

# **Exhibit L: 700C User Manual**

**FCC ID: HN2SB555**



# 7 Programming

The following programming information pertains to the 700 Series Color Mobile Computer:

- Creating CAB Files (*page 236*)
- FTP Server (*page 251*)
- Full Screen (*page 262*)
- Kernel I/O control functions (*page 264*)
- Reboot Functions (*page 280*)
- Remapping the Keypad (*page 281*)

## Creating CAB Files

The Windows CE operating system uses a .CAB file to install an application on a Windows CE-based device. A .CAB file is composed of multiple files that are compressed into one file. Compressing multiple files into one file provides the following benefits:

- All application files are present.
- A partial installation is prevented.
- The application can be installed from several sources, such as a desktop computer or a Web site.

Use the CAB Wizard application (CABWIZ.EXE) to generate a .CAB file for your application.

### Creating Device-Specific CAB Files

Do the following to create a device-specific .CAB file for an application, *in the order provided*:

- 1 Create an .INF file with Windows CE-specific modifications (*page 236*).
- 2 *Optional* Create a SETUP.DLL file to provide custom control of the installation process (*page 248*).
- 3 Use the CAB Wizard to create the .CAB file, using the .INF file, the optional SETUP.DLL file, and the device-specific application files as parameters (*page 249*).

#### Creating an .INF File

An .INF file specifies information about an application for the CAB Wizard. Below are the sections of an .INF file:

##### [Version]

This specifies the creator of the file, version, and other relevant information.

Required? Yes

- **Signature:** “*signature\_name*”  
Must be “\$Windows NT\$” as Windows CE is not available on Windows 95.
- **Provider:** “*INF\_creator*”  
The company name of the application, such as “Microsoft.”
- **CESignature:** “\$Windows CE\$”

##### EXAMPLE:

```
[Version]
Signature = "$Windows NT$"
Provider = "Microsoft"
CESignature = "$Windows CE$"
```

**[CEStrings]**

This specifies string substitutions for the application name and the default installation directory.

Required? Yes

- **AppName:** *app\_name*  
Name of the application. Other instances of %AppName% in the .INF file will be replaced with this string value, such as RP32.
- **InstallDir:** *default\_install\_dir*  
Default installation directory on the device. Other instances of %InstallDir% in the .INF file will be replaced with this string value. Example:  
\\storage\_card\\%AppName%

**EXAMPLE:**

```
[CEStrings]
AppName="Game Pack"
InstallDir=%CE1%\%AppName%
```

**[Strings]**

This section is optional and defines one or more string keys. A string key represents a string of printable characters.

Required? No

- **string\_key:** *value*  
String consisting of letters, digits, or other printable characters. Enclose *value* in double quotation marks "" if the corresponding string key is used in an item that requires double quotation marks. No string\_keys is okay.

**EXAMPLE:**

```
[Strings]
reg_path = Software\Microsoft\My Test App
```

**[CEDevice]**

Describes the platform for the targeted application. All keys in this section are optional. If a key is nonexistent or has no data, Windows CE does not perform any checking with the exception being *UnsupportedPlatforms*. If the *UnsupportedPlatforms* key exists but no data, the previous value is not overridden.

Required? Yes

- **ProcessorType** : *processor\_type*  
The value that is returned by `SYSTEMINFO.dwProcessorType`. For example, the value for the SH3 CPU is 10003 and the MIPS CPU is 4000.
- **UnsupportedPlatforms**: *platform\_family\_name*  
This lists known unsupported platform family names. If the name specified in the `[CEDevice.xxx]` section is different from that in the `[CEDevice]` section, both *platform\_family\_name* values are unsupported for the microprocessor specified by xxx. That is, the list of unsupported platform family names is appended to the previous list of unsupported names. Application Manager will not display the application for an unsupported platform. Also, a user will be warned during the setup process if the .CAB file is copied to an unsupported device.

**EXAMPLE:**

**[CEDevice]**

UnsupportedPlatforms = pltfrm1 ; pltfrm1 is unsupported

**[CEDevice.SH3]**

UnsupportedPlatforms = ; pltfrm1 is still unsupported

- **VersionMin**: *minor\_version*  
Numeric value returned by `OSVERSIONINFO.dwVersionMinor`. The .CAB file is valid for the currently connected device if the version of this device is greater than or equal to **VersionMin**. For Windows CE Japanese language devices, set this to 2.01
- **VersionMax**: *major\_version*  
Numeric value returned by `OSVERSIONINFO.dwVersionMajor`. The .CAB file is valid for the currently connected device if the version of this device is less than or equal to **VersionMax**. For Windows CE Japanese language devices, set this to 2.01



**Note:** Supported Windows CE operating system versions include 1.0, 1.01, 2.0, 2.01, and 2.10. When using these numbers, be sure to include all significant digits.

- **BuildMin**: *build\_number*  
Numeric value returned by `OSVERSIONINFO.dwBuildNumber`. The .CAB file is valid for the currently connected device if the version of this device is greater than or equal to **BuildMin**.
- **BuildMax**: *build\_number*  
Numeric value returned by `OSVERSIONINFO.dwBuildNumber`. The .CAB file is valid for the currently connected device if the version of this device is less than or equal to **BuildMax**.

**EXAMPLE:**

The following code example shows three [CEDevice] sections: one that gives basic information for any CPU and two that are specific to the SH3 and the MIPS microprocessors.

```
[CEDevice]                                ; A "template" for all platforms
UnsupportedPlatforms = pltfrm1 ; Does not support pltfrm1

; The following specifies version 1.0 devices only.
VersionMin = 1.0
VersionMax = 1.0

[CEDevice.SH3]                            ; Inherits all [CEDevice] settings
; This will create a .CAB file specific to SH3 devices.
ProcessorType = 10003                      ; SH3 .cab file is valid for SH3 microprocessors.
UnsupportedPlatforms =                    ; pltfrm1 is still unsupported

; The following overrides the version settings so that no version checking is
performed.
VersionMin =
VersionMax =

[CEDevice.MIPS]                           ; Inherits all [CEDevice] settings
; This will create a .CAB file specific to "MIPS" devices.
ProcessorType = 4000                       ; MIPS .CAB file is valid for MIPS microprocessor.
UnsupportedPlatforms =pltfrm2 ; pltfrm1, pltfrm2 unsupported for MIPS .CAB file.
```



**Note:** To create the two CPU-specific .CAB files for the SETUP.INF file in the previous example, run the CAB Wizard with the “/cpu sh3 mips” parameter.

**[DefaultInstall]**

This describes the default installation of your application. Note that under this section, you will list items expanded upon later in this description.

Required? Yes

- **Copyfiles:** *copyfile\_list\_section*  
Maps to files defined later in the .INF file, such as Files.App, Files.Font, and Files.Bitmaps.
- **AddReg:** *add\_registry\_section*  
Example: RegSettings.All
- **CEShortcuts:** *shortcut\_list\_section*  
String that identifies one more section that defines shortcuts to a file, as defined in the [CEShortcuts] section.
- **CESetupDLL:** *setup\_DLL*  
Optimal string that specifies a SETUP.DLL file. It is written by the Independent Software Vendor (ISV) and contains customized functions for operations during installation and removal of the application. The file must be specified in the [SourceDisksFiles] section.
- **CESelfRegister:** *self\_reg\_DLL\_filename*  
String that identifies files that self-register by exporting the **DllRegisterServer** and **DllUnregisterServer** Component Object Model (COM) functions. Specify these files in the [SourceDiskFiles] section. During installation, if installation on the device fails to call the file's exported **DllRegisterServer** function, the file's exported **DllUnregisterServer** function will not be called during removal.

**EXAMPLE:****[DefaultInstall]**

```
AddReg = RegSettings.All
CEShortcuts = Shortcuts.All
```

**[SourceDiskNames]**

This section describes the name and path of the disk on which your application resides.

Required? Yes

- **disk\_ordinal:** *disk\_label,,path*  
1=, "App files", C:\Appsoft\RP32\...  
2=, "Font files", C:\RpTools\...  
3=, "CE Tools", C:\windows ce tools...
- **CESignature:** "\$Windows CE\$"

**Example**

```
[SourceDisksNames]                                ; Required section
1 = , "Common files", , C:\app\common              ; Using an absolute path
[SourceDisksNames.SH3]
2 = , "SH3 files", , sh3                          ; Using a relative path
[SourceDisksNames.MIPS]
2 = , "MIPS files", , mips                        ; Using a relative path
```

**[SourceDiskFiles]**

This describes the name and path of the files in which your application resides.

Required? Yes

- **filename:** *disk\_number[,subdir]*  
 RPM.EXE = 1,c:\appsoft\...  
 WCESTART.INI = 1  
 RPMCE212.INI = 1  
 TAHOMA.TTF = 2



**Note:** [,subdir] is relative to the location of the INF file.

**Example**

```
[SourceDisksFiles]           ; Required section
begin.wav = 1
end.wav = 1
sample.hlp = 1
[SourceDisksFiles.SH3]
sample.exe = 2               ; Uses the SourceDisksNames.SH3 identification of 2.
[SourceDisksFiles.MIPS]
sample.exe = 2               ; Uses the SourceDisksNames.MIPS identification of 2.
```



**[DestinationDirs]**

This describes the names and paths of the destination directories for the application on the target device. *Note Windows CE does not support directory identifiers.*

**Required?** Yes

- **file\_list\_section:** *0,subdir*  
String that identifies the destination directory. The following list shows the string substitutions supported by Windows CE. These can be used only for the beginning of the path. \
  - %CE1% \Program Files
  - %CE2% \Windows
  - %CE3% \My Documents
  - %CE4% \Windows\Startup
  - %CE5% \My Documents
  - %CE6% \Program Files\Accessories
  - %CE7% \Program Files\Communication
  - %CE8% \Program Files\Games
  - %CE9% \Program Files\Pocket Outlook
  - %CE10% \Program Files\Office
  - %CE11% \Windows\Start Menu\Programs
  - %CE12% \Windows\Start Menu\Programs\Accessories
  - %CE13% \Windows\Start Menu\Programs\Communications
  - %CE14% \Windows\Start Menu\Programs\Games
  - %CE15% \Windows\Fonts
  - %CE16% \Windows\Recent
  - %CE17% \Windows\Start Menu
  - %InstallDir%
 Contains the path to the target directory selected during installation. It is declared in the [CEStrings] section  
 %AppName%  
 Contains the application name defined in the [CEStrings] section.

**Example****[DestinationDirs]**

```
Files.Common = 0,%CE1%\My Subdir      ; \Program Files\My Subdir
Files.Shared = 0,%CE2%                ; \Windows
```

**[CopyFiles]**

This section, under the **[DefaultInstall]** section, describes the default files to copy to the target device. Within the **[DefaultInstall]** section, files were listed that must be defined elsewhere in the INF file. This section identifies that mapping and may contain flags.

**Required?** Yes

- **copyfile\_list\_section:** *destination\_filename,[source\_filename]*  
The *source\_filename* parameter is optional if it is the same as *destination\_filename*.
- **copyfile\_list\_section:** *flags*  
The numeric value that specifies an action to be done while copying files. The following table shows values supported by Windows CE.

Flag	Value	Description
COPYFLG_WARN_IF_SKIP	0x00000001	Warn user if skipping a file is attempted after error.
COPYFLG_NOSKIP	0x00000002	Do not allow a user to skip copying a file.
COPYFLG_NO_OVERWRITE	0x00000010	Do not overwrite files in destination directory.
COPYFLG_REPLACEONLY	0x00000400	Copy the source file to the destination directory only if the file is already in the destination directory.
CE_COPYFLG_NO_DATE_DIALOG	0x20000000	Do not copy files if the target file is newer.
CE_COPYFLG_NODATECHECK	0x40000000	Ignore date while overwriting the target file.
CE_COPYFLG_SHARED	0x80000000	Create a reference when a shared DLL is counted.

**Example**

```
[DefaultInstall.SH3]
CopyFiles = Files.Common, Files.SH3
[DefaultInstall.MIPS]
CopyFiles = Files.Common, Files.MIPS
```

**[AddReg]**

This section, under the **[DefaultInstall]** section, is optional and describes the keys and values that the .CAB file adds to the device registry. Within the **[DefaultInstall]** section, a reference may have been made to this section, such as “AddReg=RegSettings.All”. This section defines the options for that setting.

Required? No

- **add\_registry\_section:** *registry\_root\_string*  
String that specifies the registry root location. The following list shows the values supported by Windows CE.
  - HKCR Same as HKEY\_CLASSES\_ROOT
  - HKCU Same as HKEY\_CURRENT\_USER
  - HKLM Same as HKEY\_LOCAL\_MACHINE
- **add\_registry\_section:** *value\_name*  
Registry value name. If empty, the “default” registry value name is used.
- **add\_registry\_section:** *flags*  
Numeric value that specifies information about the registry key. The following table shows the values that are supported by Window CE.

Flag	Value	Description
FLG_ADDREG_NOCLOBBER	0x00000002	If the registry key exists, do not overwrite it. Can be used with any of the other flags in this table.
FLG_ADDREG_TYPE_SZ	0x00000000	REG_SZ registry data type.
FLG_ADDREG_TYPE_MULTI_SZ	0x00010000	REG_MULTI_SZ registry data type. Value field that follows can be a list of strings separated by commas.
FLG_ADDREG_TYPE_BINARY	0x00000001	REG_BINARY registry data type. Value field that follows must be a list of numeric values separated by commas, one byte per field, and must not use the 0x hexadecimal prefix.
FLG_ADDREG_TYPE_DWORD	0x00010001	REG_DWORD data type. The noncompatible format in the Win32 Setup .INF documentation is supported.

**Example**

```
AddReg = RegSettings.All
```

**[RegSettings.All]**

```
HKLM,%reg_path%,,0x00000000,alpha ; <default> = "alpha"
HKLM,%reg_path%,test,0x00010001,3 ; Test = 3
HKLM,%reg_path%\new,another,0x00010001,6 ; New\another = 6
```

**[CEShortcuts]**

This section, a Windows CE-specific section under the **[DefaultInstall]** section, is optional and describes the shortcuts that the installation application creates on the device. Within the **[DefaultInstall]** section, a reference may have been made to this section, such as “Shortcuts.All”. This section defines the options for that setting.

**Required?** No

- **shortcut\_list\_section:** *shortcut\_filename*  
String that identifies the shortcut name. It does not require the .LNK extension.
- **shortcut\_list\_section:** *shortcut\_type\_flag*  
Numeric value. Zero or empty represents a shortcut to a file; any non-zero numeric value represents a shortcut to a folder.
- **shortcut\_list\_section:** *target\_file\_path*  
String value that specifies the destination location. Use the target file name for a file, such as MyApp.exe, that must be defined in a file copy list. For a path, use a *file\_list\_section* name defined in the **[DestinationDirs]** section, such as *DefaultDestDir*, or the *%InstallDir%* string.
- **shortcut\_list\_section:** *standard\_destination\_path*  
Optional string value. A standard *%CEX%* path or *%InstallDir%*. If no value is specified, the *shortcut\_list\_section* name of the current section or the *DefaultDestDir* value from the **[DestinationDirs]** section is used.

**Example**

```

CEShortcuts = Shortcuts.All
[Shortcuts.All]
Sample App,0,sample.exe          ; Uses the path in DestinationDirs. Sample
App,0,sample.exe,%InstallDir%    ; The path is explicitly specified.

```

**Sample .INF File**

```

[Version]          ; Required section
Signature = "$Windows NT$"
Provider = "Intermec Technologies Corporation"
CESignature = "$Windows CE$"

;[CEDevice]
;ProcessorType =

[DefaultInstall]  ; Required section
CopyFiles = Files.App, Files.Fonts, Files.BitMaps, Files.Intl,
Files.TelecomNcsCE, Files.Windows, Files.Import, Files.Export, Files.Work,
Files.Database, Files.WinCE AddReg = RegSettings.All ;CEShortcuts =
Shortcuts.All

[SourceDisksNames] ; Required section
1 = ,"App files" ,,c:\appsoft\...
2 = ,"Font files" ,,c:\WinNT\Fonts
3 = ,"CE Tools" ,,c:\windows ce tools\wce212\6110ie\mfc\lib\x86

[SourceDisksFiles] ; Required section
rpm.exe = 1,C:\Appsoft\program\wce212\WCEX86Rel16110
wcestart.ini = 1

```

```
rpmce212.ini = 1
intermec.bmp = 1
rpmlogo.bmp = 1
rpmname.bmp = 1
import.bmp = 1
export.bmp = 1
clock.bmp = 1
printer.bmp = 1
filecopy.bmp = 1
readme.txt = 1
lang_eng.bin = 1
rpmdata.dbd = 1,database\wce1
tahoma.ttf = 2
mfcce212.dll = 3
olece212.dll = 3
olece211.dll = 1,c:\windows ce tools\wce211\NMSD61102.11\mfc\lib\x86
rdm45wce.dll = 1,c:\rptools\rdm45wce\4_50\lib\wce212\wcex86rel
picfmt.dll = 1,c:\rptools\picfmt\1_00\wce212\wcex86rel6110
fmtctrl.dll = 1,c:\rptools\fmtctrl\1_00\wce212\wcex86rel6110
ugrid.dll = 1,c:\rptools\ugrid\1_00\wce212\wcex86rel6110
simple.dll = 1,c:\rptools\pspbm0c\1_00\wce211\wcex86rel
psink.dll = 1,c:\rptools\psink\1_00\wce211\WCEX86RelMinDependency
pslpwce.dll =1,c:\rptools\pslpm0c\1_00\wce211\WCEX86RelMinDependency
npcport.dll = 1,c:\rptools\cedk\212_03\installable drivers\printer\npcp
;dexcom.dll = 1,c:\rptools\psdxm0c\1_00\x86
ncsce.exe = 1,c:\rptools\ncsce\1_04
nrinet.dll = 1,c:\rptools\ncsce\1_04
```

```
[DestinationDirs] ; Required section
;Shortcuts.All = 0,%CE3% ; \Windows\Desktop
Files.App = 0,%InstallDir%
Files.DataBase = 0,%InstallDir%\DataBase
Files.BitMaps = 0,%InstallDir%\Bitmaps
Files.Fonts = 0,%InstallDir%\Fonts
Files.Intl = 0,%InstallDir%\Intl
Files.TelecomNcsCE = 0,%InstallDir%\Telecom\NcsCE
Files.Windows = 0,%InstallDir%\Windows
Files.Import = 0,%InstallDir%\Import
Files.Export = 0,%InstallDir%\Export
Files.Work = 0,%InstallDir%\Work
Files.WinCE = 0,\storage_card\wince
```

```
[CEStrings] ; Required section
AppName = Rp32
InstallDir = \storage_card\%AppName%
```

```
[Strings] ; Optional section
;[Shortcuts.All]
;Sample App,0,sample.exe ; Uses the path in DestinationDirs.
;Sample App,0,sample.exe,%InstallDir% ; The path is explicitly specified.
```

```
[Files.App]
rpm.exe,,,0
rpm.ini,rpmce212.ini,,0
mfcce212.dll,,,0
olece212.dll,,,0
olece211.dll,,,0
rdm45wce.dll,,,0
picfmt.dll,,,0
```

```

fmtctrl.dll,,,0
ugrid.dll,,,0
simple.dll,,,0
psink.dll,,,0
pslpwce.dll,,,0
npcppport.dll,,,0
;dexcom.dll,,,0

[Files.DataBase]
rpmdata.dbd,,,0

[Files.Fonts]
tahoma.ttf,,,0

[Files.BitMaps]
intermec.bmp,,,0
rpmlogo.bmp,,,0
rpmname.bmp,,,0
import.bmp,,,0
export.bmp,,,0
clock.bmp,,,0
printer.bmp,,,0
filecopy.bmp,,,0

[Files.Intl]
lang_eng.bin,,,0

[Files.TelecomNcsCE]
ncsce.exe,,,0
nrinet.dll,,,0

[Files.Windows]
readme.txt,,,0

[Files.Import]
readme.txt,,,0

[Files.Export]
readme.txt,,,0

[Files.Work]
readme.txt,,,0

[Files.WinCE]
wcestart.ini,,,0

[RegSettings.All]
HKLM,"SOFTWARE\Microsoft\Shell\AutoHide",,0x00010001,1
; Autohide the taskbar HKLM,"SOFTWARE\Microsoft\Shell\OnTop",,0x00010001,0
; Shell is not on top HKLM,"SOFTWARE\Microsoft\Clock",SHOW_CLOCK,0x00010001,0
; Clock is not on taskbar

```

## Using Installation Functions in SETUP.DLL

SETUP.DLL is an optional file that enables you to perform custom operations during installation and removal of your application. The following list shows the functions that are exported by SETUP.DLL.

- **Install\_Init**  
Called before installation begins. Use this function to check the application version when reinstalling an application and to determine if a dependent application is present.
- **Install\_Exit**  
Called after installation is complete. Use this function to handle errors that occur during application installation.
- **Uninstall\_Init**  
Called before the removal process begins. Use this function to close the application, if the application is running.
- **Uninstall\_Exit**  
Called after the removal process is complete. Use this function to save database information to a file and delete the database and to tell the user where the user data files are stored and how to reinstall the application.



**Note;** Use [DefaultInstall] → CEMSelfRegister (page 240) in the .INF file to point to SETUP.DLL.

## After the CAB File Extraction

Cab files that need to cause a warm reset after cab extraction will need to create the \_\_RESETMEPLEASE\_\_.TXT file in the “\Windows” directory. The preferred method to create this file is within the DllMain portion of the SETUP.DLL file. It looks like this:

```

BOOL APIENTRY DllMain( HANDLE hModule, DWORD ul_reason_for_call, LPVOID
lpReserved )
{
    switch (ul_reason_for_call)
    {
        case DLL_PROCESS_ATTACH:
            break;
        case DLL_THREAD_ATTACH:
            break;
        case DLL_THREAD_DETACH:
            break;
        case DLL_PROCESS_DETACH:
            if (bInstallSuccessful) {
                HANDLE h;
                h = CreateFile(L"\\Windows\\__resetmeplease__.txt",
                    GENERIC_READ|GENERIC_WRITE, 0, NULL, CREATE_ALWAYS,
                    FILE_ATTRIBUTE_HIDDEN, NULL);
                if (h != INVALID_HANDLE_VALUE)
                    CloseHandle(h);
            }
            break;
    }
    return TRUE;
}

```

The system software looks for the following directory structure and files on the installed media card whether it be an SD card or CF card or embedded flash file system. No other folders need exist.

```
\2577\autorun.exe
\2577\autorun.dat
\2577\autocab.exe
\2577\autocab.dat
\cabfiles\*.cab
```

## Creating CAB Files with CAB Wizard

After you create the .INF file and the optional SETUP.DLL file, use the CAB Wizard to create the .CAB file. The command-line syntax for the CAB Wizard is as follows:

```
cabwiz.exe "inf_file" [/dest dest_directory] [/err error_file] [/cpu cpu_type
[cpu_type]]
```

A batch file, located in <program> directory, with the following commands, works well:

```
cd "Windows CE Tools"\WCE211\MS HPC Pro\support\appinst\bin
cabwiz.exe c:\appsoft\<program>\<inf_file_name>
cd \appsoft\<program>
```

- **“inf\_file”**  
The SETUP.INF file path.
- **dest\_directory**  
The destination directory for the .CAB files. If no directory is specified, the .CAB files are created in the “inf\_file” directory.
- **error\_file**  
The file name for a log file that contains all warnings and errors that are encountered when the .CAB files are compiled. If no file name is specified, errors are displayed in message boxes. If a file name is used, the CAB Wizard runs without the user interface (UI); this is useful for automated builds.
- **cpu\_type**  
Creates a .CAB file for each specified microprocessor tag. A microprocessor tag is a label used in the Win32 SETUP.INF file to differentiate between different microprocessor types. The /cpu parameter, followed by multiple *cpu\_type* values, must be the last qualifier in the command line.

### Example

This example creates .CAB files for the SH3 and MIPS microprocessors, assuming that the Win32 SETUP.INF file contains the SH3 and MIPS tags:

```
cabwiz.exe "c:\myfile.inf" /err myfile.err /cpu sh3 mips
```



**Note:** CABWIZ.EXE, MAKECAB.EXE, and CABWIZ.DDF (Windows CE files available on the Windows CE Toolkit) must be installed in the same directory on the desktop computer. Call CABWIZ.EXE using its full path for the CAB Wizard application to run correctly.



## Troubleshooting the CAB Wizard

To identify and avoid problems that might occur when using the CAB Wizard, follow these guidelines:

- Use %% for a percent sign (%) character when using this character in an .INF file string, as specified in Win32 documentation. This will not work under the [Strings] section.
- Do not use .INF or .CAB files created for Windows CE to install applications on Windows-based desktop platforms.
- Ensure the MAKECAB.EXE and CABWIZ.DDF files, included with Windows CE, are in the same directory as CABWIZ.EXE.
- Use the full path to call CABWIZ.EXE.
- Do not create a .CAB file with the MAKECAB.EXE file included with Windows CE. You must use CABWIZ.EXE, which uses MAKECAB.EXE to generate the .CAB files for Windows CE.
- Do *not* set the read-only attribute for .CAB files.

## FTP Server

FTP support is provided through the FTP Server application FTPDCE.EXE (MS Windows CE Versions) which is provided as part the base system.

FTPDCE is the Internet File Transfer Protocol (FTP) server process. The server can be invoked from an application or command line. Besides servicing FTP client requests the FTP Server also send a “network announcement” to notify prospective clients of server availability.

### Synopsis

`ftpdce [ options ]`

### Options

- *-Aaddr*  
Sets the single target address to which to send the network announcement. *Default is broadcast.*
- *-Bbyte*  
Sets the FTP data block size. Smaller sizes may be useful over slower links. *Default is 65536.*
- *-Cname*  
Sets the device name. Used by Intermec management software.
- *-Fvalue*  
Disables the default Intermec account. A value of “0” disables the account. *Default is “1”.*



**Note:** Disabling the default account without providing a working access control list on the server will result in a device that will not accept any FTP connections.

- *-Hsec*  
Sets the interval between network announcements in seconds. A value of “0” turns the network announcement off. *Default is 30 seconds.*
- *-Iip*  
Sets the preferred 6920 Communications Server (*optional*).
- *-Llog*  
Sets the state of logging. *Default is 0 (disabled).*
- *-Nsec*  
Specifies the number of seconds to wait before starting FTP server services.
- *-Pport*  
Sets the UDP port on which the network announcement will be sent. *Default port is 52401.*
- *-Qport*  
Sets the port on which the FTP Server will listen for connections. *Default port is 21.*

- *-Rdir*  
Sets the FTP mount point to this directory. Default is the rootdirectory of the drive from which the FTP Server program was executed.
- *-Tscript*  
Sets the script name for the 6920 Communications Server to process.
- *-Uurl*  
Sets the default URL for this device.
- *-Z“parms”*  
Sets extended parameters to be included in the network announcement.

## Configurable Parameters Via the Registry Editor

The following parameters receive default values during the installation of the Intermec FTP Server components. A few of the parameters are visible in the registry by default, but most must be created in order to modify the default behavior of the FTP server.

### BlockSize

Setting this parameter forces the Intermec FTP Server to transmit and receive Ethernet packets using the specified data block size. By default, the FTP server transmits and receives data using a 64K data block size. Adjusting this value may be useful in certain wireless TCP/IP installations.

### Key

HKLM\Software\Intermec\IFTP

### Value Type

REG\_DWORD - data block size, in bytes.

### Valid Range

0x100-0x10000 (256-65536 decimal).

### Default

65536

**DeviceName**

This parameter forces the Intermecc FTP Server to include the specified device name in the Intermecc Device Network Announcement (IDNA). Adjusting this value may be useful in assigning a symbolic name to this device for asset tracking.

**Key**

HKLM\Software\Intermecc\IFTP

**Value Type**

REG\_SZ

**Valid Range**

None.

**Default**

None.

**DeviceURL**

This parameter forces the Intermecc FTP Server to transmit the specified URL in the IDNA. This can be used by Intermecc management software for asset management.

**Key**

HKLM\Software\Intermecc\IFTP

**Value Type**

REG\_SZ

**Valid Range**

None.

**Default**

None.

### **IDNATarget**

This parameter forces the Intermecc FTP Server to transmit the IDNA to a specific destination instead of a general UDP broadcast. This parameter is useful on networks that do not allow UDP broadcasts to be routed between subnets. The use of this parameter will restrict the reception of the IDNA to the target destination only.

#### **Key**

HKLM\Software\Intermec\IFTP

#### **Value Type**

REG\_SZ

#### **Valid Range**

None.

#### **Default**

None.

### **ManifestName**

This parameter forces the Intermecc FTP Server to transmit the specified manifest name in the IDNA. This parameter is used by the Intermecc 6920 Communications Server for communication transactions. See the 6920 Communications Server documentation for proper use of this parameter.

#### **Key**

HKLM\Software\Intermec\IFTP

#### **Value Type**

REG\_SZ

#### **Valid Range**

None.

#### **Default**

iftp.ini

**PauseAtStartup**

This parameter forces the Intermecc FTP Server to sleep for the specified number of seconds before making the FTP service available on the device.

**Key**

HKLM\Software\Intermec\IFTP

**Value Type**

REG\_DWORD - stored in seconds.

**Valid Range**

None.

**Default**

0

**Root**

This parameter forces the Intermecc FTP Server to set the root of the FTP mount point to the specified value. *Note that this must map to an existing directory or you will not be able to log into the FTP Server.*

**Key**

HKLM\Software\Intermec\IFTP

**Value Type**

REG\_SZ

**Valid Range**

None.

**Default**

\

## Transferring Files Over TCP/IP Networks

The File Transfer Protocol (FTP) server transfers files over TCP/IP networks. The FTPDCE.EXE program is a version that does not display a window, but can run in the background.

FTPDCE is the Internet File Transfer Protocol (FTP) server process. The server can be invoked from an application or command line. Besides servicing FTP client requests, the FTP Server also sends a “network announcement” to notify prospective clients of server availability.

### Remarks

The FTP Server currently supports the following FTP requests:

- **CDUP**  
Changes to the parent directory of the current working directory.
- **CWD**  
Changes working directory.
- **DELE**  
Deletes a file.
- **HELP**  
Gives help information.
- **LIST** (*This FTP request is the same as the `ls -lgA` command*).  
Gives list files in a directory.
- **MKD**  
Makes a directory.
- **MODE** (*Always Uses Binary*).  
Specifies data transfer mode.
- **NLST**  
Gives a name list of files in directory (this FTP request is the same as the `ls` command).
- **NOOP**  
Does nothing.
- **PASS**  
Specifies a password.
- **PWD**  
Prints the current working directory.
- **QUIT**  
Terminates session.
- **RETR**  
Retrieves a file.
- **RMD**  
Removes a directory.
- **RNFR**  
Specifies rename-from file name.

- **RNTO**  
Specifies rename-to file name.
- **STOR**  
Stores a file.
- **SYST**  
Shows the operating system type of server system.
- **TYPE** (*Binary transfers only.*)  
Specifies the data transfer type with the Type parameter.
- **USER**  
Specifies user name.
- **XCUP** (*Not Normally Used*)  
Changes the parent directory of the current working directory.
- **XCWD** (*Not Normally Used*)  
Changes the current directory.
- **XMKD** (*Not Normally Used*)  
Creates a directory.
- **XPWD** (*Not Normally Used*)  
Prints the current working directory.
- **XRMD** (*Not Normally Used*)  
Removes a directory.
- **SITE**  
The following nonstandard or operating system (OS)-specific commands are supported by the SITE request. For Microsoft FTP clients, you can send site commands by preceding the command with “quote” such as “quote site status.”

- **ATTRIB**

Gets or sets the attributes of a given file. (SITE ATTRIB)

*Usage:*     **QUOTE SITE ATTRIB** [+R | -R] [+A | -A] [+S | -S]  
                  [+H | -H] [[*path*] *filename*]

+	Sets an attribute.
`	Clears an attribute.
R	Read-only file attribute.
A	Archive file attribute.
S	System file attribute.
H	Hidden file attribute.

To retrieve the attributes of a file, only specify the file. The server response will be: *200-AD SHRCEIX filename*

If the flag exists in its position shown above, it is set. Also, in addition to the values defined above, there is also defined:

C	Compressed file attribute.
E	Encrypted file attribute.
I	INROM file attribute.
X	XIP file attribute (execute in ROM, not shadowed in RAM).



- **BOOT**  
Reboots the server OS. This will cause the system on which the server is executing to reboot. The FTP Server will shut down cleanly before reboot. All client connections will be terminated. Cold boot is default except for the PocketPC build in which the default is warm boot.  
(SITE BOOT)  
*Usage:* QUOTE SITE BOOT [*WARM* | *COLD*]
- **COPY**  
Copies a file from one location to another. (SITE COPY)  
*Usage:* QUOTE SITE COPY [*source*] [*destination*]

### Example

```
QUOTE SITE COPY '\\Storage Card\one.dat' '\\Storage Card\two.dat'
```

- **EXIT**  
Exits the FTP Server. This command will shut down the FTP Server thus terminating all client connections. (SITE EXIT)  
*Usage:* QUOTE SITE EXIT
- **HELP**  
Gives site command help information. (SITE HELP)  
*Usage:* QUOTE SITE HELP [*command*]
- **KILL**  
Terminates a running program. (SITE KILL)  
*Usage:* QUOTE SITE KILL [*program* | *pid*]
- **LOG**  
Opens or closes the program log. (SITE LOG)  
*Usage:* QUOTE SITE LOG [*open* [*filename*]| *close*]
- **PLIST**  
Lists the running processes (*not supported on all platforms*). (SITE PLIST)  
*Usage:* QUOTE SITE PLIST
- **RUN**  
Starts a program running. If the program to run has spaces in path or filename, wrapping the name with single quotes is required.  
*Usage:* QUOTE SITE RUN [*program*]

### Example

```
QUOTE SITE RUN '\\Storage Card\app.exe'
```

- **STATUS**

Returns the current settings of the FTP Server. MAC, serial number, model, IP address, network announcement information as well as OS memory usage are returned. (SITE STATUS)

*Usage:* QUOTE SITE STATUS

- **TIMEOUT**

Toggles idle timeout between 120 to 1200 seconds (2 to 20 minutes). If this timer expires with no activity between the client and the server, the client connection will be disconnected. If the optional seconds argument is supplied, the server will set the connection timeout to the number of seconds specified. *Default is 120 seconds or 2 minutes.* (SITE TIMEOUT)

*Usage:* QUOTE SITE TIMEOUT [*seconds*]

The remaining FTP requests specified in RFC 959 are recognized, but not implemented.

The banner returned in the parenthetical portion of its greeting shows the version number of the FTP Server as well as the MAC address, serial number and OS of the machine hosting the server.

The FTP Server supports browsing from the latest Netscape and Microsoft web browsers. Drag-and-drop capability is available using this environment.

The FTPDCMDS subdirectory contains commands that can be used from the web browser.

- Click EXITME.BIN to execute a SITE EXIT command.
- Click REBOOTME.BIN to execute SITE BOOT command.
- Use the GET command on these files to have the FTP Server execute these commands.

- **Security:**

A customer configurable access control list may be installed on the 700 Series Computer. This list will allow customers to restrict access via the FTP Server to the users they wish. This is in addition to the default Intermecc account which can be disabled using the *-FO* option at runtime.

The access control list is named FTPDCE.TXT and is placed in the same directory on the 700 Series Computer as the FTPDCE.EXE server. The FTP Server will encrypt this file to keep the information safe from unauthorized users. This file is encrypted when the FTP Server is started so a file that is placed onto the 700 Series Computer after the FTP Server starts will require a restart of the FTP Server to take effect.

The format of the FTPDCE.TXT is as follows:

```
FTPDCE:user1!passwd1<cr><lf>user2!passwd2<cr><lf>user3!passwd3<cr><lf>...
```



**Note:** The user accounts and passwords are case sensitive. Once the access control list is encrypted on the 700 Series Computer, the FTP Server will hide this file from users. Once an access control list has been installed on the 700 Series Computer, a new one will not be accepted by the FTP Server until the previous one is removed. Encrypted access control lists are not portable between 700 Series Computers.

## Stopping the FTP Server from Your Application

To allow application programmers the ability to programmatically shut down the FTP Server, the FTP Server periodically tests to see if a named event is signaled. The name for this event is “ITC\_IFTP\_STOP” (no quotes).

For examples on how to use this event, consult the Microsoft Developer Network Library at <http://www.msdn.com>. The MSDN Library is an essential resource for developers using Microsoft tools, products, and technologies. It contains a bounty of technical programming information, including sample code, documentation, technical articles, and reference guides.

## Autostart FTP



This automatically starts the FTP Server (FTPDCE.EXE) when the 700 Series Computer is powered on. This is provided with the NDISTRAY program, which displays the popup menu that currently allows you to load and unload the network drivers. Tap the antenna icon in the System Tray of the Today screen (*a sample antenna icon is circled below*) to get this popup menu.



The default is to start the FTP Server at boot time, unless the following registry entry is defined and set to “0” which disables AutoFTP. “1” enables the AutoFTP. The entry can be set from the NDISTRAY pop-up menu by selecting either **AutoFTP On** or **AutoFTP Off**.

HKEY\_LOCAL\_MACHINE\Software\Intermec\Ndistray\StartupIFTP

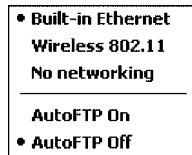
These new entries are located below the selections to load the network drivers. If the StartupIFTP registry key is not defined, the FTP Server is loaded by default, to provide “out-of-the-box” capability for customers who want to begin loading files to the 700 Series Computer without any prior configuration.



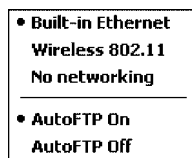
**Note:** If a network driver is unloaded using the NDISTRAY popup menu, and the FTP Server is running, the FTP Server is stopped.

On a resume, if AutoFTP is enabled and the FTP Server is running, it is stopped and restarted. NDISTRAY uses a helper application named RESE-TIFTP to implement the restart on resume feature. To do an AutoFTP Installation Check:

- 1 Ensure the FTP Server is running “out-of-the-box” the first time.
- 2 Tap **Start** → **Today** to access the Today screen, then tap the antenna icon in the System Tray to bring up the NDISTRAY pop-up menu. Select **AutoFTP Off** to disable AutoFTP. Do a warm boot and confirm the FTP Server is not running.



- 3 Tap **Start** → **Today** to access the Today screen, then tap the antenna icon in the System Tray to bring up the NDISTRAY pop-up menu. Select **AutoFTP On** to enable AutoFTP, reboot and confirm it is running.



- 4 Unload the network driver when the FTP Server is running and confirm that it is not running any more.
- 5 Load the FTP Server, establish a connection, then suspend and resume. The server should still be running, but the FTP connection to the client should be dropped.

## Full Screen

Pocket PC is a hardware specification created by Microsoft Corporation. Devices that wish to carry the Pocket PC logo must meet the minimum hardware requirements set in the Pocket PC specification. Manufacturers are free to add extra hardware functionality.

Pocket PC 2002 devices also use a specialized version of the CE operating system. This OS is built from Windows CE 3.0 but contains customizations, most notably the lack of a desktop and the addition of the Today Screen.

To carry the Pocket PC logo, all devices must be tested at an Independent Test Laboratory. The ITL testing is done based on Microsoft requirements. The test lab then reports the findings back to Microsoft Corporation and Intermec Technologies. If the 700 Series Computer passed all tests, Intermec is allowed to ship the device with the Pocket PC logo. Each time the operating system is modified, Intermec must resubmit to ITL testing.

This means we cannot change the operating system much and still be a Pocket PC device. For example, if we remove Word from the Start menu, the device would fail ITL testing and we would not be able to ship devices with the Pocket PC logo.

Although many customers want a Pocket PC device, some customers would prefer that their users not have access to all of the Pocket PC features. Intermec cannot customize the operating system in any way but a custom application can:

- Delete items from the Start menu, and Programs folder. These items are just shortcuts in the file system so the application is not really being deleted. Cold booting the device will bring these items back so the application will need to be run on every cold boot.
- Use the `RegFlushKey()` API to save a copy of the registry to a storage device. See the *Recovery CD Help* for more information on how to do this. Saving a copy of the registry will allow most system settings to be restored in a cold boot situation.
- Use the `SHFullScreen()` API in conjunction with other APIs to make the application take up the entire display and prevent the start menu from being available.
- Remap keys and disable keys on the keypad.
- Create a custom SIP.
- Make changes to the registry to configure the device.

Should you want your 700 Series Computer to display a full screen, keep in mind that your computer is Pocket-PC certified by Microsoft Corporation. Check out resources on programming for the Pocket PC, using the following links. These instructions give full instructions on how to display full screen.

- Instructions on how to create a full screen application for eVC++ applications using an SHFullScreen() API:  
*<http://support.microsoft.com/support/kb/articles/Q266/2/44.ASP>*
- Instructions on how to create a full screen application for eVB applications also using the SHFullScreen() API:  
*<http://support.microsoft.com/support/kb/articles/Q265/4/51.ASP>*

## Kernel I/O Controls

This describes the `KernelIoControl()` functions available to application programmers. Most C++ applications will need to prototype the function as the following to avoid link and compile errors.

```
extern "C" BOOL KernelIoControl(DWORD dwIoControlCode, LPVOID lpInBuf, DWORD
nInBufSize, LPVOID lpOutBuf, DWORD nOutBufSize, LPDWORD lpBytesReturned);
```

### IOCTL\_HAL\_GET\_DEVICE\_INFO

This IOCTL returns either the platform type or the OEMPLATFORM name based on an input value.

#### Syntax

```
BOOL KernelIoControl( IOCTL_HAL_GET_DEVICE_INFO, LPVOID
lpInBuf, DWORD nInBufSize, LPVOID lpOutBuf, DWORD
nOutBufSize, LPDWORD lpBytesReturned );
```

#### Parameters

<i>lpInBuf</i>	Points to a DWORD containing either the SPI_GETPLATFORMTYPE or SPI_GETOEMINFO value.
<i>lpInBufSize</i>	Must be set to sizeof(DWORD).
<i>lpOutBuf</i>	Must point to a buffer large enough to hold the return data of the function. If SPI_GETPLATFORMTYPE is specified in <i>lpInBuf</i> , then the "PocketPC\0" Unicode string is returned. If SPI_GETOEMINFO is specified in <i>lpInBuf</i> , then the "Intermec 700\0" Unicode string is returned.
<i>nOutBufSize</i>	The size of <i>lpOutBuf</i> in bytes. Must be large enough to hold the string returned.
<i>lpBytesReturned</i>	The actual number of bytes returned by the function for the data requested.

#### Return Values

Returns TRUE if function succeeds. Returns FALSE if the function fails. GetLastError() may be used to get the extended error value.

## IOCTL\_HAL\_ITC\_READ\_PARM

### Usage

#include "oemioctl.h"

### Syntax

```
BOOL KernelIoControl( IOCTL_HAL_ITC_READ_PARM, LPVOID
lpInBuf, DWORD nInBufSize, LPVOID lpOutBuf, DWORD
nOutBufSize, LPDWORD lpBytesReturned );
```

### Parameters

*lpInBuf* Points to this structure. See "ID Field Values" below.

```
struct PARMS {
    BYTE id;
    BYTE ClassId;
};
```

*nInBufSize* Must be set to the size of the PARMS structure.

*lpOutBuf* Must point to a buffer large enough to hold the return data of the function. If this field is set to NULL and *nOutBufSize* is set to zero when the function is called the function will return the number bytes required by the buffer.

*nOutBufSize* The size of *lpOutBuf* in bytes.

*lpBytesReturned* The number of bytes returned by the function for the data requested.

### Return Values

Returns TRUE if function succeeds. Returns FALSE if the function fails. GetLastError() may be used to get the error value. Either ERROR\_INVALID\_PARAMETER or ERROR\_INSUFFICIENT\_BUFFER may be returned when this function is used to get the error.

### ID Field Values

The *id* field of the PARMS structure may be one of the following values:

- **ITC\_NVPARAM\_ETHERNET\_ID**  
This IOCTL returns the Ethernet 802.11 MAC Address. Six bytes are returned in the buffer pointed to by the *lpOutBuffer* parameter.
- **ITC\_NVPARAM\_SERIAL\_NUM**  
This IOCTL returns the serial number of the device in BCD format. Six bytes are returned in the buffer pointed to by the *lpOutBuffer* parameter.
- **ITC\_NVPARAM\_MANF\_DATE**  
This IOCTL returns the device date of manufacture in the BCD YYYY/MM/DD format. Four bytes are returned in the buffer pointed to by the *lpOutBuffer* parameter.



- **ITC\_NVPARM\_SERVICE\_DATE**  
This IOCTL returns the device's date of last service in BCD YYYY/MM/DD format. Four bytes are returned in the buffer pointed to by the *lpOutBuffer* parameter.
- **ITC\_NVPARM\_DISPLAY\_TYPE**  
This IOCTL returns the device's display type. One byte is returned in the buffer pointed to by the *lpOutBuffer* parameter.
- **ITC\_NVPARM\_EDG\_IP**  
This IOCTL returns the device Ethernet debug IP address. Four bytes are returned in the buffer pointed to by the *lpOutBuffer* parameter.
- **ITC\_NVPARM\_EDBG\_SUBNET**  
This IOCTL returns the device Ethernet debug subnet mask. Four bytes are returned in the buffer pointed to by the *lpOutBuffer* parameter.
- **ITC\_NVPARM\_ECN**  
This IOCTL returns ECNs applied to the device in a bit array format. Four bytes are returned in the buffer pointed to by the *lpOutBuffer* parameter.
- **ITC\_NVPARM\_CONTRAST**  
This IOCTL returns the device default contrast setting. Two bytes are returned in the buffer pointed to by the *lpOutBuffer* parameter.
- **ITC\_NVPARM\_MCODE**  
This IOCTL returns the manufacturing configuration code for the device. Sixteen bytes are returned in the buffer pointed to by the *lpOutBuffer* parameter.
- **ITC\_NVPARM\_VERSION\_NUMBER**  
This IOCTL returns the firmware version for various system components. These values for the *ClassId* field of the PARMS structure are allowed when ITC\_NVPARM\_VERSION\_NUMBER is used in the *id* field:
  - **VN\_CLASS\_KBD**  
Returns a five-byte string, including null terminator, that contains an ASCII value which represents the keyboard microprocessor version in the system. The format of the string is *x.xx* with a terminating null character.
  - **VN\_CLASS\_ASIC**  
Returns a five-byte string, including null terminator, that contains an ASCII value which represents the version of the FPGA firmware in the system. The format of the string is *x.xx* with a terminating null character.
  - **VN\_CLASS\_BOOTSTRAP**  
Returns a five-byte string, including null terminator, that contains an ASCII value which represents the version of the Bootstrap Loader firmware in the system. The format of the string is *x.xx* with a terminating null character.

- **ITC\_NVPARAM\_INTERMEC\_SOFTWARE\_CONTENT**  
This IOCTL reads the manufacturing flag bits from the non-volatile data store that dictates certain software parameters. A BOOLEAN DWORD is returned in the buffer pointed to by *lpOutBuffer* that indicates if Intermec Content is enabled in the XIP regions. TRUE indicates that it is enabled. FALSE indicates that it is not enabled.
- **ITC\_NVPARAM\_ANTENNA\_DIVERSITY**  
This IOCTL reads the state of the antenna diversity flag. A BOOLEAN DWORD is returned in the buffer pointed to by *lpOutBuffer* that indicates if there is a diversity antenna installed. TRUE indicates that it is installed. FALSE indicates that it is not installed.
- **ITC\_NVPARAM\_WAN\_RI**  
This IOCTL reads the state of the WAN ring indicator flag. A BOOLEAN DWORD is returned in the buffer pointed to by *lpOutBuffer* that indicates the polarity of the WAN RI signal. TRUE indicates active high. FALSE indicates active low.
- **ITC\_NVPARAM\_RTC\_RESTORE**  
This IOCTL reads the state of the real-time clock restore flag. A BOOLEAN DWORD is returned in the buffer pointed to by *lpOutBuffer*. TRUE indicates that the RTC will be restored upon a cold boot. FALSE indicates that the RTC will not be restored.
- **ITC\_NVPARAM\_INTERMEC\_DATACOLLECTION\_SW**  
This IOCTL reads the state of the data collection software enabled flag. A BOOLEAN DWORD is returned in the buffer pointer to by *lpOutBuffer* that indicates the data collection software is to be installed at boot time. FALSE indicates the data collection software should not be installed.
- **ITC\_NVPARAM\_INTERMEC\_DATACOLLECTION\_HW**  
This IOCTL reads the data collection hardware flags. A BYTE is returned in the buffer pointer to by *lpOutBuffer* that indicates the type of data collection hardware installed. The maximum possible value returned is ITC\_DEVID\_SCANHW\_MAX.
  - **ITC\_DEVID\_SCANHW\_NONE**  
No scanner hardware is installed.
  - **ITC\_DEVID\_OEM2D\_IMAGER**  
OEM 2D imager is installed.
  - **ITC\_DEVID\_INTERMEC2D\_IMAGER**  
Intermec 2D imager is installed.
  - **ITC\_DEVID\_SE900\_LASER**  
SE900 laser is installed.
  - **ITC\_DEVID\_SE900HS\_LASER**  
SE900HS laser is installed.

The high bit indicates whether the S6 scanning engine is installed. The bit mask for this is ITC\_DEVID\_S6ENGINE\_MASK. A non-zero value indicates that the S6 scanning engine is installed.

- **ITC\_NVPARAM\_WAN\_INSTALLED**  
This IOCTL reads the state of the WAN radio installed flag. A BOOLEAN DWORD is returned in the buffer pointed to by *lpOutBuffer*. TRUE indicates that the WAN radio is installed. FALSE indicates that no WAN radio is installed.
- **ITC\_NVPARAM\_WAN\_FREQUENCY**  
This IOCTL reads the state of the WAN radio frequency flag. A BOOLEAN DWORD is returned in the buffer pointed to by *lpOutBuffer*. TRUE indicates that the WAN radio frequency is United States. FALSE indicates that the WAN radio frequency is European.
- **ITC\_NVPARAM\_WAN\_RADIO\_TYPE**  
This IOCTL reads the WAN radio ID installed by manufacturing. A BYTE is returned in the buffer pointer to by *lpOutBuffer* which indicates the type of WAN radio hardware installed. The maximum possible value returned is ITC\_DEVID\_WANRADIO\_MAX. The current definitions are:
  - **ITC\_DEVID\_WANRADIO\_NONE**  
No WAN radio installed.
  - **ITC\_DEVID\_WANRADIO\_SIERRA\_SB555**  
CDMA Sierra Wireless radio.
  - **ITC\_DEVID\_WANRADIO\_XIRCOM\_GEM3503**  
GSM/GPRS Intel (Xircom) radio.
  - **ITC\_DEVID\_WANRADIO\_SIEMENS\_MC45**  
GSM/GPRS Siemens radio.
- **ITC\_NVPARAM\_80211\_INSTALLED**  
This IOCTL reads the state of the 802.11b radio installed flag. A BOOLEAN DWORD is returned in the buffer pointed to by *lpOutBuffer*. TRUE indicates that the 802.11b radio is installed. FALSE indicates that no 802.11b radio is installed.
- **ITC\_NVPARAM\_80211\_RADIO\_TYPE**  
This IOCTL reads the 802.11b radio ID installed by manufacturing. A BYTE is returned in the buffer pointer to by *lpOutBuffer* that indicates the type of 802.11b radio hardware installed. The maximum possible value returned is ITC\_DEVID\_80211RADIO\_MAX. The current definitions are:
  - **ITC\_DEVID\_80211RADIO\_NONE**  
No 802.11b radio installed.
  - **ITC\_DEVID\_80211RADIO\_INTEL\_2011B**  
Intel 2011B radio installed.
- **ITC\_NVPARAM\_BLUETOOTH\_INSTALLED**  
This IOCTL reads the state of the Bluetooth radio installed flag. A BOOLEAN DWORD is returned in the buffer pointed to by *lpOutBuffer*. TRUE indicates that the Bluetooth radio is installed. FALSE indicates that no Bluetooth radio is installed.

- **ITC\_NVPARAM\_SERIAL2\_INSTALLED**  
This IOCTL reads the state of the serial 2 (COM2) device installed flag. A BOOLEAN DWORD is returned in the buffer pointed to by *lpOutBuffer*. TRUE indicates that the serial 2 device is installed. FALSE indicates that no serial 2 device is installed.
- **ITC\_NVPARAM\_VIBRATE\_INSTALLED**  
This IOCTL reads the state of the vibrate device installed flag. A BOOLEAN DWORD is returned in the buffer pointed to by *lpOutBuffer*. TRUE indicates that the vibrate device is installed. FALSE indicates that no vibrate device is installed.
- **ITC\_NVPARAM\_LAN9000\_INSTALLED**  
This IOCTL reads the state of the Ethernet device installed flag. A BOOLEAN DWORD is returned in the buffer pointed to by *lpOutBuffer*. TRUE indicates that the Ethernet device is installed. FALSE indicates that no Ethernet device is installed.
- **ITC\_NVPARAM\_SIM\_PROTECT\_HW\_INSTALLED**  
This IOCTL reads the state of the SIM card protection hardware installed flag. A BOOLEAN DWORD is returned in the buffer pointed to by *lpOutBuffer*. TRUE indicates that the SIM card protection hardware is installed. FALSE indicates that no SIM card protection hardware is installed.
- **ITC\_NVPARAM\_SIM\_PROTECT\_SW\_INSTALLED**  
This IOCTL reads the state of the SIM card protection software installed flag. A BOOLEAN DWORD is returned in the buffer pointed to by *lpOutBuffer*. TRUE indicates that the SIM card protection software is installed. FALSE indicates that no SIM card protection software is installed.

## IOCTL\_HAL\_ITC\_WRITE\_SYSPARM

Describes and enables the registry save location.

### Usage

#include "oemioctl.h"

### Syntax

```
BOOL KernelIoControl( IOCTL_HAL_ITC_WRITE_SYSPARM, LPVOID  
lpInBuf, DWORD nInBufSize, LPVOID lpOutBuf, DWORD  
nOutBufSize, LPDWORD lpBytesReturned );
```

### Parameters

*lpInBuf* A single byte that may be one of the *id* values. See "ID Field Values" below.

*nInBufSize* Must be set to the size of the *lpInBuf* in bytes.

*lpOutBuf* Must point to a buffer large enough to hold the data to be written to the non-volatile data store.

*nOutBufSize* The size of *lpOutBuf* in bytes.

*lpBytesReturned* The number of bytes returned by the function.

### Return Values

Returns TRUE if function succeeds. Returns FALSE if the function fails. GetLastError() may be used to get the error value. Either ERROR\_INVALID\_PARAMETER or ERROR\_INSUFFICIENT\_BUFFER may be returned when this function is used to get the error.

### ID Field Values

The *id* field of *lpInBuf* may be one of the following values:

- **ITC\_REGISTRY\_LOCATION**  
This IOCTL sets the default location for where to write the registry when RegFlushKey() is called by an application. The registry may be saved to Flash, a CompactFlash storage card or a SecureDigital storage card. *lpOutBuf* must point to a buffer that contains a byte value of "1" for the CompactFlash card or "2" for the SecureDigital card to specify the location.
- **ITC\_REGISTRY\_SAVE\_ENABLE**  
This function enables or disables the save registry to non-volatile media feature of the RegFlushKey() function. *lpOutBuf* must be set to zero (FALSE) if the feature is to be disabled or one (TRUE) if the feature is to be enabled.
- **ITC\_DOCK\_SWITCH**  
This IOCTL sets a position of the dock switch. The dock switch may be set to either "modem" or "serial" positions. *lpOutBuf* must point to a buffer that contains a byte value of either DOCK\_MODEM or DOCK\_SERIAL as defined in OEMIOCTL.H; the value specifies the position the switch is to be set.

- **ITC\_WAKEUP\_MASK**

This IOCTL sets a bit mask that represents the mask for the five programmable wakeup keys. The I/O key is not a programmable wakeup key. By default it is always the system resume key and all other keys are set to disable key wakeup. A zero in a bit position masks the wakeup for that key. A one in a bit position enables wakeup for that key. *lpOutBuf* must point to a buffer that contains a byte value of a wakeup mask consisting of the OR'ed constants as defined in OEMIOCTL.H. Only the following keys are programmable as wakeup events.

```
#define SCANNER_TRIGGER1
#define SCANNER_LEFT 2
#define SCANNER_RIGHT 4
#define GOLD_A1 8
#define GOLD_A2 0x10
```

- **ITC\_AMBIENT\_KEYBOARD**

This IOCTL sets the threshold for the keyboard ambient sensor. This can be a value from 0 (always off) to 255 (always on). *lpOutBuf* must point to a buffer that contains a byte value of the desired setting.

- **ITC\_AMBIENT\_FRONTLIGHT**

This IOCTL sets the threshold for the frontlight ambient sensor. This can be a value from 0 (always off) to 255. *lpOutBuf* must point to a buffer that contains a byte value of the desired setting.

## IOCTL\_HAL\_GET\_DEVICEID

This IOCTL returns the device ID. There are two types of device IDs supported, which are differentiated based on the size of the *output* buffer. The UUID is returned if the buffer size is set to *sizeof(UNIQUE\_DEVICEID)*, otherwise the oldstyle device ID is returned.

### Usage

```
#include "pkfuncs.h"
#include "deviceid.h"
```

### Syntax

```
BOOL KernelIoControl( IOCTL_HAL_GET_DEVICEID, LPVOID
  lpInBuf, DWORD nInBufSize, LPVOID lpOutBuf, DWORD
  nOutBufSize, LPDWORD lpBytesReturned );
```

### Parameters

<i>lpInBuf</i>	Should be set to NULL. STRICT_ID settings are not supported.
<i>lpInBufSize</i>	Should be set to zero.
<i>lpOutBuf</i>	Must point to a UNIQUE_DEVICEID structure as defined by DEVICEID.H if the UUID is to be returned.
<i>nOutBufSize</i>	The size of the UNIQUE_DEVICEID in bytes if the UUID is to be returned. A DEVICE_ID as defined by PKFUNCS.H is returned if the size in bytes is greater than or equal to <i>sizeof(DEVICE_ID)</i> .
<i>lpBytesReturned</i>	The number of bytes returned by the function.

### Return Values

Returns TRUE if function succeeds. Returns FALSE if the function fails. GetLastError() may be used to get the extended error value.

**IOCTL\_HAL\_GET\_OAL\_VERINFO**

Returns the HAL version information of the Pocket PC image.

**Usage**

#include "oemioctl.h"

**Syntax**

```
BOOL KernelIoControl( IOCTL_HAL_GET_OAL_VERINFO, LPVOID
lpInBuf, DWORD nInBufSize, LPVOID lpOutBuf, DWORD
nOutBufSize, LPDWORD lpBytesReturned );
```

**Parameters**

<i>lpInBuf</i>	Should be set to NULL.
<i>lpInBufSize</i>	Should be set to zero.
<i>lpOutBuf</i>	Must point to a VERSIONINFO structure as defined by OEMIOCTL.H. The fields should have these values: <ul style="list-style-type: none"> <li>• <i>cboemverinfo</i>      sizeof (tagOemVerInfo);</li> <li>• <i>verinfover</i>        1</li> <li>• <i>sig</i>;                "ITC\0"</li> <li>• <i>id</i>;                 'N'</li> <li>• <i>tgtcustomer</i>        ""</li> <li>• <i>tgtplat</i>             SeaRay</li> <li>• <i>tgtplatversion</i>    Current build version number</li> <li>• <i>tgtcputype</i>[8];    "Intel\0"</li> <li>• <i>tgtcpu</i>             "PXA250\0";</li> <li>• <i>tgtpcoreversion</i>    ""</li> <li>• <i>date</i>                Build time</li> <li>• <i>time</i>                Build date</li> </ul>
<i>nOutBufSize</i>	The size of VERSIONINFO in bytes.
<i>lpBytesReturned</i>	Returns <i>sizeof(PVERSIONINFO)</i> .

**Return Values**

Returns TRUE if function succeeds. Returns FALSE if the function fails. GetLastError() may be used to get the extended error value.



**IOCTL\_HAL\_GET\_BOOTLOADER\_VERINFO**

Returns the HAL version information of the Pocket PC image.

**Usage**

#include "oemioctl.h"

**Syntax**

```
BOOL KernelIoControl( IOCTL_HAL_GET_OAL_VERINFO, LPVOID
lpInBuf, DWORD nInBufSize, LPVOID lpOutBuf, DWORD
nOutBufSize, LPDWORD lpBytesReturned );
```

**Parameters**

- lpInBuf* Should be set to NULL.
- lpInBufSize* Should be set to zero.
- lpOutBuf* Must point to a VERSIONINFO structure as defined by OEMIOCTL.H. The fields should have these values:
- *cboemverinfo*      Sizeof (tagOemVerInfo);
  - *verinfover*        1
  - *sig;*                "ITC\0"
  - *id;*                 'B'
  - *tgtcustomer*        ""
  - *tgtplat*             SeaRay
  - *tgtplatversion*    Current build version number of the bootstrap loader
  - *tgtcputype[8];*     "Intel\0";
  - *tgcpu*               " PXA250\0"
  - *tgcoreversion*     ""
  - *date*                Build time
  - *time*                Build date
- nOutBufSize*      The size of VERSIONINFO in bytes.
- lpBytesReturned* The number of bytes returned to *lpOutBuf*.

**Return Values**

Returns TRUE if function succeeds. Returns FALSE if the function fails. GetLastError() may be used to get the extended error value.

**IOCTL\_HAL\_WARMBOOT**

Causes the system to perform a warm-boot. The object store is retained.

**Usage**

#include "oemioctl.h"

**Syntax**

```
BOOL KernelIoControl( IOCTL_HAL_WARMBOOT, LPVOID
lpInBuf, DWORD nInBufSize, LPVOID lpOutBuf, DWORD
nOutBufSize, LPDWORD lpBytesReturned );
```

**Parameters**

*lpInBuf* Should be set to NULL.

*lpInBufSize* Should be set to zero.

*lpOutBuf* Should be NULL.

*nOutBufSize* Should be zero.

**Return Values**

None.

**IOCTL\_HAL\_COLDBOOT**

Causes the system to perform a cold-boot. The object store is cleared.

**Usage**

#include "oemioctl.h"

**Syntax**

```
BOOL KernelIoControl( IOCTL_HAL_COLDBOOT, LPVOID
lpInBuf, DWORD nInBufSize, LPVOID lpOutBuf, DWORD
nOutBufSize, LPDWORD lpBytesReturned );
```

**Parameters**

*lpInBuf* Should be set to NULL.

*lpInBufSize* Should be set to zero.

*lpOutBuf* Should be NULL.

*nOutBufSize* Should be zero.

**Return Values**

None.

## IOCTL\_HAL\_GET\_RESET\_INFO

This IOCTL code allows software to check the type of the most recent reset.

### Usage

#include "oemioctl.h"

### Syntax

```
BOOL KernelIoControl( IOCTL_HAL_GET_RESET_INFO, LPVOID
  lpInBuf, DWORD nInBufSize, LPVOID lpOutBuf, DWORD
  nOutBufSize, LPDWORD lpBytesReturned );
```

### Parameters

*lpInBuf* Should be set to NULL.  
*lpInBufSize* Should be set to zero.  
*lpOutBuf* Must point to a HAL\_RESET\_INFO structure:

```
typedef struct {
    DWORD ResetReason;           // most recent reset type
    DWORD ObjectStoreState;     // state of object store
} HAL_RESET_INFO, * PHAL_RESET_INFO;

// Reset reason types
#define HAL_RESET_TYPE_UNKNOWN 0
#define HAL_RESET_REASON_HARDWARE 1 // cold
#define HAL_RESET_REASON_SOFTWARE 2 // suspend
#define HAL_RESET_REASON_WATCHDOG 4
#define HAL_RESET_BATT_FAULT 8 // power fail
#define HAL_RESET_VDD_FAULT 16 // warm boot

// Object store state flags
#define HAL_OBJECT_STORE_STATE_UNKNOWN 0
#define HAL_OBJECT_STORE_STATE_CLEAR 1
```

*nOutBufSize* The size of HAL\_RESET\_INFO in bytes.

*lpBytesReturned* The number of bytes returned by the function.

### Return Values

Returns TRUE if function succeeds. Returns FALSE if the function fails. GetLastError() may be used to get the extended error value.

## IOCTL\_HAL\_GET\_BOOT\_DEVICE

This IOCTL code allows software to check which device CE booted from.

### Usage

#include "oemioctl.h"

### Syntax

```
BOOL KernelIoControl( IOCTL_HAL_GET_BOOT_DEVICE, LPVOID
lpInBuf, DWORD nInBufSize, LPVOID lpOutBuf, DWORD
nOutBufSize, LPDWORD lpBytesReturned );
```

### Parameters

*lpInBuf* Should be set to NULL.

*lpInBufSize* Should be set to zero.

*lpOutBuf* Must point to a buffer large enough to hold a DWORD (4 bytes) that contains the boot device. The following boot devices are supported:

```
#define HAL_BOOT_DEVICE_UNKNOWN 0
#define HAL_BOOT_DEVICE_ROM_XIP 1
#define HAL_BOOT_DEVICE_ROM 2
#define HAL_BOOT_DEVICE_PCMCIA_ATA 3
#define HAL_BOOT_DEVICE_PCMCIA_LINEAR 4
#define HAL_BOOT_DEVICE_IDE_ATA 5
#define HAL_BOOT_DEVICE_IDE_ATAPI 6
```

*nOutBufSize* The size of *lpOutBuf* in bytes (4).

*lpBytesReturned* The number of bytes returned by the function.

### Return Values

Returns TRUE if function succeeds. Returns FALSE if the function fails. GetLastError() may be used to get the extended error value.

## IOCTL\_HAL\_REBOOT

Causes the system to perform a warm-boot. The object store is retained.

### Usage

#include "oemioctl.h"

### Syntax

```
BOOL KernelIoControl( IOCTL_HAL_REBOOT, LPVOID lpInBuf, DWORD  
nInBufSize, LPVOID lpOutBuf, DWORD nOutBufSize, LPDWORD  
lpBytesReturned );
```

### Parameters

*lpInBuf* Should be set to NULL.

*lpInBufSize* Should be set to zero.

*lpOutBuf* Should be NULL.

*nOutBufSize* Should be zero.

### Return Values

None.

## IOCTL\_PROCESSOR\_INFORMATION

Returns processor information.

### Usage

#include "pkfuncs.h"

### Syntax

```
BOOL KernelIoControl( IOCTL_PROCESSOR_INFORMATION, LPVOID
lpInBuf, DWORD nInBufSize, LPVOID lpOutBuf, DWORD
nOutBufSize, LPDWORD lpBytesReturned );
```

### Parameters

#### Parameters:

*lpInBuf* Should be set to NULL.

*lpInBufSize* Should be set to zero.

*lpOutBuf* Should be a pointer to the PROCESSOR\_INFO structure. The PROCESSOR\_INFO structure stores information that describes the CPU more descriptively.

```
typedef __PROCESSOR_INFO {
WORD    wVersion;           // Set to value 1
WCHAR   szProcessorCore[40]; // "ARM\0"
WORD    wCoreRevision;     // 4
WCHAR   szProcessorName[40]; // "PXA250\0"
WORD    wProcessorRevision; // 0
WCAHR   szCatalogNumber[100]; // 0
WCHAR   szVendor[100];     // "Intel Corporation\0"
DWORD   dwInstructionSet;  // 0
DWORD   dwClockSpeed;     // 400
}
```

*nOutBufSize* Should be set to sizeof(PROCESSOR\_INFO) in bytes.

*lpBytesReturned* Returns sizeof(PROCESSOR\_INFO);

### Return Values

Returns TRUE if function succeeds. Returns FALSE if the function fails. GetLastError() may be used to get the extended error value.

## IOCTL\_GET\_CPU\_ID

Returns Xscale processor ID.

### Usage

#include "oemioctl.h"

### Syntax

```
BOOL KernelIoControl( IOCTL_GET_CPU_ID, LPVOID lpInBuf, DWORD
nInBufSize, LPVOID lpOutBuf, DWORD nOutBufSize, LPDWORD
lpBytesReturned );
```

### Parameters

*lpInBuf* Should point to a CPUIdInfo structure defined in OEMIOCTL.H.

*lpInBufSize* Should be sizeof(CPUIdInfo).

*lpOutBuf* Should be NULL.

*nOutBufSize* Should be set to 0.

*lpBytesReturned* Returns sizeof(PROCESSOR\_INFO);

### Return Values

Returns TRUE if function succeeds. Returns FALSE if the function fails. GetLastError() may be used to get the extended error value.

## Reboot Functions

There are several methods, via Kernel I/O Control functions, that an application program can use to force the 700 Series Computer to reboot.

### IOCTL\_HAL\_REBOOT

IOCTL\_HAL\_REBOOT performs a warm-boot. See page 278.

### IOCTL\_HAL\_COLDBOOT

Invoking the KernelIoControl function with IOCTL\_HAL\_COLDBOOT forces a cold reboot. This resets the 700 Series Computer and reloads Windows CE as if a power-up had been performed. The contents of the Windows CE RAM-based object store are discarded. See page 275.

### IOCTL\_HAL\_WARMBOOT

This function is supported on the 700 Series Computers. It performs a warm boot of the system, preserving the object store. See page 275.

## Remapping the Keypad



**Note;** Use caution when remapping the keypad. Improper remapping may render the keypad unusable. Data within the 700 Series Computer could also be lost, should any problems occur.

Applications have the ability to remap keys on the 700 Color Keypad. This will allow applications to enable keys that would otherwise not be available, such as the [F1] function key. Also, to disable keys that should not be available, such as the alpha key because no alpha entry is required. Care should be exercised when attempting to remap the keypad because improper remapping may cause the keypad to become unusable. This can be corrected by cold booting the device which will cause the default keymap to be loaded again.

Note that remapping the keys in this way affects the key mapping for the entire system, not just for the application that does the remapping.

There are three “planes” supported for the 740 Keypad. Keys that are to be used in more than one shift plane must be described in each plane.

### Unshifted Plane

The unshifted plane contains values from the keypad when not pressed with other keys, such as the following:

- [1]                    1
- [5]                    5
- [9]                    9

### Gold Plane

The gold plane contains values from the keypad when a key is simultaneously pressed with the [Gold] key, such as the following:

- [Gold] + [1]        Send
- [Gold] + [5]        A3
- [Gold] + [9]        PageDown

### Alpha Plane

The alpha plane contains values from the keypad when the keypad has been placed in alpha mode by pressing the blue alpha key, such as the following:

- [Alpha] + [1]        Caps
- [Alpha] + [5]        JKL
- [Alpha] + [9]        WXYZ



## Key Values

Key values for each plane are stored in the registry. All units ship with a default key mapping already loaded in the registry. Applications that wish to change the default mapping need to read the appropriate key from the registry into an array of Words, modify the values required and then write the updated values back into the registry. The registry access can be done with standard Microsoft API calls, such as `RegOpenKeyEx()`, `RegQueryValueEx()`, and `RegSetValueEx()`.

- The unshifted plane mapping can be found in the registry at:

```
HKEY_LOCAL_MACHINE\HARDWARE\DEVICEMAP\KEYBD\Vkey
```

- The gold plane mapping can be found in the registry at:

```
HKEY_LOCAL_MACHINE\HARDWARE\DEVICEMAP\KEYBD\VkeyGold
```

- The alpha plane mapping can be found in the registry at:

```
HKEY_LOCAL_MACHINE\HARDWARE\DEVICEMAP\KEYBD\VkeyAlpha
```

## How Key Values Are Stored in Registry

To know which fields to update in the registry, you must know what Scan Codes are assigned to each physical key (see the table below). The Scan Code is used at the lowest level of the system to let the keypad driver know which physical key has been pressed. The keypad driver takes that scan code and looks it up in a table (a copy of the one stored in the registry) to determine which values to pass on to the operating system.

Each registry key is just an array that describes to the keypad driver what value needs to be passed for each physical key. The key values are indexed by the scan code, this is a zero-based index. For example in the unshifted plane, the [4] key has a scan code of 0x06. This means that the seventh word under the “Vkey” registry key will have the value for the [4] key. Taking a sample of the “Vkey” registry key shows the following values:

```
00,00,0B,05,02,03,C1,07,04,03,BE,00,34,00,00,00, . . .
```

The value is 34,00. The values are in reverse byte order because that is the way the processor handles data. When writing an application, nothing needs to be done to swap the bytes, as this will happen automatically when the data is read into a byte value. This is something you just need to be aware of this when looking at the registry. Knowing this, we can see that the value that the keypad driver will pass to the system is a hex 34. Looking that up on an UNICODE character chart, we see that it maps to a “4”. If you wanted the key, labeled “4”, to output the letter “A” instead, you would need to change the seventh word to “41” (the hexadecimal representation of “A” from the UNICODE chart), then put the key back into the registry.



**Note:** Do not remap scan codes 0x01, 0x41, 0x42, 0x43, 0x44. Remapping these scan codes could render your 700 Series Computer unusable until a cold-boot is performed.

If you wish to disable a certain key, remap its scan code to 0x00.

## Change Notification

Just changing the registry keys will not immediately change the key mappings. To notify the keypad driver that the registry has been updated, signal the “ITC\_KEYBOARD\_CHANGE” named event using the CreateEvent() API.

## Advanced Keypad Remapping

It is also possible to map multiple key presses to one button and to map named system events to a button. The multiple key press option could be useful to cut down on the number of keys needed to press in a given situation or to remap which key behaves like the action key. Mapping events to a button could be useful to change which buttons will fire the scanner, control volume, and allow for suspending and resuming the device. If you need help performing one of these advanced topics please contact Intermecc Technical Support.

## Scan Codes

At the lowest driver level, the 740 Keypad identifies keys as scan codes. These scan codes are sent via the keypad microcontroller, and cannot be changed without modifying the keypad firmware.

<u>Key/Meaning</u>	<u>Scancode</u>
Reserved	0x00
I/O Button	0x01
Scanner Trigger	0x02
Scanner Left	0x03
Scanner Right	0x04
.	0x05
4	0x06
None	0x07
Left Arrow	0x08
None	0x09
Backspace	0x0A
Gold Key	0x0B
None	0x0C
ESC	0x0D
Down Arrow	0x0E
1	0x0F
7	0x10
Alpha Key	0x11
None	0x12
Up Arrow	0x13
Right Arrow	0x14
2	0x15
8	0x16
0	0x17
5	0x18
None	0x19

<u>Key/Meaning</u>	<u>Scancode</u>
Action Key	0x1A
3	0x1B
9	0x1C
ENTER	0x1D
6	0x1E
None	0x1F-0x40
Charge Detect	0x41
LCD Frontlight	0x42
Ambient Light	0x42
Threshold Crossed	0x42
Headset Detected	0x43
Keypad Backlight	0x44
Ambient Light	0x44
Threshold Crossed	0x44

## Sample View of Registry Keys

The following is a sample view of the current default key mapping. See the registry on your device for the latest key mappings.

```
[HKEY_LOCAL_MACHINE\HARDWARE\DEVICEMAP\KEYBD]
"ResumeMask"=dword:7
"Vkey"=hex: 00,00,0B,05,02,03,C1,07,04,03,BE,00,34,00,00,00,\
 25,00,00,00,08,00,03,02,00,00,1B,00,28,00,31,00,\
 37,00,01,02,00,00,26,00,27,00,32,00,38,00,30,00,\
 35,00,00,00,01,03,33,00,39,00,0D,00,36,00,00,00,\
 00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,\
 00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,\
 00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,\
 00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,\
 00,00,07,05,01,05,03,05,02,05
"VkeyGold"=hex: 00,00,0B,05,02,03,C1,07,04,03,BE,00,34,00,00,00,\
 09,01,00,00,BF,00,03,02,00,00,BD,00,75,00,72,00,\
 21,00,01,02,00,00,76,00,09,00,73,00,38,01,5B,00,\
 35,00,00,00,BB,01,09,05,22,00,32,01,36,00,00,00,\
 00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,\
 00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,\
 00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,\
 00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,\
 00,00,07,05,01,05,03,05,02,05
"VkeyAlpha"=hex: 00,00,0B,05,02,03,C1,07,04,03,BE,00,47,00,00,00,\
 25,00,00,00,08,00,03,02,00,00,1B,00,28,00,02,02,\
 50,00,01,02,00,00,26,00,27,00,41,00,54,00,20,00,\
 4A,00,00,00,01,03,44,00,57,00,0D,00,4D,00,00,00,\
 00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,\
 00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,\
 00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,\
 00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,\
 00,00,07,05,01,05,03,05,02,05
```



# A Control Panel Applets

This appendix contains information about the Data Collection, SNMP, and User Information Control Panel applets that may be on your 700 Series Color Mobile Computer.

SNMP and Data Collection settings that can appear under **Settings** are dependent on what hardware configuration is done for each 700 Series Computer at the time of shipment. These settings will currently only appear if a scanner or an imager option is present.

Likewise, other control panel applets that are specifically related to the 802.11b radio module will appear when a 802.11b radio module is installed in a 700 Series Computer. Control panel applets that are specific for Wireless Printing, CDMA/1xRTT, and GSM/GPRS radio modules will only appear when each respective hardware configuration is done on the 700 Series Computer. *See Chapter 4, "Network Support," for more information about the radio modules or the wireless printing.*

## Configuration Parameters

A configuration parameter changes the way the 700 Series Color (700C) Mobile Computer operates, such as configuring a parameter to have the 700 Series Computer emit a very loud beep in a noisy environment. Use any of the following methods to execute configuration parameters:

- Change Data Collection and SNMP parameters via control panel applets later in this appendix.
- Access the 700 Series Computer via the Unit Manager through a web browser on your desktop PC via the SRDEVMGMT.CAB file. To use the Unit Manager, install this CAB file from the 700 Color Software Tools CD-ROM. Unit Manager applications are available on the *700 Series Color Unit Manager CD-ROM*. For more information, consult your Intermec sales representative.
- Send parameters from an SNMP management station. See “*SNMP Configuration*” starting on page 123.
- Scan EasySet bar codes. You can use the EasySet bar code creation software from Intermec Technologies Corporation to print configuration labels. Scan the labels to change the scanner configuration and data transfer settings.

### Changing a Parameter Setting

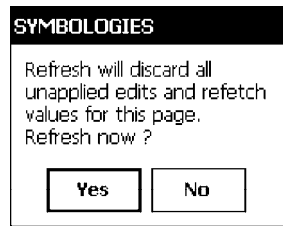
Menus of available parameters for each group are listed. Use the scroll bars to go through the list. Expand each menu (+) to view its parameter settings. Tap a parameter to select, or expand a parameter (+) to view its sub-parameters.

Note that each parameter or subparameter is shown with its default setting or current setting in (< >) brackets. Tap a parameter or subparameter to select that parameter, then do any of the following to change its setting: Tap **Apply** to apply any changes. *Note that these illustrations are from a Symbologies parameter.*

- Typing a new value in an entry field.
- Choosing a new value from the drop-down list.
- Selecting a different option. The selected option contains a bullet.
- Tap **Defaults**, then **Apply** to restore factory-default settings. Tap **Yes** when you are prompted to verify this action.



- Tap **Refresh** to discard changes and start again. Tap **Yes** when you are prompted to verify this action.



## About Configuration Parameters

You can find the following information about each configuration parameter:

- **Name and Purpose:**  
Describes the parameter and its function.
- **Action:**  
Describes what to do with a parameter once that parameter is selected.
- **SNMP OID:**  
Lists the SNMP OID for the parameter.
- **Syntax or Options:**  
**Syntax** lists the two-character code for the parameter, if the parameter is configurable by scanning a bar code or by sending parameters through a network. Both **Syntax** and **Options** list acceptable values for the parameter. *Default settings are noted in italic.*

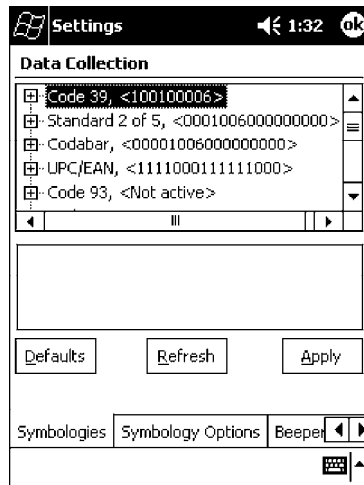
## Data Collection Control Panel Applet

See “Scanner Control and Data Transfer” in the *Intermec Windows CE/Pocket PC Software Developer’s Kit (SDK) User’s Manual* shipped with the Software Developer’s Kit (SDK) for information about data collection functions.



**Note:** Icons are shown to the left.

To access the settings from the 700 Series Computer, tap **Start** → **Settings** → the **System** tab → the **Data Collection** icon to access its control panel applet.



Use the left and right arrows to scroll through the tabs along the bottom of the control panel applet, then tap a tab to access its menus. These tabs represent the following groups of settings or parameters:

- **Symbologies**
- **Symbology Options** (*starting on page 309*)
- **Beeper/LED** (*starting on page 317*)
- **Imager** (*starting on page 323*)
- **Virtual Wedge** (*starting on page 325*)

## Symbologies

You can change bar code symbology parameter settings in your 700 Series Computer via the **Data Collection** control panel applet. The following parameters are for bar code symbologies. Additional information about the more common bar code symbologies are in Appendix C, “*Bar Code Symbologies*.” *Note that these parameters are listed in the order of their appearance within this tab.*

Most of these symbologies apply to both the imager and the laser scanner tools. However, when using an imager, the Macro PDF (*page 300*), Micro PDF 417 (*page 302*), Matrix 2 of 5 (*page 304*), Telepen (*page 305*), and Code 11 (*page 306*) symbologies are not supported. Likewise, when using a laser scanner, the QR Code (*page 307*) and Data Matrix (*page 308*) symbologies are not supported.

The following table shows which bar code symbologies are supported either by an imager or by a laser scanner.

Bar Code Symbology	Imager	Laser Scanner
Code 39	X	X
Interleaved 2 of 5	X	X
Standard 2 of 5	X	X
Matrix 2 of 5		X
Code 128	X	X
Code 93	X	X
Codabar	X	X
MSI		X
Plessey		X
UPC	X	X
EAN/EAN 128	X	X
Code 11		X
PDF 417	X	X
Micro PDF 417		X
Telepen		X
Data Matrix	X	
QR Code	X	



### Code 39

Code 39 is a discrete, self-checking, variable length symbology. The character set is uppercase A-Z, 0-9, dollar sign (\$), period (.), slash (/), percent (%), space ( ), plus (+), and minus (-).

### Action

Tap (+) to expand the **Code 39** parameter, select the setting to be changed, then tap an option to change this setting or select an option from the drop-down list.

### SNMP OID

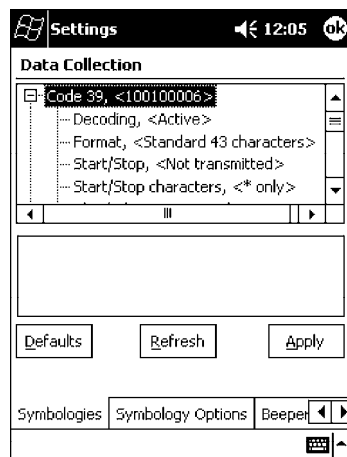
1.3.6.1.4.1.1963.15.3.3.1.1.3.1

### Options

Decoding	0	Not active
	1	Active ( <i>default</i> )
Format	0	Standard 43 characters ( <i>default</i> )
	1	Full ASCII
Start/Stop	0	Not transmitted ( <i>default</i> )
	1	Transmitted
Start/Stop characters	<i>(Not supported when using an imager):</i>	
	0	\$ (dollar sign) only
	1	* (asterisk) only ( <i>default</i> )
	2	& and * (dollar sign and asterisk)
Check digit	0	Not used ( <i>default</i> )
	1	Mod 43 transmitted
	2	Mod 43 not transmitted
	3	French CIP transmitted
	4	French CIP not transmitted
	5	Italian CPI transmitted
	6	Italian CPI not transmitted
Bar code length	0	Any length ( <i>default</i> )
	1	Minimum length
Minimum length	000-254	Minimum length 1-254 (6)



**Note:** If **Bar code length** = “1” then **Minimum length** is entered.



## Standard 2 of 5

Standard 2 of 5 is a discrete and self-checking symbology that uses the bars to encode information and the spaces to separate the individual bars.

### Action

Tap (+) to expand the **Standard 2 of 5** parameter, select the setting to be changed, then tap an option to change this setting or select an option from the drop-down list.

### SNMP OID

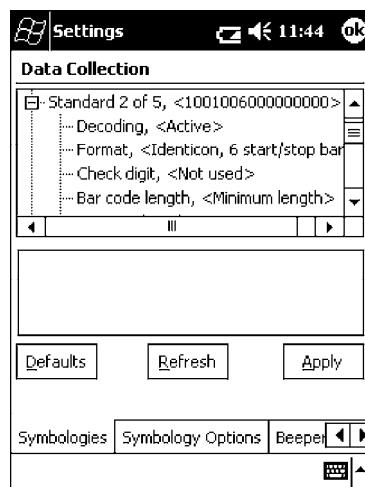
1.3.6.1.4.1.1963.15.3.3.1.1.4.1

### Options

Decoding	0	Not active ( <i>default</i> )
	1	Active
Format	0	Identicon, 6 start/stop bars ( <i>default</i> )
	1	Computer Identics, 4 start/stop
Check digit	0	Not used ( <i>default</i> )
	1	Mod 10 transmitted
	2	Mod 10 not transmitted
Bar code length	0	Any length
	1	Minimum length ( <i>default</i> )
	2	Fixed lengths
Minimum length	001-254	Minimum length 1-254 (6)
Fixed length 1	000-254	Fixed bar code length 0-254 (0)
Fixed length 2	000-254	Fixed bar code length 0-254 (0)
Fixed length 3	000-254	Fixed bar code length 0-254 (0)



**Note:** If **Bar code length** = “1” then **Minimum length** is entered. If **Bar code length** = “2” then **Fixed length 1**, **Fixed length 2**, or **Fixed length 3** is entered.



## Codabar

Codabar is a self-checking, discrete symbology.

### Action

Tap (+) to expand the **Codabar** parameter, select a setting to be changed, then select an option from the drop-down list to change this setting.

### SNMP OID

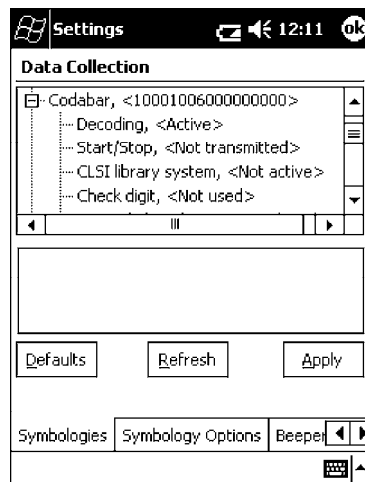
1.3.6.1.4.1.1963.15.3.3.1.1.5.1

### Options

Decoding	0	Not active ( <i>default</i> )
	1	Active
Start/Stop	0	Not transmitted ( <i>default</i> )
	1	abcd transmitted
	2	ABCD transmitted
	3	abcd/tn*e transmitted
	4	DC1`DC4 transmitted
CLSI library system ( <i>Not supported when using an imager</i> ):	0	Not active ( <i>default</i> )
	1	Active
Check digit	0	Not used ( <i>default</i> )
	1	Transmitted
	2	Not transmitted
Bar code length	0	Any length
	1	Minimum length ( <i>default</i> )
	2	Fixed lengths
Minimum length	003-254	Minimum length 3-254 (6)
Fixed length 1	000-254	Fixed length 0-254 (0)
Fixed length 2	000-254	Fixed length 0-254 (0)
Fixed length 3	000-254	Fixed length 0-254 (0)



**Note:** If **Bar code length** = “1” then **Minimum length** is entered. If **Bar code length** = “2” then **Fixed length 1**, **Fixed length 2**, or **Fixed length 3** is entered.



## UPC/EAN

UPC/EAN are fixed-length, numeric, continuous symbologies that use four element widths.

### Action

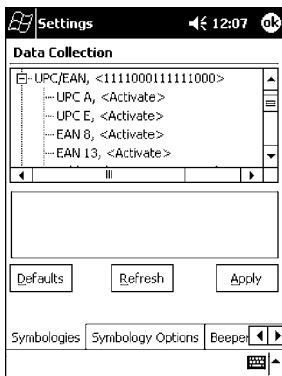
Tap (+) to expand the UPC/EAN parameter, select the setting to be changed, then select an option to change this setting.

### SNMP OID

1.3.6.1.4.1.1963.15.3.3.1.1.6.1

### Options

UPC A	0 Not active 1 Active ( <i>default</i> )
UPC E	0 Not active 1 Active ( <i>default</i> )
EAN 8	0 Not active 1 Active ( <i>default</i> )
EAN 13	0 Not active 1 Active ( <i>default</i> )
Add-on digits	0 Not required ( <i>default</i> ) 1 Required
Add-on 2 digits	0 Not active ( <i>default</i> ) 1 Active
Add-on 5 digits ( <i>Not supported when using an imager</i> ):	0 Not active ( <i>default</i> ) 1 Active
UPC A check digit	0 Not transmitted 1 Transmitted ( <i>default</i> )
UPC E check digit	0 Not transmitted 1 Transmitted ( <i>default</i> )
EAN 8 check digit	0 Not transmitted 1 Transmitted ( <i>default</i> )
EAN 13 check digit	0 Not transmitted 1 Transmitted ( <i>default</i> )
UPC A number system	0 Not transmitted 1 Transmitted ( <i>default</i> )
UPC E number system	0 Not transmitted 1 Transmitted ( <i>default</i> )
UPC A re-encoding	0 UPC A transmitted as EAN 13 ( <i>default</i> ) 1 UPC A transmitted as UPC A
UPC E re-encoding	0 UPC E transmitted as UPC E ( <i>default</i> ) 1 UPC E transmitted as UPC A
EAN 8 re-encoding	0 EAN 8 transmitted as EAN 8 ( <i>default</i> ) 1 EAN 8 transmitted as EAN 13



### Code 93

Code 93 is a variable length, continuous symbology that uses four element widths.

### Action

Tap the **Code 93** parameter, then select an option to change this parameter setting. Tap (+) to access the **Code 93 Lengths** parameter.

### SNMP OID

1.3.6.1.4.1.1963.15.3.3.1.1.7.1

### Options

- 0 Not active (*default*)
- 1 Active

### Code 93 Length

Sets the Code 93 bar code length.

### Action

Tap (+) to expand the **Code 93** parameter, then tap (+) to expand the **Code 93 Lengths** parameter. Tap the setting to be changed, then tap an option to change this setting.

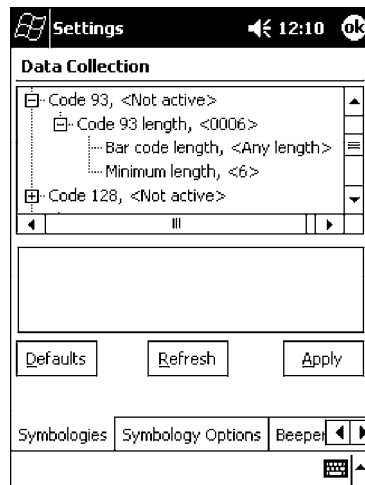
### SNMP OID

1.3.6.1.4.1.1963.15.3.3.1.1.19.1

### Options

- |                 |         |                               |
|-----------------|---------|-------------------------------|
| Bar code length | 0       | Any length ( <i>default</i> ) |
|                 | 1       | Minimum length                |
| Minimum length  | 001-254 | Minimum length 1-254 (6)      |

**Note:** If **Bar code length** = "1" then **Minimum length** is entered.



## Code 128

Code 128 is a variable-length, continuous, high-density, alphanumeric symbology that uses multiple element widths and supports the extended ASCII character set.

### Action

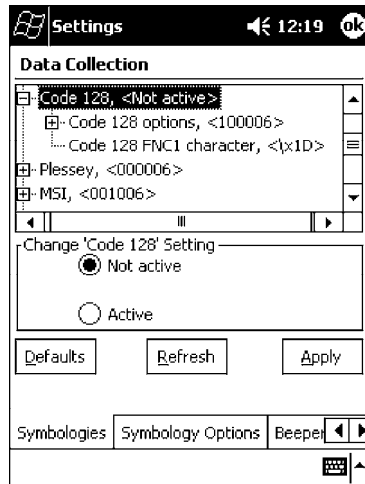
Tap the **Code 128** parameter, then select an option to change this parameter setting. *The following illustration is for a 700 Series Computer using a laser scanner.*

### SNMP OID

1.3.6.1.4.1.1963.15.3.3.1.1.9.1

### Options

- 0 Not active (*default*)
- 1 Active



### Code 128 Options

Set the following for the Code 128 parameter. *Note that the EAN 128 ]C1 and CIP 128 French Pharmaceutical options are not available when you use an imager with your 700 Series Computer.*

### Action

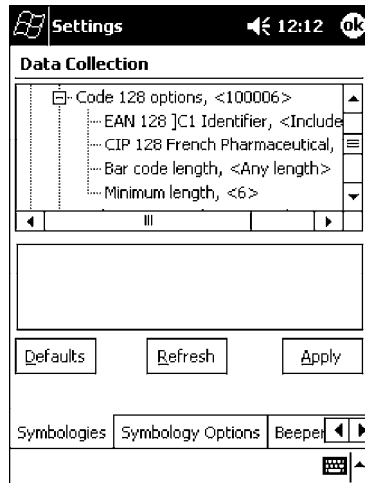
Tap (+) to expand the **Code 128 Options** parameter, select a setting, then select an option to change this setting.

### SNMP OID

None.

### Options

EAN 128 ]C1 Identifier	<i>(disabled when using an imager)</i>	
	0	Remove
	1	Include <i>(default)</i>
CIP 128 French Pharmaceutical	<i>(disabled when using an imager)</i>	
	0	Not active <i>(default)</i>
	1	Active
Bar code length	0	Any length <i>(default)</i>
	1	Minimum length
Minimum length	001-254	Minimum length 1-254 (6)



## Code 128 FNC1 Character

The Code 128 FNC1 character (EAN 128 norms) can be any ASCII character and is used as a separator when multiple identifiers and their fields are concatenated. *Note that this is not available when you use an imager with your 700 Series Computer.*

Non-printable ASCII characters can be entered using the following syntax where *HH* is the hexadecimal value of the character.

`\xHH`

For example, the GS character, whose hexadecimal value is 1D, would be entered as `\x1D`. In addition, the following characters have their own identifiers:

- BEL `\a`
- BS `\b`
- FF `\f`
- LF `\n`
- CR `\r`
- HT `\t`
- VT `\v`

## Action

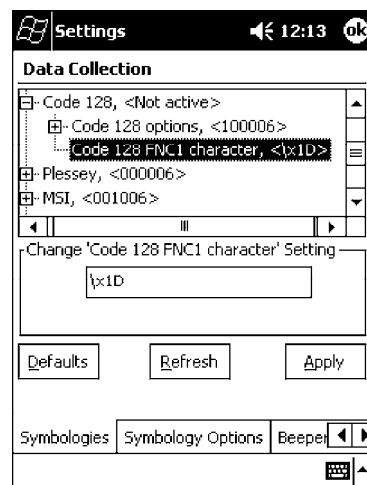
Tap (+) to expand the **Code 128** parameter, then type the ASCII characters to be set for the **Code 128 FNC1 character** parameter.

## SNMP OID

1.3.6.1.4.1.1963.15.3.3.1.1.21.1

## Options

Any ASCII character (*default is the GS function character - ID hex*)





## Plessey

Plessey is a pulse-width modulated symbology like most other bar codes. It includes a start character, data characters, an eight-bit cyclic check digit, and a termination bar. The code is continuous and not self-checking. You need to configure two parameters for Plessey code: Start Code and Check Digit. *Note that this is not available when you use an imager with your 700 Series Computer.*

## Action

Tap (+) to expand the **Plessey** parameter, select the setting to be changed, then select an option to change this setting or select an option from the drop-down list.

## SNMP OID

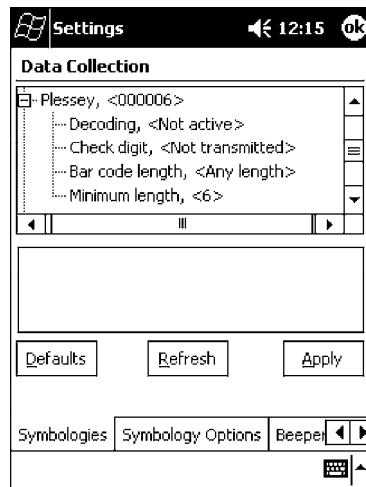
1.3.6.1.4.1.1963.15.3.3.1.1.10.1

## Options

Decoding	0	Not active ( <i>default</i> )
	1	Active
Check digit	0	Not transmitted ( <i>default</i> )
	1	Transmitted
Bar code length	0	Any length ( <i>default</i> )
	1	Minimum length
Minimum length	001-254	Minimum bar code length 1-254 (6)



**Note:** If Bar code length = “1” then Minimum length is entered.



### MSI

MSI is a symbology similar to Plessey code (page 298) that includes a start pattern, data characters, one or two check digits, and a stop pattern. *Note that this is not available when you use an imager with your 700 Series Computer.*

### Action

Tap (+) to expand the MSI parameter, select the setting to be changed, then select an option to change this setting or select an option from the drop-down list.

### SNMP OID

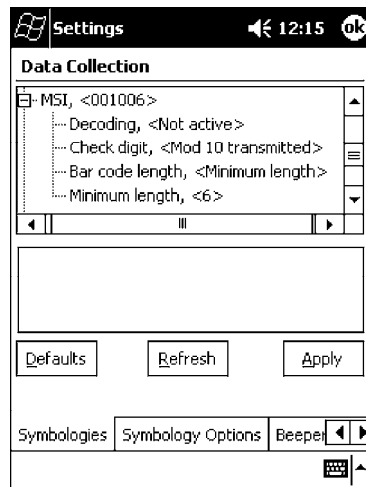
1.3.6.1.4.1.1963.15.3.3.1.1.15.1

### Options

Decoding	0	Not active ( <i>default</i> )
	1	Active
Check digit	0	Mod 10 transmitted ( <i>default</i> )
	1	Mod 10 Not transmitted
	2	Double Mod 10 transmitted
	3	Double Mod 10 not transmitted
Bar code length	0	Any length
	1	Minimum length ( <i>default</i> )
Minimum length	001-254	Minimum length 1-254 (6)



**Note:** If Bar code length = “1” then Minimum length is entered.



### PDF 417

PDF 417 is a stacked two-dimensional symbology that provides the ability to scan across rows of code. Each row consists of start/stop characters, row identifiers, and symbol characters, which consist of four bars and four spaces each and contain the actual data. This symbology uses error correction symbol characters appended at the end to recover loss of data.

Because the virtual wedge translates incoming data into keypad input, the size of the keypad buffer limits the effective length of the label to 128 characters. Longer labels may be truncated. For PDF 417 labels of more than 128 characters, you can develop an application that bypasses the keypad buffer.

### Action

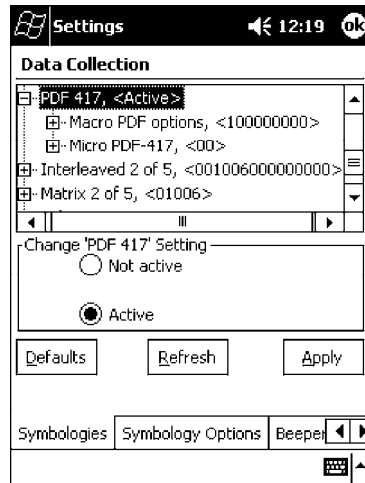
Tap the **PDF 417** parameter, then select an option to change this parameter setting. Tap (+) to access either the **Macro PDF options** parameter or the **Micro PDF 417** parameter.

### SNMP OID

1.3.6.1.4.1.1963.15.3.3.1.1.17.1

### Options

- 0 Not active
- 1 Active (*default*)



### Macro PDF options

Macro PDF is used when a long message requires more than one PDF 417 label. *Note that this is not available when you use an imager with your 700 Series Computer.*

- Select **Buffered** to store a multi-label PDF 417 message in the Sabre buffer, thus transmitting the entire message when all labels have been read.

- Select **Unbuffered** for multi-label PDF 417 messages that are too long for the Sabre buffer (memory overflow). Each part of the PDF 417 label is transmitted separately, and the host application must then assemble the message using the macro PDF control header transmitted with each label. *Control Header is only present in macro PDF codes and is always transmitted with unbuffered option.*

**Action**

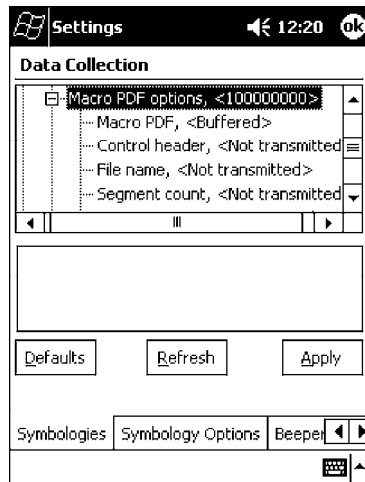
Tap (+) to expand the **PDF 417** parameter, tap (+) to expand the **Macro PDF** parameter, select a setting to be changed, then select an option to change this setting.

**SNMP OID**

1.3.6.1.4.1.1963.15.3.3.1.1.22.1

**Options**

Macro PDF	0	Unbuffered
	1	Buffered ( <i>default</i> )
Control header	0	Not transmitted ( <i>default</i> )
	1	Transmitted
File name	0	Not transmitted ( <i>default</i> )
	1	Transmitted
Segment count	0	Not transmitted ( <i>default</i> )
	1	Transmitted
Time stamp	0	Not transmitted ( <i>default</i> )
	1	Transmitted
Sender	0	Not transmitted ( <i>default</i> )
	1	Transmitted
Addressee	0	Not transmitted ( <i>default</i> )
	1	Transmitted
File size	0	Not transmitted ( <i>default</i> )
	1	Transmitted
Checksum	0	Not transmitted ( <i>default</i> )
	1	Transmitted



### Micro PDF 417

Micro PDF 417 is a multi-row symbology derived from and closely based on PDF 417 (page 300). A limited set of symbology sizes is available, together with a fixed level of error correction for each symbology size. *Note that this is not available when you use an imager with your 700 Series Computer.*

### Action

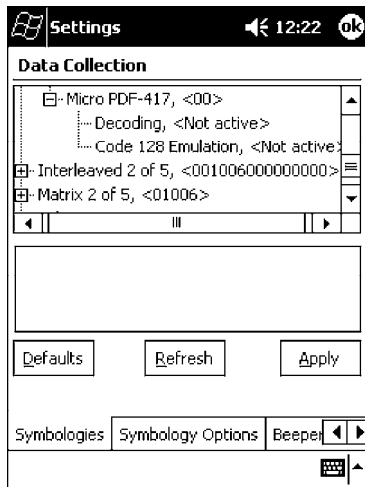
Tap (+) to expand the PDF 417 parameter, tap (+) to expand the Micro PDF 417 parameter, select a setting to be changed, then select an option to change this setting.

### SNMP OID

1.3.6.1.4.1.1963.15.3.3.1.1.27.1

### Options

Decoding	0	Not active ( <i>default</i> )
	1	Active
Code 128 Emulation	0	Not active ( <i>default</i> )
	1	Active



## Interleaved 2 of 5

Interleaved 2 of 5 (I 2 of 5) is a high-density, self-checking, continuous, numeric symbology used mainly in inventory distribution and the automobile industry.



**Note:** An Interleaved 2 of 5 bar code label must be at least three characters long for the 700 Series Computer to scan and decode correctly.

### Action

Tap (+) to expand the **Interleaved 2 of 5** parameter, select the setting to be changed, then tap an option to change this setting or select an option from the drop-down list.

### SNMP OID

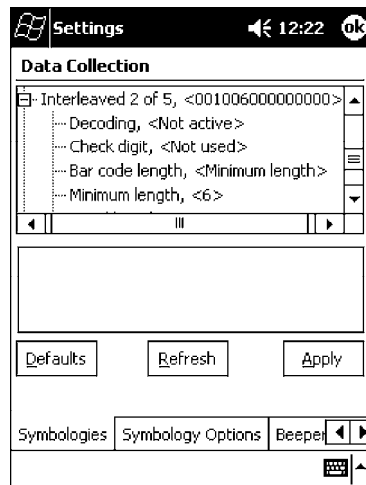
1.3.6.1.4.1.1963.15.3.3.1.1.23.1

### Options

Decoding	0	Not active ( <i>default</i> )
	1	Active
Check digit	0	Not used ( <i>default</i> )
	1	Mod 10 transmitted
	2	Mod 10 not transmitted
	3	French CIP transmitted
	4	French CIP not transmitted
Bar code length	0	Any length
	1	Minimum length ( <i>default</i> )
	2	Fixed lengths
Minimum length	003-254	Minimum length 3-254 (6)
Fixed length 1	003-254	Fixed length 3-254 (0)
Fixed length 2	003-254	Fixed length 3-254 (0)
Fixed length 3	003-254	Fixed length 3-254 (0)



**Note:** If **Bar code length** = “1” then **Minimum length** is entered. If **Bar code length** = “2” then **Fixed length 1**, **Fixed length 2**, or **Fixed length 3** is entered.



### Matrix 2 of 5

Matrix 2 of 5 is a numerical symbology. *Note that this is not available when you use an imager with your 700 Series Computer.*

### Action

Tap (+) to expand the **Matrix 2 of 5** parameter, select the setting to be changed, then tap an option to change this setting or select an option from the drop-down list.

### SNMP OID

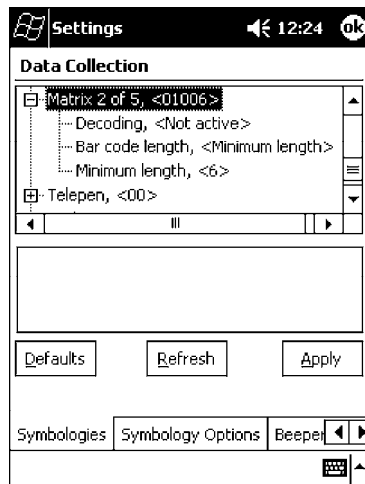
1.3.6.1.4.1.1963.15.3.3.1.1.24.1

### Options

Decoding	0	Not active ( <i>default</i> )
	1	Active
Bar code length	0	Any length
	1	Minimum length ( <i>default</i> )
Minimum length	001-254	Minimum length 1-254 (6)



**Note:** If **Bar code length** = “1” then **Minimum length** is entered.



## Telepen

Telepen is an alphanumeric, case-sensitive, full ASCII symbology. *Note that this is not available when you use an imager with your 700 Series Computer.*

### Action

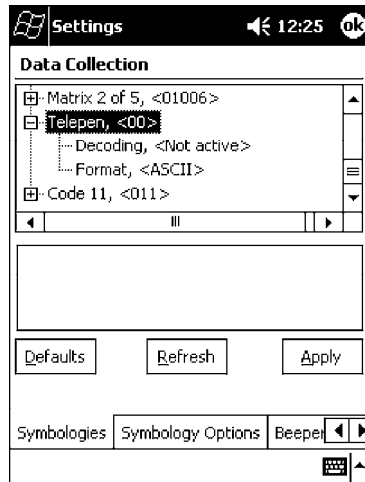
Tap (+) to expand the **Telepen** parameter, select the setting to be changed, then tap an option to change this setting.

### SNMP OID

1.3.6.1.4.1.1963.15.3.3.1.1.25.1

### Options

Decoding	0	Not active ( <i>default</i> )
	1	Active
Format	0	ASCII ( <i>default</i> )
	1	Numeric





### Code 11

Code 11 is a high density, discrete numeric symbology that is extensively used in labeling telecommunications components and equipment. *Note that this is not available when you use an imager with your 700 Series Computer.*

### Action

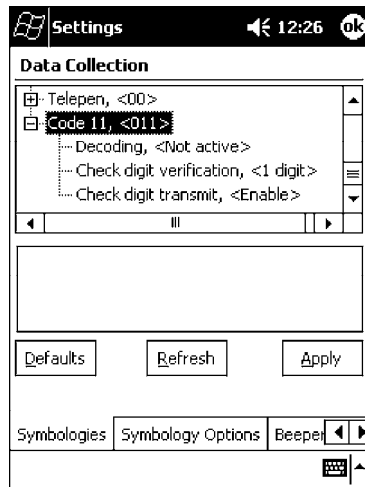
Tap (+) to expand the **Code 11** parameter, select the setting to be changed, then tap an option to change this setting.

### SNMP OID

1.3.6.1.4.1.1963.15.3.3.1.1.26.1

### Options

Decoding	0	Not active ( <i>default</i> )
	1	Active
Check digit verification	1	1 digit ( <i>default</i> )
	2	2 digits
Check digit transmit	0	Disable ( <i>default</i> )
	1	Enable



## QR Code

QR Code (Quick Response Code) is a two-dimensional matrix symbology containing dark and light square data modules. It has position detection patterns on three of its four corners and features direct encodation of the Japanese Kana-Kanji character set. It can encode up to 2509 numeric or 1520 alphanumeric characters and offers three levels of error detection.

*Note that this is not available when you use a laser scanner with your 700 Series Computer.*

## Action

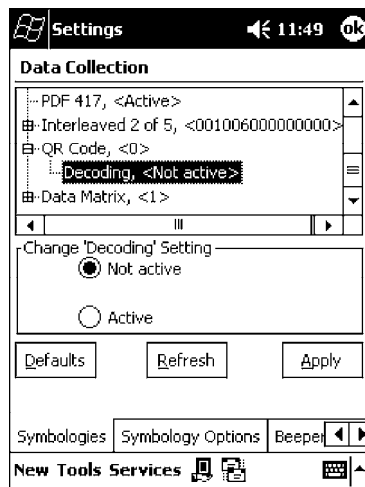
Tap (+) to expand the **QR Code** parameter, select the setting to be changed, then tap an option to change this setting or select an option from the drop-down list.

## SNMP OID

1.3.6.1.4.1.1963.15.3.3.1.1.35.1

## Options

Decoding 0 Not active  
 1 Active (*default*)



### Data Matrix

A two-dimensional matrix symbology, which is made of square modules arranged within a perimeter finder pattern. The symbology utilizes Error Checking and Correcting (ECC) algorithm with selectable levels for data error recovery and Cyclic Redundancy Check algorithm to validate the data. The character set includes either 128 characters conforming to ISO 646 (ANSI X3.4 - 1986) or 256 extended character set. Maximum capacity of a symbol is 2335 alphanumeric characters, 1556 8-bit byte characters or 3116 numeric digits. *Note that this is not available when you use a laser scanner with your 700 Series Computer.*

### Action

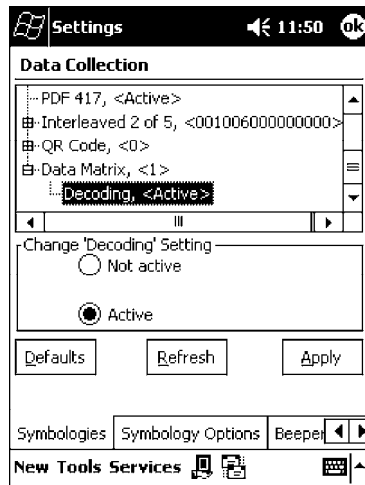
Tap (+) to expand the **Data Matrix** parameter, select the setting to be changed, then tap an option to change this setting or select an option from the drop-down list.

### SNMP OID

1.3.6.1.4.1.1963.15.3.3.1.1.34.1

### Options

- Decoding 0 Not active
- 1 Active (*default*)



## Symbology Options



To access the settings from the 700 Series Computer, tap **Start** → **Settings** → the **System** tab → the **Data Collection** icon to access its control panel applet.

Use the right and left arrows to scroll to the **Symbology Options** tab, then tap this tab to access its parameters. The following are parameters for bar code symbology options. *Note that these are listed in the order of their appearance within the Symbology Options tab.*

### Symbology ID

Identifies the bar code symbology in which data has been encoded by prepending a user-specified symbology identifier to the data. You can prepend one of these types of character strings to identify the symbology:

- **User-defined ASCII Character (Option 1):**  
A user-defined symbology identifier is a single ASCII character. You can assign a custom identifier character to each bar code symbology. *Note that this is not available when you use an imager with your 700 Series Computer.*
- **AIM ISO/IEC Standard (Option 2 - Required to define symbology IDs):**  
The AIM Standard has a three-character structure which indicates the symbology and optional features. See the *AIM ISO/IEC Standard* for more information.

### Action

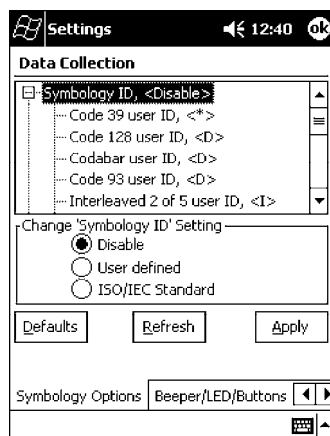
Select **Symbology ID**, then select an option to change this parameter setting. Tap (+) to expand the **Symbology ID** parameter, then select any of the user ID parameters listed. *See the top of the next page for a sample screen of the Code 39 user ID.*

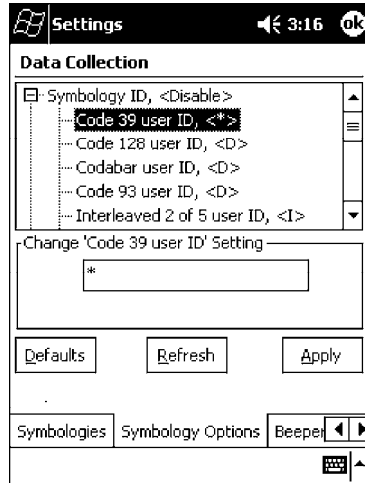
### SNMP OID

1.3.6.1.4.1.1963.15.3.3.4.1.22.1

### Options

- 0 Disable (*default*)
- 1 User defined (*disabled when using an imager*)
- 2 ISO/IEC Standard





### Code 39 User ID

If “1” was selected in the **Symbology ID** parameter, you can set your own ASCII character to identify Code 39 bar code data. *Note that this is not available when you use an imager with your 700 Series Computer.*

**Action:** Tap (+) to expand the **Symbology ID** parameter, select the **Code 39 user ID** parameter, then enter a user ID value to change this parameter setting.

**SNMP OID:** 1.3.6.1.4.1.1963.15.3.3.4.1.3.1

**Options:**  $x$  where  $x$  is a single ASCII character. *Default is asterisk (\*).*

### Code 128 User ID

If “1” was selected in the **Symbology ID** parameter, you can set your own ASCII character to identify Code 128 bar code data. *Note that this is not available when you use an imager with your 700 Series Computer.*

**Action:** Tap (+) to expand the **Symbology ID** parameter, select the **Code 128 user ID** parameter, then enter a user ID value to change this parameter setting.

**SNMP OID:** 1.3.6.1.4.1.1963.15.3.3.4.1.5.1

**Options:**  $x$  where  $x$  is a single ASCII character. *Default is asterisk (\*).*

### Codabar User ID

If “1” was selected in the **Symbology ID** parameter, you can set your own ASCII character to identify Codabar bar code data. *Note that this is not available when you use an imager with your 700 Series Computer.*

**Action:** Tap (+) to expand the **Symbology ID** parameter, select the **Codabar user ID** parameter, then enter a user ID value to change this parameter setting.

**SNMP OID:** 1.3.6.1.4.1.1963.15.3.3.4.1.2.1

**Options:**  $x$  where  $x$  is a single ASCII character. *Default is D.*

**Code 93 User ID**

If “1” was selected in the **Symbology ID** parameter, you can set your own ASCII character to identify Code 93 bar code data. *Note that this is not available when you use an imager with your 700 Series Computer.*

**Action:** Tap (+) to expand the **Symbology ID** parameter, select the **Code 93 user ID** parameter, then enter a user ID value to change this parameter setting.

**SNMP OID:** 1.3.6.1.4.1.1963.15.3.3.4.1.4.1

**Options:** *x* where *x* is a single ASCII character. *Default is asterisk (\*)*.

**Interleaved 2 of 5 User ID**

If “1” was selected in the **Symbology ID** parameter, you can set your own ASCII character to identify Interleaved 2 of 5 bar code data. *Note that this is not available when you use an imager with your 700 Series Computer.*

**Action:** Tap (+) to expand the **Symbology ID** parameter, select the **Interleaved 2 of 5 user ID** parameter, then enter a user ID value to change this parameter setting.

**SNMP OID:** 1.3.6.1.4.1.1963.15.3.3.4.1.10.1

**Options:** *x* where *x* is a single ASCII character. *Default is I (not lowercase L)*.

**PDF-417 User ID**

If “1” was selected in the **Symbology ID** parameter, you can set your own ASCII character to identify PDF 417 bar code data. *Note that this is not available when you use an imager with your 700 Series Computer.*

**Action:** Tap (+) to expand the **Symbology ID** parameter, select the **PDF 417 user ID** parameter, then enter a user ID value to change this parameter setting.

**SNMP OID:** 1.3.6.1.4.1.1963.15.3.3.4.1.12.1

**Options:** *x* where *x* is a single ASCII character. *Default is an asterisk (\*)*.

**MSI User ID**

If “1” was selected in the **Symbology ID** parameter, you can set your own ASCII character to identify MSI bar code data. *Note that this is not available when you use an imager with your 700 Series Computer.*

**Action:** Tap (+) to expand the **Symbology ID** parameter, select the **MSI user ID** parameter, then enter a user ID value to change this parameter setting.

**SNMP OID:** 1.3.6.1.4.1.1963.15.3.3.4.1.11.1

**Options:** *x* where *x* is a single ASCII character. *Default is D*.

### Plessey User ID

If “1” was selected in the **Symbology ID** parameter, you can set your own ASCII character to identify Plessey bar code data. *Note that this is not available when you use an imager with your 700 Series Computer.*

**Action:** Tap (+) to expand the **Symbology ID** parameter, select the **Plessey user ID** parameter, then enter a user ID value to change this parameter setting.

**SNMP OID:** 1.3.6.1.4.1.1963.15.3.3.4.1.13.1

**Options:** *x* where *x* is a single ASCII character. *Default is D.*

### Standard 2 of 5 User ID

If “1” was selected in the **Symbology ID** parameter, you can set your own ASCII character to identify Standard 2 of 5 bar code data. *Note that this is not available when you use an imager with your 700 Series Computer.*

**Action:** Tap (+) to expand the **Symbology ID** parameter, select the **Standard 2 of 5 user ID** parameter, then enter a user ID value to change this parameter setting.

**SNMP OID:** 1.3.6.1.4.1.1963.15.3.3.4.1.23.1

**Options:** *x* where *x* is a single ASCII character. *Default is D.*

### UPC A User ID

If “1” was selected in the **Symbology ID** parameter, you can set your own ASCII character to identify UPC-A (Universal Product Code) bar code data. *Note that this is not available when you use an imager with your 700 Series Computer.*

**Action:** Tap (+) to expand the **Symbology ID** parameter, select the **UPC A user ID** parameter, then enter a user ID value to change this parameter setting.

**SNMP OID:** 1.3.6.1.4.1.1963.15.3.3.4.1.6.1

**Options:** *x* where *x* is a single ASCII character. *Default is A.*

### UPC E User ID

If “1” was selected in the **Symbology ID** parameter, you can set your own ASCII character to identify UPC-E bar code data. *Note that this is not available when you use an imager with your 700 Series Computer.*

**Action:** Tap (+) to expand the **Symbology ID** parameter, select the **UPC E user ID** parameter, then enter a user ID value to change this parameter setting.

**SNMP OID:** 1.3.6.1.4.1.1963.15.3.3.4.1.7.1

**Options:** *x* where *x* is a single ASCII character. *Default is E.*

**EAN 8 User ID**

If “1” was selected in the **Symbology ID** parameter, you can set your own ASCII character to identify EAN-8 bar code data. *Note that this is not available when you use an imager with your 700 Series Computer.*

**Action:** Tap (+) to expand the **Symbology ID** parameter, select the **EAN 8 user ID** parameter, then enter a user ID value to change this parameter setting.

**SNMP OID:** 1.3.6.1.4.1.1963.15.3.3.4.1.8.1

**Options:** *x* where *x* is a single ASCII character. *Default is \xFF.*

**EAN 13 User ID**

If “1” was selected in the **Symbology ID** parameter, you can set your own ASCII character to identify EAN-13 (European Article Numbering) bar code data. *Note that this is not available when you use an imager with your 700 Series Computer.*

**Action:** Tap (+) to expand the **Symbology ID** parameter, select the **EAN 13 user ID** parameter, then enter a user ID value to change this parameter setting.

**SNMP OID:** 1.3.6.1.4.1.1963.15.3.3.4.1.9.1

**Options:** *x* where *x* is a single ASCII character. *Default is F.*

**Matrix 2 of 5 User ID**

If “1” was selected in the **Symbology ID** parameter, you can set your own ASCII character to identify Matrix 2 of 5 bar code data. *Note that this is not available when you use an imager with your 700 Series Computer.*

**Action:** Tap (+) to expand the **Symbology ID** parameter, select the **Matrix 2 of 5 user ID** parameter, then enter a user ID value to change this parameter setting.

**SNMP OID:** 1.3.6.1.4.1.1963.15.3.3.4.1.24.1

**Options:** *x* where *x* is a single ASCII character. *Default is D.*

**Telepen User ID**

If “1” was selected in the **Symbology ID** parameter, you can set your own ASCII character to identify Telepen bar code data. *Note that this is not available when you use an imager with your 700 Series Computer.*

**Action:** Tap (+) to expand the **Symbology ID** parameter, select the **Telepen user ID** parameter, then enter a user ID value to change this parameter setting.

**SNMP OID:** 1.3.6.1.4.1.1963.15.3.3.4.1.25.1

**Options:** *x* where *x* is a single ASCII character. *Default is an asterisk (\*).*



### **Code 11 User ID**

If “1” was selected in the **Symbology ID** parameter, you can set your own ASCII character to identify Code 11 bar code data. *Note that this is not available when you use an imager with your 700 Series Computer.*

**Action:** Tap (+) to expand the **Symbology ID** parameter, select the **Code 11 user ID** parameter, then enter a user ID value to change this parameter setting.

**SNMP OID:** 1.3.6.1.4.1.1963.15.3.3.4.1.16.1

**Options:** *x* where *x* is a single ASCII character. *Default is asterisk (\*).*

**Prefix**

Prepends a string of up to 20 ASCII characters to all scanned data.

**Action**

Tap the **Prefix** parameter, then enter a prefix value to change this parameter setting.

**SNMP OID**

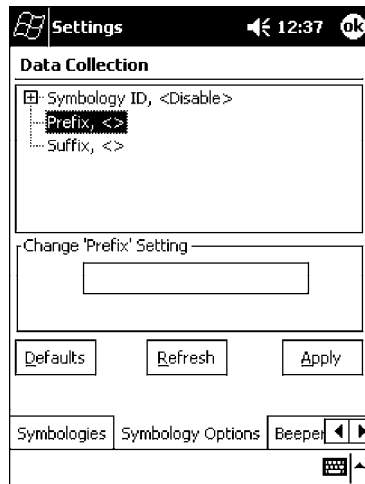
1.3.6.1.4.1.1963.15.3.3.4.1.29.1

**Options**

Acceptable values are up to 20 ASCII characters.

Embedded null (<NUL >) characters are not allowed.

*Default is no characters (disabled).*



### Suffix

Appends a string of up to 20 ASCII characters to all scanned data.

### Action

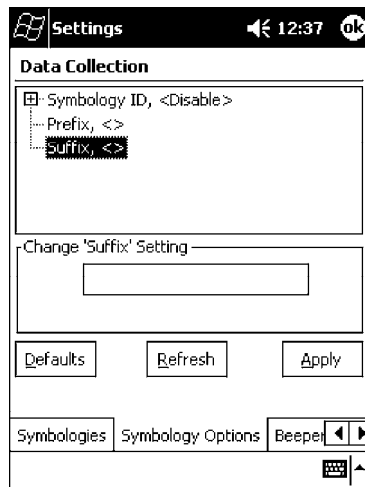
Tap the **Suffix** parameter, then enter a suffix value to change this parameter setting.

### SNMP OID

1.3.6.1.4.1.1963.15.3.3.4.1.30.1

### Options

Acceptable values are up to 20 ASCII characters. Embedded null (<NUL >) characters are not allowed. *Default is no characters (disabled).*



## Beeper/LED



To access the settings from the 700 Series Computer, tap **Start** → **Settings** → the **System** tab → the **Data Collection** icon to access its control panel applet.

Use the right and left arrows to scroll to the **Beeper/LED** tab, then tap this tab to access its parameters.

*Most of these functions are not available when using an imager.* The following table shows which functions are supported either by an imager or by a laser scanner.

<b>Beeper Function</b>	<b>Imager</b>	<b>Laser Scanner</b>
Beeper Volume	X	X
Beeper Frequency		X
Good Read Beeps		X
Good Read Beep Duration		X

The following are parameters for features on the 700 Series Computer.  
*Note that these are listed in the order of their appearance.*

## Beeper Volume

Sets the volume for the good read beep.

### Action

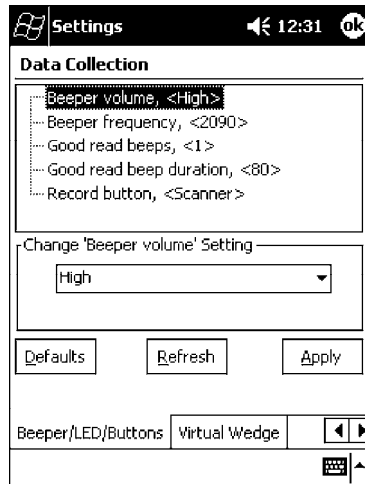
Tap the **Beeper volume** parameter, then select an option to change this parameter setting.

## SNMP OID

1.3.6.1.4.1.1963.15.3.1.4.1.6.1

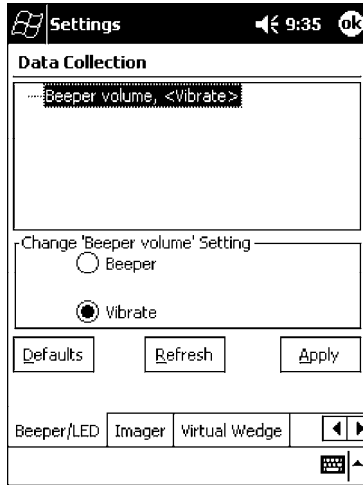
## Laser Scanner Options

- 0 Low
- 1 High (*default*)
- 2 Medium
- 3 Off
- 4 Vibrate



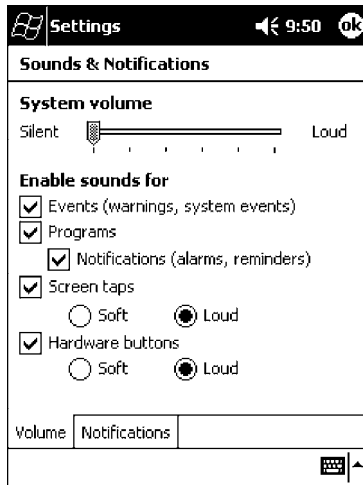
## Imager Options

- 1 Beeper (*default*)
- 4 Vibrate



## Silencing the Beeper Volume

To turn the beeper off, tap **Start** → **Settings** → the **Personal** tab → **Sounds and Notifications** → the **Volume** tab, drag the **System volume** slider bar to the left “Silent” position, then tap **ok** to exit this applet.



## Beeper Frequency

Sets the frequency for the good read beep. *Note that this is not available when you use an imager with your 700 Series Computer.*

### Action

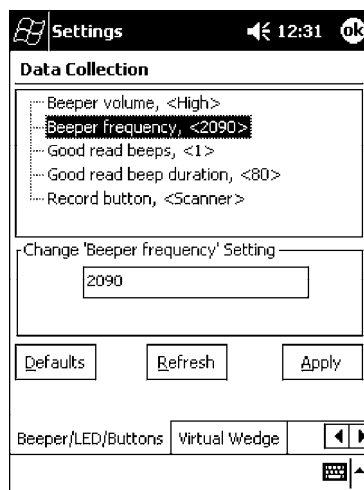
Tap the **Beeper frequency** parameter, then enter a frequency value to change this parameter setting.

### SNMP OID

1.3.6.1.4.1.1963.15.3.1.4.1.7.1

### Options

1000-4095 (*default is 2090*)



## Good Read Beeps

Sets the number of good read beeps. *Note that this is not available when you use an imager with your 700 Series Computer.*

### Action

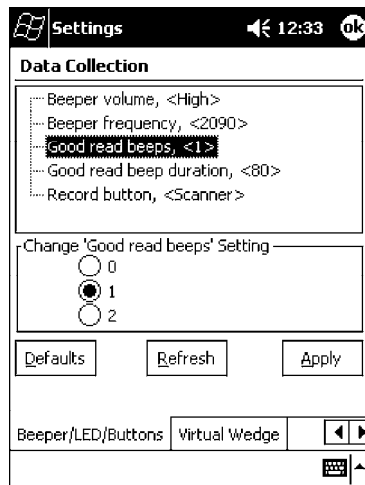
Tap the **Good read beeps** parameter, then select an option to change this parameter setting.

### SNMP OID

1.3.6.1.4.1.1963.15.3.1.4.1.8.1

### Options

- 0 No beeps
- 1 One beep (*default*)
- 2 Two beeps





### Good Read Beep Duration

Sets the duration of the good read beep. *Note that this is not available when you use an imager with your 700 Series Computer.*

#### Action

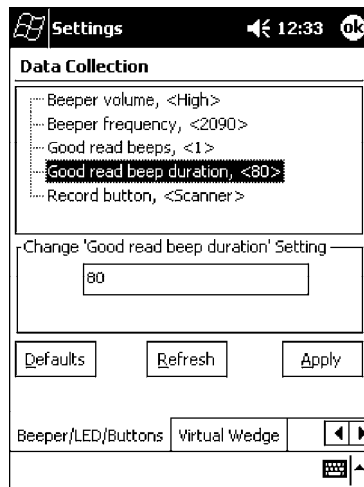
Tap the **Good read beep duration** parameter, then enter a duration value to change this parameter setting.

#### SNMP OID

1.3.6.1.4.1.1963.15.3.1.4.1.9.1

#### Options

0`2550 Beep duration in milliseconds. (*default is 80*)



## Imager



To access the settings from the 700 Series Computer, tap **Start** → **Settings** → the **System** tab → the **Data Collection** icon to access its control panel applet.

Use the right and left arrows to scroll to the **Imager** tab, then tap this tab to access its parameters.

The following are parameters for the imager. Note that these are listed in the order of their appearance within the Imager tab.

### Aimer LED duration

The Aimer LED duration controls the time the Aimer LED is turned on when the scan button is pressed. After this time, images are captured for decoding. The purpose is to position the Aimer LED on the bar code symbol before attempting to decode the bar code. *Note that this is not available when you use a laser scanner with your 700 Series Computer.*

### Action

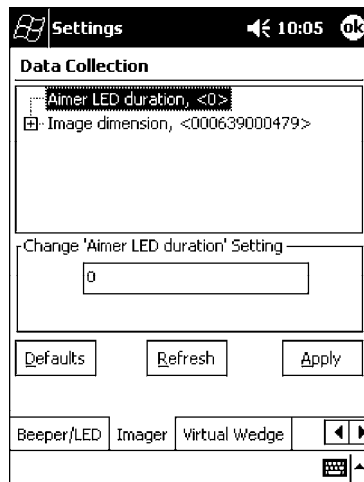
Tap the **Aimer LED duration** parameter, then enter a value to change this setting. Note that values must be in 50 ms increments, such as 500, 650, or 32500. Values not entered in 50 ms increments will be rounded down. For example, 2489 ms would be rounded down to 2450 ms, 149 ms would be rounded down to 100 ms, etc..

### SNMP OID

1.3.6.1.4.1.1963.15.3.3.3.1.1.21.1

### Options

0-65500 ms (*Default is 0*)



### Image Dimension

The image dimensions control the horizontal size of the image for decoding. This can restrict the image to one bar code when otherwise, there might be more than one bar code in the image to be decoded. *Note that this is not available when you use a laser scanner with your 700 Series Computer.*

### Action

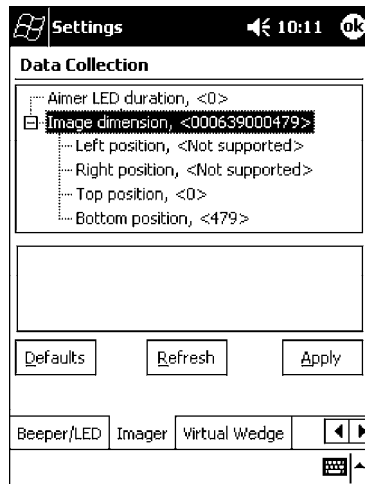
Tap the **Image dimension** parameter, select the position to be changed, then tap an option or enter a value to change this position.

### SNMP OID

1.3.6.1.4.1.1963.15.3.3.3.1.1.22.1

### Options

Left position	0	Not supported
Right position	0	Not supported
Top position	0-478	Position in pixels (0)
Bottom position	0-479	Position in pixels (479)



## Virtual Wedge



To access the settings from the 700 Series Computer, tap **Start** → **Settings** → the **System** tab → the **Data Collection** icon to access its control panel applet.

Use the right and left arrows to scroll to the **Virtual Wedge** tab, then tap this tab to access its parameters.

The following are parameters for the virtual wedge scanner. *Note that these are listed in the order of their appearance within the Virtual Wedge tab.*

### Virtual Wedge

Enables or disables the virtual wedge for the internal scanner. The virtual wedge retrieves scanned Automatic Data Collection (ADC) data and sends it to the keypad driver so that the 700 Series Computer can receive and interpret the data as keypad input.

Because the virtual wedge translates incoming data into keypad input, the size of the keypad buffer limits the effective length of the label to 128 characters. Longer labels may be truncated. For labels of more than 128 characters, you need to develop an application that bypasses the keypad buffer.

### Action

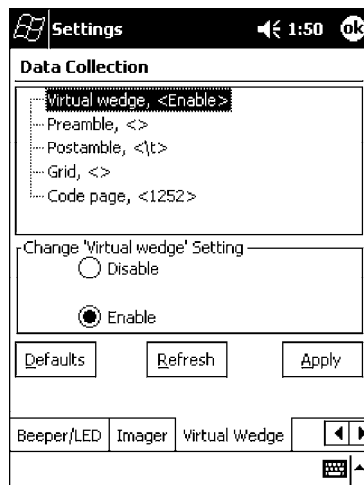
Tap the **Virtual Wedge** parameter, then tap an option to change this parameter setting.

### SNMP OID

1.3.6.1.4.1.1963.15.3.2.1.1.2.1

### Options

- 0 Disable
- 1 Enable (*default*)



### Preamble

Sets the preamble that precedes any data you scan with the 700 Series Computer. Common preambles include a data location number or an operator number.

### Action

Tap the **Preamble** parameter, then enter a preamble value to change this parameter setting.

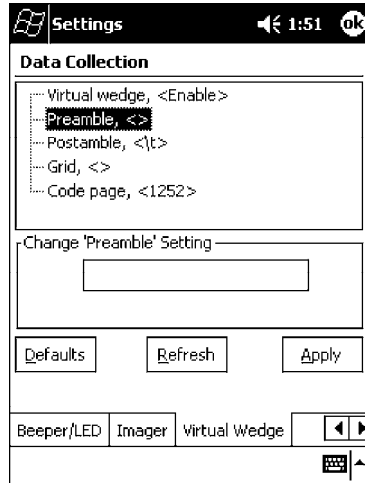
### SNMP OID

1.3.6.1.4.1.1963.15.3.2.1.1.3.1

### Syntax

ADdata

where *data* is acceptable values up to 31 ASCII characters. Embedded null (<NUL >) characters are not allowed. *Default is no characters (disabled)*.



**Note:** When you enter the AD command without data, the preamble is disabled. If you want to use quotation marks or the following combinations of characters as part of the appended data, separate those characters from the AD command with quotes. If you do not use quotes as described here, the 700 Series Computer will interpret the characters as another configuration command:

AD  
AE  
AF  
KC  
BV  
EX  
DF

### EXAMPLE:

To use the two-character string BV as a preamble, scan this command (as a Code 39 label) or send this command through the network: \$+AD"BV"

## Postamble

Sets the postamble that is appended to any data you scan with the 700 Series Computer. Common postambles include cursor controls, such as tabs or carriage return line feeds.

### Action

Tap the **Postamble** parameter, then enter a postamble value to change this parameter setting.

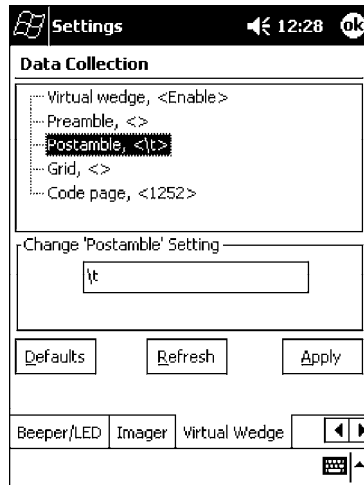
### SNMP OID

1.3.6.1.4.1.1963.15.3.2.1.1.4.1

### Syntax

AEdata

where *data* is any acceptable values up to 31 ASCII characters. Embedded null (<NUL >) characters are not allowed. *Default is the tab character (\t).*



**Note:** When you enter the AE command without data, the postamble is disabled. If you want to use quotation marks or the following combinations of characters as part of the appended data, separate those characters from the AE command with quotes. If you do not use quotes as described here, the 700 Series Computer will interpret the characters as another configuration command.

AD  
AE  
AF  
KC  
BV  
EX  
DF

### EXAMPLE:

To use the two-character string BV as a postamble, scan this command (as a Code 39 label) or send this command through the network: \$+AE"BV"

## Grid

Sets the virtual wedge grid, which filters the data coming from this 700 Series Computer. The data server supports data filtering, which allows you to selectively send scanned data. The virtual wedge grid is similar to the “format” argument of the C Runtime Library scan function.

## Action

Tap the **Grid** parameter, then enter a grid value to change this parameter setting.

## SNMP OID

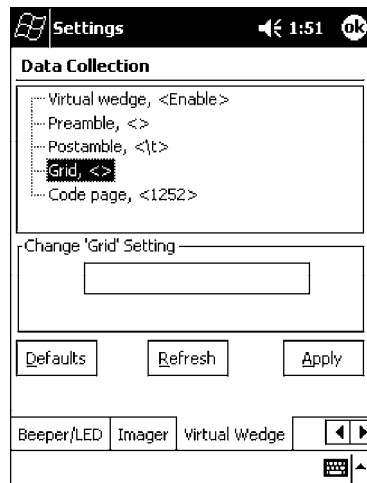
1.3.6.1.4.1.1963.15.3.2.1.1.5.1

## Syntax

AF<symID> filter-expression= > editing-expression

where:

- <symID>  
The AIM symbology ID.
- *filter-expression*  
Any character string that includes valid filter expression values, and editing-expression is any character string that includes valid editing expression values.
- <width>  
Any positive integer or NULL. A NULL width means that the field type (defined next) applies all the way to the end of the data string. A non-NULL width means that the field applies to that many characters of data. The grid can be up to 240 characters in length. *Default is NULL.*



## Code Page

Sets the virtual wedge code page. The code page controls the translation from the character set of the raw collected data to Unicode, which is the character set expected by Windows CE applications. The default code page is 1252, which is the Windows Latin 1 (ANSI) character set.

## Action

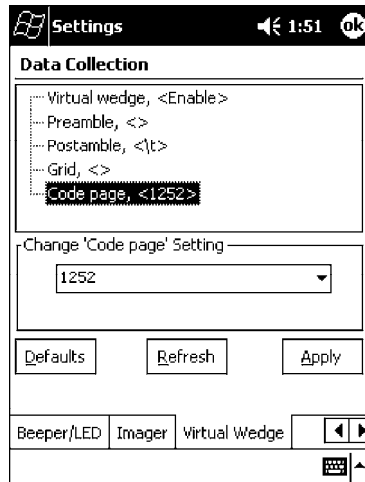
Tap the **Code Page** parameter, then select an option to change this parameter setting.

## SNMP OID

1.3.6.1.4.1.1963.15.3.2.1.1.6.1

## Options

The only acceptable value for the code page parameter is “1252,” which is the default.



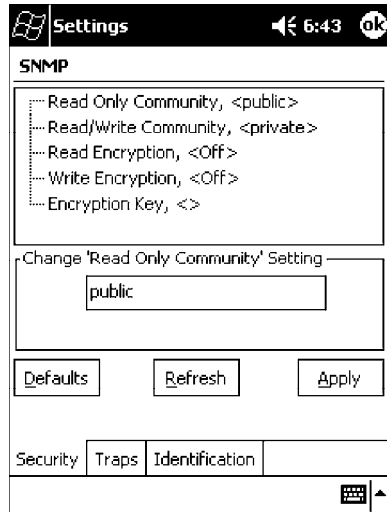


## SNMP Control Panel Applet

Simple Network Management Protocol (SNMP) parameters include identification information, security encryption, security community strings, and traps.



To access the settings from the 700 Series Computer, tap **Start** → **Settings** → the **System** tab → the **SNMP** icon to access its control panel applet.



Tap a tab to access its menus. These tabs represent three groups of settings or parameters:

- **Security** (*starting on the next page*)
- **Traps** (*starting on page 336*)
- **Identification** (*starting on page 338*)

## Security



SNMP

To access the settings from the 700 Series Computer, tap **Start** → **Settings** → the **System** tab → the **SNMP** icon → the **Security** tab to access its parameters.

The following are parameters that affect encryption and community strings. *Note that these are listed in the order of their appearance within the Security tab.*

### Read Only Community

Sets the read-only community string for this 700 Series Computer, which is required for processing of SNMP get and get next requests.

### Action

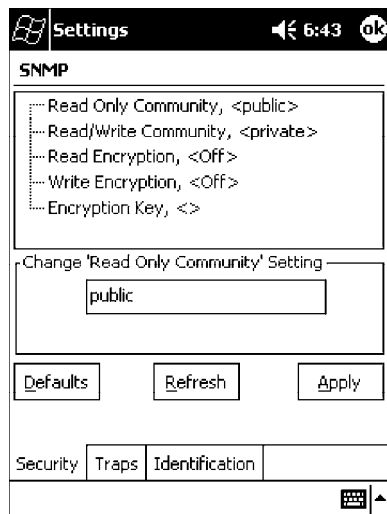
Tap the **Read Only Community** parameter, then enter a community string to change this parameter setting.

### SNMP OID

1.3.6.1.4.1.1963.10.5.1.2.0

### Options

The read-only community string can be up to 128 ASCII characters. *Default is Public.*



### Read/Write Community

Sets the read/write community string, which is required for processing of SNMP set requests by this 700 Series Computer. An SNMP packet with this name as the community string will also process SNMP get and next requests.

### Action

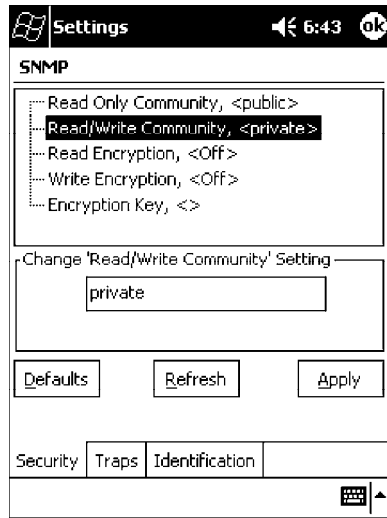
Tap the **Read/Write Community** parameter, then enter a community string to change this parameter setting.

### SNMP OID

1.3.6.1.4.1.1963.10.5.1.3.0

### Options

The read/write community string can be up to 128 ASCII characters. *Default is Private.*



## Read Encryption

Sets the packet-level mode of security for SNMP read-only requests. If you enable read encryption, all received SNMP get and get next packets have to be encrypted or the packet will not be authorized. If encryption is enabled, you can only use software provided by Intermecc Technologies.



**Note:** To enable security encryption, you also need to set the Security Encryption Key (page 335).

### Action

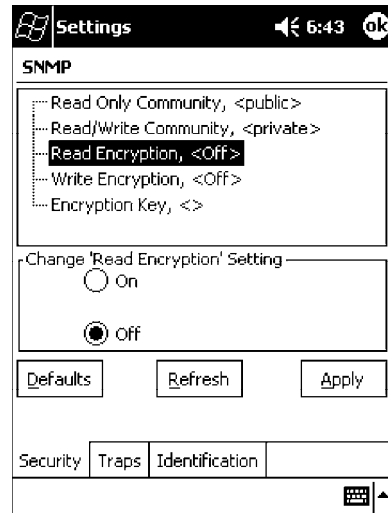
Tap the **Read Encryption** parameter, then select an option to change this parameter setting.

### SNMP OID

1.3.6.1.4.1.1963.10.5.1.4.0

### Options

- 1 On SNMP get and get next packets must be encrypted
- 2 Off SNMP packets do not have to be encrypted (*default*)



## Write Encryption

Sets the packet-level mode of security for SNMP read/write requests. If you enable write encryption, all SNMP packets that are received with the read/write community string have to be encrypted or the packet will not be authorized. You need to use software from Intermec Technologies that supports encryption.



**Note:** To enable security encryption, you also need to set the Security Encryption Key (page 335).

### Action

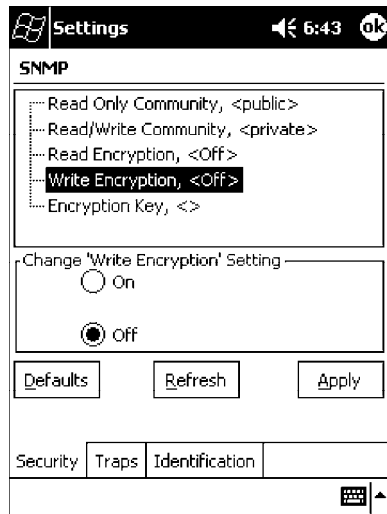
Tap the **Write Encryption** parameter, then select an option to change this parameter setting.

### SNMP OID

1.3.6.1.4.1.1963.10.5.1.5.0

### Options

- 1 On SNMP packets must be encrypted
- 2 Off SNMP packets do not have to be encrypted (*default*)



## Encryption Key

Identifies the key that this 700 Series Computer uses to encrypt or decipher SNMP packets. Encryption is used only by software provided by Intermecc Technologies. If encryption is enabled, SNMP management platforms will not be able to communicate with the 700 Series Computer. The encryption key is returned encrypted.

## Action

Tap the **Encryption Key** parameter, then enter a security encryption key value to change this parameter setting.



**Note:** You also need to set either **Read Encryption** (page 333) or **Write Encryption** (page 334) or both.

## SNMP OID

1.3.6.1.4.1.1963.10.5.1.6.0

## Options

The encryption key can be from 4 to 20 ASCII characters. *Default is NULL.*

The screenshot shows the 'Settings' application with the 'SNMP' section expanded. The following settings are listed:

- Read Only Community, <public>
- Read/Write Community, <private>
- Read Encryption, <Off>
- Write Encryption, <Off>
- Encryption Key, <>**

Below the list is a section titled 'Change 'Encryption Key' Setting' with an empty text input field. At the bottom of the screen are three buttons: 'Defaults', 'Refresh', and 'Apply'. A tabbed interface at the very bottom shows 'Security' as the active tab, with 'Traps' and 'Identification' as other options.

## Traps



SNMP

To access the settings from the 700 Series Computer, tap **Start** → **Settings** → the **System** tab → the **SNMP** icon → the **Traps** tab to access its parameters.

The following are authentication and threshold parameters for traps. *Note that these are listed in the order of their appearance within the Traps tab.*

### Authentication

Determines whether to send authentication traps. When trap authentication is enabled, an authentication trap is sent if an SNMP packet is received by the master agent with an invalid community string.

### Action

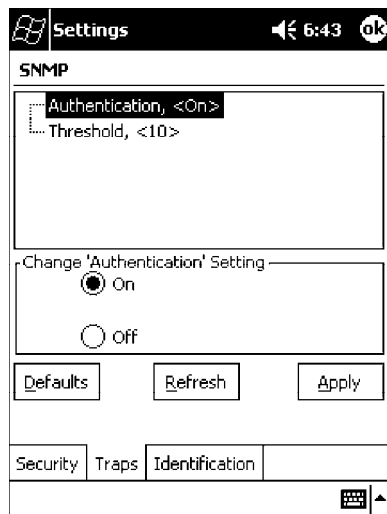
Tap the **Authentication** parameter, then select an option to change this parameter setting.

### SNMP OID

1.3.6.1.4.1.1963.10.5.2.2.0

### Options

- 1 On (*default*)
- 2 Off



## Threshold

Determines the maximum number of traps per second that the master agent generates. If the threshold is reached, the trap will not be sent.

## Action

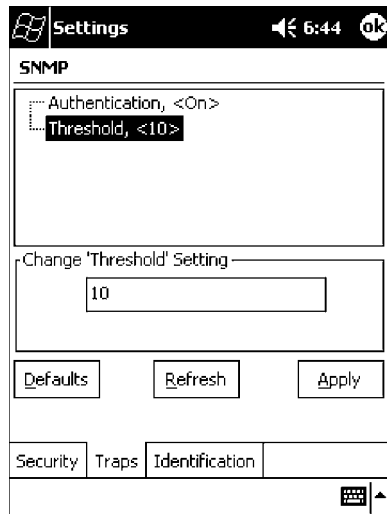
Tap the **Threshold** parameter, then enter a threshold value to change this parameter setting.

## SNMP OID

1.3.6.1.4.1.1963.10.5.2.3.0

## Options

Any positive integer value. *Default is 10.*





## Identification



SNMP

To access the settings from the 700 Series Computer, tap **Start** → **Settings** → the **System** tab → the **SNMP** icon → the **Identification** tab to access its parameters.

The following are parameters for contact, location, and name information for support purposes. *Note that these are listed in the order of their appearance within the Identification tab.*

### Contact

Sets the contact information for the person responsible for this 700 Series Computer.

### Action

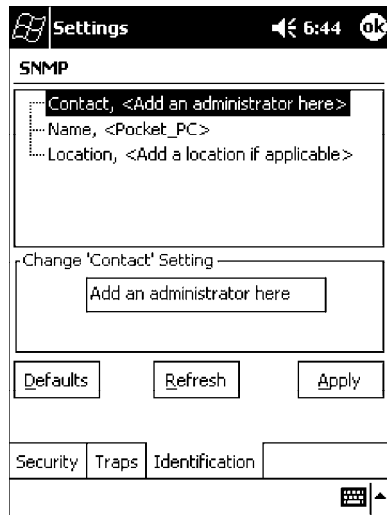
Tap the **Contact** parameter, then enter the name of your contact representative to change this parameter setting.

### SNMP OID

1.3.6.1.2.1.1.4.0

### Options

The identification contact may be up to 255 ASCII characters. *Default is no characters or blank.*



**Name**

Sets the assigned name for this 700 Series Computer.

**Action**

Tap the **Name** parameter, then enter the name of your 700 Series Computer to change this parameter setting.

**SNMP OID**

1.3.6.1.2.1.1.5.0

**Options**

The identification name may be up to 255 ASCII characters. *Default is no characters or blank.*

The screenshot shows a mobile device's Settings applet for SNMP configuration. At the top, the title bar reads 'Settings' with a back arrow, the time '6:44', and an 'ok' button. Below the title bar, the 'SNMP' section is visible. It contains three fields: 'Contact, <Add an administrator here>', 'Name, <Pocket\_PC>', and 'Location, <Add a location if applicable>'. The 'Name' field is highlighted with a red box. Below these fields is a section titled 'Change 'Name' Setting' with a text input field containing 'Pocket\_PC'. At the bottom of this section are three buttons: 'Defaults', 'Refresh', and 'Apply'. Below the buttons is a tabbed interface with 'Security', 'Traps', and 'Identification' tabs. The 'Identification' tab is currently selected. At the very bottom, there is a keyboard icon and an upward-pointing arrow.

### Location

Sets the identification location for this 700 Series Computer, such as “Shipping.”

### Action

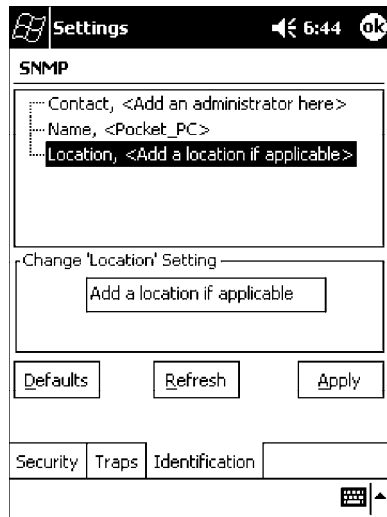
Tap the **Location** parameter, then enter the location of where your 700 Series Computer to change this parameter setting.

### SNMP OID

1.3.6.1.2.1.1.6.0

### Options

The identification location may be up to 255 ASCII characters. *Default is no characters or blank.*

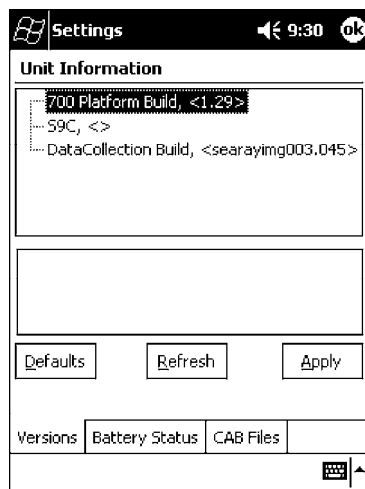


## Unit Information Control Panel Applet

Unit Information is a read-only control panel applet that provides information about your 700 Series Computer, such as software version builds, available CAB files, and the internal battery status.

This control panel applet is only available in the 700 Series Computer if Intermecc Content is enabled, the Plus region is enabled and installed, and a laser scanner is installed.

To access the settings from the 700 Series Computer, tap **Start** → **Settings** → the **System** tab → the **Unit Information** icon to access its control panel applet.



Tap a tab to access its menus. These tabs represent three groups of settings or parameters:

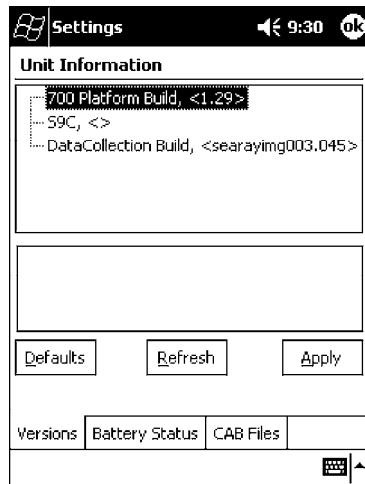
- **Versions** (*starting on the next page*)
- **Battery Status** (*starting on page 343*)
- **CAB Files** (*starting on page 344*)

## Versions



You can view the latest software build version on your 700 Series Computer by accessing the **Unit Information** control panel applet.

To access the settings from the 700 Series Computer, tap **Start** → **Settings** → the **System** tab → the **Unit Information** icon → the **Versions** tab to view the latest software build version. Tap **ok** to exit this information.



Below are some of the software applications you may find on this screen:

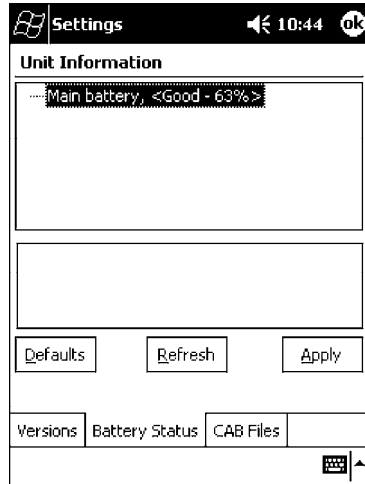
- **700 Platform Build:**  
Shows the latest development or released version of the software build for the 700 Series Computer.
- **S9C:**  
Provides the name and version of the scanner file built into this 700 Series Computer, along with the current CPU version.
- **DataCollection Build:**  
Shows the latest development or released version of the software build for the Data Collection control panel applet.

## Battery Status

You can view the battery status for your 700 Series Computer by accessing the **Unit Information** control panel applet. Unit Manager applications are available on the *700 Series Color Unit Manager CD-ROM*. For more information, consult your Intermec sales representative.



To access the settings from the 700 Series Computer, tap **Start** → **Settings** → the **System** tab → the **Unit Information** icon → the **Battery Status** tab to view the current status. Tap **ok** to exit this information.

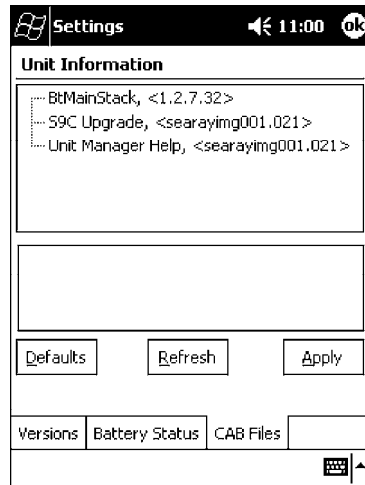


## CAB Files

You can view the latest developer or released version of each CAB file from Intermec Technologies Corporation that are installed in your 700 Series Computer via the **Unit Information** control panel applet. *Custom CAB files are not displayed in this applet.* See the *Software Tools User's Manual* for more information about these files.



To access the information from the 700 Series Computer, tap **Start** → **Settings** → the **System** tab → the **Unit Information** icon → the **CAB Files** tab to view the current CAB file versions. Tap **ok** to exit this information.



When a CAB file is built, a registry entry is created with a build number for that file. This CAB Files control panel applet looks for a registry key for each CAB file installed. When the registry entry is found, the CAB file name and version number information are displayed. If a CAB file has not been installed, then its information is not displayed.

Below is a list of CAB files from Intermec Technologies that are available for your 700 Series Computer with their latest developer or released version of the software build. Should you need to add any of these to your 700 Series Computer, contact an Intermec representative.

- **BtMainStack:**  
Installation of the Main Bluetooth Stack is handled automatically as part of the operating system boot-up procedure. *See Chapter 4, “Network Support,” for more information about Bluetooth wireless printing.*
- **Comm Port Wedge:**  
The software build for the Comm Port Wedge. *Note that the Comm Port Wedge CAB file is available on the 700C Tools CD.*
- **NPCPTest:**  
This installs a Norand® Portable Communications Protocol (NPCP) Printing test application which will print to an Intermec® 4815, 4820, or 6820 Printer. *See Chapter 5, “Printer Support,” for more information.*



- **PDWPM0C:**  
This is the installer for the Wireless Printing Demo application. To run this demonstration, tap **Start** → **Programs** → the **Wireless Printing Demo** icon. *Press Help in the demo application for more information.*
- **S9C Upgrade:**  
Installs the files needed to upgrade the S9C scanner firmware. *See the Recovery CD Help for more information about upgrading the firmware.*
- **SDK:**  
Installs the Intermec Software Developer's Kit (SDK). *See the SDK User's Manual for more information.*
- **Unit Manager:**  
Installs the Unit Manager application which provides tools for remotely managing the 700 Series Computer. Unit Manager applications are available on the *700 Series Color Unit Manager CD-ROM*. For more information, consult your Intermec sales representative.
- **Unit Manager Help:**  
Installs the online help for the Unit Manager application.
- **WinCfg:**  
Configures the NRINET.INI file, launches the NRINet client, and loads and unloads the LAN and WLAN device drivers. *See the Windows 95 and Windows CE Configuration Utilities Reference Manual (P/N: 978-054-010) for more information.*
- **Wireless Printing Sample:**  
Installs a sample application that developers can use for reference when they are developing their own Wireless Printing applications. The source code for this application is included as part of the Wireless Printing SDK on the 700C Tools CD. *See the SDK User's Manual for more information.*
- **ActiveX Control Tools:**  
This lists some of the CAB files that may be available with which to install ActiveX Control Tools. *See the SDK Online Help for more information.*
  - **AXCommunication:**  
Communication controls that transmit or receive messages from input connections.
  - **AXFileTransfer:**  
File transfer controls that transmit and receive files using the Trivial File Transfer Protocol (TFTP).
  - **AXReaderCommand:**  
Reader command functions that modify and retrieve configuration information from your 700 Series Computer.
  - **AXVWedge:**  
The virtual wedge control that retrieves scanned ADC data and sends it to the keyboard driver to interpret data as keyboard input.







# B Unit Manager

Configuration parameters are also configurable using a Unit Manager application which accesses the 700 Series Computer through a web browser on your desktop PC via the SRDEVMGMT.CAB file.

Unit Manager applications are available on the *700 Series Color Unit Manager CD-ROM*. For more information, consult your Intermecc sales representative.



**Note:** Parameter information, such as SNMP OID and options, is detailed in Appendix A, “*Control Panel Applets*.”

## Data Collection



Data Collection

Within the Unit Manager, click **Configuration** from the left navigation bar, then click the **Data Collection** icon to access any of these tabs: Symbologies, Symbology ID, Beeper/LED, or Virtual Wedge.

## Symbologies

Within the Unit Manager, select **Configuration Management** → **Data Collection**, then click the **Symbologies** tab to access the following parameters. Options for these parameters are listed on the page provided. *These are listed in alphabetical order.*

- Codabar (*page 292*)
- Code 11 (*page 306*)
- Code 128 (*page 295*)
  - Code 128 Options (*page 296*)
  - Code 128 FNC1 Character (*page 297*)
- Code 39 (*page 290*)
- Code 93 (*page 294*)
  - Code 93 Length (*page 294*)
- Data Matrix (*page 308*)
- Interleaved 2 of 5 (*page 303*)
- Matrix 2 of 5 (*page 304*)
- MSI (*page 299*)
- PDF 417 (*page 300*)
  - Macro PDF (*page 300*)
  - Micro PDF 417 (*page 302*)
- Plessey (*page 298*)
- QR Code (*page 307*)
- Standard 2 of 5 (*page 291*)
- Telepen (*page 305*)
- UPC/EAN (*page 293*)

## Symbology ID

Within the Unit Manager, select **Configuration Management** → **Data Collection**, then click the **Symbology ID** tab to access the following parameters. Options for these parameters are listed on the page provided. *These are listed in alphabetical order.*

- Prefix (page 315)
- Suffix (page 316)
- Symbology ID (page 309)
  - Codabar user ID (page 310)
  - Code 11 user ID (page 314)
  - Code 128 user ID (page 310)
  - Code 39 user ID (page 310)
  - Code 93 user ID (page 311)
  - EAN-13 user ID (page 313)
  - EAN-8 user ID (page 313)
  - Interleaved 2 of 5 user ID (page 311)
  - Matrix 2 of 5 user ID (page 313)
  - MSI user ID (page 311)
  - PDF 417 user ID (page 311)
  - Plessey user ID (page 312)
  - Standard 2 of 5 user ID (page 312)
  - Telepen user ID (page 313)
  - UPC-A user ID (page 312)
  - UPC-E user ID (page 312)

## Beeper/LED

Within the Unit Manager, select **Configuration Management** → **Data Collection**, then click the **Beeper/LED** tab to access the following parameters. Options for these parameters are listed on the page provided. *These are listed in alphabetical order.*

- Beeper Frequency (page 320)
- Beeper Volume (page 318)
- Good Read Beep Duration (page 322)
- Good Read Beeps (page 321)

## Imager

Within the Unit Manager, select **Configuration Management** → **Data Collection**, then click the **Imager** tab to access the following parameters. Options for these parameters are listed on the page provided. *These are listed in alphabetical order.*

- Aimer LED Duration (page 323)
- Image Dimension (page 324)

## Virtual Wedge

Within the Unit Manager, select **Configuration Management** → **Data Collection**, then click the **Virtual Wedge** tab to access the following parameters. Options for these parameters are listed on the page provided. *These are listed in alphabetical order.*

- Code Page (page 329)
- Grid (page 328)
- Postamble (page 327)
- Preamble (page 326)
- Virtual Wedge (page 325)

## SNMP



SNMP

Within the Unit Manager, click **Configuration** from the left navigation bar, then click the **SNMP** icon to access any of these tabs: Security, Traps, or Identification.

## Security

Within the Unit Manager, select **Configuration Management** → **SNMP**, then click the **Security** tab to access the following parameters. Options for these parameters are listed on the page provided. *These are listed in alphabetical order.*

- Encryption Key (page 335)
- Read Encryption (page 333)
- Read Only Community (page 331)
- Read/Write Community (page 332)
- Write Encryption (page 334)

## Traps

Within the Unit Manager, select **Configuration Management** → **SNMP**, then click the **Traps** tab to access the following parameters. Options for these parameters are listed on the page provided. *These are listed in alphabetical order.*

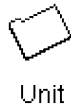
- Authentication (*page 336*)
- Threshold (*page 337*)

## Identification

Within the Unit Manager, select **Configuration Management** → **SNMP**, then click the **Identification** tab to access the following parameters. Options for these parameters are listed on the page provided. *These are listed in alphabetical order.*

- Contact (*page 338*)
- Location (*page 340*)
- Name (*page 339*)

# Unit



Within the Unit Manager, click **Configuration** from the left navigation bar, then click the **Unit** icon to access any of these tabs: Date/Time, Display, Keypad, Power Management, or Speaker.

## Date/Time

Sets the current date and time.

### Action

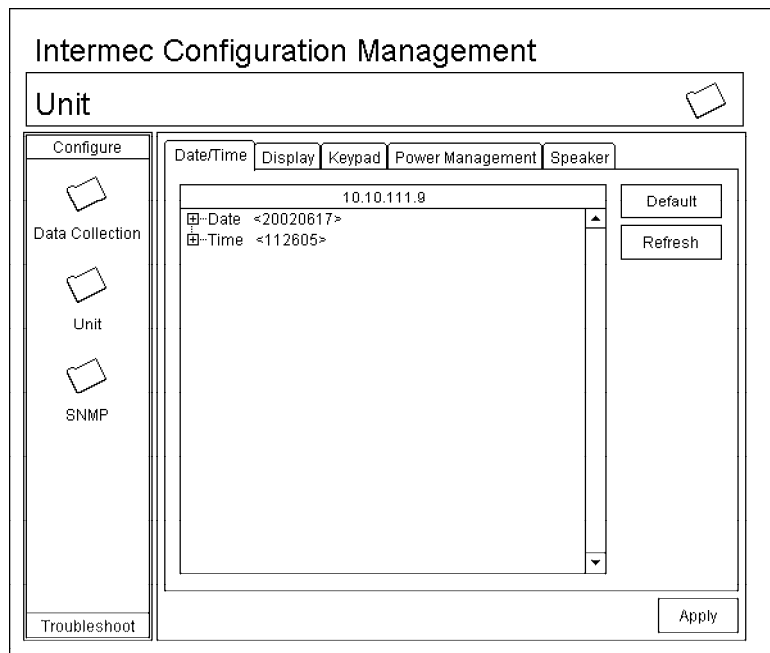
Click the **Date/Time** tab, then select **Date** or **Time** and make changes in the entry field, or tap (+) to expand either the Date or Time parameter, select the setting to be changed, then select a value from the drop-down list or enter a new value to change this setting.

### SNMP OID

Date: 1.3.6.1.4.1.1963.15.501.2.1.0  
 Time: 1.3.6.1.4.1.1963.15.501.2.2.0

### Options

Date	Year	0000`999	(1999)
	Month	1-12	(6)
	Day	1-31	(1)
Time	Hour	0-23	(0)
	Minute	0-59	(00)
	Second	0-59	(00)



## Backlight Timeout

Sets the length of time that the display backlight remains on. If you set a longer timeout value, you use the battery power at a faster rate.

### Action

Click the **Display** tab, then select an option from the **Backlight timeout** drop-down list.

### SNMP OID

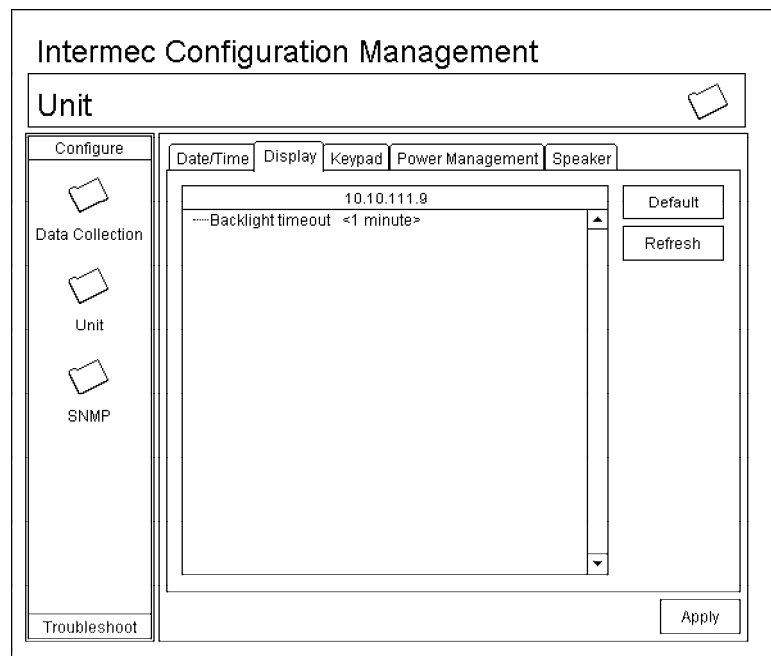
1.3.6.1.4.1.1963.15.13.1.0

### Syntax

DFdata

where *data* is any of the following:

10	10 seconds
30	30 seconds
60	1 minute ( <i>default</i> )
120	2 minutes
180	3 minutes
240	4 minutes
300	5 minutes





## Key Clicks

Enables or disables the keypad clicks. The 700 Series Computer emits a click each time you press a key or decode a row of a two-dimensional symbology.

### Action

Click the **Keypad** tab, then select an option from the **Key clicks** drop-down list.

### SNMP OID

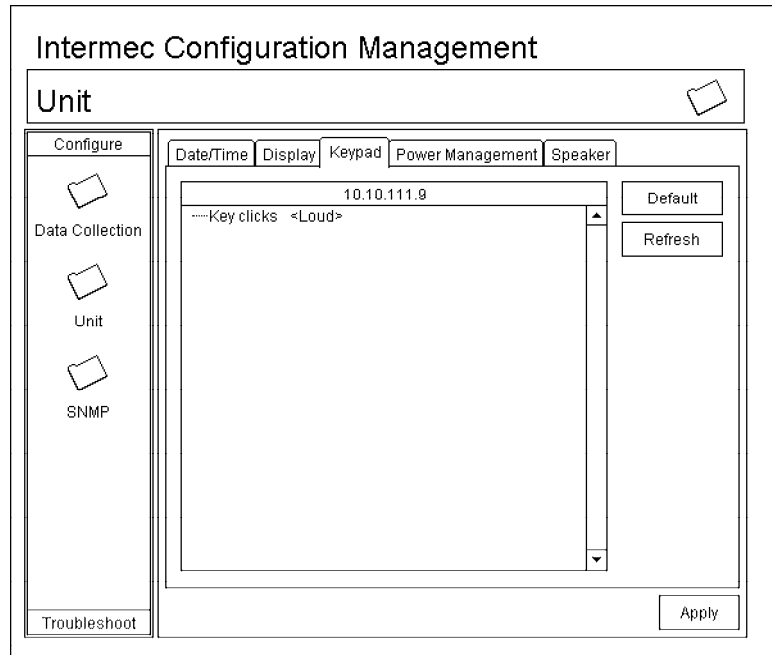
1.3.6.1.4.1.1963.15.12.1.0

### Syntax

KCdata

where *data* is any of the following:

- 0 Disable clicks
- 1 Enable soft key clicks
- 2 Enable loud key clicks (*default*)



## Automatic Shutoff

Sets the length of time the 700 Series Computer remains on when there is no activity. When you turn on the 700 Computer, it either resumes exactly where it was when you turned it off or boots and restarts your application.

### Action

Click the **Power Management** tab, then select an option from the **Automatic shutoff** drop-down list.

### SNMP OID

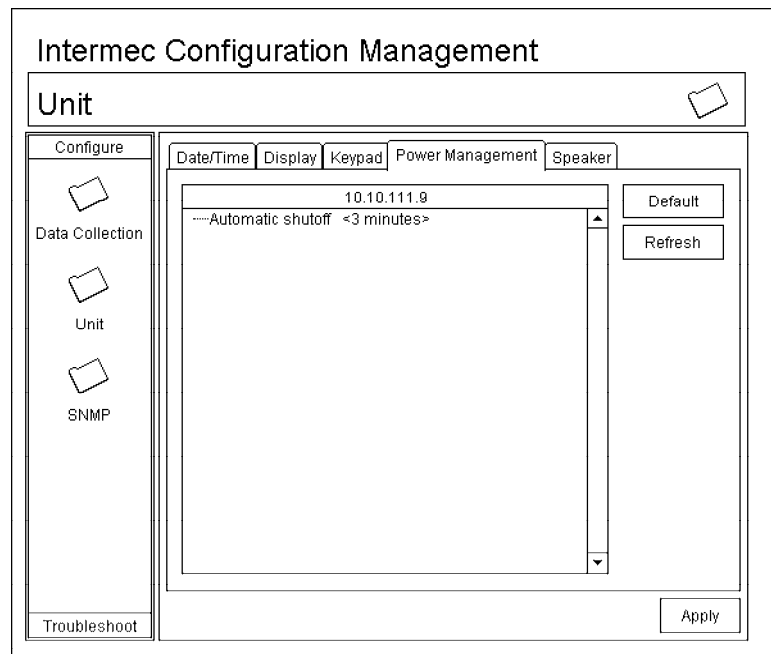
1.3.6.1.4.1.1963.15.11.3.0

### Syntax

EZdata

where *data* is any of the following:

- 1 1 minute
- 2 2 minutes
- 3 3 minutes (*default*)
- 4 4 minutes
- 5 5 minutes



## Volume

Changes the volume of all audio signals.

### Action

Click the **Speaker** tab, then select an option from the **Volume** drop-down list.

### SNMP OID

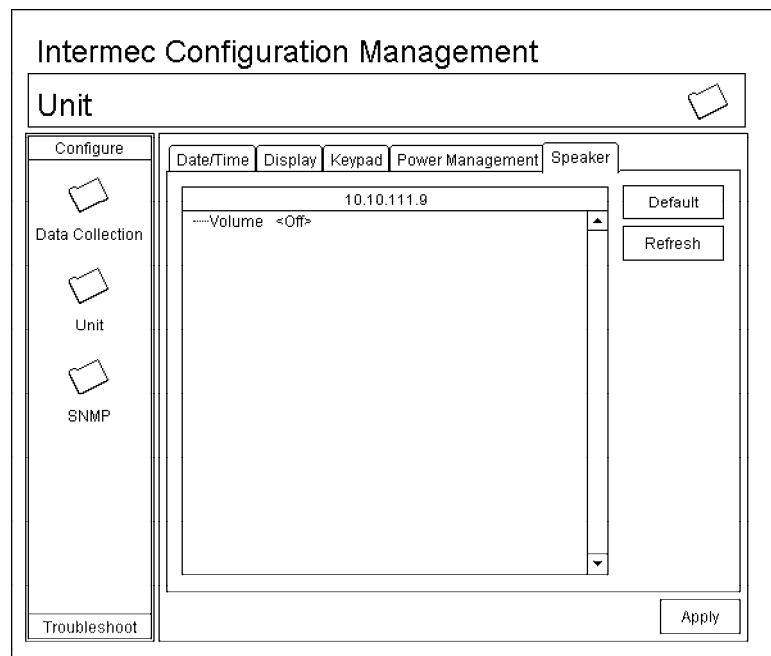
1.3.6.1.4.1.1963.15.3.1.3.0

### Syntax

BVdata

where *data* is any of the following:

- 0 Off
- 1 Very quiet
- 2 Quiet
- 3 Normal (*default*)
- 4 Loud
- 5 Very loud



## Using Reader Commands

After the 700 Series Computer is connected to your network, you can send the 700 Series Computer a reader command from an application to perform a task, such as changing the time and date. Some reader commands temporarily override the configuration settings and some change the configuration settings.

### Change Configuration

The Change Configuration command must precede any configuration command. If you enter a valid string, the 700 Series Computer configuration is modified and the computer emits a high beep. To send the Change Configuration command through the network, use the `$+ [command]` syntax where *command* is the two-letter command syntax for the configuration command followed by the value to be set for that command.

You can also make changes to several different commands by using the `$+ [command]...[command n]` syntax. There are seven configuration command settings that can be changed in this way. *See each command for information on respective acceptable “data” values.*

Command	Syntax
Audio Volume	BV <i>data</i>
Automatic Shutoff	EZ <i>data</i>
Backlight Timeout	DF <i>data</i>
Key Clicks	KC <i>data</i>
Virtual Wedge Grid	AF <i>data</i>
Virtual Wedge Postamble	AE <i>data</i>
Virtual Wedge Preamble	AD <i>data</i>



**Note:** See Appendix A, “Control Panel Applets” for more information about the **Virtual Wedge Postamble** and **Virtual Wedge Preamble** commands.

#### Example 1

To change the Beep Volume to Off, you can send this string to the 700 Series Computer through the network: `$+BV0`

where:

- `$+` Indicates Change Configuration.
- `BV` Specifies the Audio Volume parameter.
- `0` Specifies a value of Off.

#### Example 2

To change the Beep Volume to Very Quiet and the Virtual Wedge Grid to 123: `$+BV1AF123`

where:

- `$+` Indicates Change Configuration
- `BV1` Specifies Audio Volume, set to Very Quiet (1)
- `AF123` Specifies Virtual Wedge Grid, set to a value of 123.

## Set Time and Date

This command sets the date and time on the 700 Series Computer. The default date and time is *June 1, 1999 at 12:00 AM*.

From the network, send the following:

```
/+ yyyyymmddhhmmss
```

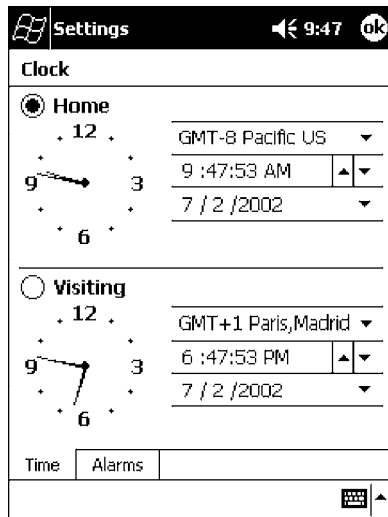
where acceptable values for the date are:

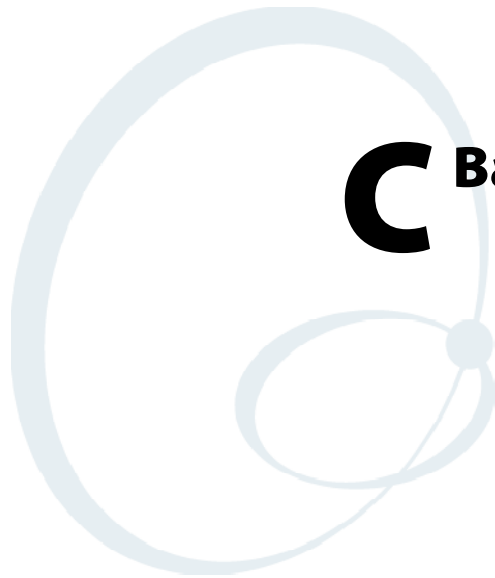
yyyy	0000-9999	Year
mm	01-12	Month of the year
dd	01-31	Day of the month
hh	00-23	Hour
mm	00-59	Minutes
ss	00-59	Seconds



**Clock**

You can also set the time and date by using Configuration Management in Unit Manager, or by using the **Clock** control panel applet in the Settings menu. To access this control panel applet, tap **Start** → **Settings** → the **System** tab → the **Clock** icon to access its control panel applet.





# **C** Bar Codes

This appendix contains a brief explanation of some of the bar code symbologies that the 700 Series Color (700C) Mobile Computer decodes and explains some of the general characteristics and uses of these bar code types. It also includes several bar code labels that can be scanned into your 700 Series Computer.

## Bar Code Symbolologies

Specific bar code algorithms can be enabled using the setup menus or the host computer. Once the computer correctly decodes a bar code, the computer encodes data with descriptive information about the symbol. Response time is improved by limiting the computer to the bar codes being used.

### Bar Code Data String Formats

Data Bar Code Type	Data Format	Data Length
UPC short (UPC-E)	n d d d d d d c	8
EAN short (EAN-8)	f n d d d d d c	8
UPC long (UPC-A)	n d d d d d d d d d c	12
EAN long (EAN-13)	f n d d d d d d d d c	13
UPC short add-on 2	n d d d d d d c a a	10
EAN short add-on 2	f n d d d d d c a a	10
UPC long add-on 2	n d d d d d d d d d c a a	14
EAN long add-on 2	f n d d d d d d d d c a a	15
UPC short add-on 5	n d d d d d d c a a a a a	13
EAN short add-on 5	f n d d d d d c a a a a a	13
UPC long add-on 5	n d d d d d d d d d c a a a a a	17
EAN long add-on 5	f n d d d d d d d d c a a a a a	18
Interleaved 2 of 5	d.....d	Scan device dependent
Standard 2 of 5	d.....d	Scan device dependent
Plessey	d.....dc	Scan device dependent
Codabar	sd....ds	Scan device dependent
Code 11	d.....d	Scan device dependent
Code 39	d.....d	Scan device dependent
Extended Code 39	d.....d	Scan device dependent
Code 93	d.....d	Scan device dependent
Code 128	d.....d	Scan device dependent



**Note:** These bar code data definitions apply to the Data Format column in the previous table

- a Add-on code digits
- c Check digits
- d Bar code digits
- f EAN flag 1 characters
- n Number system digits
- s Start and stop digits

If MOD 10 or MOD 11 check digits are enabled, the digit falls at the end of a bar code data string. Each check digit enabled extends the bar code data string length by one character.

The 700 Series Computer recognizes eleven of the most widely used bar code symbologies. With bar code symbologies, like languages, there are many different types. A bar code symbology provides the required flexibility for a particular inventory tracking system.

A symbology may be for particular industries, such as food and beverage, automotive, railroad, or aircraft. Some of these industries have established their own bar code symbology because other symbologies did not meet their needs.

Without going into great detail on the bar code structure, note that no two products use the same bar code. Each product gets a unique bar code.

Industries that use a particular type of bar code symbology have formed regulating committees or are members of national institutes that issue and keep track of bar codes. This ensures that each organization that contributes to a particular industry conforms to its standard. Without some form of governing body, bar coding would not work.

- UPC (Universal Product Code) with/without add-ons
- EAN (European Article Numbering Code) with/without add-ons
- Codabar
- C11 (Code 11)
- C39 (Code 39)
- C93 (Code 93)
- C128 (Code 128)
- I 2 of 5 (Interleaved 2 of 5 Code)
- S 2 of 5 (Standard 2 of 5)
- Plessey
- MSI (a variant of Plessey)



## UPC

The UPC (Universal Product Code) is the symbology used throughout the grocery and retail industries. This bar code symbology contains two pieces of numerical information encoded on the bar code, producer identification, and product identification information.

The UPC symbol is 12 characters long. The first character of the UPC symbol is a number system character, such as “0” for grocery items and “3” for drug- and health-related items.

The UPC symbology is for retail environments such as grocery stores, convenience stores, and general merchandise stores.

Some retail items are so small that a standard UPC bar code cannot fit on the packaging. When this occurs there is a permitted shorter version of the UPC symbology, referred to as UPC-E. UPC-E is six characters long (eight including number system and check digit), approximately half the size of a standard UPC bar code.

## EAN

EAN (European Article Numbering) symbology is similar to UPC symbology, except that it contains 13 characters and uses the first two to identify countries.

The EAN symbology is used in the retail environment throughout most of Europe. Though similar to UPC symbology, these are not interchangeable.

## Codabar

Codabar was for retail price-labeling systems. Today it is widely accepted by libraries, medical industries, and photo finishing services.

Codabar is a discrete, self-checking code with each character represented by a stand-alone group of four bars and three intervening spaces.

Four different start or stop characters get defined and designated “a”, “b”, “c”, and “d”. These start and stop characters are constructed using one wide bar and two wide spaces. A complete Codabar symbol begins with one of the start or stop characters followed by some number of data characters and ending in one of the start or stop characters.

Any of the start or stop characters may be used on either end of the symbol. It is possible to use the 16 unique start or stop combinations to identify label type or other information.

Since Codabar is variable-length, discrete, and self-checking, it is a versatile symbology. The width of space between characters is not critical and may vary significantly within the same symbol. The character set consists of “0” through “9”, “-”, “\$”, “:”, “/”, “.”, and “+”.

The specific dimensions for bars and spaces in Codabar optimize performance of certain early printing and reading equipment. Codabar has 18 different dimensions for bar and space widths. So many different dimensions often result in labels printed out of specification and cause Codabar printing equipment to be more expensive.

## Code 11

Code 11 satisfies the requirements for a very high density, discrete numeric bar code. The name Code 11 derives from 11 different data characters that can be represented, in addition to a start or stop character.

The character set includes the 10 digits and the dash symbol. Each character is represented by a stand-alone group of three bars and two intervening spaces. Although Code 11 is discrete, it is not self-checking. A single printing defect can transpose one character into another valid character. One or two check digits obtain data security.

The specifications for Code 11 suggest that this code should have a narrow element width of 7.5 mils. This results in an information density of 15 characters per inch.

## Code 39

Code 39 (C39) is the most widely used symbology among the industrial bar codes. Most major companies, trade associations, and the federal government find this code to fit their needs. The main feature of this symbology is the ability to encode messages using the full alphanumeric character set, seven special characters, and ASCII characters.

Programming for this symbology can be for any length that the application requires. The application program for the 700 Series Computer handles symbology at least one character but no more than 32 characters in length.

When programming the computer for Code 39, it is important to set the symbology limit as close as possible (minimum and maximum bar code lengths being scanned). Doing so keeps the computer bar code processing time to a minimum and conserves battery power.

Bar code readers can respond to Uniform Symbology Specification symbols in non-standard ways for particular applications. These methods are not for general applications, because of the extra programming required. Code 39 Full ASCII is one example of non-standard code.



**Note:** See page 368 to scan several Code 39 bar code labels available to change settings on your 700 Series Computer.

### Encoded Code 39 (Concatenation)

If the first data character of a symbol is a space, the reader may be programmed to append the information contained in the remainder of the symbol to a storage buffer. This operation continues for all successive symbols that contain a leading space, with messages being added to the end of previously stored ones. When a message is read which does not contain a leading space, the contents are appended to the buffer, the entire buffer is transmitted, and the buffer is cleared.

### Encoded Code 39 (Full ASCII)

If the bar code reader is programmed for the task, the entire ASCII character set (128 characters) could be coded using two character sequences: a symbol (“\$”, “.”, “%”, “/”) followed by a letter of the alphabet.

## Code 93

The introduction of Code 93 provided a higher density alphanumeric symbology designed to supplement Code 39. The set of data characters in Code 93 is identical with that offered with Code 39. Each character consists of nine modules arranged into three bars and three spaces.

Code 93 uses 48 of the 56 possible combinations. One of these characters, represented by a square, is reserved for a start or stop character, four are used for control characters, and the remaining 43 data characters coincide with the Code 39 character set. An additional single module termination bar after the stop character concludes the final space.

Code 93 is a variable length, continuous code that is not self-checking. Bar and spaces widths may be one, two, three, or four modules wide. Its structure uses edge-to-similar-edge decoding. This makes the bar code immune to uniform ink spread, which allows liberal bar width tolerances.

Code 93 uses two check characters. Its supporters believe this makes it the highest density alphanumeric bar code. The dual check digit scheme provides for high data integrity. All substitution errors in a single character are detected for any message length.

## Code 128

Code 128 (C128) is one of the newest symbologies used by the retail and manufacturing industries. It responds to the need for a compact alphanumeric bar code symbol that could encode complex product identification.

The fundamental requirement called for a symbology capable of being printed by existing data processing printers (primarily dot-matrix printers) that produce daily, work-in-progress, job, and product traceability documents. The ability to print identification messages between 10 and 32 characters long, on existing forms and labels deemed an important requirement.

Code 128 uniquely addresses this need as the most compact, complete, alphanumeric symbology available.

Additionally, the Code 128 design with geometric features, improves scanner read performance, does self-checking, and provides data message management function codes.

Code 128 encodes the complete set of 128 ASCII characters without adding extra symbol elements. Code 128 contains a variable-length symbology and the ability to link one message to another for composite message transmission. Code 128, being a double-density field, provides two numeric values in a single character.

Code 128 follows the general bar code format of start zone, data, check digit, stop code, and quiet zone. An absolute minimum bar or space dimension of nine mils (0.010 inch minimum nominal  $\pm$  0.001 inch tolerance) must be maintained.

Characters in Code 128 consist of three bars and three spaces so that the total character set includes three different start characters and a stop character.

UCC/EAN-128 Shipping Container Labeling is a versatile tool that can ease movement of products and information. The Shipping Container Labeling bar code can take any form and usually has meaning only within the company or facility where applied.

Because this *random* data can get mistaken later for an industry standard code format, the UCC and EAN chose a symbology uniquely identified from these other bar codes. This standard is for maximum flexibility, to handle the diversity of distribution in global markets by cost efficiency.

The UCC/EAN-128 Container Labeling specification calls for a FUNC1 to immediately follow the bar code's start character. FUNC1 also follows any variable-length application field. The specification also calls for the computer to send "J1" for the first FUNC1. The specification requires that the computer send a "<GS>" (hex 1D) for subsequent FUNC1 codes in the bar code.

Because "<GS>" is not compatible with computer emulation data streams, the Uniform Code Council has been asked to change the specification. This change is made to send the same three character sequence "J1" to identify the embedded FUNC1 codes.

This implementation should provide for clean application coding by identifying the same sequences for the same scanned codes. If the communication of Norand bar code types is enabled, the Shipping Container Label codes precede with a "J". These strings will appear on the computer display. The application may have to allow for strings longer than 48 characters (maximum length indicated in the specification). Actual length variance depends on the number of variable-length data fields. Allowing for 60 characters should be sufficient. Within the Code 128 specification, the computer can link bar codes together. If this is to happen, allow for more characters (computer limit is 100 characters).

The Application Identifier Standard, that is part of the UCC/EAN Shipping Label concept, complements, rather than replaces, other UCC/EAN standards. Most UCC/EAN standards primarily identify products.

Several industries expressed the need to standardize more than product identification. The UCC/EAN Code 128 Application Identifier Standard supplies this tool. The standard adds versatility for inter-enterprise exchanges of perishability dating, lot and batch identification, units of use measure, location codes, and several other information attributes.

For more detailed information on Code 128 UCC/EAN Shipping Label bar code and Application Identifier Standard, refer to the UCC/EAN-128 Application Identifier Standard specification.

## I 2 of 5 (Interleaved)

I 2 of 5 (Interleaved 2 of 5 Code) is an all-numeric symbology, widely used for warehouse and heavy industrial applications. Its use has been particularly prevalent in the automobile industry. The I 2 of 5 symbology can be placed on smaller labels than what the standard UPC symbology requires.

I 2 of 5 also provides a little more flexibility on the type of material it can print on. Interleaved 2 of 5 Code has its name because of the way the bar code is configured.

I 2 of 5 bars and spaces both carry information. The bars represent the odd number position digits, while spaces represent the even number position digits. The two characters are interleaved as one. Messages encoded with this symbology have to use an even number of characters since two numeric characters always get interleaved together.

## S 2 of 5 (Standard 2 of 5)

The code S 2 of 5 (Standard 2 of 5 Code) is designed primarily for:

- Warehouse inventory handling
- Identification of photo finishing envelopes
- Airline tickets
- Baggage and cargo handling

The code S 2 of 5 is simple and straightforward. All information is contained in the widths of the bars, with the spaces serving only to separate the individual bars.

Bars can either be wide or narrow, and the wide bars are usually three times the widths of the narrow bars. Spaces may be any reasonable width but are typically equal to the narrow bars. Narrow bars are identified as zero bits and wide bars as one bits.

Remember the code structure by associating the bar positions from left to right with weighting factors 1, 2, 4, 7, and parity. Exceptions to this rule are zero, start, and stop. This code is a discrete code, since the white spaces between the characters are not part of the code. Because the white spaces carry no information, their dimensions are not critical.

The S 2 of 5 code is self-checking, meaning a scanner passing through a printing void would detect the proper ratio of wide bars to total bars. When the scanner spots an error, a non-read will occur.

## Plessey

Plessey finds its origin in the pulse width modulated (PWM) code developed in England. It is widely used for shelf markings in grocery stores. Pulse width modulated codes represent each bit of information by a bar and space pair. A zero bit consists of a narrow bar followed by a wide space, while a one bit consists of a wide bar followed by a narrow space. It is mainly a numeric symbology (0-9) with six extra characters available for assigning any symbol or letter desired.

Plessey codes are not self-checking and employ a variety of check characters. Plessey employs a polynomial-based Cyclic Redundancy Check (CRC). For start and stop characters, Plessey employs a 1101 and previously used a 0101.

This symbology is very limited about what information can be encoded. It is not considered for new applications.

### MSI Code (Variant of Plessey)

In addition to Plessey characteristics, the MSI Code employs a Modulus 10 Check. For start and stop checks, MSI employs a single bit pair of 1 as a start symbol and a single bit pair of 0 as a stop symbol. MSI reverses the 1-2-4-8 BCD pattern for bit pair weighting to 8-6-2-1.

## Bar Code Labels

You can change some settings on your 700 Series Computer by scanning the following Code 39 bar code labels.

- You can use the Unit Manager application to set the Automatic Shutoff, Volume, Backlight Timer, or Key Clicks parameters (*starting on page 352*).
- You can use the Unit Manager application or the Data Collection control panel to set the three Virtual Wedge parameters (*starting on page 325*).



**Note:** When you use a bar code creation utility to make a scannable bar code label, the utility probably adds opening and closing asterisks automatically. Asterisks are included here for translation purposes.

## Audio Volume



**Note:** The Audio Volume parameter information is on page 356.

Turn Audio Off



\*\$+BV0\*

Set Audio Volume to very quiet



\*\$+VB1\*

Set Audio Volume to quiet



\*\$+BV2\*

Set Audio Volume to normal (*default*)



\*\$+BV3\*

Set Audio Volume to loud



\*\$+BV4\*

Set Audio Volume to very loud



\*\$+BV5\*

## Automatic Shutoff



**Note:** The Automatic Shutoff parameter information is on page 355.

Set Automatic Shutoff to 1 minute



\*\$+EZ1\*

Set Automatic Shutoff to 2 minutes



\*\$+EZ2\*

Set Automatic Shutoff to 3 minutes (*default*)



\*\$+EZ3\*

Set Automatic Shutoff to 4 minutes



\*\$+EZ4\*

Set Automatic Shutoff to 5 minutes



\*\$+EZ5\*

## Backlight Timeout



**Note:** The Backlight Timeout parameter information is on page 353.

Backlight Timeout 10 seconds



\*\$+DF10\*

Backlight Timeout 30 seconds



\*\$+DF30\*

Backlight Timeout 1 minute (*default*)



\*\$+DF60\*



Backlight Timeout 2 minutes



\*\$+DF120\*

Backlight Timeout 3 minutes



\*\$+DF180\*

Backlight Timeout 4 minutes



\*\$+DF240\*

Backlight Timeout 5 minutes



\*\$+DF300\*

## Key Clicks



**Note:** The Key Clicks parameter information is on page 354.

Disable key clicks



\*\$+KC0\*

Enable soft key clicks



\*\$+KC1\*

Enable loud key clicks (*default*)



\*\$+KC2\*

## Virtual Wedge Grid, Preamble, Postamble

The following parameters are user-configurable strings. Refer to a full ASCII chart for more information.

### Grid

For Virtual Wedge Grid, the first part of the bar code would be the following, which can include a string of up to 240 characters. *Parameter information starts on page 328.*



\*\$+AF

### Preamble

For Virtual Wedge Preamble, the first part of the bar code would be below, followed by a string of up to 31 characters (*no <NUL>*) and an asterisk. *Default is no characters. Parameter information is on page 326.*



\*\$+AD

### Postamble

For Virtual Wedge Postamble, the first part of the bar code would be below, followed by a string of up to 31 characters (*no <NUL>*) and an asterisk. *Default is no characters. Parameter information is on page 327.*



\*\$+AE





The Classes and Functions Index covers classes and functions for the 700 Series Color Mobile Computer.

The General Index covers all topics. Those in italics are figures, those in bold are tables.

The Files Index is to assist you in locating descriptions for device drivers, applications, utilities, batch files, or other files within this publication.

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