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The Enterprise Mobility Company™

AirBEAM® Smart Windows® CE Client

AirBEAM smart

Product Reference Guide

AirBEAM® Smart Windows® CE Client
Product Reference Guide

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symbol®
The Enterprise Mobility Company™

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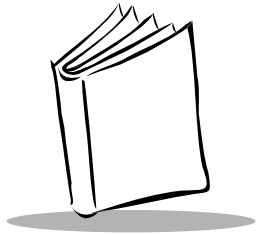

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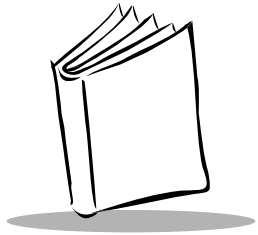

About This Guide

The *AirBEAM® Smart Windows® CE Client Product Reference Guide* provides information about Symbol's AirBEAM Smart Client product. This guide is designed for system administrators and users who configure and operate AirBEAM Smart Client. In addition, this guide provides troubleshooting information and techniques for using AirBEAM Smart Client.

Chapter Descriptions

Topics covered in this guide are as follows:

- Chapter 1, *AirBEAM Smart*, provides an introduction to AirBEAM Smart, instructions for installing the license key, list of supported mobile computers and instructions for installing and updating the AirBEAM Smart Client.
- Chapter 2, *AirBEAM Smart Client Configuration*, provides instructions for configuring the AirBEAM Smart Client using a variety of methods.
- Chapter 3, *AirBEAM Smart Client Synchronization*, provides instructions for synchronizing the Client with the server through a variety of ways.
- Chapter 4, *AirBEAM Smart Client Staging*, provides an introduction to AirBEAM Smart Staging and details for the fields of the graphical user interface of the application.
- Chapter 5, *AirBEAM CE Client Development Kit*, provides an introduction to the *AirBEAM CE Client Development Kit* and details for the contents of the kit.
- Appendix A, *AirBEAM Smart Client Logic Flows*, provides flows for AirBEAM Smart Client boot logic, package synchronization logic, and the Staging Client logic.

Notational Conventions

The following conventions are used in this document:

- A “mobile computer” refers to any Symbol device or terminal, that supports AirBEAM.
- “User” refers to anyone using the AirBEAM Smart application.
- *Italics* are used to highlight the following:
  - chapters and sections in this and related documents
  - dialog box, window and screen names
  - drop-down list and list box names
  - checkbox and radio button names
- **Bold** text is used to highlight the following:
  - key names on a keypad
  - button names on a screen
- Bullets (•) indicate:
  - action items
  - lists of alternatives
  - lists of required steps that are not necessarily sequential
- Sequential lists (e.g., those that describe step-by-step procedures) appear as numbered lists.

Related Documents

- *AirBEAM Package Builder Product Reference Guide*, p/n 72E-55769-xx.
- *Product Reference Guide* for your mobile computer, available at http://www.symbol.com/manuals.
- *AirBEAM CE Client Development Kit*, available for download from http://devzone.symbol.com/.

Service Information

If you have a problem with your equipment, contact the *Symbol Support Center* for your region. See page ix for contact information. Before calling, have the model number, serial number, and several of your bar code symbols at hand.

Call the Support Center from a phone near the scanning equipment so that the service person can try to talk you through your problem. If the equipment is found to be working properly and the problem is symbol readability, the Support Center will request samples of your bar codes for analysis at our plant.

If your problem cannot be solved over the phone, you may need to return your equipment for servicing. If that is necessary, you will be given specific directions.

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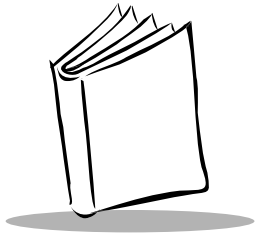


Chapter 1
AirBEAM Smart

Introduction

AirBEAM Smart Client is part of Symbol's AirBEAM suite, which also includes AirBEAM Safe and AirBEAM Manager. The AirBEAM Smart Client system uses the network accessible host server to store software files that are to be downloaded to the mobile computers. The AirBEAM Smart Client provides the mobile computers with the "smarts" to request software from the host. It allows them to request, download and install software, as well as to upload files and status data. The mobile computers are configured with the server access information, the names of the packages to be downloaded and other controlling parameters.

The AirBEAM Smart Client uses the industry standard FTP or TFTP file transfer protocols to check the host system for updates, and if necessary, to transfer updated software. File download and upload can be accomplished in a single communication session. The ability to transfer software over a radio network can reduce the logistical efforts of client software management.

Note: *Most often, AirBEAM Smart Client is used with wireless networks, but any TCP/IP connection can be used.*

Version Synchronization

Version synchronization is the process used to update a mobile computer's software packages that are loaded from a host onto the mobile computer. A package is simply a collection of files that are loaded together, for a specific function.

The mobile computers use an executable module to check for, and if appropriate, load packages from the host system. Each package is defined by a package definition file, which is also stored on the host. The version synchronization logic checks the host's version of the package that is to be loaded to a mobile computer and downloads the package only if it has been updated. For a more detailed logic flow, see *Package Synchronization Logic* on page A-3.

Refer to the *AirBEAM Package Builder Product Reference Guide* for more information on building packages.

AirBEAM Smart Client License Installation

The AirBEAM Smart Client is a licensed software product. The Client's version synchronization functionality is enabled through a license key file that is stored on the mobile computer. The license key file contains a unique key and a customer specific banner that is displayed when the client version synchronization logic is invoked.

The license key file can either be included in a custom application partition or can be copied into the mobile computer using ActiveSync.

Custom Application Partition

Including a license key file in the custom application partition causes the installed Client to be licensed and fully functional. In order to include the file in the custom application partition:

1. Obtain an AirBEAM license file. A license file will be provided when AirBEAM Smart Client is purchased. Contact your Symbol Sales Representative for more information.
2. Use the TCM utility to open the appropriate TCM script file. The TCM utility and script files are available in the development kit (see Chapter 5, *AirBEAM CE Client Development Kit* for detailed information).
3. Use the *File Explorer* window in the TCM utility to add the airbeam.key file to the \Application folder.
4. Build a new \Application partition HEX image.
5. Load the new HEX image onto your mobile computer. Refer to the mobile computer's *Product Reference Guide* for specific instructions.

Using ActiveSync

1. Establish an ActiveSync connection between the host computer and the mobile computer. Refer to your mobile computer's *Product Reference Guide* for instructions.
2. In ActiveSync, click *Explore*. Windows Explorer opens the *Mobile Device* window.
3. Open another Windows Explorer window and browse to the license key file.
4. Right-click the file and click *Copy*. Place the cursor in the Application folder in the *Mobile Device* window, right-click, and click *Paste*.

Mobile Computer Support

The AirBEAM Smart Client is supported on most mobile computers and is integrated into the manufacturing build of several mobile computers and can be installed on mobile computers that do not have it integrated in the build. The following table lists the mobile computers that support AirBEAM and indicates whether the mobile computer has the Client integrated into the OS.

Table 1-1. Mobile Computers that Support AirBEAM

Mobile Computer	OS Integration
MC9000 Series	Integrated in all OS versions
MK 1100	Integrated in all OS versions
MK 2000	Integrated in all OS versions
PDT 7200 (CE 2.11)	Not integrated
PDT 7200 (CE 3.0)	Not integrated
PDT 7500 (CE 2.11)	Not integrated
PDT 7500 (CE 3.0)	Not integrated
PDT 8000	Integrated in all OS versions
PDT 8100	Integrated in Service Pack (SP) 2 and later
PDT 8100 with Intel XScale™ technology	Integrated in all OS versions
PPT 2700	Not integrated

Table 1-1. Mobile Computers that Support AirBEAM (Continued)

Mobile Computer	OS Integration
PPT 2800	Integrated in SP2 and later
PPT 8800	Integrated in all OS versions
VRC 7900	Integrated in all OS versions
VRC 8900	Integrated in all OS versions

Note: *There are two versions of the AirBEAM Smart Client, one for OS versions prior to SP2 and one for SP2 and later OS versions. The Client for OS versions prior to SP2 is installed on the \Application FLASH partition. The Client for SPr or later OS versions is integrated into the \Platform FLASH partition. Both versions of the AirBEAM Smart Client (pre-SP2, and SP2 and later) are maintained. Ensure that you se the appropriate version of the AirBEAM Smart Client to install or update the AirBEAM Smart Client on a PPT 2800 and PDT 8100.*

AirBEAM Smart Client Installation

This section describes the steps to install the AirBEAM Smart Client onto a mobile computer that does not have it already integrated. The required files can be obtained from the development kit (see Chapter 5, *AirBEAM CE Client Development Kit* for detailed information).

The method required to install the Client varies by mobile computer type. The following table lists the methods available for the supported mobile computers. Detailed instructions for each method can be found in the mobile computer's *Product Reference Guide*.

Note: *For mobile computers not included in this table, AirBEAM Smart Client is integrated into the manufacturing build of the mobile computer.*

Table 1-2. Installing the AirBEAM Smart Client

Mobile Computer	Methods	
	ActiveSync (to copy files)	**TCM (to build and download custom \Platform)**
PDT 7200	✓	✓
PDT 7500	✓	✓
PDT 8100 (Pocket PC) PDT 8100 (Pocket PC 2002 prior to SP2)	✓	✓
PPT 2700	✓	✓
PPT 2800 (Pocket PC) PPT 2800 (Pocket PC 2002 prior to SP2)	✓	✓

Client Components Directory Location

The following tables specify the location of the components for the Clients that are installed on the mobile computer by the user.

PDT 7500 and PDT 7200

Table 1-3. Client Components Directory Location

File	CE Directory
ab.exe	\Application\Airbeam
abclient.exe	\Application\Airbeam
cad.dll[1]	\Application\System\Bin
abboot.exe	\Application\Airbeam
airbeam.reg[2]	\Application\User\Regs
airbeam.key[3]	\Application

[1]Cad.dll supports reboot.

[2]The AirBEAM Client Development Kit contains a default airbeam.reg file which can be edited to customize the configuration.

[3]The airbeam.key file is an optional file that contains a customer-specific AirBEAM Smart Client license. The license key is provided upon purchase of an AirBEAM Smart license(s).

PDT 8100 and PPT 2800 (Pocket PC and Pocket PC 2002 prior to SP2)

Table 1-4. Client Components Directory Location

File	CE Directory
ab.exe	\Application\Airbeam
abclient.exe	\Application\Airbeam
cad.dll[1]	\Application
abboot.exe	\Application\Airbeam
airbeam.lnk	\Application\Airbeam
airbeam.cpy	\Application
airbeam.reg[2]	\Application
airbeam.key[3]	\Application

[1]Cad.dll supports reboot.

[2]The AirBEAM Client Development Kit contains a default airbeam.reg file which can be edited to customize the configuration.

[3]The airbeam.key file is an optional file that contains a customer-specific AirBEAM Smart Client license. The license key is provided upon purchase of an AirBEAM Smart license(s).

PPT 2700

Table 1-5. Client Components Directory Location

File	CE Directory
ab.exe	\Application\Airbeam
abclient.exe	\Application\Airbeam
abboot.exe	\Application\Airbeam
airbeam.lnk	\Application\Airbeam
airbeam.cpy	\Application

Table 1-5. Client Components Directory Location (Continued)

File	CE Directory
airbeam.reg[1]	\Application
airbeam.key[2]	\Application
[1]The AirBEAM Client Development Kit contains a default airbeam.reg file which can be edited to customize the configuration. [2]The airbeam.key file is an optional file that contains a customer-specific AirBEAM Smart Client license. The license key is provided upon purchase of an AirBEAM Smart license(s).	

Updating the AirBEAM Client

This section describes how to update the AirBEAM Smart Client on a mobile computer. The required files can be obtained from the development kit (see Chapter 5, *AirBEAM CE Client Development Kit* for detailed information).

There are two methods for updating the Client:

- Use the existing Client to download the AirBEAM update package. The AirBEAM update package is a pre-built package that is included in the Packages\ sub-directory of the development kit. This package updates the various components of the Client.

  OR

- Re-install the Client. The table below lists the methods for reinstalling AirBEAM on each mobile computer:

Table 1-6. Updating the AirBEAM Smart Client

Mobile Computer	Methods			
	FTP (to copy files)	**ActiveSync (to copy files)**	**TCM (to build and download custom \Platform)**	**TCM (to build and download custom \Application)**
MC9000 Series		✓	✓	
MK 1100	✓	✓	✓	
MK 2000	✓	✓	✓	
PDT 7200		✓		✓
PDT 7500		✓		✓
PDT 8000		✓	✓	
PDT 8100 (Pocket PC 2002 prior to SP2)				✓
PDT 8100 (Pocket PC 2002 SP2 or later)		✓	✓	
PPT 2700		✓		✓

Table 1-6. Updating the AirBEAM Smart Client (Continued)

Mobile Computer	Methods			
	FTP (to copy files)	**ActiveSync (to copy files)**	**TCM (to build and download custom \Platform)**	**TCM (to build and download custom \Application)**
PPT 2800 (Pocket PC 2002 prior to SP2)				✓
PPT 2800 (Pocket PC 2002 SP2 or later)		✓	✓	
PPT 8800		✓	✓	
VRC 7900		✓		
VRC 8900		✓		

Client Components Directory Location

The following tables specify the location of the components for the Clients that are integrated into the manufacturing build of the mobile computer.

MC9000 Series, MK 1100, MK 2000, PDT 8000, PDT 8100 (Pocket PC 2002 SP2 and later), PPT 2800 (Pocket PC 2002 SP2 and later), PPT 8800

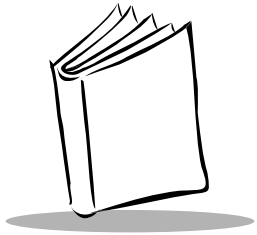
Table 1-7. Client Components Directory Location

File	CE Directory
abboot.exe	\Platform\Airbeam
astart.exe	\Platform\Airbeam
abclient.exe	\Platform\Airbeam
airbeam.lnk	\Platform\Airbeam
abstage.lnk	\Platform\Airbeam
default.reg	\Platform
airbeam.cpy	\Platform
airbeam.reg	\Platform

VRC 7900 and VRC 8900

Table 1-8. Client Components Directory Location

File	CE Directory
ab.exe	\FlashFx\Airbeam
abclient.exe	\FlashFx\Airbeam
abboot.exe	\FlashFx\CopyToRam\Startup
airbeam.lnk	\FlashFx\CopyToRam\System\Programs
airbeam.reg	\FlashFx\CopyToRam\Startup



Chapter 2
AirBEAM Smart Client Configuration

Introduction

The AirBEAM Smart Client must be configured with server access information, the names of the packages to download and other controlling parameters. The Client can be configured using one or more of the following methods:

- using the graphical user interface
- creating a registry file
- requesting a BOOTP/DHCP server response.

Graphical User Interface Configuration

1. Tap *Start* - *Programs*.
2. Select the *AirBEAM Client* icon. The main screen appears. This screen allows access to the main menu selections.

3. Tap *File - Configure*. The configuration dialog box appears.

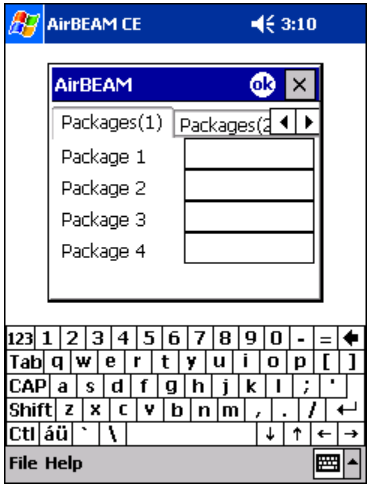
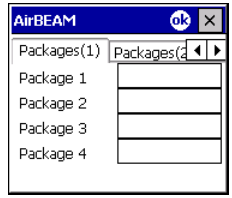


Figure 2-1. Configuration Dialog Box

The configuration dialog box is used to view and edit the Client configurations. This dialog box has six tabs that you can modify - Packages(1), Packages(2), Server, Misc(1), Misc(2) and Misc(3).

Packages(1) Tab

Use this tab to specify the package name of the first four of eight packages that are to be loaded during the AirBEAM synchronization process. Ensure that the specified package name corresponds to a package that is available on the specified package server.

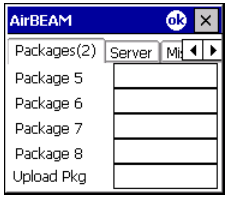


Note: *Do not include the .apd extension in the package name. The Client automatically appends a .apd extension before requesting the package definition file from the server.*

Table 2-1. Packages(1) Tab Fields

Field	Description
Package 1	Use this optional edit control to specify the first package name that is to be loaded during the AirBEAM synchronization process. If used, ensure that the specified package name corresponds to a package that is available on the specified package server.
Package 2	Use this optional edit control to specify the second package name that is to be loaded during the AirBEAM synchronization process. If used, ensure that the specified package name corresponds to a package that is available on the specified package server.
Package 3	Use this optional edit control to specify the third package name that is to be loaded during the AirBEAM synchronization process. If used, ensure that the specified package name corresponds to a package that is available on the specified package server.
Package 4	Use this optional edit control to specify the fourth package name that is to be loaded during the AirBEAM synchronization process. If used, ensure that the specified package name corresponds to a package that is available on the specified package server.

Packages(2) Tab



Use this tab to specify the package name of the last four of eight packages that are to be loaded during the AirBEAM synchronization process. It is also used to specify the name of the package that is to be uploaded during the AirBEAM synchronization process. Ensure that the specified package name corresponds to a package that is available on the specified package server.

Note: *Do not include the .apd extension in the package name. The Client automatically appends a .apd extension before requesting the package definition file from the server.*

Table 2-2. Packages(2) Tab Fields

Field	Description
Package 5	Use this optional edit control to specify the fifth package name that is to be loaded during the AirBEAM synchronization process. If used, ensure that the specified package name corresponds to a package that is available on the specified package server.
Package 6	Use this optional edit control to specify the sixth package name that is to be loaded during the AirBEAM synchronization process. If used, ensure that the specified package name corresponds to a package that is available on the specified package server.
Package 7	Use this optional edit control to specify the seventh package name that is to be loaded during the AirBEAM synchronization process. If used, ensure that the specified package name corresponds to a package that is available on the specified package server.
Package 8	Use this optional edit control to specify the eighth package name that is to be loaded during the AirBEAM synchronization process. If used, ensure that the specified package name corresponds to a package that is available on the specified package server.
Upload Pkg	Use this optional edit control to specify the package name of a package that is to be processed for “upload files” during the AirBEAM synchronization process. If used, ensure that the specified package name corresponds to a package that is available on the specified package server.

Server Tab

Use this tab to specify the configurations of the server to which the Client connects during the package synchronization process.

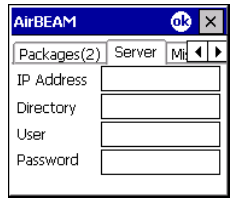


Table 2-3. Server Tab Fields

Field	Description
IP Address	Use this optional edit control to specify the IP address of the server to which the Client connects during the package synchronization process. The IP address may be a host name or a dot notation format. A leading dot (".") indicates that the IP address of the server is derived from the IP address of the mobile computer. This technique can be used if the FTP server and the mobile computer are on the same subnet. This technique also requires that DHCP is used to assign the Client IP address. In this mode, the specified octets are replaced at the end of the Client's IP address to derive the server's IP address. The network subnet mask is applied before the specified octets are applied. If the server's IP address is being returned in the DHCP response (see *Use DHCP server* on page 2-8), do not specify this edit control.
Directory	Use this optional edit control to specify the directory on the server that contains AirBEAM package definition files. All AirBEAM package definition files are retrieved from this directory during the package synchronization process. **Note:** A common error may occur if the specified Package Directory is not relative to the FTP server's root.
User	Use this optional edit control to specify the FTP user name used during the log-in phase of the package synchronization process.
Password	Use this optional edit control to specify the FTP password that corresponds to the FTP user specified in the User edit control. The specified password used during the login phase of the package synchronization process.

Misc(1) Tab

Use this tab to configure various miscellaneous features.

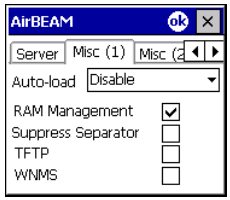


Table 2-4. Misc(1) Tab Fields

Field	Description
Auto-load	Use this drop-down menu to specify whether (and how) the Client is to be invoked automatically when the mobile computer is rebooted. The selections are: Disable: the Client is not invoked automatically during the boot sequence. Interactive: the Client is invoked automatically during the boot sequence. The package synchronization process is started automatically. The *Synchronization Dialog* box is displayed, and the user is required to press the **OK** button when the process is complete. Non-interactive: the Client is invoked automatically during the boot sequence. The package synchronization process is started automatically. The *Synchronization Dialog* box is displayed, but the user is not required to press the **OK** button when the process is complete. The Synchronization Dialog box terminates automatically. **Note**: If an error occurs, the user is required to press the **OK** button. Background: the Client is invoked automatically during the boot sequence. The package synchronization process is started automatically. Nothing is displayed while the synchronization process is occurring.
RAM Management	Use this check box control to specify whether the automatic RAM management is enabled during the package synchronization process. If enabled, RAM management logic is invoked when there is not enough free disk space to download a package. The RAM management logic attempts to remove any discardable AirBEAM packages resident on the Client. Refer to the detailed discussion of the RAM Management feature in the *AirBEAM Package Builder Product Reference Guide*.

Table 2-4. Misc(1) Tab Fields (Continued)

Field	Description
Suppress Separator	Use this check box control to specify whether the automatic insertion of a file path separator character is to be suppressed when the Client generates server package definition file names. When enabled, the parameter also disables the appending of .apd to the package. This feature is useful for AS/400 systems, in which the file path separator character is a period. When this feature is enabled, the server directory (Directory) and package name (Package 1 - Package 8, and Upload Pkg) are appended “as is” when building the name for the server package definition file. When this feature is disabled, a standard file path separator is used to separate the server directory (Directory) and package name (Package 1 - Package 8, and Upload Pkg) when building the name for the server package definition file. In addition, a .apd extension is appended automatically.
TFTP	Use this check box control to specify whether the TFTP protocol is to be used to download files. By default, the Client uses the FTP protocol.
WNMS	Use this check box control to specify whether the Client uploads an information file to AirBEAM Manager at the end of each version synchronization.

Misc(2) Tab

Use this tab to configure various miscellaneous features.

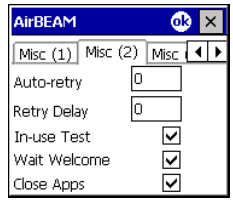


Table 2-5. Misc(2) Tab Fields

Field	Description
Auto-retry	Use this edit control to specify whether the Client automatically retries if there is a failure during the synchronization process. If the Auto-retry feature is enabled the Client displays a popup dialog indicating that a retry is going to be attempted. The popup dialog is displayed for the number of seconds specified in the Retry Delay parameter. The auto-retry feature is not supported in background mode. Valid values are: - 1: the Client automatically retries indefinitely. 0: the Client does not automatically retry. >0: the Client automatically retries up to the number of times specified.

Table 2-5. Misc(2) Tab Fields (Continued)

Field	Description
Retry Delay	Use this edit control to specify the amount of time, in seconds, that the Client delays before automatically retrying after a synchronization failure.
In-use Test	Use this check box control to specify whether the Client tests to determine if a file is in-use before downloading. If the In-use Test feature is enabled the Client downloads a temporary copy of any files that are in-use. If any temporary in-use files are downloaded the Client automatically resets the Client to complete the copy of the in-use files. If the In-use Test feature is disabled the synchronization process fails (error -813) if any download files are in-use.
Wait Welcome (CE 3.0 only)	Use this check box control to specify whether the Client waits for the CE 3.0 WELCOME screens to be completed before automatically launching the synchronization process after a reset.
Close Apps	Use this check box control to specify whether the Client automatically attempts to close non-system applications prior to resetting the mobile computer. If enabled the Client sends a WM_CLOSE message to all non-system applications before resetting the mobile computer. This feature offers applications the opportunity to prepare (i.e. close open files) for the pending reset.

Misc(3) Tab

Use this tab to configure various miscellaneous features.

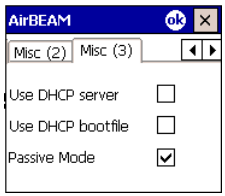


Table 2-6. Misc(3) Tab Fields

Field	Description
Use DHCP server	Use this check box control to specify whether the Client uses the DHCP response option 66 to specify the IP address of the FTP/TFTP server. If enabled, special RF network registry settings are required to force the DHCP server to return the “TFTP server name” field (option 66). The special RF network registry settings are included, but commented out, in the radio network registry initialization files that are included in the development kit.
Use DHCP bootfile	Use this check box control to specify whether the Client uses the DHCP response option 67 to specify the Package Directory and Package 1 Name. If enabled, special RF network registry settings are required to force the DHCP server to return the “Bootfile name” field (option 67). The special RF network registry settings are included, but commented out, in the radio network registry initialization files that are included in the development kit.

Table 2-6. Misc(3) Tab Fields (Continued)

Field	Description
Passive Mode	Use this checkbox to specify whether the Client uses passive mode FTP. This setting is ignored if TFTP protocol is used. Passive mode prompt was added in version 1.39.

Registry File Configuration

The Client configuration can be initialized by creating a registry initialization file. This file, if used, is automatically loaded by the Symbol CE operating system when a hard reset is performed on the mobile computer (refer to the mobile computer's *Product Reference Guide* for detailed instructions).

Place the registry initialization file, which has a .reg file extension, in a directory that is appropriate for registry initialization files. This directory varies for the different mobile computers. The table below outlines the appropriate directory for each mobile computer:

Table 2-7. Directory for registry initialization file

Mobile Computer	Directory
PPT2800/PDT8000/PDT8100/ MC9000/PPT8800/MK1100/ MK2000	\Application
PDT7500/PDT7200	\Application\System\Regs
VRC7900/VRC8900	\FlashFx\CopytoRam\Startup

For a sample registry file, see *Sample Registry File* on page 2-21.

Registry Entries

All AirBEAM registry entries are string values (RG_SZ) and are stored in HKEY_LOCAL_MACHINE\SOFTWARE\AIRBEAM. The AirBEAM registry entries are described in the following sections.

PACKAGE

Specifies the package name of the first of eight packages that are to be loaded during the AirBEAM synchronization process.

Value can be left blank.

PACKAGE2 - PACKAGE8

Specifies the package name of the second through eighth of eight packages that are to be loaded during the AirBEAM synchronization process.

Value can be left blank.

PUTPACKAGE

Specifies the package name of a package that is to be processed for upload files.

Value can be left blank.

SERVERIP

Specifies the IP address of the server to which the Client connects during the package synchronization process. The IP address may be a host name or a dot notation format.

A DNS lookup is required if a host name is used. It is necessary to specify a DNS server for the Client. Generally a DNS server is configured as part of the DHCP process.

PACKAGEDIR

Specifies the directory on the server that contains AirBEAM package definition files. All AirBEAM package definition files are retrieved from this directory during the package synchronization process.

FTPUSER

Specifies the FTP user name that is used during the log-in phase of the package synchronization process.

This parameter is required for FTP, but can be left blank for TFTP.

FTPPASSWORD

Specifies the FTP password that corresponds to the FTP user specified in the FTPUSER parameter. The specified password is used during the login phase of package synchronization process.

This parameter is required for FTP, but can be left blank for TFTP.

AUTOLOAD

Specifies whether (and how) the Client is to be invoked automatically when the Client mobile computer is rebooted.

Valid values are:

- “0”: The Client is not invoked automatically during the boot sequence.
- “1”: The Client is invoked automatically during the boot sequence in the Interactive mode. In this mode, the package synchronization process is started automatically. The Synchronize Dialog is displayed, and the user is required to press the OK button when the synchronization process is complete.
- “2”: The Client is invoked automatically during the boot sequence in the Noninteractive mode. In this mode, the package synchronization process is started automatically. The Synchronize Dialog is displayed, but the user is NOT required to press the OK button when the synchronization process is complete. The Synchronize Dialog terminates automatically.
- “3”: The Client is automatically invoked during the boot sequence in Background mode. In this mode, the package synchronization process is started automatically. Nothing is displayed while the synchronization process is occurring.
  The auto-retry feature is not supported in background mode.

RAMMGT

Specifies whether the automatic RAM management is enabled during the package synchronization process. If enabled, RAM management logic is invoked when there is not enough free disk space to download a package. The RAM management logic attempts to remove any discardable AirBEAM packages resident on the Client. Refer to the detailed discussion of the RAM Management feature in the *AirBEAM Package Builder Product Reference Guide*.

Valid values are:

- “0”: RAM management logic is disabled.
- “1”: RAM management logic is enabled.

SUPPRESSSEP

Specifies whether the automatic insertion of a file path separator character is to be suppressed when the Client generates server package definition file names. When enabled, the parameter also disables the appending of .apd to the package. This feature is useful for AS/400 systems, in which the file path separator character is a period. When this feature is enabled, the server directory (Directory) and package name (Package 1, Package 2, Package 3, and Package 4) are appended “as is” when building the name for the server package definition file. When this feature is disabled, a standard file path separator is used to separate the server directory (Directory) and package name (Package

1, Package 2, Package 3, and Package 4) when building the name for the server package definition file. In addition, a .apd extension is appended automatically.

Valid values are:

- “0”: Suppress separator logic is disabled. This value is appropriate for most systems.
- “1”: Suppress separator logic is enabled. This value is usually appropriate for AS/400 systems, as described above.

TFTP

Specifies whether the TFTP protocol is to be used to download files.

Note that upload package processing is disabled if TFTP used.

Valid values are:

- “0”: TFTP protocol is disabled. FTP protocol is used.
- “1”: TFTP protocol is enabled.

WNMS

Specifies whether the Client uploads a WNMS information file at the end of each version synchronization.

Valid values are:

- “0”: WNMS file upload is disabled.
- “1”: WNMS file upload is enabled.

INUSETEST

Specifies whether the Client performs a deferred copy of files that are in use when a download is attempted. If enabled, the Client makes a temporary copy of any download files that cannot be downloaded because the file is already in use on the Client. The Client automatically initiates a warm reset if temporary copies exist. The AirBEAM boot logic completes the copy of any temporary files.

Valid values are:

- “0”: In use checking is disabled.
- “1”: In use checking is enabled.

AUTORETRY

Specifies whether the Client automatically retries the synchronization process if an error occurs. The value specifies the maximum number of times that the Client is automatically retried. If an error occurs the Client displays a dialog and wait for the number of seconds specified in the RETRYDELAY parameter.

The auto-retry feature is not supported in background mode.

Valid values are:

- “-1”: Retry indefinitely.
- “0”: Automatic retry feature is disabled.
- “1” - “65535”: The Client attempts up to the specified number of times.

RETRYDELAY

Specifies the amount of time in seconds that the Client delays before automatically retrying the synchronization process. The Client displays a dialog and wait for the number of seconds specified. The dialog displays an ABORT and RETRY button.

Valid values are:

- “1” - “65535”: The Client delays specified number of seconds before attempting to retry synchronization. A value of zero retries once.

WAITWELCOME

Specifies whether the CE 3.0 Client waits for the CE 3.0 WELCOME screens to complete before allowing the AirBEAM synchronization to be launched after a cold reset.

Valid values are:

- “0”: The Client does not wait for WELCOME screens to complete before launching synchronization process.
- “1”: The Client waits for WELCOME screens to complete before launching synchronization process.

CLOSEAPPS

Specifies whether the Client attempts to close, via a WM_CLOSE message, all non-system applications before initiating an automatic warm reset. The Client initiates an automatic warm reset if it is specified in a successfully loaded package. The Client also initiates a warm reset if there are any deferred copies of in-use files during a package download.

Valid values are:

- "0": The Client does not issue a WM_CLOSE message to all non-system applications prior to automatically performing a warm reset.
- "1": The Client does issue a WM_CLOSE message to all non-system applications prior to automatically performing a warm reset.

IGNORESERVER

Specifies whether the Client uses the DHCP response 66 to determine the IP address of the FTP/TFP server.

Valid values are:

- "0": The Client uses the DHCP option 66 value to determine the IP address of the FTP/TFP server. The SERVERIP setting is ignored.
- "1": The Client does not use the DHCP option 66 to determine the server IP address.

IGNOREPACKAGE

Specifies whether the Client uses the DHCP response 67 to determine the server package directory and the name of the first package to be loaded.

Valid values are:

- "0": The Client uses the DHCP option 67 value to determine the package directory and the name of the first package. The PACKAGEDIR and PACKAGE settings are ignored.
  The DHCP option 67 field is configured to return the full path to the package definition file (.apd) of the first AirBEAM package that is to be loaded. The Client derives the package directory and package name from the path specified.
- "1": The Client does not use the DHCP option 67 to determine the server IP address

PASSIVEMODE

Specifies whether the Client uses passive mode FTP. Passive mode FTP is generally not required, but it may be required to get through some firewalls.

Valid values are:

- "0": The Client uses normal mode (not passive mode) FTP.
- "1": The Client uses passive mode FTP.

SCHEDULEMODE

Specifies whether, and if so how, the Client automatically checks for package updates in the background. This feature is not supported on all mobile computers. See *Background Package Update Check Logic* on page A-5 for a detailed description of this feature.

Valid values are:

- “0”: The Client does not automatically check for package updates in the background.
- “1”: The Client automatically checks for package updates in the background a specific time after midnight (specified in SCHEDULETIME) everyday.
- “2”: The Client automatically checks for package updates in the background at a specific time interval (specified in SCHEDULETIME).

Enable the auto-load feature (AUTOLOAD values of 1, 2, or 3) for the background package checking logic to be invoked.

The background package checking logic uses the mobile computer's clock to determine when to check for package updates. Set the mobile computer's clock for accurate operation in specific time mode (1).

SCHEDULETIME

Specifies when the Client automatically checks for package updates in the background, if the background package checking logic is enabled (see SCHEDULEMODE).

Valid values are 0-1440 (minutes).

When the SCHEDULEMODE is specific time mode (1), the SCHEDULETIME value indicates the number of minutes past midnight to check for package updates. For example: 9:00 AM = 540 (9*60) or 7:00 PM = 1140 (19*60).

When the SCHEDULEMODE is interval time mode (2), the SCHEDULETIME value indicates that the check for packages occurs every n minutes. For example: Every 15 minutes = 15 or every 6 hours = 360 (6*60).

SCHEDULEPROMPT

Specifies whether the Client automatically downloads AirBEAM packages when it discovers there are updates available, if the background package checking logic is enabled (see SCHEDULEMODE).

If automatic updates are not enabled then a dialog is presented to the end-user that indicates updates are available.

Valid values are:

- "0": The Client automatically downloads packages as soon as the background package check logic determines there are updates.
- "1": The Client does not automatically download packages when the background package check logic determines there are updates. The Client displays a message dialog when the background package check logic determines there are package updates available.
- "2": A dialog is presented to the end-user that indicates updates are available. The end-user can select whether to download the updates or skip the download process.
- "3": A dialog is presented to the end-user that indicates updates are available. The end-user can select whether to download the updates or skip the download process. An additional confirmation dialog is presented, if the end-user indicates the updates should be downloaded.

Enable the auto-load feature (AUTOLOAD values of 1, 2, or 3) for the background package checking logic to be invoked.

SCHEDULELOADMODE

Note: *Available in AirBEAM Smart Client version 1.37 and later, only.*

Specifies the load mode that is to be used during schedule mode operation.

Valid values are:

- "0": The load mode is the same as the setting of AUTOLOAD (see page 2-10).
- "1": The Client is invoked automatically during the boot sequence in the Interactive mode. In this mode, the package synchronization process is started automatically. The Synchronize Dialog is displayed, and the user is required to press the OK button when the synchronization process is complete.
- "2": The Client is invoked automatically during the boot sequence in the Noninteractive mode. In this mode, the package synchronization process is started automatically. The Synchronize Dialog is displayed, but the user is NOT required to press the OK button when the synchronization process is complete. The Synchronize Dialog terminates automatically.
- "3": The Client is automatically invoked during the boot sequence in Background mode. In this mode, the package synchronization process is started automatically.

Nothing is displayed while the synchronization process is occurring.
The auto-retry feature is not supported in background mode.

AUTOLOADNOPROMPT

Note: *Available in AirBEAM Smart Client version 1.38e and later, only.*

Specifies whether the AirBEAM client will prompt OK/Retry even if the session fails in interactive mode (see AUTOLOAD). This feature can be useful on systems that generally do not have an end-user present during the update session (i.e. MK1100 and MK2000). With this feature the synchronize dialog will display indicating the update progress, but an end-user will not need to respond to the OK/Retry dialog in the event of an error.

Valid values are:

- "0": The AirBEAM client prompts OK/Retry if the update session fails in interactive mode (see AUTOLOAD).
- "1": The AirBEAM client does not prompt OK/Retry even if the update session fails in interactive mode (see AUTOLOAD). If the session fails, including any automatic retries, the OK/Retry prompt is bypassed and the update session terminates.

ASCENDINGONLY

Forces the Client to only download versions from the server that are greater than the version currently on the Client.

Valid values are:

- "0": Off - Allows the Client to download any version from the server that is different than what is currently on the Client.
- "1": On - Forces the Client to only download versions from the server that are greater than the version currently on the Client.

The Client does a string compare on the versions. The compare is a byte for byte compare from left to right. The first byte that is different in the two strings is compared to see which is greater. The user is responsible for creating version that are greater on the FTP server for downloads to occur. The table below illustrates a few examples:

Table 2-8. Examples of ASCENDINGONLY Registry Entry

Server Version	Client Version	Result when value = 0	Result when value = 1
2.1	2.0	Client will download.	Client will download.

Table 2-8. Examples of ASCENDINGONLY Registry Entry

Server Version	Client Version	Result when value = 0	Result when value = 1
1.2b	1.2a	Client will download.	Client will download.
1.4F	1.4E	Client will download.	Client will not download.
Version 2.0	Version 1.0	Client will download.	Client will download.

LAUNCHONFAIL

Note: *Available in AirBEAM Smart Client version 1.39 and later, only.*

Specifies whether the AirBEAM client attempts to launch a downloaded application, even if the AirBEAM session fails.

Valid values are:

- "0": The AirBEAM client will not automatically launch an application if the AirBEAM session fails.
- "1": The AirBEAM client will attempt to automatically launch an application, even if the AirBEAM session fails.

WNMSONTEST

Note: *Available in AirBEAM Smart Client version 1.42 and later, only.*

Specifies whether to enable the upload of the WNMS information file during test mode. Test mode is used during the schedule mode when the SCHEDULEPROMPT setting is set to force an end-user prompt.

Valid values are:

- "0": The upload of the WNMS information file is disabled during test mode.
- "1": The upload of the WNMS information file is enabled during test mode. The WNMS setting determines whether the WNMS information file is uploaded.

FORCETOPMOST

Note: *Available in AirBEAM Smart Client version 1.42 and later, only.*

Specifies whether the AirBEAM client dialog will stay-on-top.

Valid values are:

- “0”: The AirBEAM client will not stay on top if another application is activated.
- “1”: The AirBEAM client will stay on top, even if another application is activated.

NOREGFILE

Note: *Available in AirBEAM Smart Client version 1.42 and later, only.*

Specifies whether to disable the creation and maintenance of the airbeam.reg file.

Valid values are:

- “0”: The AirBEAM client will create (if needed) and maintain the airbeam.reg file.
- “1”: The AirBEAM client will not create or maintain the airbeam.reg file.

MAXNOPRESS

Note: *Available in AirBEAM Smart Client version 1.47 and later, only.*

Specifies the maximum number of times an end-user can decline an update discovered by the AirBEAM background schedule logic.

This setting is only meaningful if the AirBEAM background schedule logic is enabled (see *SCHEDULEMODE* on page 2-15) and if the SCHEDULEPROMPT setting is configured to present a confirmation dialog to the end-user.

A value of zero will allow the end-user to decline updates indefinitely.

NOPING

Note: *Available in AirBEAM Smart Client version 1.47 and later, only.*

Specifies whether the client should ping to determine whether the FTP server is accessible.

Valid values are:

- “0”: The AirBEAM client will ping the FTP server before initiating the synchronization process. Note that the AirBEAM client will only ping the FTP server

when the AirBEAM client is automatically launched (see *AUTOLOAD* on page 2-10).

- "1": The AirBEAM client will not ping the FTP server before initiating the synchronization process. If the NOPING feature is enabled then the AirBEAM client will simply delay approximately 10 seconds before attempting to connect to the FTP server. Note that the AirBEAM client will only delay prior to connecting to the FTP server when the AirBEAM client is automatically launched (see *AUTOLOAD* on page 2-10).

FTPPORT

Note: *Available in AirBEAM Smart Client version 1.54 and later, only.*

Specifies the number of the control port used by the FTP server.

A value of zero indicates that the default FTP control port number (21) should be used.

Sample Registry File

The following lines are an example of the contents of a valid registry initialization file for the Client configuration. Replace the *value* placeholder with a valid value for each parameter. Some parameters can be left blank (“”).

```
[HKEY_LOCAL_MACHINE\SOFTWARE\AIRBEAM]
"PACKAGE"="value"
"PACKAGE2"="value"
"PACKAGE3"="value"
"PACKAGE4"="value"
"PACKAGE5"="value"
"PACKAGE6"="value"
"PACKAGE7"="value"
"PACKAGE8"="value"
"PUTPACKAGE"="value"
"SERVERIP"="value"
"PACKAGEDIR"="value"
"FTPUSER"="value"
"FTPPASSWORD"="value"
"AUTOLOAD"="value"
"RAMMGT"="value"
"SUPPRESSSEP"="value"
"TFTP"="value"
"WNMS"="value"
"INUSETEST"="value"
"AUTORETRY"="value"
"RETRYDELAY"="value"
"WAITWELCOME"="value"
"CLOSEAPPS"="value"
"IGNORESERVER"="value"
"IGNOREPACKAGE"="value"
"PASSIVEMODE"=" value"
"SCHEDULEMODE"=" value"
"SCHEDULETIME"=" value"
"SCHEDULEPROMPT"=" value"
“SCHEDULELOADMODE”=”value”
“AUTOLOADNOPROMPT”=”value”
“LAUNCHONFAIL”=”value”
“WNMSONTEST”=”value”
“FORCETOPMOST”=”value”
“NOREGFILE”=”value”
“MAXNOPRESS”=”value”
“NOPING”=”value”
“FTPPORT”=”value”
```

BOOTP/DHCP Server Response Configuration

One or more AirBEAM Smart Client parameters can be initialized through the DHCP or BOOTP server. By correctly configuring the server, the DHCP or BOOTP server response can be setup to return information to the mobile computer that can be used to initialize the respective parameters.

The following Client configuration parameters can be initialized from a DHCP or BOOTP response:

- FTP or TFTP server IP address
- AirBEAM package directory on the server
- Name of the first AirBEAM package that is to be loaded.

The Client can be configured to process the relevant DHCP response fields, namely the *TFTP server name* (option 66) and the *Bootfile-name* (option 67), in the DHCP or BOOTP response.

Note: *This method is very useful since it can usually allow a common configuration to be used across multiple locations. For a customer that has several locations with individual FTP server addresses, the Client can be configured by a common image (registry file) and the FTP server address for each location can be configured separately by the local DHCP server.*

DHCP or BOOTP Server Configuration

The DHCP or BOOTP server is configured to return one or both of the following DHCP/ BOOTP response fields:

- TFTP Server-Name: This field can be used to specify the IP address of the FTP or TFTP server to which the Client connects.
- Bootfile-Name: This field can be used to specify the FTP or TFTP server's AirBEAM package directory and the first package that the Client loadS. If used by the Client, this field is used to specify the full path of the AirBEAM package definition file of the first AirBEAM package that is to be loaded. The Client parses the contents of the *Bootfile-Name* parameter to obtain the AirBEAM package directory and the name of the first AirBEAM package to be loaded.

Example:

AirBEAM package definition file:	myapp.apd
AirBEAM package directory:	/airbeam
Bootfile-Name	/airbeam/myapp.apd

For UNIX systems, BOOTP responses are generally configured in a file called *bootptab*.

For Windows and most UNIX systems, DHCP responses are configured using an administrative utility.

Client Configuration

The following steps describe the Client configuration required to process the DHCP or BOOTP response.

1. Enable DHCP or BOOTP on the Client.
2. Configure the Client to request DHCP options.
3. Enable processing for the appropriate DHCP or BOOTP response fields.

Enable DHCP or BOOTP on the Client

To enable DHCP on the Client:

1. For mobile computers running Pocket PC 2002
   a. Tap *Start* - *Settings* - *Connections* tab - *Network Adapters* icon.
   b. Select an adapter from the *Adapters installed:* list box.
   c. Tap **Properties**.
   d. Select the *Use server-assigned IP address* checkbox.
   e. Tap **ok**. A notification window appears.
   f. Tap **ok**.
   g. Tap **ok**.
2. For mobile computers running Windows Mobile 2003 Software for Pocket PCs and Microsoft WinCE .NET (including MC 9000, 11MB version)
   a. Tap the *Mobile Companion* icon on the task tray.

b. Tap *Find WLANs*. The Mobile Companion window appears.

Figure 2-2. Find WLANs Window

c. The mobile computer tries to locate Access Points (APs) in the area. When it locates a wireless LAN(s), the ESSID name displays in the WLAN Profile list.

d. Tap the ESSID name and then tap **Connect**.

e. The Mobile Companion *Mode* tab appears.

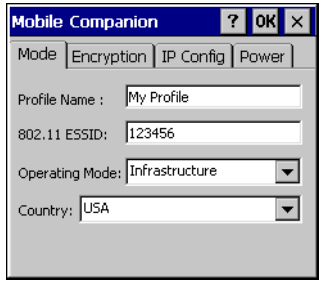


Figure 2-3. Mobile Companion - Mode Tab

f. Tap the *IP Config* tab.

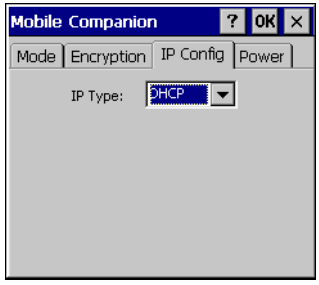


Figure 2-4. Mobile Companion - IP Config Tab (DHCP)

g. Select *DHCP* from the *IP Type* drop-down menu.
h. Tap **OK**.
i. Tap **OK**.

3. For MC 9000, 2MB version
   a. Double tap the *FH Settings* icon in the Demo window to launch the control panel applet.
   b. Tap the *IP Config* tab.

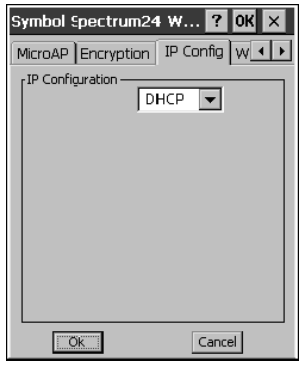


Figure 2-5. FH Settings - IP Config Tab

   c. Select *DHCP* from the drop-down menu.
   d. Tap **OK**.
   e. Tap **OK**.

Configure the Client to Request DHCP Options

Configuring the Client to request DHCP options 66 and/or 67 can only be accomplished by adding entries to the network registry settings. These additional registry entries are generally created using a .reg file. If a .reg file is already being used to initialize the radio and TCP/IP settings, the additional registry entries can be added to the same file.

Creating a New Registry File

1. Open any text editing application, such as Microsoft Notepad.
2. Create the content of the registry file. You may use the sample registry file included in the development kit as a base for your new file.
3. Once you have created the file, save it. You can give it any name you want.

Note: *When saving the file, ensure that you do not change the file type, i.e. ensure you are saving the file as a .reg file.*

4. Load the new file back on to the mobile computer. See *To load the file back on the mobile computer* on page 2-27.
5. Hard reset the mobile computer, so new registry settings can be merged. Refer to your mobile computer's *Product Reference Guide* for instructions.

Manually Updating the Existing Registry File

The additional required registry entries can be included in the same registry file used to initialize the radio and TCP/IP settings. If this file exists on your mobile computer, copy it from your mobile computer onto the host computer, make the necessary changes and load the new file back onto the mobile computer.

To copy the file from your mobile computer

1. Establish an ActiveSync connection between the host computer and the mobile computer. Refer to your mobile computer's *Product Reference Guide* for instructions.
2. In ActiveSync, click *Explore*. Windows Explorer opens the *Mobile Device* window for your mobile computer.
3. Navigate to the Platform folder and find the appropriate registry file.
4. Right-click the file and click *Copy*. Place the cursor in the desired folder on your host computer, right-click, and click *Paste*.

To make changes to the file

1. Open the registry file you downloaded above in any text editor application, such as Microsoft Notepad. You cannot double-click to open the file. It can only be opened through the application.
2. Add the following lines of text to the registry file:

```
[HKEY_LOCAL_MACHINE\Comm\RADIO\Parms\TcpIp\DhcpOptions]
@="1"
"1"=hex:00,00,00,00
"3"=hex:00,00,00,00
"6"=hex:00,00,00,00
"15"=hex:00,00,00,00
"44"=hex:00,00,00,00
"46"=hex:00,00,00,00
"47"=hex:00,00,00,00
```

"66"=hex:00,00,00,00
"67"=hex:00,00,00,00

Replace the value of ***RADIO*** in the registry key name with the appropriate value below, based on the radio type.

Table 2-9. Value of *RADIO* in Registry File

Mobile Computer	2MB FH radio	11 MB DS radio
PDT 7200/PDT 7500	SLACE1	SLA41ND41
PPT 2700	SLACE1	SLA41ND41
PPT 2800/PDT 8100/PDT 8000/PPT 8800/ MC9000 Series/MK 2000/MK 1100	SLACE1	NETWLAN1
VRC 7900/VRC 8900	SLACE1	SLA41ND41

3. Once all changes have been made, save the file. If you are using Microsoft Notepad, click *File* - *Save* to save it under the current name or click *File* - *Save As* to save it under a different name.

Note: *When saving the file, ensure that you do not change the file type, i.e. ensure you are saving the file as a .reg file.*

To load the file back on the mobile computer

1. Establish an ActiveSync connection between the host computer and the mobile computer. Refer to your mobile computer's *Product Reference Guide* for instructions.
2. In ActiveSync, click *Explore*. Windows Explorer opens the *Mobile Device* window for your mobile computer.
3. Open another Windows Explorer window and browse to the file that you want to copy on your mobile computer, i.e. the updated or new registry file you created.
4. Right-click the file and click *Copy*. Place the cursor in the Application folder in your *Mobile Device* window, right-click, and click *Paste*.
5. Hard reset the mobile computer, so new registry settings can be merged. Refer to your mobile computer's *Product Reference Guide* for instructions.

Enable Processing for DHCP or BOOTP Response Fields

You can enable processing for the appropriate DHCP or BOOTP response fields either through the graphical user interface or through the registry file.

Graphical User Interface

When using the graphical user interface, ensure the following two fields are enabled:

1. Select the *Use DHCP server* check box from the Misc(3) screen.
2. Select the *Use DHCP bootfile* check box from the Misc(3) screen.

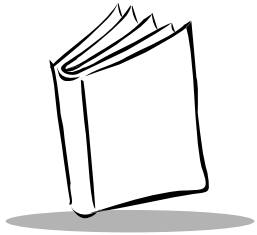
For detailed descriptions of these fields, see *Misc(3) Tab* on page 2-8.

Registry File

When creating a registry file, pre-configure the following entries with the specified options:

1. IGNORESERVER - make value equal to “0”
2. IGNOREPACKAGE - make value equal to “0”

For detailed descriptions of these registry entries see *IGNORESERVER* on page 2-14 and *IGNOREPACKAGE* on page 2-14.



Chapter 3
AirBEAM Smart Client Synchronization

Introduction

When the synchronization process is initiated, the AirBEAM Smart Client attempts to open an FTP session using the Client configuration. Once connected, the Client processes the specified packages. Packages are loaded depending on the specified value of the ASCENDINGONLY registry entry (see *ASCENDINGONLY* on page 2-17). Once the upload process is complete, the Client closes the FTP session with the server.

The AirBEAM Smart Client synchronization logic can be launched in one of five ways:

- Manual launch from CE shell
  The Client can be invoked from the CE shell by selecting the AirBEAM Smart Client executable.
- Auto-load during boot sequence
  The Client can be configured to be invoked automatically each time the mobile computer is rebooted. See *AUTOLOAD* on page 2-10 for a detailed description.
- Called from an application
  The Client can be invoked from another CE application using the CreateProcess() CE system call. When invoked from an application, command-line parameters can be passed to the Client. If used, command-line parameters override the Client registry configuration.
- Using an ethernet connection
  The Client can be launched through an Ethernet connection, using a Four-Slot Ethernet cradle.
- Using a serial TCP/IP connection
  The Client provides the ability to download packages over a TCP/IP connection.

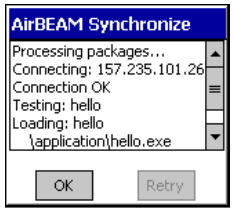
The Client runs over any TCP/IP connection, including a serial or modem connection.

Note: *A common error may occur if a downloaded "application" is not automatically launched after the synchronization process. To avoid this verify an appropriate executable was loaded as part of the package (.LNK or .EXE file) and that the executable has the same name as the package.*

Manual Launch

The Client can be invoked from the CE shell by selecting the AirBEAM Smart Client executable and then by using the main menu from the main AirBEAM screen, as follows:

1. Start the AirBEAM Smart Client:
   a. on mobile computers running PocketPC 2002, tap *Start - Programs - AirBEAM Client* icon.
   b. on the MC9000 Series mobile computer, tap *Start - AirBEAM Smart Client*.
2. From the main AirBEAM screen, tap *File - Synchronize*.
3. Once connected, the *AirBEAM Synchronize* screen appears.



   a. The Status List displays status messages that indicate the progress of the synchronization process. See page 3-5 for a list of messages and codes that display in this window.
   b. The **OK** button returns to the Main Menu. This button remains inactive until the synchronization process is complete.
   c. The **Retry** button restarts the synchronization process. This button is activated only if there is an error during the synchronization process.

Auto-load During Boot Sequence

The AirBEAM Smart Client can be configured to launch automatically using the *Misc(1)* tab in the configuration screen. When setting this screen, use the *Auto-load* drop-down menu to specify whether (and how) the Client is to be invoked automatically when the mobile computer is rebooted. See *Misc(1) Tab* on page 2-6 for the possible selections.

Call From an Application

The Client can be invoked from another CE application using the CreateProcess() CE system call. When invoked from an application, command-line parameters can be passed to the Client. If used, command-line parameters override the AirBEAM registry configuration.

Command Line Syntax

abclient.exe [-L<mode>] [-M] [-P<package name>] [-R] [-U<package name>] [-T] [-D<package name>]

where:

- "-L": Specifies the auto-load mode. Valid values for mode are:
  - "0": Synchronization is not automatically started.
  - "1": Synchronization is automatically started in interactive mode.
  - "2": Synchronization is automatically started in non-interactive mode.
  - "3": Synchronization is automatically started in background mode.
- "-M": Enables RAM management.
- "-P": Specifies a package to be loaded. This parameter can be specified up to four times.
- "-R": Disables the automatic reboot logic.
- "-U": Specifies a package to be processed for upload files.
- "-T": Specifies test mode. Client tests for package updates, but does not load packages.
- "-D": Specifies a package to be deleted.

Return Values

The following return values can be returned:

- < 0: An error has occurred. Refer to the error code list for a description of specific error.
- 0: Package(s) successfully tested. No update was required.
- 1: Package(s) successfully updated.
- 2: Soft reboot required. This value is returned only if -R is specified.
- 3: Hard reset required. This value is returned only if -R is specified.

Using Ethernet Connection

AirBEAM Smart Client can be launched through an ethernet connection, using a Four-Slot Ethernet cradle. To configure this appropriately, the following issues need to be addressed:

- install and configure eConnect.
- disable ActiveSync's auto-connect feature.
- disable the radio network interface, if any.
- setup an ethernet connection between the cradle and the host.

Note: *The instructions in this section apply to the following mobile computers:*
PPT 2800 with CRD 2700-4000E
PDT 8100 with CRD 8100-4000E
PDT 8000 with CRD 8000-4000E

Follow the steps below to set up the mobile computer to use an Ethernet connection to launch the Client:

1. Install eConnect onto your mobile computer. Refer to the *Product Reference Guide* for your mobile computer for detailed instructions.
2. Configure eConnect to automatically launch the AirBEAM Smart Client when the mobile computer is inserted in the cradle. This can be done either through the user interface or the eConnect.reg registry file.
3. If your mobile computer is equipped with a radio, disable your radio network interface. This can be done by setting the mobile computer's ESSID to an invalid value either through the user interface of the radio configuration registry file.
4. Disable ActiveSync from automatically starting when the mobile computer is inserted into the cradle.
5. Configure the Client. See Chapter 2, *AirBEAM Smart Client Configuration* for detailed instructions.

Note: *Disable the auto-load feature to prevent the Client from launching automatically during the boot sequence.*

---

6. Install and configure the ethernet cradle. Refer to the *Product Reference Guide* for your mobile computer for instructions on installing and configuring the cradle.

7. Hard reset the mobile computer. A hard reset is required in order to force the .reg files to be processed. Refer to the *Product Reference Guide* for your mobile computer for instructions on resetting the mobile computer.
8. Insert the mobile computer in the cradle. If the system is configured correctly the Client launches automatically.

Using Serial TCP/IP Connection

AirBEAM Smart Client provides the ability to download packages over a TCP/IP connection. The Client runs over any TCP/IP connection, including a serial connection through a modem. Follow the steps below to set up this implementation:

1. Install eConnect onto your mobile computer. Refer to the *Product Reference Guide* for your mobile computer for detailed instructions.
2. Configure eConnect to automatically launch the AirBEAM Smart Client when the mobile computer is inserted in the cradle. This can be done either through the user interface or the eConnect.reg registry file.
3. Configure the Client. See Chapter 2, *AirBEAM Smart Client Configuration* for detailed instructions.

Note: *Disable the auto-load feature to prevent the Client from launching automatically during the boot sequence.*

---

4. Configure the TCP/IP connection. This connection can be made through a Single-Slot Modem cradle or a Snap-On Modem. Refer to the *Product Reference Guide* for your mobile computer for instructions on installing and configuring the these accessories.
5. Hard reset the mobile computer. A hard reset is required in order to force the .reg files to be processed. Refer to the *Product Reference Guide* for your mobile computer for instructions on resetting the mobile computer.
6. Insert the mobile computer in the cradle. If the system is configured correctly the Client launches automatically.
7. Once the package(s) is downloaded, the TCP/IP connection is terminated.

Status List

The Status List appears on the *AirBEAM Synchronization* window and displays status messages that indicate the progress of the synchronization process.

Status Messages

This list control displays status messages that indicate the progress of the synchronization process. The table below describes the various status messages.

Table 3-1. Status Message Descriptions

Message	Description
Processing packages...	Displays at the beginning of the synchronization process.
Missing package temp directory	Indicates that the AirBEAM temporary directory is missing. This directory is created automatically during the Client initialization.
Missing package directory	Indicates that the AirBEAM package directory is missing. This directory is created automatically during the Client initialization.
Connecting: <host name/address>	Indicates that the Client is attempting to open a session to the FTP server on the host specified in the *IP Address* configuration parameter. <*host name/address*> displays the server name or the address as configured in the *IP Address* configuration parameter.
Connection <status>	Indicates the status of the attempt to open an FTP session with the server. <*status*> displays **OK** or an error number. See *Status Error Codes* on page 3-8 for a description of the various error codes.
Testing <package name>	Indicates that a package is being tested to determine whether an updated version exists on the server. <*package name*> displays the name of the package being tested.
Deleting <package name>	Indicates that a package is being deleted by the RAM management logic to make room for a package that is to be loaded. <*package name*> displays the name of the package being deleted.

Table 3-1. Status Message Descriptions (Continued)

Message	Description
PKG MEM ERR <number of bytes> required	Indicates that an insufficient memory error has occurred. This error occurs if there is insufficient space to load a package that is to be loaded. < *number of bytes* > displays the number of bytes required.
Skipping <package name>	Indicates that a package is being skipped and does not be downloaded. This situation occurs when the Client already has the same version of a package as on the server. <*package name*> displays the name of the package being skipped.
Loading <package name>	Indicates that a package is being loaded. This message is displayed while all of the package components are being loaded. <*package name*> displays the name of the package being loaded.
Load <status>	Indicates the status of the attempt to load a package from the server. This message immediately follows a *Loading: <package name>* message, when the load is complete. <*status*> displays **OK** or an error number. See *Status Error Codes* on page 3-8 for a description of the various error codes.
Moving <package name>	Indicates that a successfully loaded *failsafe* package is being moved from temporary storage. <*package name*> displays the name of the package being moved.

Table 3-1. Status Message Descriptions (Continued)

Message	Description
Installing <package name>	Indicates that a successfully loaded package is being installed. The message is displayed when the package's install command is executed. <*package name*> displays the name of the package being installed.
Uploading <package name>	Indicates that an upload package is being processed. <*package name*> displays the name of the upload package that is being processed.
Uploading to WNMS	Indicates that the Client is uploading WNMS.
Disconnecting	Indicates that the FTP session is being closed.

Status Error Codes

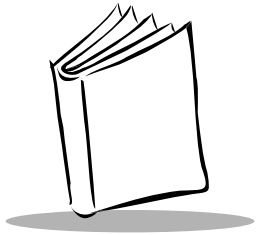
The following error codes may be returned if there is an error during the package synchronization process:

Table 3-2. Status Error Code Descriptions

Code	Description
-801	Fatal error during creation of file on mobile computer.
-802	Package does not exist in host package directory.
-803	Format error in AirBEAM package.
-805	Insufficient memory to load package (and subpackages).
-806	Invalid FTP user.
-807	Invalid FTP password for FTP user.
-808	Invalid FTP account.
-810	Error attempting to set binary mode for FTP transfer.
-811	Error connecting to the FTP server.
-812	Error resolving FTP server name.
-813	Error occurred during file transfer.
-815	Error occurred while determining available disk space.

Table 3-2. Status Error Code Descriptions (Continued)

Code	Description
-816	Invalid path specified for mobile computer file.
-817	Error occurred in mkdir() call.
-822	Missing temporary package directory (\application\airbeam_pt).
-823	Missing package directory (\application\airbeam\pkg).
-836	Error occurred while uploading a file.
-837	Error occurred while reading host directory.
-838	Host file existed prior to upload in safe mode.
-839	Error client file to be uploaded.
-840	Too many install command line arguments.
-841	Error occurred while executing the install command line.
-842	Error occurred while executing the uninstall command line.
-843	Error occurred while opening package definition file.
-845	Error creating WNMS information file.
-846	Error uploading WNMS information file.
-847	Missing/invalid AirBEAM license file.
-848	Corrupt package definition file (.apd).



Chapter 4
AirBEAM Smart Client Staging

Introduction

This chapter describes the staging support built into the AirBEAM Smart Client. The staging support is part of the Client that is integrated into the PPT 2842, PPT 2846, PDT 8142, PDT 8146, PDT 8000 (all models), PPT 8800 (all models), MC 9000 (all models), MK 2000 (all models) and MK 1100 (all models).

The staging support is intended to speedup and simplify the process of staging custom or updated operating software onto mobile computers directly from manufacturing. It works by defaulting the Client configuration and radio configuration to a known set of values and launching the AirBEAM Smart package download logic to load a single AirBEAM staging package. A staging environment, including an RF network, FTP server, DHCP server and a staging package is setup. Ideally a staging wireless network and staging server is setup that matches the default AirBEAM Smart Staging Client configuration.

The staging support provides several benefits:

- Many mobile computers can be simultaneously staged over the RF network.
- The AirBEAM Smart Staging utility provides a single simple dialog user interface that is used to quickly start the software download process.

The staging support can only be used by licensed AirBEAM Smart users.

AirBEAM Smart Staging System

An AirBEAM Smart Staging system consists of the following components:

- Wireless network
- DHCP server
- FTP Server
- AirBEAM staging package.

Wireless Network

An AirBEAM Smart Staging system includes a wireless network that is compatible with the Client mobile computers that are to be staged. The system typically uses a dedicated wireless network separate from any production wireless networks. The number of access points in a staging system can be increased to add additional download bandwidth to support a large number of simultaneous staging sessions.

Ensure that the staging system's FTP server and DHCP server is reachable over the staging wireless network.

DHCP Server

An AirBEAM Smart Staging system includes a DHCP server. The staging Client relies on the DHCP server to obtain the Client mobile computer's IP address, the wireless network's subnet mask and the wireless network's default router.

The DHCP server is configured to return Option 66 (TFTP server name) to the AirBEAM Staging Client in the DHCP response. The DHCP response Option 66 is configured to specify the IP address of the staging system's FTP server. When Option 66 is supported it is not necessary to manually enter the FTP server's IP address on the AirBEAM Staging Client.

In most AirBEAM Smart Staging systems the required DHCP server and FTP server reside on the same server platform.

FTP Server

An AirBEAM Smart Staging system includes an FTP server. The FTP server is used to download the AirBEAM staging package to the AirBEAM Staging Client. The AirBEAM staging package must be installed on the FTP server. The AirBEAM Package Builder can be used to install the AirBEAM staging package onto the FTP server.

In most AirBEAM staging systems the required DHCP server and FTP server reside on the same server platform.

Package Directory

The AirBEAM Package Directory is the directory on the staging FTP server where the AirBEAM Smart staging package definition file (.apd) is located. Note that the AirBEAM Package Directory is always specified relative to the FTP server's FTP Root directory. By default, the AirBEAM Smart Staging Client is configured to use /airbeam as the AirBEAM Package Directory. If possible, use /airbeam as the AirBEAM Package Directory on the FTP server. If a directory other than /airbeam is used as the AirBEAM Package Directory, then the Package configuration setting on the AirBEAM Smart Staging Client must be changed manually.

FTP User

The staging FTP server must be configured to allow the AirBEAM Smart Staging Client to log in. The AirBEAM Smart Staging Client attempts to log into the FTP server using the AirBEAM Smart Staging Client's User configuration setting. By default, the AirBEAM Smart Staging Client is configured to use airbeam as the FTP user. If possible, support airbeam as an FTP user on the staging FTP server. If an FTP user other than airbeam is to be used, then the AirBEAM Smart Staging Client's User configuration setting on the must be changed manually.

FTP Password

The AirBEAM Smart Staging Client attempts to log into the FTP server using the AirBEAM Smart Staging Client's User configuration setting. By default, the AirBEAM Smart Staging Client is configured to use airbeam as the password during the FTP login process. If possible, support airbeam as the password for the FTP user used by the AirBEAM Smart Staging Client. If an FTP password other than airbeam is to be used, then the AirBEAM Smart Staging Client's Password configuration setting on the must be changed manually.

AirBEAM Staging Package

The AirBEAM Staging Client downloads a single package from the staging system's FTP server. This package is referred to as an AirBEAM staging package.

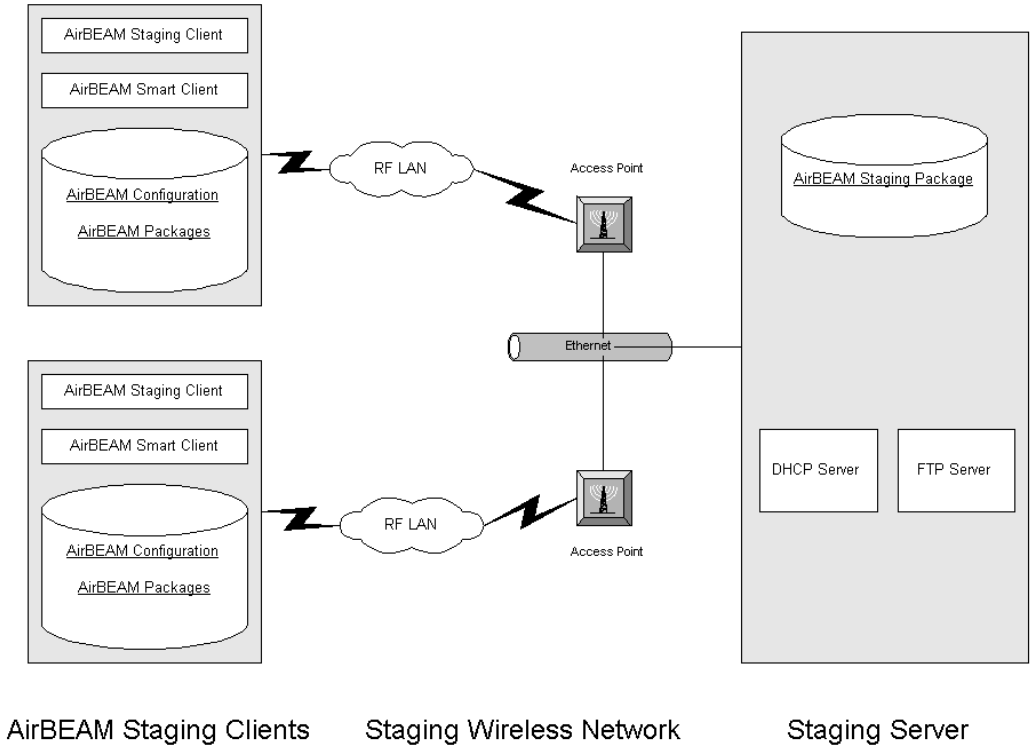
The AirBEAM staging package must be enabled by Symbol. This is due to the fact that, in general, the AirBEAM Client is not yet licensed when the AirBEAM Staging Client is used. There is a process by which AirBEAM staging packages can be enabled for use by the unlicensed AirBEAM Client software. This process requires that the staging package's package file (.apf) be sent to Symbol. The package is enabled and returned. Symbol only

enables staging packages for customers who have purchased a license for the AirBEAM Smart Client. In order to avoid unnecessarily enabling packages, it is suggested that the staging package be developed and tested in a non-staging mode. In other words, the staging package can be tested on a licensed AirBEAM Client using the standard AirBEAM Client. When the staging package has been tested it can then be enabled and used by unlicensed AirBEAM clients in the staging system. Contact the AirBEAM Product group at airbeam@symbol.com to obtain information on how to get a staging package enabled.

There are three common types of AirBEAM staging packages:

- The staging package contains a .reg file that contains the production client radio configuration, a .reg file (airbeam.reg) that contains the production Client configuration, and an AirBEAM license file (airbeam.key). The .reg files and the AirBEAM license file are downloaded to the Client's \Application folder. The staging package is configured to reboot the mobile computer. During the subsequent reboot the downloaded .reg files are processed and the Client is ready to be used in the production environment.
- The staging package uses the AirBEAM OSUPD utility to download a full set of ROM image files. Typically, the downloaded ROM images contain the standard partition images (IPL, OS, splash, platform and partition table) and a custom application partition image. The AirBEAM OSUPD utility automatically reboots the mobile computer after the ROM images have been loaded and the Client is ready to be used in the production environment.
- The staging package contains a .reg file (airbeam.reg) to reconfigure the staging AirBEAM Client configuration, and an AirBEAM license file. Generally the downloaded airbeam.reg file simply specifies a list of additional packages that are to be loaded form the AirBEAM staging FTP server. This approach is useful if there are more than one package that needs to staged onto the mobile computer (i.e. radio firmware update and an OS update). The staging package is configured to reboot the mobile computer. During the subsequent reboot the downloaded REG files are processed and the Client automatically resumes the staging process and download the packages specified in the downloaded airbeam.reg file. After the additional packages are processed the Client is ready to be used in the production environment.

Typical AirBEAM Staging System Diagram



AirBEAM Staging User Interface

The AirBEAMStaging Client utilizes the standard AirBEAM Smart Client to download and process a single staging package. When invoked, the AirBEAM Staging Client presents a single dialog that is used to configure the AirBEAM Staging Client and then initiate the package download process.

The AirBEAM Smart staging utility is invoked from the AirBEAM platform folder by tapping *Start* - *Programs* - *File Explorer* - *Platform* folder - *AirBEAM* folder - *ABSTAGE*. The following screen appears:

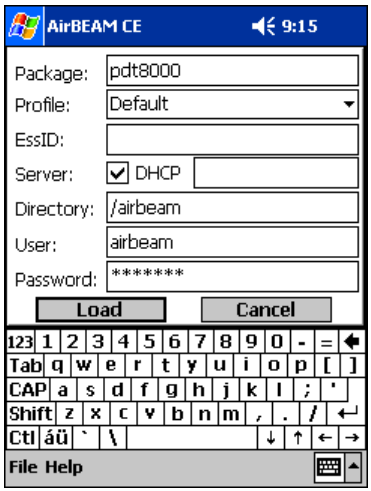


Figure 4-1. AirBEAM Staging Window

The following sections describe the fields on the screen shown above.

Package

Use this edit control to specify the name of the AirBEAM package that is loaded by the AirBEAM Staging Client. The value of this edit control defaults to mobile computer type.

The format for the default package name is as follows:

mmmmmmmmd_rrrrrrrr

where:
mmmmmmmm - specifies the mobile computers base mobile computer type
d - specifies the display type
rrrrrrrr - specifies the radio type

Default Staging Package Names

Table 4-1. Default Staging Package Name

Client Mobile Computer Type	Package Name
MC9042 color	mc9000c_slace
MC9042 monochrome	mc9000m_slace
MC9046 color	mc9000c_netwlan
MC9046 monochrome	mc9000m_netwlan
PDT 8042	pdt8000_slace
PDT 8046	pdt8000_netwlan
PDT 8142 color	pdt8100c_slace
PDT 8142 monochrome	pdt8100m_slace
PDT 8146 color	pdt8100c_netwlan
PDT 8146 monochrome	pdt8100m_netwlan
PPT 2842 color	ppt2800c_slace
PPT 2842 monochrome	ppt2800m_slace
PPT 2846 color	ppt2800c_netwlan
PPT 2846 monochrome	ppt2800m_netwlan
PPT 8842	ppt8800_slace
PPT 8846	ppt8800_netwlan
MK 2000 (11 MB radio)	mk2000_netwlan
MK 2000 (2 MB radio)	mk2000_slace
MK 1100 (11 MB radio)	mk1100_netwlan
MK 1100 (2 MB radio)	mk1100_slace

Profile

Use this drop-down list to specify the base radio configuration that is to be used by the AirBEAM Staging Client. When a profile is selected from the list the Client's radio configuration is defaulted using the selected profile's values. The ESSID value may then be changed manually, if necessary. Note that when WEP is enabled the first WEP key index 1 (the first WEP key) is used.

PPT 2846 and PDT 8146

Profile Name	ESSID	WEP Enabled	WEP Mode
Default	current radio setting	No	N/A
airbeam - WEP	airbeam	Yes	128 bit Symbol default
airbeam - no WEP	airbeam	No	N/A

PPT 2842 and PDT 8142

Profile Name	ESSID	WEP Enabled	WEP Mode
Default	current radio setting	No	N/A
airbeam - WEP	airbeam	Yes	40 bit Symbol default
airbeam - no WEP	airbeam	No	N/A

PDT 8000 (all models)

Profile Name	ESSID	WEP Enabled	WEP Mode
Default	current radio setting	No	N/A

MC9000 Series, PPT 8800 (all models), MK 2000 (all models) and MK 1100 (all models)

Profile Name	ESSID	WEP Enabled	WEP Mode
Default	current radio setting	No	N/A
airbeam - DS WEP	airbeam	Yes	128bit Symbol default
airbeam - DS No WEP	airbeam	No	N/A
airbeam - FH WEP	airbeam	Yes	40bit Symbol default
airbeam - FH No WEP	airbeam	No	N/A

ESSID

Use this edit control to specify the staging radio network's ESSID. This value is used to configure the Client's radio. The default value is the value currently used by the radio. This

value can be changed manually, or through the selection on an optional Profile, as described above.

Server

Use this edit control to specify the IP address of the FTP server. This edit control is disabled if the FTP server's IP is to be derived from the DHCP response (see DHCP check-box).

DHCP

Use this check box control to specify whether the DHCP response is to be used to determine the FTP server's IP address. If this check box is checked the FTP server's IP address is determined from the DHCP response option 66. If this check box is not selected the FTP server's IP address must be specified in the Server edit control.

In order to use this feature the DHCP server must supply Option 66 (also known as TFTP server name) in the DHCP response. If the DHCP server does not support Option 66 then the FTP server's IP address must be specified in the Server edit control.

Directory

Use this edit control to specify the directory on the FTP server where the AirBEAM package definition files are located. This directory is commonly referred to as the AirBEAM Package Directory. The default value is /airbeam.

User

Use this edit control to specify the FTP user that is used to logon to the FTP server. The default value is airbeam.

Password

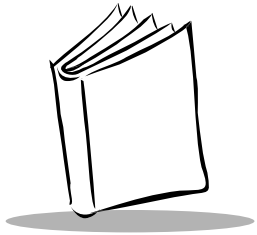
Use this edit control to specify the FTP password to be used to logon to the FTP server. The default value is airbeam.

Load Button

Use this button control to start the package download process.

Cancel Button

Use this button control to abort the staging process. The AirBEAM staging utility terminates.



Chapter 5
AirBEAM CE Client Development Kit

Introduction

The *AirBEAM CE Client Development Kit* is a zipped file that contains a set of files to facilitate the development of custom AirBEAM CE client implementations. The *AirBEAM CE Client Development Kits* are mobile computer-specific and the appropriate kit must be used for a given mobile computer. An *AirBEAM CE Client Development Kit* is available for all mobile computers that support the AirBEAM Smart Client. The latest release of the various *AirBEAM CE Client Development Kits* can be downloaded from the Symbol DevZone website (http://devzone.symbol.com).

The naming convention for the *AirBEAM CE Client Development Kit* zipped file is:

nnnnnnnn_vvv.zip

where:
nnnnnnnn specifies the base filename as listed below
vvv specifies the AirBEAM Client version number

The following table lists various Symbol models and their base development kit name.

Table 5-1. Client Development Kit base filename

Mobile Computer	***AirBEAM CE Client Development Kit* base filename**
MK 1100	ab1100
MK 2000	ab2000
PDT 7500 (CE 2.11)	ab7500ce
PDT 7500 (CE 3.00)	ab7500ce300
PDT 8000 PDT 8100 (SP2 and later) PPT 2800 (SP2 and later)	ab2800p
PDT 8100 (prior to SP2) PPT 2800 (prior to SP2)	ab2800
PPT 8800 (CE .NET)	ab8800
PPT 8800 (Windows Mobile 2003 Software for Pocket PCs)	ab8800_ppc
MC9000 Series	ab9000
PPT 2700	ab2700
PDT 7200 (CE 2.11)	ab7200ce
PDT 7200 (CE 3.00)	ab7200ce300
VRC 7900 VRC 8900	ab7900

ZIP File Contents

The *AirBEAM CE Client Development Kit* is mobile computer specific and the appropriate kit must be used based on the Symbol mobile computer type. The AirBEAM Client Development Kit contains the following components:

- AirBEAM Client component files: These files can be used to install or update the AirBEAM Client on compatible mobile computer.
- Release notes

- Standard AirBEAM packages: Most AirBEAM Client Development Kits contain two pre-built AirBEAM packages:
  - AirBEAM Client update package
  - Radio firmware update package.
- Custom .reg files: These files can be used to pre-configure the AirBEAM Client and radio configuration.
- Package development support utilities: These utilities are generally mobile computer-specific copies of executables that can be used to automate package installation logic.
  - merge.exe: This utility can be invoked from a package's Install Command to process .reg and .cpy files downloaded in the package. The use of this utility can eliminate the need to reboot after a package is updated.

Standard AirBEAM Packages

AirBEAM Client Update Package

The AirBEAM Client update package is designed to automatically update the AirBEAM Client on a Symbol mobile computer. The package contains the various AirBEAM Client components that must be updated to update the AirBEAM Client.

Table 5-2. Client Update Package Name

Mobile Computer	AirBEAM Client update package
MK 1100	abup1100
MK 2000	abup2000
PDT 7500 (CE 2.11)	abup754xce
PDT 7500 (CE 3.00)	abup754xce300
PDT 8000 PDT 8100 PPT 2800	abup284x
PDT 8800 (CE .NET)	abup8800
PDT 8800 (Windows Mobile 2003 Software for Pocket PCs)	abup8800_ppc

Table 5-2. Client Update Package Name (Continued)

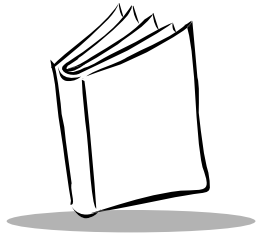
Mobile Computer	AirBEAM Client update package
MC9000 Series	abup9000
PPT 2700	abup274x
PDT 7200 (CE 3.00)	abup724xce300
VRC 7900 VRC 8900	abup794x

Radio Firmware Update Package

The radio firmware package is designed to automatically update the radio firmware in the mobile computer's integrated radio card. The package contains the latest released firmware at the time the AirBEAM Client Development Kit was released and a utility that is used to actually update the radio. Later versions of radio firmware can be used to update radio firmware package.

Table 5-3. Radio Firmware Update Package Name

Mobile Computer	AirBEAM radio firmware update package	Notes
MK 1100	Not supported	Radio firmware updates are supported through radio driver.
MK 2000	Not supported	Radio firmware updates are supported through radio driver.
PDT 7500	abrf7x46ce	11MB radio
PDT 8000 PDT 8100 PPT 2800	abrf2846	11MB radio
PDT 8800	Not supported	Radio firmware updates are supported through radio driver.
MC9000 Series	Not supported	
PPT 2700	Not supported	
PDT 7200	abrf7x46ce	11MB radio
VRC 7900 VRC 8900	abrf7946	11MB radio



Appendix A
AirBEAM Smart Client Logic Flows

Boot Logic

The AirBEAM Smart Client contains a component (abboot.exe) that is automatically invoked each time the Client is rebooted. The abboot.exe file is installed in the Windows CE Startup directory. The Client boot logic implemented in abboot.exe is outlined below.

1. The Client processes one-time boot processing files (_bootpro.reg, _bootpro.cpy and _bootpro.exe), if any.

   AirBEAM packages can download one-time boot processing files that are processed one-time during the start-up processing after the next reboot. The purpose of these files is to enable downloaded AirBEAM packages to complete any installation processing that may need to occur after a reset.

   If present, the _bootpro.exe file is executed and then deleted.

   If present, the _bootpro.reg file is deleted. The _bootpro.reg file is processed by the standard Symbol CE boot processing to initialize CE registry entries.

   If present, the _bootpro.cpy file is deleted. The _bootpro.cpy file is processed by the standard Symbol CE boot processing to copy files to volatile memory.
   Note: The _bootpro.cpy logic is not supported on the VRC 7900.

Load the one-time boot files into the following directories:

Table A-1. _bootpro.exe

Mobile Computer	Directory
VRC 7900/VRC 8900	\FlashFx
All other mobile computer	\Application

Table A-2. _bootpro.reg

Mobile Computer	Directory
VRC 7900/VRC 8900	\FlashFx\CopyToRam\StartUp
All other mobile computer	\Application

Table A-3. _bootpro.cpy

Mobile Computer	Directory
VRC 7900/VRC 8900	Not supported
All other mobile computers	\Application

2. If enabled, the Client waits for WELCOME processing to complete after a cold reset (CE 3.0 only).

   The Client optionally waits for the CE 3.0 WELCOME processing to be completed before launching the AirBEAM synchronization processing. The CE 3.0 WELCOME processing includes the calibration, using pop-up menus, and time zone setup screens that are displayed during start-up after a cold reset.

   The *wait for welcome* feature can be enabled using the WAITWELCOME registry entry.

3. The Client completes any pending deferred copies.

   The Client completes the process of copying any files that could not be directly downloaded because they were in-use. The INUSETEST registry entry must be set to enable the checking for in-use files and allowing the deferred copy logic.

4. The Client checks all alternate storage packages to determine if they need to be reloaded.

The Client determines whether the contents of alternate storage packages are still present on the mobile computer. If any components are missing the entire package is removed. The removed packages, if any, are reloaded by the Client.

5. The mobile computer automatically launches the Client if Auto-load feature is enabled, or if Client is starting after an AirBEAM initiated reset.

Package Synchronization Logic

Packages are "loaded" onto the mobile computer via version synchronization logic provided by the AirBEAM Smart Client.

The package synchronization logic is outlined below:

1. The Client connects to the FTP or TFTP server specified in the Client configuration.

   If the FTP protocol is enabled the Client automatically logs on to the FTP server using the user and password in the configuration.

2. The Client downloads up to eight packages that are specified in the configuration. The Client loads and processes the packages sequentially.

   The following processing occurs for each of the packages that are to be loaded onto the Client:

   a. The Client determines if the host (FTP or TFTP server) has an updated version of the package.

      If the specified package does not exist on the mobile computer it is loaded. If a version exists on the mobile computer, then the version on the host is checked to determine if it is different. If it is different it is loaded. If the host's version of the package and the version on the mobile computer are the same, the package is not loaded.

   b. Once the Client determines to load a package, it determines if there is enough file system space to load the package.

      The package's file system footprint is specified by the package's Total Package Size attribute, in the package's package definition file.

      The amount of free file system space that is required depends on whether the package is to be loaded in REPLACE or FAILSAFE mode. The REPLACE/FAILSAFE mode is specified in the package's package definition file.

      In REPLACE mode, the prior version if any, of the package is removed from the mobile computer before the newer version is loaded. If specified, the packages

uninstall logic is invoked for the version being removed. An advantage of this approach is that it requires less free file system memory to accomplish the download. The downside, however, is that if a fatal error occurs the prior version of the package is discarded.

In FAILSAFE mode, the prior version if any, is saved until after the new version is successfully loaded. A disadvantage of this approach is that it requires more free file system memory to accomplish the download. The advantage, however, is that if a fatal error occurs, the prior version of the package is still loaded.

If there is sufficient file system space the package's component files are loaded.

If there is insufficient space, the Client invokes RAM management logic (if enabled) to free up enough file system space to load the package. If RAM management is disabled, or if enough memory cannot be freed up an error is returned.

If the package specifies that an alternate storage area is to be used the available memory check and RAM management logic uses the specified storage area.

c. Once the Client has determined that there is sufficient file space to load the package, the package's component files are downloaded.

   In FAILSAFE mode the previous version of the package is removed after all the components of the new version are successfully loaded. If specified, the packages uninstall logic is invoked for the version being removed.

   If the INUSETEST feature is enabled the download logic tests all files to make sure they are not currently in-use on the Client before downloading. If the INUSETEST feature is enabled, the Client downloads a temporary copy of the file and initiates a warm reset after all the package's components have been successfully loaded. The boot logic completes the download process by copying the file that was in-use. If the INUSETEST is not enabled, attempts to download files that are in use results in an FT error (access denied).

d. Once the package's component files have been successfully loaded, the package's install logic, if specified, is invoked.

   The optional package installation logic can be used to provide any additional processing required to completely install the package. An example of typical installation logic would be invoking a utility to update a FLASH ROM image.

e. Once the package's installation logic, if any, has been processed the package can optionally force the Client to reboot.

The automatic reboot feature is useful if a reboot is required for the package contents to become effective. An example of a package that would force a reboot is a package that updates low-level system components that need to be reloaded by the boot sequence.

If the Client does initiate a reboot, the mobile computer's boot logic automatically re-invokes the Client so that the package synchronization logic can continue.

If the package does not specify that reboot is required the load logic continues to the next download package, or to the upload package logic if there are no more download packages.

3. Once all download packages have been processed an optional upload package is processed.

   If specified, the upload package specifies files that are to be uploaded to the server. Upload processing is only possible if the FTP protocol is used.

   There are several attributes that control the way uploaded files are processed. The *Replace Mode* attribute for upload files specifies whether the file is to be uploaded if it already exists on the server. If the *Delete After Upload* attribute is specified the uploaded file is removed from the mobile computer after it is successfully uploaded.

4. Once all package synchronization is complete the Client disconnects from the FTP or TFTP server.
5. Once the Client has disconnected from the FTP or TFTP server, it attempts to automatically start a Client application.

   If an executable exists with the same name as the first download package parameter it is automatically invoked.

   This feature is useful because, if configured correctly, the Client's main application is synchronized and automatically started each time the mobile computer is rebooted. The Client's main application may be a front-end menu, or a single application such as an emulator.

Background Package Update Check Logic

Starting with version 1.34 of the AirBEAM Smart Client, the Client supports the ability to check in the background for package updates. If this feature is enabled, the Client periodically connects to the FTP server and test for package updates. This testing process occurs in the background and is transparent to the mobile computer's end-user. The frequency with which the Client checks for updates is configurable. The background

process can be configured to automatically start the package download process, or inform the mobile computer end-user that package updates are available.

The background package update check logic is not available on all mobile computers. The feature is NOT available on the following mobile computers:

- PDT 7200 (CE 2.11)
- PDT 7500 (CE 2.11)
- PDT 8100 (OS versions before SP2)
- PPT 2700
- PPT 2800 (OS versions before SP2)
- VRC 7900
- VRC 8900.

The background package update check feature is enabled and configured through three registry settings (SCHEDULEMODE, SCHEDULETIME, SCHEDULEPROMPT, and SCHEDULELOADMODE). See *Registry Entries* on page 2-9 for details on configuring registry settings.

The AirBEAM auto-load feature must also be enabled in order for the background package update check feature to be enabled.

AirBEAM Staging Client Logic Flow

1. End-user invokes the AirBEAM Staging Client on the mobile computer.

   The Staging Client is invoked using the abstage shortcut located in the \Platform\AirBEAM folder. File Explorer can be used to navigate to the \Platform\AirBEAM folder, and the AirBEAM Smart staging utility can be invoked by tapping on the abstage shortcut icon.

   When the Staging Client is invoked the *AirBEAM Staging Client* window is displayed.

2. End-user makes any required configuration changes.

   If possible, configure the staging network to match the Staging Client's default configuration (i.e. staging package name, ESSID, FTP server address, AirBEAM package directory, FTP user and FTP password).

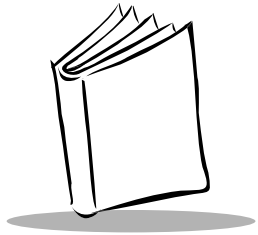
3. End-user taps **Load** to initiate the package download process.

The Staging Client prompts the end-user that the mobile computer has rebooted to initiate the staging process.

The Staging Client builds a .reg file to configure the radio and AirBEAM Client. The Staging Client reboots the mobile computer to initiate the download process.

4. During the subsequent reboot the Client is automatically invoked to start the download process.

   The Client connects to the specified FTP server and download the specified staging package.



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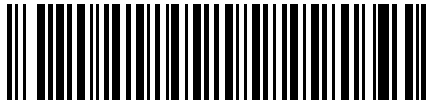

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