Ingenico 6780

User's Guide

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Ingenico 6780 User's Guide
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Revision History

Date	Changes	Manual Revision
	Initial Release	

Chapter 1

Introduction

1.1 Payment Types

The Ingenico 6780 customer input terminal supports payment information processing and authorization at the point of sale (POS) in your business. With the appropriate application software, the Ingenico 6780 terminal supports the following payment types:

- Credit
- Debit, ATM
- Electronic Benefits Transfer (EBT)

The Ingenico 6780 is also a utility platform for electronic marketing, such as advertising and loyalty programs. In addition to payment, the terminal can be used for the following:

- Customer graphics display
- Item scrolling
- Loyalty programs
- Advertising
- Instant credit
- Personal messaging
- Cross selling
- Electronic couponing

The Ingenico 6780 terminal can capture an electronic image of a customer's signature for credit transactions and transmit it to a host system (i.e., cash register or computer).

1.2 Connectivity

The Ingenico 6780 terminal can connect directly to a cash register, computer, Ethernet LAN, or RS485 LAN. Peripherals such as check readers and bar code scanners can be connected to the AUX port.

For more information about connectivity, refer to the *Ingenico 6780 Installation & Operations Guide*, part number DIV350487.

1.3 About this Manual

Chapters 1 through 7 explain how to use the Extended Menu. Chapters 8 through 10 give background information to help you understand downloading and key management, and Chapters 11, 12, and 13 address downloading.

Chapter 1, *Introduction*, gives an overview of the terminal, this manual, and kits that are available.

Chapter 2, *Extended Menu Overview*, explains how to navigate the Extended Menu and find the unit's current configuration settings. It also lists the options available within each menu.

Chapter 3, *System Configuration Menu*, explains how to perform the functions in the system configuration menu: change date and time, set display contrast, and adjust beep tones.

Chapter 4, *System Info Menu*, explains how to navigate through the system info menu to view the following system information: check versions, check security info, and view parameters.

Chapter 5, *Supervisor Menu*, gives the password to enter this menu, and explains how to change the password. It explains how to check or erase the application file in the terminal, and how to perform the following security functions: set key injection port, allow key injection, check the key value, and allow the serial key to be injected.

Chapter 6, *System Parameters Menu*, explains how to indicate the download method, set the download port, setup the port, and configure the host port's auto detect feature.

Chapter 7, *Diagnostic Menu*, explains how to perform diagnostic tests on the display, keypad, beeper, communications, MSR, smart card reader, SAMs, touch screen, and signature capture.

Chapter 8, *Architecture*, explains the system architecture, host communications, and terminal architecture. It explains the components inside the terminal that are referred to in subsequent chapters.

Chapter 9, *Key Architecture*, explains the sponsor key (KTK), terminal based keys, application based keys, and security options, such as MACing.

Chapter 10, *Secure Certificate*, explains the securing process and the components of the secure certificate.

Chapter 11, *IBMEFT Download*, explains the prerequisites, preparation, timing, and steps involved with the IBMEFT method of downloading.

Chapter 12, *Download Errors*, explains how to resolve errors that might be encountered during an IBMEFT download.

Chapter 13, *IBMEFT Troubleshooting*, explains how to resolve error messages that may appear on your Ingenico 6780 display if using IBMEFTDL.

1.4 Conventions Used in this Manual

The following table explains the conventions used in this manual.

Convention	Use	Example
[Brackets]	Highlights a key to press on the terminal	[1]
Bold	Highlights text that displays on the computer screen	**My Computer**
Code	Highlights coding used in descriptors	MAC=12345678
Italic	Highlights book titles, important terms, variables	*applname*

1.5 Kits

The following kits are available from your Ingenico representative, including integration and development kits used to write custom applications to run on the Ingenico 6780 terminal.

1.5.1 Basic Installation Kit

The Basic Installation Kit consists of an Ingenico 6780 terminal and an Ingenico 6780-to-ECR cable. Refer to the *Ingenico 6780 Installation and Operations Guide* for detailed instructions on installing the unit.

1.5.2 Store Installation Kit

The store installation kit consists of the contents of the Basic Installation Kit plus a CD-ROM containing the Ingenico 6780 Retail Base Application program and parameter files and a copy of the MLDT utility program.

1.5.3 Retail Base Application Integration Kit

The Retail Base Application Integration Kit consists of the Store Installation Kit, an adapter kit, and all necessary manuals. This allows for the connection of the Ingenico 6780 to an IBM PC for downloading a program or parameters using MLDT.

1.5.4 OPOS Software Development Kit

This kit contains the programs, files, and manuals needed to allow a programmer to write a custom application for a register or host that interfaces with the Ingenico 6780 using OPOS (object linking and embedding for retail point of sale).

1.5.5 JavaPOS Software Development Kit

This kit contains the programs, files, and manuals needed to allow a programmer to develop a custom application for a register or host that interfaces with the Ingenico 6780 using JavaPOS (Java for retail point of sale).

1.5.6 UNICAPT 32 Software Development Kit

This kit allows a programmer to develop a custom application for the Ingenico 6780 terminal using Ingenico's operating system, UNICAPT 32.

Chapter 2

Extended Menu Overview

2.1 Overview

The Extended Menu allows you to configure the terminal, get system information, check the file system, do key injection, get key check value, set system parameters for downloading, and test the product hardware. This chapter explains how to navigate the Extended Menu and includes a chart of menu options. Subsequent chapters explain how to perform functions in the Extended Menu. The Extended Menu descriptions are current as of SSA VAR05 version 2.36.

2.2 Accessing the Extended Menu

To access the Extended Menu:

Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.

2.3 Navigating the Extended Menu

The current menu name displays on the first line, and the menu options appear on subsequent lines.

- To press a screen button, use your finger or the stylus.
- To select a menu item, tap it using the stylus, or use the keys to select (see following table).

Note: Because the menu items are small, touching a menu item with your finger to select will not work (use the stylus instead). Or, you may use the following keys to navigate the menu.

Keys: USA	Canada	Europe	Action
+	+	-	Scroll down one item
-	-	+	Scroll up one item
X Enter	X OK	X Enter	Initiate selected menu option
< Clear	< Corr	< Clear	No effect in the Extended Menu
O Cancel	O Can/Ann	O Cancel	Return to the previous menu If you are at the Extended Menu, return to application's idle prompt

Note: As you can see in the table, there are three sets of keys, one for each region. ***This***

manual will refer to the keys by the USA key names. European users will need to reverse the + and – keys in the instructions.

2.4 Finding the Current Setting

The current setting will be highlighted in reverse video.

Display	Explanation
COM1 **COM2**	In this example, COM2 is the current setting.

2.5 Finding Options in the Extended Menu

Menu	Submenu	Submenu	Submenu
Serialnum Inject			
System Config	System Date/Time		
	Display Contrast		
	Display Backlight		
	Key Press Beep	Enable	Length Tone
		Disable	
	Backlight On/Off	Always On	
		Always Off	
		Idle Timeout	

System Info	Versions Security Info RAM Info View Parameter			
Supervisor Menu	Change Password			
	Application File	AppA AppB	Read Erase	
	Security	Key Injection	Inject Keys	
			Injection Port	COM1 COM2
			Index Select	
			App Select	
		Key Check Value	Term Keys Application Keys	
		Erase App Keys	Key1	
			Key2	
		SerialnumInject		
	Sys Parameters	Download Method	IBMEFT NCREFT Zontalk GEMS Germany	
		Download Port	Port 1	
			Port 2	
			Port 3	
		Setup Port	Port 1	Interface Type Baud Rate Data Bits Stop Bits Parity Retry Count Response TMO LAN Address Poll TMO

					Turnaround TMO
			Port 2		Interface Type Baud Rate Data Bits Stop Bits Parity Retry Count Response TMO LAN Address Poll TMO Turnaround TMO
			Port 3		Interface Type Baud Rate Data Bits Stop Bits Parity Retry Count Response TMO DHCP Local IP Local IP Port ▼ Server IP Server IP Port IP Add Mask Gateway Primary DNS Secondary DNS Domain Name
			Dial		Dial Phone Num Modem Speed
			Host Port		COM1 COM2 COM3
			Aux Port		COM1 COM2 COM3
		Auto Detect		AD On/Off	On Off
				AD Timeout	

		Parameter Editor	AD Retry Times
Diagnostic Menu	Display		
	Keypad		
	Beeper		
	RS232	COM1	
		COM2	
	Tailgate		
	USB		
	Mag Stripe Reader		
	Smart Card Reader		
	SAM		
	Touch Screen		
	Signature Capture		
	Pen Calibration		
	Finger Calibration		
SCV Verification	*(Ingenico use only)*		

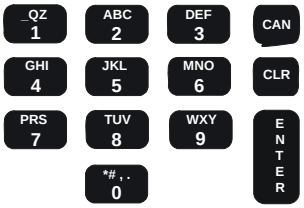
Chapter 3

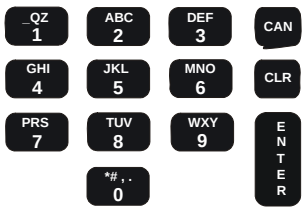
System Configuration Menu

3.1 Overview

This chapter explains how to perform the functions in the system configuration menu: change date and time, set display contrast, and adjust beep tones (length and tone).

3.2 Changing the Date and Time

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **System Config**.
System Config System Date/Time Display Contrast	Tap **System Date/Time**.
Enter Date 2003/08/22 	Key the new date using the format YYYYMMDD, then press [Enter]. To bypass, press [Enter].
Enter Time 17H21	Key the new time using the format, HHMM, then press [Enter]. The system uses a 24-hour clock. To bypass, press [Enter]. **Note**: You do not need to enter the H (for hour).

 _QZ 1 ABC 2 DEF 3 CAN GHI 4 JKL 5 MNO 6 CLR PRS 7 TUV 8 WXY 9 ENTER *# , . 0	

3.3 Changing the Display Contrast

If you are have difficulty reading your terminal screen, you can increase or decrease the contrast. This setting is stored in sysPara.cfg. You can also test the display contrast: see “Testing the Display Contrast” on page 67.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **System Config**.
System Config System Date/Time Display Contrast	Tap **Display Contrast**.
Contrast = 100% ↑ ↓ OK Cancel	The current value is displayed, between 0 and 100. To decrease the contrast, press the [**+**] key. To increase the contrast, press the [**-**] key. When the desired setting is reached, press [Enter] to accept and return to the configuration menu. **Note**: If you press [Cancel] or [Clear], the contrast setting is not changed.

Note: The terminal modifies contrast settings automatically when temperatures vary.

3.4 Adjusting the Display Backlight Brightness

You can adjust the brightness of the backlight on the display screen.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **System Config**.

System Config System Date/Time Display Contrast **Display Backlight** Key Press Beep	Tap **Display Backlight**.
Backlight = 100% ↑ ↓ OK Cancel	To adjust the backlight brightness: ▪ Press [**+**] to increase the brightness ▪ Press [**-**] to decrease the brightness ▪ Press [Enter] when finished

3.5 Changing the Beep Tones

You may disable, enable, or change the beep tones that sound when keys are pressed. These settings are stored in sysPara.cfg. To test the beep tones, see "Testing the Beeper" on page 68.

3.5.1 Enable/Disable Beep Tones

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject **System Config** System Info Supervisor Menu	Using the stylus, tap **System Config**.
System Config System Date/Time Display Contrast Display Backlight **Key Press Beep**	Tap **Key Press Beep**.
Beep Tone Status **Enable** Disable	To turn on key press beeps, tap **Enable**. To turn off key press beeps, tap **Disable**.
Key Beep Length Tone	Tap **Prev**. To change the beep length or tone, see the following tables. **Note**: Prompt displays if you selected Enable.

3.5.2 Changing the Beep Length

This option allows you to change how long the beep sounds on key press. To hear what each beep sounds like, see "Testing the Beeper," described on page 68.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **System Config**.
System Config Change Date/Time Display Contrast Display Backlight Key Press Beep	Tap **Key Press Beep**.
Beep Tone Status Enable Disable	Tap **Enable**.
Key Beep Length Tone	Tap **Length**.
Beep Length Click Short Long	Select the option you want.
Key Beep Length Tone PREV	You are returned to the previous menu. Tap **Prev** to return to the previous menu.

3.5.3 Changing the Beep Tones

This option allows you to change the tone of the beep that sounds on key press. To hear what each beep sounds like, see “Testing the Beeper” on page 68.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **System Config**.
System Config Change Date/Time Display Contrast Key Press Beep	Tap **Key Press Beep**.
Beep Tone Status Enable Disable	Press [Enter] to select **Enable**.
Key Beep Length Tone	Tap **Tone**.
Beep Tone Low Midtone High	Select the option you want.
Key Beep Length Tone PREV	You are returned to the previous menu. Tap **Prev** to return to the previous menu.

3.6 Turning the Backlight Off

3.6.1 Turning the Backlight Off

This allows you to turn the backlight on the display screen on or off. You may also set the backlight to be off when idle only (see next section).

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **System Config**.
System Config Change Date/Time Display Contrast Key Press Beep Backlight On/Off	Tap **Backlight**.
Backlight Always On Always Off Idle Timeout	Select **Always On** or **Always Off**. For instructions on how to set the idle timeout for the backlight, see the following section.
System Configuration Updating	
Backlight Always On Always Off Idle Timeout PREV	The current value displays in reverse video. Tap **Prev** to return to the previous menu.

3.6.2 Setting Backlight to Off When Idle

When the terminal is not in use, this option allows you to set an amount of time after which the backlight on the display screen automatically turns off. When a customer or process engages the terminal, the backlight is turned back on.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info	Using the stylus, tap **System Config**.
System Config Change Date/Time Display Contrast Key Press Beep Backlight	Tap **Backlight**.
Backlight Always On Always Off Idle Timeout	Tap **Idle Timeout**.
Idle Timeout(s): Old Value: Always On Enter New Value: _QZ 1 · ABC 2 · DEF 3 · CAN GHI 4 · JKL 5 · MNO 6 · CLR PRS 7 · TUV 8 · WXY 9 · ENTER *# , . 0	Enter the new timeout value in seconds.
System Configuration Updating	
Backlight Always On Always Off Idle Timeout PREV	Tap **Prev** to return to the previous menu.

Chapter 4

System Info Menu

4.1 Overview

This chapter explains how to navigate through the system info menu to view the following system information: check versions of download files, operating system, SSA, and applications; check security information such as MACing; and view parameter settings.

4.2 Finding Version Numbers

This allows you to look up the current version numbers for hardware, firmware, and software loaded in your terminal.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config **System Info** Supervisor Menu	Using the stylus, tap **System Info**.
System Info **Versions** Security Info	Press [Enter] to select **Versions**.
Versions EFTL XXXX EFTP XXXX TALIF XX.XX DIG LOADER XX.XX.XX DIG APP XX.XX.XX OS XX.XX SSA VAR05 XX.XX APP1 XX.XX PREV	This screen displays the version numbers of the download files (EFTL and EFTP), Talif chip, Digitizer loader and application, operating system (OS), System and Security Application (SSA), maintenance application (MNT APP), and all other applications. Tap **Prev** to return to the previous menu.

4.3 Checking the Security Information

This allows you to look up information related to security and key management.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **System Info**.
System Info Versions Security Info	Tap **Security Info**.
Security Info Prompt MAC Key: Terminal Based Reinject SN: Do Not Erase Keys Prompt MACing: Disable Code MACing: Disable MAC Calculation: Double Length Key Atalla KBK: Disable Startup Verify MACing: Disable PED Mode: Disable Financial Key: App Based Serial Number: XXXXXXXXX Cancel	The security options and serial number display. When you are finished reading it, tap **Cancel** to return to the previous menu. ***Note***: Your parameter values may be different.

4.4 RAM Info

This allows you to look up information on your terminal's memory space.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **System Info**.
System Info Versions Security Info RAM Info	Tap **RAM Info**.
Security Info Total RAM Size: 0 bytes Smallest Free Mem Siz: 0 bytes Biggest Free Mem Chun: 0 bytes Backup SRAM Size: 0 bytes Cancel	The security options and serial number display. When you are finished reading it, tap **Cancel** to return to the previous menu. ***Note***: Values listed are examples only.

4.5 Viewing All Parameter Values

This menu option allows you to view the current system parameter settings. To change system parameters, see Chapter 6, "System Parameters Menu," on page 38.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **System Info**.
System Info Versions Security Info View Parameter	Tap **View Parameter**.
View Parameters Version Info: 1.1 Key Entry Beep: Enable Key Beep Length: Click Key Beep Tone: Low Device Type: Signature Capture LCD Contrast: 100% Key Inj Port: COM1 Manufacture ID: INGNAR Device Type ID: I6780N Backlight TMO: 11s. LCD Backlight: 100%	The current parameter settings display. To scroll down to the next screen, press [**+**]. When you are finished reading it, press [Cancel] to return to the previous menu. ***Note***: Your parameter values may be different. TMO = timeout

COM1 AutoDet Res: RS485 COM1AutoDet On/Off OFF COM1 AutoDet TMO: 500ms COM1 AutoDet Retry: 3 Download Method: IBMEFT Download Port Number: COM1 Download Port Type: RS232 Last download result: No Download Host Port Number: COM1 Aux Port Number: COM2 ↓	Press [+] to advance to the next screen.
COM1 Interface Type: ↑ RS232 COM1 Baud Rate: 9600 COM1 Data Bits: 8 COM1 Stop Bits: 1 COM1 Parity: NONE COM1 LAN Address: 104 COM1 Retry Times: 3 COM1 Resp TMO: 3000ms COM1 Poll TMO: 3000ms COM1 TurnArd TMO: 3000ms	TMO = timeout

COM2 Interface Type: RS232 COM2 Baud Rate: 9600 COM2 Data Bits: 8 COM2 Stop Bits: 1 COM2 Parity: NONE COM2 LAN Address: 101 COM2 Retry Times: 3 COM2 Stop Bits: 1 COM2 Parity: NONE COM2 LAN Address: 101 COM2 Retry Times: 3 COM2 Resp TMO: 3000ms COM2 Poll TMO: 3000ms COM2 TurnArd TMO: 3000ms COM3 Interface Type: RS232 COM3 Baud Rate: 19200 COM3 Data Bits: 8 ↓	TMO = timeout
COM3 Stop Bits: ↑ 1 COM3 Parity: NONE COM3 Retry Times: NONE	

COM3 Resp Timeout: 3000ms ETH DHCP NONE/AUTO: AUTO ETH Local IP Add: 0.0.0.0 ETH Local IP Port: 0	
ETH Remote IP Add: 0.0.0.0 ETH Remote IP Port: 0 ETH IP Add Mask: 0.0.0.0 ETH Gateway: 0.0.0.0	
ETH Primary DNS: 0.0.0.0 ETH Secondary DNS: 0.0.0.0 ETH Domain Name: Dial Phone Num:	
Modem Speed: 9600 Appl Comment: 0.0.0.0	

Chapter 5

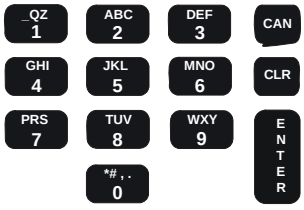
Supervisor Menu

5.1 Overview

This chapter explains how to change the supervisor password, check or erase the application file in the terminal, and perform the following security functions: set key injection port, allow key injection, check the key value, and allow the serial key to be injected.

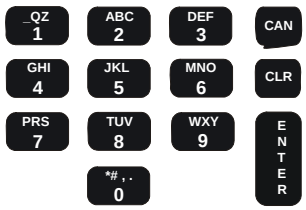
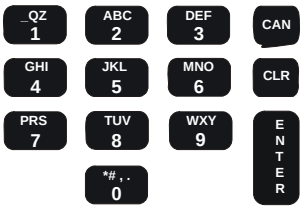
5.2 Supervisor Menu Password

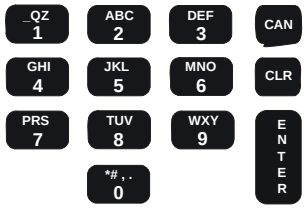
This is the default password for entering the Supervisor Menu.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password: 	Key password [2] [6] [3] [4], then press [Enter]. **Note**: If an incorrect password is entered, the message **Password Invalid** displays, then a prompt asks you to reenter the password. After three incorrect passwords, the application returns to the Extended Menu.

5.3 Changing the Supervisor Menu Password

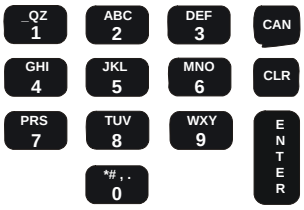
Ingenico recommends that you do not change the Supervisor Menu password. If you do change the Supervisor menu password, and then forget what that password is, the unit will need to be sent to an authorized repair facility to be reset. The applications and security keys will need to be reloaded into the unit.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File	Press [Enter] to select Change Password.
Old Password: 	Enter old password, then press [Enter].
New Password: 	Enter new password, then press [Enter]. ***Caution***: See preceding warning.

New Password Again: 	Enter new password again to confirm, then press [Enter].
Password Updated!	Be sure to make a note of your new password. (See preceding warning.)

5.4 Application File in Terminal

5.4.1 Reading the Application File

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password: 	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File	Tap **Application File**.
Select Appl App A App B App C	Select the application you want to check.
Select File sysPara.cfg	Select the file.

File Menu Read Erase	Press [Enter] to select Read.
sysPara.cfg Read [SOF] 010000000000 …… 010000000000 ……	The contents of the file display. To scroll down to the next screen, press [**+**]. When you are finished reading it, press [Cancel] to return to the previous menu.

5.4.2 Erasing the Application File

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security	Tap **Application File**.
Select Appl App A App B App C	Select the application you want to erase.
Select File sysPara.cfg	Select the file you want to erase.
File Menu Read Erase	Tap **Erase**.
Syspara.cfg Erase [SOF] 010000000000 ….	The contents of the file display. To erase, press [Enter].
Erase File? No Yes	Tap **YES** or **NO**.
Erasing File	If you selected YES, the terminal confirms it is erasing the file.

Select File sysPara.cfg	If you selected NO, you are returned to the SELECT File prompt. Select another file to erase or press [Cancel] to return to a previous menu.

5.5 Security

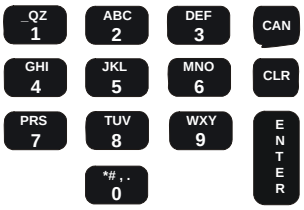
5.5.1 Setting the Key Injection Port

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security	Tap **Security**.
Security Key Injection Key Check Value Erase App Keys	Press [Enter] to select Key Injection.
Key Injection Inject Keys Injection Port	Tap **Injection Port**.
Injection Port COM1 COM2 Ethernet	Select the port you want.
Updating	

5.5.2 Injecting Keys

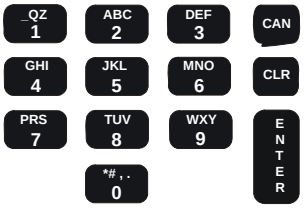
Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security	Tap **Security**.
Security Key Injection Key Check Value Erase App Keys Serialnum Inject	Press [Enter] to select Key Injection.
Key Injection Inject Keys Injection Port	Press [Enter] to select Inject Keys.
Key Injection Wait for command… Cancel	The terminal will now accept the key injection. For instructions on how to inject keys, see the manual for your key injection software (such as Ingenico's KeyFac or WinKeyFac). When finished, press [Cancel] to return to the previous menu.

5.5.3 Setting the Key Index

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security	Tap **Security**.
Security Key Injection Key Check Value Erase App Keys Serialnum Inject	Tap [Enter] to select Key Injection.
Key Injection Inject Keys Injection Port Index Select(X)	Tap **Index Select(X)**.
Index Select Old Value: X Enter New Value: 	Enter the new index select value, and then press [Enter].
Key Injection Inject Keys Injection Port Index Select(Y)	The Index Select(Y) option now reflects the new index number.

5.5.4 Setting the Application Number

You will have to know the four-digit application ID number to perform this procedure.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security	Tap **Security**.
Security Key Injection Key Check Value Erase App Keys Serialnum Inject	Press [Enter] to select Key Injection.
Key Injection Inject Keys Injection Port Index Select(X) App Select(AAAA)	Tap **App Select**(AAAA).
App Select Old Value: XXXX Enter New Value: 	Enter the new application select value, and then press [Enter].
Key Injection Inject Keys Injection Port Index Select(Y) App Select(BBBB)	The Index Select(BBBB) option now reflects the new application number.

5.5.5 Finding the Key Check Value: Terminal Keys

The key check value is a hexadecimal value that is used to verify that you have the right key in the terminal. You can find a key check value for terminal keys or application keys. This section covers terminal keys.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security	Tap **Security**.
Security Key Injection Key Check Value Erase App Keys Serialnum Inject	Tap **Key Check Value**.
Key Check Value Term Keys Application Keys	Select the type of key check values you want to see.
Terminal Keys Special Keys M/S Keys DUKPT Keys	Select the type of terminal key.
Special Keys KTK: XXXXXX Secure Text Key: XXXXXX Clear Text Key: XXXXXX Download Key: XXXXXX	The values for the keys you selected display – one of the following three screens will display (Special Keys, M/S Keys, or DUKPT Keys).

M/S Keys Master Key 0: Session Key 0: Master Key 1: Session Key 1: etc.	
DUKPT Keys DUKPT Key 0: DUKPT Key 1: etc.	

5.5.6 Finding the Key Check Value: Application Keys

The key check value is a hexadecimal value that is used to verify that you have the right key in the terminal. You can find a key check value for terminal keys or application keys. This section covers application keys.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security	Tap **Security**.
Security Key Injection Key Check Value Erase App Keys Serialnum Inject	Tap **Key Check Value**.
Key Check Value Term Keys Application Keys	Select the type of key check values you want to see.
Application Keys APP1 APP2	Select the application you want.

APP1 Special Keys M/S Keys DUKPT Keys	Select the type of keys you want.
Special Keys Secure Text Key: 012345 Clear Text Key: 123456	The values for the keys you selected display – one of the following three screens will display (Special Keys, M/S Keys, or DUKPT Keys).
M/S Keys Master Key 0: XXXXXX Session Key 0: XXXXXX Master Key 1: XXXXXX Session Key 1: XXXXXX etc.	
DUKPT Keys DUKPT Key 0: XXXXXX DUKPT Key 1: XXXXXX etc.	

5.5.7 Erasing Application Keys

The Erase App Keys option lists applications; you can choose to delete the keys to these applications. The applications listed no longer exist in the terminal, but the terminal has found keys that are still associated to them. These orphan keys are the only ones that the Extended Menu allows you to erase.

The i6780 terminal keeps the keys of deleted applications so that if a new version of the application is downloaded, the keys for that application will already be loaded in the terminal. However, if an application is no longer needed, the customer may choose to delete the keys using this menu option.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].

Supervisor Menu Change Password Application File Security	Tap **Security**.
Security Key Injection Key Check Value Erase App Keys Serialnum Inject	Tap **Erase App Keys**.
Erase App Keys App A App B	Select the application with the keys you want to delete.
? **App Keys Erase** Erase App A Keys? YES NO	Tap **Yes** or **No**.
Processing	Displays if app keys were deleted. You are returned to the previous menu.

5.5.8 Injecting a Serial Number

When authorized repair technicians replace a damaged terminal, they sometimes need to inject the serial number of the old terminal into a new terminal.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security	Tap **Security**.

Security Key Injection Key Check Value Erase App Keys Serialnum Inject	Tap **Serialnum Inject**.
Inject Serial # Wait for online… _____ Cancel	The terminal will now accept a serial number injection.

5.6 System Parameters

The system parameters are explained in the following chapter.

Chapter 6

System Parameters Menu

6.1 Overview

This chapter explains how change system parameters. These parameters allow you to indicate the download method, set the download port, setup the port, and configure the host port's auto detect feature.

To view a list of current parameter settings, see "Viewing All Parameter Values" on page 21.

All system parameters are saved in the public file, sysPara.cfg, which can be read by all applications that reside in the terminal.

6.2 Setting the Download Method

Use this procedure to select IBMEFT, NCREFT, Zontalk, GEMS, or Germany as your download method.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security Sys Parameters	Tap **Sys Parameters**.
Sys Parameters Download Method Download Port Setup Port	Press [Enter] to select Download Method.

Download Method IBMEFT NCREFT Zontalk GEMS Germany	Select the method you want. **Note**: The default is IBMEFT.
Updating	

6.3 Selecting the Download Port

Use this procedure to select the port you will use for downloading applications.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security Sys Parameters	Tap **Sys Parameters**.
Sys Parameters Download Method Download Port Setup Port	Tap **Download Port**.
Download Port Port1 Port2 Port3	Select the port that you want to use as the download port (by default, 1 for Host, 2 for Aux, or 3 for E-NET - Ethernet).

6.4 Setting Up the Port

6.4.1 Selecting the Download Interface Type

Use this procedure to select RS232, RS485, Ethernet, etc. as the interface type for Port1 (Host), Port2 (Aux), or Port3 (Ethernet).

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security Sys Parameters	Tap **Sys Parameters**.
Sys Parameters Download Method Download Port Setup Port	Tap **Setup Port**.
Download Port Port1 Port2 Port3 Dial Host Port Aux Port	Tap **Port1**, **Port2**, or **Port3**. (By default, Port 1 = Host, Port 2 = Aux, Port 3 = E-NET port - Ethernet.)
PortX Interface Type Baud Rate Data Bits	Press [Enter] to select **Interface Type**.
PortX Auto Detect Result RS232 RS485	Select the communications method you want. If you select Port 1 and Auto Detect Result, the application will detect the communications type of a cable plugged into the selected port and return that information to you.

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6.4.2 Setting the Baud Rate

Set the baud rate according to the host requirements.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security Sys Parameters	Tap **Sys Parameters**.
Sys Parameters Download Method Download Port Setup Port	Tap **Setup Port**.
Setup Port Port1 Port2 Port3 Dial	Tap **Port1**, **Port2**, or **Port3**. (By default, Port 1 = Host, Port 2 = Aux, Port 3 = E-NET port - Ethernet.)
Port X Interface Type Baud Rate Data Bits Stop Bits	Tap **Baud Rate**.
Baud Rate 19200 38400 57600	Select the appropriate baud rate.

76800 115200	
Updating	Press [Cancel] to return to the previous menu.

6.4.3 Setting the Data Bits

Set the data bits according to the host requirements.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security Sys Parameters	Tap **Sys Parameters**.
Sys Parameters Download Method Download Port Setup Port	Tap **Setup Port**.
Setup Port Port1 Port2 Port3	Select **Port1**, **Port2**, or **Port3**. (By default, Port 1 = Host, Port 2 = Aux, Port 3 = E-NET port - Ethernet.)
Port X Interface Type Baud Rate Data Bits Stop Bits	Tap **Data Bits**.
Data Bits 5 6 7 8	Select the appropriate data bits value.
Updating	

6.4.4 Setting the Stop Bits

Set the stop bits according to the host requirements.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security Sys Parameters	Tap **Sys Parameters**.
Sys Parameters Download Method Download Port Setup Port	Tap **Setup Port**.
Setup Port Port1 Port2 Port3	Select **Port1**, **Port2**, or **Port3**. (By default, Port 1 = Host, Port 2 = Aux, Port 3 = E-NET port - Ethernet.)
Set Port X Interface Type Baud Rate Data Bits Stop Bits	Tap **Stop Bits**.
Stop Bits 1 2	Select the appropriate stop bits value.
Updating	

6.4.5 Setting the Parity

Set the parity according to the host requirements.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Tap **Supervisor Menu**.
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security Sys Parameters	Using the stylus, tap **Sys Parameters**.
Sys Parameters Download Method Download Port Setup Port	Tap **Setup Port**.
Setup Port Port1 Port2 Port3	Select **Port1**, **Port2**, or **Port3**. (By default, Port 1 = Host, Port 2 = Aux, Port 3 = E-NET port - Ethernet.)
Set Port X Interface Type Baud Rate Data Bits Stop Bits Parity	Tap **Parity**.
Parity None Odd Even	Select the appropriate parity.

6.4.6 Defining the LAN Address

Use this procedure if you are connecting your terminal to a local area network (LAN) through the Host or Aux port.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security Sys Parameters	Tap **Sys Parameters**.
Sys Parameters Download Method Download Port Setup Port	Tap **Setup Port**.
Setup Port Port1 Port2	Select **Port1** or **Port2**. (By default, Port 1 = Host, Port 2 = Aux.)
Port X Interface Type Baud Rate Data Bits Stop Bits Parity LAN Address	Tap **LAN Address**.
LAN Address Old Value: 104 Enter New Value:	Key the appropriate LAN address, then press [Enter].

6.4.7 Setting the Retry Count

This option sets the number of times the COM port should retry communications in the event of failure (0 to 10).

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security Sys Parameters	Tap **Sys Parameters**.
Sys Parameters Download Method Download Port Setup Port	Tap **Setup Port**.
Setup Port Port1 Port2 Port3	Select **Port1** or **Port2**. (By default, Port 1 = Host, Port 2 = Aux.)
Port X Interface Type Baud Rate Data Bits Stop Bits Parity LAN Address Retry Count	Tap **Retry Count**.
Retry Count Old Value: 4 Enter New Value:	Enter the number of times the COM port should retry in the event of failure (0 to 10).

6.4.8 Setting the Response Timeout

This option sets the amount of time after which the port should cease waiting for a response, in units of 1/100 of a second.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security Sys Parameters	Tap **Sys Parameters**.
Sys Parameters Download Method Download Port Setup Port	Tap **Setup Port**.
Setup Port Port1 Port2 Port3	Select **Port1**, **Port2**, or **Port3**. (By default, Port 1 = Host, Port 2 = Aux, Port 3 = E-NET port - Ethernet.)
Port X Interface Type Baud Rate Data Bits Stop Bits Parity LAN Address Retry Count Response TMO	Tap **Response TMO** (timeout).
Response TMO (10 ms) Old Value: 300 Enter New Value:	Enter an amount of time after which the port should cease waiting for a response, in units of 1/100 of a second.

6.4.9 Setting the Poll Timeout

Poll Timeout is the amount of time the host waits for a response after transmitting a device poll before it records a device poll timeout, in units of one-tenths of a second.

This time varies. It depends on the number of devices connected to the host system. The more devices connected to the host, the longer it takes the host to poll each device. If the PIN pad device misses more than 16 consecutive polls, the host will abandon the device.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**..
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security Sys Parameters	Tap **Sys Parameters**.
Sys Parameters Download Method Download Port Setup Port	Tap **Setup Port**.
Setup Port Port1 Port2	Select **Port1** or **Port2**. (By default, Port 1 = Host, Port 2 = Aux.)
Port X Interface Type Baud Rate Data Bits Stop Bits Parity LAN Address Retry Count Response TMO Poll TMO	Tap **Poll TMO** (timeout).
Poll Timeout Old Value: 300 Enter New Value:	Enter an amount of time after which the port should cease polling, in units of 1/100 of a second.

6.4.10 Setting the Turnaround Timeout

The Turnaround Timeout indicates the time a concentrator or a hub will wait between its request for data and a device's response in a poll sequence.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security Sys Parameters	Tap **Sys Parameters**.
Sys Parameters Download Method Download Port Setup Port	Tap **Setup Port**.
Setup Port Port1 Port2	Select **Port1** or **Port2**. (By default, Port 1 = Host, Port 2 = Aux.)
Port X Interface Type Baud Rate Data Bits Stop Bits Parity LAN Address Retry Count Response TMO Poll TMO Turnaround TMO	Tap **Turnaround TMO**.
Turnaround TMO Old Value: 300 Enter New Value:	Enter an amount of time after which the port should cease turnaround, in units of 1/100 of a second.

6.4.11 Enabling DHCP

DHCP stands for dynamic host configuration protocol. This is commonly used when a company uses a fixed (static) IP address such as 81.2.5.12 to show to the outside world, but the IP addresses inside the company are not seen from the outside and may change. They may be attributed dynamically by a server (DHCP server) when machines startup.

If your terminal is using Ethernet, you can set the DHCP address to None or Auto. If set to None, the terminal will not use DHCP because a fixed address has been assigned the terminal. If set to Auto, when the terminal starts up, it will ask the DHCP server to assign it an IP address.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security Sys Parameters	Tap **Sys Parameters**.
Sys Parameters Download Method Download Port Setup Port	Tap **Setup Port**.
Setup Port Port1 Port2 Port3	Tap **Port3**, Ethernet.
Port3 Interface Type Baud Rate Data Bits Stop Bits Parity Retry Count Response TMO DHCP	Tap **DHCP**.

DHCP None Auto	Select **None** or **Auto**, and then press [Enter].
Updating	

6.4.12 Defining the Local IP Address

If your terminal is using Ethernet, and DHCP is set to None, you will need to configure the local IP address, which identifies the terminal on the network. Each machine connected to the Internet has an address known as an Internet Protocol address (IP address). The IP address takes the form of four numbers separated by dots, for example: 192.168.0.5.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security Sys Parameters	Tap **Sys Parameters**.
Sys Parameters Download Method Download Port Setup Port	Tap **Setup Port**.
Setup Port Port1 Port2 Port3	Tap **Port3**, Ethernet.
Port3 Interface Type Baud Rate Data Bits Stop Bits Parity DHCP Local IP	Tap **Local IP**.

Local IP 192.168.0.5	Enter the local IP address.

6.4.13 Setting the Local IP Port Number

If your terminal is using Ethernet, and DHCP is set to None, you will need to configure the local IP port for the terminal to use. This is a number that is used in TCP/IP applications to designate which application the device is communicating with.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**..
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security Sys Parameters	Tap **Sys Parameters**.
Sys Parameters Download Method Download Port Setup Port	Tap **Setup Port**.
Setup Port Port1 Port2 Port3	Tap **Port3**, Ethernet.
Port3 Interface Type Baud Rate Data Bits Stop Bits Parity DHCP Local IP Local IP Port	Tap **Local IP Port**.

Local IP Port Old Value: XXXXX Enter New Value:	Enter the local IP port number.

6.4.14 Defining the Server IP Address

If your terminal is using Ethernet, and DHCP is set to None, you will need to configure the download server's IP address.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security Sys Parameters	Tap **Sys Parameters**.
Sys Parameters Download Method Download Port Setup Port	Tap **Setup Port**.
Setup Port Port1 Port2 Port3	Tap **Port3**, Ethernet.
Port3 Interface Type Baud Rate Data Bits Stop Bits Parity DHCP Local IP Local IP Port Server IP	Tap ▼ until you reach Server IP, then tap **Server IP**.

Server IP 192.168.0.5	Enter the server IP address.

6.4.15 Setting the Server IP Port Number

If your terminal is using Ethernet, and DHCP is set to None, you will need to configure the download server's IP port number. This is a number that is used in TCP/IP applications to designate which application the device is communicating with.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security Sys Parameters	Tap **Sys Parameters**.
Sys Parameters Download Method Download Port Setup Port	Tap **Setup Port**.
Setup Port Port1 Port2 Port3	Tap **Port3**, Ethernet.
Port3 Interface Type Baud Rate Data Bits Stop Bits Parity DHCP Local IP Local IP Port Server IP Server IP Port	Tap ▼ until you reach Server IP Port, then tap **Server IP Port**.

Server IP Port Old Value: XXXXX Enter New Value:	Enter the server IP port number.

6.4.16 Setting the Subnet Mask (IP Add Mask)

The IP Add Mask menu option refers to the subnet mask. A subnet mask is a number starting with 255 that is unique for your network.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**..
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security Sys Parameters	Tap **Sys Parameters**.
Sys Parameters Download Method Download Port Setup Port	Tap **Setup Port**.
Setup Port Port1 Port2 Port3	Tap **Port3**, Ethernet.

Port3 Interface Type Baud Rate Data Bits Stop Bits Parity DHCP Local IP Local IP Port Server IP Server IP Port IP Add Mask	Tap ▼ until you reach IP Add Mask, then tap **IP Add Mask** (IP address mask or subnet mask).
IP ADD MASK XXX.XXX.XXX.XXX	Enter the subnet mask.
Updating	

6.4.17 Setting the Gateway

If you are using Ethernet, you will need to enter the IP address of the gateway server. A gateway is a router; it is a specific host on the network which can transmit requests from one network to another, in this case from the Ethernet network to the Internet and back again. In many cases, this will be the subnet with a ".1" address (i.e., 192.168.1.1).

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**..
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security Sys Parameters	Tap **Sys Parameters**.
Sys Parameters Download Method Download Port Setup Port	Tap **Setup Port**.

Setup Port Port1 Port2 Port3	Tap **Port3**, Ethernet.
Port3 Interface Type Baud Rate Data Bits Stop Bits Parity DHCP Local IP Local IP Port Server IP Server IP Port IP Add Mask Gateway	Tap ▼ until you reach Gateway, then tap **Gateway**.
Gateway XXX.XXX.XXX.XXX	Enter the address of the gateway.
Updating…	

6.4.18 Setting the Primary DNS

If you are using Ethernet, and DHCP is set to None, you will need to enter the primary Domain Name Service (DNS). This is used to change Internet domain names and computer names into IP addresses and vice versa. DNS specifications require that each domain name is served by at least two DNS servers for redundancy, a primary and secondary.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security Sys Parameters	Tap **Sys Parameters**.

Sys Parameters Download Method Download Port Setup Port	Tap **Setup Port**.
Setup Port Port1 Port2 Port3	Tap **Port3**, Ethernet.
Port3 Interface Type Baud Rate Data Bits Stop Bits Parity DHCP Local IP Local IP Port Server IP Server IP Port IP Add Mask Gateway Primary DNS	Tap ▼ until you reach Primary DNS, then tap **Primary DNS**.
Primary DNS XXX.XXX.XXX.XXX	Enter the address of the Primary DNS.
Updating…	

6.4.19 Setting the Secondary DNS

If you are using Ethernet, and DHCP is set to None, you will need to enter the secondary Domain Name Service (DNS). This is used to change Internet domain names and computer names into IP addresses and vice versa. DNS specifications require that each domain name is served by at least two DNS servers for redundancy, a primary and secondary.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].

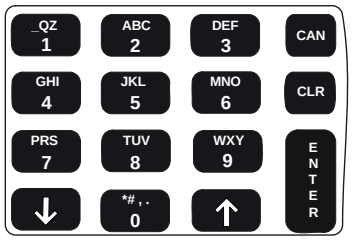
Supervisor Menu Change Password Application File Security Sys Parameters	Tap **Sys Parameters**.
Sys Parameters Download Method Download Port Setup Port	Tap **Setup Port**.
Setup Port Port1 Port2 Port3	Tap **Port3**, Ethernet.
Port3 Interface Type Baud Rate Data Bits Stop Bits Parity DHCP Local IP Local IP Port Server IP Server IP Port IP Add Mask Gateway Primary DNS Secondary DNS	Tap ▼ until you reach Secondary DNS, then tap **Secondary DNS**.
Secondary DNS XXX.XXX.XXX.XXX	Enter the address of the secondary DNS.
Updating…	

6.4.20 Setting the Domain Name

If you are using Ethernet, and DHCP is set to None, you will need to set the domain name to use. Domain names are the human-readable addresses used on the Internet (e.g., www.microsoft.com). The Domain Name Service (DNS) translates these names into IP addresses which TCP/IP programs use directly.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.

Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security Sys Parameters	Tap **Sys Parameters**.
Sys Parameters Download Method Download Port Setup Port	Tap **Setup Port**.
Setup Port Port1 Port2 Port3	Tap **Port3**, Ethernet.
Port3 Interface Type Baud Rate Data Bits Stop Bits Parity DHCP Local IP Local IP Port Server IP Server IP Port IP Add Mask Gateway Primary DNS Secondary DNS Domain Name	Tap ▼ until you reach Domain Name, then tap **Domain Name**.

Domain Name  	Enter the domain name. For example, to enter A, press 2 twice. To enter C, press 2 four times.
Updating…	

6.4.21 Setting Up the Phone Number to Dial

This option is not applicable to the Ingenico 6780, since none of the Ingenico 6780 configurations have a modem.

6.4.22 Setting Up the Modem Speed

This option is not applicable to the Ingenico 6780, since none of the Ingenico 6780 configurations have a modem.

6.4.23 Changing the Position of the Host Port or Aux Port

The ports are labeled Host, Aux, and E-NET, and by default, Port 1 = Host, Port 2 = Aux, Port 3 = Ethernet. However, you may configure Port 1, 2, or 3 as the Host port or Aux port through this menu option. For example, if your host uses Ethernet, you may set your host port as Port 3.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security Sys Parameters	Tap **Sys Parameters**.

Sys Parameters Download Method Download Port Setup Port	Tap **Setup Port**.
Setup Port Port1 Port2 Port3 Dial Host Port Aux Port	Tap **Host** or **Aux** port, and then press [Enter].
Dial COM1 COM2 COM3	Select the port you want. By default, COM1 = Host, COM2 = Aux, COM3 = Ethernet.
Updating	

6.5 Configuring the Host Port Auto Detect Feature

By default, the Host port is set to automatically detect the communications method being used on that port: RS232, RS485 IVI LAN protocol, RS485 Tailgate protocol, USB, or PoweredUSB.

6.5.1 Disabling or Enabling the Auto Detect Feature

When the auto detect feature is enabled on the host port, it will automatically detect the communications method being used on that port. By default, the Host port's Auto Detect feature is enabled.

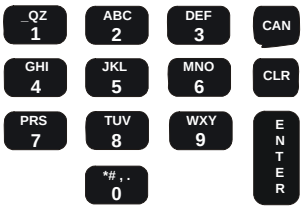
Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security Sys Parameters	Tap **Sys Parameters**.

Sys Parameters Download Method Download Port Setup Port Auto Detect	Tap **Auto Detect**.
Auto Detect AD On/Off AD Timeout AD Retry Times	Press [Enter] to select **AD On/Off**.
AD On/Off Off On	Select the option you want.

6.5.2 Setting the Auto Detect Timeout

You can configure the amount of time after which the unit will cease trying to automatically detect the communications in Port 1, in units of 1/100 of a second.

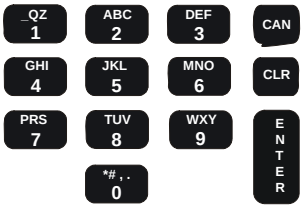
Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security Sys Parameters	Tap **Sys Parameters**.
Sys Parameters Download Method Download Port Setup Port Auto Detect	Tap **Auto Detect**.
Auto Detect AD On/Off AD Timeout AD Retry Times	Tap **AD Timeout**.

AD Timeout Old Value: XXXXXXXXX Enter New Value: 	Enter the amount of time after which the unit will cease trying to automatically detect the communications in the Port 1, in units of 1/100 of a second.

6.5.3 Setting the Auto Detect Retry Times

The Auto Detect Retry Times indicates how many times the terminal will attempt a communications protocol before trying the next one on the list. For example, if it is set to 3, when the terminal starts up, it will try 3 times to connect to the HOST in USB mode. If it fails, then it will try 3 times to connect to the HOST in RS485 mode. If it fails, then it will try 3 times to connect to the host in Tailgate mode. If it fails, then it will decide that COM1 is working in RS232 mode. Therefore, the less retry times, the less amount of time it will take to auto-detect the communications type.

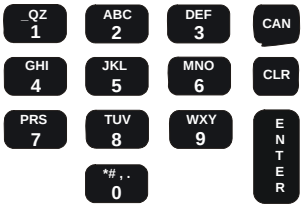
Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security Sys Parameters	Tap **Sys Parameters**.
Sys Parameters Download Method Download Port Setup Port Auto Detect	Tap **Auto Detect**.

Auto Detect AD On/Off AD Timeout AD Retry Times	Tap **AD Retry Times**.
AD Retry Times Old Value: XXXXX Enter New Value: 	The current value displays. Enter the number of times to retry the auto-detection of the Host port, from 0 to 10.

6.6 Editing Parameters

Although most parameters can be updated through the menu using the graphical user interface, the parameter editor allows you to edit parameters manually by entering the parameter ID number and numeric or alphanumeric value. This method is not recommended since it is easy to make a mistake. The parameter editor is typically used by developers and technicians to change settings that are not available in the menu options.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu	Using the stylus, tap **Supervisor Menu**.
Enter Password:	Key password [2] [6] [3] [4], then press [Enter].
Supervisor Menu Change Password Application File Security Sys Parameters	Tap **Sys Parameters**.
Sys Parameters Download Method Download Port Setup Port Auto Detect Parameter Editor	Tap **Parameter Editor**.

Parameter ID: 	Enter the parameter ID (maximum three digits).
Updating	

For a listing of parameter ID numbers, descriptions, and values for the North American terminal application, ask your Ingenico representative for the latest copy of the internal document, NAR SSA Library: Security Part.

Chapter 7

Diagnostic Menu

7.1 Overview

This chapter describes the diagnostic tests that the customer can perform on the Ingenico 6780. The diagnostic tests allow you to isolate failures in field-installed Ingenico 6780 units. These tests are part of the operating system and are not changed by applications. The diagnostics are menu-driven with features that allow a logical progression through the tests. Once a test is selected, a test or a series of tests will be performed on the selected entity. The result of the test will be displayed to facilitate diagnosis of the malfunctioning parts.

7.2 Testing the Display Contrast

To change the display contrast, see "Changing the Display Contrast" on page 12. To test the display contrast, follow this procedure. This test tests all pixels to see if they are working.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu Diagnostic Menu	Using the stylus, tap **Diagnostic Menu**.
Diagnostic Menu Display Keypad	Tap **Display**.
	The pixels are tested to determine if any are not working, or are stuck on. The unit goes through the following sequence: All pixels on – White screen displays. Every other pixel off – Light gray screen displays. All pixels off – Dark gray screen displays. Every other pixel on – Light gray screen displays.

7.3 Testing the Keypad

This allows you to test each key to ensure the proper value returns.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu Diagnostic Menu	Using the stylus, tap **Diagnostic Menu**.
Diagnostic Menu Display Keypad	Tap **Keypad**.
Keypad 0 (0x30) To exit, press “Cancel”	Press a key to test. (Here, we pressed 0). The key value and hexadecimal value stored in the terminal’s memory returns. When finished, press [Cancel].

7.4 Testing the Beeper

This feature tests the beeper by sounding and displaying each possible beep type.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu Diagnostic Menu	Using the stylus, tap **Diagnostic Menu**.
Diagnostic Menu Display Keypad Beeper	Tap **Beeper**.

Beeper Length: Click Frequency: Low	The terminal displays and sounds each possible beep type.

7.5 Testing the RS232 Connection

This feature tests the RS232 connection.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu Diagnostic Menu	Using the stylus, tap **Diagnostic Menu**.
Diagnostic Menu Display Keypad Beeper RS232	Tap **RS232**.
RS232 COM1 COM2	Select the communications port to test.
RS232 Host 19200, None, 8 Test OK Cancel	The results of the test display. Press [Cancel] to exit.

7.6 Testing the RS485 Tailgate Connection

This feature tests the RS485 Tailgate connection on the HOST port.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu Diagnostic Menu	Using the stylus, tap **Diagnostic Menu**.
Diagnostic Menu Display Keypad Beeper RS232 Tailgate	Tap **Tailgate**.
Tailgate IBM 46xx Test 2A23 (0x68)	The results of the test display. To exit, press [Cancel].

7.7 Testing the USB Port

This feature tests the USB connection.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu Diagnostic Menu	Using the stylus, tap **Diagnostic Menu**.
Diagnostic Menu Display Keypad Beeper RS232 Tailgate USB	Tap **USB**.
USB Diagnostic Connect USB Port OK Start PC App then Push OK Key to send	1. From the HOST, start uloop.exe. 2. From the terminal, press [Enter].
USB Diagnostic MESSAGE n Send . . .	The results of the test display. To exit, press [Cancel].

7.8 Testing the Magnetic Stripe Reader

This feature tests the magnetic stripe reader.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu Diagnostic Menu	Using the stylus, tap **Diagnostic Menu**.
Diagnostic Menu Display Keypad Beeper RS232 Tailgate USB Mag Stripe Reader	Tap **Mag Stripe Reader**.
MSR Swipe Card Now	Swipe a magnetic stripe card.
MSR 2 tracks read!	The terminal displays how many tracks were read.
MSR TrackNumber=2x, Status=0x Length=40x	The terminal displays the results of the test for the first track read.
MSR TrackNumber=1x, Status=4x Length=54x	The terminal displays the results of the test for the next track read.
Diagnostic Menu Display Keypad Beeper RS232 Tailgate USB Mag Stripe Reader	You are returned to the previous menu.

7.9 Testing the Smart Card Reader

This feature tests the smart card reader.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu Diagnostic Menu	Using the stylus, tap **Diagnostic Menu**.
Diagnostic Menu Display Keypad Beeper RS232 Tailgate USB Mag Stripe Reader Smart Card Reader	Tap **Smart Card Reader**.
Smart Card Reader Insert Card Now	Insert a smart card.
Smart Card Reader SynchXXX card	The terminal displays the results of the smart card test.
Smart Card Reader Please remove the card!	Remove the card.

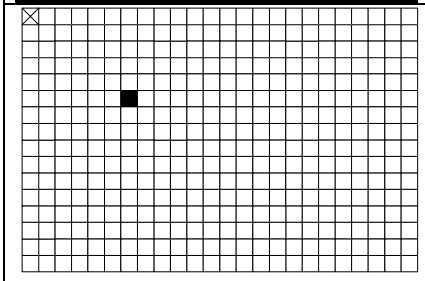
7.10 Testing the SAMs

This feature tests communication between the SAM slots and the SAM micro-controller (SMC).

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu Diagnostic Menu	Using the stylus, tap **Diagnostic Menu**.
Diagnostic Menu Display Keypad Beeper RS232 Tailgate USB Mag Stripe Reader Smart Card Reader SAM	Tap **SAM**.
SAM Found SAM Slot1. Found SAM Slot2. Found SAM Slot3. Found SAM Slot4.	
SAM Check Slot2 ATR Read data from Slot2 (Result)	ATR means answer to reset.
SAM Power off all slots Close all smc slots	SMC stands for SAM micro-controller.

7.11 Testing the Touch Screen

This feature displays a grid. When you touch anywhere on the screen, a box on the grid is darkened.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu Diagnostic Menu	Using the stylus, tap **Diagnostic Menu**.
Diagnostic Menu Display Keypad Beeper RS232 Tailgate USB Mag Stripe Reader Smart Card Reader SAM Touch Screen	Tap **Touch Screen**.
	This feature displays a grid. When you tap the screen, a box on the grid is darkened to let you know where you tapped. This allows you to test a portion of the screen you suspect may be having problems. To exit, tap the X in the top left corner.

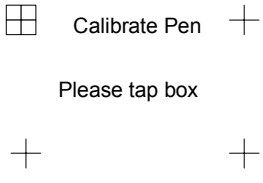
7.12 Testing Signature Capture

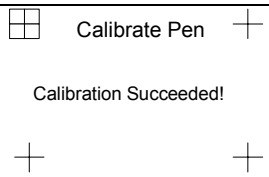
This feature displays a signature capture screen, so you can test how a signature inks and displays on the screen.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu Diagnostic Menu	Using the stylus, tap **Diagnostic Menu**.
Diagnostic Menu Display Keypad Beeper RS232 Tailgate USB Mag Stripe Reader Smart Card Reader SAM Touch Screen Signature Capture	Tap ▼ until you reach Signature Capture, then tap **Signature Capture**.
OK **Clear**  Please sign with pen	This feature displays a signature capture screen, so you can test how a signature inks and displays on the screen. When finished, tap **OK**.

7.13 Testing Pen Calibration

Your terminal was calibrated by the manufacturer and you will not need to recalibrate it. This feature is for use by repair facilities. If they replace the glass on the display screen, or if they run a production test application, they need to recalibrate the terminal.

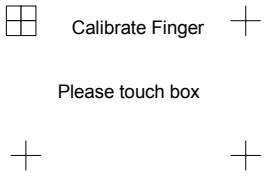
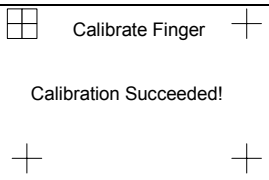
Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu Diagnostic Menu	Using the stylus, tap **Diagnostic Menu**.
Diagnostic Menu Display Keypad Beeper RS232 Tailgate USB Mag Stripe Reader Smart Card Reader SAM Touch Screen Signature Capture Pen Calibration	Tap ▼ until you reach Pen Calibration, then tap **Pen Calibration**.
Please remove hands/objects from around the display **Calibration will start in 3 seconds…**	
	Using the stylus, tap the four-box grid. The box moves around to the next corner; tap again. Repeat until you are notified if the test was successful.

	You are notified if the calibration succeeded or failed.

7.14 Testing Finger Calibration

Your terminal was calibrated by the manufacturer and you will not need to recalibrate it. This feature is for use by repair facilities. If they replace the glass on the display screen, or if they run a production test application, they need to recalibrate the terminal.

Display	Action
	Restart the terminal by pressing [1] + [Cancel] + [Enter] simultaneously; while the terminal is starting up, press [1] + [3] simultaneously to access the Extended Menu.
Extended Menu Serialnum Inject System Config System Info Supervisor Menu Diagnostic Menu	Using the stylus, tap **Diagnostic Menu**.
Diagnostic Menu Display Keypad Beeper RS232 Tailgate USB Mag Stripe Reader Smart Card Reader SAM Touch Screen Signature Capture Pen Calibration Finger Calibration	Tap ▼ until you reach Finger Calibration, then tap **Finger Calibration**.
Please remove hands/objects from around the display, calibration will start in 3 seconds…	

	Using your finger, touch the four-box grid. The box moves around to the next corner; touch again. ***Tip***: For the calibration to succeed, you need to touch the buttons from the side: Touch the left buttons with your left hand and the right buttons with your right hand. Repeat until you are notified that the test was successful.
	You are notified if the finger calibration was successful. If calibration failed, try again, making sure to follow the preceding tip.

7.15 SCV Verification (Ingenico use only)

This test is used by the manufacturer, authorized repair centers, and deployment centers to verify that the correct configuration has been loaded for the customer.

You can find the same information by going to the **System Info** menu and selecting **Version Numbers** (for details, see “Finding Version Numbers” on page 18).

Chapter 8

Architecture

8.1 Overview

To understand downloading, it helps to understand the architecture of the Ingenico 6780 terminal. Terms explained in this chapter are used in the subsequent chapters. This chapter explains the system architecture, how the unit connects to the host device, and the terminal's architecture.

8.2 System Architecture

The server (local or remote) sends information to the store controller (if present), which sends it to each host or point of sale device - typically an electronic cash register (ECR), and each ECR sends it to the Ingenico 6780 terminal attached to it. The Ingenico 6780 terminal in turn sends information back through the chain. Figure 1 and Figure 2 illustrate the information flow for stores with and without a store controller.

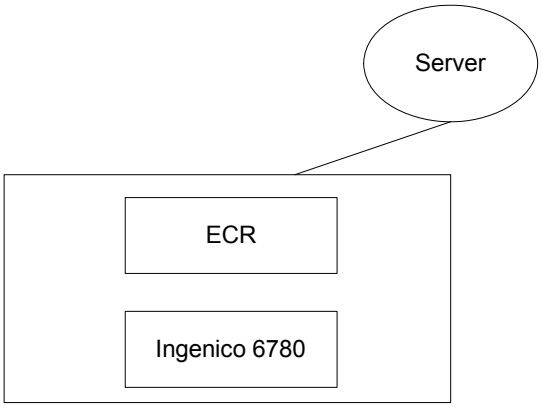


Figure 1 Single Unit Architecture

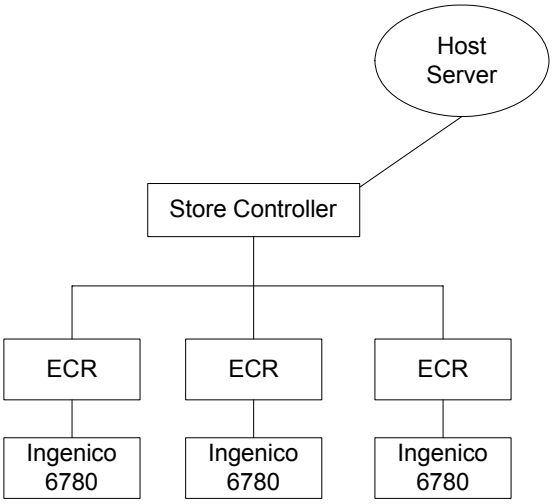


Figure 2 Multiple Unit Architecture

8.3 Host Connections

The point of sale (POS) system, which can be comprised of the server, store controller, and host devices, communicates with the Ingenico 6780 terminal through an RS232 or RS485 serial interface, Ethernet LAN, or USB, depending on the requirements of the host device (typically a computer or ECR). Data is sent using one of these interfaces over a cable that connects the host device to the Ingenico 6780 terminal.

The Ingenico 6780 terminal can connect directly to a cash register, computer, Ethernet LAN, or RS485 LAN. Peripherals such as check readers and printers can be connected to the AUX port.

Depending on your configuration, there are two to four communication ports.

The HOST port, which connects to POS terminals, can connect to the following protocols: RS232, USB/PoweredUSB, RS485 IVI LAN protocol, or RS485 Tailgate protocol (North America only).

The AUX port is RS232 for connecting an auxiliary device such as a printer or check reader.

The E-NET port is for connecting to Ethernet 10 base T, TCP/IP.

The ITI port is not used.

Note: For instructions on making these connections, refer to the *Ingenico 6780 Installation Guide*.

8.4 Terminal Architecture

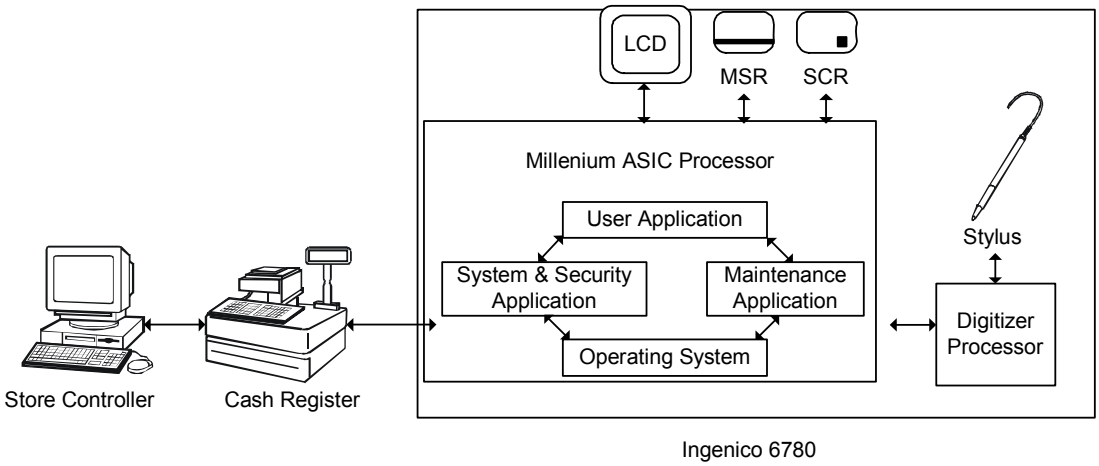


Figure 3 Terminal Architecture

As illustrated in Figure 3 Terminal Architecture, the Millennium ASIC processor runs programs that act as an interface between the ECR and the Ingenico 6780 terminal: the

operating system, system and security application, maintenance application, and user application.

8.4.1 Operating System

The operating system is comprised of several elements. Some of the more prominent ones are explained in this section.

Code File System
The operating system is separated in several code files, and any application can be implemented as one or several code files. Code files can be run and downloaded independently from each other. The Code File System (CFS) manages the storage of all code files in flash devices. A configuration file lists all the code files composing and describing an application. The System and Security Application manages the CFS.

Data File System
The Data File System (DFS) manages storage and organization of permanent data. The DFS enables each application to create directories and to store data in files inside flash devices. The allocation of CFS and DFS in flash memory, a total of 8 MB, is determined at the factory (e.g., 2.5 CFS and 5.5 DFS).

Human Machine Interface
The Human Machine Interface (HMI) peripheral allows applications to interface to the human element of the system through the sensory input/output devices present in the system, such as the display, keypad, and stylus.

Memory Management Unit
The Memory Management Unit (MMU) controls memory access permissions, aborting illegal accesses. It protects the memory of the operating system and of each application, so that applications cannot access or destroy data and code in the operating system or in other applications.

Each application is fire walled from the other applications using the MMU. Each application runs in its own MMU virtual context that prevents any other applications from accessing its data. The operating system runs inside its own MMU virtual context in supervisor mode. Each application runs inside its own MMU virtual context in user mode. The MMU translates these virtual addresses into physical addresses. The MMU presents the physical memory locations to a program so it can access the code and data. This partitioning prevents any application from accessing other application data or operating system data.

All applications are linked at the same virtual address using the MMU. This allows independent development of all applications using the same framework. However, communications between applications are not completely prevented; they are managed through the application manager peripheral.

Application Manager Peripheral
The Application Manager Peripheral is the main component of the multi-application management system. It is in charge of the management of all UNICAPT 32 native applications, which run in the operating system simultaneously. The application manager peripheral provides mechanisms that allow synchronization between applications and exchange of data.

System and Security Application
The System and Security Application (SSA) has two modules.

- The system module contains the terminal's Extended Menu, where users can change options related to downloading, diagnostics, system parameters, and system configuration.
- The security module implements all security requirements, such as key injection and key management. The cryptography functions of the operating system, including key storage areas, are only accessible to the security module. The security module provides a cryptography API to other applications. The SSA blocks any user applications from using the HMI peripheral of the operating system. Thus, all requests by the user application to display forms or receive touch or stylus input must go through the SSA. The SSA then rejects any improper insecure requests, such as:
    - Activate more than 8 screen buttons (which could be used to create a false PIN pad).
    - Activate PIN entry with a prompt that has no valid message authentication code (MAC - if the MACing option is on; this prevents the improper collection of the encryption results of known data).
    - Activate clear text entry with a prompt that has no valid MAC (if the MACing option is on).
    - Activate clear text entry with a prompt that contains words such as PIN, NIP, etc. (if the MACing option is off).
    - Retrieve pixel coordinates of individual screen touches (which could be used to create a false PIN pad).
    - Request more than 30 PIN encryptions within 15 seconds when using MASTER PIN KEY.

Maintenance Application
The maintenance application is in charge of system components and secure application download. It is an extension of the SSA and the SSA invokes it. It executes before other user applications in order to check version numbers and download new software if needed.

The maintenance application communicates with the user application through the peripheral application manager (PAM). The maintenance application has a downloader that communicates with the host in the specified download protocol to receive data and send responses. Each download protocol has its own download application.

The maintenance application sends the code files and application data files it receives to the data file system (DFS) first. At the end of download, it releases the COM port, and then requests an offline download from the SSA. The SSA maintenance module performs a security call back to decrypt, unzip, and authenticate the code before it writes the code file to the code file system (CFS). Also, it takes the data files from DFS, goes through the call back function to authenticate them, and puts them in the right place within the DFS.

The download port selection, download protocol, and port setting can be set in the supervisor menu (see Chapter 6, "System Parameters Menu" on page 38).

User Application
A user application controls the terminal through customer-specific forms and prompts. User applications are also called payment applications or financial applications. There can be a single user application or multiple ones. User applications vary widely. An application may be thick and contain much business logic, or it may be a thin layer that simply passes on requests from the register. Ingenico provides standard user applications intended for certain markets, or you can create your own user applications using Ingenico's Ingedev application development environment. In the North American market, standard user applications include the Retail Base Application, JavaPOS, and OPOS.

A user application accesses secure functions, such as the display screen, screen buttons, terminal keys, and signature capture, through the security module of the SSA. For all other functions, such as port communications, smart card, and magnetic stripe reader, the user application accesses the operating system directly.

8.4.2 Digitizer

The digitizer is a chip with software on it that handles the interface with the user. It receives finger and stylus input from the display screen, which it sends to the operating system, where it goes first to the human machine interface to be processed. The HMI sends the data to the SSA for security screening. The SSA sends it to the user application.

8.4.3 Transmitting Data

The operating system receives commands from the host (through a port), magnetic stripe reader (MSR), and smart card reader and sends them to the user application. Secure functions, such as display screen, screen buttons, terminal keys, and signature capture, are sent to the SSA for security screening before being sent to the user application.

The user application controls the terminal through customer-specific forms and prompts that it sends to the SSA for security screening. The SSA then sends the data to the display screen. The user application uses the operating system to send and receive messages to the host through a port.

The operating system provides the user application with debit and credit card information from the MSR and stored value from the smart card reader. The operating system encrypts the user PIN. This encrypted information is sent from the operating system to the user application. From the user application, it goes from the cash register to the store controller, and then on to banks and other processors.

The digitizer handles the interface with the user. It receives input from the touch screen and translates it into data that the operating system and SSA can process and encrypt.

8.5 Download File Architecture

The download file is installed on the server. The customer is responsible for sending the code from the server to the electronic cash registers (ECRs). Each ECR sends the code to its Ingenico 6780 terminal.

On the POS system, two software components are required:

- Files to be downloaded to the Ingenico 6780 terminal
- Downloader, specific to the cash register. Ingenico supports several formats including:
    - IBM EFT download format
    - NCR download format
    - GEMS and GEMS Lite

Chapter 9

Key Architecture

9.1 Overview

This chapter is extracted from the document NAR System & Security Application (SSA) Software Architecture, Key Architecture section, revision 1.19.

Figure 4 on page 87 provides an overview of the Ingenico 6780's key architecture. A default key is used for the highest level, Sponsor Key KTK (Key Transfer Key). Customers can change the sponsor key. Figure 4 shows the sponsor key under the terminal ID because the sponsor key is unique per terminal.

All keys indicated are loaded by the financial institution or authorized injection facility. The cryptographic keys must be injected into the i6780 terminal in a Key Secure Room. The KTK is the only key that can be transported in the clear between the Key Injection Utility and the device. The rest of the keys may be generated randomly, entered in the system as cryptograms, or entered by key parts using principles of both split knowledge and dual control.

Use a key injection utility, such as Ingenico's WinKeyFac software program, to perform these functions and to set security options (see "Security Options" on page 89).

Financial keys (Master/Session and DUKPT) can be based on an application or a terminal. By default, all financial keys are based on an application, as shown in Figure 4. By changing the value of the Financial Key security option (see "Financial Key Option" on page 93), you can make all financial keys based on a terminal; however, this will erase all previously injected financial keys.

Some keys are segregated by application. The application number is part of the application name. Once the keys are injected, the application number is used as the application reference. When the application calls a cryptographic function, it passes the application reference as the application name. The SSA will check that the caller passes the application name, and from the name, it will determine the number that defines the injected key set.

Single-length DES keys have a length of 8 bytes. Double-length triple DES keys have a length of 16 bytes. The *level* of the specific key set indicates the position of the key set in the internal key hierarchy. For example, keys at Level 1 (sponsor keys) are loaded in clear text and sit at the top of the key hierarchy. Keys at Level 2 are loaded encrypted under the keys at Level 1. Keys at Level 3 are loaded encrypted under the keys at Level 2. Loading a key at a higher level will cause the erasure of all the related lower level keys. The following sections describe each key.

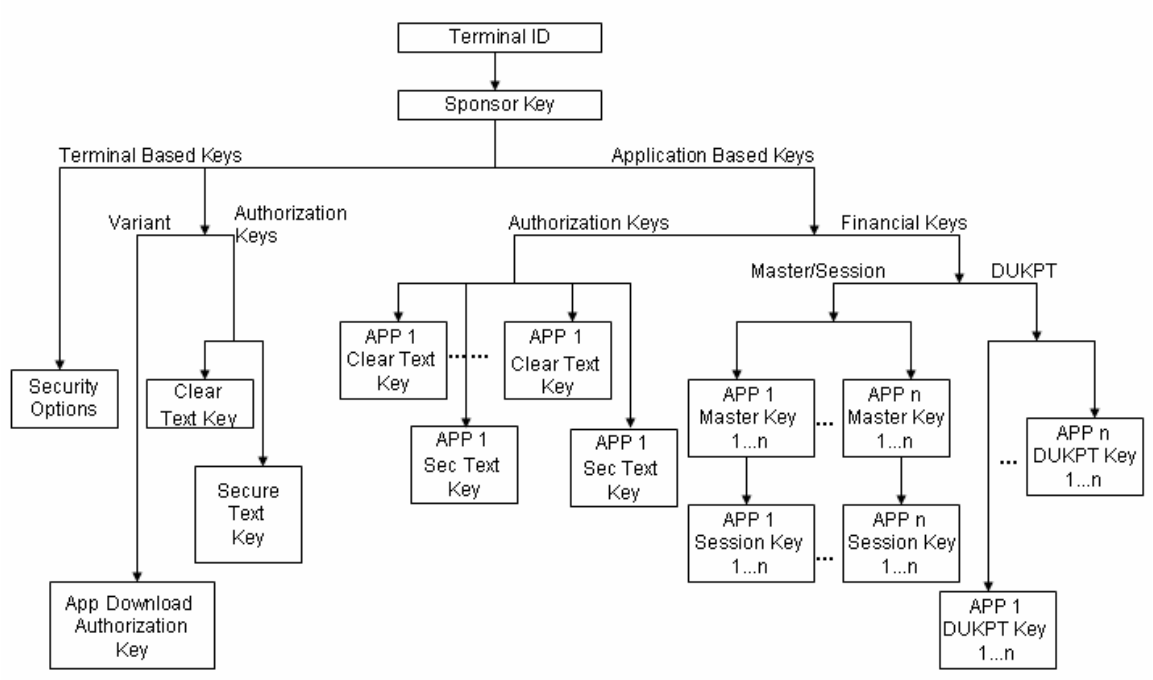


Figure 4 Key Architecture

9.2 Sponsor Key (KTK)

Key Name	Index	Length	Description of Key
Sponsor key (KTK, key transfer key, also known as TMK)	0	16	This key will be loaded as clear text. All Level 2 keys will be transferred to the debit terminal encrypted under this key. A default key is set if no customer key is injected.

9.3 Terminal Based Keys

Key Name	Index	Length	Description of Key
Secure Text Entry Form Authorization Key (PEFMK)	1	8/16	This key is loaded encrypted under the KTK. All prompts and/or screens used for Secure Text Entry of all applications will be authenticated using this key if the Prompts Authentication Key security option is set to terminal based (0).
Clear Text Entry Form Authorization Key (CEFMK)	2	8/16	This key is loaded encrypted under the KTK. All prompts and/or screens used for Clear Text Entry of all applications will be authenticated using this key if Prompts Authentication Key security option is set to terminal based (0).
Application Download Authorization Key (CDMK)	3	8/16	This key is the variant of KTK. It will be used to verify the MAC value of the fingerprint of the code being downloaded into the device. Code MACing always uses the Application Download Authorization Key.

9.4 Application Based Keys

9.4.1 Special Keys

Special keys are loaded encrypted under the KTK. The SSA will have a key structure matrix indexed by application ID. These keys can be both single-length DES keys and double-length triple DES keys.

These two Application Special Keys are only used if the Prompts Authentication Key security option is set to 1 (application based, see section 9.5.1 on page 90). If Prompt MACing is also enabled, the Secure Text and Clear Text prompts will be verified with these two keys. If the Prompts Authentication Key is set to 0 (terminal based), the terminal-based keys are used instead (see section 9.3 on page 87).

Key Name	Index	Length	Description of Key
Secure Text Entry Form Authorization Key	1	8/16	This key is loaded encrypted under the KTK. All prompts and/or screens used for Secure Text Entry of the application will be authenticated using this key if the Prompts Authentication Key security option is set to application based (1).
Clear Text Entry Form Authorization Key	2	8/16	This key is loaded encrypted under the KTK. All prompts and/or screens used for Clear Text Entry of the application will be authenticated using this key if the Prompts Authentication Key security option is set to application based (1).

9.4.2 Master Keys

Master keys are loaded encrypted under the KTK or current Master Key. For application-based financial keys, the SSA will have a key structure matrix indexed by application ID.

The device can accommodate up to ten master keys per application, or 64 master keys per terminal. Each key is independent and used to transport the corresponding working (session) key. Available indexes for master keys are 0 – 9 per application or 0 – 63 per terminal. These keys can be both single-length DES keys and double-length triple DES keys.

The device supports four types of master keys.

Key Name	Description of Key
Master Terminal PIN Key (MTPK)	This key is used to encrypt the Working (session) Terminal PIN Key (WTPK).
Master Message Authentication Code Key (MMACK)	This key is used to encrypt the Working (session) Message Authentication Code Key (WMACK).
Master Communication	This key is used to encrypt the Working (session) Communication Key (WCK).

Key (MCK)	
Master Atalla Key	This key is used to XOR a value for PIN entry, MAC, or encrypt/decrypt to form master variant keys to decrypt for PIN entry, MAC, and COM session keys.

9.4.3 Session Keys

These keys are loaded encrypted under the corresponding master keys. This means that the type and index of the working (session) key have to match the type and index of the corresponding master key that was used to encrypt it. For application based financial keys, the SSA will have a key structure matrix indexed by application ID.

The device can accommodate up to ten working (session) keys per application, or up to 64 working (session) keys per terminal. Available indexes for the working (session) keys are 0 – 9 per application or 0 – 64 per terminal. These keys can be both single-length DES keys and double-length triple DES keys. Similar to the master keys, the device supports four types of working (session) keys.

Key Name	Description of Key
Working (session) Terminal PIN Key (WTPK)	This key is loaded encrypted under the corresponding Master Terminal PIN Key. It is used to encrypt the customer PIN for transmission to the host.
Working (session) Message Authentication Code Key (WMACK)	This key is loaded encrypted under the corresponding Master Message Authentication Code Key. It is used to authenticate the customer transaction.
Working (session) Communication Key (WCK)	This key is loaded encrypted under the corresponding Master Communication Key. It is used to encrypt customer transaction data between the debit terminal and the host.
Working (session) Atalla Key	This key is decrypted by the Master Atalla Variant Key, which is created from the Master Atalla Key according to the type of operation to be performed.

9.4.4 DUKPT Keys

The Initial PIN Pad Keys (IPPKs) are loaded encrypted under the KTK. The device can accommodate up to ten separate DUKPT engines. Each engine is initialized with an IPPK. Available indexes for the DUKPT engines are 0 – 9. The IPPKs can be both single-length DES keys and double-length triple DES keys.

9.5 Security Options

This section provides a synopsis of each security option. All the security options can be loaded during key injection. The user application can request the security options setting from an SSA API.

9.5.1 Prompts Authentication Key Options

This option controls whether the prompt authentication keys are based on the terminal or the application. These options will be used when doing any secure data entry.

When prompt MACing is enabled and the prompts authentication key security option is set to 0 (terminal based), at data entry time, the secure text and clear text prompts will be verified with the terminal-based special keys.

When prompt MACing is enabled and the prompts authentication key security option is set to 1 (application based), at data entry time, the secure text and clear text prompts will be verified with application based special keys.

Possible Values	Description
0	Prompts authentication key is terminal based. If Prompt MACing is also enabled, the form's prompt display will be authenticated by the terminal-based clear text key and security text key. (Default)
1	Prompts authentication key is application based. The form's prompt display is authenticated by an application-based clear text key or a security text key.

9.5.2 Change Terminal ID Option

This option controls the financial keys existence once the terminal ID is re-loaded.

Possible Values	Description
0	Changing Terminal ID will not erase all keys. (Default) Once the terminal ID is re-injected through the key injection process, the existing keys will be retained.
1	Changing Terminal ID will erase the keys. Once the terminal ID is re-injected, all of the financial keys, including Master/Session and DUKPT keys, will be erased.

9.5.3 Prompt MACing

Prompt MACing controls how a data entry form's display prompts are shown.

Possible Values	Status	Description
0	Disabled	Prompts are not authenticated before being displayed the screen. (Default)
1	Enabled	Prompts are authenticated and then displayed on the screen.

Prompt MACing uses a key that depends on how the form/prompt authentication option is set. If set to:

- Terminal based, Prompt MACing will use terminal based clear text key if the form is set to clear text entry. It will use the terminal-based security text key if the form is set to secure text entry.
- Application based, Prompt MACing will use application based clear text key if the form is set to clear text entry. It will use the application-based security text key if the form is set to security text entry.

Prompt MACing will be used to authenticate the prompts during the data entry process and the load font process.

9.5.4 Code MACing

Code MACing controls how code files are updated.

Possible Values	Status	Description
0	Disabled	No authentication is performed on code file updates. (Default)
1	Enabled	Special authentication is performed on code file updates.

Code MACing verifies that only certified applications and files are loaded into the device.

During security download, if Code MACing is enabled, all the code files will be authenticated after they are downloaded. The authentication method is given in the certificate file, which includes NONE, SHA1+MAC, MAC, etc.

9.5.5 Double-Length Key MAC Calculation

This option controls how the MAC calculation algorithm operates when the MAC key is a double-length key. This setting only applies to MAC calculation in financial transactions.

Possible Values	Encryption	Description
0	EDE (encrypt, decrypt, encrypt)	Double-length key encryption on each block of data. (Default)
1	E (encrypt)	Single-length key encryption on each block of data, except for the last block, which uses EDE encryption.

9.5.6 Atalla Key Block Protection Option

This option controls whether the double-length master/session key injection is protected by the Atalla key block injection. If the option is enabled, double-length master or session key can only be injected through Atalla key block.

Possible Values	Status	Description
0	Disabled	No protection is applied. Double-length master/session key can be injected through any format. (Default)
1	Enabled	Protection is applied. ▪ Double-length master key and double-length session key can only be injected through Atalla key block. They cannot be injected through the normal key format. ▪ Single-length master/session keys, Atalla key block format keys, single or double feature keys, and single or double DUKPT keys can be injected through both the normal key format and Atalla key block format.

9.5.7 Terminal Startup Verify MAC Option

This option controls whether the terminal needs to verify the MAC at terminal startup for user application code files and data files that are contained in a valid certificate file. The default value is disabled because the manufacturer does not load the certificate file.

Possible Values	Status	Description
0	Disabled	Disable startup verify MAC option. (Default)
1	Enabled	Enable startup verify MAC option.

9.5.8 Visa PED Mode Option

This option controls whether the terminal runs in Visa PED mode. In this mode, if prompt MAC verification fails, PIN exhaustion validation and the three button limit will be applied when prompt MAC verification fails.

- PIN exhaustion validation means that the customer can only enter their PIN three times; after the third failed attempt, the terminal returns to the idle prompt.
- The three button limit means that forms that do not have Prompt MACing are limited to three buttons. If the form requires more than three data inputs, such as PIN entry or cash back amount, it must have prompt MACing.

Possible Values	Status	Description
0	Disabled	Normal mode.
1	Enabled	Visa PED mode.

9.5.9 Financial Key Option

This option controls whether the financial keys are application based or terminal based.

Caution: If you change this security option, previously loaded financial keys will be lost.

Possible Values	Status	Description
0	Disabled	Financial keys are application based. (Default) For application based financial keys, SSA supports 10 Master/Session keys and 10 DUKPT keys per application.
1	Enabled	Financial keys are terminal based. For terminal based financial keys, SSA supports 64 Master/Session keys and 10 DUKPT keys per terminal.

Chapter 10

Secure Certificate

10.1 Overview

This chapter is extracted from the NAR Secure Certificate document, part 0190-00252-0103, revision 1.03.

The secure certificate file is a descriptor of all of the software components that are necessary to make up one or more applications that are going to be downloaded to the Secure PIN Entry Device, such as the i6780.

Note: Terms used in this chapter are explained in *Terminal Architecture* on page 81.

If the secure Code MACing option is enabled, the downloaded application must provide what is called a “secure certificate file” (certific.txt). This file contains security information for every file and application to be downloaded. It can also indicate which application, code file, or data file needs to be deleted. This certificate is mandatory if Code MACing is enabled.

During the terminal download process, if the downloaded certificate file is valid and the download is successful, SSA will replace the previous copy, if it exists, with the new copy.

The secure certificate file will also be used each time the terminal starts up to authenticate the MAC of the user application’s CFS and DFS if the security option “Terminal Startup Verify MAC Option” is enabled.

The following section describes how the securing process uses the secure certificate and gives practical considerations for application developers.

10.2 Securing Process

The securing process can be used during the validation of the application code files and application data files.

The secure certificate will be downloaded into the data file system (DFS) first, along with code files and data files. The secure certificate contains all security-related information, and information about all of the code files and data files in the download package. The securing process is composed of the following steps:

1. The secure certificate is used to validate the complete download of all required download files. If Code MACing is enabled, downloading any file that is not listed in the secure certificate file causes the download to fail.

2. The maintenance application sends a request to SSA to validate the secure certificate file.

3. The secure certificate file is used to validate the signature of code files and data files as soon as they are installed. The secure certificate can also be accessed as needed throughout the download procedure.

4. If the download is successful, the secure certificate file will be erased from a temporary location and updated into SSA's memory.

10.3 Secure Certificate Text File

The secure certificate is a text file that contains security information for a download package.

Once the text file is constructed, it must be passed through a securing utility which generates the MAC of the certificate. The utility will also generate MACs for all of the software components described in the certificate.

The secure certificate contains all the security information necessary for SSA to determine if the downloaded application is eligible to upgrade. The secure certificate is also a descriptor of all the software components that are necessary to make up a download session. In effect, the secure certificate represents an application descriptor file that contains secured fingerprints for each of the software components representing the application.

The following is an example of a secure certificate text file.

```
MAC=12345678

[VisaPEDMode]
1

[Appl]
MAC=12345678 applname dstfilename.ext authmethod encrypt
srcfilename.ext

[SecFiles]
MAC=12345678 applname dstfilename.ext class authmethod encrypt
existence srcfilename.ext
MAC=12345678 applname dstfilename.ext class authmethod encrypt
existence srcfilename.ext

[NonSecFiles]
applname filename.ext class existence
applname filename.ext class existence

[DeleteAppl]
applname codefilename1
applname codefilename2

[DeleteFiles]
applname filename.ext class
applname filename.ext class

[DeleteWholeApp]
applname
```

Note: All lines within the secure certificate text file are terminated with a character sequence carriage return followed by line feed (e.g., <*cr*><*lf*>) ***except*** for the last line of the file.

The fields of the file are described more fully in the sections that follow.

10.4 Secure Certificate Descriptor Sections

The following descriptor sections make up a secure certificate:

- Secure certificate MAC descriptor section
- Visa PED mode descriptor section
- Application descriptor section
- Secure file descriptor section
- Non-secure file descriptor section
- Delete application code file descriptor section
- Delete data file descriptor section
- Delete the whole application descriptor section

10.4.1 Secure Certificate MAC Descriptor Section

This section, which is the MAC of the secure certificate file, must exist on the first line of the file. If it does not, validation fails. If it does, a MAC is calculated on the secure certificate, using SHA1 + MAC, starting from the first character of the second line of the file until the end of the file.

If the MAC detected on the first line of the file is not the same as the calculated MAC, validation fails.

The first line of the file must be in the following format:

```
MAC=12345678
```

The first field of the application descriptor is the MAC for the secure certificate file itself.

- *MAC*= is a text string indicating that the precalculated fingerprint follows
- *12345678* is the Hex ASCII representation of the most significant 4 bytes of the MAC value of the SHA1 result for the whole certificate file, precalculated and applied by the securing utility prior to download.

Note: The first line of the file must end with a carriage return and line feed. The second line is considered to begin at the first character immediately after the first carriage return and line feed characters of the file.

10.4.2 Visa PED Mode Descriptor Section

The Visa PED mode descriptor section allows you to set the terminal into a special mode that meets the Visa PIN encryption device (PED) requirements. Visa PED mode should be entered before downloading.

The section identifier *[VisaPedMode]<cr><lf>* marks the beginning of the Visa PED mode section within the file. The Visa PED Mode descriptor section is found after the secure certificate MAC section identifier and before the start of the next section identifier (i.e., encountered by *<cr><lf>[*).

The first line of the file must look like this:

```
mode
```

- *mode* represents the value of the Visa PED mode before the certificate file is updated and before the download starts.

Possible Values	Description
;	No security mode is set.
1 – 7 (00000B2B1 B0)	B0 – Visa PED mode B1 – Code MACing B2 – Prompt MACing
1 (000000001)	Visa PED mode. Visa PED mode will not be enabled if the secure text entry key and the clear text entry key are not injected, or if the download key is not injected.
2 (000000010)	Code MACing. Code MACing will not be enabled if the download key is not injected.
3 (000000011)	Visa PED mode and Code MACing. Visa PED mode and Code MACing will not be enabled if the secure text entry key and clear text entry key are not injected, or if the download key is not injected.
4 (000000100)	Prompt MACing. Prompt MACing will not be enabled if the secure text entry key and clear text entry key are not injected.
5 (000000101)	Visa PED Mode and Prompt MACing. This option will not be enabled if the secure text entry key and clear text entry key are not injected, or if the download key is not injected.
6 (000000110)	Prompt MACing and Code MACing. This option will not be enabled if the secure text entry key and clear text entry key are not injected, or if the download key is not injected.
7 (000000111)	Visa PED mode and Prompt MACing and Code MACing. This option will not be enabled if the secure text entry key and clear

	text entry key are not injected, or if download key is not injected.

The three security options (Visa PED Mode, Prompt MACing, and Code MACing) can only be turned off through the key injection module.

If the Visa PED mode section indicates to turn Visa PED mode on, but the platform code files (in the download package or terminal) cannot pass the authentication or cannot find MAC information in the certificate file, then Visa PED mode cannot turn on and the download fails.

If the Visa PED Mode section indicates to turn Code MACing on, but the platform and financial application code files (in the download package or terminal) cannot pass the authentication or cannot find MAC information in the certificate file, Code MACing cannot turn on and the download fails.

Note: The first line of the file must end with a carriage return and line feed.

The second line is considered to begin at the first character immediately after the first carriage return and line feed characters of the file.

10.4.3 Application Descriptor Section

The application descriptor section is an area of the secure certificate file that contains information pertaining to the application code files.

The section identifier *[Appl]<cr><lf>* marks the beginning of the application descriptor section within the file. The section ends before the start of the next section identifier (i.e., encountered by *<cr><lf>[*), or the end of the file.

There must be at least one application descriptor; otherwise, the secure validation process fails. Only the first application descriptor is accepted and parsed within the application section.

The application descriptor is in the format:

```
MAC=12345678 applname dstfilename.ext authmethod encrypt
srcfilename.ext
```

The first field of the application descriptor is the MAC for the application.

- *MAC*= is a text string identifying that the pre-calculated fingerprint follows
- *12345678* is the Hex ASCII representation of the most significant 4 bytes of the MAC applied by the securing utility prior to download.
- *applname* represents the application name of the application binary being loaded. For instance: CA2100_IBMEF
- *dstfilename.ext* represents the code file name of the application binary file residing in the terminal. For instance: WW002G011010
- *authmethod* represents the code file authentication method, i.e., the MAC calculation method that the code file used. Possible values:
    - SHA1+MAC

— CBC+MAC. Use Code Download MAC Key: CDMK XOR 0x0000 0000 0000 00FF for each half of the key to do MAC calculation/verification.

The MAC is calculated before the code file is encrypted. If the code file is specified to be encrypted, then the calculated data needs to be a multiple of 8 bytes. If it isn't, the generated encrypted code file will have zeros appended at the end of the file for MAC calculation.

- *encrypt* represents whether the code file is encrypted and needs to be decrypted. Possible values: Y, N. If the code file is encrypted, it should be encrypted under the variant of CDMK.

  The applied variant method is use CDMK XOR 0x0000 0000 0000 FF00 for each half of the key to do encryption/decryption.

  If the code file needs to be encrypted, the MAC value will be calculated and it will be added to the certificate file. Next, it will encrypt the code using the variant of CDMK starting from address 0x0200 (the code file header is not encrypted). If the code file is not a multiple of 8 bytes, the last data block will have zeros appended for encryption calculation. The number of zeros that are appended to the code file are also appended to the end of the output encrypt file (e.g., adds "4" to represent four zeros). An encrypted code file will be generated with extension '.enc'. The encrypted application code file thus consists of three portions:

  — The first 0x0200 bytes (i.e. 512 bytes) are the first 512 bytes of the original application code file in clear form.

  — The second portion is variable in length depending on the size of the original application code file. It consists of groups of encrypted data. Each group is of 8 bytes long. The last group is padded with 0's to make up 8 bytes, if necessary, before encryption.

  — The third portion is one byte long. Its value indicates the number of 0's padded to the last group of data. It is in clear form.

  — Note: Code file 0 won't be encrypted even if the encrypt field is specified to be "yes."

- *srcfilename.ext* represents the relative or full path of the code file residing in the computer. For instance: code\ WW002G011010. This field is not used by the secure process, but will be used by the securing utility.

10.4.4 Secure File Descriptor Section

The secure file descriptor section is an area of the secure certificate file that contains information pertaining to the files that require secure fingerprint validation.

By being able to define the files that require fingerprint validation, the developer can maintain some level of control over what and how much of the application needs to be validated.

Note: If an application has parameter files that could change dynamically from an external source, then these files can be defined in the non-secure section, thus escaping the rigors of fingerprint validation. The securing party has ultimate control

over whether to accept or reject such a configuration. This decision is made prior to MACing the secure certificate.

The secure file descriptor section is found after the identifier *[SecFiles]*<*cr*><*lf*> and before the next section identifier (i.e., encountered by <*cr*><*lf*>*[*), or end of the file. The secure file descriptor is in the format:

```
MAC=12345678 applname dstfilename.ext class authmethod encrypt
existence srcfilename.ext
```

The first field of the secure file descriptor is the MAC for the application data file.

- *MAC*= is a text string identifying that the pre-calculated fingerprint follows.
- *12345678* is the Hex ASCII representation of the most significant 4 bytes of the MAC applied by the securing utility prior to download.
- *applname* represents what application this data file belongs to.
- *dstfilename.ext* represents the relative path and file name where the data file will reside in the UNICAPT 32 file system. For instance: bitmaps/card.bmp
- *class* represents the particular categorization of the file within the terminal's file system. Possible values: 0=private, 1=public.
- *authmethod* represents the data file authentication method, i.e., the MAC calculation method that the data file used. Possible values:
  - SHA1+MAC
  - CBC+MAC. Use Code Download MAC Key: CDMK XOR 0x0000 0000 0000 00FF for each half of the key as the variant of CDMK to do MAC calculation/verification. The variant of CDMK that results from the XOR operation is used for both methods.

    The MAC is calculated before the data file is encrypted. If the data file is specified to be encrypted, then the calculated data needs to be a multiple of 8 bytes. If it isn't, the generated encrypted code file will have zeros appended at the end of the file for MAC calculation.
- *encrypt* represents whether the data file is encrypted and needs to be decrypted. Possible values: Y, N. If the data file is encrypted, it should be encrypted under the variant of CDMK.

  Use Code Download MAC Key: CDMK XOR 0x0000 0000 0000 00FF for each half of the key as the variant of CDMK to do encryption/decryption.

  If the data file is specified to be encrypted, the MAC value is calculated and then added to the certificate file. Next, it will encrypt the data using the variant of CDMK. If the data file is not a multiple of 8 bytes, the last data block will have zeros appended for encryption calculation. The number of zeros that are appended to the code file are also appended to the end of the output encrypt file (e.g., adds "4" to represent four zeros). An encrypted data file will be generated with extension '.enc'.

  The encrypted secure data file thus consists of two portions:

  - The first portion is variable in length, depending on the size of the

original application code file. It consists of groups of encrypted data. Each group is of 8 bytes long. If necessary, the last group is padded with zeros to make up 8 bytes before encryption.

— The second portion is one byte long. Its value indicates the number of zeros padded to the last group of data. It is in clear form.

- *existence* is an option to determine whether the file must exist in terminal memory in order for secure validation to succeed.
  - — "Y" indicates that the file must exist. If Y is selected and the file exists but does not validate, then the secure process fails.
  - — "N" indicates the file need not exist. If N is selected, then the file optionally may or may not exist for validation to succeed.
- *srcfilename.ext* represents the full or relative DOS path and file name that the data file binary resides in. This field is not used by the secure process, but may be used by the securing utility.

Note: When Visa PED Mode is on, the BIN configuration file has to be included in the Security File Section, and the applname should be SSA.

10.4.5 Non-Secure File Descriptor Section

The non-secure file descriptor section is an area of the secure certificate file that contains information pertaining to the files that do not require secure fingerprint validation.

All files of an application that have not been defined in the secure file section must be defined in the non-secure file section.

The non-secure file descriptor section begins with the descriptor *[NonSecFiles]*<*cr*><*lf*>. This section ends with the start of the next section header (i.e., encountered by <*cr*><*lf*>*[*), or end of the file. The non-secure file descriptor is in the format:

```
applname filename.ext class existence
```

- *applname* represents what application this data file belongs to.
- *filename.ext* represents the relative path and file name where the data file will reside in the UNICAPT 32 file system. For instance : bitmaps\card.bmp
- *class* represents the particular categorization of the file within the terminal's file system. Possible values: 0=private, 1=public.
- *existence* is an option to determine whether the file must exist in terminal memory in order for secure validation to succeed.
  - — "Y" indicates that the file must exist. If Y is selected and the file exists but does not validate, then the secure process fails.
  - — "N" indicates the file need not exist. If N is selected, then the file optionally may or may not exist for validation to succeed.

10.4.6 Delete Application Code File Descriptor Section

The delete application code file descriptor section is an area of the code to be deleted.

The delete application code file descriptor section begins with the descriptor *[DeleteAppl]<cr><lf>*. The section ends with the start of the next section header (i.e., encountered by "*<cr><lf>[*"), or end of the file. The delete code file descriptor is in the format:

```
applname codefilename
```

- *applname* represents the application that this code file belongs to.
- *codefilename* represents the code file that belongs to an application. For example, CA0003001000.

Note: The operating system, maintenance application, and System & Security Application cannot be deleted. Only the financial application can be deleted.

10.4.7 Delete Data File Descriptor Section

The delete data file descriptor section is an area of the data file that contains information pertaining to the files to be deleted.

The delete data file descriptor section begins with the descriptor *[DeleteFiles]<cr><lf>*. The section ends with the start of the next section header (i.e., encountered by *<cr><lf>[*), or end of the file. The delete file descriptor is in the format:

```
applname filename.ext class
```

- *applname* represents the application this data file belongs to.
- *filename.ext* represents the relative path and file name where the data file resides in the UNICAPT 32 file system. For instance: bitmaps\card.bmp
- *class* represents the particular categorization of the file within the terminal's file system. Possible values: 0=private, 1=public.

10.4.8 Delete Whole Application Descriptor Section

The delete whole application descriptor section is an area of application to be deleted.

The delete whole application descriptor section begins with the identifier *[DeleteWholeApp]<cr><lf>*. This section ends with the start of the next section header (i.e., encountered by *<cr><lf>[*), or end of the file. The delete whole application descriptor is in the format:

```
applname
```

- *applname* represents the application name that is going to be deleted. For example: US0901_UPOS.

Note: The operating system, maintenance application, and System & Security Application cannot be deleted. Only the financial application can be deleted.

Chapter 11

IBMEFT Download

11.1 Prerequisites

The prerequisites are:

- The ability to accept downloaded files and store on system.
- A download utility (IBMEFT or NCREFT - IBM EFT uses an IBM protocol for downloading, and NCR uses an NCR protocol for downloading).
- A POS system that supports IBMEFTDL, NCREFTDL, or equivalent functionality, as determined by your project manager.

  Note: IBMEFTDL is an Ingenico download utility that runs on the store controller or server. It downloads data through the ECR to the Ingenico 6780 using the IBMEFT protocol.

NCREFTDL is supported and managed directly by NCR for NCR customers.

11.2 Preparation

Ensure equipment is functional and in the right place:

- Ensure store network is operational
- Ensure each cash register is functional and connected to the network
- Ensure store controller has the ability to manage all download files and interface with each ECR
- Ensure that each Ingenico 6780 terminal is connected to an ECR
- Ensure that the application levels are the same in all Ingenico 6780 terminals

It is a good idea to download to a small number of terminals first.

11.3 Timing

To perform a download on an RS232 Type A communication running at:

- 19200 bps, it takes approximately 25 minutes
- 9600 bps, it takes approximately 40 minutes

11.4 Download Process

11.4.1 Outline

The download process is as follows:

1. Ensure that all Ingenico 6780 terminals operating in the store are running the same levels of software. If they are not, take note of the software levels (see "Finding Version Numbers" on page 18), then check with your account manager before proceeding to see if additional testing is necessary.

2. Install all of the necessary Ingenico download utility and EFT files to the proper directory on the store controller or server.

3. From the store controller, initiate the download.

4. Sign onto each cash register that has an Ingenico 6780 terminal attached to it. The store controller will check for Ingenico 6780 EFT version levels. If the EFT version levels differ from the Ingenico 6780, the store controller will detect that and automatically update the software.

Note: For stores that operate 24 hours, the process involves going to one unused register at a time, until every cash register and every Ingenico 6780 terminal is upgraded. Ask store management for cashier assistance to prevent interruption of store operations and facilitate awareness of progress.

While the download is in process at a terminal, it cannot be used to process transactions.

11.4.2 Feedback

Depending on your cash register configuration, the i6780 terminal may not be used if PROGxxxx/PARMxxxx is displayed during download. If no message is displayed in the cashier display, debit and credit transactions cannot be processed.

It is critical to execute a systematic incremental procedure in order to ensure consistency of download on all units in store. For assistance in the preparation to implement a multiple-unit simultaneous download procedure, please contact your Ingenico Project Manager.

If a power outage or glitch occurs during the download, or if you disconnect the Ingenico 6780 terminal during the download, the terminal will cease to function. If the disruption occurred during the upgrade of the System & Security Application, the terminal will need to be sent to an authorized repair facility for recovery (contact your project manager).

Monitor both the store controller and Ingenico 6780 terminal during the download process.

If the download fails, it will assist troubleshooting efforts to know at what point the download failed and to record what error code displays on either the store controller or on the i6780 terminal display.

To run your batch file:

1. Ensure the Ingenico 6780 terminals are in the ready state.

2. Load files into the store controller's PIN pad program directory.

3. Initiate a download from the controller.

   The cashier display details activity and status updates, such as "Downloading, PROG xxxx" or "Downloading PARM xxxx."

   The Ingenico 6780 terminal indicates a summary of its activity, "IBM EFT prog Dowld.blk ##." When complete, the cashier display reads "Closed" or "Enter Item." The Ingenico 6780 terminal goes into the online or offline state.

4. Ensure that all Ingenico 6780 terminals that have attempted an IBMEFTDL or parameter level upgrade are running the proper levels of software (see section 4.2, "Finding Version Numbers," on page 17). Record discrepancies if any are found to have failed acceptance of the download and note the location of the device. If a download fails, always conduct a second download attempt and report second failures to your Ingenico Project Manager.

5. Check the properties of the communications port to make sure that the interrupt request and input/output range has not been changed.

Chapter 12

Download Errors

12.1 Error Opening Port

This error message displays on the computer or cash register. The following sections list possible causes and corresponding solutions.

12.1.1 Communications port that IBMEFTDL is using is already being used by another application

Close the other application and run the download file again.

12.1.2 Communications port is not working

- Try another computer.
- Ask your Ingenico representative to change the batch file to work with the new communications port. Change to the new communications port, then run the new batch file.

12.1.3 Hardware settings in i6780 have been changed

1. Check the properties of the communications port to make sure that the interrupt request and input/output range has not been changed. In Windows 98 or 2000:

   a. Right-click **My Computer**, then select **Properties**.

   b. Click the **Device Manager** tab.

   c. From the list, double-click **Ports**, double-click **Communications Ports**, and then go to the **Resources** tab.

2. Ensure the settings for COM1 are the default, as follows:

   - **Interrupt Request** is **04**
   - **Input/Output Range** is **03F8**

3. Ensure the settings for COM2 are the default, as follows:

   - **Interrupt Request** is **03**
   - **Input/Output Range** is **02F8**

12.2 Received 3 NAKs or Timeout in sendVISAPacket()

This error message displays on the computer or cash register. The following sections list possible causes and corresponding solutions.

12.2.1 Connection between the host and i6780 may be loose

Ensure the cables are securely connected.

12.2.2 Communications port settings and EFT/NCR protocol setting in i6780 may be wrong

The following procedure explains how to compare the configuration that you have in your IBMEFTDL file to make sure that it is the same as the default setup configuration in your Ingenico 6780 terminal (for details, see “Default Setup Configuration” on page 98).

1. To find the communication port settings in your IBMEFTDL file, open the download batch file, search for the keyword "ibmeftdl", and find the following parameters:

   — /b: the number following this parameter is the required RS232 baud rate.

   — /d: the number following this parameter is the required RS232 data bits.

   — /t: the character following this parameter is the required RS232 parity setting. An "n" means none parity, "e" means even, "o" means odd parity.

2. Write these parameters down.

3. Next, go the Ingenico 6780 terminal to read the current settings to see if they are the same. Restart the terminal by pressing [1] + [Enter] + [Cancel]; while it is restarting, access the Extended Menu by pressing [1] and [3] simultaneously.

4. Select **System Info**, and then select **View Parameter**. The screen displays the current download configuration for the port the terminal has configured to do the download, the baud rate, data bits, stop bits, and parity of that port.

5. Compare these settings to the IBMEFTDL parameters that you wrote down in step 2; they should be the same. If not, change them using the following steps.

6. From the Communications menu, press [Cancel] twice to return to the **Supervisor Menu**. Enter the password, select **System Parameters,** and then select **Download Method**. Select IBMEFT or NCREFT.

7. Press [Cancel] to return to the **System Parameters** menu**,** and then select **Download Port**. Select the correct download port and correct communication type.

8. Press [Cancel] to return to the **System Parameters** menu**,** and then select **Setup Port**. Select the port to setup, and select the correct baud rate, data bits, stop bits, and parity.

9. After all the settings are updated, the terminal will update the system parameter setting, when you exit the Extended Menu, the terminal will reset.

12.3 Default Setup Configuration

Configuration	Default Value
IBMEFT/NCR protocol selection	IBMEFT
Download Port Number	Com1
Download Port Type	RS232
RS232 baud rate	19200
RS232 data bits	8
RS232 parity	No parity
RS232 stop bits	1

12.4 Error: Bad Prog.

The flash memory in the terminal may not match the flash memory requirement of EFTL file. Contact your account manager to arrange to have the terminal sent in for repair.

12.5 Device already loaded with program x and parameter y

This error message displays on the computer or cash register if the Ingenico 6780 has already been upgraded.

12.6 CRC Error

The CRC Error message, followed by multiple characters in a string, displays on the Ingenico 6780 to indicate that the Security Module has been compromised. Notate error to report with issue. Notify your Ingenico project m anager immediately and request RMA number authorization to return unit to an authorized repair facility for recovery.

12.7 Not Enough DFS Space

This error occurs during a download if the Ingenico 6780 terminal's data file system does not have enough space to receive any additional download components. To resolve the error, clean up the DFS to make room for downloads. There are two ways to do this:

- Use MLDT or Wingload 32 to get the DFS information from the terminal and manually delete any redundant files.
- Go to the Core Menu (or Production Menu) by restarting the terminal and pressing the top left corner of the screen while the terminal is starting up. Select **AdvancedOptions**, enter the password, and then select **FormatDFS**. ***This method will reformat the data file system and delete all existing data files.***

12.8 Comm Receive Error

This error occurs when the terminal doesn't receive a message from the host within the timeout period. To resolve the error, extend the Response TMO setting in the terminal or host.

Chapter 13

IBMEFT Troubleshooting

This section describes how to resolve error messages that may appear on your Ingenico 6780 device display if using IBMEFTDL.

13.1 Card Read Error

If the Card Read Error message displays on the device after swiping a card through the MSR:

- Try swiping the card a few more times, varying the speed at which the card is physically drawn through the reader.
- Try swiping the card in the reverse direction (i.e., if swiping the card from top to bottom, try swiping the card from bottom to top, front to back: back to front).
- Make sure that you are swiping the card in a straight line (i.e., make sure the MSR card is always touching the bottom of the MSR track).
- If none of these actions work, then the MSR card is worn and cannot be read electronically. Enter the card number manually.
- If the register is reloaded immediately after powering up, the Ingenico 6780 may not come up in the correct state. Signing in at the register and seeing if the Ingenico 6780 display reads “Please Slide Card” can determine this. If it does not (i.e., display continues to read, “Closed”), then perform the same steps as for the next error message, EFT Device Not Available.

13.2 EFT Device Not Available

If the EFT Device Not Available message displays on the register, perform the following steps:

1. Check to make sure the Ingenico 6780 is on and is displaying the first prompt screen of your application software.
2. On the register, press the **Clear** key and select the transaction type again. If the problem persists, continue to step 3.
3. To restart the Ingenico 6780 device, press **Cancel + 0 + Enter** simultaneously.

   The Ingenico 6780 restarts and the first prompt screen of the application software displays.

4. On the register, press the **Clear** key and select either the CREDIT or DEBIT transaction type again.

   The Ingenico 6780 should now be at the first prompt screen of your application software (i.e., it now reads “Please Slide Card”). If not, sign off the register and then sign on again.

13.3 EFT Device Not Available – During Check Authorization

If the EFT Device Not Available message displays on the register during check authorization:

1. Check to make sure the Ingenico 6780 is on and is displaying the first prompt screen of your application software.

2. On the register, press the **Clear** key and select the transaction type again. If the problem persists, continue to step 3.

3. To restart the Ingenico 6780 device, press **Cancel + 0 + Enter** simultaneously.

   The Ingenico 6780 restarts and the first prompt screen of the application software displays.

4. On the register, press the **Clear** key and select the CHECK transaction type.

The Ingenico 6780 should now be at the first prompt screen of your application software (i.e., it now reads “Please Slide Card”). If not, sign off the register and then sign on again.