Symbol Palm Terminals

Scanner System Software Manual

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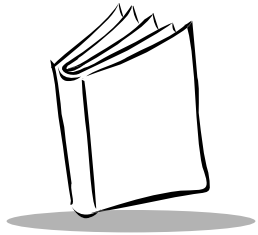

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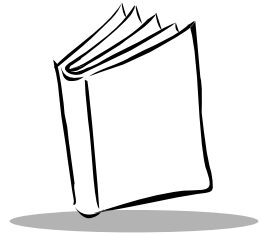


About This Guide

The *Symbol Palm Terminal Scanner System Software Manual* is part of the Scan Manager software development kit (SDK). You can use the SDK to create scan-aware applications for the Symbol Palm Terminal that scan and decode various types of barcodes.

This chapter provides an overview of the *Symbol Palm Terminal Scanner System Software Manual* and provides a list of the appropriate reference documents and conventions. This guide is for developers who want to create scan-aware applications for the terminal. The guide assumes that you are familiar with the CodeWarrior development environment.

Scan Manager Library API SDK Documentation

The *Symbol Palm Terminal Scanner System Software Manual* provides you with:

- A description of how to use the Scan Manager library
- Explanations of the Application Program Interface (API) function calls
- A description of a sample Scan Manager application

What This Guide Contains

This section provides a description of the chapters in this guide.

Chapter 1 Using the Scan Manager Shared Library—A high-level overview of the code that creates a typical scanning application, and a description of a simple scanning application that lists the function calls that should be included in a typical scanning application.

Chapter 2 Scanner Commands—A list of the commands that operate the scanner.

Chapter 3 Barcode Parameter Functions—A list of the parameter functions that set the scan parameters associated with specific types of barcodes.

Chapter 4 Hardware Parameter Functions—A list of the parameter functions that set the parameters associated with the scanning hardware.

Chapter 5 Power Considerations—A description of how Scan Manager functions affect the levels of power available to the scanner hardware.

Chapter 6 Sample Scanning Application—A demo application included with the Scan Manager SDK that exercises nearly all of the API.

Chapter 7 2-Dimensional Scanning Considerations—A description of issues to be considered when developing applications for use in the 2-D scanning model of the SPT 1700 series terminal

Appendix A ASCII Equivalents—A list of the scan value, hex value, full ASCII code, and keystrokes for each barcode.

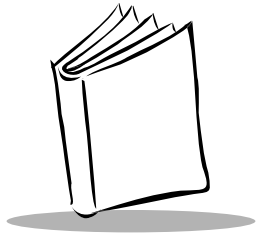
Appendix B Parameter Definitions—A list of the parameters available to developers, and the parameter default values.

Conventions Used in this Guide

This guide uses the following typographical conventions:

This style	Is used for . . .
`Fixed width font`	Code elements such as functions, structures, fields, and bitfields
`->`	Input
Blue	Hotlinks

This style	Is used for . . .
Italics	Emphasis (for other elements)



Chapter 1
Using the Scan Manager Shared Library

Using the API

The Scan Manager software development kit (SDK) is used by third-party developers to create scanner-enabled applications for the terminal. The Scan Manager shared library API allow terminal applications to control and receive data from the scanner hardware.

A typical application uses the Scan Manager shared library to do the following, in the order listed below:

1. Open the scanner.
2. Enable the scanner to initiate scans through either the hardware or the application.
3. Handle any decoded data or error messages received from the decoder.
4. Shut down the scanner.

Refer to Chapter 6 for a detailed walk-through of SScan, a sample scanner-enabled application.

The following snippets of code are a simple construct of a typical third-party application:

```
#include "Pilot.h"      // all the system toolbox headers
#include <Menu.h>
...
...
#include "ScanMgrDef.h" // Scan Manager constant definitions
#include "ScanMgrStruct.h"    // Scan Manager structure definitions
```

```
#include "ScanMgr.h"    // Scan Manager API function definitions
...
#include "SScanRsc.h"         // application resource defines
#include "Utils.h"      // miscellaneous utility functions

DWord PilotMain(Word cmd, Ptr cmdPBP, Word launchFlags)
{
      // Check for a normal launch.
      if (cmd == sysAppLaunchCmdNormalLaunch)
      {
            Err error = STATUS_OK;

            // Set up Scan Manager and the initial (Main) form.
            StartApplication();

            // Start up the event loop.
            EventLoop();

            // Close down Scan Manager, decoder
            StopApplication();
      }

      return(0);
}
```

```
/*****************************************************************
 *
 * FUNCTION:     StartApplication
 *
 * DESCRIPTION:  This routine sets up the initial state of the

 *               application.
 *
*****************************************************************/
static void StartApplication(void)
{
      Err error;

      // Call up the main form.
      FrmGotoForm( MainForm );

      // Now, open the scan manager library
      error = ScanOpenDecoder();

      // Set decoder parameters we care about...
      // enable scanning
      ScanCmdScanEnable();
      // allow software-triggered scans
      ScanSetTriggeringModes( HOST );
      // Enable any barcodes to be scanned
      ScanSetBarcodeEnabled( barUPCA, true );
      ScanSetBarcodeEnabled( barUPCE, true );
```

```
      ScanSetBarcodeEnabled( barUPCE1, true );
      ScanSetBarcodeEnabled( barEAN13, true );
      ScanSetBarcodeEnabled( barEAN8, true );
      ScanSetBarcodeEnabled( barBOOKLAND_EAN, true);
      ScanSetBarcodeEnabled( barCOUPON, true);

      // We've set our parameters...
      // Now call "ScanCmdSendParams" to send them to the decoder
      ScanCmdSendParams( No_Beep);
}

/*****************************************************************
 *
 * FUNCTION:     StopApplication
 *
 * DESCRIPTION:  This routine does any cleanup required, including
 *               shutting down the decoder and Scan Manager shared
 *               library.
 *

*****************************************************************/
static void StopApplication(void)
{
      // Disable the scanner and Close Scan Manager shared library
      ScanCmdScanDisable();
      ScanCloseDecoder();
}
```

To start the scanner:

1. Call the **`ScanOpenDecoder()`** function to open the Scan Manager shared library, and to initialize the scanner. You *must* call this function first, before any other function in the shared library can be called.
2. Use the appropriate Scan Manager functions to set any of the other scanner parameters, such as barcode formats. The specified parameters are *only set locally.* To send the new parameters to the scanner, you *must* call **`ScanCmdSendParams()`**. The new parameters remain in effect until you or another application changes them, or **`ScanCmdParamDefaults()`** is called.
3. Call the **`ScanCmdScanEnable()`** function to allow scanning to be performed.

To set the scan trigger:

Call the **`ScanSetTriggeringModes()`** function to identify the type of trigger that will initiate scans. The typical application passes this function to the **`LEVEL`** parameter.

To handle scanner data and errors:

1. In your event handling code, respond to any **`scanDecodeEvent`** by storing or displaying the decoded data.
2. Respond to error conditions (such as **`scanBatteryErrorEvent`**) by alerting the user or performing appropriate recovery routines.

To shut down the scanner:

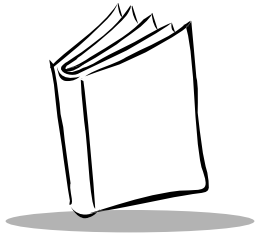
1. Call the **`ScanCmdScanDisable()`** function to shut down the scanner.
2. Call the **`ScanCloseDecoder()`** function at the conclusion of the program. If you don't, you'll get system errors and unexpected results.

Using the Scan Demo Application

Scan Demo is a demo application included with the Scan Manager shared library. Scan Demo exercises nearly all of the API, and shows you how to:

- Use the API to set and get scanner parameters
- Handle decoded scanner data
- Handle scan errors and a low-battery condition

This demo application also allows you to use the terminal's graphical interface to display and change scanner settings. Refer to the Scan Manager library for the location of Scan Demo.



Chapter 2
Scanner Commands

Introduction

The Scan Manager API in this section give you commands to manipulate the scanner. Using these commands, an application should perform the following functions:

- Enable or disable scanning
- Start a decode
- Turn the LED on or off
- Sound any of the defined beep patterns
- Set the scanner into “aim” (laser-pointer) mode
- Get version information for the various terminal software components

Returned Status Definitions

The scanner commands in this chapter may return one of the status codes described in Table 2-1.

Table 2-1. Returned Status Codes

STATUS CODE	DEFINITION
Any non-negative value (0 to 32767)	Parameter value.
STATUS_OK	The function's parameters were verified. If a function must wait for an ACK from the scanner, STATUS_OK indicates that the ACK was received.
NOT_SUPPORTED	The last packet received from the scanner generated either a NAK_DENIED or NAK_BAD_CONTEXT status. This usually indicates that the specified parameter is not supported by this scanner, or the scanner was unable to comply with the request.
COMMUNICATIONS_ERROR	Either a timeout condition or the maximum number of retries (or both) occurred. The previous transmit message was not verified through an ACK, and therefore, is questionable.
BAD_PARAM	One or more of the function call parameters supplied by the user was not in the expected range.
BATCH_ERROR	The limits of a batch function have been exceeded. Unless otherwise indicated, functions that start with **`ScanSet`** are responsible for generating a batch command to establish scanner parameters. The parameters are not sent to the scanner until the **`ScanCmdSendParams()`** function is called, at which time a new batch is started.
ERROR_UNDEFINED	An error condition exists that is not specifically associated with the scanner or its communications.

Scanner Commands

Table 2-2 lists the scanner commands described in this chapter.

Table 2-2. Scanner Commands

FUNCTION	PAGE
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ScanCloseDecoder

Purpose Closes the Scan Manager shared library and frees up system resources.

Prototype

```
int ScanCloseDecoder (
                    void);
```

Returned Status

Zero=**No errors closing shared library**
Non-zero=**Error closing shared library**

Comments Must be called by all applications that call the **ScanOpenDecoder** function. Failure to do so will cause system errors and unpredictable results.

See Also **ScanOpenDecoder**

ScanCmdAimOff

Purpose Takes the scanner out of the “aim” mode (also known as “laser pointer” mode).

Note: SPT 170x0-2D does not support aim mode.

Prototype

```
int ScanCmdAimOff (
                    void);
```

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

COMMUNICATIONS_ERROR

NOT_SUPPORTED

See Also **ScanCmdAimOn**

ScanCmdAimOn

Purpose Places the scanner into its “aim” mode (also known as “laser pointer” mode).

Note: SPT 170x0-2D does not support aim mode.

Prototype

```
int ScanCmdAimOn (
                  void);
```

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

COMMUNICATIONS_ERROR

NOT_SUPPORTED

Comments This function call only tells the scanner that you want to use the scanner laser for aiming, not decoding. To execute the aim, the user must press the scanner’s trigger, or a **`ScanCmdStartDecode`** command must be sent.

See Also **`ScanCmdAimOff`**

ScanCmdBeep

Purpose Executes the specified beep sequence.

Prototype

```
int ScanCmdBeep (
                    BeepType beep);
```

Parameters

-> **beep** Must be one of the following values:

ONE_SHORT_HIGH
TWO_SHORT_HIGH
THREE_SHORT_HIGH
FOUR_SHORT_HIGH
FIVE_SHORT_HIGH

ONE_SHORT_LOW
TWO_SHORT_LOW
THREE_SHORT_LOW
FOUR_SHORT_LOW
FIVE_SHORT_LOW

ONE_LONG_HIGH
TWO_LONG_HIGH
THREE_LONG_HIGH
FOUR_LONG_HIGH
FIVE_LONG_HIGH

ONE_LONG_LOW
TWO_LONG_LOW
THREE_LONG_LOW
FOUR_LONG_LOW
FIVE_LONG_LOW

FAST_WARBLE
SLOW_WARBLE

MIX1
MIX2
MIX3
MIX4

```
DECODE_BEEP
BOOTUP_BEEP
PARAMETER_DEFAULTS_
   BEEP
```

Returned Status

STATUS_OK

If an error occurs, the returned status is the following:

BAD_PARAM

COMMUNICATIONS_ERROR

NOT_SUPPORTED

ScanCmdGetAllParams

Purpose Retrieves the current parameters from the scanner.

Prototype

```
int ScanCmdGetAllParams(
                unsigned char *ptr,
                int maxlength);
```

Parameters

-> **ptr[]**	Array where the scanner's parameter information is deposited.
-> **maxlength**	Maximum size (in bytes) of the parameter values stored in the **ptr[]** array.

Returned Status Number of bytes copied into **ptr[]**.

If an error occurs, the returned status is one of the following:

COMMUNICATION_ERROR

NOT_SUPPORTED

Comments The location of the array where the parameters are stored begins with **ptr[0]**. The parameters are returned as data pairs consisting of **(parameter_number** and **parameter_value)**. You must parse through the data pairs and associate each **parameter_number** with a specific scanner capability. If the number of bytes you specify in **maxlength** is less than the number of scanner parameters retrieved, the remaining parameters are lost. To make sure you retrieve all of the parameters, set **Ptr** to at least 256 bytes.

As you use **ScanSet** commands to set the decoder's parameters, the new parameters will not be reflected in the **ptr[]** array. You must update your own parameter storage when you change parameters.

ScanCmdLedOff

Purpose Immediately turns off the scanner's green LED.

Prototype

```
int ScanCmdLedOff (
                    void);
```

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

COMMUNICATIONS_ERROR

NOT_SUPPORTED

See Also **ScanCmdLedOn**

ScanCmdLedOn

Purpose Immediately turns on the scanner's green LED.

Prototype

```
int ScanCmdLedOn (
                  void);
```

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

COMMUNICATIONS_ERROR

NOT_SUPPORTED

Comments The LED stays on until the **ScanCmdLedOff** command is sent.

See Also **ScanCmdLedOff**

ScanCmdParamDefaults

Purpose Sets all parameters to the factory-installed defaults.

Prototype

```
int ScanCmdParamDefaults (
                    void);
```

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

COMMUNICATIONS_ERROR

NOT_SUPPORTED

ScanCmdScanDisable

Purpose Prevents the scanner from activating the laser when the trigger is pressed or a **ScanCmdStartDecode** command is received.

Prototype

```
int ScanCmdScanDisable (
                    void);
```

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

COMMUNICATIONS_ERROR

NOT_SUPPORTED

See Also **ScanCmdScanEnable**

ScanCmdScanEnable

Purpose Permits the scanner to activate the laser when the trigger is pressed or a **ScanCmdStartDecode** command is received.

Prototype

```
int ScanCmdScanEnable (
                    void);
```

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

COMMUNICATIONS_ERROR

NOT_SUPPORTED

See Also **ScanCmdScanDisable**

ScanCmdSendParams

Purpose Sends to the scanner any parameters changed by your application. Also can initiate a beep when the parameters have been successfully changed.

Prototype

```
int ScanCmdSendParams(
                    BeepType beep);
```

Parameters

-> **beep**	Set this parameter to one of the BeepType values listed in the ScanMgrDef.h header file. If you do not want a beep, send the NO_BEEP parameter.

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

COMMUNICATIONS_ERROR

NOT_SUPPORTED

Comments This function transmits the scanner parameter values set by other functions. If you do not call **ScanCmdSendParams** after you have called all of your "set" functions, the settings will not take effect.

The values you set are permanent and will persist until either the terminal is reset or until you perform a **ScanCmdParamDefaults** command.

The **beep** parameter is the sound the beeper should make when the parameters have been successfully changed.

ScanCmdStartDecode

Purpose Instructs the scanner to turn on the laser and begin decoding a barcode.

Prototype

```
int ScanCmdStartDecode (
                    void);
```

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

COMMUNICATIONS_ERROR

NOT_SUPPORTED

Comments This command only initiates a scanning session if the trigger mode is set to Host (see **ScanSetTriggeringModes**). If the scanner was previously set to aim mode by the **ScanCmdAimOn** command, this command initiates a laser pointer operation. The laser remains on for the value set in **ScanSetLaserOnTime** x 10.

See Also **ScanCmdStopDecode**

ScanCmdStopDecode

Purpose Instructs the scanner to abort a decode attempt.

Prototype

```
int ScanCmdStopDecode (
                    void);
```

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

COMMUNICATIONS_ERROR

NOT_SUPPORTED

See Also **ScanCmdStartDecode**

ScanGetAimMode

Purpose Identifies whether the scanner is in “normal mode” or “aim” mode (for use as a laser pointer).

Note: SPT 170x0-2D does not support aim mode.

Prototype

```
int ScanGetAimMode (
                    void);
```

Returned Status

Zero=**normal mode**
Non-zero=**Aim mode**

See Also **ScanCmdAimOn**
ScanCmdAimOff

ScanGetDecodedData

Purpose Retrieves the decoded data from the last scan. Also fills in the **DECODE_DATA_STRUCT** structure with barcode type, length, and checksum information.

Prototype

```
int ScanGetDecodedData (
                    MESSAGE *ptr);
```

Parameters

-> **ptr**	A pointer to the user-allocated **DECODE_DATA_STRUCT** where the decoded data is to be placed.
-> **ptr->length**	Number of characters in the decoded data string.
-> **ptr->data**	Contains the decoded data.
-> **ptr->data**	Start of the packet.
[ptr->length]	Checksum.
-> **ptr->type**	The type of barcode that was decoded:

BCTYPE_NOT_APPLICABLE
BCTYPE_BOOKLAND_EAN
BCTYPE_COUPON_CODE
BCTYPE_CODABAR
BCTYPE_CODE32
BCTYPE_CODE39
BCTYPE_CODE39_FULL_ASCII
BCTYPE_CODE93
BCTYPE_CODE128
BCTYPE_D2OF5
BCTYPE_EAN8
BCTYPE_EAN8_2_SUPPLEMENTALS
BCTYPE_EAN8_5_SUPPLEMENTALS

BCTYPE_EAN13_5
SUPPLEMENTALS
BCTYPE_EAN13
BCTYPE_EAN13_2
SUPPLEMENTALS
BCTYPE_EAN128
BCTYPE_I2OF5
BCTYPE_IATA2OF5
BCTYPE_ISBT128
BCTYPE_MSI_PLESSEY
BCTYPE_TRIOPTIC_
CODE39
BCTYPE_UPCA
BCTYPE_UPCA_2
SUPPLEMENTALS
BCTYPE_UPCA_5
SUPPLEMENTALS
BCTYPE_UPCE0
BCTYPE_UPCE0_2
SUPPLEMENTALS
BCTYPE_UPCE0_5
SUPPLEMENTALS
BCTYPE_UPCE1
BCTYPE_UPCE1_2
SUPPLEMENTALS
BCTYPE_UPCE1_5
SUPPLEMENTALS
BCTYPE_PDF417

Returned Status

STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

COMMUNICATIONS_ERROR

NOT_SUPPORTED

Comments

Typically, an application calls this function in response to an **EVENT_DECODE_DATA** type of event.

See Also ScanGetExtendedDecodedData

ScanGetExtendedDecodedData

Purpose Retrieves the decoded data larger than 255 bytes (multipacket data) from the last scan.

Prototype

```
int ScanGetExtendedDecodedData (int length, int
                *type. unsigned char
                *extendedData);
```

Parameters

length	passed to the function by the application, and is the size of the buffer pointed to by *buf.
extendedData	pointer to the buffer to place the decoded data.
type	pointer to an int, and will contain the bar code type after the API is successfully called.

Returned Status Status_OK
If an error occurs, the returned status is one of the following:
BAD_PARAM
COMMUNICATIONS_ERROR
NOT_SUPPORTED

Comments Typically, an application calls this function in response to an EVENT_DECODE_DATA type of event and when extended data flag is set to indicate that extended data has been decoded. The length of the data is also sent out from the scanner manager to the application. Note that scan angle selection is not supported and ScanCmdAimOn is not supported.

SeeAlso ScanGetDecodedData

ScanGetDecoderVersion

Purpose Retrieves the ASCII revision string of the scanner's decode software. Also copies the string to a user-specified location.

Prototype

```
int ScanGetDecoderVersion (
                CharPtr ptr,
                Word max_length);
```

Parameters

-> **ptr**	A pointer to a user-allocated char array. This function places the revision into the array, null terminated.
-> **max_length**	Maximum number of characters to be copied to **ptr[]**.

Returned Status Length of the revision string.

If an error occurs, the returned status is one of the following:

BAD_PARAM
COMMUNICATIONS_ERROR
NOT_SUPPORTED

Comments The application should call this function after receiving a **REVISION_REPLY_EVENT**.

ScanGetLedState

Purpose Indicates whether the green LED is currently on or off.

Prototype

```
int ScanGetLedState (
                    void);
```

Returned Status

Zero=**OFF**
Non-zero=**ON**

See Also ScanCmdLedOff
ScanCmdLedOn

ScanGetScanEnabled

Purpose Indicates whether the scanner is currently enabled.

Prototype

```
int ScanGetScanEnabled (
                    void);
```

Returned Status Zero=**DISABLED**
Non-zero=**ENABLED**

See Also **ScanCmdScanEnable**
ScanCmdScanDisable

ScanGetScanManagerVersion

Purpose Copies the ASCII version string for the Scan Manager software into a user-specified location.

Prototype

```
int ScanGetScanManagerVersion (
                CharPtr ptr,
                Word max_length);
```

Parameters

-> **ptr**	A pointer to a user-allocated char array. This function places the version into the array, null terminated.
-> **max_length**	Maximum number of characters to be copied to **ptr[]**.

Returned Status Length of the revision string.

If an error occurs, the returned status is the following:

NOT_SUPPORTED

See Also **ScanGetScanPortDriverVersion**

ScanGetScanPortDriverVersion

Purpose Copies the ASCII version string for the scan port driver software into a user-specified location.

Prototype

```
int ScanGetScanPortDriverVersion (
                    CharPtr ptr,
                    Word max_length);
```

Parameters

-> **ptr**	A pointer to a user-allocated char array. This function places the version into the array, null terminated.
-> **max_length**	Maximum number of characters to be copied to **ptr[]**.

Returned Status Length of the revision string.

If an error occurs, the returned status is the following:

NOT_SUPPORTED

See Also **ScanGetScanManagerVersion**

ScanOpenDecoder

Purpose Loads and initializes the Scan Manager shared library, and initializes the scanner.

Prototype

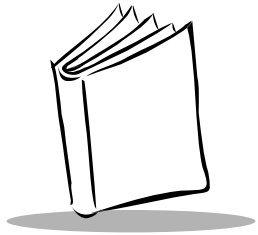
```
int ScanOpenDecoder (
                    void);
```

Returned Status DECODER_ALREADY_OPEN—The function was previously called without a corresponding call to the **ScanCloseDecoder** function.

STATUS_OK

Comments Must be called by all applications before any of the other functions in the Scan Manager shared library can be used. Also include a call to the **ScanCloseDecoder** function.

See Also **ScanCloseDecoder**



Chapter 3
Barcode Parameter Functions

Introduction

The Scan Manager functions described in this chapter give you the ability to control how the scanner handles various types of barcodes. These functions allow your application to control the following types of settings:

- Which specific barcode types will be decoded
- Which specific barcode lengths will be decoded
- Which conversions will be performed on the decoded data
- Whether to decode Universal Product Code (UPC) preamble and supplemental data
- How many times a barcode is to be scanned to ensure an accurate decode (redundancy)

The Scan Manager software places events into your application's event queue to notify you of pertinent scanner events. The following scanner events, at a minimum, should be handled by your application:

- Decode Event
- Scanning Error

Returned Status Definitions

The function calls listed in this chapter may return one of the status codes described in Table 3-1.

Table 3-1. Returned Status Codes

STATUS CODE	DEFINITION
Any non-negative value (0 to 32767)	Parameter value.
STATUS_OK	The function's parameters were verified. If a function must wait for an ACK from the scanner, STATUS_OK indicates that the ACK was received.
NOT_SUPPORTED	The last packet received from the scanner generated either a NAK_DENIED or NAK_BAD_CONTEXT status. This usually indicates that the specified parameter is not supported by this scanner, or the scanner was unable to comply with the request.
COMMUNICATIONS_ERROR	Either a timeout condition or the maximum number of retries (or both) occurred. The previous transmit message was not verified through an ACK, and therefore, is questionable.
BAD_PARAM	One or more of the function call parameters supplied by the user was not in the expected range.
BATCH_ERROR	The limits of a batch function have been exceeded. Unless otherwise indicated, functions that start with **`ScanSet`** are responsible for generating a batch command to establish scanner parameters. The parameters are not sent to the scanner until the **`ScanCmdSendParams()`** function is called, at which time a new batch is started.
ERROR_UNDEFINED	An error condition exists that is not specifically associated with the scanner or its communications.

Barcode Types

Table 3-2 lists the barcode types that can be enabled by the parameter functions in this chapter.

Table 3-2. Barcode Types

BARCODE TYPE	PAGE
Codabar Barcode Parameter Functions	3-4
Code 32 Barcode Parameter Functions	3-9
Code 39 Barcode Parameter Functions	3-12
General Barcode Parameter Functions	3-17
I 2 of 5 Barcode Parameter Functions	3-30
MSI Plessey Barcode Parameter Functions	3-33
UPC/EAN Barcode Parameter Functions	3-38

The actual parameter functions for each barcode type are listed in the appropriate section.

Codabar Barcode Parameter Functions

Table 3-3 lists the Codabar barcode parameter functions described in this section.

Table 3-3. Codabar Barcode Parameter Functions

PARAMETER FUNCTION	PAGE
ScanGetClsiEditing	3-5
ScanGetNotisEditing	3-6
ScanSetClsiEditing	3-7
ScanSetNotisEditing	3-8

ScanGetClsiEditing

Purpose Identifies whether the start and stop characters are being stripped from a 14-character Codabar symbol, and a space is being inserted after the first, fifth, and tenth characters.

Prototype

```
int ScanGetClsiEditing (
                    void);
```

Returned Status

Zero=**DISABLE**

>zero=**ENABLE**

If an error occurs, the returned status is one of the following:

COMMUNICATIONS_ERROR

NOT_SUPPORTED

See Also **ScanSetClsiEditing**

ScanGetNotisEditing

Purpose Identifies whether the start and stop characters are being stripped from a 14-character Codabar symbol.

Prototype

```
int ScanGetNotisEditing (
                    void);
```

Returned Status Zero=**DISABLE**

>zero=**ENABLE**

If an error occurs, the returned status is one of the following:

COMMUNICATIONS_ERROR

NOT_SUPPORTED

See Also **ScanSetNotisEditing**

ScanSetClsiEditing

Purpose When enabled, strips the start and stop characters from a 14-character Codabar symbol, and inserts a space after the first, fifth, and tenth characters.

Prototype

```
int ScanSetClsiEditing (
                    Boolean bEnable);
```

Parameters

-> **bEnable**	Must be one of the following values: True=**ENABLE** False=**DISABLE**

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

BATCH_ERROR

See Also **ScanGetClsiEditing**

ScanSetNotisEditing

Purpose When enabled, strips the start and stop characters from a 14-character Codabar symbol.

Prototype

```
int ScanSetNotisEditing (
                    Boolean bEnable);
```

Parameters

-> **bEnable**	Must be one of the following values: True=**ENABLE** False=**DISABLE**

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

BATCH_ERROR

See Also **ScanGetNotisEditing**

Code 32 Barcode Parameter Functions

Table 3-4 lists the Code 32 barcode parameter functions described in this section.

Table 3-4. Code 32 Barcode Parameter Functions

PARAMETER FUNCTION	PAGE
ScanGetCode32Prefix	3-10
ScanSetCode32Prefix	3-11

ScanGetCode32Prefix

Purpose Identifies whether the character 'A' is being appended to the beginning of decode data that is in Code 32 format.

Prototype

```
int ScanGetCode32Prefix (
                    void);
```

Returned Status Zero=**DISABLE**

>zero=**ENABLE**

If an error occurs, the returned status is one of the following:

COMMUNICATIONS_ERROR

NOT_SUPPORTED

See Also **ScanSetCode32Prefix**

ScanSetCode32Prefix

Purpose Determines whether the character "A" is to be appended to the beginning of decode data that is in Code 32 format.

Prototype

```
int ScanSetCode32Prefix (
                    Boolean bEnable);
```

Parameters

-> **bEnable**	Must be one of the following values: True=**ENABLE** False=**DISABLE**

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

BATCH_ERROR

See Also **ScanGetCode32Prefix**

Code 39 Barcode Parameter Functions

Table 3-5 lists the Code 39 barcode parameter functions described in this section.

Table 3-5. Code 39 Barcode Parameter Functions

PARAMETER FUNCTION	PAGE
ScanGetCode39CheckDigitVerification	3-13
ScanGetCode39FullAscii	3-14
ScanSetCode39CheckDigitVerification	3-15
ScanSetCode39FullAscii	3-16

ScanGetCode39CheckDigitVerification

Purpose Identifies whether a Code 39 symbol is complying with specified algorithms.

Prototype

```
int ScanGetCode39CheckDigitVerification (
                    void);
```

Returned Status

ENABLE

DISABLE

If an error occurs, the returned status is one of the following:

COMMUNICATIONS_ERROR

NOT_SUPPORTED

See Also **ScanSetCode39CheckDigitVerification**

ScanGetCode39FullAscii

Purpose Identifies whether an ASCII character code is being assigned to letters, punctuation marks, numerals, and most keyboard control keystrokes.

Prototype

```
int ScanGetCode39FullAscii (
                    void);
```

Returned Status `Zero=`**`DISABLE`**

`>``zero=`**`ENABLE`**

If an error occurs, the returned status is one of the following:

COMMUNICATIONS_ERROR

NOT_SUPPORTED

See Also **`ScanSetCode39FullAscii`**

ScanSetCode39CheckDigitVerification

Purpose Determines whether a Code 39 symbol is to comply with specified algorithms.

Prototype

```
int ScanSetCode39CheckDigitVerification (
                    Word check_digit);
```

Parameters

-> `check_digit`	Must be one of the following values: **ENABLE** **DISABLE**

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

BATCH_ERROR

Comments Only those Code 39 symbols that include a modulo 43 check digit are decoded when this parameter is enabled.

See Also `ScanGetCode39CheckDigitVerification`

ScanSetCode39FullAscii

Purpose Determines whether an ASCII character code is to be assigned to letters, punctuation marks, numerals, and most keyboard control keystrokes.

Prototype

```
int ScanSetCode39FullAscii (
                    Boolean bEnable);
```

Parameters

`-> full_ascii`	Must be one of the following values: `True=`**`ENABLE`** `False=`**`DISABLE`**

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

BATCH_ERROR

Comments Code 39 Full ASCII interprets the barcode special character ($ + % /) preceding a Code 39 character, and assigns an ASCII character value to the pair. For example, when Code 39 Full ASCII is enabled and a +B is scanned, it is interpreted as b; %J as 7; and $H emulates the keystroke BACKSPACE. Scanning ABC$M outputs the keystroke equivalent of ABC ENTER.

Do not enable Code 39 Full ASCII and Trioptic Code 39 at the same time.

See Also **`ScanGetCode39FullAscii`**

General Barcode Parameter Functions

Table 3-6 lists the general barcode parameter functions described in this section.

Table 3-6. General Barcode Parameter Functions

PARAMETER FUNCTION	PAGE
ScanGetBarcodeEnabled	3-18
ScanGetBarcodeLengths	3-19
ScanGetConvert	3-21
ScanGetTransmitCheckDigit	3-22
ScanSetBarcodeEnabled	3-23
ScanSetBarcodeLengths	3-25
ScanSetConvert	3-27
ScanSetTransmitCheckDigit	3-29

ScanGetBarcodeEnabled

Purpose Determines whether the specified barcode type is currently enabled for decoding.

Prototype

```
int ScanGetBarcodeEnabled (
                    BarType barcodeType);
```

Returned Status The enabled state of the specified barcode type:

```
Zero=DISABLE
>zero=ENABLE
barBOOKLAND_EAN
barCODABAR
barCODE39
barCODE93
barCODE128
barCOUPON
barD2OF5
barEAN8
barEAN13
barI2OF5
barISBT128
barMSI_PLESSEY
barTRIOPTICCODE39
barUCC_EAN128
barUPCA
barUPCE
barUPCE1
barPDF417
```

If an error occurs, the returned status is one of the following:

COMMUNICATIONS_ERROR

NOT_SUPPORTED

See Also `ScanSetBarcodeEnabled`

ScanGetBarcodeLengths

Purpose Identifies the number of human-readable symbols in the specified format that are being decoded.

Prototype

```
int ScanGetBarcodeLengths (
                BarType barcodeType,
                WordPtr pLengthType,
                WordPtr pLength1,
                WordPtr pLength2);
```

Returned Status **barcodeType** will be filled with one of the following values:

barCODABAR

barCODE39

barCODE93

barD25

barI2of5

barMSI_PLESSEY

pLengthType will be filled with one of the following values:

ONE_DISCRETE_LENGTH

TWO_DISCRETE_LENGTHS

LENGTH_WITHIN_RANGE

ANY_LENGTH

If applicable, **pLength1** will be used to return **length1**.

If applicable, **pLength2** will be used to return **length2.**

STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

BATCH_ERROR

COMMUNICATIONS_ERROR

NOT_SUPPORTED

Comments

If **pLengthType** is **ONE_DISCRETE_LENGTH**, ignore the value returned in **pLength2**. If **pLengthType** is **ANY_LENGTH**, ignore the values returned in **pLength1** and **pLength2**.

See Also

ScanSetBarcodeLengths

ScanGetConvert

Purpose Identifies whether decoded data is being converted to the specified format before transmission.

Prototype

```
int ScanGetConvert (
                    ConvertType conversion);
```

Parameters

`-> conversion`	Must be one of the following values: **`UPCEtoUPCA`** **`UPCE1toUPCA`** **`EAN8toEAN13`** **`CODE39toCODE32`** **`I2OF5toEAN13`**

Returned Status

`Zero=`**`DISABLE`**

`>zero=`**`ENABLE`**

If an error occurs, the returned status is one of the following:

COMMUNICATIONS_ERROR

NOT_SUPPORTED

See Also **`ScanSetConvert`**

ScanGetTransmitCheckDigit

Purpose Identifies whether the specified code is being transmitted with a check digit.

Prototype

```
int ScanGetTransmitCheckDigit (
                    barType barcodeType);
```

Parameters

-> **barcodeType** Must be one of the following values:

barUPCA
barUPCE
barUPCE1
barCODE39
barI2OF5
barMSI_PLESSEY

Returned Status The barcode format specified in the **ScanSetTransmitCheckDigit** function call.

TRANSMIT_CHECK_DIGIT

DO_NOT_TRANSMIT_CHECK_DIGIT

If an error occurs, the returned status is one of the following:

COMMUNICATIONS_ERROR

NOT_SUPPORTED

See Also **ScanSetTransmitCheckDigit**

ScanSetBarcodeEnabled

Purpose Dictates whether the specified barcode type is to be enabled for decoding.

Prototype

```
int ScanSetBarcodeEnabled (
                    BarType barcodeType,
                    Boolean bEnable);
```

Parameters

-> barcodeType Must be one of the following values:

barBOOKLAND_EAN
barCODABAR
barCODE39
barCODE93
barCODE128
barD2OF5
barEAN8
barEAN13
barI2OF5
barISBT128
barMSI_PLESSEY
barTRIOPTICCODE39
barUCC_EAN128
barUPCA
barUPCE
barUPCEANCOUPONCODE
barUPCE1
barPDF417

-> bEnable Must be one of the following values:

True=**ENABLE**
False=**DISABLE**

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

BATCH_ERROR

See Also **`ScanGetBarcodeEnabled`**

ScanSetBarcodeLengths

Purpose Determines the number of human-readable symbols in the specified format that are to be decoded.

Prototype

```
int ScanSetBarcodeLengths (
                    BarType barcodeType,
                    Word lengthType,
                    Word length1,
                    Word length2);
```

Parameters

-> **barcodeType**	Must be one of the following values: **barCODABAR** **barCODE39** **barCODE93** **barD25** **barI2of5** **barMSI_PLESSEY**
-> **lengthType**	Must be one of the following values: **ONE_DISCRETE_LENGTH** **TWO_DISCRETE_LENGTHS** **LENGTH_WITHIN_RANGE** **ANY_LENGTH**
-> **length1**, **length2**	The discrete lengths you wish to decode, or the range of barcode lengths you wish to decode. These lengths are ignored if the **ANY_LENGTH** parameter is set.

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

BATCH_ERROR

Comments

The number of human-readable characters in the specified barcode format (including check digits) that are to be decoded may be set for:

- **One discrete length:** Decode only those codes that contain a selected length. For example, if you select **`ONE_DISCRETE_LENGTH`** and pass a length value of 14, only the barcode symbols containing 14 characters are decoded. Codes that contain two discrete lengths (**`length2`**) are ignored.
- **Two discrete lengths:** Decode only those codes that contain two selected lengths. For example, if you select **`TWO_DISCRETE_LENGTHS`** and pass length values of 2 and 14, only the barcode symbols containing 2 or 14 characters are decoded.
- **Lengths within a specified range:** Decode those codes that contain a specified range of characters. If you select **`LENGTH_WITHIN_RANGE`** and pass length values of 4 and 12, only the barcode symbols containing between 4 and 12 characters are decoded.
- **Any length:** Decode specified barcode symbols containing any number of characters. The length values that you pass are ignored. Codes that contain one discreet length or two discreet lengths are ignored.

If Code 39 Full ASCII is enabled, try to use the **`LENGTH_WITHIN_RANGE`** or **`ANY_LENGTH`** options.

See Also

`ScanGetBarcodeLengths`

ScanSetConvert

Purpose Converts decoded data to the specified format before transmission.

Prototype

```
int ScanSetConvert (
                    ConvertType conversion,
                    Boolean bEnable);
```

Parameters

`-> conversion`	Must be one of the following values: **`UPCEtoUPCA`** **`UPCE1toUPCA`** **`EAN8toEAN13`** **`CODE39toCODE32`** **`I2OF5toEAN13`**
`bEnable`	Must be one of the following values: `True=`**`ENABLE`** `False=`**`DISABLE`**

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

BATCH_ERROR

Comments **Converting UPC-E to UPC-A—**To transmit UPC-E (zero suppressed) decoded data, select **`DISABLE`**. After being converted, the data follows UPC-A format conventions, and is affected by UPC-A programming selections (such as preamble, check digit).

Converting UPC-E1 to UPC-A—To transmit UPC-E1 (zero suppressed) decoded data, select **`DISABLE`**. After being converted, the data follows UPC-A format conventions and is affected by UPC-A programming selections (such as, preamble or check digit).

Converting EAN-8 to EAN-13—When EAN Zero Extend is disabled, this parameter has no effect on barcode data.

Converting I 2 of 5 to EAN-13—The I 2 of 5 code must be enabled, one length must be set to 14, and the code must have a leading zero and a valid EAN-13 check digit.

See Also

`ScanGetConvert`

ScanSetTransmitCheckDigit

Purpose Determines whether the specified code is to be transmitted with a check digit.

Prototype

```
int ScanSetTransmitCheckDigit (
                BarType barcodeType,
                Word check_digit);
```

Parameters

`-> barcodeType` Must be one of the following values:

barUPCA
barUPCE
barUPCE1
barCODE39
barI2OF5
barMSI_PLESSEY

`-> check_digit` Must be one of the following values:

TRANSMIT_CHECK_DIGIT
DO_NOT_TRANSMIT_CHECK_DIGIT

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

BATCH_ERROR

Comments Check digits are used by the scanner to validate that the correct data has been decoded. In UPC code, the check digit's value is based on the other data in the barcode.

See Also **ScanGetTransmitCheckDigit**

I 2 of 5 Barcode Parameter Functions

Table 3-7 lists the I 2 of 5 barcode parameter functions described in this section.

Table 3-7. I 2 of 5 Barcode Parameter Functions

PARAMETER FUNCTION	PAGE
ScanGetI2of5CheckDigitVerification	3-31
ScanSetI2of5CheckDigitVerification	3-32

ScanGetI2of5CheckDigitVerification

Purpose Identifies whether an I 2 of 5 symbol is complying with specified algorithms.

Prototype

```
int ScanGetI2of5CheckDigitVerification (
                    void);
```

Returned Status

`DISABLE`

`OPCC_CHECK_DIGIT`

`USS_CHECK_DIGIT`

If an error occurs, the returned status is one of the following:

COMMUNICATIONS_ERROR

NOT_SUPPORTED

See Also `ScanSetI2of5CheckDigitVerification`

ScanSetI2of5CheckDigitVerification

Purpose Determines whether an I 2 of 5 symbol is to comply with specified algorithms.

Prototype

```
int ScanSetI2of5CheckDigitVerification (
                    Word check_digit);
```

Parameters

-> `check_digit`	Must be one of the following values:
	
	`DISABLE`
	`USS_CHECK_DIGIT`
	`OPCC_CHECK_DIGIT`

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

BATCH_ERROR

Comments The I 2 of 5 symbol must comply with one of the following algorithms:

- Optical Product Code Council (OPCC)
- Uniform Symbology Specification (USS)

See Also `ScanGetI2of5CheckDigitVerification`

MSI Plessey Barcode Parameter Functions

Table 3-8 lists the MSI Plessey barcode parameter functions described in this section.

Table 3-8. MSI Plessey Barcode Parameter Functions

PARAMETER FUNCTION	PAGE
ScanGetMsiPlesseyCheckDigit Algorithm	3-34
ScanGetMsiPlesseyCheckDigits	3-35
ScanSetMsiPlesseyCheckDigit Algorithm	3-36
ScanSetMsiPlesseyCheckDigits	3-37

ScanGetMsiPlesseyCheckDigit Algorithm

Purpose Determines whether MSI Plessey-encoded symbols with two check digits are being verified a second time before being transmitted.

Prototype

```
int ScanGetMsiPlessey
                CheckDigitAlgorithm (
                void);
```

Returned Status `MOD10_MOD11`

`MOD10_MOD10`

If an error occurs, the returned status is one of the following:

COMMUNICATIONS_ERROR

NOT_SUPPORTED

See Also `ScanSetMsiPlesseyCheckDigitAlgorithm`

ScanGetMsiPlesseyCheckDigits

Purpose Determines the number of check digits that are being inserted at the end of MSI Plessey-encoded data.

Prototype

```
int ScanGetMsiPlesseyCheckDigits (
                    void);
```

Return Status

`ONE_CHECK_DIGIT`

`TWO_CHECK_DIGITS`

If an error occurs, the returned status is one of the following:

COMMUNICATIONS_ERROR

NOT_SUPPORTED

See Also `ScanSetMsiPlesseyCheckDigits`

ScanSetMsiPlesseyCheckDigit Algorithm

Purpose Determines whether MSI Plessey-encoded symbols with two check digits are to be verified a second time before being transmitted.

Prototype

```
int ScanSetMsiPlessey
                CheckDigitAlgorithm (
                Word algorithm);
```

Parameters

-> `algorithm`	Must be one of the following values:
	
	`MOD10_MOD11`
	`MOD10_MOD10`

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

BATCH_ERROR

See Also `ScanGetMsiPlesseyCheckDigitAlgorithm`

ScanSetMsiPlesseyCheckDigits

Purpose Determines the number of check digits that are to be inserted at the end of MSI Plessey-encoded data.

Prototype

```
int ScanSetMsiPlesseyCheckDigits (
                    Word check_digits);
```

Parameters

-> `check_digits`	Must be one of the following values:
	
	`ONE_CHECK_DIGIT`
	`TWO_CHECK_DIGITS`

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

BATCH_ERROR

Comments The check digits at the end of the barcode verify the integrity of the data. At least one check digit is always required. Check digits are not automatically transmitted with the data.

See Also `ScanGetMsiPlesseyCheckDigits`

UPC/EAN Barcode Parameter Functions

Table 3-9 lists the UPC/EAN (European Article Numbering) barcode parameter functions described in this section:

Table 3-9. UPC/EAN Barcode Parameter Functions

PARAMETER FUNCTION	PAGE
ScanGetDecodeUpcEanRedundancy	3-39
ScanGetDecodeUpcEanSupplementals	3-40
ScanGetEanZeroExtend	3-41
ScanGetUpcEanSecurityLevel	3-42
ScanGetUpcPreamble	3-43
ScanSetDecodeUpcEanRedundancy	3-44
ScanSetDecodeUpcEanSupplementals	3-45
ScanSetEanZeroExtend	3-47
ScanSetUpcEanSecurityLevel	3-48
ScanSetUpcPreamble	3-50

ScanGetDecodeUpcEanRedundancy

Purpose When the autodiscriminate UPC/EAN supplementals parameter is selected in the **`ScanSetDecodeUpcEanRedundancy`** function, it identifies the number of times a symbol without supplementals is decoded before being transmitted.

Prototype

```
int ScanGetDecodeUpcEanRedundancy (
                    void);
```

Returned Status Integer in the range [0...20].

If an error occurs, the returned status is one of the following:

COMMUNICATIONS_ERROR

NOT_SUPPORTED

See Also **`ScanSetDecodeUpcEanRedundancy`**

ScanGetDecodeUpcEanSupplementals

Purpose Identifies how UPC or EAN code that includes supplemental characters is being decoded.

Prototype

```
int ScanGetDecodeUpcEanSupplementals (
                    void);
```

Returned Status

`DECODE_SUPPLEMENTALS`

`IGNORE_SUPPLEMENTALS`

`AUTODISCRIMINATE_SUPPLEMENTALS`

If an error occurs, the returned status is one of the following:

COMMUNICATIONS_ERROR

NOT_SUPPORTED

See Also `ScanSetDecodeUpcEanSupplementals`

ScanGetEanZeroExtend

Purpose Determines whether five leading zeros are being added to decoded EAN-8 symbols.

Prototype

```
int ScanGetEanZeroExtend (
                    void);
```

Returned Status

`Zero=`**`DISABLE`**

`>zero=`**`ENABLE`**

If an error occurs, the returned status is one of the following:

COMMUNICATIONS_ERROR

NOT_SUPPORTED

See Also **`ScanSetEanZeroExtend`**

ScanGetUpcEanSecurityLevel

Purpose Identifies the number of times the barcode is scanned before being decoded.

Prototype

```
int ScanGetUpcEanSecurityLevel (
                    void);
```

Returned Status

SECURITY_LEVEL0

SECURITY_LEVEL1

SECURITY_LEVEL2

SECURITY_LEVEL3

If an error occurs, the returned status is one of the following:

COMMUNICATIONS_ERROR

NOT_SUPPORTED

See Also **ScanSetUpcEanSecurityLevel**

ScanGetUpcPreamble

Purpose Identifies whether the specified UPC code is being transmitted with lead-in characters.

Prototype

```
int ScanGetUpcPreamble (
                    BarType barcodeType);
```

Parameter

-> `barcodeType`	Must be one of the following values: **barUPCA** **barUPCE** **barUPCE1**

Returned Status One of the following values:

NO_PREAMBLE

SYSTEM_CHARACTER

SYSTEM_CHARACTER_COUNTRY_CODE

If an error occurs, the returned status is one of the following:

COMMUNICATIONS_ERROR

NOT_SUPPORTED

See Also **ScanSetUpcPreamble**

ScanSetDecodeUpcEanRedundancy

Purpose With the autodiscriminate UPC/EAN supplementals option selected, it adjusts the number of times a symbol without supplementals is to be decoded before being transmitted.

Prototype

```
int ScanSetDecodeUpcEanRedundancy (
                    Word supplemental_redundancy);
```

Parameters

-> **`supplemental_redundancy`**	Must be an integer in the range [2...20].

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

BATCH_ERROR

Comments The range is from two to 20 times. Five or above is recommended when decoding a mix of UPC/EAN symbols with and without supplementals, and the autodiscriminate option is selected.

See Also **`ScanGetDecodeUpcEanRedundancy`**

ScanSetDecodeUpcEanSupplementals

Purpose Determines how UPC or EAN code that includes supplemental characters is to be decoded.

Prototype

```
int ScanSetDecodeUpcEanSupplementals (
                    Word supplementals);
```

Parameters

-> **supplementals**	Must be one of the following values: **DECODE_SUPPLEMENTALS** **IGNORE_SUPPLEMENTALS** **AUTODISCRIMINATE_ SUPPLEMENTALS**

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

BATCH_ERROR

Comments Supplementals are two or five characters added to code according to specific format conventions (for example, UPC A+2, UPC E+2, EAN 8+2).

Three options are available:

- If you select the **decode_supplementals** parameter, UPC/EAN symbols that don't have supplemental characters are not decoded.
- If you select the **ignore_supplementals** parameter, UPC/EAN symbols that have supplemental characters are decoded, and the supplemental characters are ignored.

- If you select the **`autodiscriminate_supplementals`** parameter, you can adjust the number of times a symbol is scanned to ensure that both the barcode and the supplementals are correctly decoded. If you use autodiscriminate, consider setting redundancy to greater than five.

See Also

`ScanGetDecodeUpcEanSupplementals`

ScanSetEanZeroExtend

Purpose When enabled, adds five leading zeros to decoded EAN-8 symbols.

Prototype

```
int ScanSetEanZeroExtend (
                    Boolean bEnable);
```

Parameters

-> **bEnable**	Must be one of the following values: True=**ENABLE** False=**DISABLE**

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

BATCH_ERROR

Comments This function call makes EAN-8 symbols compatible to EAN-13 symbols.

See Also **ScanGetEanZeroExtend**

ScanSetUpcEanSecurityLevel

Purpose Selects the number of times the barcode is to be scanned before being decoded.

Prototype

```
int ScanSetUpcEanSecurityLevel (
                    Word security_level);
```

Parameters

-> `security_level`	Must be one of the following values:
	
	`SECURITY_LEVEL0`
	`SECURITY_LEVEL1`
	`SECURITY_LEVEL2`
	`SECURITY_LEVEL3`

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

BATCH_ERROR

Comments The SPT scanner offers four levels of decoding security for UPC/EAN barcodes. Security levels determine the number of times linear barcodes (such as Code 39 or I 2 of 5) are scanned before being decoded. Higher security levels are needed for decreasing barcode quality. Data must be decoded the same twice in a row for the scan to be considered good. As security levels increase, the scanner's aggressiveness decreases, so be sure to choose only that level of security necessary for any given application.

Security Level 0—The default setting. Allows the scanner to operate in its most aggressive state, while providing sufficient security for decoding in-spec barcodes.

Security Level 1—As barcode quality levels diminish, certain characters (1, 2, 7, or 8) become prone to misdecodes. Select this security level if you are experiencing misdecodes because of poorly printed barcodes, and the misdecodes are limited to these characters.

Security Level 2—Select this security level if you are experiencing misdecodes of poorly printed barcodes, and the misdecodes are not limited to characters 1, 2, 7, or 8.

Security Level 3—Select this security level if you have tried Security Level 2 and are still experiencing misdecodes. This security level significantly impairs the decoding ability of the scanner. If this level of security is necessary, try to improve the barcode's quality.

See Also

`ScanGetUpcEanSecurityLevel`

ScanSetUpcPreamble

Purpose Determines whether the specified UPC code is to be transmitted with lead-in characters.

Prototype

```
int ScanSetUpcPreamble (
                BarType barcodeType,
                int preamble);
```

Parameters

-> **barcodeType**	Must be one of the following values: **barUPCA** **barUPCE** **barUPCE1**
-> **preamble**	Must be one of the following values: **NO_PREAMBLE** **SYSTEM_CHARACTER** **SYSTEM_CHARACTER_** **COUNTRY_CODE**

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

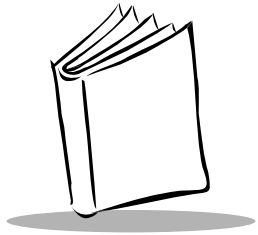
BATCH_ERROR

Comments Three options are given for transmitting lead-in characters (preamble) added to UPC-A symbols:

- Transmit system character only
- Transmit system character and country code ("0" for USA)
- Do not transmit the preamble

The preamble is considered part of the symbol.

See Also `ScanGetUpcPreamble`



Chapter 4
Hardware Parameter Functions

Introduction

The Scan Manager functions in this section give you ability to set up the scanner. With these functions, an application can perform the following:

- Set scan angle and aim duration
- Set triggering mode
- Set beep durations and frequencies
- Set redundancy and security levels
- Identify and manipulate barcode data

Returned Status Definitions

The hardware parameter functions may return one of the status codes described in Table 4-1.

Table 4-1. Returned Status Codes

STATUS CODE	DEFINITION
Any non-negative value (0 to 32767)	Parameter value.
STATUS_OK	The function's parameters were verified. If a function must wait for an ACK from the scanner, STATUS_OK indicates that the ACK was received.
NOT_SUPPORTED	The last packet received from the scanner generated either a NAK_DENIED or NAK_BAD_CONTEXT status. This usually indicates that the specified parameter is not supported by this scanner, or the scanner was unable to comply with the request.
COMMUNICATIONS_ERROR	Either a timeout condition or the maximum number of retries (or both) occurred. The previous transmit message was not verified through an ACK, and therefore, is questionable.
BAD_PARAM	One or more of the function call parameters supplied by the user was not in the expected range.
BATCH_ERROR	The limits of a batch function have been exceeded. Unless otherwise indicated, functions that start with **`ScanSet`** are responsible for generating a batch command to establish scanner parameters. The parameters are not sent to the scanner until the **`ScanCmdSendParams()`** function is called, at which time a new batch is started.
ERROR_UNDEFINED	An error condition exists that is not specifically associated with the scanner or its communications.

Hardware Parameter Functions

Table 4-2 lists the hardware parameter functions described in this chapter.

Table 4-2. Hardware Parameter Functions

PARAMETER FUNCTION	PAGE
ScanGetAimDuration	4-5
ScanGetBeepAfterGoodDecode	4-6
ScanGetBeepDuration	4-7
ScanGetBeepFrequency	4-8
ScanGetBidirectionalRedundancy	4-9
ScanGetDecodeLedOnTime	4-10
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Table 4-2. Hardware Parameter Functions

PARAMETER FUNCTION	PAGE
ScanSetLinearCodeTypeSecurityLevel	4-27
ScanSetPrefixSuffixValues	4-29
ScanSetScanDataTransmissionFormat	4-30
ScanSetTransmitCodeIdCharacter	4-31
ScanSetTriggeringModes	4-38

ScanGetAimDuration

Purpose Identifies the amount of time the aiming pattern is seen before a scan begins.

Prototype

```
int ScanGetAimDuration (
                    void);
```

Returned Status Integer in the range [0...99], representing a time period of 0.0 to 9.9 seconds, in 0.1-second increments.

If an error occurs, the returned status is one of the following:

COMMUNICATIONS_ERROR

NOT_SUPPORTED

See Also **ScanSetAimDuration**

ScanGetBeepAfterGoodDecode

Purpose Identifies whether the unit has been set to beep after a good decode.

Prototype

```
int ScanGetBeepAfterGoodDecode (
                    void);
```

Returned Status Zero=**DISABLE**

>zero=**ENABLE**

If an error occurs, the returned status is one of the following:

COMMUNICATIONS_ERROR

NOT_SUPPORTED

See Also **ScanSetBeepAfterGoodDecode**

ScanGetBeepDuration

Purpose Identifies the duration of the beep for the specified beep types.

Prototype

```
int ScanGetBeepDuration (
                    DurationType type);
```

Parameters

-> `type`	Must be one of the following values: **DECODE** **SHORT** **MEDIUM** **LONG**

Returned Status STATUS_OK

See Also **ScanSetBeepDuration**

ScanGetBeepFrequency

Purpose Gets the frequency of the beeper for the specified beep types.

Prototype

```
int ScanGetBeepFrequency (
                    FrequencyType beep_type);
```

Parameters

`-> beep_type`	Must be one of the following values:
	
	`DECODE`
	`LOW`
	`MEDIUM`
	`HIGH`

Returned Status STATUS_OK

See Also `ScanSetBeepFrequency`

ScanGetBidirectionalRedundancy

Purpose Identifies whether a barcode must be successfully scanned in both directions before being decoded.

Prototype

```
int ScanGetBidirectionalRedundancy (
                    void);
```

Returned Status **ENABLE**

DISABLE

If an error occurs, the returned status is one of the following:

COMMUNICATIONS_ERROR

NOT_SUPPORTED

See Also **ScanSetBidirectionalRedundancy**

ScanGetDecodeLedOnTime

Purpose Identifies the amount of time the LED is to be turned on when a successful scan is performed.

Prototype

```
int ScanGetDecodeLedOnTime (
                    void);
```

Returned Status Integer in the range [0...100], representing a time period of 0.0 to 10.0 seconds, in 0.1-second increments.

If an error occurs, the returned status is one of the following:

COMMUNICATIONS_ERROR

NOT_SUPPORTED

See Also `ScanSetDecodeLedOnTime`

ScanGetLaserOnTime

Purpose Identifies the maximum scanner processing time allowed during a scan.

Prototype

```
int ScanGetLaserOnTime (
                    void);
```

Returned Status Integer in the range [5...99], representing a time period of 0.5 to 9.9 seconds, in 0.1-second increments.

If an error occurs, the returned status is one of the following:

COMMUNICATIONS_ERROR

NOT_SUPPORTED

See Also `ScanSetLaserOnTime`

ScanGetLinearCodeTypeSecurityLevel

Purpose Identifies the number of times the barcode is scanned before being decoded.

Prototype

```
int ScanGetLinearCodeTypeSecurityLevel (
                    void);
```

Returned Status

SECURITY_LEVEL1

SECURITY_LEVEL2

SECURITY_LEVEL3

SECURITY_LEVEL4

If an error occurs, the returned status is one of the following:

COMMUNICATIONS_ERROR

NOT_SUPPORTED

See Also Comment for **ScanSetLinearCodeTypeSecurityLevel**

ScanGetPrefixSuffixValues

Purpose Identifies any prefix or suffixes appended to the scanned data.

Prototype

```
int ScanGetPrefixSuffixValues (
                    CharPtr pPrefix,
                    CharPtr pSuffix_1,
                    CharPtr pSuffix_2);
```

Returned Status **ptr[0]** returns **prefix**

ptr[1] returns **suffix_1**

ptr[2] returns **suffix_2**

STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

COMMUNICATIONS_ERROR

NOT_SUPPORTED

See Also **ScanSetPrefixSuffixValues**
Appendix A for prefix/suffix values

ScanGetAngle

Purpose Identifies the scanner's field of view.

Note: SPT 17X0-2D does not support scan angle selection.

Prototype

```
int ScanGetAngle (
                  void);
```

Returned Status **SCAN_ANGLE_WIDE**

SCAN_ANGLE_NARROW

If an error occurs, the returned status is one of the following:

COMMUNICATIONS_ERROR

NOT_SUPPORTED

See Also **ScanSetAngle**

ScanGetScanDataTransmissionFormat

Purpose Identifies the scan data transmission format.

Prototype

```
int ScanGetScanDataTransmissionFormat (
                    void);
```

Returned Status

DATA_AS_IS

DATA_SUFFIX1

DATA_SUFFIX2

DATA_SUFFIX1_SUFFIX2

PREFIX_DATA

PREFIX_DATA_SUFFIX1

PREFIX_DATA_SUFFIX2

PREFIX_DATA_SUFFIX1_SUFFIX2

If an error occurs, the returned status is one of the following:

COMMUNICATIONS_ERROR

NOT_SUPPORTED

See Also **ScanSetScanDataTransmissionFormat**

ScanGetTransmitCodeIdCharacter

Purpose Determines whether a character has been selected to identify the scanned barcode's code type and the method selected.

Prototype

```
int ScanGetTransmitCodeIdCharacter (
                    void);
```

Returned Status `AIM_CODE_ID_CHARACTER`

`DISABLE`

`SYMBOL_CODE_ID_CHARACTER`

If an error occurs, the returned status is one of the following:

COMMUNICATIONS_ERROR

NOT_SUPPORTED

See Also `ScanSetTransmitCodeIdCharacter`

ScanGetTriggeringModes

Purpose Identifies the type of scan engine trigger.

Prototype

```
int ScanGetTriggeringModes (
                    void);
```

Return Status

HOST

LEVEL

PULSE

If an error occurs, the returned status is one of the following:

COMMUNICATIONS_ERROR

NOT_SUPPORTED

See Also **ScanSetTriggeringModes**

ScanIsPalmSymbolUnit

Purpose Identifies whether the application is running on an SPT device (Palm organizer with scanner hardware and software).

Prototype

```
int ScanIsPalmSymbolUnit (
                    void);
```

Return Status Zero=**Unit is not an SPT device**

Non-zero=**Unit is an SPT device**

If an error occurs, the returned status is one of the following:

COMMUNICATIONS_ERROR

NOT_SUPPORTED

Comments Use this call when your software needs to run on both an unmodified Palm III device and an SPT device.

ScanSetAimDuration

Purpose Sets the amount of time the aiming pattern is to be seen before a scan begins.

Prototype

```
int ScanSetAimDuration (
                    Word aim_duration);
```

Parameters

->	**aim_duration**	Must be an integer in the range [0...99], representing a time period of 0.0 to 9.9 seconds.

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

BATCH_ERROR

Comments This function is invoked when the trigger is pressed or a **ScanCmdStartDecode** command is received. This function call does not apply to the aim signal or to the **ScanCmdAimOn** command.

The **aim_duration** parameter is programmable in 0.1-second increments. If a value of 0 is set for **aim_duration**, the aim pattern is disabled.

See Also **ScanGetAimDuration**

ScanSetAngle

Purpose Sets the scanner's field of view.

Note: SPT 17X0-2D does not support scan angle selection.

Prototype

```
int ScanSetAngle (
                Word scanner_angle);
```

Parameters

-> `scanner_angle`	Must be one of the following values: **`SCAN_ANGLE_WIDE`** **`SCAN_ANGLE_NARROW`**

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

BATCH_ERROR

Comments A **`SCAN_ANGLE_WIDE`** field of view allows the scanner to decode more barcode characters at the same time.

See Also **`ScanGetAngle`**

ScanSetBeepAfterGoodDecode

Purpose Determines whether the unit is to beep after a good decode.

Prototype

```
int ScanSetBeepAfterGoodDecode (
                    Boolean bEnableBeep);
```

Parameters

-> **bEnableBeep**	Must be one of the following values: True=**ENABLE** False=**DISABLE**

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

BATCH_ERROR

Comments When **bEnableBeep** is disabled, the beep still operates during parameter menu scanning, and indicates error conditions.

See Also **ScanGetBeepAfterGoodDecode**

ScanSetBeepDuration

Purpose Sets the duration of the beep for the specified beep types.

Prototype

```
int ScanSetBeepDuration (
                DurationType type,
                int beep_duration);
```

Parameters

-> **type**	Must be one of the following values: **DECODE** **SHORT** **MEDIUM** **LONG**
-> **beep_duration**	A numeric beep length in milliseconds (ms).

Returned Status STATUS_OK

If an error occurs, the returned status is:

BAD_PARAM

Comments Default durations are:

Decode	90 ms
Short	70 ms
Medium	90 ms
Long	240 ms

The acceptable range for any of these durations is 0 to 10,000 ms.

See Also **ScanGetBeepDuration**

ScanSetBeepFrequency

Purpose Sets the frequency of the beeper for the specified beep types.

Prototype

```
int ScanSetBeepFrequency (
                    FrequencyType type,
                    int beep_freq);
```

Parameters

-> **type**	Must be one of the following values: **DECODE FREQUENCY** **LOW FREQUENCY** **MEDIUM FREQUENCY** **HIGH FREQUENCY**
-> **beep_freq**	A numeric beep frequency in hertz (Hz).

Returned Status STATUS_OK

If an error occurs, the returned status is:

BAD_PARAM

Comments Default frequencies are:

Decode frequency	3000 Hz
Low frequency	1500 Hz
Medium frequency	3000 Hz
High frequency	7500 Hz

The acceptable range for any of these frequencies is 0 to 15,000 Hz.

See Also **ScanGetBeepFrequency**

ScanSetBidirectionalRedundancy

Purpose Requires that a barcode be successfully scanned in both directions before being decoded.

Prototype

```
int ScanSetBidirectionalRedundancy (
                    Word redundancy);
```

Parameters

-> `redundancy`	Must be one of the following values: **`ENABLE`** **`DISABLE`**

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

BATCH_ERROR

Comments This parameter is only valid when the **`ScanSetLinearCodeTypeSecurityLevel`** function call has been enabled.

See Also **`ScanGetBidirectionalRedundancy`**

ScanSetDecodeLedOnTime

Purpose Sets the amount of time the LED will be turned on when a successful scan is performcd.

Prototype

```
int ScanSetDecodeLedOnTime (
                    Word led_on_time);
```

Parameters

->	`led_on_time`	Must be an integer in the range [0...99], representing a time period of 0.0 to 9.9 seconds.

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

BATCH_ERROR

Comments If a value of 0 is set for **`led_on_time`**, the LED will not be turned on. The **`led_on_time`** parameter is programmable in 0.1-second increments.

See Also **`ScanGetDecodeLedOnTime`**

ScanSetLaserOnTime

Purpose Sets the maximum scanner processing time to be allowed during a scan.

Prototype

```
int ScanSetLaserOnTime (
                    Word laser_on_time);
```

Parameters

-> **laser_on_time**	Must be an integer in the range [5...99], representing a time period of 0.5 to 9.9 seconds.

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

BATCH_ERROR

Comments Your application should use the hardware trigger, instead of the **ScanCmdStartDecode** command, to initiate a scan. However, if the scanner was previously set to laser pointer mode by the **ScanCmdAimOn** command and the laser is activated by the **ScanCmdStartDecode** command, the laser remains on for **laser_on_time** x 10 seconds.

The **laser_on_time** parameter is programmable in 0.1-second increments.

See Also **ScanGetLaserOnTime**

ScanSetLinearCodeTypeSecurityLevel

Purpose Selects the number of times the barcode is to be scanned before being decoded.

Prototype

```
int ScanSetLinearCodeTypeSecurityLevel (
                    Word security_level);
```

Parameters

-> `security_level`	Must be one of the following values: **SECURITY_LEVEL1** **SECURITY_LEVEL2** **SECURITY_LEVEL3** **SECURITY_LEVEL4**

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

BATCH_ERROR

Comments Security levels determine the number of times linear barcodes (such as Code 39 or I 2 of 5) are scanned before being decoded.

Security levels do not apply to code 128 function calls.

Higher security levels are needed for decreasing barcode quality. As security levels increase, the scanner's aggressiveness decreases, so be sure to choose only that level of security necessary for any given application.

Linear Security Level 1: The following code types must be successfully read twice before being decoded:

CODE TYPE	LENGTH
Codabar	All
MSI Plessey	4 or less
D 2 of 5	8 or less
I 2 of 5	8 or less

Linear Security Level 2: The following code types must be successfully read twice before being decoded:

Code Type	Length
All	All

Linear Security Level 3: Code types other than the following must be successfully read twice before being decoded. The following codes must be read three times:

Code Type	Length
MSI Plessey	4 or less
D 2 of 5	8 or less
I 2 of 5	8 or less

Linear Security Level 4: The following code types must be successfully read three times before being decoded:

Code Type	Length
All	All

See Also `ScanGetLinearCodeTypeSecurityLevel`

ScanSetPrefixSuffixValues

Purpose Appends a prefix or one or two suffixes to scanned data.

Prototype

```
int ScanSetPrefixSuffixValues (
                Char prefix, Char suffix_1,
                Char suffix_2);
```

Parameters

-> **prefix**, **suffix_1** and **suffix_2**	The desired ASCII values.

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

BATCH_ERROR

Comments Before setting the prefix/suffix values, set the Scan Data Transmission Format.

See Also **ScanGetPrefixSuffixValues**
ScanSetScanDataTransmissionFormat
Appendix A for prefix/suffix values

ScanSetScanDataTransmissionFormat

Purpose Changes the scan data transmission format.

Prototype

```
int ScanSetScanDataTransmissionFormat (
                    Word transmission_format);
```

Parameters

->	`transmission_format`	Must be one of the following values:
		
		`DATA_AS_IS`
		`DATA_SUFFIX1`
		`DATA_SUFFIX_2`
		`DATA_SUFFIX1_SUFFIX2`
		`PREFIX_DATA`
		`PREFIX_DATA_SUFFIX1`
		`PREFIX_DATA_SUFFIX2`
		`PREFIX_DATA_SUFFIX1_SUFFIX2`

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

BATCH_ERROR

See Also `ScanGetScanDataTransmissionFormat`

ScanSetTransmitCodeIdCharacter

Purpose Selects a character that identifies the scanned barcode's code type.

Prototype

```
int ScanSetTransmitCodeIdCharacter (
                    Word code_id);
```

Parameters

-> `code_id`	Must be one of the following values:	`SYMBOL_CODE_ID_CHARACTER`
		`AIM_CODE_ID_CHARACTER`
		`DISABLE`

Returned Status STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

BATCH_ERROR

Comments The code ID character is useful when the scanner is decoding more than one code type. The code ID character is inserted between the prefix and the decoded symbol.

The user may select:

- No code ID character
- Symbol Code ID character
- AIM Code ID character

The Symbol Code ID characters are listed and defined in Table 4-3.

Table 4-3. Symbol Code ID Characters

CODE	DEFINITION
A	UPC-A, UPC-E, UPC-E1, EAN-8, EAN-13
B	Code 39, Code 32
C	Codabar
D	Code 128 or ISBT 128
E	Code 93
F	Interleaved 2 of 5
G	Discrete 2 of 5 or Discrete 2 of 5 IATA
J	MSI Plessey
K	UCC/EAN-128
L	Bookland EAN
M	Trioptic Code 39
N	Coupon Code

The definitions for each AIM Code ID character contains a three-character string (in the format]**cm**). These characters are defined in Table 4-4:

Table 4-4. AIM Code ID Characters

CODE	DEFINITION	REFER TO
]	Flag character (ASCII 93)	N/A
c	Code character	Table 4-5
m	Modifier character	Table 4-6

The Code characters are listed in Table 4-5:

Table 4-5. Code Characters

CODE	DEFINITION
A	Code 39, Code 32
C	Code 128 or ISBT 128
E	**UPC-A, UPC-E, UPC-E1, EAN-8, EAN-13, UCC/EAN-128**
F	Codabar
G	Code 93
I	Interleaved 2 of 5
M	MSI Plessey
S	Discrete 2 of 5 and Discrete 2 of 5 IATA
X	Bookland EAN, Trioptic Code 39, Coupon Code

The Modifier characters are listed in Table 4-6:

Table 4-6. Modifier Characters

BARCODE TYPE	MODIFIER CHAR	OPTION	EXAMPLE
Code 39	0	Decoder has not checked any check characters or performed a full ASCII processing	A full ASCII barcode with check character W, A+I+MI+D+W, is transmitted as]A7AimId
	1	Decoder has checked one check character	
	3	Decoder has checked and stripped one check character	
	4	Decoder has performed a full ASCII character conversion	
	5	Decoder has performed a full ASCII character conversion and checked one check character	
	7	Decoder has performed a full ASCII character conversion, and checked and stripped one check character	
Trioptic Code 39	0	No options	A Trioptic barcode 412356 is transmitted as]**X0**412356
Code 128	0	Standard data packet with no function code 1 character in the first symbol position	A Code 128 barcode with a function code 1 character in the first position, FNCI AimId, is transmitted with an AIM ID of]**C1**

Table 4-6. Modifier Characters

BARCODE TYPE	MODIFIER CHAR	OPTION	EXAMPLE
Code 128 (cont'd)	1	Function code 1 character in the first symbol position	
	2	Function code 1 character in the second symbol position	
I 2 of 5	0	No check digit processing	An I 2 of 5 barcode 4123 without a check digit being checked is transmitted as]**I0**4123
	1	Decoder has checked the check digit	
	3	Decoder has stripped the check digit before transmission	
Codabar	0	No check digit processing	A Codabar barcode 4123 without a check digit being checked is transmitted as]**F0**4123
	1	Decoder has checked the check digit	
	3	Decoder has stripped the check digit before transmission	
Code 93	0	No options	A Code 93 barcode 012345678905 is transmitted as]**G0**012345678905

Table 4-6. Modifier Characters

BARCODE TYPE	MODIFIER CHAR	OPTION	EXAMPLE
MSI Plessey	0	Single check digit checked	An MSI Plessey barcode 4123 with a single check digit checked is transmitted as]**M0**4123
	1	Two check digits checked	
	2	Single check digit checked and stripped before transmission	
	3	Two check digits checked and stripped before transmission	
D 2 of 5	0	No options	A D 2 of 5 barcode 4123 is transmitted as]**S0**4123
UPC/EAN	0	Standard packet in full EAN country code format: 13 digits for UPC-A and UPC-E (not including supplemental data)	A UPC-A barcode 012345678905 is transmitted as]**E0**012345678905
	1	Two-digit supplemental data only	
	2	Five-digit supplemental data only	
	4	EAN-8 data packet	
Bookland EAN	0	No options, always transmit 0	A Bookland barcode 123456789X is transmitted as]**X0**123456789X

See Also `ScanGetTransmitCodeIdCharacter`

ScanSetTriggeringModes

Purpose Sets the type of scan engine trigger.

Prototype

```
int ScanSetTriggeringModes (
                    Word triggering_mode);
```

Parameters

`-> triggering_mode` Must be one of the following values:

`LEVEL`—Only the terminal Scan trigger initiates the scan; the laser is turned off when the trigger is released or the decode was good.

`PULSE`—Only the terminal Scan trigger initiates the scan; the laser is turned off when the value set in **`ScanSetLaserOnTime`** is reached or when the decode was good.

`HOST`—The terminal Scan trigger or the application's **`ScanCmdStartDecode`** command initiates the scan; the laser is turned off when the trigger is released, or when the value set in **`ScanSetLaserOnTime`** is reached, the **`ScanCmdStopDecode`** command is called, or the decode was good.

Returned Status

STATUS_OK

If an error occurs, the returned status is one of the following:

BAD_PARAM

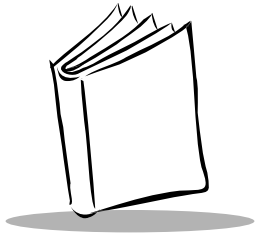
BATCH_ERROR

Comments

If the scanner was previously set to aim mode by the **ScanCmdAimOn** command, each mode functions as described above, except the laser will be on for the value set in **ScanSetLaserOnTime** x 10, and decoding is disabled.

See Also

ScanGetTriggeringModes
ScanSetLaserOnTime
ScanCmdStartDecode
ScanCmdStopDecode
ScanCmdAimOn



Chapter 5
Power Considerations

The power-consumption characteristics of the SPT device are different than those of a normal Palm III device, and it is important to keep this in mind when writing your application. The normal low-battery alert is displayed whenever the battery voltage falls below the acceptable operating level. However, a scan operation requires a different power threshold. When battery levels fall below this threshold (approximately 2.3 volts) an attempted scan will fail, and the scanner is disabled. Your application must alert the end-user in this situation, explaining why the scan failed, and directing them to install fresh batteries.

scanBatteryErrorEvent

Your code needs to handle the **`scanBatteryErrorEvent`**. The Scan Manager application generates this event whenever it detects the low-battery condition. Consult one of the two sample programs (ScanDemo or SScan) for an example of how to handle this event. Be sure to catch this event in all of your event handlers that might be in effect when a scan operation is attempted. For example, the ScanDemo program catches the **`scanBatteryErrorEvent`** in **`ApplicationHandleEvent`** so that it is handled in whatever form being displayed.

Sudden Loss of Power

If the terminal is put into sleep mode (through the unit's on/off button) while a scan-aware application is running, the state of the scanner will be preserved when the unit is turned back on. If the terminal is put into sleep mode while a scan is in progress, the scan will be aborted before the unit goes to sleep.

If the end-user removes the batteries while a scan-aware application is running (and the unit is not in sleep mode), Scan Manager removes power to the scanner and tries to maintain its current settings. However, this is not recommended, and you may see unpredictable results.

Backlighting

If your application controls or relies on the Palm device's backlighting feature, be aware that Scan Manager turns backlighting off at the outset of a scan operation. It also restores backlighting after the scan is completed.

Other Power Notes

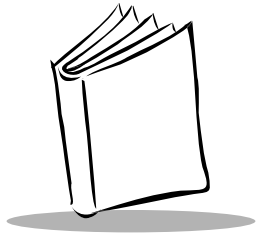
Certain decoder settings affect power consumption, and therefore affect battery life. The "laser pointer" mode set in **`ScanCmdAimOn`** draws a lot of power. Selecting pulse mode rather then trigger mode generally draws more power. Also, increasing values from the defaults for the following increases power consumption somewhat:

- **`LaserOnTime`**
- **`DecodeLedTime`**
- **`DecodeBeepDuration`**
- **`AimDuration`**

The scanner draws no power until **`ScanOpenDecoder()`** is called. It stops drawing power when **`ScanDecoderClose()`** is called. Therefore, if you need the scanner's capabilities only during certain portions of your application, you may want to issue the **`ScanOpenDecoder`** call before you enter that portion of the application, and **`ScanCloseDecoder`** when you exit that portion of the application. For example, you may need the scanner for entering data in fields on only one form of your application.

To avoid excessive voltage draw, the Scan Manager software puts the terminal into sleep mode while the laser is on. You should be careful to preserve this functionality. For this reason, it is recommended that you do not pass a timeout value to "EvtGetEvent." (For example, do not generate a nilEvent every few milliseconds in a scanning situation). Doing so could cause the terminal to come out of sleep mode at one of your timeout intervals while the laser is firing.

Finally, to reduce instantaneous power draw, your application should avoid opening the IR Exchange Manager or HotSync port while the scanner is open.



Chapter 6
Sample Scanning Application

The Scan Manager application described in this chapter is called *SScan*. It is a sample scan-aware application that demonstrates the basics of building a scan-aware application. The sections in this chapter describe, at a high level, the components in the Sscan application. The Scan Manager library also includes a detailed application, called Scan Demo, that exercises nearly all of the API. Refer to the Scan Manager library for the location of Scan Demo.

Writing the Code

Include Files

The following three **`#include`** statements provide you with the Scan Manager interface definitions, including the API functions, constants, and data structures.

```
#include "ScanMgrDef.h"// Scan Manager constant definitions

#include "ScanMgrStruct.h"// Scan Manager structure definitions

#include "ScanMgr.h" // Scan Manager API function definitions
```

PilotMain Routine

The **`PilotMain`** function is a standard Palm organizer application. It contains the code for handling a normal application launch (**`sysAppLaunchCmdNormalLaunch`**) by calling three other functions: **`StartApplication`**, **`EventLoop`**, and **`StopApplication`**.

```
/*****************************************************************
 *
 * FUNCTION:      PilotMain
 *
 * DESCRIPTION:   This function is the equivalent of a main()
 *                function in standard C.  It is called by the
 *                Emulator to begin execution of this application.
 *
 * PARAMETERS:    cmd - command specifying how to launch the
 *                application.
 *                cmdPBP - parameter block for the command.
 *                launchFlags - flags used to configure the launch.
 *
 * RETURNED:      Any applicable error code.
 *
*****************************************************************/
DWord PilotMain(Word cmd, Ptr cmdPBP, Word launchFlags)
{
      // Check for a normal launch.
      if (cmd == sysAppLaunchCmdNormalLaunch)
      {
            Err error = STATUS_OK;

            // Set up Scan Manager and the initial (Main) form.
            StartApplication();

            // Start up the event loop.
            EventLoop();

            // Close down Scan Manager, decoder
            StopApplication();
      }

      return(0);
}
```

The StartApplication Function

Sscan's **`StartApplication`** function demonstrates what you need to do at the outset of your program to properly initialize the scanner.

The first thing the **`StartApplication`** function does is call **`ScanIsPalmSymbolUnit`**, which tells the application whether it is running on a device that contains scanner hardware and software. This function is useful when your application needs to run on both an unmodified Palm III device and on a SPT device. Based on the result of this call, you can continue either as a normal application or as a scan-aware application.

Before calling any other Scan Manager library function, you ***must*** call **`ScanOpenDecoder`**. This function:

- Loads the Scan Manager shared library
- Powers on the decoder
- Initiates communication between the application and the scanner unit

Be sure to check the return value of the **`ScanOpenDecoder`** call. If it does not return a value of STATUS_OK, do **not** proceed with other Scan Manager calls.

If your application successfully performs **`ScanOpenDecoder`**, you may configure the decoder to suit your application's needs. This could involve enabling the scanner, setting the trigger mode, and enabling the appropriate barcode types. The Sscan application enables the scanner by calling **`ScanCmdScanEnable`**.

Next, it calls the **`ScanSetTriggeringModes`** function with a parameter of **`HOST`** to configure the triggering mode so that software-initiated scanning can be performed. Finally, several UPC and EAN barcode types (or symbologies) are enabled by the function **`ScanSetBarcodeEnabled`**.

For these parameters to actually take effect, you must call the **`ScanCmdSendParams`** function. All **`ScanSet...`** functions must be set with this function call. You only need to call **`ScanCmdSendParams`** once, after you have set all of your parameters.

NOTE: You are not required to call **`ScanCmdSendParams`** after you call other **`ScanCmd...`** functions, such as **`ScanCmdScanEnable`**. **`ScanCmd...`** functions take effect automatically.

```
/*****************************************************************
 *
 * FUNCTION:     StartApplication
 *
 * DESCRIPTION:  This routine sets up the initial state of the
 *               application.
 *
 * PARAMETERS:   None.
 *
 * RETURNED:     Nothing.
 *
*****************************************************************/
static void StartApplication(void)
{
      Err error;

      // Call up the main form.
      FrmGotoForm( MainForm );

      if (ScanIsPalmSymbolUnit())
      {
            // Now, open the scan manager library
            error = ScanOpenDecoder();

            // Set decoder parameters we care about...
            ScanCmdScanEnable(); // enable scanning

            // allow software-triggered scans (from Scan button)
            ScanSetTriggeringModes( HOST );

            // Enable any barcodes to be scanned
            ScanSetBarcodeEnabled( barUPCA, true );
            ScanSetBarcodeEnabled( barUPCE, true );
            ScanSetBarcodeEnabled( barUPCE1, true );
            ScanSetBarcodeEnabled( barEAN13, true );
            ScanSetBarcodeEnabled( barEAN8, true );
            ScanSetBarcodeEnabled( barBOOKLAND_EAN, true);
            ScanSetBarcodeEnabled( barCOUPON, true);
            ScanSetBarcodeEnabled( barPDF417, true);
```

```
            // We've set our parameters...
            // Call "ScanCmdSendParams" to send to decoder
            ScanCmdSendParams( No_Beep);
      }
}
```

The MainFormHandleEvent Function

After calling **StartApplication**, **PilotMain** calls **EventLoop**, which initiates the standard event-processing routine familiar to Palm organizer application developers. From the standpoint of scan-aware application developers, the most interesting code in Sscan is the **MainFormHandleEvent** function, which is the event handler for Sscan's main form.

```
/*****************************************************************
 *
 * FUNCTION:      MainFormHandleEvent
 *
 * DESCRIPTION:   Handles processing of events for the ÒmainÓ form.
 *
 * PARAMETERS:    event - the most recent event.
 *
 * RETURNED:      True if the event is handled, false otherwise.
 *
*****************************************************************/
static Boolean MainFormHandleEvent(EventPtr event)
{
      Boolean     bHandled = false;
      Word        extendedDataFlag;

      switch( event->eType )
      {
            case frmOpenEvent:
                  MainFormOnInit();
                  bHandled = true;
                  break;

            case menuEvent:
                  MainFormHandleMenu(event->data.menu.itemID);
                  bHandled = true;
                  break;
```

```
        case scanDecodeEvent:
              // A decode has been performed.
              // Use decoder API to retrieve decoder data.
              // Get barcode parameters from the registers.
              extendedDataFlag= ((ScanEventPtr)event)
              ->scanData.scanGen.data1;
              extendedDataLength = (int)(((ScanEventPtr)event)
              ->scanData.scanGen.data2);

              extend = extendedDataFlag & EXTENDED_DATA_FLAG;
              OnDecoderData();
              bHandled = true;
              break;

        case scanBatteryErrorEvent:
        {
              Char szTemp[10];
              StrIToA( szTemp, ((ScanEventPtr)event)
                    ->scanData.batteryError.batteryLevel );
              FrmCustomAlert( BatteryErrorAlert, szTemp, NULL,
                    NULL );
              bHandled=true;
              break;
        }

        case ctlSelectEvent:
        {
              if (ScanIsPalmSymbolUnit())
              {
                    // Scan Button
                    if (event->data.ctlEnter.controlID ==
                          MainSCANButton)
                    {
                          ScanCmdStartDecode();
                          bHandled = true;
                    }
              }
        break;
        }
  case fldChangedEvent;
```

```
            UpdateScrollBbar();
            bHandled = true;
            break;

      case sclRepeatEvent:
            ScrollLines(event->data.sclRepeat.newvalue - event ->
            data.sclRepeat.value, false);
            break;
      case keyDownEvent;
      {
            if (event->data.keyDown.chr ==pageUpChr) {
                  PageScroll (up);
                  bHandled = true;
            }else if (event->data.keyDown.chr ==pageDownChr) {
                  PageScroll (down);
                  bHandled = true;
            }
            break;
         {

      } //end switch

      return(bHandled);
}
```

```
/*****************************************************************
 *
 * FUNCTION:      MainFormOnInit
 *
 * DESCRIPTION:   This routine sets up the initial state of the main
 *                form.
 *
 * PARAMETERS:    None.
 *
 * RETURNED:     Nothing.
 *
*****************************************************************/
static void MainFormOnInit()
{
      FormPtr pForm = FrmGetActiveForm();
      if( pForm )
      {
            // initialize the barcode type and barcode data fields
            SetFieldText(MainBarTypeField, "No Data", 20, false );
            SetFieldText(MainScandataField, "No Data", 80, false );
            FrmDrawForm( pForm );
      }
}

/*****************************************************************
 *
 * FUNCTION:      MainFormHandleMenu
 *
 * DESCRIPTION:   This routine handles menu selections off of the
 *                main form.
 *
 * PARAMETERS:    None.
 *
 * RETURNED:      Nothing.
 *
*****************************************************************/

void MainFormHandleMenu( Word menuSel )
{
      switch( menuSel )
```

```
      {
            // Options menu
            case OptionsResetDefaults:
                  if (ScanIsPalmSymbolUnit()) {
                        ScanCmdScanDisable();

                        if (ScanCmdParamDefaults () ==Status_OK)
                              ScanCmdScanEnable ();
                              //enable scanning
                  }
                  break;

            case OptionsAbout:
                  OnAbout();
                  break;
      }
}

/*****************************************************************
 *
 * FUNCTION:      OnDecoderData
 *
 * DESCRIPTION:   Handles processing of events for the main form.
 *
 * PARAMETERS:    None
 *
 * RETURNED:      True if the event is handled, false otherwise.
 *
*****************************************************************/

Boolean OnDecoderData() //GetSerialData()
{
      static Char BarTypeStr[80]=" ";
      MESSAGE     decodeDataMsg;
      int         status;
      VoidHand    hExtendedData;
      unsigned char*pExtendedData;
      int         extendedDataType;
      Word        numlines;
      if (extend) {
```

```
        hExtendedData = MemHandleNew ( extendedDataLength);
        pExtendedData = (unsigned char *) MemHandleLock
        (hExtendedData);
        status = ScanGetExtendedDecodedData
        (extendedDataLength, &extendedDataType,
        pExtendedData);
}
else        {
        status = ScanGetDecodedData ( &decodeDataMsg);
        extendedDataType = decodeDataMsg.type
        extendedDataLength = decodeDataMsg.length;
        hExtendedData = MemHandleNew (extendedDataLength +1)
        pExtendedData = (unsigned char *) MemHandleLock
              (hExtendedData);
        pExtendedData [extendedDataLength] = '\0';
        MemMove (&pExtendedData [0], &decodeDataMsg.data [0],
              extendedDataLength+1);
}
if (status == STATUS_OK ) // if we successfully got the decode
                          //    data from the API...
        FieldPTR    pField;
        //call a function to translate barcode type into a
        //string, and display it
        ScanGetBarTypeStr (extendedDataType, BarTypeStr, 30);
        //in Utils.c
        SetFieldText (MainBarTypeField, BarTypeStr, 30, true);

        //Check to see if this scan was a "No Read Data"
        //(indicated by type of zero)
        if (extendedDataType ==0)
        {
              SetFieldText (MainScandataField, "No Scan", 30,
              true);
        }
        else
        {
              // Place the barcode data into the field and
              //display
              /*Set up data display field to display the
              memory*/
```

```
            pField =(FieldPtr)GetObjectPtr(MainScandataField);

            pField->attr.editable =true;
            FldDelete (pField, 0, FldGetTextLength (pField));
            //clear out old data

            if (extendedDataLength -> FldGetMaxChars (pField))
                  FldSetMaxChars (pField, extendedDataLength);

            FldEraseField (pField);//hide field so we don't see the
                                    //data scroll in
            FldInsert(pField, (char*) (&pExtendedData [0],
                  extendedDataLength);
            //move to top of scroll bar
            numlines = FldCalcFieldHeight ((char*)&pExtendedData
            [0], SCANDATA_WIDTH);
            ScrollLines (-numlines, false);//scroll to top of data
            FldDrawField(pField);         // show field
            pField->attr.editable = false;
            }
      }
      UpdateScrollbar();

      MemHandleUnlock (hExtendedData);
      MemHandleFree (hExtendedData);

      return(0);
}
```

MainFormHandleEvent handles five specific events. Most are standard Palm events that are probably already familiar to you. However, two are events that scan-aware applications will need to handle.

- **scanDecodeEvent** is a special event issued by the Scan Manager software to your application. It signals to your code that a scan (either successful or unsuccessful) has been completed. In response to the **scanDecodeEvent**, you can call the **ScanGetDecodedData** Scan Manager function, which gives you the results from the most recent scan. This is illustrated in the **OnDecoderData** function shown previously.

- **`scanBatteryErrorEvent`** is another special event issued by Scan Manager to your application. You receive this event whenever a scan operation fails because of low battery levels. When this condition occurs, the scanner is disabled until the batteries are replaced or recharged. Because of this, and because this condition occurs sooner than the normal low-battery warning of a Palm organizer, it is important that you execute some code to alert end-users. The Sscan application does this by issuing an alert.
- **`frmOpenEvent`** is a standard event that most Palm organizer developers are familiar with. Sscan calls **`MainFormOnInit`** to initialize and draw the main form.
- **`menuEvent`** is another standard Palm event. The **`menuEvent`** code in Sscan allows you to issue a decoder command to reset all of the decoder parameters to their defaults. It also allows you to display an About form with all of the version information for your SPT scanner software.
- **`ctlSelectEvent`** is an event received by the application in response to the user pushing a button. In Sscan, it is in response to the "Scan" button on the main form. Upon receiving this event, a scan is initiated by calling the **`ScanCmdStartDecode`** Scan Manager API function.

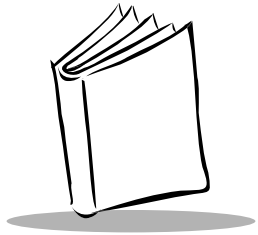
The StopApplication Function

The **`StopApplication`** function is called at the conclusion of **`PilotMain`**. This function first uses **`ScanIsPalmSymbolUnit`** to make sure the application is running on an SPT device. We recommend this check only if your software might be running on both unmodified Palm III devices and SPT devices. If Sscan is running on an SPT device, we call **`ScanCmdScanDisable`** to disable scanning. This is not required, merely suggested.

Finally, you must call the **`ScanCloseDecoder`** function before exiting your program. This function powers down the decoder and closes the Scan Manager shared library. Failure to call **`ScanCloseDecoder`** can cause unpredictable system problems.

```
/*****************************************************************
 *
 * FUNCTION:      StopApplication
 *
 * DESCRIPTION:   This routine does any cleanup required, including
 *                shutting down the decoder and Scan Manager shared
 *                library.
 *
 * PARAMETERS:    None.
 *
 * RETURNED:      Nothing.
 *
*****************************************************************/

static void StopApplication(void)
{
      if (ScanIsPalmSymbolUnit())
      {
            // Disable scanner and close Scan Manager library
            ScanCmdScanDisable();
            ScanCloseDecoder();
      }
}
```



Chapter 7
2-Dimensional Scanning Considerations

Introduction

In the Scan Manager for the SPT 1500 and SPT 17xx, the maximum length of decoded data was set to 255, which is long enough for any 1-Dimensional barcode. However, it is possible for the information encoded in a 2-Dimensional PDF417 symbol to exceed the 255-byte limit. For models of the SPT 1700 that perform 2-dimensional scanning, the maximum length of decoded data is 3000 bytes. Because of these 'Extended Data' barcodes, and because of the need to maintain compatibility with legacy applications, a new method was created for applications to retrieve this 'Extended Data'.

Issue

Because the maximum length of decoded data is increased for 2D barcodes, the shared scanner library needs to be changed to support this. However, the Scanner Manager cannot just assume the application has been written to handle receiving large amounts of decode data, since legacy applications were written assuming the maximum data length was 255 bytes. A new API, described below, allows applications written with the original scanner library to still function properly, while also allowing applications written for 2D bar codes to receive the extended data.

Solutions

To allow new applications to receive Extended Data bar codes, we must create a new API that does not use the MESSAGE structure for delivering the decode data to the application. However, to allow existing scanning applications to function on both a standard SPT 1500/

SPT 1700 and the SPT 1700 2-Dimensional unit, we need to ensure that if an application is using the MESSAGE structure, then only a maximum of 255 bytes of data are returned to that application, even if a larger bar code has been scanned. To allow the receiving of Extended decode data, a new API has been added to the scanner SDK.

```
ScanGetExtendedDecodeData(int length, int *type, unsigned char *buf)
```

where:

`length`: passed to the function by the application, and is the size of the buffer pointed to by *buf.

`*type`: pointer to an int, and will contain the bar code type after the API is successfully called.

`*buf`: pointer to the buffer to place the decoded data.

Two dimensional scanning can be implemented as follows:

After the Scan Manager receives the decoded data, a flag is set in the **`scanDecodeEvent`** message to notify the application that extended data is being sent and the length of the extended data is passed to the user. The flag is **`bit 0`** of **`scanData.scanGen.data1`** of struct **`ScanEventType`**, which is defined in **`ScanMgrStruct.h`**. The length of the extended data is stored in **`scanData.scanGen.data2`** of struct **`ScanEventType`**:

```
typedef struct
{
            enum events    eType;
            Boolean        penDown;
            SWord          screenX;
            SWord          screenY;
            union scanData
            {
                   struct scanGen
            {
                   Word data1;    //Bit 0 is the flag to tell app
                                  //if decode data has extended data.
                   Word data2;    //Length of the decoded data.
                   Word data3;
                   Word data4;
                   Word data5;
                   Word data6;
                   Word data7;
                   Word data8;
            } scanGen;
            struct
            {
                   UInt batteryLevel;// The current voltage
                          //      measured in millivolts
```

```
                    UInt batteryErrorType;// not used
                } batteryError;
        } scanData;// End of union

} ScanEventType;
typedef ScanEventType *ScanEventPtr;
```

In ScanMgrDef.h, we have added the following #define for the extended data flag:

```
#define EXTENDED_DATA_FLAG 0x01
```

An application gets the flag and the length of the extended data from the event in function MainFormHandleEvent:

```
Word            extendedDataFlag;
int             extendedDataLength;
Boolean extend;
.
.
.
case scanDecodeEvent:
        extendedDataFlag=((ScanEventPtr)event)->scanData.scanGen.data1;
        extendedDataLength=(int)(((ScanEventPtr)event)
        ->scanData.scanGen.data2);
        if (extendedDataFlag & EXTENDED_DATA_FLAG){
                extend = true;
        }
        else    {
                extend = false;
        }
        OnDecoderData(extend);
        .
        .
        .
```

In function **OnDecoderData**, check **extendedDataFlag**. If this is set, the application allocates a buffer with the size of **extendedDataLength** and retrieves the decoded data in it by calling **ScanGetExtendedDecodedData()**. Please note: this buffer must be freed by the user after use. If this flag is not set, the application retrieves the decoded data by calling **ScanGetDecodedData()** as before:

```
Boolean OnDecoderData(Boolean extend)
{


        static Char BarTypeStr[80]=" ";
        MESSAGE        decodeDataMsg;
```

```
        int             status;
        VoidHand        hExtendedData;
        unsigned char*pExtendedData;
        int             extendedDataType;


        if (extend){
                hExtendedData = MemHandleNew( extendedDataLength );
                pExtendedData = MemHandleLock( hExtendedData );
                status = ScanGetExtendedDecodedData(extendedDataLength,
                        &extendedDataType, pExtendedData);
        }

        else    {
                status = ScanGetDecodedData( &decodeDataMsg );
                extendedDataType = decodeDataMsg.type;
                extendedDataLength = decodeDataMsg.length;
                hExtendedData = MemHandleNew(extendedDataLength+1);
                pExtendedData = MemHandleLock( hExtendedData );
                pExtendedData[extendedDataLength] = '\0';
                MemMove( &pExtendedData[0], &decodeDataMsg.data[0],
                        extendedDataLength+1 );

        }



        if( status == STATUS_OK )
        {
        /* if we successfully got the decode data from the API, place the
        barcode data into the field and display.  Please read the
        sample code Scan2D.c about using scroll bar to show extended
        data.   */

        }
        .
        .
        .
        return(0);

}
```

If an application ignores the extendedDataFlag and calls ScanGetDecodedData(), then the scan manager will return only the first 255 bytes of the data.

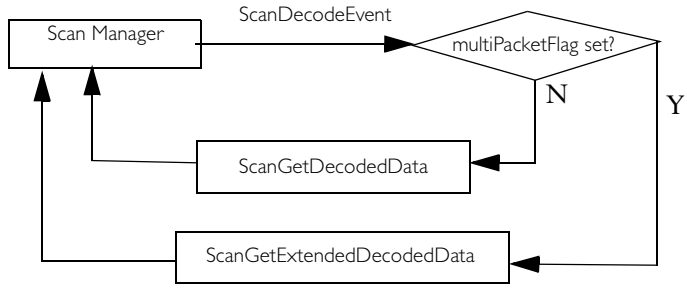
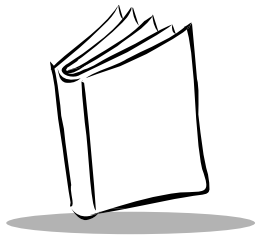


Figure 7-1. Scanner Library



Appendix A
ASCII Equivalents

Table A-1 contains the ASCII equivalents for adding prefix and suffix values to scanned data. See **ScanGetPrefixSuffixValues** and **ScanSetPrefixSuffixValues**.

Table A-1. ASCII Equivalents

Scan Value	Hex Value	Full ASCII Code 39 Encode Character	Keystroke
1000	00h	%U	CTRL+2
1001	01h	$A	CTRL+A
1002	02h	$B	CTRL+B
1003	03h	$C	CTRL+C
1004	04h	$D	CTRL+D
1005	05h	$E	CTRL+E
1006	06h	$F	CTRL+F
1007	07h	$G	CTRL+G
1008	08h	$H	CTRL+H
1009	09h	$I	CTRL+I
1010	0Ah	$J	CTRL+J
1011	0Bh	$K	CTRL+K
1012	0Ch	$L	CTRL+L
1013	0Dh	$M	CTRL+M

Table A-1. ASCII Equivalents

Scan Value	Hex Value	Full ASCII Code 39 Encode Character	Keystroke
1014	0Eh	$N	CTRL+N
1015	0Fh	$O	CTRL+O
1016	10h	$P	CTRL+P
1017	11h	$Q	CTRL+Q
1018	12h	$R	CTRL+R
1019	13h	$S	CTRL+S
1020	14h	$T	CTRL+T
1021	15h	$U	CTRL+U
1022	16h	$V	CTRL+V
1023	17h	$W	CTRL+W
1024	18h	$X	CTRL+X
1025	19h	$Y	CTRL+Y
1026	1Ah	$Z	CTRL+Z
1027	1Bh	%A	CTRL+[
1028	1Ch	%B	CTRL+\
1029	1Dh	%C	CTRL+]
1030	1Eh	%D	CTRL+6
1031	1Fh	%E	CTRL+-
1032	20h	Space	Space
1033	21h	/A	!
1034	22h	/B	‘
1035	23h	/C	#
1036	24h	/D	$
1037	25h	/E	%
1038	26h	/F	&
1039	27h	/G	‘

Table A-1. ASCII Equivalents

Scan Value	Hex Value	Full ASCII Code 39 Encode Character	Keystroke
1040	28h	/H	(
1041	29h	/I	)
1042	2Ah	/J	*
1043	2Bh	/K	+
1044	2Ch	/L	,
1045	2Dh	“	“
1046	2Eh	.	.
1047	2Fh	/	/
1048	30h	0	0
1049	31h	1	1
1050	32h	2	2
1051	33h	3	3
1052	34h	4	4
1053	35h	5	5
1054	36h	6	6
1055	37h	7	7
1056	38h	8	8
1057	39h	9	9
1058	3Ah	/Z	:
1059	3Bh	%F	;
1060	3Ch	%G	<
1061	3Dh	%H	=
1062	3Eh	%I	>
1063	3Fh	%J	?
1064	40h	%V	@
1065	41h	A	A

Table A-1. ASCII Equivalents

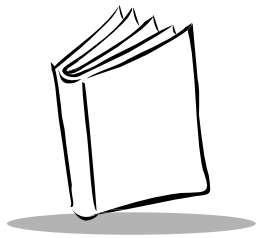
Scan Value	Hex Value	Full ASCII Code 39 Encode Character	Keystroke
1066	42h	B	B
1067	43h	C	C
1068	44h	D	D
1069	45h	E	E
1070	46h	F	F
1071	47h	G	G
1072	48h	H	H
1073	49h	I	I
1074	4Ah	J	J
1075	4Bh	K	K
1076	4Ch	L	L
1077	4Dh	M	M
1078	4Eh	N	N
1079	4Fh	O	O
1080	50h	P	P
1081	51h	Q	Q
1082	52h	R	R
1083	53h	S	S
1084	54h	T	T
1085	55h	U	U
1086	56h	V	V
1087	57h	W	W
1088	58h	X	X
1089	59h	Y	Y
1090	5Ah	Z	Z
1091	5Bh	%K	[

Table A-1. ASCII Equivalents

Scan Value	Hex Value	Full ASCII Code 39 Encode Character	Keystroke
1092	5Ch	%L	\
1093	5Dh	%M	]
1094	5Eh	%N	^
1095	5Fh	%O	_
1096	60h	%W	‘
1097	61h	+A	a
1098	62h	+B	b
1099	63h	+C	c
1100	64h	+D	d
1101	65h	+E	e
1102	66h	+F	f
1103	67h	+G	g
1104	68h	+H	h
1105	69h	+I	i
1106	6Ah	+J	j
1107	6Bh	+K	k
1108	6Ch	+L	l
1109	6Dh	+M	m
1110	6Eh	+N	n
1111	6Fh	+O	o
1112	70h	+P	p
1113	71h	+Q	q
1114	72h	+R	r
1115	73h	+S	s
1116	74h	+T	t
1117	75h	+U	u

Table A-1. ASCII Equivalents

Scan Value	Hex Value	Full ASCII Code 39 Encode Character	Keystroke
1118	76h	+V	v
1119	77h	+W	w
1120	78h	+X	x
1121	79h	+Y	y
1122	7Ah	+Z	z
1123	7Bh	%P	{
1124	7Ch	%Q	|
1125	7Dh	%R	}
1126	7Eh	%S	~
1127	7Fh	Undefined	



Appendix B
Parameter Definitions

Table B-1 lists the parameters available in the Scan Manager shared library. The information in this table includes parameter name, the terminal default setting, and the acceptable values.

Table B-1. Parameter Definitions

PARAMETER		DEFAULT SETTING	ACCEPTABLE VALUES
ParamDefaults		All defaults	
BeepFrequency	**Decode**	3000 Hz	0 - 15,000 Hz
	Low	1500 Hz	
	Medium	3000 Hz	
	High	7500 Hz	
BeepDuration	**Decode**	90 ms	0 - 10,000 ms
	Short	70 ms	
	Medium	90 ms	
	Long	240 ms	
LaserOnTime		3.0 seconds	0 - 10
AimDuration		0.0 seconds	
TriggeringModes		Level	Level, Pulse, Host
BeepAfterGoodDecode		Enable	Enable, Disable

Table B-1. Parameter Definitions

PARAMETER		DEFAULT SETTING	ACCEPTABLE VALUES
LinearCodeTypeSecurityLevel		Security_Level1	Level1 - Level4
BidirectionalRedundancy		Disable	
BarcodeEnabled	**UPC-A**	Enable	
	UPC-E	Enable	
	UPC-E1	Disable	
	EAN-8	Enable	
	EAN-13	Enable	
	Bookland EAN	Disable	
	Code 128	Enable	
	UCC/EAN-128	Enable	
	ISBT 128	Enable	
	Code 39	Enable	
	Trioptic Code 39	Disable	
	Code 93	Disable	
	I2of5	Enable	
	D2of5	Disable	
	Codabar	Disable	
	MSI Plessey	Disable	
DecodeUpcEanSupplementals		Ignore	
DecodeUpcEanRedundancy		7	2-20
TransmitCheckDigit	**UPC-A**	Enable	
	UPC-E	Enable	
	UPC-E1	Enable	

Table B-1. Parameter Definitions

PARAMETER		DEFAULT SETTING	ACCEPTABLE VALUES
TransmitCheckDigit (cont'd)	**Code 39**	Disable	
	I2of5	Disable	
	MSI Plessey	Disable	
UpcPreamble	**UPC-A**	System character	
	UPC-E	System character	
	UPC-E1	System character	
Convert	**UPC-E to A**	Disable	
	UPC-E1 to A	Disable	
	EAN-8 to EAN-13	Type is EAN-13	
	Code 39 to Code 32	Disable	
	I2of5 to EAN-13	Disable	
EanZeroExtend		Disable	
UpcEanSecurityLevel		0	Level 1 - Level 4
Code32Prefix		Disable	
BarcodeLengths	**Code 39**	2-32	
	Code 93	4-55	
	I2of5	14	
	D2of5	12	
	Codabar	5-55	

Table B-1. Parameter Definitions

PARAMETER		DEFAULT SETTING	ACCEPTABLE VALUES
BarcodeLengths (cont'd)	**MSI Plessey**	6-55	
Code39CheckDigitVerification		Disable	
Code39FullAscii		Disable	
I2of5CheckDigitVerification		Disable	
ClsiEditing		Disable	
NotisEditing		Disable	
MsiPlesseyCheckDigits		One	One, Two
MsiPlesseyCheckDigitAlgorithm		Mod 10/Mod 10	
TransmitCodeIdCharacter		None	
PrefixSuffixValues	**Prefix**	Null	
	Suffix 1	LF	
	Suffix 2	CR	
ScanDataTransmissionFormat		Data as is	
ScanAngle		Wide	Wide, Narrow
DecodeLedOnTime		3 seconds	0 - 99