QUALCOMM®

Binary Runtime Environment for Wireless®

BREW® Application Manager 2.0 Guide

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BREW® Application Manager 2.0 Guide

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Contents

1 Introducing the BREW Application Manager Guide

The *BREW Application Manager Guide* describes the Binary Runtime Environment for Wireless® (BREW®) Application Manager, subsequently referred to as the AppManager, and MobileShop®, an application that is a component of the AppManager. The AppManager and MobileShop are delivered to device manufacturers as source code.

This document presents the design specifications for the reference version of the AppManager. The design specifications for the final version is defined through the customization process described in Chapter “BREW AppManager Customization Process” on page 12.

The remainder of the *BREW 2.0 Application Manager Guide* contains the following sections:

BREW AppManager Overview	Provides a general overview of the AppManager application and how it’s used on the device.
BREW AppManager Customization Process	Provides information about the process of customizing AppManager and what roles the carrier and QUALCOMM have concerning customization.
BREW AppManager Required Features	Provides information about features that must be supported by the final customized version of the AppManager for device users when they use and manage BREW applications.
Reference UI Specifications	Provides information about the AppManager UI design.

NOTE: You need to implement the information provided in all sections of this document to support BREW.

1.1 BREW OEM documentation set

The BREW OEM documentation set includes the following documents:

BREW OEM Porting Guide	Describes the interfaces required from the OEM that allow BREW to provide various applications services.
BREW OEM API Reference	Describes the OEM mobile interface layer (MIL) and chip interface layer (ChIL) details.
BREW Porting Evaluation Kit (PEK)	Describes the OEM Porting Kit tools and how to use them. The BREW PEK contains the BREW OEM Acceptance Test (OAT), the OAT Log Viewer, BREWStone®, the AppLoader, the DMI test tool, and BREW FontScan.
BREW Application Manger Guide	Provides application requirements the AppManager and MobileShop. It also provides reference UI specifications for an OEM that is developing a device for a carrier.

1.2 BREW carrier documentation set

The BREW carrier documentation set includes the following documents:

Operator's Guide to BREW Application Distribution	Explains the BREW distribution process from an operator's point of view, including populating the Carrier Parts List, creating and managing application catalogs, and distributing BREW applications to device users.
BREW Porting Evaluation Kit (PEK)	Describes the OEM Porting Kit tools and how to use them. The BREW PEK contains the BREW OEM Acceptance Test (OAT), the OAT Log Viewer, BREWStone, the AppLoader, the DMI test tool, and BREW FontScan.
Transaction Manager Specification	Explains how the Transaction Manager integrates with the billing system.
BREW Device Behavior	Identifies the behavior of BREW-enabled devices as it relates to the BREW transaction management and billing processes.

1.3 Acronyms and terms

The following acronyms and terms are used throughout this document.

ADS	Application Download Server.
BDS	BREW Distribution System
DAP	Developer Application Price
Disable	Partially remove a BREW application from the device without requiring the user to pay an additional purchase cost to restore it. This frees storage space so the user can download more applications despite the storage limitation of the device.
Download options	The options in MobileShop for downloading BREW applications. They include the following: • Free demo download • Purchase an application (see Price basis) • Upgrade (free or fee)
Dynamic BREW application	An application that is generated independently of the core BREW. Most dynamic BREW applications are downloaded by using MobileShop, but they can also be pre-loaded on the device.
EULA	End User License Agreement
MIF	Module Information File
Preview text	A description associated with either a category or a BREW application. It is retrieved from the download server and displayed in MobileShop.
Price basis	The method of pricing a BREW application.
Remove	Delete a BREW application from the device. The device user must pay an additional purchase cost to re-download it.
Restore	Re-download a disabled BREW application with no additional purchase cost.
Static BREW application	An application that is built with the core BREW; it cannot be disabled or removed. The AppManager is a static BREW application.

NOTE: For OEMs, see the introductory section to the *BREW OEM Porting Guide* for more definitions of acronyms and terms used in the BREW OEM document set. For carriers, see the *BREW SDK® User Docs* help included with the BREW SDK.

1.4 Requesting assistance on UI issues

UI issues may exist on both a device-by-device and a BREW carrier-by-carrier basis. QUALCOMM staff is available to provide support on these UI issues. For example, details regarding the AppManager's location within a device's native UI can vary. Also, carriers may have specific branding requests within the AppManager and MobileShop UI.

QUALCOMM UI design professionals and software engineers are available for consultation on modifications to the AppManager and MobileShop. For more information, send an email message to brew-request@qualcomm.com.

1.5 Requesting new BREW features

Do you have ideas for features that would make the BREW OEM software more valuable and useful to you? If so, send email to brew-request@qualcomm.com. Each request is evaluated, and a member of the New Features Response Team will respond to your email.

1.6 For more information

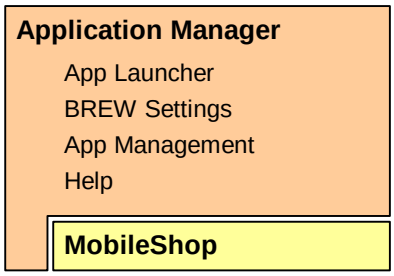
Online information and support is available for BREW OEMs. Please visit the BREW web site for details: www.qualcomm.com/brew/manufacturer.

Online information and support is available for BREW carriers, Please visit the BREW web site for details: www.qualcomm.com/brew/carrier/carrier.html

2 BREW AppManager Overview

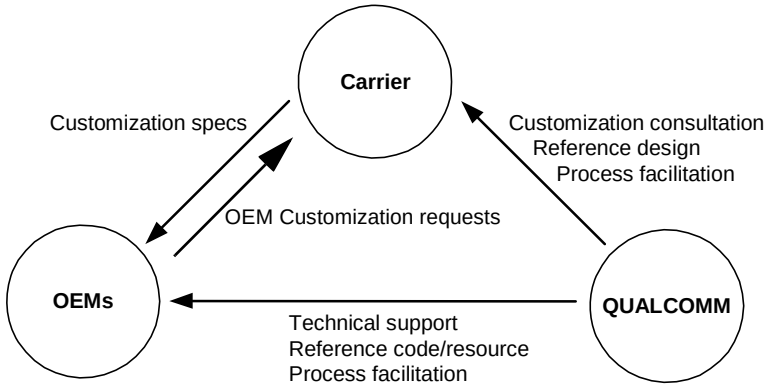
The AppManager is a static BREW application that enables device users to start and manage BREW applications. The AppManager also includes a software tool called MobileShop that allows device users to browse, purchase, and download BREW applications from the BREW Application Download Server (ADS). Every BREW device must implement a version of the AppManager.

AppManager



AppManager is delivered to device manufacturers as a reference application, and it is intended to be customized based primarily on the carrier specific design and branding requirements. Device manufacturers may also modify the design for a particular handset. Customizing the AppManager involves the carrier, device manufacturers, and QUALCOMM, as depicted in the following diagram.

BREW AppManager customization process



Because the process involves the carrier, device manufacturer, and QUALCOMM at different levels, QUALCOMM will facilitate the process for efficiency. See Chapter “BREW AppManager Customization Process” on page 12.

To support the device users when using and managing BREW applications, a set of features have been identified that must be supported by the final customized version of the AppManager. For information on the required features, see Chapter “BREW AppManager Required Features” on page 14.

Although the AppManager is a reference application, the carrier often does not have to make significant modifications. For information on design specifications, see Chapter “Reference UI Specifications” on page 28.

2.1 AppManager package for device manufacturers

The AppManager package consists of the following items.

- AppManager source files
- Graphics source files
- *BREW AppManager Guide*
- English resource files

Resource files for the following languages are available through the BREW OEM Extranet:

- Chinese (simplified)
- French (Canadian)
- Japanese
- Korean
- Portuguese (Brazilian)
- Spanish (Latin American)

3 BREW AppManager Customization Process

This section describes a process for supporting a carrier's effort to customize the AppManager. The AppManager is provided as source code to the OEMs. Carriers and OEMs can modify the AppManager to meet their own needs. Customizations often include localization and cosmetics, but other features can be added or modified as long as the application supports the required features described in Chapter "BREW AppManager Required Features" on page 14.

Following are the main reasons for using the customizing process:

- Help carriers understand the role and benefit of the AppManager.
- Help carriers identify their customization needs.
- Facilitate the communications between carriers, OEMs, and QUALCOMM.
- Verify that all the required features are implemented.

3.1 Customization process

The following is a process that is used to facilitate the communications between a carrier, a device manufacturer, and QUALCOMM.

1. QUALCOMM presents the AppManager to the carrier. The information provided at this time includes:
   - Introduction to the AppManager
   - Feature requirements
   - Reference Design
2. The carrier checks whether its devices are compatible with the hardware features—for example, support for the four directional keys, that are assumed by the reference design. If there are any devices that are not compatible, the carrier and QUALCOMM discuss and determine how to handle each case.

3. QUALCOMM and the carrier generate a document that describes how the AppManager must be customized. This customization document only describes only specifications that are different from or added to the specifications described in this document. See Chapter “Reference UI Specifications” on page 28.
4. QUALCOMM reviews the customization document and verifies that all the features are supported.
5. If the customization document is approved, it is presented to the device manufacturers and possibly third party developers. The carrier may allow each device manufacturer to negotiate additional customizations. QUALCOMM and the carrier will take one of the following two actions if at least one device manufacturer is interested in making additional customizations:
   - Generate an additional customization document per OEM that intends to make additional customizations.
   - Or modify the original customization document based on the requests given by device manufacturers.
6. If any revisions are made by device manufacturers, QUALCOMM reviews each revised customization document, and verifies that all the features are supported. Otherwise, go to the next step.
7. Each OEM or possibly third party developers implements the final and customized version of the AppManager.
8. The carrier will verify that all the features presented in the core document and the customization document are implemented.

NOTE: QUALCOMM will facilitate the process.

4 BREW AppManager Required Features

This section presents information on the AppManager’s required features. All BREW devices must support all the features that are described in this section. Exceptions are made for those features that are explicitly indicated as options.

Most of the required features listed here are already implemented in the reference application. Those features that must be implemented by the device manufacturers are indicated explicitly.

4.1 Starting the AppManager

Device users must be able to start the AppManager using no more than three button presses from the native idle screen. Also, device users must be able to see the AppManager's icon after pressing no more than one button from the idle screen.

NOTE: This feature must be implemented by the device manufacturer.

4.2 Quitting the AppManager

AppManager must quit when one of the following conditions exists:

- If the device user presses the clear key while the root level UI of the application launcher, MobileShop, the Settings menu, and the Help menu.
- If the device user, when in any screen, presses the end key.
- (Optional) If the device user does not touch any of the device keys for a certain duration. (This feature must be implemented by the device manufacturer.)

No other conditions allow the AppManager to quit.

4.3 AppManager icons and names

QUALCOMM provides icons for the AppManager and MobileShop. However, the carrier determines the final application names and icons to be used for these two applications.

For the use of QUALCOMM's trademarks, including the BREW logo, contact QUALCOMM.

NOTE: This feature must be implemented by the device manufacturer.

4.4 Application launcher

The AppManager implements an application launcher tool that allows device users to start applications.

4.4.1 Starting BREW applications

The application launcher allows device users to start all BREW applications, static and dynamic.

BREW applications can be started automatically. See section 4.9, Starting applications automatically on page 25.

4.4.2 Display of application names and icons

The application launcher displays both application icons and their names in the UI. The application icons and the names are retrieved from the Module Information Files (MIF).

4.4.3 Application status indication

Each BREW application has one of the following application statuses. The current status of each application must be visually indicated in the application launcher.

- Disabled applications
- Expired applications
- Demo applications
- Expired demo applications

- Normal applications

4.4.4 Predefined application launcher categories

The AppManager provides device users with multiple predefined categories. From the device user's point of view, each category is like a folder where BREW applications can be browsed and started. At least one launcher category must be provided by default. Categories cannot be nested and renamed.

The AppManager must provide tools that allow device users to perform the following tasks in the settings tool:

- Assign launcher categories to BREW applications.
- Change the order of BREW applications listed in each launcher category.

See section 4.6, Settings on page 22.

4.4.5 Handling disabled applications

If the device user tries to launch a disabled application, the application launcher provides the user with an option to restore the application from the ADS.

4.4.6 Handling expired applications

If the device user tries to launch an expired application, the application launcher provides the user with an option to repurchase the application from the ADS.

4.4.7 Handling demos

If the device user tries to start a demo, the application launcher asks if the user is interested in purchasing the application and provides the following options:

- Purchase the application (default).
- Run the demo.

4.4.8 Handling expired demos

If the device user tries to start an expired demo, the application launcher provides the user with an option to purchase the application from the ADS.

4.4.9 Handling applications RAM fragmentation

If the device user tries to run an application and the device does not have enough RAM, the launcher informs the user that there is not enough RAM to run the application on the device. The launcher suggests to the device user to power cycle the device.

NOTE: MobileShop's catalog does not display applications that can never be executed by the device user due to the RAM limitation of the device.

4.4.10 Handling download acknowledgement pending applications

If the user tries to launch an application with a download acknowledgement pending, the application launcher provides the user with an option to verify the application from the ADS.

If the application cannot be verified (the download acknowledge fails), the AppManager removes the application from memory.

4.5 MobileShop

The AppManager implements MobileShop, which is a software tool that allows a device user to browse, purchase, and download BREW applications from the ADS.

MobileShop is presented as an option on the top most menu in the AppManager. This is to encourage the device user to use it often for downloading.

4.5.1 Catalog browser

MobileShop includes an interactive tool that allows device users to browse the application catalog downloaded from the ADS.

MobileShop and the ADS support several levels of hierarchically organized information. The following sections detail these levels. Following is a short summary:

- Category level as defined through the carrier's catalog Extranet: This level lists the categories of BREW applications, such as games and entertainment. Categories can be nested within other categories, such as action games in the games and entertainment section.
- Application title level, one level down from the category level: The application title level displays the name for each application held within the parent category.
- Application download options level: After an application title is selected, the device user is shown a further level of menu choices that includes the download purchase options and an option to preview further information on the application.

4.5.2 MobileShop linger timer

When the device user selects the catalog option from the top level of the MobileShop UI, a connection is made to the ADS. The ADS contains the catalog of BREW applications available for downloading.

If this connection is successfully made, airtime usage occurs. From this point on, a linger timer-part of the BREW platform, but not specific to MobileShop, is applied to control the traffic channel usage and data caching of received information within the MobileShop application. This application catalog information caching occurs for each catalog browsing session, and the cached information is cleared and reset only when the MobileShop application is exited and restarted again.

The airtime linger timer maintains the connection to the ADS and is set to count down by the second. The duration of the linger timer can be defined at compile time; otherwise, the default (30 seconds) is used. If additional connection attempts to the server are made by way of a device user's action to request more data, the timer is reset. If the device user provides input to navigate the already downloaded catalog information items for the current MobileShop usage session, the download timer is not reset. The linger time that has not expired is terminated when the device user exists MobileShop.

4.5.3 Application preview text

When MobileShop retrieves the download/purchase options of an application from the ADS, a brief description about the application may be available from the server. If the preview text is available, MobileShop provides device users with a UI to read the application's description.

4.5.4 Application size preview

When MobileShop retrieves the download or purchase options of an application from the ADS, the size of the application is available and displayed.

4.5.5 Downloading options

After device users find an application they may want to purchase in the catalog browser, MobileShop provides a UI that lists possible download options. The application developers determine which set of download options are available for each BREW application. The following are the possible download options:

- View information about the application.
- Purchase the application—for example, by time, number of uses, subscriptions, and so forth.
- Download a free demo version of the application.
- Upgrade the application (if the older version is already installed).

4.5.6 Restoring a disabled application

A disabled application is an application that the device user has downloaded but has been disabled. A disabled application can be restored by trying to launch the application from the AppManager. See section 4.4.5 Handling disabled applications on page 16.

4.5.7 Searching for applications and categories

MobileShop supports a UI for searching applications and application categories in the catalog by using keywords.

NOTE: This feature requires that you have BDS 1.1 or higher.

4.5.8 Automatically selecting an application to disable

When MobileShop discovers that there is not enough storage space for downloading a new application, MobileShop provides an option to automatically select applications that can be disabled, based on the application's frequency of use.

4.5.9 Indicating application and category types using icons (optional)

MobileShop allows the carrier to use unique icons for applications and categories in the catalog menus. The icons must be pre-installed on the device, each of which is associated with a particular icon ID. The carrier may assign a particular icon ID for a category or an application on the carrier's Extranet. If the icon specified by the icon ID does not exist on the device, the default icon is used.

4.5.10 Upgrade options

For applications that have already been downloaded, the device user may have the option to download a reduced price or free upgrade. If an upgrade is available, it is shown in the download options menu. If the device user purchases additional uses or time for an application that can be upgraded, the application is automatically upgraded.

4.5.11 Reinstalling an active application

A device user can use MobileShop to browse the application catalog and purchase additional uses or extend usage of an existing application provided that the same price basis is chosen.

If the device user chooses to re-download an application that doesn't have any upgrades (binary updates), only the usage information is upgraded and the application binary is actually not re-downloaded.

If the device user chooses to download an application that exists at a different price basis (that is, the old price is no longer available), the old price basis is overwritten. Unless the application has any upgrades (binary updates), the application binary is not redownloaded, and only the new usage information is downloaded and stored.

4.5.12 Starting MobileShop from other applications (optional).

Any BREW application can start MobileShop.

4.5.13 Price basis change warning

If a device user tries to redownload an existing application using a different price basis, MobileShop warns the user that the new price basis is used instead of the old price basis.

4.5.14 Purchase confirmation

Immediately after a purchase option is selected from the download options menu, MobileShop must ask the device user to confirm the price and the application name.

In addition, if the device user selects a subscription option, MobileShop notifies the device user that he or she is billed for the application periodically—for example, monthly—until the subscription is canceled by the device user.

4.5.15 EULA prompt

After the purchase confirmation dialog, MobileShop may display a EULA dialog for each application if it is provided by the ADS. MobileShop must implement a UI that allows the device user to agree or disagree. MobileShop completes the downloading process only if the device user agrees with the EULA.

4.5.16 Insufficient funds notification (prepay service only)

The insufficient funds notification is for carriers that offer prepay services. When a device user requests an application download from MobileShop, and if the ADS finds that the user does not have enough money to purchase the application in the prepaid account, the user is not allowed to download the application. A message string returned from the ADS appears to the device user.

4.5.17 MobileShop help

MobileShop includes help that explains basic concepts of downloading an application and instructions for performing common tasks.

4.5.18 Credit back capability

The credit back feature is a short-term enhancement to provide a partial solution for an application transfer feature. Credit back is activated when a device user swaps his or her BREW-enable device with another one. The device user is credited for the remaining amount of uses that his or her application had on the old device on the carrier’s invoice. To start the credit back process, a special code is entered on the original device. The device user may re-download the application on the new device, but it is considered a separate transaction.

4.6 Settings

The AppManager implements an area of the UI that lists a set of BREW specific settings tools. The AppManager must include the following tools:

- A tool to assign launcher categories (folders) to BREW applications.
- A tool to edit the order of applications within a launcher category (folder).
- A tool to organize and remove BREW applications. See section 4.7, Management tool on page 22.
- A tool to view the log that documents the date of the following activities:
  - Disabling applications
  - Downloading/Installing applications
  - Failed downloading attempt
  - Removing applications
  - Restoring application
- A tool to select the current screen saver or turn the screen saver off.
- A tool to change the main menu's display style.
- A tool to enable or disable airtime warnings.

The following tool is for testing only and can be available by modifying a compile time setting:

- A tool to select and switch ADS used by MobileShop. This item must not be included for commercial service.

4.7 Management tool

The AppManager must implement a management tool that includes a set of small tools for organizing and removing dynamic BREW applications. The tools also allow the viewing of the application’s properties, the setting of folders, the settings of sounds and images, and allowing the locking and unlocking of applications. The management tool must be accessible from the settings tool.

4.7.1 Remove applications

The management tool allows device users to remove applications. If the user attempts to remove an application that has not expired, it displays a warning message to indicate that the application has not expired.

NOTE: As a special UI requirement for subscribed applications, in the remove/disable menu, the management tool uses the phrase “cancel subscription” instead of “remove” for those applications that are subscription-based. After the cancellation is complete, a confirmation message appears to confirm to the device user that he or she is not invoiced anymore, and that the application has been deleted.

4.7.2 Postponed transaction notification for cancelled subscriptions

When the device user removes a subscription application, the BREW core applications, subsequently referred to as the core applications, attempt to contact the ADS to cancel the subscription immediately upon the removal of the application, unlike the deletion of a non-subscription application. If the core applications cannot contact the ADS, they queue the transaction with a timestamp, and the transaction is completed when the core applications successfully access the ADS again. In this case, the core applications notify the device user that the cancellation is completed when the device user accesses the ADS again, and that the charges are not applied after the date of cancellation.

4.7.3 Application properties

For each application, the management tool allows device users to view the following application properties:

- Total application size: the storage space that is freed by removing an application.
- Application core size: the storage space that is freed by disabling an application; that is, the MOD, BAR, and SIG files.
- Data size: Total application size minus application core size.
- License information: expired or not, remaining uses, time, subscription fee, subscribed application's monthly anniversary date.
- Copyright Information.
- Developer name.

- Last use: time and day.
- Version number.
- Demo or not: If it is not a demo, it does not have to be explicitly stated.
- Disabled or not: If it is not disabled, it does not have to be explicitly stated.

4.7.4 System properties

Device users can view the following system properties:

- Total storage size
- Free storage size
- Used storage size
- ·BREW version
- ·AppManager version

4.7.5 Manual upgrade check

The management tool allows device users to find out whether or not upgrade options are available for applications.

NOTE: This feature is turned off if the BDS's version is not 1.2 or higher.

4.7.6 Set categories

The management tool allows the device users to assign a category to each application.

4.7.7 Lock or unlock

The management tool allows the device users to lock or unlock each application. A locked application cannot be considered a candidate for automatic disable in MobileShop. See section 4.5.8 Automatically selecting an application to disable on page 19.

4.7.8 Sound and image configuration

The management tool allows the device user to associate images and sounds to BREW applications that appear in the application launcher's menu.

4.8 Airtime charge warning

The AppManager may notify the device user that airtime charges apply for network connection time when the device user attempts to do the following:

- Make the connection to the ADS—one warning per MobileShop catalog access.
- Use the search tool in MobileShop.
- Check upgrade availabilities manually.
- Restore an application in the Application launcher (for disabled applications).
- Purchase demo applications or expired applications from the application launcher.
- Cancel a subscription application (management tool).

The user is given a choice to turn off each airtime charge warning. The user can also turn off all the airtime warnings using the settings tool. See section 4.6, Settings on page 22.

As part of the factory settings, the airtime charge warning can be turned on or off.

In addition, the AppManager's Help must contain the detailed information regarding exactly when airtime charges apply.

4.9 Starting applications automatically

An application can start automatically during the following circumstances:

- When the device is turned on.
- Receipt of SMS notifications.
- Receipt of notifications from other external BREW applications/classes; that is, non-core BREW extensions.

- Receipt of notifications from core, system-level BREW classes; for example, TAPI timers.

When an application automatically runs, it is in the runtime state and can exit at any time. Applications that were suspended by the application that was launched automatically can resume after the application is exited.

4.10 Automatic application recall

The BREW ADS servers can automatically delete an application in two ways:

- Pushed SMS application recall: When sent to a designated device, MobileShop runs, and an application is immediately deleted.
- MobileShop application recall check: When a device user starts a new MobileShop application browse session; that is, connects to the server to download catalog information. MobileShop checks a server-held application recall list. If a server flagged application exists on the device, the application is immediately deleted.

In either of the above cases, the recall event is recorded in the log and the device user is shown a message indicating that the application has been deleted.

4.11 Automatic recall notification

If a BREW application is recalled and removed by an SMS message, the AppManager must notify the device user that the application has been recalled and removed and ask the device user to acknowledge it.

If a BREW application is recalled and removed when the device user accesses MobileShop, MobileShop notifies the user that the application has been recalled and removed and asks the user to acknowledge it before it displays the catalog.

4.12 AppManager help

The AppManager includes a help tool that explains basic concepts of BREW as well as how common tasks can be performed.

4.13 International language support

AppManager must support all the languages that are supported by the device. If multiple languages are supported by the device, the AppManager automatically uses the current language on the device.

4.14 Handling R-UIM errors

When the Removable User Identity Module (R-UIM) card is used with BREW handsets, application ownership is associated with a unique identifier (International Mobile Subscriber Identifier or IMSI) on hte card, which can be plugged into different devices. The card used to download the application is required to perform the following tasks:

- Start an application
- Restore a disabled application
- Upgrade an application
- Extend the license of an application

Whether the original card is required or not to delete an application is configurable by carriers. If the device user tries to perform these without the original card, a warning message appears.

5 Reference UI Specifications

This section presents information about the UI specifications of the reference AppManager. The purpose of this UI specification is to document the interface design of the reference AppManager so that carriers can clearly specify their customizations. As described in Chapter 3, “BREW AppManager Customization Process” on page 12, QUALCOMM works with each carrier to generate a customization document.

NOTE: The UI flows that appear in this section are schematic diagrams, which do not necessarily represent the exact appearance on the screen. To make the diagrams easy to read, many of the backflows initiated by pressing the clear key are not included. In general, it is assumed that the clear key brings the device user back to the previous screen. Also, the diagrams do not include all the error message dialog boxes.

5.1 Device assumptions

The UI design specifications described in the following sections assume that BREW devices support the following features.

5.1.1 Keypad

The following hardware keys are supported by the BREW device.

- Four directional keys (up, down, left, right)
- Select key
- Clear (back) key
- Send key
- End key
- Standard 12-key phone keypad (0-9, #, *)

5.1.2 Display

The color depth of the display can be monochrome, grayscale (for example, 4-bit), or color, (for example 8-bit, 16-bit).

5.1.3 Fonts

At least three fonts, normal, bold, and large, are supported.

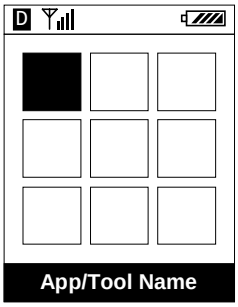
5.2 AppManager Main Menu

The following subsections describe the different layouts for the AppManager's main menu. Three types of menus are available. These views can be turned off as part of factory settings See Section 5.12, “Factory settings” on page 61.

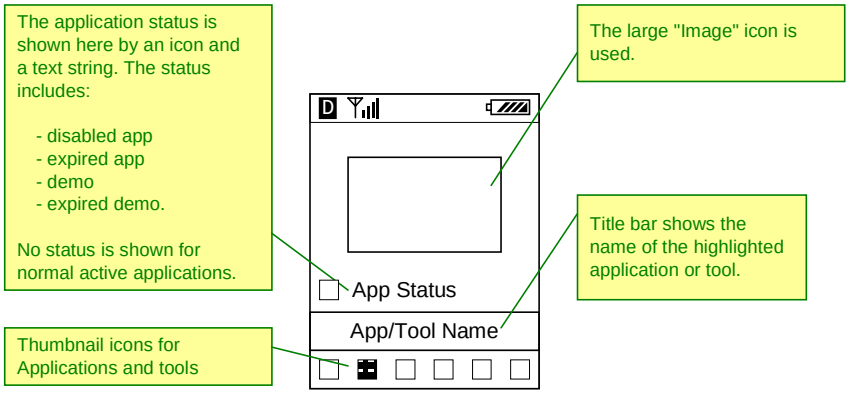
The AppManager allows the device user to switch the main menu's view using a settings tool. See Section 5.6.7, “Main menu style display setting” on page 49.

The main menu includes MobileShop, Settings, Help, and three application folders (categories). It also includes downloaded BREW applications. The device user may move applications from the main menu to application folders by using the settings tool.

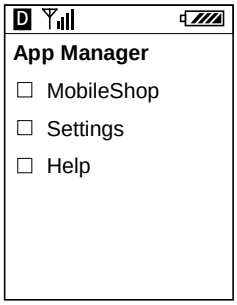
Small icon view (default)



Large icon view



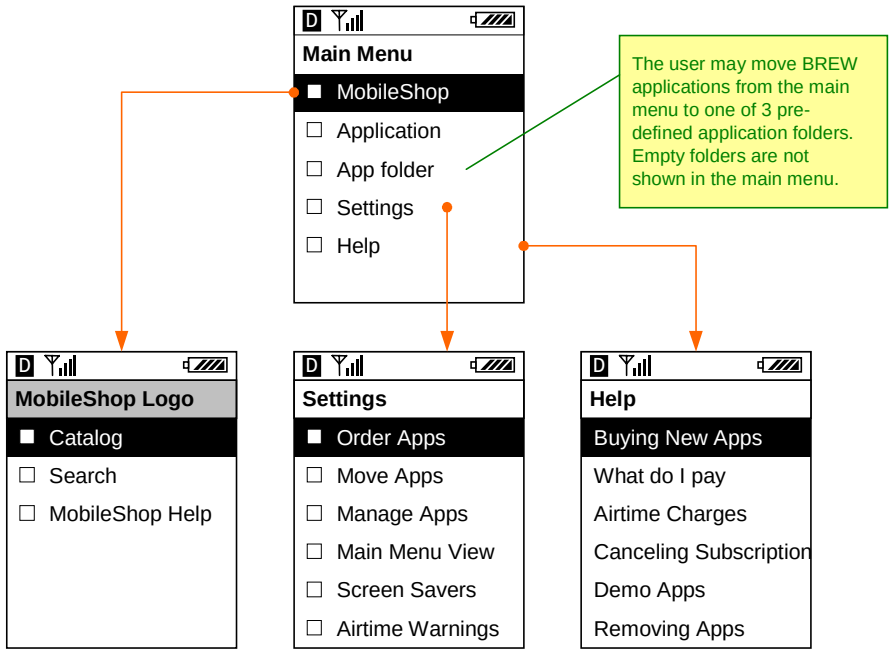
List view



5.3 Top-level UI flows

The following describes the top-level UI flow on device displays.

Main menu flow



5.4 Application launcher

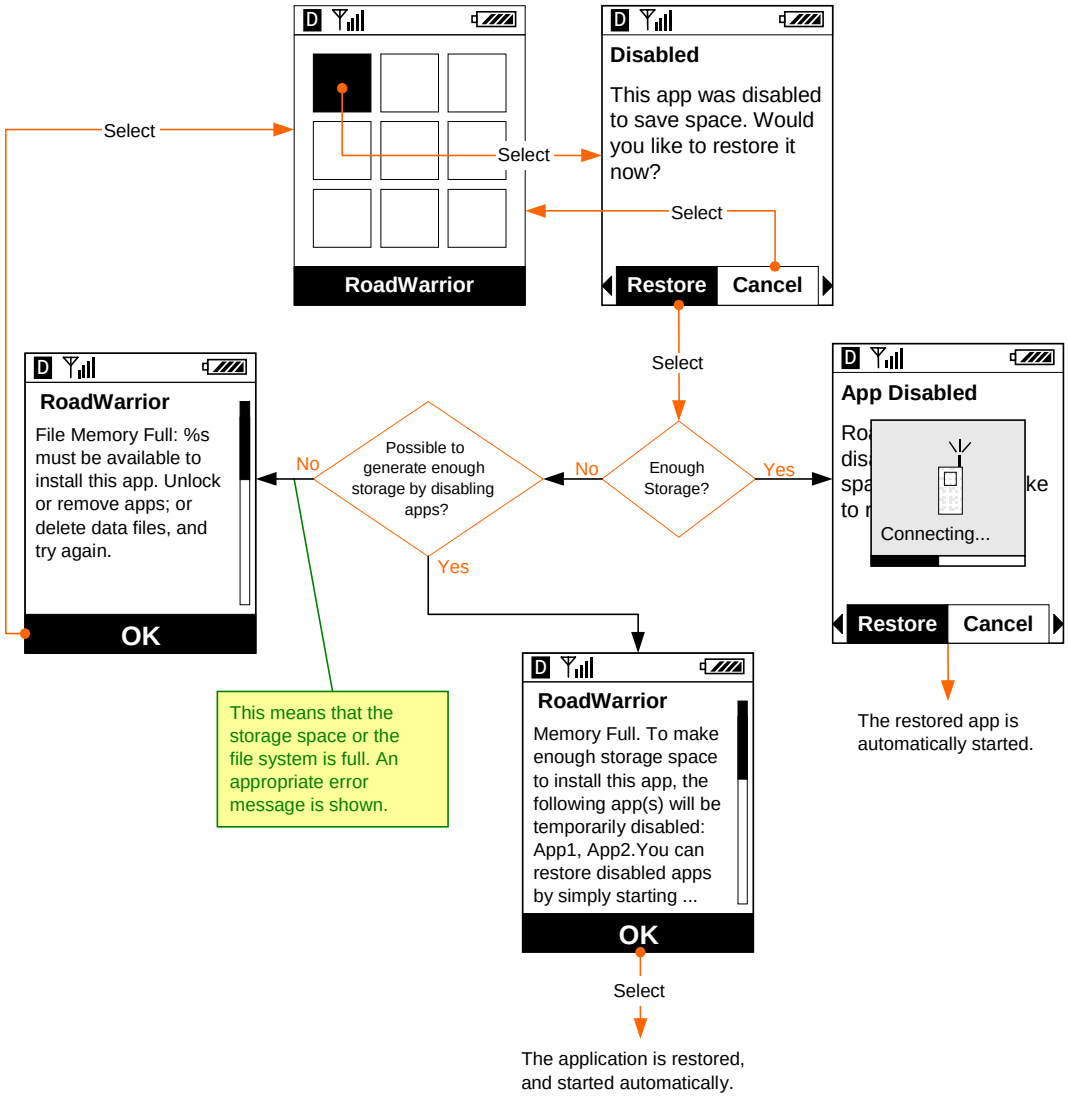
The main menu of AppManager functions as launcher, where the user can start BREW applications. See 5.2 “AppManager Main Menu” on page 29.

By selecting a BREW application from the main menu or from one of the category menus starts the application. However, there are certain cases where the application launcher handles it differently. The following subsections describe those cases.

5.4.1 Handling disabled applications

If the device user tries to launch a disabled application, the application launcher helps the device user to restore the application. The following diagram shows the interaction sequence for restoring disabled applications.

Restoring a disabled application



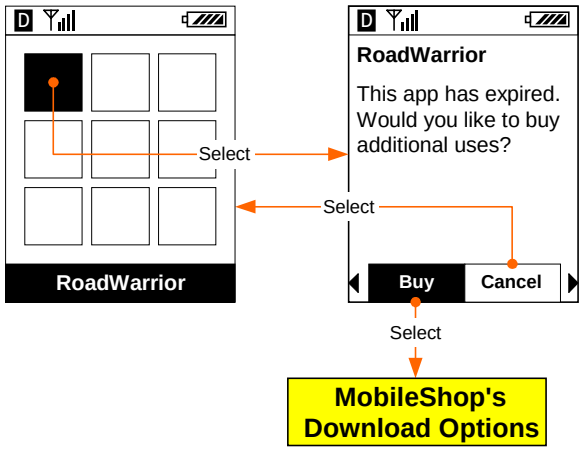
5.4.2 Handling expired applications

If the device user tries to launch an expired application, the application launcher provides the device user with the following options:

- Purchase more uses.
- Do nothing for now (Cancel).

This diagram shows the interface flows for handling an expired application.

Rebuying an expired application



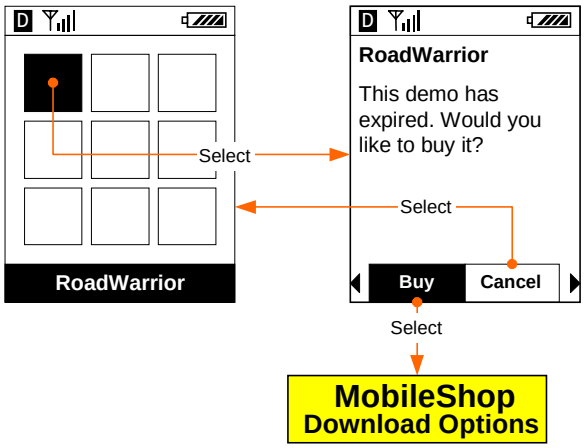
5.4.3 Handling expired demos

If the device user tries to launch an expired demo, the application launcher provides the device user with the following options:

- Purchase more uses.
- Do nothing for now (Cancel).

The following diagram shows the interface flows for handling an expired demo.

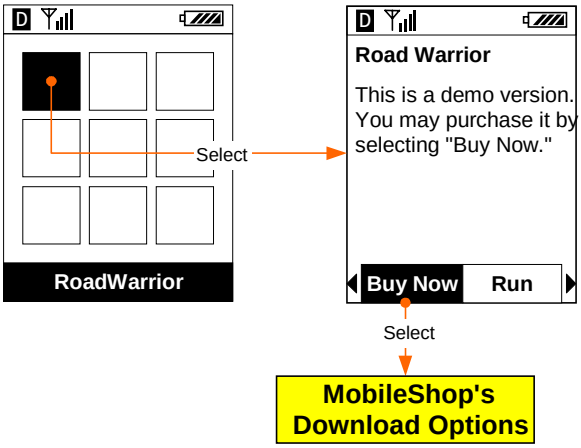
Option to purchase expired demos



5.4.4 Handling demo applications

If the device user tries to launch a demo version that has not expired, the application launcher always provides an option to purchase the application, as shown in the following diagram.

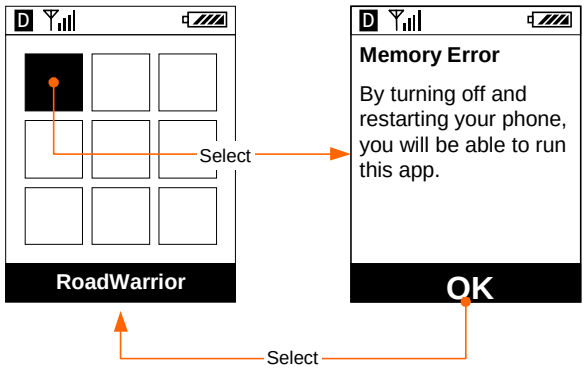
Option to purchase a demo application



5.4.5 Handling RAM limitation

If the device user tries to start an application, but there is not enough RAM to run the application, a warning dialog appears, as shown in the following diagram.

RAM limitation

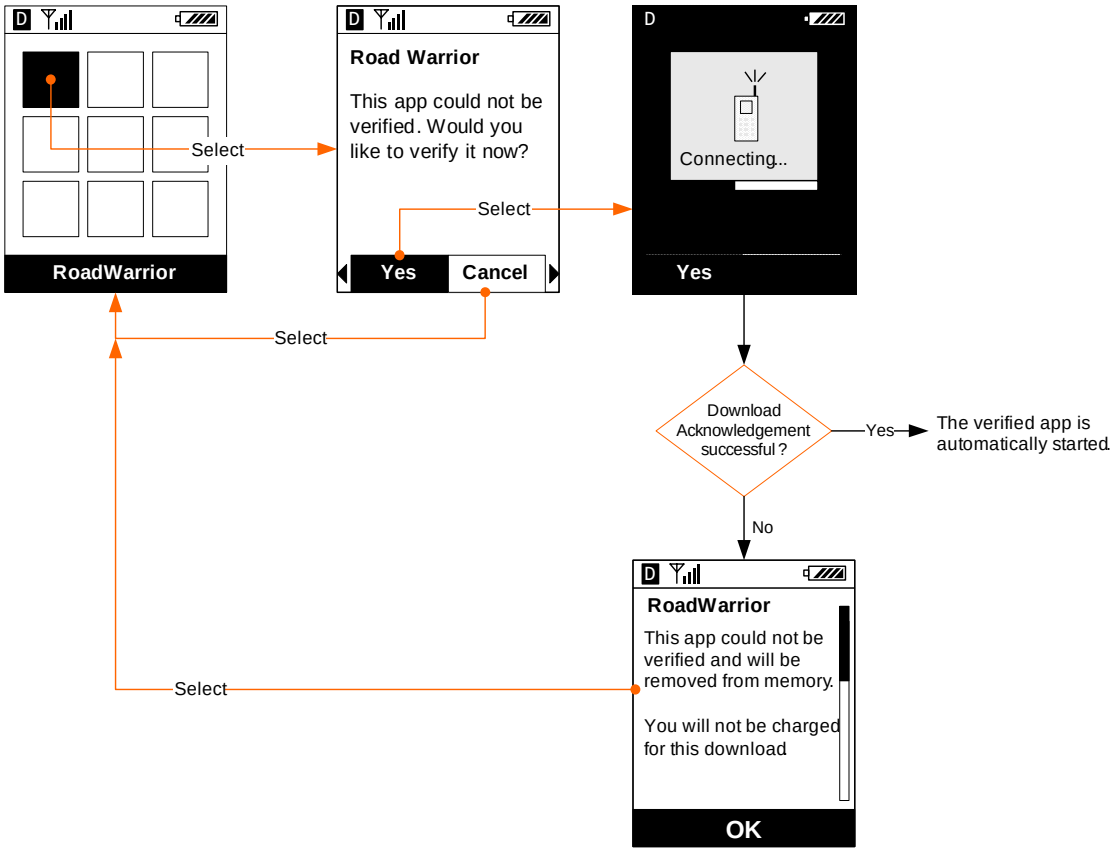


5.4.6 Handling download acknowledgement pending applications

If the user tries to launch an application with a download acknowledgement pending, the application launcher provides the user with an option to verify the application from the ADS.

If the application cannot be verified (download acknowledgement fails), the AppManager removes the application from memory.

The following diagram shows the interface flows for handling an expired demo.



5.5 MobileShop

The following subsections provide information about MobileShop, its functionality, and displays.

5.5.1 Main menu

MobileShop's main menu consists of the following options:

Catalog	The catalog includes multiple categories and applications structured in a hierarchical fashion. A category may include subcategories and applications.
Search	The search tool allows device users to search the catalog using keywords.
MobileShop Help	MobileShop Help explains how MobileShop works.

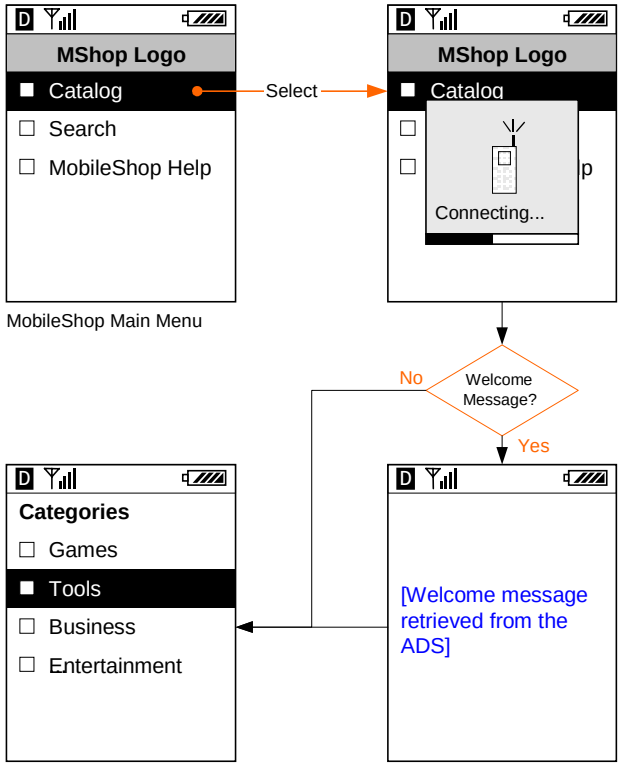
The following diagram is an example of the MobileShop main screen.

MobileShop main menu

5.5.2 Catalog option

The following diagram shows the UI flow after the catalog menu item in the main screen is selected. The top-level categories in the catalog are downloaded and displayed in a menu.

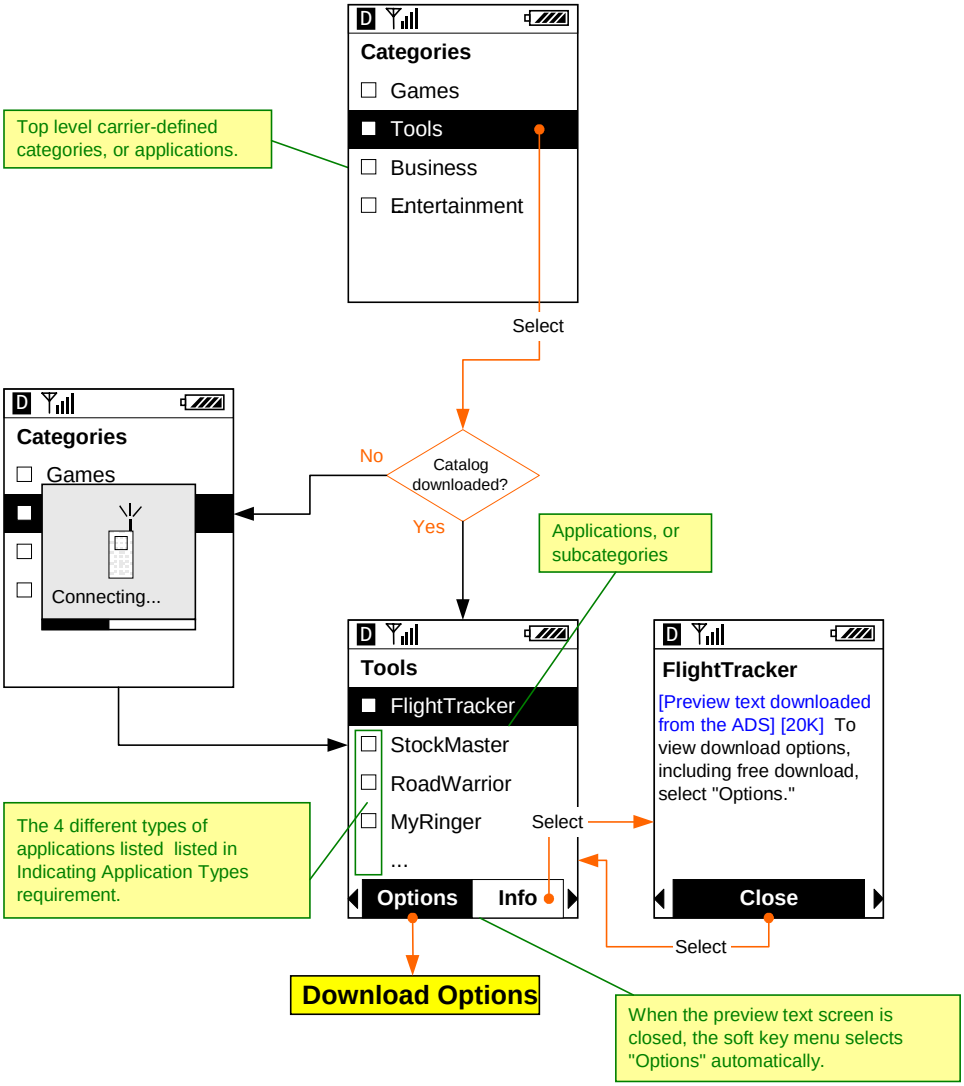
Browsing the catalog



After downloading the top-level categories, the device user can browse the catalog using the UI flow shown in the following diagram.

NOTE: The automatic upgrade features are turned off if the BREW Distribution System's (BDS) version is not 1.2 or higher.

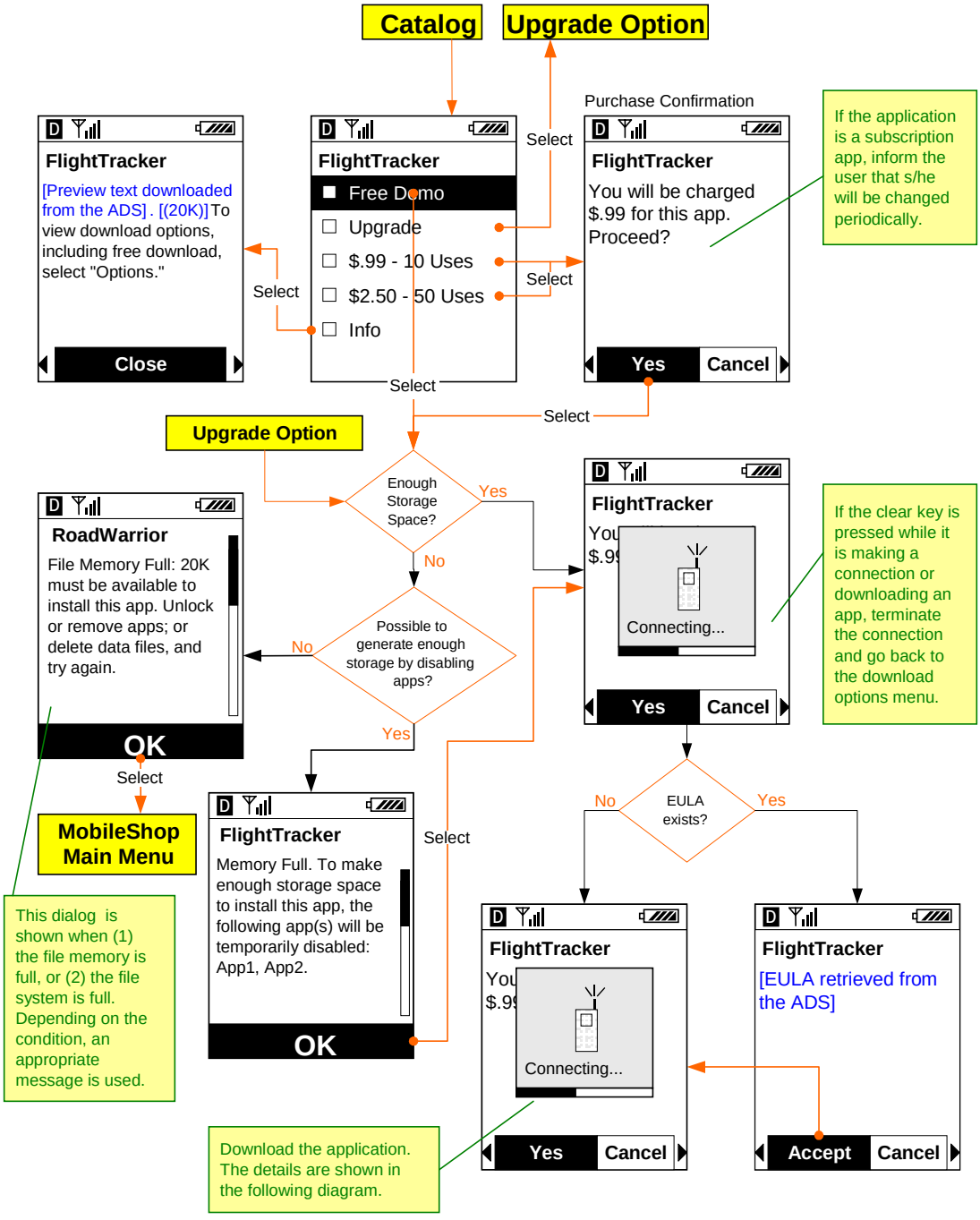
Browsing the catalog (continued)



5.5.3 Download options

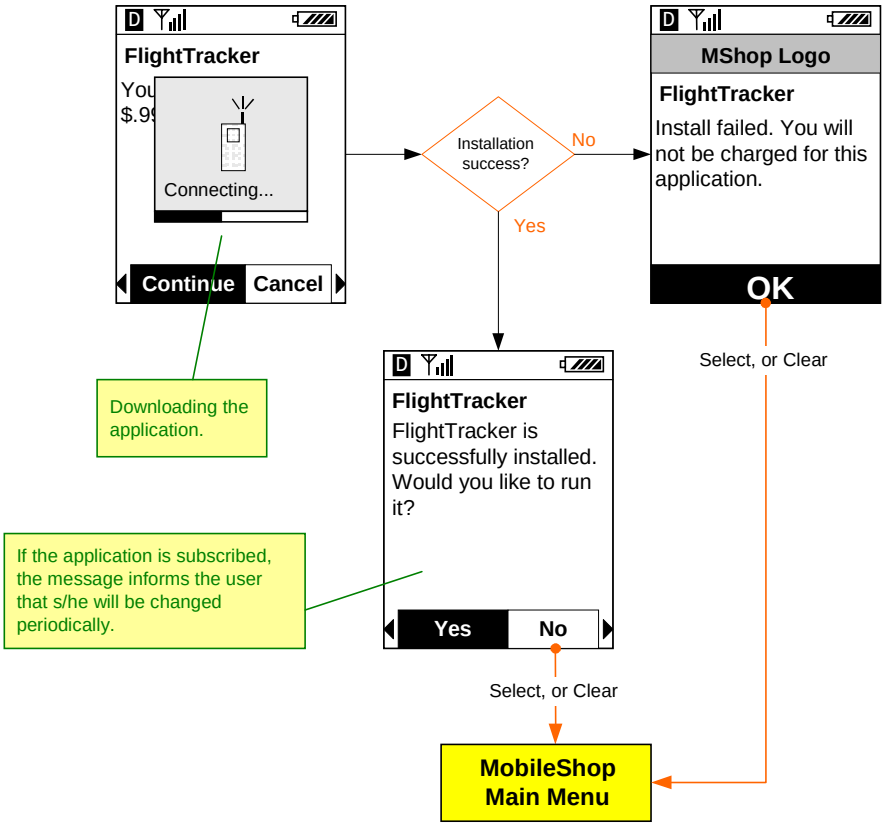
If the device user selects an application in the catalog, MobileShop displays a set of download options. The following diagram shows the UI flow after the download options menu is shown.

Downloading options



The following diagram shows the UI flow after the downloading process starts.

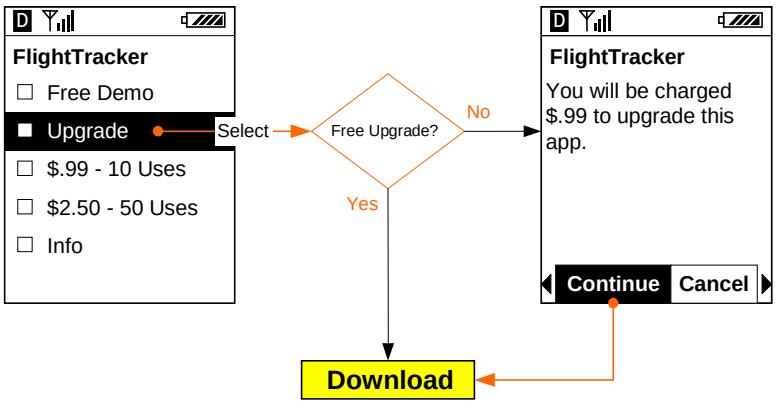
Downloading



5.5.4 Upgrade option

The following diagram shows the UI flow after the device user selects the upgrade option in the download options menu.

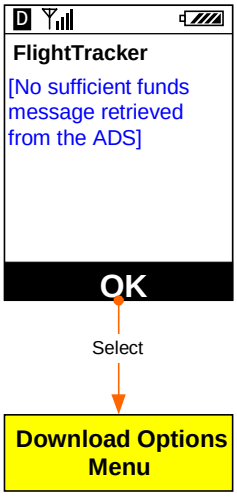
Manual upgrade option



5.5.5 Insufficient funds notification

If the device user has a prepay service, and his or her account does not have enough funds to purchase the application, the following message is shown. Then, the device user is returned to the download options menu.

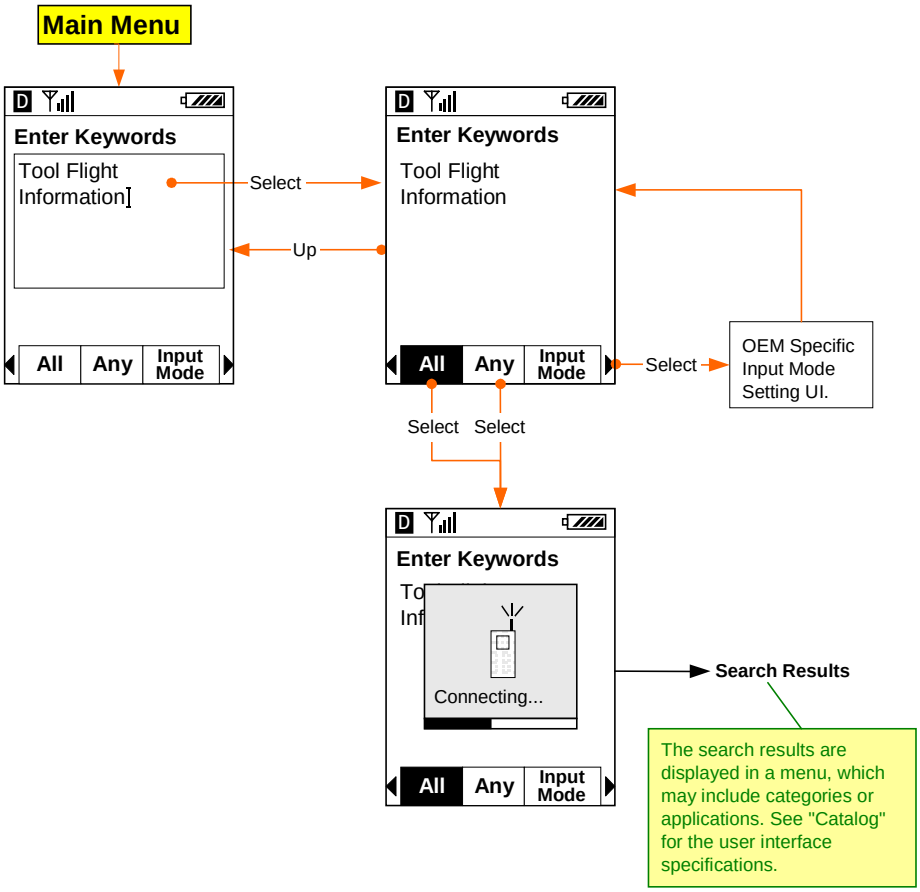
Insufficient funds warning



5.5.6 Search option

If the device user selects the Search option in MobileShop's main menu, MobileShop provides the device user with the following interface to enter keywords and search for desired applications.

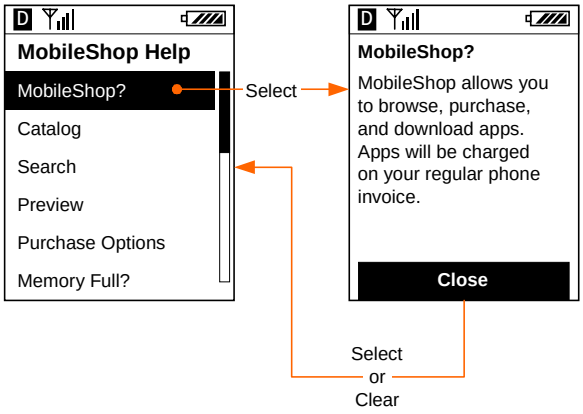
Search tool



5.5.7 MobileShop help

The following diagrams shows the UI flow of MobileShop's help.

MobileShop help



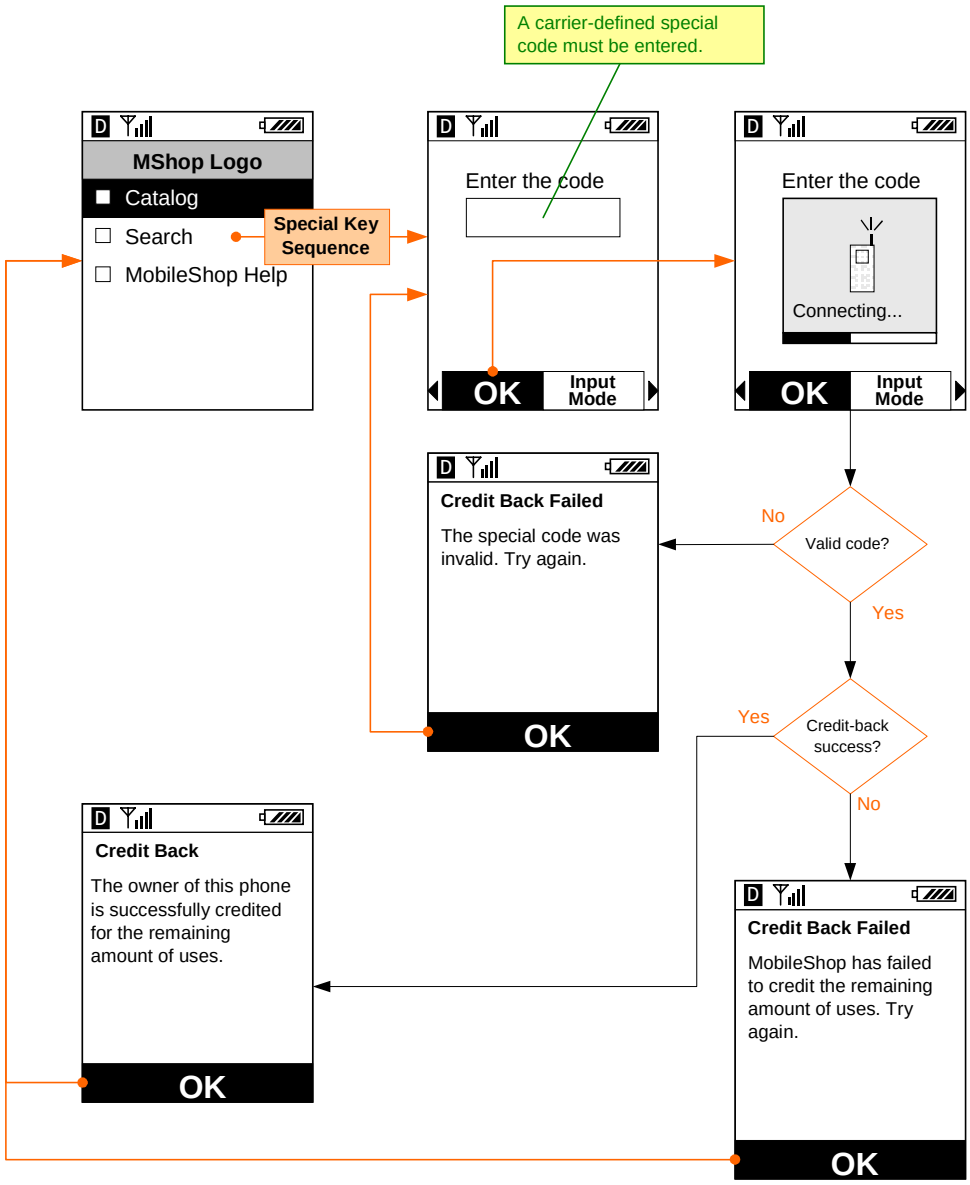
5.5.8 Credit back UI

The credit back interface is used by one of the following types of device users:

- A device user who is guided by the carrier's customer support personnel over the phone; that is, the device user is canceling the service over the phone.

- An employee of the store where the device user is returning the BREW device; that is, the device user is either replacing the device or canceling the service at the store.

Credit back process



NOTE: When the MobileShop server setting is changed, the management log is erased.

5.5.9 UI text retrieved from the ADS

The following table lists the UI text messages that are retrieved from the ADS and displayed in MobileShop.

Text	Source
Catalog's welcome message	Carrier Extranet.
Preview text for each application	Developer Extranet. Can be modified in Carrier extranet.
"No sufficient funds" error message for prepay users	Carrier's system that checks the user's account.
End Device User License Agreement (EULA)	Developer Extranet.
Category names shown in the MobileShop catalog	Carrier Extranet.
Application names shown in the MobileShop catalog	Developer Extranet. Can be modified in Carrier Extranet.
DAP, Price plans, and Price points	Developer Extranet.
Consumer list price	Carrier Extranet.

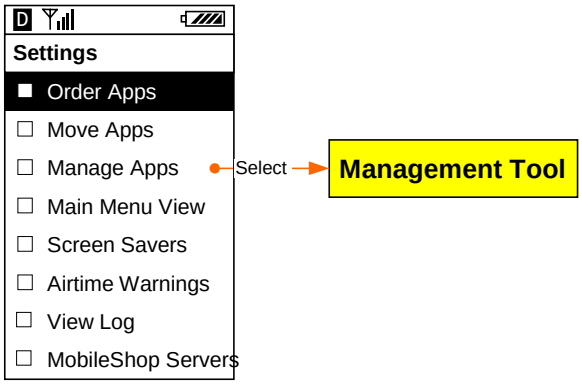
5.6 Settings

The following subsections describe the AppManager settings.

5.6.1 Settings main menu

The following diagram shows the main menu of the settings tool.

Settings tool main menu

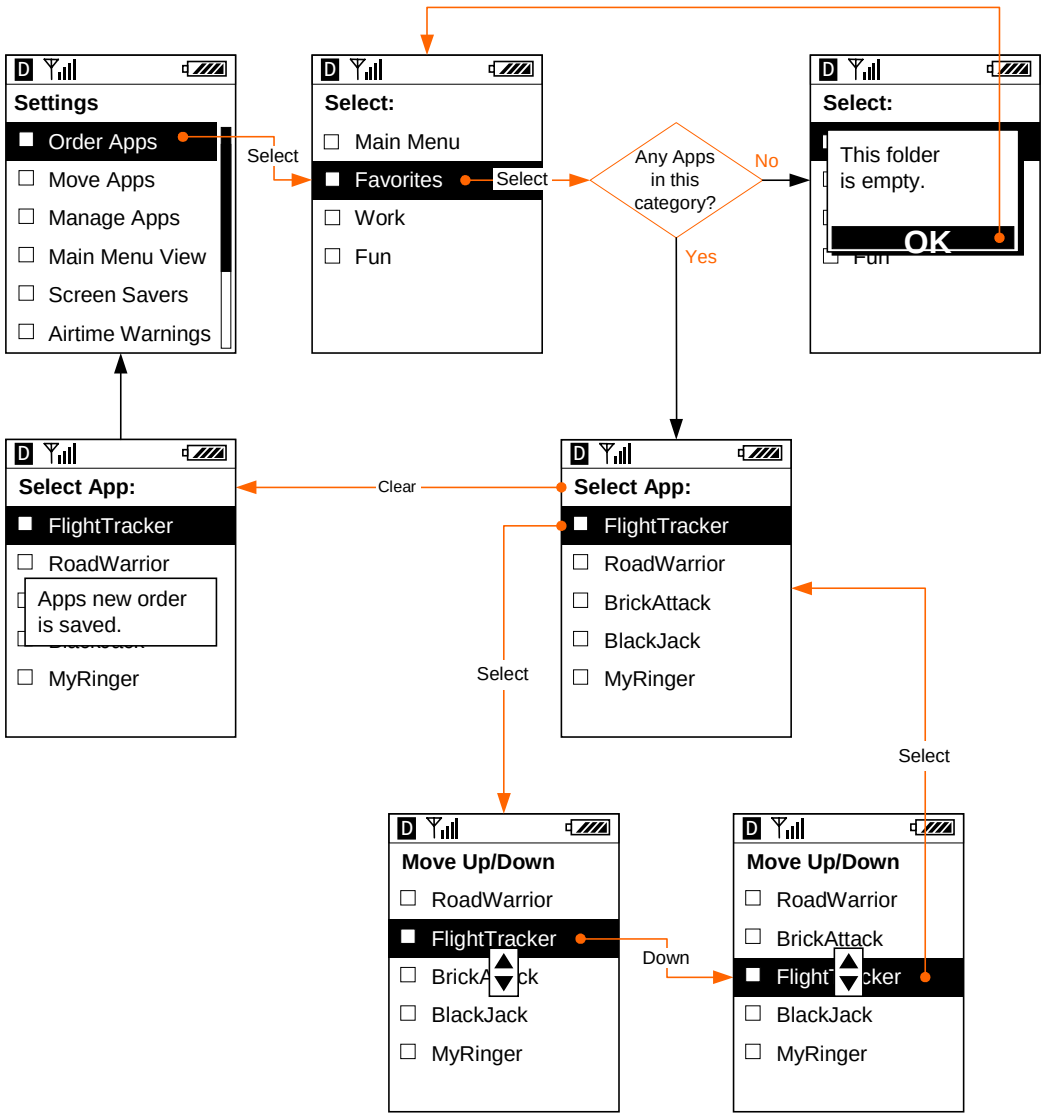


The UI flows for the management tool are shown in “Management tool” on page 52.

5.6.2 Order applications within a category

The following diagram shows the tool that allows device users to change the order of applications in a category menu and the main menu.

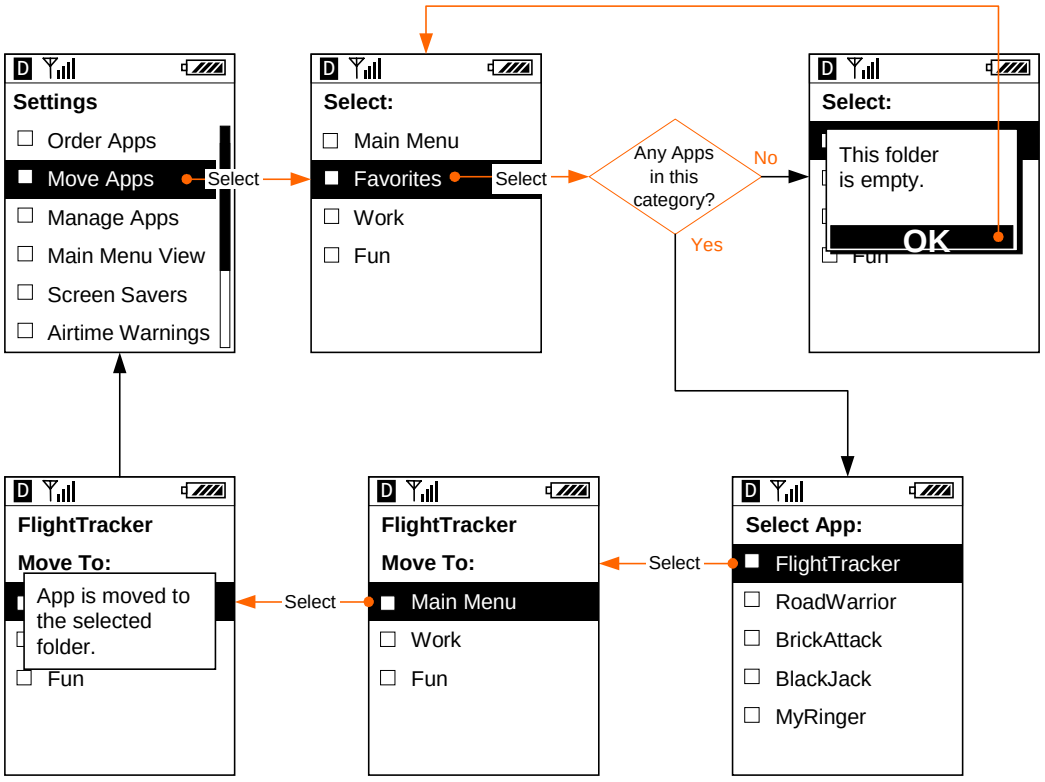
Order applications tool



5.6.3 Move applications across categories

The following diagram shows the tool that allows device users to move applications from one category to another (including the main menu).

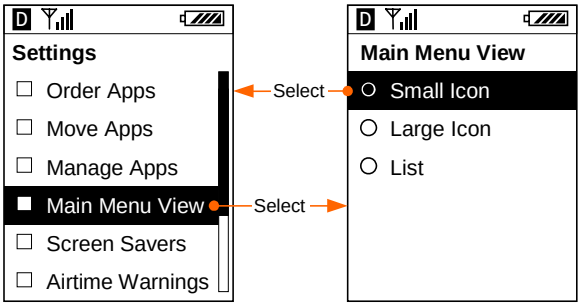
Move application tool



5.6.4 Main menu style display setting

If the simple menu is used, a main menu style setting is provided. The following diagram shows the UI for setting the style of the main menu.

Main menu settings tool

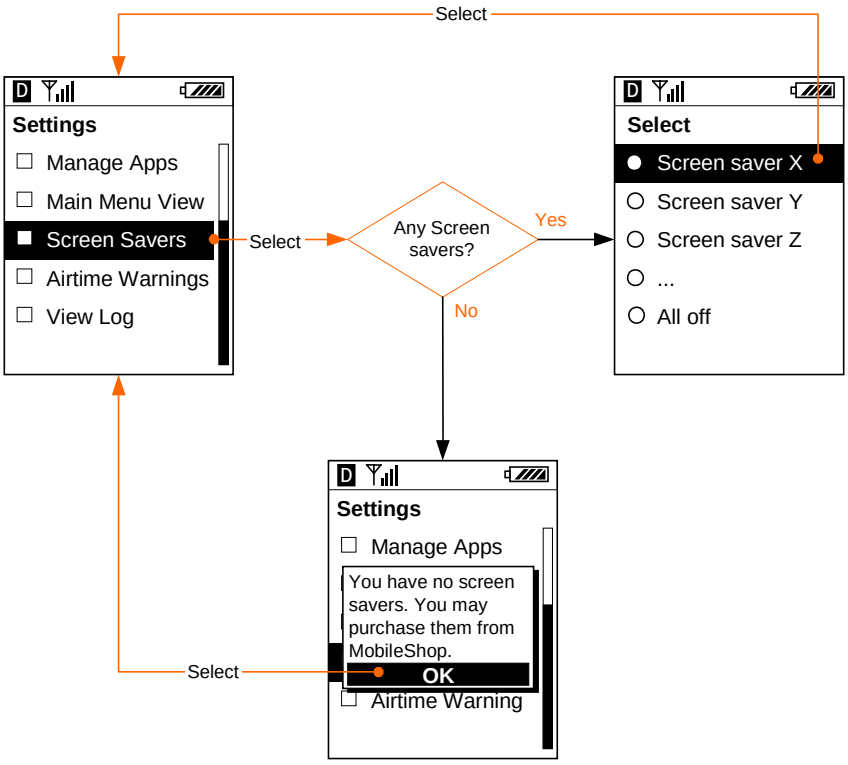


See “AppManager Main Menu” on page 29 for the details on the menu styles.

5.6.5 Screen saver setting

The following diagram shows the UI for selecting or turning off the current screen saver.

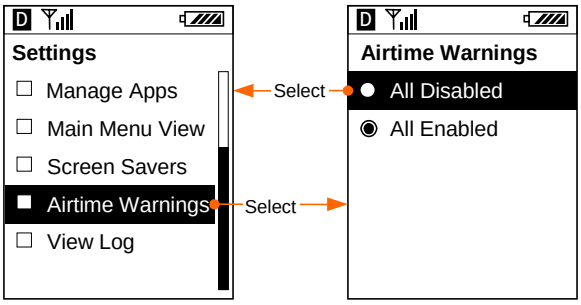
Screen saver setting tool



5.6.6 Airtime warning setting

The following diagram shows the UI flow for enabling and disabling airtime warnings.

Airtime warning setting (enabling and disabling)

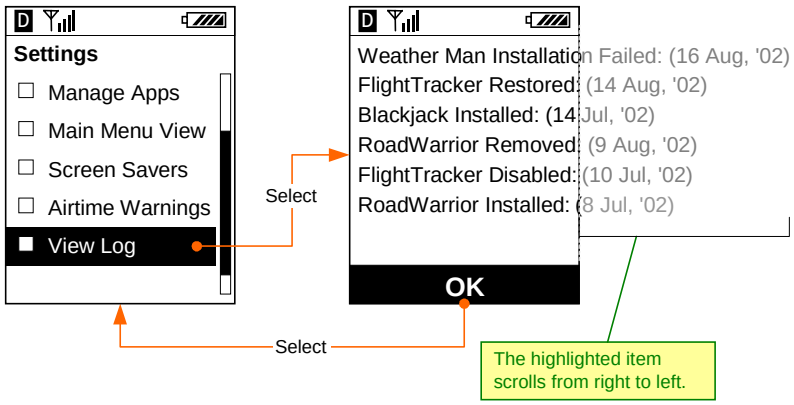


NOTE: Use the configuration setting is both device-dependent and carrier-dependent. Contact QUALCOMM to determine if the Configure menu item needs to be used for the device.

5.6.7 Management log tool

The following diagram shows the tool that displays the log.

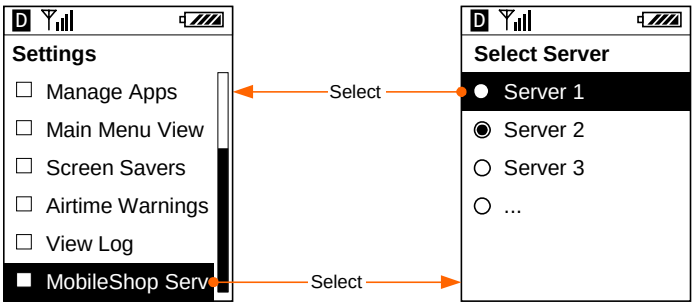
Management log tool process



5.6.8 MobileShop server setting

The following diagram shows the UI for setting the current MobileShop server.

MobileShop server selection tool



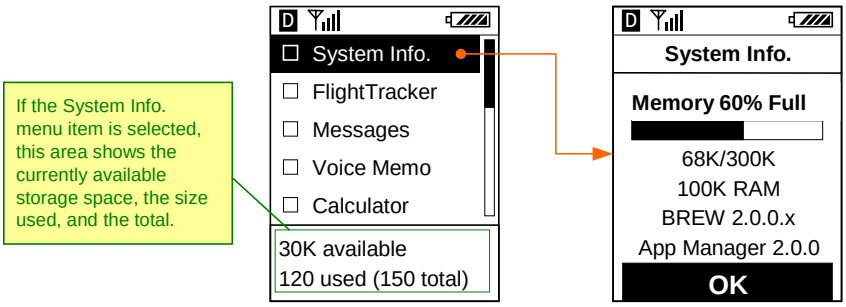
5.7 Management tool

The management tool is included in the Settings menu. See “Settings” on page 45. It includes various utilities that help device users manage BREW applications. The following subsections describe the UI specifications.

5.7.1 System information

The following diagram shows the main UI screen with System Info selected.

Application management main menu

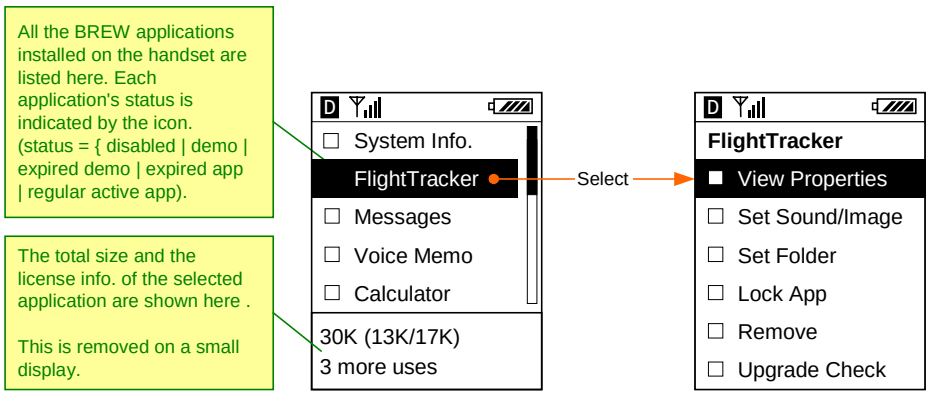


5.7.2 Application management

The remaining option on the menu includes all downloaded BREW applications installed on the device.

NOTE: The upgrade check feature is removed from the menu if the BDS’s version is not 1.2. or higher.

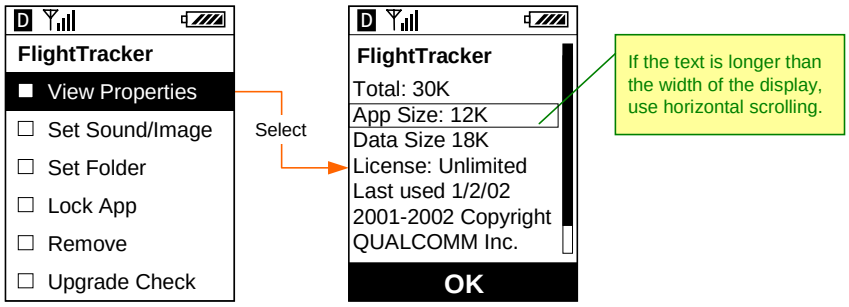
Application management process



5.7.3 View properties option

The following diagram shows how the application properties are displayed.

View application properties



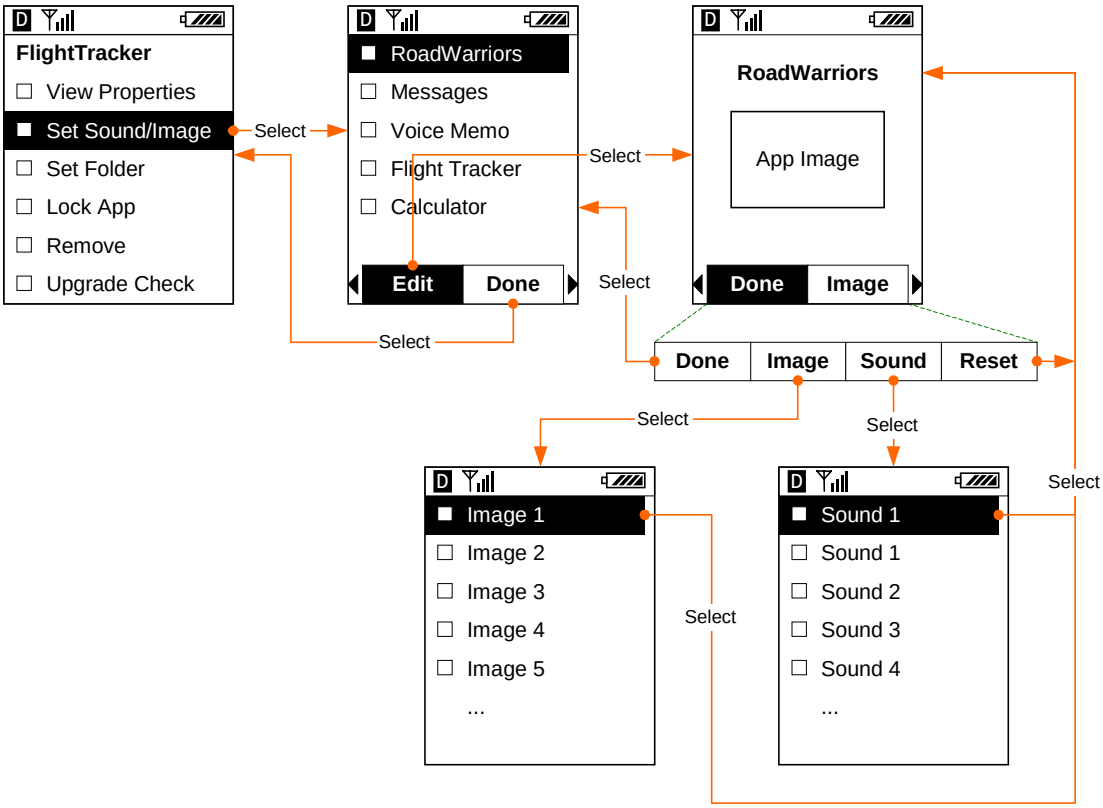
The application properties are displayed in the following order:

- Total application size
- App size
- Data size
- License information
- Date of last use
- Copyright
- Developer name
- Version number
- Application status
  - If the application is a disabled app, a demo app, expired demo app, or expired app, show the status. If the application is a normal active app, show nothing here.

5.7.4 Sound and image configuration

The following UI flow shows how the image and sound can be associated with BREW applications using the configure image/sound tool.

Application launch to set image and sound files

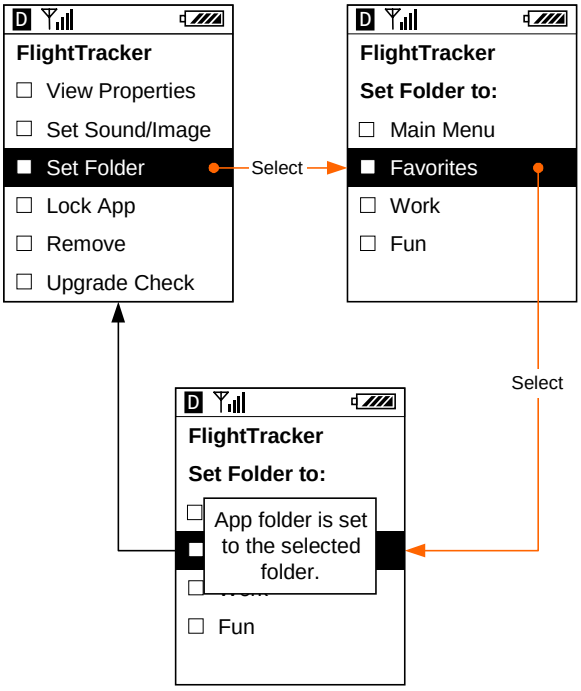


NOTE: Use the configuration setting is both device-dependent and carrier-dependent. Contact QUALCOMM to determine if the Configure menu item needs to be used for the device.

5.7.5 Set Folder option

The following diagram shows the UI that allows the device users to assign a folder to an application.

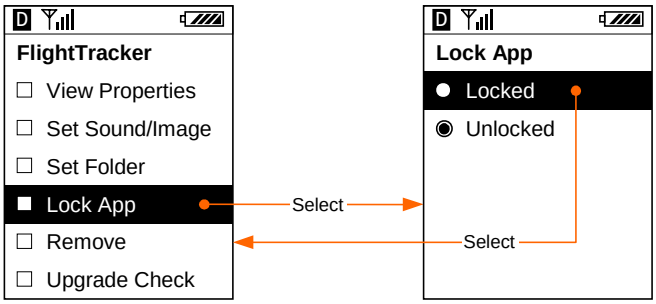
Folder setting tool



5.7.6 Lock/unlock option

The following diagram shows the UI flows for locking and unlocking an application.

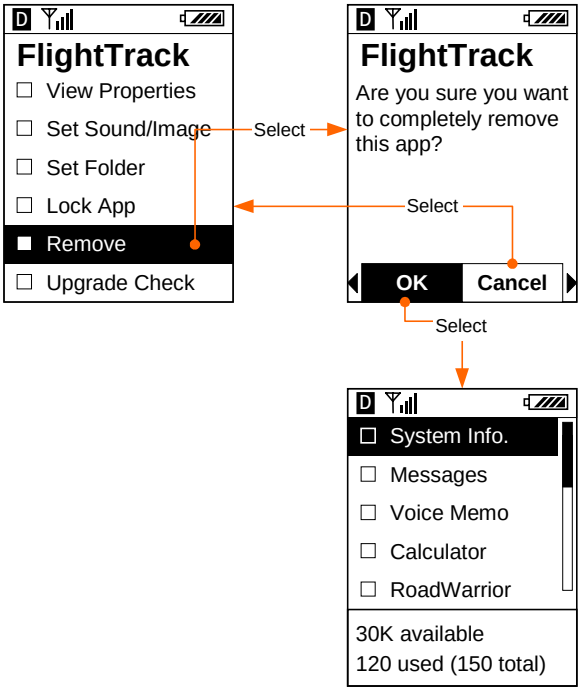
Lock/Unlock option



5.7.7 Remove applications and cancel subscription options

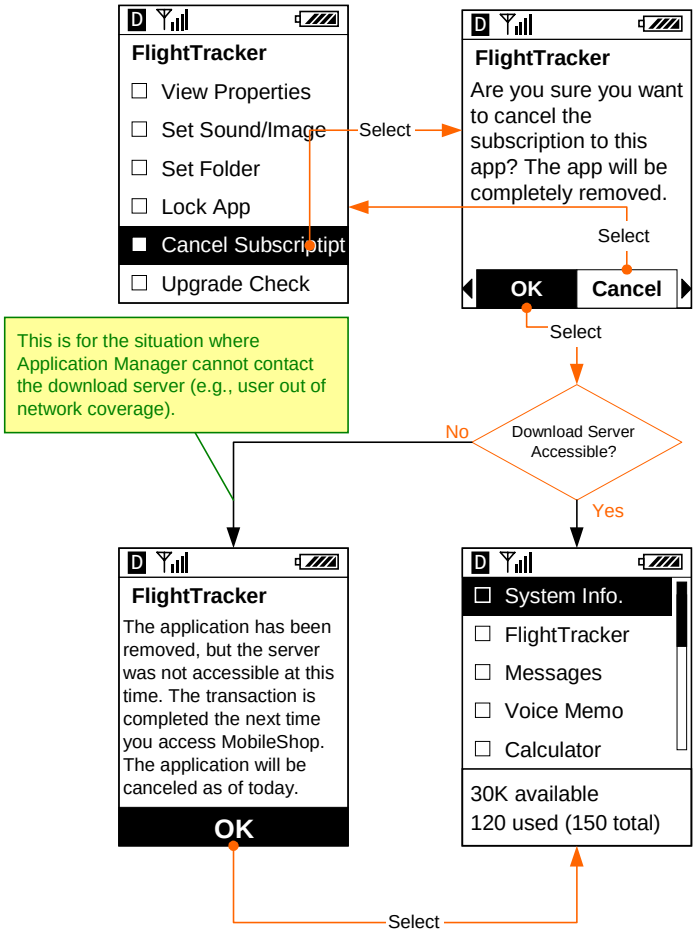
The following diagram shows the UI flow for removing applications that are not subscribed to.

Remove an application



The following diagram shows the UI flow for canceling applications that are subscribed.

Cancel a subscription application

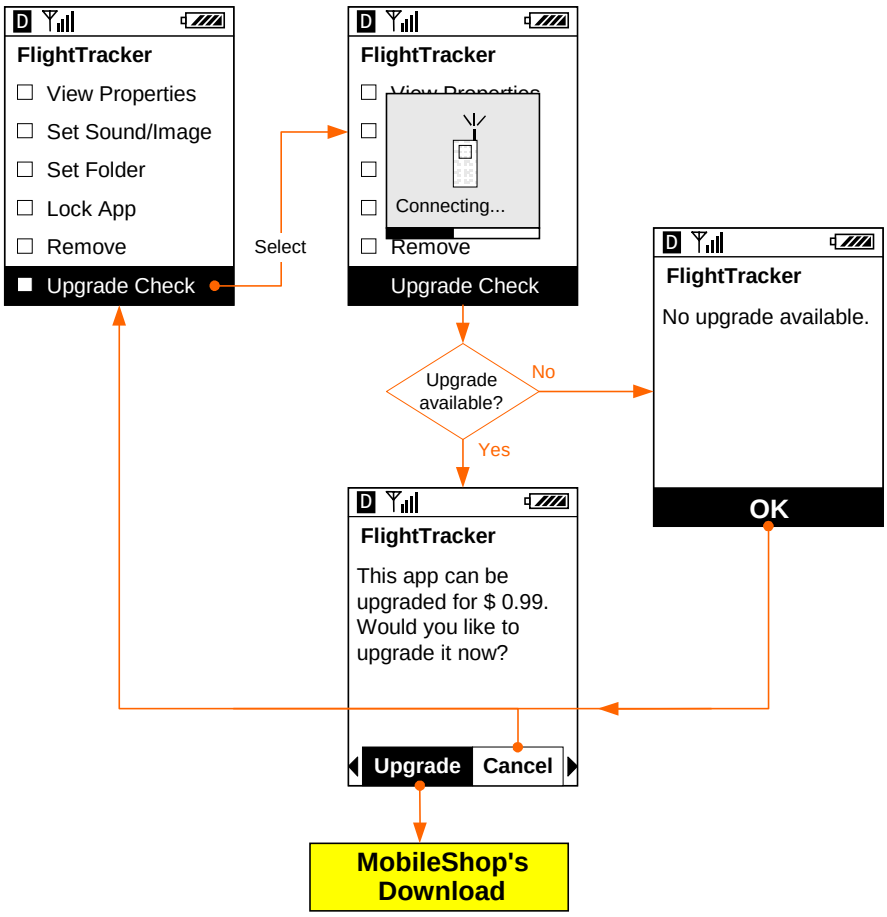


5.7.8 Manual upgrade check

The following diagram shows the device user interaction flows for upgrade checking.

NOTE: This feature is removed from the menu if the BDS's version is not 1.2 or higher.

Upgrade check tool



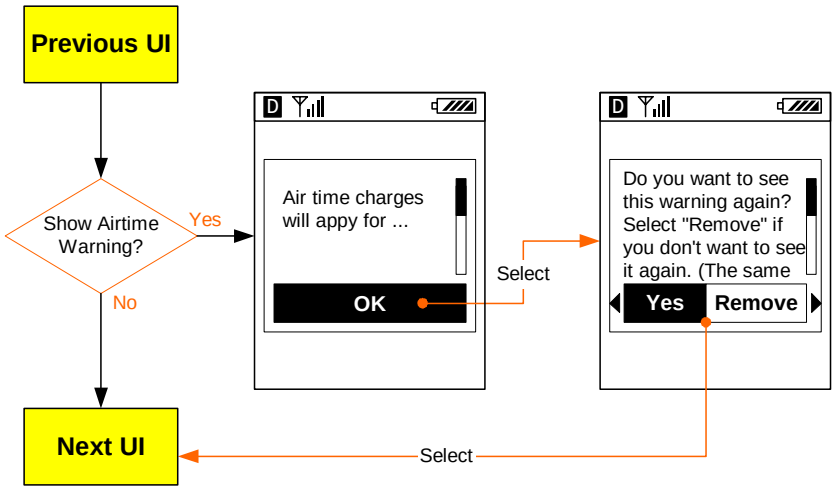
5.8 Airtime charge warning

The carrier may choose to display a warning dialog for airtime usage when the device user does the following:

- Attempts to make the connection to the download server (one warning per MobileShop use).
- Checks upgrade availabilities manually.
- Launches the AppManager.
- Launches a network application.

The following diagram shows the generic airtime warning used in the conditions listed above. As part of the factory settings, the airtime charge warning can be turned on or off.

Airtime charge warning



5.9 Generic error and warning prompt

In general, error and warning messages appear in the dialog box shown in the following diagram.

Generic error message dialog

Error messages overlap with margins outside each edge of the screen. The size of the error dialog box is specified proportional to the device screen size as part of factory settings. The default is 75%.

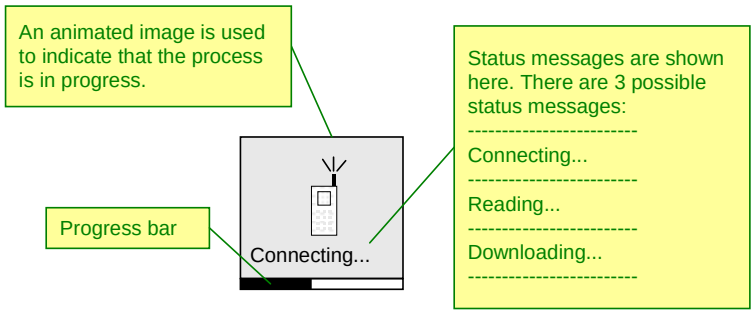
If the screen size is too small to use margins, the following full screen dialog boxes may be used by setting the dialog size to be 100% of the device display size.

Full screen dialog box for small displays

5.10 Generic progress display

The following is the schematic design of the progress display used in this document. The animation used in the progress display can be customized.

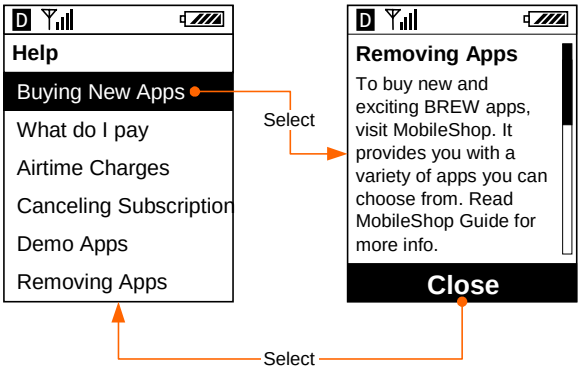
Download progress display



5.11 AppManager Help tool

The help tool has two layers. The first level is the main menu that shows the help topics. The second level shows the help content for the chosen topic.

Help topic and content



5.12 Factory settings

The following is a list of features that can be turned on/off without modifying the logic in the source code:

- The airtime warning can be turned on or off (per airtime warning).
- The size of the area to use for an error or warning dialog box.
- Keypress sequence to start the credit back user interface. The default is 11111111 (eight number ones).
- Sound configuration tool (on or off)
- Image configuration tool (on or off)
- Directory where sound files for the sound configuration tool are stored.
- Directory where image files for the image configuration tool are stored.
- Default main menu style (Small icon view, Large icon view, or List view)
- Testing mode (MobileShop Server settings—on or off).
- Screen saver support (on or off)

- Default settings for BDS dependent features. These settings are used only before MobileShop makes the initial connection to the download server.
  - MobileShop's search feature (on or off)
  - Upgrade checking feature (on or off)
- Small screen support (on or off). If a device is designated as small screen device, the large icon view uses icons (26x26) instead of an image and application size. Preview found in settings -> manage apps will not display.

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