode

TRGMOD0.

Manual Trigger Enhanced mode

PAPHHS.

The DExx advanced scanners can also operate in modes which are optimized for Cell Phone or LED display reading. These modes include a Mobile Phone trigger mode and a Mobile Phone presentation mode. Note in Mobile Phone mode the speed of scanning barcodes on paper maybe slightly reduced. The following barcodes can be used to set the specific operating modes. Note the DECCEL1 command can also be utilized to optimize the readers ability to read barcodes on Cell Phone and LED screen. This is helpful in setting the reader to read in presentation mode and optimized cell phone reading.

Mobile Phone Mode presentation

PAPSPC.

Mobile Phone Mode manual trigger

PAPHHC.

LED Illumination – Manual Trigger

If you wish to set the illumination LED brightness, scan one of the bar codes below. This sets the LED illumination for the scan engine when the trigger is pressed.

Illumination off

PWRNOL0.

Illumination low

PWRNOL100.

Illumination Medium

PWRNOL120.

Illumination High *

PWRNOL150.

Trigger Toggle – Manual Trigger

Trigger Toggle mode lets you quickly hit the trigger two or three times to put the scanner into either imaging mode or centering mode, then toggle back to scanning. So, like a double-click with a mouse, you can control what the next scanner's action will be. For example, you could double-press the trigger to go into imaging mode, then the next trigger press takes the image. The scanner then reverts to scanning mode. Use the following codes to configure what action you would like the scanner to take when in Trigger Toggle mode.

Trigger Toggle off *

TRGTGM0.

Trigger Toggle image capture

TRGTGM1.

Trigger Toggle Centering

TRGTGM3.

Trigger Number

This sets the number of trigger presses required to activate the Trigger Toggle Mode.

2 Quick Triggers

TRGTPC2.

3 Quick Triggers

TRGTPC3.

4 Quick Triggers

TRGTPC4.

Trigger Toggle Indicator

When using the Trigger Toggle Mode, you can enable beep and LED indicators that indicate when switching to primary mode. When on, beeper beeps twice, first time 100 ms at 1800 Hz, second beep 150 ms at 1000 Hz.

Off *

TRGIND0.

On

TRGIND1.

Snap & Ship Trigger Mode

The Snap and Ship trigger mode can be used to instruct the reader to take a picture and send it to the host. The image will be sent to the host as a BMP file. This mode does not decode bar codes.

Snap & Ship Mode

PAPTSS.

Streaming Presentation™ Mode

When in Streaming Presentation mode, the scan engine's aimer goes out after a short time, but the scan illumination remains on all the time to continuously search for bar codes. Two modes are available, Normal and Enhanced. Normal mode offers good scan speed and the longest working ranges (depth of field). Enhanced mode will give you the highest possible scan speed but slightly less range than Normal mode. Enhanced mode is best used when you require a very fast scan speed and don't require a long working range.

Streaming Presentation Mode

TRGMOD8.

Streaming Presentation Enhanced Mode

PAPSPE.

Presentation Mode—Full Depth of Field

Often Presentation Mode is used to read bar codes at a close distance. However there may be applications where you need to read bar codes at a further distance. In this case use Presentation Mode—Full Depth of Field when scanning at a far distance.

Streaming Presentation Full depth of field

PAPTPE.

LED Illumination - Presentation Mode

If you wish to set the illumination LED brightness, scan one of the bar codes below. This sets the LED illumination for the scanner when it is in Presentation Mode. (If the scanner is triggered manually, the LED illumination will switch to the setting for a manual trigger.

Note: The LEDs are like a flash on a camera. The lower the ambient light in the room, the brighter the LEDs need to be so the scanner can "see" the bar codes.

Off

PWRLDC0.

Low

PWRLDC100.

High

PWRLDC150.

Idle Illumination - Presentation Mode

Idle illumination settings are used to control the LED intensity level when the scanner is in presentation mode in an idle state. In presentation mode the scanner will come on when it senses movement and the LED illumination will then be set to the intensity level defined above using the PWRLDC parameter value. Note if using the low idle illumination value, below, in an environment where there is low ambient light the scanner may have a difficult time sensing motion in order to return to an active state. In these cases it is recommended to use a higher idle illumination level.

Off

PWRIDL0.

Low

PWRIDL7.

Medium

PWRIDL15.

High *

PWRIDL50.

Presentation Sensitivity

Presentation Sensitivity is a numeric range that increases or decreases the scan engine's reaction time to bar code presentation. The TRGPMS command followed by a value (0-20) can be used to set the sensitivity. 0 is the most sensitive setting, and 20 is the least sensitive. *Default = 1.*

Programmatic Interface Protocol

The DExx advanced scanners support programming via either reading programming barcodes or via a host programmatic configuration through the USB Serial, RS232, or UART communications interface. Configuration programming includes a host of features including changing the scanner operating modes, operating parameters, image processing features, data formatting, etc. The programmatic interface requires that the user send commands to the scanner in the correct format. This format is defined as the following:

Prefix Tag SubTag{data}[,SubTag{data}][; Tag SubTag{data}][…] Storage

Prefix	(3) Ascii characters **SYN M CR** (ASCII 22, 77, 13)
Tag	A (3) character case-insensitive field that identifies the desired menu command Group. For example, all RS232 configuration settings are identified with a Tag of **232**
SubTag	A (3) character case-insensitive field that identifies the desired menu command within the tag group. For example, the SubTag for the RS232 baud rate is **BAD**
Data	The new value for a menu setting, identified by the Tag and SubTag.
Storage	A single character that specifies the storage table to which the command is applied (**!** exclamation point performs the commands' operation on the scanners' volatile memory.) (**.** period performs the commands' operation on the scanners non-volatile memory. Use the scanners non-volatile memory for permanent changes you want saved through a power cycle)

*** Note**: The scanners' non-volatile memory has a limited number of write cycles. When sending commands frequently as in testing it is recommended to use the ! point for saving to volatile memory.

Example Commands:

The following command will set the RS232 Baud rate to 115,200 and save the value to volatile memory.

Prefix	Tag	SubTag	Data	Storage
SYN M CR	232	BAD	9	!

The following command will set the RS232 Baud rate to 115,200 and save the value to non-volatile memory.

Prefix	Tag	SubTag	Data	Storage
SYN M CR	232	BAD	9	.

Scanner Response

The scanner will respond to commands by echoing back the command followed by three possible responses to the command. These responses are as follows.

Response	Description
ACK	Indicates a good command which has been accepted and processed.
ENQ	Indicates an invalid Tag or SubTag in the command.
NAK	Indicates the command was good but the Data field value was out of allowable range for this Tag and SubTag combination. Example: an

Query Commands

There are also (3) query commands which can be used with the scanner in order to receive information on the scanners settings.

Query Command	Definition
^	What is the default value for the settings
?	What is the scanners current value for the settings
*	What is the range of possible values for the settings. The devices response uses a dash(-) to indicate a continuous range of values. A pipe (|) separates items in a list of non continuous values.

Command Examples

The following are examples of commands sent to the scanner and responses from the scanner (note [] are used to show characters but are not used in the scanner protocol).

Example: Disable scanning of Data Matrix symbology codes and store in non-volatile memory

Host: **[SYN]M[CR] IDMENA0.**

Scanner: **IDMENA0[ACK].**

In this example the command was accepted and processed. The scanner will no longer read Data Matrix codes.

Example: Disable scanning of Data Matrix symbology codes and store in non-volatile memory but value of (4) is out of range.

Host: **[SYN]M[CR]IDMENA4.**

Scanner: **IDMENA4[NAK].**

In this example the scanner responded that the command was good but the data field value, in this case (4), was out of allowable range.

Example: Turn off the scanner's illumination lights and store in volatile memory.

Host: **[SYN]M[CR]SCNLED0!**

Scanner: **SCNLED0[ACK]!**

In this example the command was accepted and processed and stored in volatile memory.

Example: Turn off the scanner's illumination lights and store in volatile memory but command is misspelled.

Host: **[SYN]M[CR]SCMLED0!**

Scanner: **SCMLED0[ENQ]!**

In this example the command was rejected as the tag value was incorrect and not understood by the scanner.

Trigger Commands

When the DExx advanced scanner is set to Trigger operating mode, the scanner will turn on when it receives a trigger activate command and turn off when it receives a trigger deactivate. The trigger activate and deactivate commands utilize the following format.

Trigger Activate: **SYN T CR**

Trigger Deactivate: **SYN U CR**

When the scanner receives the Trigger Activate command its' LED illumination will come on and it will begin looking for barcodes. The scanner will turn off and deactivate the scanning phase when either the scanner finds and decodes a valid barcode, the scanner receives the trigger deactivate command, or the scanners serial time out value has been reached (see Read-Time Out in the below command list, default value is 30 seconds).

Setting a Trigger Activation Character

You can also use the HSTCEN1 command to enable the use of a specific character as the trigger activation character. When the activation character is received, the scan engine starts the scanning phase and will scan until either the Character Activation Timeout, the deactivation character is received, or a bar code is scanned and transmitted. To set an activation character send the HSTACH command followed by the hex code for the preferred activation character. Default = Off.

Likewise you can enable the use of a trigger deactivation character using the HSTDEN1 command. Then use the HSTDCH command along with a hex code to set the preferred deactivation character. Default = Off.

Character Activation Timeout

You can use the HSTCDT command followed by a value to set a timeout for the length of time the scanner remains attempting to decode bar codes after it receives the trigger activation character. The value is specified in milliseconds and can be 1 – 300,000.

Programming Chart inside the back cover of this manual, then scanning Save.

Default = 30,000 ms.

Scanner Defaults

The scanner can be restored to its factory default setting by either scanning barcodes or programmatically sending commands to the reader. The programmatic codes are listed in the Command List table in this guide.

To restore to custom defaults, scanning barcodes, scan the Activate Custom Defaults barcode below. The restore to Factory defaults first scan the Remove Custom Defaults barcode below and then scan the Activate Defaults barcode.

Activate Custom Defaults

DEFALT.

Remove Custom Defaults

DEFOVR.

You have the ability to save a set of commands as a custom configuration. This can be done programmatically using the MNUCDP command as listed in the below tables or by scanning the below MNUCDP Barcode. The sequence to do this is to first programmatically send or scan the MNUCDP command then send the commands that you wish to include to the reader. When you have completed sending all the commands programmatically send or scan the below code of the MNUCDS (Save Custom Defaults) barcode.

If you made a mistake or wish to change the value of one of the commands in your sequence of custom commands simply send or scan the MNUCDP. Then send or scan the code for the setting you wish to change and then rescan or resend the MNUCDS command and the custom defaults in the DExx scanner will be updated.

Set Custom Defaults

MNUCDP.

Save Custom Defaults

MNUCDS.

Defining Reading Areas and What to Read

The DExx advanced readers can be programmed to read or not read all codes types or they can be programmed to only read certain types of codes. They can also be programmed to only read codes located in certain defined areas. The following sections provide details on implementing this functionality. Additional details on available commands can be found in the Command List section of this document.

Enabling and Disabling Symbologies

Any code can be enabled or disabled in the scan engine forcing the reader to either read or ignore codes it finds of the respective symbology. Use the commands in the symbologies section of the below command list to perform this function.

Preferred Symbology

The PREFENA1 command can be used to program the scan engine to enable Preferred Symbology. This allows the scan enginee to recognize one symbology as a higher priority over other symbologies. This is helpful in situations where both bar code symbologies appear on the same label, but the lower priority symbology cannot be disabled. For example, you may be using the scanner in a retail setting to read U.P.C. symbols,but have occasional need to read a code on a drivers license. Since some licenses have a Code 39 symbol as well as the PDF417 symbol, you can use Preferred Symbology to specify that the PDF417 symbol be read instead of the Code 39.

Preferred Symbology classifies each symbology as high priority, low priority, or as an unspecified type. When a low priority symbology is presented, the scanner ignores it for a set period of time (see Preferred Symbology Time-out command) while it searches for the high priority symbology. If a high priority symbology is located during this period, then that data is read immediately. If the time-out period expires before a high priority symbology is read, the scanner will read any bar code in its view (low priority or unspecified). If there is no bar code in the scanner's view after the time-out period expires, then no data is reported. Note: A low priority symbol must be centered on the aiming pattern to be read. Symbology. Default = Preferred Symbology Off.

High Priority Symbology

Use the PRFCOD command along with a barcode symbology type, in Hex format, to specify the high priority symbology. The barcode symbology hex values can be found in the Symbology Chart found in Appendix A of this manual. For example PRFCOD6A will set the high priority symbology = Code 128.

Default = None

Preferred Symbology On
* Preferred Symbology Off High

Low Priority Symbology

Use the PRFBLK command along with a barcode symbology type, in Hex format, to specify the high priority symbology. The barcode symbology hex values can be found in the Symbology Chart found in Appendix A of this manual. For example PRFCOD6A will set the low priority symbology = Code 128.

If you want to set additional low priority symbologies, send FF, then an additional 2 digit hex values from the Programming Chart, then FF, then the next symbology, etc. You can program up to 5 low priority symbologies. *Default = None*

Preferred Symbology Time-out

Once you have enabled Preferred Symbology and entered the high and low priority symbologies, you must set the time-out period. This is the period of time the scan engine will search for a high priority bar code after a low priority bar code has been encountered. Use the PRFPTO followed by 1-3000ms to set the desired symbology time out. *Default = 500 ms.*

Preferred Symbology Default

Use the PRFDFT command to set all Preferred Symbology entries to their default values

Poor Quality 1D Codes

The DECLDI command improves the scanner's ability to read damaged or badly printed linear bar codes. When Poor Quality 1D Reading On is scanned or sent to the reader, poor quality linear bar code reading is improved, but the scanner's snappiness is decreased, making it less aggressive when reading good quality bar codes. This setting does not affect 2D bar code reading. Default = Poor Quality 1D Reading Off.

Decode Security

The DECSEC command allows the user to control the scan engines tolerance in reading damaged codes, print errors, and under sampling on Code 39, UPC, and Code 128.

Very High Reading Tolerance is the most permissive mode. When enabled, the scanner reads codes of variable quality. Low Reading Tolerance is the least permissive mode. *Default = Medium Reading Tolerance*.

Reread Delay

The DLYRRD command sets the time period before the scan engine can read the *same* bar code a second time. Setting a reread delay protects against accidental rereads of the same bar code. Longer delays are effective in minimizing accidental rereads. Use shorter delays in applications where repetitive bar code scanning is required. Reread Delay only works when in presentation mode. *Default = Medium.*

User-Specified Reread Delay

If you want to set your own length for the reread delay, use the DLYRRD command followed by a numerical value in milliseconds (from 0-30,000 milliseconds)

2D Reread Delay

Sometimes 2D bar codes can take longer to read than other bar codes. If you wish to set a separate Reread Delay for 2D bar codes use the DLY2RR command followed by the value you want to set. See the command list for further details. Setting DLY2RR to 0 indicates that the same read delay is used for both 1D and 2D bar codes. *Default = 2D Reread Delay Off.*

Multiple Symbols

The SHOTGN1 command can be used to instruct the reader to read multiple barcodes in the same reading phase. If the SHOTGN1 command is set in the reader while sending a Hardware trigger this will result in the reader decoding and sending back any codes in its' field of view. The reader will continue to read if the Hardware trigger remains active in the case of a hardware trigger. SHOTGN2 functions the same as SHOTGN1 but in a more aggressive and expedient manner.

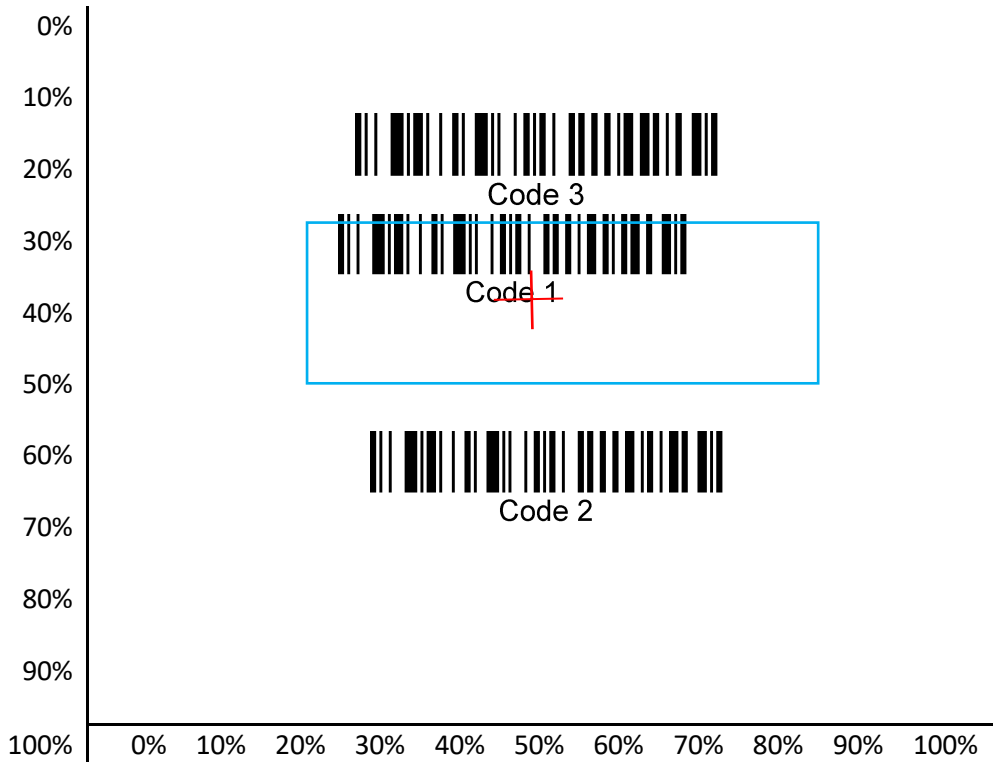
Default = Off.

Centering

The DExx advanced readers can be configured to read codes located only in a certain region of the scanners field of view. This is called centering and it allows the reader to only decode and report data from codes the user is interested in reading. An example would be reading from a list of codes but only reading specific codes in the list. Centering can be

configured for either Presentation or Trigger modes and the commands are unique for each mode.

In order to utilize centering you first need to use either the PDCWIN1 or DECWIN1 to enable centering for either Presentation or Trigger mode respectively. This setting will tell the reader to only read codes that are located in or partially in the center of the image. A centering window can also be defined by the user. To define the centering window the user needs to utilize the PDCTOP, PDCBOT, PDCLFT, PDCRGT or DECTOP, DECBOT, DECLFT, DECRGT (PDC commands used when in Presentation Mode, DEC commands used when in Trigger Mode) to define the area in which codes should be read. The following diagram illustrates how centering works. The red cross hair is the readers aimer. If centering is enabled and the centering window is defined as DECTOP30, DECBOT52, DECLFT25, and DECRGT90 the centering window will thus be defined as the blue box in the below diagram. Using these parameters the reader will only read Code 1 and will not read Code 3 or Code 2 as both Code 2 and Code 3 are outside the centering window.



Centering can also be enabled using PDCWIN2, DECWIN2, PDCWIN3, DECWIN3. PDCWIN2 and DECWIN2 will instruct the reader to read codes that are at least partially captured within the centering window. DECWIN3 and PDCWIN3 will force the reader to only read those codes that are totally enclosed within the centering window. Using this setting the user needs to ensure that the centering window is large enough to include the entire code.

Data Formatting

There are several commands which can be used to instruct the scanner to format its barcode output data in a specific order or format. Due to the flexibility of these commands further discussion and explanation is provided here.

No Read

The SHWNRD1 command can be used to instruct the reader to send a no read (NR message when the reader cannot read a code. If No Read is turned Off, the "NR" will not appear. Default = Off.

You can also use a different notation than "NR," for example, "Error," or "Bad Code,". To do this you can edit the output message see the Data Formatting section in this manual. The hex code for the No Read symbol is 9C.

Data Format Editor Introduction

You may use the Data Format Editor to change the scan engine's output. For example, you can use the Data Format Editor to insert characters at certain points in bar code data as it is scanned. The selections in the following pages are used only if you wish to alter the output. *Default Data Format setting = None.*

Normally, when you scan a bar code, it is output automatically. However, when you create a format, you must use a "send" command, defined in the following sections, within the format program to output data. Multiple formats may be programmed into the scan engine. They are stacked in the order in which they are entered. However, the following list presents the order in which formats are applied:

1. Specific Terminal ID, Actual Code ID, Actual Length
2. Specific Terminal ID, Actual Code ID, Universal Length
3. Specific Terminal ID, Universal Code ID, Actual Length
4. Specific Terminal ID, Universal Code ID, Universal Length
5. Universal Terminal ID, Actual Code ID, Actual Length
6. Universal Terminal ID, Actual Code ID, Universal Length
7. Universal Terminal ID, Universal Code ID, Actual Length
8. Universal Terminal ID, Universal Code ID, Universal Length

The maximum size of a data format configuration is 2000 bytes, which includes header information. If a bar code is read that fails the first data format, the next data format, if there is one, will be used on the bar code data. If there is no other data format, the raw

data is output. If you have changed data format settings, and wish to clear all formats and return to the factory defaults, send the Default Data Format command DFMDF3 below.

Add a Data Format

Step 1. Build a scanner command starting with the DFMBK3 command.

Step 2. Instruct the scanner if this will be the Primary/Alternate Format

This allows you to save a total of 4 different data formats. To program your primary format, add 0 to the command otherwise add 1, 2, or 3 depending on which alternate format you are programming.

Step 3. Terminal Type Refer to the terminal ID table below, and locate the Terminal ID number for your Host system. Add the three digit code to your command string. You must use 3 digits For example, scan 0 0 3 for an AT wedge.

Note: 099 indicates all terminal types.

Step 4. Code I.D. In the Symbology Chart , in this guide, find the symbology to which you want to apply the data format. Locate the Hex value for that symbology and add this value to your command string. If you wish to create a data format for all symbologies, with the exception of some specific symbologies, refer to B8 format below.

If you are creating a data format for Batch Mode Quantity, use 35 for the Code I.D.

Note: 99 indicates all symbologies.

Step 5. Length specify what length (up to 9999 characters) of data will be acceptable for this symbology. Add the 4 digit length to the command string. As an example a value of 0050 would equate to 50 characters.

Note: 9999 indicates all lengths.

Step 6. Editor Commands see the command format commands below and add the commands indicated to format as desired to implement to your command string.

Step 7. Add the save to volatile ! or save to permanent memory command syntax to your command string depending on whether you want to save the format permanent or volatile.

Other Programming Selections

• The DFMCL3 command can be used to Clear One Data Format

This deletes one data format for one symbology. If you are clearing the primary format, add 0 to the command. If you are clearing an alternate format, enter 1, 2, or 3, depending on the format you are clearing. Add the Terminal Type and Code I.D. (see the Symbology Chart, and add the bar code data length for the specific data format that you want to delete. All other formats remain unaffected.

• The DFMCA3 command can be used to Clear all Data Formats

• Discard to exit without saving any data format changes.

Terminal ID Table

	Terminal Model(s)	Terminal ID
USB	PC keyboard (HID)	124
	Mac Keyboard	125
	PC Keyboard (Japanese)	134
	Serial (COM driver required)	130
	HID POS	131
	USB SurePOS Handheld	128
	USB SurePOS Tabletop	129
Serial	RS232 TTL	000
	RS232 True	000
	RS485 (IBM-HHBCR 1+2, 46xx)	051
Keyboard	PS2 compatibles	003
	AT compatibles	002

Data Format Editor Commands

When working with the Data Format Editor, a virtual cursor is moved along your input data string. The following commands are used to both move this cursor to different positions, and to select, replace, and insert data into the final output.

F1—Send all characters

Include in the output message all of the characters from the input message, starting from current cursor position, followed by an insert character. *Syntax = F1xx* where xx stands for the insert character's hex value for its ASCII code. Refer to the ASCII Conversion Chart in Appendix A of this guide for decimal, hex and character codes.

F2—Send a number of characters

Include in the output message a number of characters followed by an insert character. Start from the current cursor position and continue for "nn" characters or through the last character in the input message, followed by character "xx." *Syntax = F2nnxx* where nn stands for the numeric value (00-99) for the number of characters, and xx stands for the insert character's hex value for its ASCII code. Refer to the ASCII Conversion Chart in Appendix A of this guide for decimal, hex and character codes.

Example: Send a number of characters

1234567890ABCDEFGHIJ

Send the first 10 characters from the bar code above, followed by a carriage return.
Command string: F2100D (Full Command string = **DFMBK30099990020F2100D**)
DFMBK3 = Enable data format
0 = Enable primary format
099 = Enable for all terminal IDs
99 = Enable for all symbologies
0020 = Code length is 20 characters
F2 = Send a number of characters command
10 = Number of characters to send
0D = Hex value for CR

The data is output as: **1234567890**

Example: Split characters into 2 lines
Send the first 10 characters from the bar code above, followed by a carriage return, followed by the rest of the characters.
Command string: F2100DF10D
F2 = Send a number of characters command
10 = Number of characters to send
0D = Hex value for CR
F1 = Send all characters command
0D = Hex value for CR

The data is output as:
1234567890
ABCDEFGHIJ
<CR>

F3—Send all characters up to a particular character

Include in the output message all characters from the input message, starting with the character at the current cursor position and continuing to, but not including, the search character "ss," followed by an insert character. The cursor is moved forward to the "ss" character. *Syntax = F3ssxx* where ss stands for the search character's hex value for its ASCII code, and xx stands for the insert character's hex value for its ASCII code.

Refer to the ASCII Conversion Chart in Appendix A of this guide for decimal, hex and character codes.

Example: Send all characters up to a particular character

1234567890ABCDEFGHIJ

Using the bar code above, send all characters up to but not including "D," followed by a carriage return.
Command string: F3440D

F3 = Send all characters up to a particular character command
44 = Hex value for a "D"
0D = Hex value for CR

The data is output as:
1234567890ABC
<CR>

B9—Send all characters up to a string

Include in the output message all characters from the input message, starting with the character at the current cursor position and continuing to, but not including, the search string "s...s." The cursor is moved forward to the beginning of the "s...s" string. *Syntax = B9nnnns...s* where nnnn stands for the length of the string, and s...s stands for the string to be matched. The string is made up of hex values for the characters in the string. Refer to the ASCII Conversion Chart in Appendix A of this guide for decimal, hex and character codes.

Example: Send all characters up to a defined string

1234567890ABCDEFGHIJ

Using the bar code above, send all characters up to but not including "AB."
Command string: B900024142

B9 = Send all characters up to a string command
0002 = Length of the string (2 characters)
41 = Hex value for A

42 = Hex value for B

The data is output as: **1234567890**

E9—Send all but the last characters

Include in the output message all but the last “nn” characters, starting from the current cursor position. The cursor is moved forward to one position past the last input message character included. *Syntax = E9nn* where nn stands for the numeric value (00-99) for the number of characters that will not be sent at the end of the message.

F4—Insert a character multiple times

Send “xx” character “nn” times in the output message, leaving the cursor in the current position. *Syntax = F4xxnn* where xx stands for the insert character’s hex value for its ASCII code, and nn is the numeric value (00-99) for the number of times it should be sent. Refer to the ASCII Conversion Chart in Appendix A of this guide for decimal, hex and character codes.

Example: Send all but the last characters, followed by 2 tabs

1234567890ABCDEFGHIJ

Send all characters except for the last 8 from the bar code above, followed by 2 tabs.
Command string: E908F40902

E9 = Send all but the last characters command
08 = Number of characters at the end to ignore
F4 = Insert a character multiple times command
09 = Hex value for a horizontal tab
02 = Number of times the tab character is sent

The data is output as: **1234567890AB <tab><tab>**

BA—Insert a string

Send “ss” string of “nn” length in the output message, leaving the cursor in the current

position. *Syntax = BAnnnns...s* where nnnn stands for the length of the string, and s...s stands for the string. The string is made up of hex values for the characters in the string. Refer to the ASCII Conversion Chart in Appendix A of this guide for decimal, hex and character codes.

Example: Look for the string "AB" and insert 2 asterisks (**)

1234567890ABCDEFGHIJ

Using the bar code above, send all characters up to but not including "AB." Insert 2 asterisks at that point, and send the rest of the data with a carriage return after.
Command string: B900024142BA00022A2AF10D

E9 = Send all but the last characters command
08 = Number of characters at the end to ignore
F4 = Insert a character multiple times command
09 = Hex value for a horizontal tab
02 = Number of times the tab character is sent
B9 = Send all characters up to a string" command
0002 = Length of the string (2 characters)
41 = Hex value for A
42 = Hex value for B
BA = Insert a string command
0002 = Length of the string to be added (2 characters)
2A = Hex value for an asterisk (*)
2A = Hex value for an asterisk (*)
F1 = Send all characters command
0D = Hex value for a CR

The data is output as:
1234567890**ABCDEFGHIJ
<CR>

B3—Insert symbology name

Insert the name of the bar code's symbology in the output message, without moving the cursor. See Symbology Charts. Refer to the ASCII Conversion Chart in Appendix A of this guide for decimal, hex and character codes.

B4—Insert bar code length

Insert the bar code's length in the output message, without moving the cursor. The length is expressed as a numeric string and does not include leading zeroes.

Example: Insert the symbology name and length

1234567890ABCDEFGHIJ

Send the symbology name and length before the bar code data from the bar code above. Break up these insertions with spaces. End with a carriage return.
Command string: B3F42001B4F42001F10D

B3 = Insert symbology name command
F4 = Insert a character multiple times" command
20 = Hex value for a space
01 = Number of times the space character is sent
B4 = Insert bar code length command
F4 = Insert a character multiple times command
20 = Hex value for a space
01 = Number of times the space character is sent
F1 = Send all characters" command
0D = Hex value for a CR

The data is output as:
Code128 20 1234567890ABCDEFGHIJ
<CR>

Move Commands

F5—Move the cursor forward a number of characters

Move the cursor ahead "nn" characters from current cursor position.
Syntax = F5nn where nn is the numeric value (00-99) for the number of characters the cursor should be moved ahead.

Example: Move the cursor forward and send the data

1234567890ABCDEFGHIJ

Move the cursor forward 3 characters, then send the rest of the bar code data from the bar code above. End with a carriage return.
Command string: F503F10D

F5 = Move the cursor forward a number of characters command
03 = Number of characters to move the cursor
F1 = Send all characters command
0D = Hex value for a CR

The data is output as:
4567890ABCDEFGHIJ
<CR>

F6—Move the cursor backward a number of characters

Move the cursor back "nn" characters from current cursor position.
Syntax = F6nn where nn is the numeric value (00-99) for the number of characters the cursor should be moved back.

F7—Move the cursor to the beginning

Move the cursor to the first character in the input message. *Syntax = F7.*
FE and F7 Example: Manipulate bar codes that begin with a 1

1234567890ABCDEFGHIJ

Search for bar codes that begin with a 1. If a bar code matches, move the cursor back to the beginning of the data and send 6 characters followed by a carriage return. Using the bar code above:
Command string: FE31F7F2060D

FE = Compare characters command
31 = Hex value for 1
F7 = Move the cursor to the beginning command
F2 = Send a number of characters" command
06 = Number of characters to send
0D = Hex value for a CR

The data is output as:
123456

<CR>

EA—Move the cursor to the end

Move the cursor to the last character in the input message. *Syntax = EA.*

Search Commands

F8—Search forward for a character

Search the input message forward for “xx” character from the current cursor position, leaving the cursor pointing to the “xx” character. *Syntax = F8xx* where xx stands for the search character’s hex value for its ASCII code.
Refer to the ASCII Conversion Chart in Appendix A of this guide for decimal, hex and character codes.

1234567890ABCDEFGHIJ

F8 Example: Send bar code data that starts after a particular character
Search for the letter “D” in bar codes and send all the data that follows, including the “D.” Using the bar code above:
Command string: F844F10D

F8 = Search forward for a character command
44 = Hex value for “D”
F1 = Send all characters command
0D = Hex value for a CR

The data is output as:
DEFGHIJ
<CR>

F9—Search backward for a character

Search the input message backward for “xx” character from the current cursor position, leaving the cursor pointing to the “xx” character. *Syntax = F9xx* where xx stands for the search character’s hex value for its ASCII code.
Refer to the ASCII Conversion Chart in Appendix A of this guide for decimal, hex and character codes.

B0—Search forward for a string

Search forward for “s” string from the current cursor position, leaving cursor pointing to “s” string. Syntax = B0nnnnS where nnnn is the string length (up to 9999), and S consists of the ASCII hex value of each character in the match string. For example, B0000454657374 will search forward for the first occurrence of the 4 character string “Test.” Refer to the ASCII Conversion Chart in Appendix A of this guide for decimal, hex and character codes.

1234567890ABCDEFGHIJ

B0 Example: Send bar code data that starts after a string of characters
Search for the letters “FGH” in bar codes and send all the data that follows, including “FGH.” Using the bar code above:

Command string: B00003464748F10D
B0 = Search forward for a string command
0003 = String length (3 characters)
46 = Hex value for “F”
47 = Hex value for “G”
48 = Hex value for “H”
F1 = Send all characters command
0D = Hex value for a CR

The data is output as:
FGHIJ
<CR>

B1—Search backward for a string

Search backward for “s” string from the current cursor position, leaving cursor pointing to “s” string. Syntax = B1nnnnS where nnnn is the string length (up to 9999), and S consists of the ASCII hex value of each character in the match string. For example, B1000454657374 will search backward for the first occurrence of the 4 character string “Test.”
Refer to the ASCII Conversion Chart in Appendix A of this guide for decimal, hex and character codes.

E6—Search forward for a non-matching character

Search the input message forward for the first non-“xx” character from the current cursor position, leaving the cursor pointing to the non-“xx” character. *Syntax = E6xx* where xx stands for the search character’s hex value for its ASCII code. Refer to the ASCII Conversion Chart in Appendix A of this guide for decimal, hex and character codes.

000037692

E6 Example: Remove zeroes at the beginning of bar code data
This example shows a bar code that has been zero filled. You may want to ignore the zeroes and send all the data that follows. E6 searches forward for the first character that is not zero, then sends all the data after, followed by a carriage return.
Using the bar code above:

Command string: E630F10D

E6 = Search forward for a non-matching character command
30 = Hex value for 0
F1 = Send all characters command
0D = Hex value for a CR

The data is output as:
37692
<CR>

E7—Search backward for a non-matching character

Search the input message backward for the first non-“xx” character from the current cursor position, leaving the cursor pointing to the non-“xx” character. *Syntax = E7xx* where xx stands for the search character’s hex value for its ASCII code. Refer to the ASCII Conversion Chart in Appendix A of this guide for decimal, hex and character codes.

Miscellaneous Commands

FB—Suppress characters

Suppress all occurrences of up to 15 different characters, starting at the current cursor position, as the cursor is advanced by other commands. When the FC command is encountered, the suppress function is terminated. The cursor is not moved by the FB command. Syntax = FBnnxxyy . .zz where nn is a count of the number of suppressed characters in the list, and xxyy .. zz is the list of characters to be suppressed.

345 678 90

FB Example: Remove spaces in bar code data
This example shows a bar code that has spaces in the data. You may want to remove the spaces before sending the data. Using the bar code above:

Command string: FB0120F10D

FB = Suppress characters command
01 = Number of character types to be suppressed
20 = Hex value for a space
F1 = Send all characters command
0D = Hex value for a CR

The data is output as:
34567890
<CR>

FC—Stop suppressing characters

Disables suppress filter and clear all suppressed characters. *Syntax = FC.*

E4—Replace characters

Replaces up to 15 characters in the output message, without moving the cursor. Replacement continues until the E5 command is encountered. *Syntax = E4nnxx-*$_1$*xx*$_2$*yy*$_1$*yy*$_2$*...zz*$_1$*zz*$_2$ where nn is the total count of the number of characters in the list (characters to be replaced plus replacement characters); xx_1 defines characters to be replaced and xx_2 defines replacement characters, continuing through zz_1 and zz_2.

1234056780ABC

E4 Example: Replace zeroes with CRs in bar code data
If the bar code has characters that the host application does not want included, you can use the E4 command to replace those characters with something else. In this example, you will replace the zeroes in the bar code above with carriage returns.

Command string: E402300DF10D

E4 = Replace characters command

02 = Total count of characters to be replaced, plus the replacement characters (0 is replaced by CR, so total characters = 2)

30 = Hex value for 0

0D = Hex value for a CR (the character that will replace the 0)

F1 = Send all characters command

0D = Hex value for a CR

The data is output as:

1234

5678

ABC

<CR>

E5—Stop replacing characters

Terminates character replacement. *Syntax = E5.*

FE—Compare characters

Compare the character in the current cursor position to the character "xx." If characters are equal, move the cursor forward one position. *Syntax = FExx* where xx stands for the comparison character's hex value for its ASCII code. Refer to the ASCII Conversion Chart in Appendix A of this guide for decimal, hex and character codes.

B2—Compare string

Compare the string in the input message to the string "s." If the strings are equal, move the cursor forward past the end of the string. Syntax = B2nnnnS where nnnn is the string length (up to 9999), and S consists of the ASCII hex value of each character in the match string. For example, B2000454657374 will compare the string at the current cursor position with the 4 character string "Test."
Refer to the ASCII Conversion Chart in Appendix A of this guide for decimal, hex and character codes.

EC—Check for a number

Check to make sure there is an ASCII number at the current cursor position. The format is aborted if the character is not numeric.

EC Example: Only output the data if the bar code begins with a number

If you want only data from bar codes that begin with a number, you can use EC to check for the number.

Command string: ECF10D

EC = Check for a number command
F1 = Send all characters command
0D = Hex value for a CR

If this bar code is read: AB1234 the next data format, if there is one, will be used on the data. If there is no other format, the format fails and the raw data is output as **AB1234**.

If this bar code is read: 1234AB the data is output as:
1234AB
<CR>

ED—Check for non-numeric character

Check to make sure there is a non-numeric ASCII character at the current cursor position. The format is aborted if the character is numeric.

ED Example: Only output the data if the bar code begins with a letter
If you want only data from bar codes that begin with a letter, you can use ED to check for the letter.

Command string: EDF10D

ED = Check for a non-numeric character command
F1 = Send all characters command
0D = Hex value for a C

If this bar code is read: AB1234 the next data format, if there is one, will be used on this data. If there is no other format, the format fails and the raw data is output as **1234AB**.

If this bar code is read: 1234AB the data is output as:

AB1234
<CR>

EF—Insert a delay

Inserts a delay of up to 49,995 milliseconds (in multiples of 5), starting from the current cursor position. Syntax = EFnnnn where nnnn stands for the delay in 5ms increments, up to 9999. This command can only be used with keyboard emulation.

B8—Discard Data

Discards types of data. For example, you may want to discard Code 128 bar codes that begin with the letter A. In step 4 of the above Add a Data Format procedure select 6A (for Code 128), and in step 5, select 9999 (for all lengths). Enter FE41B8 to compare and discard Code 128 bar codes that begin with the letter A. *Syntax = B8.*

Note: The B8 command must be entered after all other commands. The Data Format must be Required in order for the B8 command to work. If Data Format is On, but Not Required, bar code data that meets the B8 format is scanned and output as usual. Because the data format needs to be On and Required for the B8 command, you must input data formats for all bar codes you wish to discard as well as all bar codes you wish to output. Other data format settings impact the B8 command. If Data Format Non-Match Error Tone is On, the scan engine emits an error tone. If Data format Non-Match Error Tone is Off, the code is disabled for reading and no tone is sounded.

Data Formatter

When Data Formatter is turned Off, using the command DFM_EN0, the bar code data is output to the host as read, including prefixes and suffixes.

Use the following commands to instruct the scanner how to utilize the formats which have been created and saved.

The following commands can be applied to your data format:

DFM_EN1 = Data Formatter On, Not Required, Keep Prefix/Suffix
Scanned data is modified according to your data format, and prefixes and suffixes are transmitted.

DFM_EN3 = Data Formatter On, Not Required, Drop Prefix/Suffix
Scanned data is modified according to your data format. If a data format is found for a particular symbol, those prefixes and suffixes are not transmitted. If a data format is not found for that symbol, the prefixes and suffixes are transmitted.

DFM_EN2 = Data Format Required, Keep Prefix/Suffix
Scanned data is modified according to your data format, and prefixes and suffixes are transmitted. Any data that does not match your data format requirements generates an error tone and the data in that bar code is not transmitted. If you wish to process this type of bar code without generating an error tone, see Data Format Non-Match Error Tone.

DFM_EN4 = Data Format Required, Drop Prefix/Suffix
Scanned data is modified according to your data format. If a data format is found for a particular symbol, those prefixes and suffixes are not transmitted. Any data that does not match your data format requirements generates an error tone. If you wish to process this type of bar code without generating an error tone, see Data Format Non-Match Error Tone command.

Default = Data Formatter On, Not Required,Keep Prefix/Suffix.

Output Sequence Editor

The Output Sequence Editor commands can be used to instruct the scanner to provide its output scan data in a specific order based on code type. The data output is regardless of the order in which the codes were read by the scanner. To add a programmed sequence to the DE02 or DE23 follow the below procedure to build a program command line.

1. Enter sequence command, SEQBLK.
2. On the symbology chart in the appendix of this guide locate the 2-digit Hex value for the code ID to which you want the sequence to apply and add to the command line.
3. Add the length of the data output which will be acceptable for the symbology chosen. The length can be up to 9999 characters. When calculating the length, you need to include any defined prefixes or suffixes for the code. A code length of 20 characters would be represented as 0020. If you do not care about the length then you need to send 9999 which indicates any length.
4. Add any match character(s) you want the DE02 to use in matching a specific code with the symbology chosen. You need to scan or send the hex value for the

character(s). If you do not care about matching a specific code you can use hex code 99 which indicates all characters.

5. Add FF to an Output Sequence then add additional symbologies as needed.

The command line will take this format:

<SYN>M<CR>SEQBLK[Symb1Code][Symy1NumChars][Symb1MatchCode]<0xFF>...[SymbNCode][SymbNNumChars][SymbNMatchCode]<0xFF>.

Output Sequence Example

In this example a user will be scanning a code 39, a code 128, and a Data Matrix code but you want the scanner to output the data as Data Martrix, Code 128, and Code 39.

1 - Code 39

3 - Data Matrix

2 - Code 128

The following output sequence programming would be needed:

SEQBLK77999933FF6A999932FF62999931FF

SEQBLK	**Sequence editor start command**
77	**Code identifier for Data Matrix**
9999	**Code length to match 9999 = all lengths**
33	**33 hex = 3 decimal first charater of Data Matrix code to match**
FF	**Termination string for first code**
6A	**Code identifier for Code 128**
9999	**Code length to match 9999 = all lengths**
32	**32 hex = 2 decimal first character of Data Matrix code to match**
FF	**Termination string for second code**
62	**Code identifier for Code 39**
9999	**Code length to match 9999 = all lengths**
31	**31 hex = 1 decimal first character of Code of Code 39 to match**
FF	**Termination string for third code**

Adding a Prefix or Suffix

You can easily add a Prefix or Suffix to the data stream coming from the DExx scanner using the PREBK2 or SUFBK2 commands respectively. A prefix or suffix can be a single character or a group of characters and these can be applied to all barcodes read or to specific barcode symbologies. The process to build a command line to add a prefix or suffix is the same and is as follows:

1. Add prefix or add suffix command (PREBK2, SUFBK2).
2. Add 2-digit hex value for the symbology you want to apply the prefix or suffix to. The hex code can be found in the Symbology Chart found in the appendix of this guide. If you want to apply the prefix or suffix to all symbologies scan or send 99 to the DE02.
3. Add the hex value for the character(s) which you want to use as the prefix or suffix.

The command line will take this format:

<SYN>M<CR>PREBK2[SymbCode][Char1Hex][Char2Hex]...[CharNHex].

Add Prefix or Suffix examples

The following programming sequence will add the STX character as a prefix to all symbologies being read and store the value in non-volatile memory.

PREBK29902.

The following programming sequence will add the CR as a suffix to all symbologies being read and store the value in non-volatile memory.

SUFBK2990D.

The following programming sequence will add the STX as a prefix to code 128 and store the value in temporary memory. Code 128 has a hex ID = 6A.

PREBK26A02!

The following programming sequence will add CR, LF, ETX as the suffix to code 128 and store the value temporary memory.

SUFBK26A0D0A03!

Useful tip: Scanning the following barcode instructs the reader to report its current data format settings.

DFMBK3?.

Imaging Commands

The DE02 and DE23 include a digital image sensor which can be used to provide images to the host system. The image commands can be used to manipulate and transfer images.

Command Syntax

Multiple modifiers and commands can be issued within one sequence. If additional modifiers are to be applied to the same command, just add the modifiers to that command. For example, to add 2 modifies to the Image Snap command, such as setting the Imaging Style to 1P and the Wait for Trigger to 1T, enter **IMGSNP1P1T.**

Note: After processing an image capture command (IMGSNP), the host must follow it with an IMGSHP command to receive the actual image.

To add a command to a sequence, each new command is separated with a semicolon. For example, to add the Image Ship command to the above sequence enter:

IMGSNP1P1T;IMGSHP

Image Snap – IMGSNP

An image is taken by the DE02 or DE23 whenever a trigger is received by the reader or when the IMGSNP command is received. The IMGSNP command has several modifiers that can be used to change the look of the image in memory. Any number of these modifiers may be appended to the IMGSNP command. As an example, the following command will snap an image, increase the gain, and have the beeper sound once the snap has completed.

IMGSNP2G1B

IMGSNP – Modifiers

P – Imaging Style

The P modifier sets the image snap style.

0P – Decoding style – this processing allows a few frames to be taken until the exposure parameters are met. The last frame is then available for further use.

1P - Photo style (default) – this mimics a simple digital camera and results in a visually optimized image.

2P - Manual style - This is an advanced style that should only be used by experienced users. It allows for the most flexibility in scanners setup and has no auto-exposure.

B – Beeper

Causes a beep to sound after an image is snapped.

0B – No beep (default).

1B – Sound a beep when the image is captured.

T – Wait for Trigger

Wait for a hardware trigger before taking the image. This is only available when using Photo style (1P).

OT – Takes and image immediately (default).

1T – Takes an image on receiving a hardware trigger.

L – LED State

Determines if the illumination LEDs should be on or off and when. Ambient illumination is preferred for taking pictures of color documents, such as ID Cards, especially when the scanner is in a stand. LED illuminate (1L) is preferred when the scanner is handheld. LED State is not available when using Decoding Style (0P).

0L – LEDs off (default)

1L – LEDs on

E – Exposure

Exposure is used in Manual Style (2P), and allows the host to set the exposure time. This is similar to setting a shutter speed in a camera. The exposure time determines how long the DE02 or DE23 takes to record an image. On a bright light environments exposure times can be short because plenty of light is available for image. In dark environments exposure times will need to increase. Exposure time is provided in 127 microseconds increments.

#E # = 1 – 7874 (Default = 7874)

G – Gain

Gain is used in Manual Style only (2P). The gain modifier boosts the signal and multiplies the pixel value increasing the brightness of the image. As the gain in an image is increased the noise also increases.

40G – Medium Gain

64G – Heavy Gain (default)

96G – Maximum Gain

W – Target White Value

This modifier sets the target for the median grayscale value in the captured image. When capturing close up images of high contrast documents, a lower W setting such as 75 is recommended. Higher settings result in longer exposure times and brighter images but too high a setting will result in overexposed images. Target white value is only available when using Photo Style (1P).

#W # = 0 - 255 (default = 90)

D – Delta for Acceptance

The D modifier sets the allowable range for the white value setting. Delta is only available when using Photo Style (1P).

#D # = 0 – 255 (default = 25)

U – Update Tries

This sets the maximum number of frames that the scan engine should take to reach the D – delta for acceptance. Update tries is only available when using Photo Style (1P).

#U # = 0-10 (default = 6)

% Target Set Point Percentage

Sets the target point for the light and dark values in the captured image. A setting of 75% means 75% of the pixels are at or below the target white value, and 25% are above the target white value. Altering this setting from the default is not recommended under normal conditions. To alter grayscale values W – Targer White Value should be used.

#% # = 0 – 99 (default = 50)

Image Ship – IMGSHP

The IMGSHP command is used to instruct the DE02 OR DE23 to ship the last image in memory to the Host application. The IMGSHP command has several modifiers which are used to change the look of the image but they do not affect the image in memory. Any number of modifiers may be sent in a command line to the reader. The following example ships a bitmap image with gamma correct and document image filtering to the host application.

IMGSNP – Modifiers

A – Infinity Filter

The A infinity filter modifier enhances pictures taken form very long distances (greater than 10 feet). They will increase the clarity of the image. Infinity filters should not be used with IMGSNP modifiers.

0A - Infinity filter off (default)

1A – Infinity filter on

C – Compensation

Flattens the image to account for variations in illumination across the image.

0C – Compensation off (default)

1C – Compensation on

D – Pixel Depth

Indicates the number of bits per pixel in the transmitted image. Only supported in KIM and BMP format images.

8D – 8 bits per pixel grayscale (default)

1D – 1 bit per pixel black and white image

E – Edge Sharpen

Edge sharpen filter that cleans up the edges of an image making it look cleaner and sharper. Edge sharpen will remove some fine details from the image. The strength of the edge sharpen filter can be entered from 1 to 24. A value of 23E provides the sharpest edges but also increases noise in the image.

0E – Sharpen off (default)

14E – Apply edge sharpen for a typical image

#E – Apply edge sharpen using strength # = 1 – 24

F – File Format

Indicates the desired format for the image.

0F – KIM format

1F – TIFF binary

2F – TIFF binary group 4 compressed

3F – TIFF grayscale

4F – Uncompressed binary (upper left to lower right, 1 pixel/bit, 0 padded end of line.)

5F – Uncompressed grayscale (upper left to lower right, bitmap format)

6F – JPEG image (default)

8F – BMP format (lower right to upper left, uncompressed)

15F – BMP uncompressed raw image

H – Histogram Stretch

Increases the contrast of the transmitted image. Not available with all image formats.

0H - No stretch (default)

1H – Histogram stretch

I – Invert Image

Invert image is used to rotate an image around the X or Y axis.

1ix – Invert around the X axis (flips the image upside down)

1iy – Invert around the Y axis (flips the image left to right)

IF – Noise Reduction

Used to reduce the sale and pepper noise in an image.

Oif – Noise reduction off (default)

1if – Noise reduction on

IR – Image Rotate

0ir – Image rotate off (default)

1ir – Rotate image 90 degrees to the right

2ir – Rotate image 180 degrees

3ir – Rotate image 90 degrees to the left

J – JPEG Image quality

Sets the desired JPEG image quality. Higher numbers result in higher quality but larger files. Smaller numbers result in greater amounts of compression, faster transmission, lower quality, and smaller files.

#J – Image is compressed as much as possible while preserving quality factor #. (where # = 0 – 100)

0J – Lowest quality

100J – Highest quality

K - Gamma Correction

Gamma measures the brightness of midtone values in an image. Gamma can be used to brighten or darken and image. A higher gamma correction yields and overall brighter image. The lower the setting, the darker the image. The optimal setting for text images is 50K.

0K – Gamma correct off (default)

50K – Apply gamma correction for brightening

#K – Apply gamma correct factor # (# = 0 – 100)

L,R,T,B, M – Image Cropping

The L, R, T, B modifiers allow the host to specify the left, right, top, and bottom pixel coordinates. Image columns are numbered 0 – 1279, and image rows are numbered 0 thorough 959. The M modifier allow the host to specify the number of pixels to cut from the outside margin of the image, thus only the center pixels are transmitted.

#L – The left edge of the shipping image corresponds to the column # of the image (# = 000 – 843) (default = 0)

#R – The right edge of the shipping image corresponds to the column # of the image (# = 000 – 843) (default = 0)

#T – The top edge of the shipped image corresponds to row # of the image. (# = 000 – 639)

#B - The bottom edge of the shipped image corresponds to row # of the image. (# = 000 – 639)

#M – Margin cut # columns from the left # + 1 columns from the right, # rows from the top, and # + 1 rows from the bottom of the image. Send the remaining center pixels to the host. Range 0 – 238 (default = 0 full image)

P – Protocol

The P modifier defines the protocol with which the image data is sent to the host. Hmodem is defined as Xmodem 1K variant that has additional header information.

0P – None (raw data)

2P – None (default for USB communications)

3P – Hmodem compressed (default for RS232)

4P – Hmodem

S – Pixel Ship

The S pixel ship modifier reduces the image size by shipping only certain regularly spaced pixels. As an example, a setting of 4S would transmit every fourth pixel from every fourth line of the image data. The smaller number of pixels reduces the image data size.

1S – Ship every pixel (default)

2S – Ship every 2nd pixel both horizontal and vertical

3S – Ship every 3rd pixel both horizontal and vertical

4S – Ship every 4th pixel both horizontal and vertical

U – Document Image Filter

The U modifier is used to sharpen the edges and smooth the area between the edges of text in an image. The U modifier should be used with gamma correction. The U modifier typically provides better JPEG compression than the standard E edge sharpen command. This also works well when sending pure black and white images (1 bit per pixel). The optimal setting is 26U.

0U – Filter off (default)

26U – Apply filter for typical document image

#U – Apply filter using a grayscale threshold #. Lower numbers are used when the contrast is lower. 1U will have a similar effect as setting E edge sharpen. # = 0 – 255

V – Blur Image

Smooths the transitions by averaging the pixels next to the hard edges of defined lines and shaded areas in an image.

0V – Off (default)

1V – On

W – Histogram Ship

Instructs the reader to transmit the histogram of the image. The histogram of the image provides a picture of the tonal range in an image, or key type. A low key image has detail concentrated in the shadows of the image. A high key image has detail concentrated in the high lights. An average key image has detail concentrated in the midtones.

0W – Do not send histogram (default)

1W – Send histogram

Command List

The below table includes the programmatic commands for the DExx advanced scanners.

Selection	Setting * indicates Default	Serial Command ## indicates a numeric value	Description
Product Default Settings			
Setting Custom Defaults	Set Custom Defaults	MNUCDF	Save following commands as custom default
	Save Custom Defaults	MNUCDS	Save list of entered commands as custom default
	Remove custom defaults	DEFOVR	Removes custom default setting in which case DEFALT will return the scanner to factory defaults
Resetting the Custom Defaults	Activate Custom Defaults	DEFALT	Default scanner
Programming the Interface			
RS232 Interface	RS232 Serial Port	TERMID0;232BAD9;232WRD2	Set RS232 115,200 baud, 8 Data, 1 Stop, No Parity
Remote MasterMind for USB	ReM Off	REMIFC0	
	*ReM On	REMIFC1	
Plug and Play *Codes*: USB	*USB Keyboard (PC)	PAP124	
	USB Keyboard (Mac)	PAP125	
	USB HID	TERMID131	
	USB Serial	TERMID130	
	CTS/RTS Emulation On	USBCTS1	

	CTS/RTS Emulation Offf	USBCTS0	
	ACK/NAK Mode On	USBACK1	
	ACK/NAK Mode Off*	USBACK0	
Program Keyboard Country	*USA	KBDCTY0	
	Albania	KBDCTY35	
	Azeri (Cyrillic)	KBDCTY81	
	Azeri (Latin)	KBDCTY80	
	Belarus	KBDCTY82	
	Belgium	KBDCTY1	
	Bosnia	KBDCTY33	
	Brazil	KBDCTY16	
	Brazil (MS)	KBDCTY59	
	Bulgaria (Cyrillic)	KBDCTY52	
	Bulgaria (Latin)	KBDCTY53	
	Canada (French legacy)	KBDCTY54	
	Canada (French)	KBDCTY18	
	Canada (Multilingual)	KBDCTY55	
	Croatia	KBDCTY32	
	Czech	KBDCTY15	
	Czech (Programmers)	KBDCTY40	
	Czech (QWERTY)	KBDCTY39	
	Czech (QWERTY2)	KBDCTY38	
	Denmark	KBDCTY8	
	Dutch (Netherlands)	KBDCTY11	
	Estonia	KBDCTY41	
	Faroese	KBDCTY83	
	Finland	KBDCTY2	
	France	KBDCTY3	
	Gaelic	KBDCTY84	
	Germany	KBDCTY4	
	Greek	KBDCTY17	

Greek (220 Latin)	KBDCTY64	
Greek (220)	KBDCTY61	
Greek (319 Latin)	KBDCTY65	
Greek (319)	KBDCTY62	
Greek (Latin)	KBDCTY63	
Greek (MS)	KBDCTY66	
Greek (Polytonic)	KBDCTY60	
Hebrew	KBDCTY12	
Hungarian (101 key)	KBDCTY50	
Hungry	KBDCTY19	
Iceland	KBDCTY75	
Irish	KBDCTY73	
Italian (142)	KBDCTY56	
Italy	KBDCTY5	
Japan ASCII	KBDCTY28	
Kazakh	KBDCTY78	
Kyrgyz (Cyrillic)	KBDCTY79	
Latin America	KBDCTY14	
Latvia	KBDCTY42	
Latvia (QWERTY)	KBDCTY43	
Lithuania	KBDCTY44	
Lithuania (IBM)	KBDCTY45	
Macedonia	KBDCTY34	
Malta	KBDCTY74	
Mongolian (Cyrillic)	KBDCTY86	
Norway	KBDCTY9	
Poland	KBDCTY20	
Polish (214)	KBDCTY57	
Polish (Programmers)	KBDCTY58	
Portugal	KBDCTY13	
Romania	KBDCTY25	

	Russia	KBDCTY26	
	Russian (MS)	KBDCTY67	
	Russian (Typewriter)	KBDCTY68	
	SCS	KBDCTY21	
	Serbia (Cyrillic)	KBDCTY37	
	Serbia (Latin)	KBDCTY36	
	Slovakia	KBDCTY22	
	Slovakia (QWERTY)	KBDCTY49	
	Slovakia (QWERTZ)	KBDCTY48	
	Slovenia	KBDCTY31	
	Spain	KBDCTY10	
	Spanish variation	KBDCTY51	
	Sweden	KBDCTY23	
	Switzerland (French)	KBDCTY29	
	Switzerland (German)	KBDCTY6	
	Tatar	KBDCTY85	
	Turkey F	KBDCTY27	
	Turkey Q	KBDCTY24	
	Ukrainian	KBDCTY76	
	United Kingdom	KBDCTY7	
	United States (Dvorak right)	KBDCTY89	
	United States (Dvorak left)	KBDCTY88	
	United States (Dvorak)	KBDCTY87	
	United States (International)	KBDCTY30	
	Uzbek (Cyrillic)	KBDCTY77	
Keyboard Conversion	*Keyboard Conversion Off	KBDCNV0	
	Convert all Characters to Upper Case	KBDCNV1	
	Convert all Characters to Lower Case	KBDCNV2	
Keyboard Styled	*Regular	KBDSTY0	

	Cap Lock	KBDSTY1	
	Shift Lock	KBDSTY2	
	Automatic Caps Lock	KBDSTY6	
	Emulate External Keyboard	KBDSTY5	
Control Character Output	*Control Character Output Off	KBDNPE0	
	Control Character Output On	KBDNPE1	
Keyboard Modifiers	*Control + X Off	KBDCAS0	
	DOS Mode Control + X	KBDCAS1	
	Windows Mode Control + X	KBDCAS2	
	Windows Mode Prefix/Suffix Off	KBDCAS3	
	*Turbo Mode Off	KBDTMD0	
	Turbo Mode On	KBDTMD1	
	*Numeric Keypad Off	KBDNPS0	
	Numeric Keypad On	KBDNPS1	
	*Auto Direct Connect Off	KBDADC0	
	Auto Direct Connect On	KBDADC1	
Baud Rate	300 BPS	232BAD0	
	600 BPS	232BAD1	
	1200 BPS	232BAD2	
	2400 BPS	232BAD3	
	4800 BPS	232BAD4	
	9600 BPS	232BAD5	
	19200 BPS	232BAD6	
	38400 BPS	232BAD7	
	57600 BPS	232BAD8	
	*115200 BPS	232BAD9	
Word Length: Bata Bits, Stop Bits, and Parity	7 Data, 1 Stop Parity Even	232WRD3	
	7 Data, 1 Stop, Parity None	232WRD0	
	7 Data, 1 Stop, Parity Odd	232WRD6	
	7 Data, 2 Stop, Parity Even	232WRD4	

	7 Data, 2 Stop, Parity None	232WRD1	
	7 Data, 2 Stop, Parity Odd	232WRD7	
	8 Data, 1 Stop, Parity Even	232WRD5	
	*8 Data, 1 Stop, Parity None	232WRD2	
	8 Data, 1 Stop, Parity Odd	232WRD8	

Selection	**Setting * indicates Default**	**Serial Command** **## indicates a numeric value**	**Description**
RS232 Receiver Time-out	Range 0-300 seconds	232LPT###	Time SCANNER stays awake waiting to receive data. Trigger resets the timer
RS232 Handshaking	*RTS/CTS Off	232CTS0	
	Flow Control, No Timeout	232CTS1	
	Two-Direction Flow Control	232CTS2	
	Flow Control with Timeout	232CTS3	
	RS232 Timeout	232DEL####	
	*XON/XOFF Off	232X0N0	
	XON/XOFF On	232X0N1	
	*ACK/NAK Off	232ACK0	
	ACK/NAK On	232ACK1	
RS232 Stop Mode	RS232 Stop Mode On	232SDY	Stops RS232, restart by sending a trigger
Input/Output Selections			
Power Up Beeper	Power Up Beeper Off – Scanner	BEPPWR0	
	Power Up Beeper On – Scanner	BEPPWR1	
Beep on BEL Character	Beep on BEL On	BELBEP1	Reader will respond with a beep after receiving a BEL character. This can be used to confirm command communications.

	*Beep on BEL Off	BELBEP0	
Trigger Click	On	BEPTRG1	SCANNER will provide an audible click on hardware trigger.
	*Off	BEPTRG0	
Beeper – Good Read	Off	BEPBEP0	
	*On	BEPBEP1	
Beeper Volume – Good Read	Off	BEPLVL0	
	Low	BEPLVL1	
	Medium	BEPLVL2	
	*High	BEPLVL3	
Beeper Pitch – Good Read (Frequency)	Low (1600) (min 400Hz)	BEPFQ11600	BEPFQ1####(400-9000)
	*Medium (2400)	BEPFQ12400	
	High (4200) (max 9000Hz)	BEPFQ14200	
Beeper Pitch – Error (Frequency)	*Razz (250) (min 200Hz)	BEPFQ2800	BEPFQ2####(200-9000)
	Medium (3250)	BEPFQ23250	
	High (4200) (max 9000Hz)	BEPFQ24200	
Beeper Duration – Good Read	*Normal Beep	BEPBIP0	
	Short Beep	BEPBIP1	
LED – Good Read	Off	BEPLED0	
	*On	BEPLED1	
Number of Beeps – Error	*1	BEPERR3	
	Range 1-9	BEPERR#	
Number of Beeps – Good Read	*1	BEPRPT1	
	Range 1-9	BEPRPT#	
Good Read Delay	*No Delay	DLYGRD0	Minimum time before SCANNER can read another barcode
	Short Delay (500ms)	DLYGRD500	
	Medium Delay (1000ms)	DLYGRD1000	
	Long Delay (1500ms)	DLYGRD1500	
User-Specified Good Read Delay	Range 0 – 30,000ms	DLYGRD#####	

Manual Trigger Mode	*Manual Trigger – Normal	TRGMOD0	
	Manual Trigger - Enhanced Mode	PAPHHS	
Mobile Phone mode manual trigger	Manual trigger – Cell Phone	PAPHHC	Manual trigger mode optimized for cell phone and LED screen reading
LED Illumination – Manual Trigger	Off	PWRNOL0	
	Low	PWRNOL100	
	Medium	PWRNOL120	
	*High	PWRNOL150	
Trigger Toggle	*Trigger Toggle Off	TRGTM0	
	Trigger Toggle – image capture	TRGTGM1	
	Trigger Toggle – Centering	TRGTGM2	
Trigger Number	2 Quick Triggers	TRGTPC2	
	*3 Quick Triggers	TRGTPC3	
	4 Quick Triggers	TRGTP4	
Trigger Toggle Timeout	Trigger Toggle Timeout (range 0-65) *5	TRGTGT##	
Trigger Toggle Indicator	*Off	TRGIND0	
	On	TRGIND1	
Snap & Ship Trigger Mode	Snap & Ship Trigger Mode	PAPTSS	
Character Activation Mode	*Off	HSTCEN0	Allows for the use of a user defined character to trigger the SCANNER. SCANNER will scan until either Deactivation character is received, time out occurs or barcode is successfully scanned.
	On	HSTCEN1	
Activation Character (range 0-255)	*12 [DC2]	HSTACH###	
End Character Activation After Good Read	*Do not end	HSTCGD0	LED illumination remains on after good read and SCANNER continues scanning

	End	HSTCGD1	LED illumination turns off after good read scanning phase ends
Character Activation Timeout	Range 1-30,000ms (*30,000ms)	HSTCDT	Timeout for LED illumination of HSTCGD command
Character Deactivation Mode	*Off	HSTDEN0	Sets the scanner to deactivate scanning on receiving a user defined character
	On	HSTDEN1	
Deactivation Character	*14 [DC4]	HSTDCH	Sets user defined deactivation character
Serial Trigger Mode	Read Time-Out (0-300,000ms) *30,000	TRGSTO####	Scanner reads is initiated by either HW or SW trigger to scanner
Presentation Mode	Presentation Mode	TRGMOD3	Scanner in presentation mode.
Streaming Presentation Mode	Streaming Presentation Mode Normal	TRGMOD8	
	Streaming Presentation Mode Enhanced	PAPSPE	
Presentation Mode Full Depth of Field	Presentation Mode Full Depth of Field	PAPTPE	
Mobile Phone Presentation mode	Presentation Mode – Cell Phone	PAPSPC	Presentation mode optimized for cell phone and LED screen reading
LED Illumination Presentation Mode	Off	PWRLDC0	
	Low	PWRLDC100	
	*High	PWRLDC150	
Idle Illumination	Off	PWRIDL0	LED illumination state when SCANNER is in presentation mode in idle state
	Low	PWRIDL7	
	Medium	PWRIDL15	
	*High	PWRIDL50	

Presentation LED behavior after decode	*LEDs On	TRGPCK1	
	LEDs Off	TRGPCK0	
Presentation Sensitivity	Range 0-20 (*1)	TRGPMS##	Sets the scan engines reaction time to bar code presentation. 0 = fastest response
Presentation Centering	On	PDCWIN1	Narrows area in which codes will be detected in presentation mode. This allows user to pick specific codes to be read when multiple codes are in close proximity. The below settings are used to define a % of the centering window in which codes must be present to be read
	*Off	PDCWIN0	
	Top	PDCTOP##	40% is default of top when centering = on
	Bottom	PDCBOT##	60% is default of bottom when centering = on
	Left	PDCLFT##	40% is default of top when centering = on
	Right	PDCRGT##	60% is default of bottom when centering = on
	Note: xx = percentage of centering window		
Code Gate	*Off	AOSCGD0	Scanners sends decoded data on decode
	On	AOSCGD1	Delays the transmission of decoded data until scanner receives a trigger signal
Mobile Phone Read Mode optimization	On	DECCEL1	Optimize scanner for reading codes off mobile devices screens

	Off	DECCEL0	Turn off cell phone mode optimization
Poor Quality 1D Codes	Poor Quality 1D reading on	DECLDI1	Improves scanners ability to read poorly printed 1D codes, Note reduces scanner snappiness in reading
	* Poor Quality 1D reading Off	DECLDI0	
Poor Quality PDF Codes	Poor Quality PDF reading on	PDFXPR1	Improves scanners ability to read poorly printed PDF codes, Note reduces scanner snappiness in reading
	* Poor Quality PDF reading Off	PDFXPR0	
Decode Security	Very high	DECSEC0	Very high most permissive reading
	High	DECSEC1	High reading tolerance
	*Medium	DECSEC2	Medium reading tolerance
	Low	DECSEC3	Low reading tolerance
Decode Time-Out	0-2500 ms	DECTMX####	Maximum amount of time the decoder will use to decode an image
Hands Free Time-Out	Range 0-300,000ms	TRGPTO#####	
Reread Delay	Short (500ms)	DLYRRD500	Sets the timeout before the SCANNER will read the same barcode again. Used to protect against multiple reads of the same code. Note only valid in Presentation operation mode
	*Medium (750ms)	DLYRRD750	
	Long (1000ms)	DLYRRD1000	
	Extra Long (2000ms)	DLYRRD2000	
User-specified Reread Delay	Range 0 – 30,000 ms	DLYRRD#####	User defined re-read delay
2D Re-read Delay	*2D Re-read delays off	DLY2RR0	Re-read delay between re-reading a 2D code. Default is off which

			means 2D delay = 1D delay
	Short (1000)	DLY2RR1000	1000 ms
	Medium (2000ms)	DLY2RR2000	2000 ms
	Long (3000ms)	DLY2RR3000	3000 ms
	Extra Long (4000ms)	DLY2RR4000	4000 ms
Illumination Lights	*Lights On	SCNLED1	
	Lights Off	SCNLED0	
	Lights On – Mobile Phone Reading	SCNLED3	
Aimer Delay	200 milliseconds	SCNDLY200	Sets a delay between when a trigger is activated and the scanner acquires and image for processing. Aiming light will appear on trigger but LED illumination will not appear until delay time has elapsed
	400 milliseconds	SCNDLY400	
	*Off (no delay)	SCNDLY0	
User-Specified Aimer Delay	Range 0-4000ms	SCNDLY####	
Aimer Mode	Off	SCNAIM0	
	*Interlaced	SCNAIM2	
	Concurrent	SCNAIM3	
Centering Window	Centering On read codes that are at least partially in the defined centering window in perspective to imager. If no centering windows is defined reader will only read codes in center of field of view.	DECWIN1	Narrows area in which codes will be detected. This allows user to pick specific codes to be read when multiple codes are in close proximity. The below settings are used to define a % of the centering window in which codes must be present to be read. DECWIN1 will only read codes that are at least

			partially inside the defined window.
	Centering On read codes that are at least partially in the defined centering window in perspective to scanner aimer. If no centering windows is defined reader will only read codes in center of field of view.	DECWIN2	
	Centering On read only those codes that are totally withing the defined centering window. If no centering windows is defined reader will only read codes in center of field of view.	DECWIN3	
	*Centering Off	DECWIN0	
	Top of Centering Window (*40%)	DECTOP###	
	Bottom of Centering Window (*60%)	DECBOT###	
Show Centering Windows	Show centering window	SHWWIN1	Turn on. On sending a IMGSHP command, A box will be shown representing the defined centering window.
		SHWWIN0	Turn off.
Preferred Symbology	On	PRFENA1	
	Off	PRFENA0	
	High priority Symbology	PRFCOD##	
	Low priority Symbology	PRFBLK##	
	Preferred Symbology Time out (*500) Range 100-3000	PRFPTO####	
	Preferred Symbology Default	PRFDFT	
Output Sequence Editor	Enter Sequence	SEQBLK	Instructs SCANNER to output code data in a user defined order see overview in this guide.
	Default Sequence	SEQDFT	Transmit data as decoded

Partial Sequence	Transmit Partial Sequence	SEQTTS1	Transmit data that is a partial sequence of the sequence which has been programmed into the reader using the Output Sequence editor command.
	*Discard Partial Sequence	SEQTTS0	Discard data that is a partial sequence of the sequence which has been programmed into the reader using the Output Sequence editor command.
Require Output Sequence	Required	SEQ_EN2	Do not transmit data that does not match the defined sequence
	On/Not Required	SEQ_EN1	Scanner attempts to get the output data to match the output sequence but if this is not possible transmit all data as is.
	*Off	SEQ_EN0	Transmit data to host as it is decoded
Multiple Symbols	On	SHOTGN1	Instructs reader to read as many codes as it sees while the HW trigger is active. Each code is read once.
	On/Aggressive Search	SHOTGN2	Instructs the reader to read as many codes as it sees while the HW Trigger is active. Each code is read once. More aggressive searching for multiple codes enabled.
	*Off	SHOTGN0	Turns off Shotgun Mode
No Read	On	SHWNRD1	Notify host when code cannot be read transmitting a NR

	*Off	SHWNRD0	Do not notify host when a code cannot be read.
Video Reverse	Video Reverse Only	VIDLDP1	Only read inverted codes (where black bars are represented as white spaces, and white spaces become black bars)
	Video Reverse and Standard Bar Codes	VIDLDP2	Read both inverted and non inverted codes
	*Video Reverse Off	VIDLDP0	Turns off this feature
Working Orientation	*Upright	ROTATN0	Used to read direction sensitive codes such as KIX codes when they may not be presented to the scanner in the correct orientation
	Vertical, Bottom to Top (Rotate CCW 90°)	ROTATN1	
	Upside Down	ROTATN2	
	Vertical, Top to Bottom (Rotate CW 90°)	ROTATN3	
Prefix/Suffix Selections			
Add CR Suffix to All Symbologies		VSUFCR	
Prefix	Add Prefix	PREBK2##	## = hex representation of Prefix to add. See overview in this guide.
	Clear One Prefix	PRECL2	
	Clear All Prefixes	PRECA2	
Suffix	Add Suffix	SUFBK2##	## = hex representation of Prefix to add. See overview in this guide.
	Clear One Suffix	SUFCL2	
	Clear All Suffixes	SUFCA2	
Function Code Transmit	*Enable	RMVFNC0	
	Disable	RMVFNC1	
Intercharacter Delay	Range 0-1000 (5ms increments)	DLYCHR##	Slows transmission of data.

User Specified Intercharacter Delay	Delay Length 0-1000 (5ms increments)	DLYCRX##	Slows the transmission of data after a user defined character.
	Character to Trigger Delay	DLY_XX##	
Interfunction Delay	Range 0-1000 (5ms increments)	DLYFNC##	Delay between the transmission of each control character.
Intermessage Delay	Range 0-1000 (5ms increments)	DLYMSG##	Delay between each scan transmission.
Data Formatter			
Data Format Editor	*Default Data Format (None)	DFMDF3	
	Enter Data Format	DFMBK3##	
	Clear One Data Format	DFMCL3	
	Clear All Data Formats	DFMCA3	
Data Formatter	Data Formatter Off	DFM_EN0	
	*Data Formatter On, Not Required, Keep Prefix/Suffix	DFM_EN1	
	Data Format Required, Keep Prefix/Suffix	DFM_EN2	
	Data Formatter On, Not Required, Drop Prefix/Suffix	DFM_EN3	
	Data Format Required, Drop Prefix/Suffix	DFM_EN4	
Data Format Non-Match Error Tone	*Data Format Non-Match Error Tone On	DFMDEC0	
	Data Format Non-Match Error Tone Off	DFMDEC1	
Primary/Alternate Data Formats	Primary Data Format	ALTFNM0	
	Data Format 1	ALTFNM1	
	Data Format 2	ALTFNM2	
	Data Format 3	ALTFNM3	
Single Scan Data Format Change	Single Scan-Primary Data Format	VSAF_0	
	Single Scan-Data Format 1	VSAF_1	

	Single Scan-Data Format 2	VSAF_2	
	Single Scan-Data Format 3	VSAF_3	
Symbologies			
All Symbologies	All Symbologies Off	ALLENA0	
	All Symbologies On	ALLENA1	
Codabar	Default All Codabar Settings	CBRDFT	
	Off	CBRENA0	
	*On	CBRENA1	
Codabar Start/Stop Char.	*Don't Transmit	CBRSSX0	
	Transmit	CBRSSX1	
Codabar Check Char	*No Check Character	CBRCK20	
	Validate Modulo 16, but don't transmit	CBRCK21	
	Validate Modulo 16, and transmit	CBRCK22	
Codabar Concatenation	*Off	CBRCCT0	
	On	CBRCCT1	
	Require	CBRCCT2	
Codabar Message Length	Minimum (2-60)*4	CBRMIN##	
	Maximum (2-60)*60	CBRMAX##	
Code 39	Default All Code 39 Settings	C39DFT	
	Off	C39ENA0	
	*On	C39ENA1	
Code 39 Start/Stop Char.	*Don't Transmit	C39SSX0	
	Transmit	C39SSX1	
Code 39 Check Char.	*No Check Char.	C39CK20	
	Validate, but don't transmit	C39CK21	
	Validate and transmit	C39CK22	
Code 39 Message Length	Minimum (0 - 48) *0	C39MIN##	
	Maximum (0 - 48) *48	C39MAX##	
Code 39 Append	*Off	C39APP0	
	On	C39APP1	
	*Off	C39B320	

Code 32 Pharmaceutical (PARAF)	On	C39B321	
Code 39 Full ASCII	*Off	C39ASC0	
	On	C39ASC1	
Code 39 Code Page	Code 39 Code Page	C39DCP	
Code 39 Unconventional Inter-Character Gaps	*Off	C39UIC0	
	On	C39UIC1	
Interleaved 2 of 5	Default All Interleaved 2 of 5 Settings	I25DFT	
	Off	I25ENA0	
	On	I25ENA1	
Interleaved 2 of 5 Check Digit	*No Check Char.	I25CK20	
	Validate, But Don't Transmit	I25CK21	
	Validate, and Transmit	I25CK22	
Interleaved 2 of 5 Message Length	Minimum (2 - 80) *4	I25MIN##	
	Maximum (2 - 80) *80	I25MAX##	
FEBRABAN Decode	*Off	I25PAY0	
	On	I25PAY1	
NEC 2 of 5	Default All NEC 2 of 5 Settings	N25DFT	
	*Off	N25ENA0	
	On	N25ENA1	
NEC 2 of 5 Check Digit	*No Check Char	N25CK20	
	Validate, But Don't Transmit	N25CK21	
	Validate, and Transmit	N25CK22	
NEC 2 of 5 Message Length	Minimum (2 - 80) *4	N25MIN##	
	Maximum (2 - 80) *80	N25MAX##	
NEC 2 of 5 Redundancy	Range(0-10) *0	N25VOT##	

Code 93	Default All Code 93 Settings	C93DFT	
	Off	C93ENA0	
	*On	C93ENA0	
Code 93 Message Length	Minimum (0 - 80) *0	C93MIN##	
	Maximum (0 - 80) *80	C93MAX##	
Code 93 Redundancy	Range (0-10)*0	C93VOT##	
Code 93 Append	On	C93APP1	
	*Off	C93APP0	
Code 93 Code Page	Code 93 Code Page	C93DCP	
Straight 2 of 5 Industrial	Default All Straight 2 of 5 Industrial settings	R25DFT	
	*Off	R25ENA0	
	On	R25ENA1	
Straight 2 of 5 Industrial Message Length	Minimum (1 - 48) *4	R25MIN##	
	Maximum (1 - 48) *48	R25MAX##	
Straight 2 of 5 Industrial Redundancy	Range (0-10)*0	R25VOT##	
Straight 2 of 5 IATA	Default All Straight 2 of 5 IATA Settings	A25DFT	
	*Off	A25ENA0	
	On	A25ENA1	
Straight 2 of 5 IATA Message Length	Minimum (1 - 48) *4	A25MIN##	
	Maximum (1 - 48) *48	A25MAX##	
Straight 2 of 5 IATA Redundancy	Range (0-10)*0	A25VOT##	
Matrix 2 of 5	Default All Matrix 2 of 5 Settings	X25DFT	
	*Off	X25ENA0	
	On	X25ENA1	
Matrix 2 of 5 Message Length	Minimum (1 - 80) *4	X25MIN##	
	Maximum (1 - 80) *80	X25MAX##	
Matrix 2 of 5 Redundancy	Range (0-10)*0	X25VOT##	
Code 11	Default All Code 11 Settings	C11DFT	
	*Off	C11ENA0	

	On	C11ENA1	
Code 11 Check Digits Required	1 Check Digit	C11CK20	
	*2 Check Digits	C11CK21	
Code 11 Message Length	Minimum (1 - 80) *4	C11MIN##	
	Maximum (1 - 80) *80	C11MAX##	
Code 11 Redundancy	Range (0-10)*0	C11VOT##	
Code 128	Default All Code 128 Settings	128DFT	
	Off	128ENA0	
	*On	128ENA1	
ISBT Concatenation	*Off	ISBENA0	
	On	ISBENA1	
Code 128 Message Length	Minimum (0 - 80)*0	128MIN##	
	Maximum (0 - 90) *80	128MAX##	
Code 128 Append	*On	128APP1	
	Off	128APP0	
Code 128 Code Page	Code 128 Code Page (*2)	128DCP##	
Code 128 Redundancy	Range (0-10)*0	128VOT##	
GS1-128	Default All GS1-128 Settings	GS1DFT	
	*On	GS1ENA1	
	Off	GS1ENA0	
GS1-128 Message Length	Minimum (1 - 80) *1	GS1MIN	
	Maximum (0 - 80) *80	GS1MAX	
GS1-128 Redundancy	Range (0-10)*0	GS1VOT##	
Telepen	Default All Telepen Settings	TELDFT	
	*Off	TELENA0	
	On	TELENA1	
Telepen Output	*AIM Telepen Output	TELOLD0	
	Original Telepen Output	TELOLD1	
Telepen Message Length	Minimum (1 - 60) *1	TELMIN##	

	Maximum (1 - 60) *60	TELMAX##	
Telepen Redundancy	Range (0-10)*0	TELVOT##	
UPC-A	Default All UPC-A Settings	UPADFT	
	Off	UPBENA0	
	*On	UPBENA1	
UPC-A Check Digit	Off	UPACKX0	
	*On	UPACKX1	
UPC-A Number System	Off	UPANSX0	
	*On	UPANSX1	
UPC-A Redundancy	Range (0-10)*0	UPAVOT##	
UPC-A 2 Digit Addenda	*Off	UPAAD20	
	On	UPAAD21	
UPC-A 5 Digit Addenda	*Off	UPAAD50	
	On	UPAAD51	
UPC-A Addenda Required	*Not Required	UPAARQ0	
	Required	UPAARQ1	
Addenda Timeout	Range (0-65535) *100	DLYADD####	
UPC-A Addenda Separator	Off	UPAADS0	
	*On	UPAADS1	
UPC-A/EAN-13 with Extended Coupon Code	*Off	CPNENA0	
	Allow Concatenation	CPNENA1	
	Require Concatenation	CPNENA2	
Coupon GS1 DataBar Output	GS1 Output Off	CPNGS10	
	GS1 Output On	CPNGS11	
UPC-E0	Default All UPC-E settings	UPEDFT	
	Off	UPEEN00	
	*On	UPEEN01	
UPC-E0 Expand	*Off	UPEEXP0	

	On	UPEEXP1	
UPC-E0 Redundancy	Range (0-10)*0	UPEVOT##	
UPC-E0 Addenda Required	Required	UPEARQ1	
	*Not Required	UPEARQ0	
UPC-E0 Addenda Separator	*On	UPEADS1	
	Off	UPEADS0	
UPC-E0 Check Digit	Off	UPECKX0	
	*On	UPECKX1	
UPC-E0 Leading Zero	Off	UPENSX0	
	*On	UPENSX1	
UPC-E0 Addenda	2 Digit Addenda On	UPEAD21	
	*2 Digit Addenda Off	UPEAD20	
	5 Digit Addenda On	UPEAD51	
	*5 Digit Addenda Off	UPEAD50	
UPC-E1	*Off	UPEEN10	
	On	UPEEN11	
EAN/JAN-13	Default All EAN/ JAN Settings	E13DFT	
	Off	E13ENA0	
	*On	E13ENA1	
Convert UPC-A to EAN-13	UPC-A Converted to EAN-13	UPAENA0	
	Do not Convert UPC-A	UPAENA1	
EAN/JAN-13 Check Digit	Off	E13CKX0	
	*On	E13CKX1	
	2 Digit Addenda On	E13AD21	
	*2 Digit Addenda Off	E13AD20	
	5 Digit Addenda On	E13AD51	
	*5 Digit Addenda Off	E13AD50	
EAN/JAN-13 Redundancy	Range (0-10)*0	E13VOT##	
EAN/JAN-13 Addenda Required	*Not Required	E13ARQ0	
	Required	E13ARQ1	
	*Don’t Require 5 Digit Addenda	ARQ2900	

EAN/JAN-13 Beginning with 290 Addenda Required	Require 5 Digit Addenda	ARQ2901	
EAN/JAN-13 Beginning with 378/379 Addenda Required	*Don't Require Addenda	ARQ3780	
	Require 2 Digit Addenda	ARQ3781	
	Require 5 Digit Addenda	ARQ3782	
	Require 2 or 5 Digit Addenda	ARQ3783	
EAN/JAN-13 Beginning with 414/419 Addenda Required	*Don't Require Addenda	ARQ4140	
	Require 2 Digit Addenda	ARQ4141	
	Require 5 Digit Addenda	ARQ4142	
	Require 2 or 5 Digit Addenda	ARQ4143	
EAN/JAN-13 Beginning with 434/439 Addenda Required	*Don't Require Addenda	ARQ4340	
	Require 2 Digit Addenda	ARQ4341	
	Require 5 Digit Addenda	ARQ4342	
	Require 2 or 5 Digit Addenda	ARQ4343	
EAN/JAN-13 Beginning with 977 Addenda Required	*Don't Require 2 Digit Addenda	ARQ9770	
	Require 2 Digit Addenda	ARQ9771	
EAN/JAN-13 Beginning with 978 Addenda Required	*Don't Require 5 Digit Addenda	ARQ9780	
	Require 5 Digit Addenda	ARQ9781	
EAN/JAN-13 Beginning with 979 Addenda Required	*Don't Require 5 Digit Addenda	ARQ9790	
	Require 5 Digit Addenda	ARQ9791	
EAN/JAN-13 Addenda Separator	Off	E13ADS0	
	*On	E13ADS1	
ISBN Translate	*Off	E13ISB0	
	On	E13ISB1	
EAN/JAN-8	Default All EAN/ JAN 8 Settings	EA8DFT	
	Off	EA8ENA0	
	*On	EA8ENA1	
EAN/JAN-8 Check Digit	Off	EA8CKX0	
	*On	EA8CKX1	
EAN/JAN-8 Addenda	*2 Digit Addenda Off	EA8AD20	
	2 Digit Addenda On	EA8AD21	
	5 Digit Addenda On	EA8AD51	

	*5 Digit Addenda Off	EA8AD50	
EAN/JAN-8 Addenda Required	*Not Required	EA8ARQ0	
	Required	EA8ARQ1	
EAN/JAN-8 Addenda Separator	Off	EA8ADS0	
	*On	EA8ADS1	
MSI	Default All MSI Settings	MSIDFT	
	*Off	MSIENA0	
	On	MSIENA1	
MSI Check Character	*Validate Type 10, but Don't Transmit	MSICHK0	
	Validate Type 10 and Transmit	MSICHK1	
	Validate 2 Type 10 Chars, but Don't Transmit	MSICHK2	
	Validate 2 Type 10 Chars and Transmit	MSICHK3	
	Validate Type 10 then Type 11 Char, but Don't Transmit	MSICHK4	
	Validate Type 10 then Type 11 Char and Transmit	MSICHK5	
	Disable MSI Check Characters	MSICHK6	
MSI Message Length	Minimum (4 - 48) *4	MSIMIN##	
	Maximum (4 - 48) *48	MSIMAX##	
MSI Redundancy	Range (0-10)*0	MSIVOT##	
GS1 DataBar Omnidirectional	Default All GS1 DataBar Omnidirectional Settings	RSSDFT	
	Off	RSSENA	
	*On	RSSENA1	
GS1 Databar Omnidirectional Redundancy	Range (0-10)*0	RSSVOT##	
GS1 DataBar Limited	Default All GS1 DataBar Limited Settings	RSLDFT	
	Off	RSLENA0	
	*On	RSLENA1	
GS1 Databar Limited Redundancy	Range (0-10)*0	RSLVOT	

GS1 DataBar Expanded	Default All GS1 DataBar Expanded Settings	RSEDFT	
	Off	RSEENA0	
	*On	RSEENA1	
GS1 DataBar Expanded Msg. Length	Minimum (4 - 74) *4	RSEMIN##	
	Maximum (4 - 74) *74	RSEMAX##	
GS1 Databar Expanded Redundancy	Range (0-10)*0	RSEVOT##	
Trioptic Code	*Off	TRIENA0	
	On	TRIENA1	
Trioptic Redundancy	Range (0-10) *0	TRIVOT##	
Codablock A	Default All Codablock A Settings	CBADFT	
	*Off	CBAENA0	
	On	CBAENA1	
Codablock A Msg. Length	Minimum (1 - 600) *1	CBAMIN####	
	Maximum (1 - 600) *600	CBAMAX####	
Codablock F	Default All Codablock F Settings	CBFDFT	
	*Off	CBFENA0	
	On	CBFENA1	
Codablock F Msg. Length	Minimum (1 - 2048) *1	CBFMIN####	
	Maximum (1 - 2048) *2048	CBFMAX####	
Label Code	On	LBLENA1	
	* Off	LBLENA0	
PDF417	Default All PDF417 Settings	PDFDFT	
	*On	PDFENA1	
	Off	PDFENA0	
PDF417 Msg. Length	Minimum (1-2750) *1	PDFMIN	
	Maximum (1-2750) *2750	PDFMAX	
PDF417 Code Page	PDF417 Code Page	PDFDCP##	
MacroPDF417	*On	PDFMAC1	
	Off	PDFMAC0	
MicroPDF417	Default All Micro PDF417 Settings	MPDDFT	

	On	MPDENA1	
	*Off	MPDENA0	
MicroPDF417 Msg. Length	Minimum (1-366) *1	MPDMIN	
	Maximum (1-366) *366	MPDMAX	
MicroPDF417 Code Page	MicroPDF417 Code Page (*30)	MPDDCP##	
GS1 Composite Codes	On	COMENA1	
	*Off	COMENA0	
UPC/EAN Version	On	COMUPC1	
	*Off	COMUPC0	
GS1 Composite Codes Msg. Length	Minimum (1-2435) *1	COMMIN	
	Maximum (1-2435) *2435	COMMAX	
GS1 Composite Code Code Page	GS1 Composite Code Code Page	COMDCP##	
GS1 Emulation	GS1-128 Emulation	EANEMU1	
	GS1 DataBar Emulation	EANEMU2	
	GS1 Code Expansion Off	EANEMU3	
	EAN8 to EAN13 Conversion	EANEMU4	
	*GS1 Emulation Off	EANEMU0	
TCIF Linked Code 39	On	T39ENA1	
	*Off	T39ENA0	
QR Code	Default All QR Code Settings	QRCDFT	
	*On	QRCENA1	
	Off	QRCENA0	
QR Code Msg. Length	Minimum (1-7089) *1	QRCMIN	
	Maximum (1-7089) *7089	QRCMAX	
QR Code Append	*On	QRCAPP1	
	Off	QRCAPP0	
QR Code Page	QR Code Page (*3)	QRCDCP##	
QR Code No Quiet Zone	On	QRCNQZ1	
	Off	QRCNQZ1	
DotCode	Default All DotCode Settings	DOTDFT	
	On	DOTENA1	

	*Off	DOTENA0	
Poor Quality DotCodes	Poor Quality DotCodes On	DOTEXS1	
	*Poor Quality DotCodes Off	DOTEXS0	
DotCode Message Length	Minimum (1-2400) *1	DOTMIN####	
	Maximum (1-2400) *2400	DOTMAX####	
Digimarc Barcode	Decoder Attempts (0-10) *3	DIGSTR##	
	Off	DIGENA0	
	On	DIGIENA1	
	Uses ID Decoder then Both Decoders	DIGIENA2	
	*Uses Digimarc Decoder then Both Decoders	DIGIENA3	
	Uses Digimarc Decoder then Alternates Decoders	DIGIENA5	
Data Matrix	Default All Data Matrix Settings	IDMDFT	Data Matrix
	*On	IDMENA1	
	Off	IDMENA0	
Low Contrast Data Matrix Enhancements	*Low Contrast Data Matrix Enhancements On	DPMENA1	Low Contrast Data Matrix Enhancements
	Low Contrast Data Matrix Enhancements Off	DPMENA0	
Data Matrix Msg. Length	Minimum (1-3116) *1	IDMMIN	Data Matrix Msg. Length
	Maximum (1-3116) *3116	IDMMAX	
Data Matrix Append	*On	IDMAPP1	Data Matrix Append
	Off	IDMAPP0	
Data Matrix Code Page	Data Matrix Code Page (*51)	IDMDCP##	Data Matrix Code Page
Grid Matrix	Default All Grid Matrix Settings	GMXDFT	Grid Matrix
	On	GMXENA1	
	*Off	GMXENA0	
Grid Matrix Message Length	Minimum (1-2751) *1	GMXMIN####	Grid Matrix Message Length
	Maximum (1-2751) *2751	GMXMAX####	
MaxiCode	Default All MaxiCode Settings	MAXDFT	MaxiCode

	*On	MAXENA1	
	Off	MAXENA0	
MaxiCode Message Format	Primary Message Only	MAXFMT0	MaxiCode Message Format
	Primary Required, Secondary if Available	MAXFMT1	
	Both Primary and Secondary Required	MAXFMT2	
MaxiCode Msg. Length	Minimum (1-150) *1	MAXMIN	MaxiCode Msg. Length
	Maximum (1-150) *150	MAXMAX	
Aztec Code	Default all Aztec Code settings	AZTDFT	
	*On	AZTENA1	
	Off	AZTENA0	
Aztec Code Msg. Length	Minimum (1-150) *1	AZTMIN	
	Maximum (1-150)*150	AZTMAX	
Aztec Append	*OneScan	AZTAPP1	
	Swipe	AZTAPP2	
	Point and Shoot	AZTAPP3	
	Off	AZTAPP0	
Aztec Code Page	Aztec Code Page (*51)	AZTDCP##	
Chinese Sensible (Han Xin) Code	Default All Han Xin Code settings	HX_DFT	
	On	HX_ENA1	
	*Off	HX_ENA0	
Chinese Sensible (Han Xin) Code Msg. Length	Minimum (1-7833) *1	HX_MIN	
	Maximum (1-7833)*7833	HX_MAX	

POSTAL CODES – 2D			
2D Postal Codes	*Off	POSTAL0	
Single 2D Postal Codes	Australian Post On	POSTAL1	
	British Post On	POSTAL7	
	Canadian Post On	POSTAL30	
	Intelligent Mail Bar Code On	POSTAL10	
	Japanese Post On	POSTAL3	
	KIX Post On	POSTAL4	
	Planet Code On	POSTAL5	
	Postal-4i On	POSTAL9	
	Postnet On	POSTAL6	
	Postnet with B and B[1] Fields On	POSTAL11	
	InfoMail On	POSTAL2	
Combination 2D Postal Codes	InfoMail and British Post On	POSTAL8	
	Intelligent Mail Bar Code and Postnet with B and B[1] Fields On	POSTAL20	
	Postnet and Postal-4i On	POSTAL14	
	Postnet and Intelligent Mail Bar Code On	POSTAL16	
	Postal-4i and Intelligent Mail Bar Code On	POSTAL17	
	Postal-4i and Postnet with B and B[1] Fields On	POSTAL19	
	Planet and Postnet On	POSTAL12	
	Planet and Postnet with B and B[1] Fields On	POSTAL18	
	Planet and Postal-4i On	POSTAL13	
	Planet and Intelligent Mail Bar Code On	POSTAL15	
	Planet, Postnet, and Postal-4i On	POSTAL21	
	Planet, Postnet, and Intelligent Mail Bar Code On	POSTAL22	
	Planet, Postal-4i, and Intelligent Mail Bar Code On	POSTAL23	

	Postnet, Postal-4i and Intelligent Mail Bar Code On	POSTAL24	
	Planet, Postal-4i and Postnet with B and B^1 Fields On	POSTAL25	
	Planet, Intelligent Mail Bar Code and Postnet with B and B^1 Fields On	POSTAL26	
	Postal-4i, Intelligent Mail Bar Code and Postnet with B and B^1 Fields On	POSTAL27	
	Planet, Postal-4i, Intelligent Mail Bar Code and Postnet On	POSTAL28	
	Planet, Postal-4i, Intelligent Mail Bar Code and Postnet with B and B^1 Fields On	POSTAL29	
Planet Code Check Digit	Transmit	PLNCKX1	
	*Don't Transmit	PLNCKX0	
Postnet Check Digit	Transmit	NETCKX1	
	*Don't Transmit	NETCKX0	
Australian Post Interpretation	Bar Output	AUSINT0	
	Numeric N Table	AUSINT1	
	Alphanumeric C Table	AUSINT2	
	Combination N and C Tables	AUSINT3	
Postal Codes – Linear			
China Post (Hong Kong 2 of 5)	Default All China Post (Hong Kong 2 of 5) Settings	CPCDFT	
	*Off	CPCENA0	
	On	CPCENA1	
China Post (Hong Kong 2 of 5) Msg. Length	Minimum (2-80) *4	CPCMIN##	
	Maximum (2-80)*80	CPCMAX##	
China Post Redundancy	Range (0-10)*0	CPCVOT##	
Korea Post	Default All Korea Post Settings	KPCDFT	
	*Off	KPCENA0	
	On	KPCENA1	
Korea Post Msg. Length	Minimum (2-80) *4	KPCMIN##	
	Maximum (2-80)*48	KPCMAX##	

Korea Post Check Digit	Transmit Check Digit	KPCCHK1	
	*Don't Transmit Check Digit	KPCCHK0	
Data Formatting Commmands			
Data format default	Factory default data format	DFMDF3	Restore factory default data format
Imaging Default Commands			
Image Snap	Default all Imaging Commands	IMGDFT	See overview in this guide on imaging commands.
	Imaging Style- Decoding	SNPSTY0	Processing until exposure parameters are met, last frame then available for use.
	*Imaging Style- Photo	SNPSTY1	Mimics digital camera, a visually optimized image is taken.
	Imaging Style- Manual	SNPSTY2	Expert mode not auto-exposure.
	Beeper On	SNPBEP1	Causes a beep after an image is snapped.
	*Beeper Off	SNPBEP0	
	*Wait for Trigger Off	SNPTRG0	Waits for hardware button press to take image only
	Wait for Trigger On	SNPTRG1	
	*LED State- Off	SNPLED0	
	LED State- On	SNPLED1	
	Exposure (1-7874 microseconds)	SNPEXP	
	*Gain – None	SNPGAN1	
	Gain – Medium	SNPGAN2	
	Gain – Heavy	SNPGAN4	
	Gain – Maximum	SNPGAN8	

	Target White Value (0-255)*125	SNPWHT###	
	Delta for Acceptance (0-255)*25	SNPDEL###	
	Update Tries (0-10)*6	SNPTRY##	
	Target Set Point Percentage (1-99)*50	SNPPCT##	
Image Ship	*Infinity Filter – Off	IMGINF0	
	Infinity Filter – On	IMGINF1	
	*Compensation Off	IMGCOR0	
	Compensation On	IMGCOR1	
	*Pixel Depth – 8 bits/pixel (greyscale)	IMGBPP8	
	Pixel Depth – 1 bit/pixel (B&W)	IMGBPP1	
	*Don't Sharpen Edges	IMGEDG0	
	Sharpen Edges (0-23)	IMGEDG##	
	*File Format – JPEG	IMGFMT6	
	File Format – KIM	IMGFMT0	
	File Format – TIFF binary	IMGFMT1	
	File Format – TIFF binary group 4, compressed	IMGFMT2	
	File Format – TIFF grayscale	IMGFMT3	
	File Format – Uncompressed binary	IMGFMT4	
	File Format – Uncompressed greyscale	IMGFMT5	
	File Format – BMP	IMGFMT8	
	*Histogram Stretch Off	IMGHIS0	
	Histogram Stretch On	IMGHIS1	
	*Noise Reduction Off	IMGFSP0	
	Noise Reduction On	IMGFSP1	
	Invert Image around X axis	IMGNVX1	
	Invert Image around Y axis	IMGNVY1	
	Rotate Image none	IMGROT0	
	Rotate Image 90° right	IMGROT1	
	Rotate Image 180° right	IMGROT2	

	Rotate Image 90° left	IMGROT3	
	JPEG Image Quality (0-100)*50	IMGJQF###	
	*Gamma Correction Off	IMGGAM0	
	Gamma Correction On (0-1000)	IMGGAM###	
	Image Crop – Left (0-640)*0	IMGWNL###	Defaults may vary due to engine resolution
	Image Crop – Right (0-640)*639	IMGWNR###	Defaults may vary due to engine resolution
	Image Crop – Top (0-480)*0	IMGWNT###	Defaults may vary due to engine resolution
	Image Crop – Bottom (0-480)*479	IMGWNB###	Defaults may vary due to engine resolution
	Image Crop – Margin (1-238)*0	IMGMAR###	Defaults may vary due to engine resolution
	Protocol – None (raw)	IMGXFR0	
	Protocol – None (default USB)	IMGXFR2	
	Protocol – HModem Compressed	IMGXFR3	
	Protocol – HModem	IMGXFR4	
	Ship Every Pixel	IMGSUB1	
	Ship Every 2nd Pixel	IMGSUB2	
	Ship Every 3rd Pixel	IMGSUB3	
	*Document Image Filter Off	IMGUSH0	
	Document Image Filter On (0-255)	IMGUSH###	
	*Don't Ship Histogram	IMGHST0	
	Ship Histogram	IMGHST1	
Image Size Compatibility	Force VGA Resolution	IMGVGA1	
	*Native Resolution IMGVGA0	IMGVGA0	
Intelligent Signature Capture	Optimize On	DECBND1	
	*Optimize Off	DECBND0	
Utilities			

Add Code ID Prefix to All Symbologies (Temporary)		PRECA2,BL2995C80!	
Show Decoder Revision		REV_DR	
Show Scan Driver Revision		REV_SD	
Show Software Revision		REVINF	
Show Data Format		DFMBK3?	
Test Menu	On	TSTMNU1	
	*Off	TSTMNU0	
Application Plug-Ins (Apps)	*Decoding Apps On	PLGDCE1	
	Decoding Apps Off	PLGDCE0	
	*Formatting Apps On	PLGFOE1	
	Formatting Apps Off	PLGFOE0	
	List Apps	PLGINF	
Resetting the Factory Defaults	Remove Custom Defaults	DEFOVR	
	Activate Defaults	DEFALT	

Appendix A

Symbology Chart

Symbology	**ID**	**Possible Modifiers (m)**	**ID**	**Hex**
All Symbologies				99
Codabar	]Fm	0-1	a	61
Code 11	]H3		h	68
Code 128	]C*m*	0,1,2,4	j	6A
Code 32 Pharmaceutical (PARAF)	]X0		<	3C
Code 39 (supports Full ASCII mode)	]A*m*	0,1,3,4,5,7	B	62
TCIF Linked Code 39 (TLC39)	]L2		T	54
Code 93 and 93i	]G*m*	0-9, A-Z,a-m	i	69
EAN	]E*m*	0,1,3,4	d	64
EAN-13 (including Bookland EAN)	]E0		d	64

EAN-13 with Add-On	]E3		d	64
EAN-13 with Extended Coupon Code	]E3		d	64
EAN-8	]E4		D	44

Symbology	**ID**	**Possible modifiers (m)**	**ID**	**Hex**
EAN-8 with Add-On	]E3		D	44
GS1				
GS1 DataBar	]*em*	0	y	79
GS1 DataBar Limited	]*em*		{	7B
GS1 DataBar Expanded	]*em*		}	4D
GS1-128	]C1		I	49
2-5				
China Post (Hong Kong 2 of 5)	]X0		Q	51
Interleaved 2 of 5	]I*m*	0,1,3	e	65
Matrix 2 of 5	]X0		m	6D
NEC 2 of 5	]X0		Y	59
Straight 2 of 5 IATA	]R*m*	0,1,3	f	66
Straight 2 of 5 Industrial	]S0		f	66
MSI	]M*m*	0,1	g	67
Telepen	]B*m*		t	74
UPC		0,1,2,3,8,9,A,B,C		
UPC-A	]E0		c	63
UPC-A with Add-On	]E3		c	63
UPC-A with Extended Coupon Code	]E3		c	63
UPC-E	]E0		E	45
UPC-E with Add-On	]E3		E	45
UPC-E1	]X0		E	45

Add Code ID				5C80
Add AIM Code ID				5C81
Add Backslash				5C5C
Batch mode quantity			5	35

Symbology	**AIM ID**	**Possible modifiers**	**CODE ID**	**Hex**

		(m)		
All Symbologies				99
Aztec Code	]z*m*	0-9,A-C	z	7A
Chinese Sensible Code (Han Xin Code)	]X0		H	48
Codablock A	]O6	0,1,4,5,6	V	56
Codablock F	]O*m*	0,1,4,5,6	q	71
Code 49	]T*m*	0,1,2,4	l	6C
Data Matrix	]*dm*	0-6	w	77
GS1	]*em*	0-3	y	79
GS1 Composite	]*em*	0-3	y	79
GS1 DataBar Omnidirectional	]*em*		y	79
MaxiCode	]U*m*	0-3	x	78
PDF417	]L*m*	0-2	r	72
MicroPDF417	]L*m*	0-5	R	52
QR Code	]Q*m*	0-6	s	73
Micro QR Code	]Q*m*		s	73

Symbology	**ID**	**Possible modifiers (m)**	**ID**	**Hex**
All Symbologies				99
Australian Post	]X0		A	41
British Post	]X0		B	42
Canadian Post	]X0		C	43
China Post	]X0		Q	51
InfoMail	]X0		,	2c
Intelligent Mail Bar Code	]X0		M	4D
Japanese Post	]X0		J	4A
KIX (Netherlands) Post	]X0		K	4B
Korea Post	]X0		?	3F
Planet Code	]X0		L	4C
Postal-4i	]X0		N	4E
Postnet	]X0		P	50

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