

# CHAPTER 7 POCKET BROWSER

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## Introduction

This feature-rich, mobile application development tool is designed to allow Web developers to rapidly create robust mobile applications that can include a wide range of advanced data capture capabilities. Whether you want to streamline your warehouse, delivery or service operations, or enable more robust asset tracking or visibility, Pocket Browser will help you get your enterprise mobility solution up and running faster — and more cost efficiently.

The Pocket Browser Developer Help provides detailed information about how to use each feature of the browser. Each feature includes a sample for you to use, however, please be aware that the sample does not necessarily show the only way to implement each feature.

Pocket Browser enables developers and integrators to provide advanced Web-based solutions to select Microsoft® Windows Mobile and Windows CE mobile computers. PocketBrowser makes the most of enterprise-level applications while speeding up development time and reducing costs. With it, making the transition to web-based solutions is now fast, easy and affordable - especially in high-volume mobile environments.

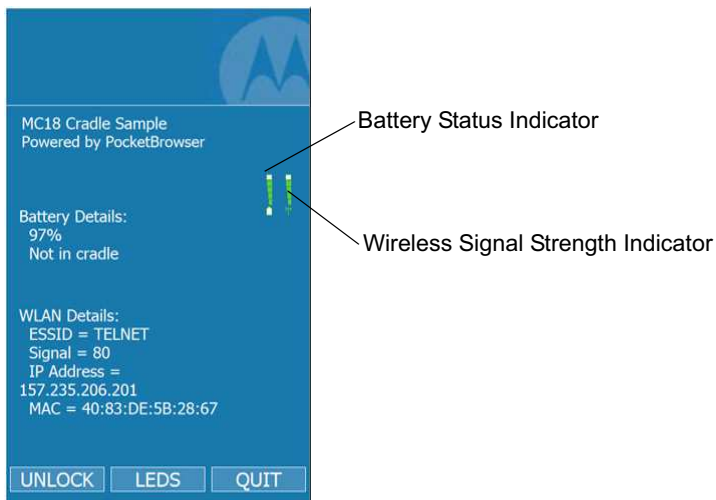
Pocket Browser is a software tool that extends the core rendering engine functionality of Microsoft PocketIE or Microsoft IE with Symbol Technologies application programming interfaces (APIs). It provides interfaces to the MC18 hardware and features using meta tags and Microsoft ActiveX® components designed specifically for Symbol Technologies systems. Pocket Browser offers easy integration with bar code scanners, RFID readers and other peripherals such as printers and magnetic stripe readers (MSR) for complete transaction processing.

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## Sample Application

The MC18 comes with a sample PocketBrowser v 3.1.0 applications factory-installed. The sample application is accessible from the **Programs** menu.

To start PocketBrowser, select **Start > Programs > Pocket Browser**. The PocketBrowser window appears.



**Figure 7-1** Sample PocketBrowser Screen

The sample PocketBrowser provides the following information:

- Battery level status bars
- WLAN signal strength status bars
- Battery Details:
  - Battery strength in percentage
  - Battery change / no charge status
- WLAN details:
  - ESSID name
  - Signal
  - IP Address of the MC18
  - MAC address of the MC18

The three buttons at the bottom of the screen:

- UNLOCK/LOCK - Unlocks and locks the MC18 into the cradle
- LEDS - Illuminates the cradle LEDs
- QUIT - Exits the sample PocketBrowser application

## Configuring the Pocket Browser

The information on the Pocket Browser startup page can be configured by changing the Config.xml file (from the MC18 root directory, select **Program Files > PocketBrowser > Config > Config.xml**). Before launching the Pocket Browser for configuration, the MC18 must be connected to a network.

# CHAPTER 8 CRADLE INSTALLATION

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## Introduction

A system is comprised of a family of hardware devices interconnected through a WLAN radio backbone to the retail establishment's server(s). The hardware devices are the MC18 mobile computers, single-slot or three slot cradles, power supplies and cables. A *dispenser* typically refers to a piece of furniture which has mounted to it the cradles, their power supplies, and cables.

Customers (retail establishments) design their own dispensers to meet their particular floor space and display requirements. The information in this chapter should help a customer to design a dispenser and to understand the installation requirements.

✓ **IMPORTANT** The MC18 cradles are NOT compatible with MC17 cradles and the MC17 cradles are NOT compatible with MC18 cradles.

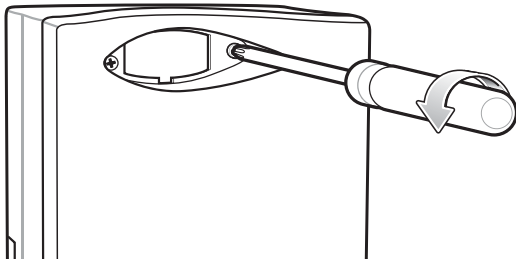
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## Installation of the Single-Slot Cradle

### Removing the Front Cover

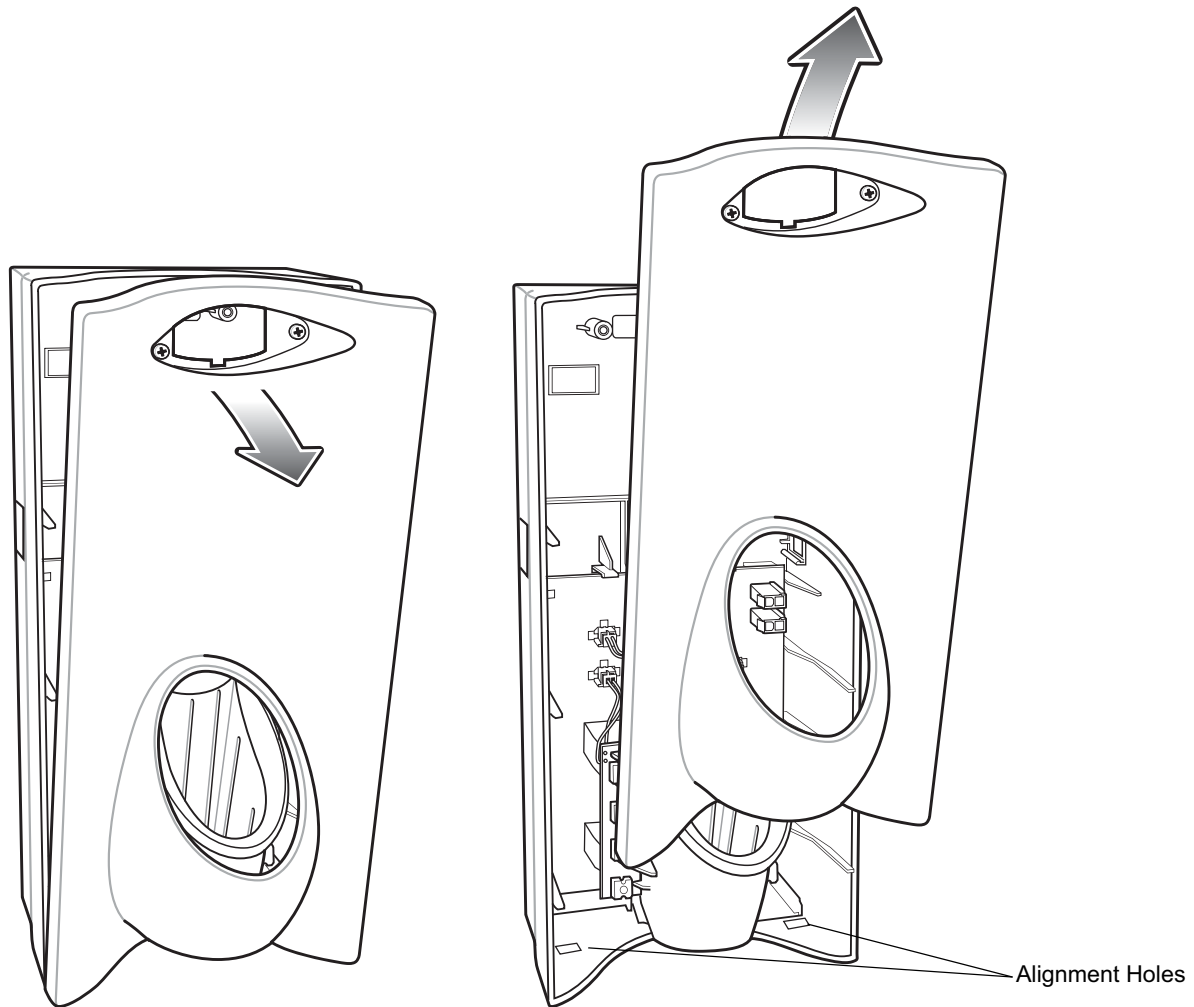
Use this procedure to remove the front cover:

1. Loosen two captive screws securing the front cover to the base.



**Figure 8-1** Remove Screws

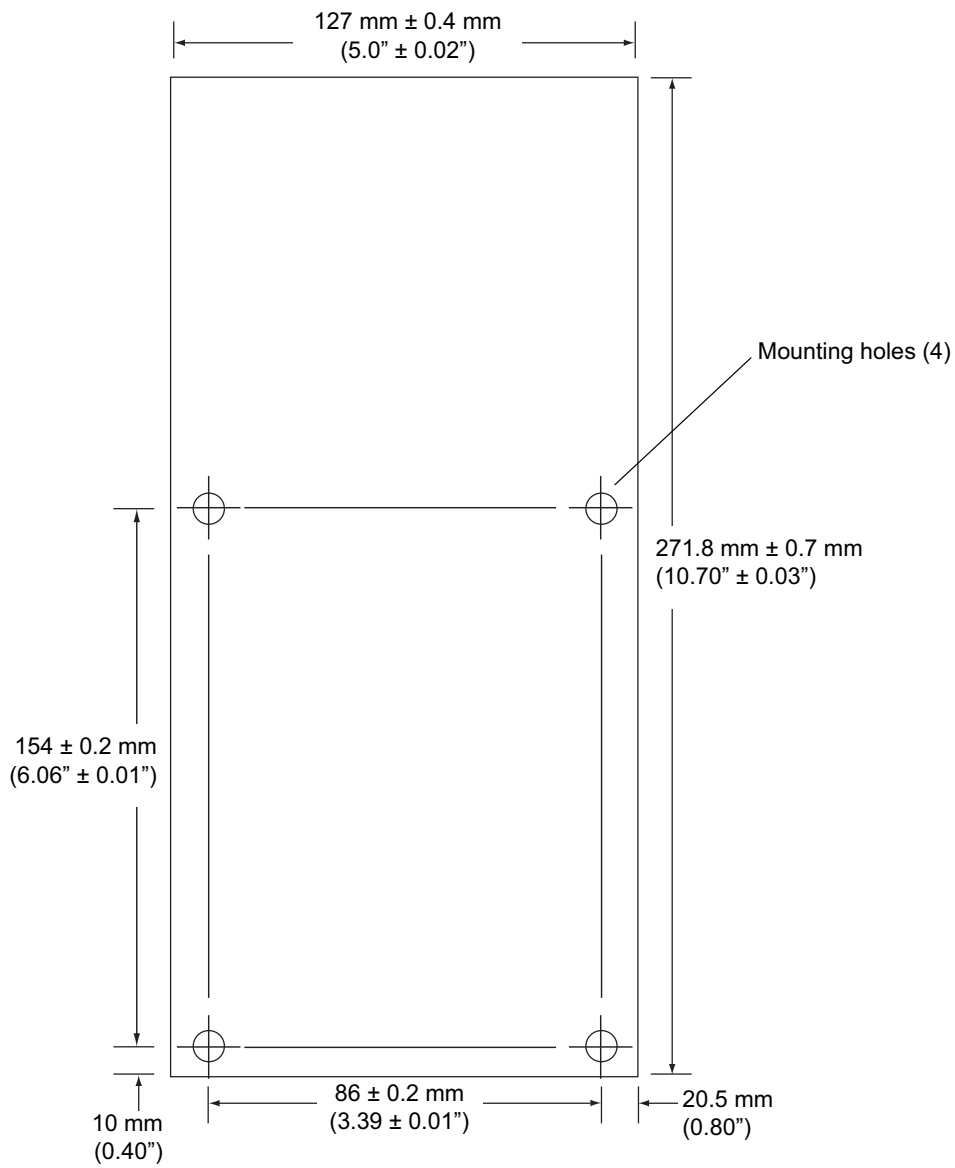
2. Pull front cover away from base and then lift out of the base.



**Figure 8-2** Cover Removal

## Mounting the Cradle

The charge cradle contains mounting holes in the back housing so that it can be bolted to supporting furniture. In addition, it comes with plugs and a variety of cable routing outlets. Cable outlets not used can be concealed with the plugs provided. [Figure 8-3](#) provide the information required to design correct mounting holes for the charge cradles.



**Figure 8-3** Cradle Mounting Template

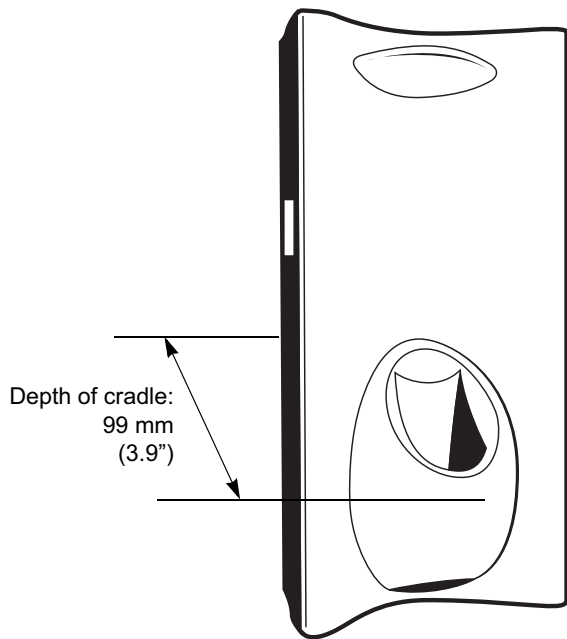


Figure 8-4 Overall Depth of Cradle

## Wiring

✓ **NOTE** During installation ensure all interconnect cables are fully enclosed within the power supply or cradle enclosure.

1. Install power supply, including AC line cord and power cable, into Decorative Housing.

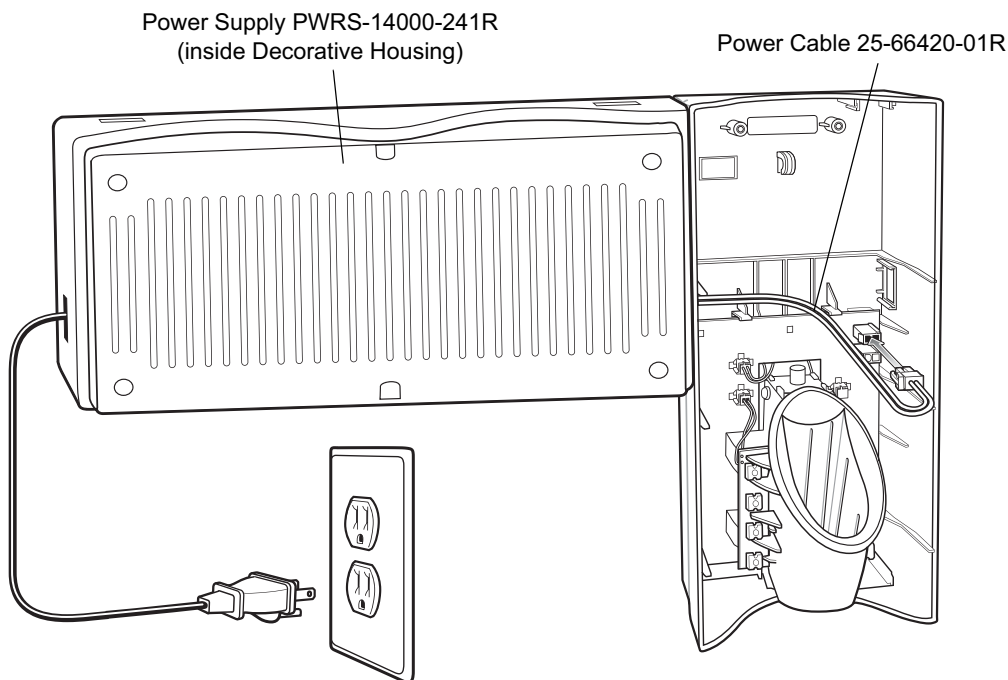
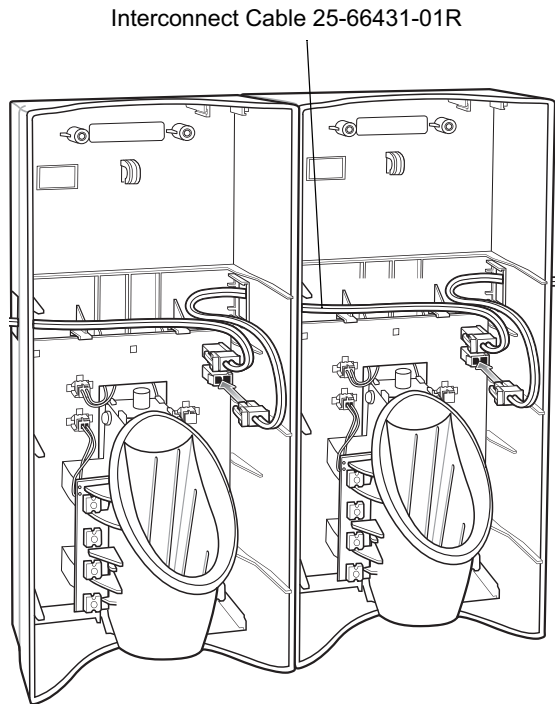


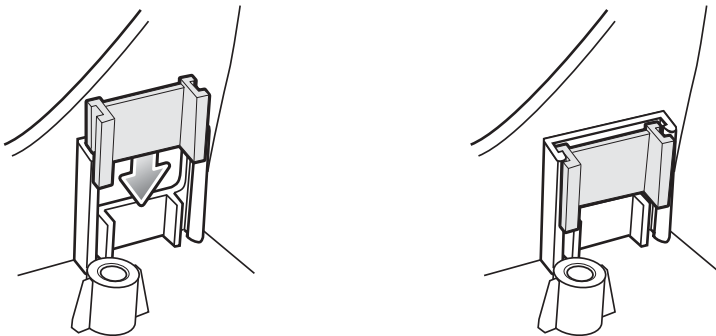
Figure 8-5 Connecting Power Supply

2. Insert power cable through a cable outlet of cradle back housing.
3. Plug connector into power connector on printed circuit board.
4. If more than one cradle, connect the interconnect cable from the first cradle to the second cradle.



**Figure 8-6** *Daisy-Chaining Cradles*

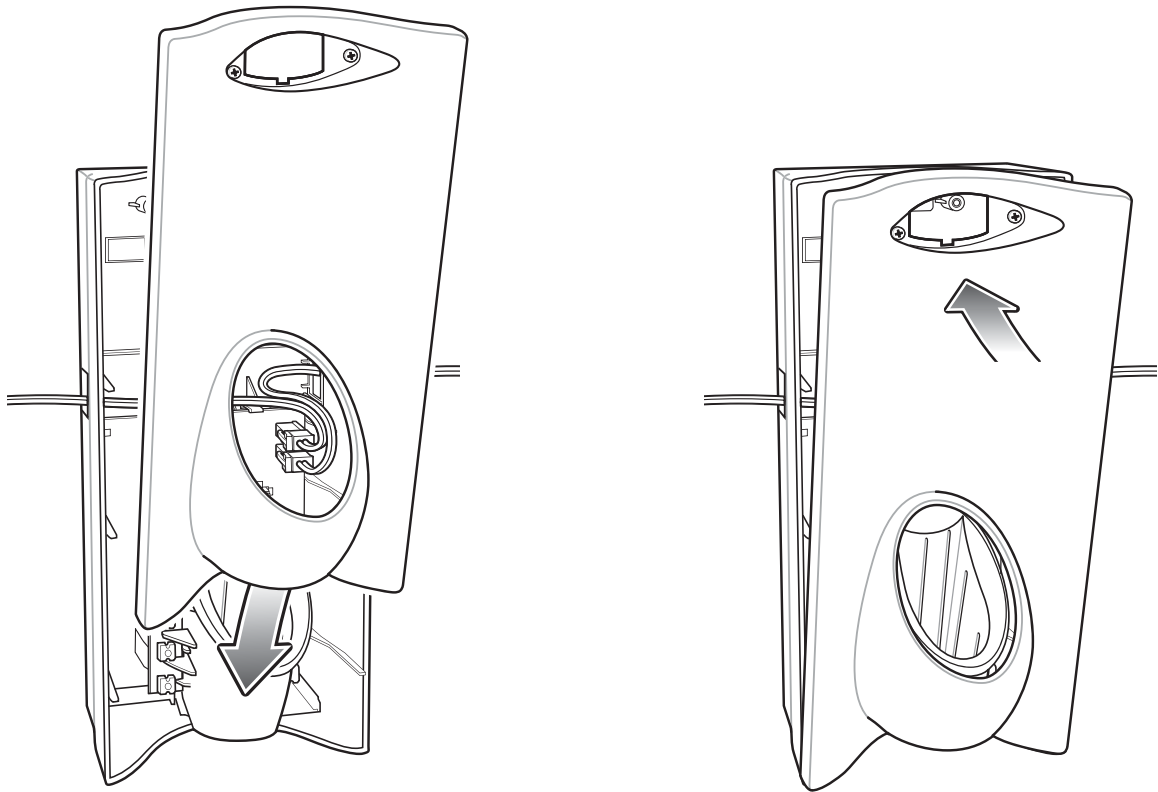
5. Use plugs to cover un-used cable outlets.



**Figure 8-7** *Cable Hole Plug Installation*

## Assembly

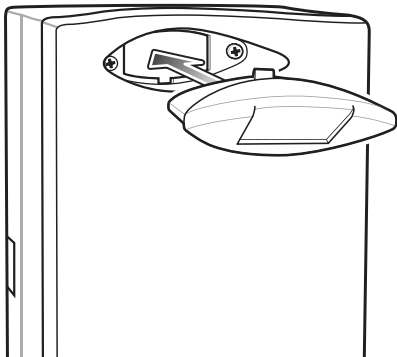
1. Replace cover.
2. Secure cover with screws.



**Figure 8-8** *Replace Cover*

✓ **NOTE** Do not install the target cover until you are sure that you do not need to remove the front cover again.

3. Insert bar code target cover.
4. Push target cover into front cover until it snaps into place.



**Figure 8-9** *Replace Target Bar Code Cover*



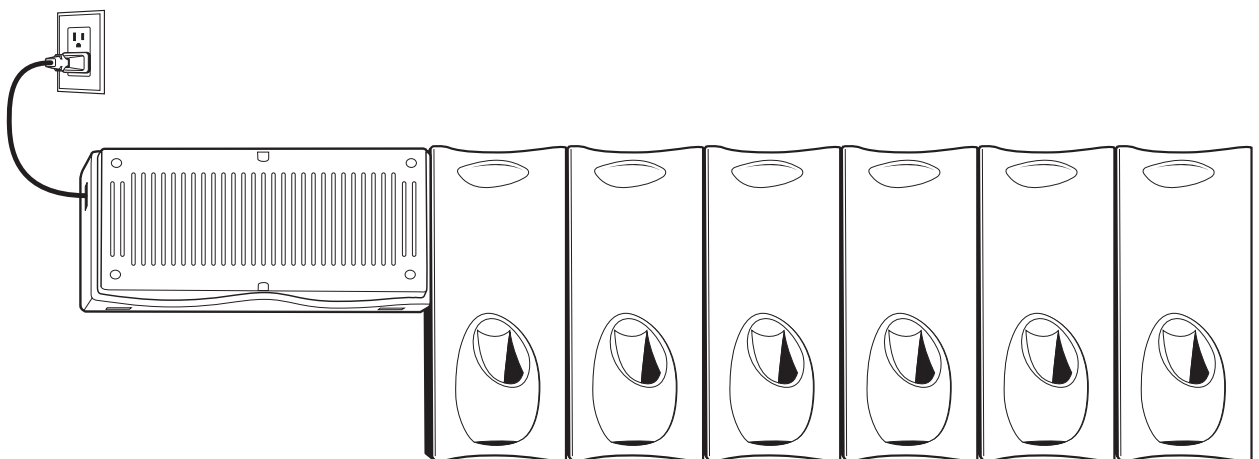
## System Cabling

There are some general limitations that must be taken into account when designing a dispenser and ordering hardware elements of a system:

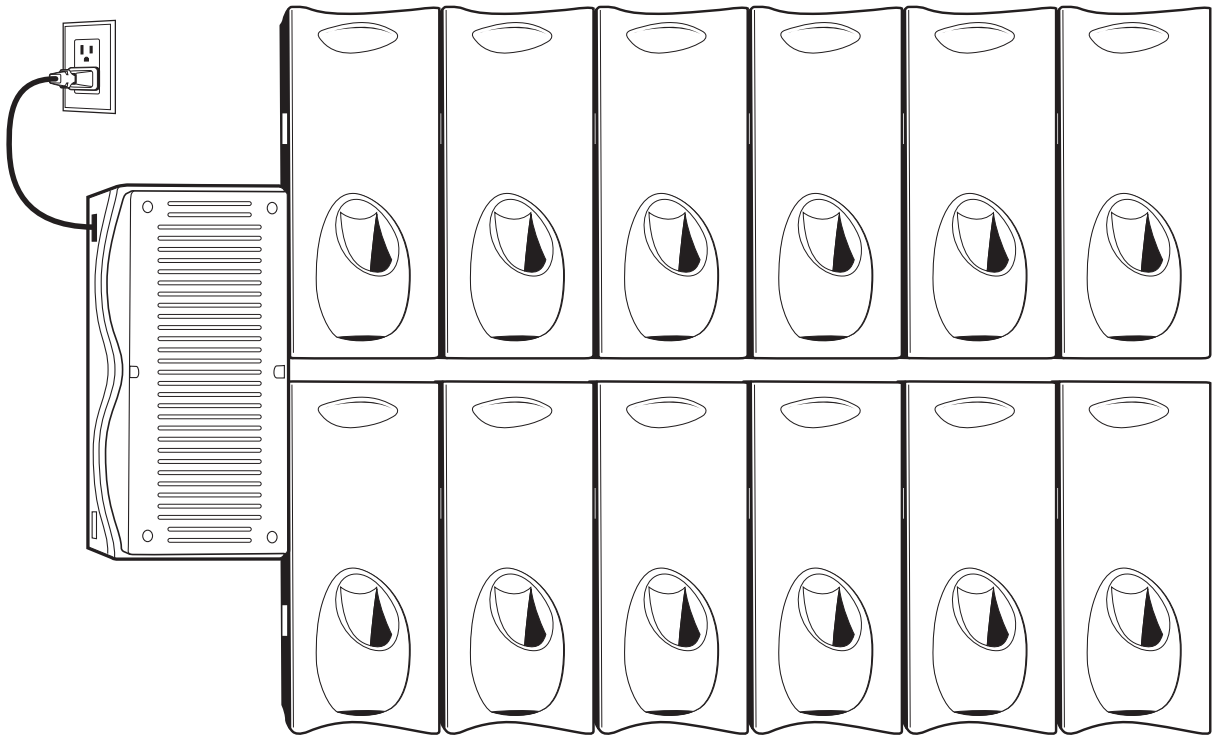
- No more than six cradles can be powered off of one power supply and power cable 25-66420-01R.
- No more than 12 cradles can be powered off of one power supply and “Y” power cable 25-67592-01R.
- No more than six cradles can be powered off each leg of the “Y” power cable.
- A power supply cable runs from the power supply to one or two cradles.
- Cradle interconnection cables run between each successive cradle in the chain.
- The power supply is air cooled, and as such expects some circulation of fresh air around it. Do not enclose it in a small airtight enclosure.
- Power supplies must be mounted in their natural, landscape orientation. They contain fans and their vents must allow for the free flow of air.
- Power supplies should be mounted either above or below dispensers and entrance heads. Mounting of power supplies to the right or left is not preferred.
- When laying out furniture, cable routing should be as direct as possible. Routing should follow vertical and horizontal runs through the modules. As part of each power supply that is shipped is a set of labels numbered 1 through 12. These labels are to be used to track the number of loads on a particular supply. Each label is affixed to the cradle interconnection cable when a cradle is added to the daisy chain. When all labels are used, the supply is fully loaded.

*Figure 8-10* shows how the maximum number of cradles can be cabled to a power supply using power cable 25-66420-01R.

*Figure 8-11* shows how the maximum number of cradles can be cabled to a power supply using the “Y” power cable 25-67592-01R. Note that there are only six cradles per leg of the power supply cable, and only 12 cradles in total.



**Figure 8-10** Maximum Number of Charge Cradles per Power Supply



**Figure 8-11** Maximum Number of Charge Cradles per Power Supply with “Y” Power Cable

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## Installation of the Three Slot Cradle

Installation of the three slot cradle include the following mounting steps:

- Selecting the mounting configuration (see [Mounting Configurations on page 8-9](#))
- Selecting the charging mode (see [Charging Modes on page 8-11](#))
- Mounting the power supply unit (see [Mounting the Power Supply Unit on page 8-19](#))
- Setting the cradle(s) (see [Setting and Controlling the Cradle on page 6-9](#))

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## Mounting Configurations

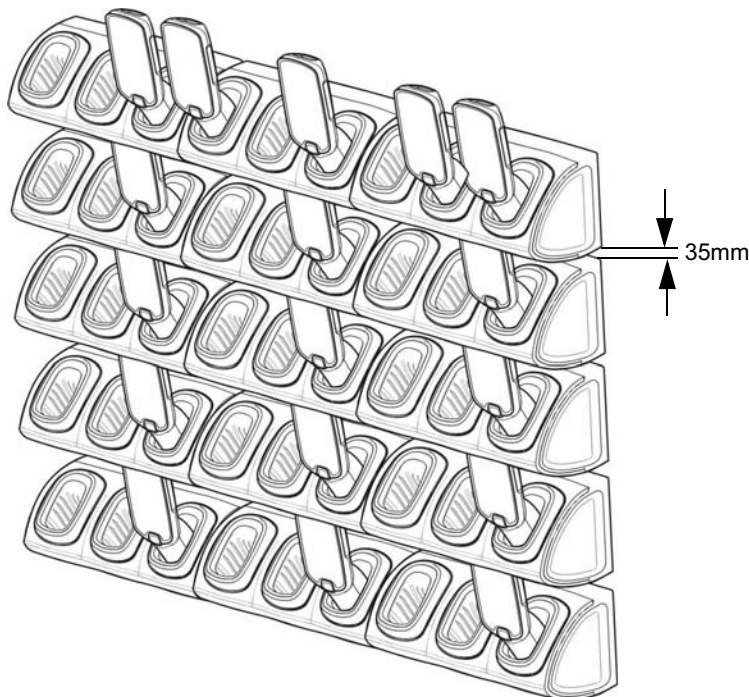
Three slot cradles can be installed in the following mounting configurations:

- High Density (HD) configuration - Using HD cradles
- Super High Density (SHD) configuration - Using SHD cradles
- Desktop configuration - Using stand alone cradle(s) on a flat surface

### High Density Configuration

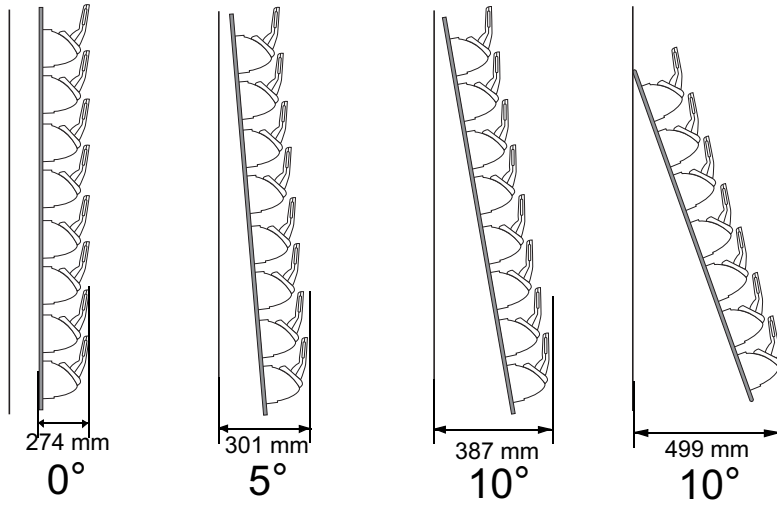
The cradle can be installed in high density configuration so that the display of the MC18 units is facing the user. In such configuration, cradles are installed in a vertical gap of 35mm between each other.

- ✓ **NOTE** In high density configuration, the MC18 units have 10 Degrees forward-facing tilt that should be taken in consideration if furniture is planned to be placed in front of the dispenser wall.



**Figure 8-12** Installation in High Density Configuration

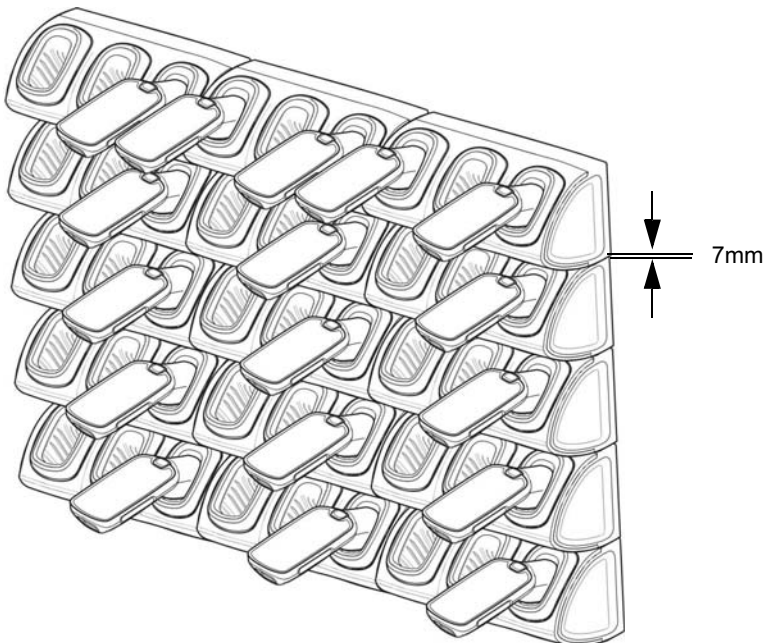
The installation of the dispenser wall can be design so that it tilts backward slightly in the following angles:



**Figure 8-13** Dispenser Wall Angles

### Super High Density Configuration

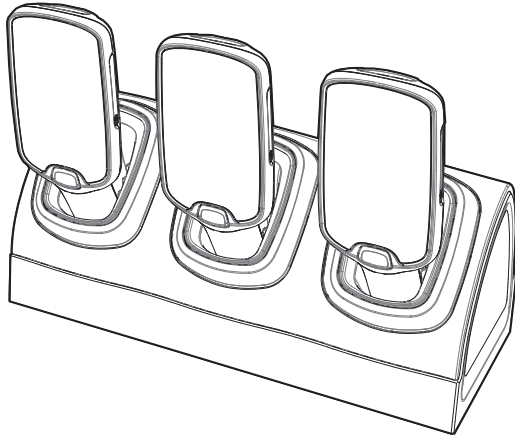
The cradle can be installed in super high density configuration so that the display of the MC18 units is facing up. In such configuration, cradles are installed with vertical gap of 7mm from each other to allow more cradles per given area.



**Figure 8-14** Installation in Super High Density Configuration

## Desktop Configuration

In desktop configuration, the cradle can be placed on a flat tabletop or shelf in checkout locations or back room locations.



**Figure 8-15** *Installation in Desktop Configuration*

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## Charging Modes

Three slot cradles can be installed in the following charging modes:

- Standard charging
- Fast charging

There are some general charging considerations that must be taken into account when designing a dispenser and ordering hardware elements of a system:

### Standard Charging Mode

- In standard charging mode, no more than four cradles can be powered off of one power supply unit (p/n PWRS-14000-241R) using “Y” power cable (p/n 25-67592-01R or p/n 25-66210-01R), power extension cables (p/n CBL-MC18-EXINT1-01) and interconnect cables (p/n 25-66431-01R).
- In standard charging mode, the current draw by each docked MC18 can reach a maximum of 1A.
- Cable routing should be as direct as possible. Routing should follow vertical and horizontal runs through the modules.

Figure 8-16 shows how the four cradles can be cabled to a power supply unit in standard charging mode.

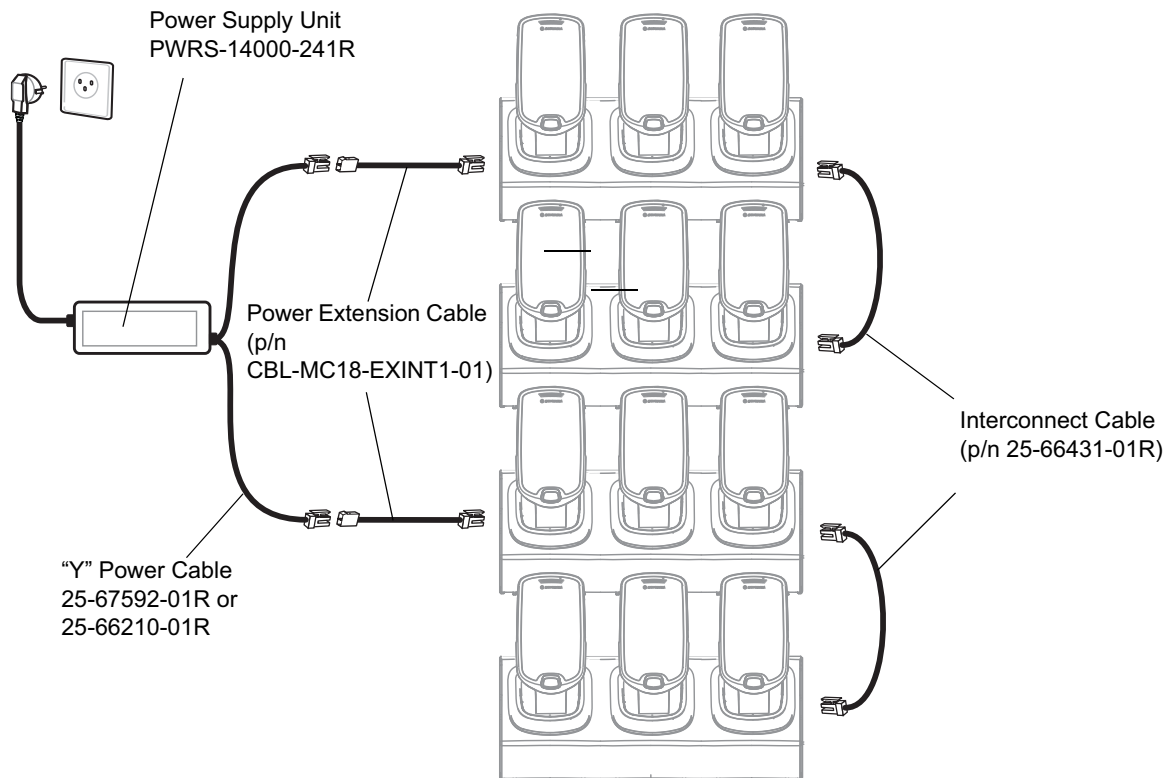
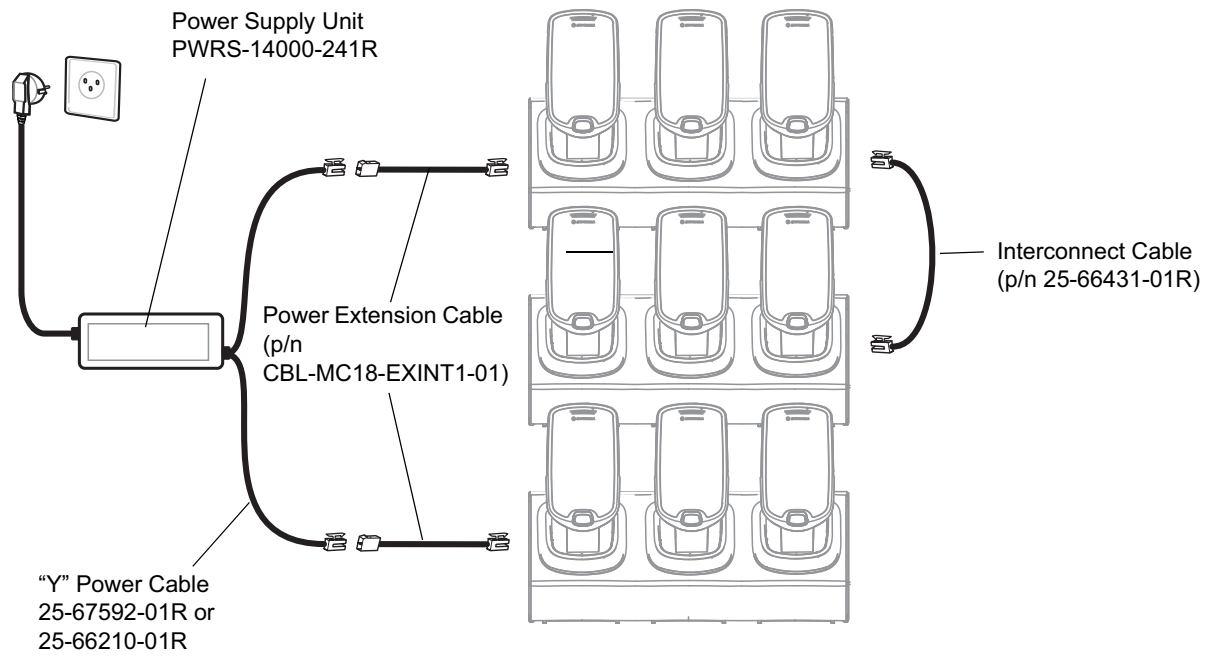


Figure 8-16 Standard Charging Mode - Cable Connections

### Fast Charging Mode

- In fast charging mode, no more than three cradles can be powered off of one power supply unit (p/n PWRS-14000-241R) using "Y" power cable (p/n 25-67592-01R or p/n 25-66210-01R), power extension cables (p/n CBL-MC18-EXINT1-01) and interconnect cable (p/n 25-66431-01R).
- In fast charging mode, the current draw by each docked MC18 can reach a maximum of 1.5A.
- Cable routing should be as direct as possible. Routing should follow vertical and horizontal runs through the modules.

Figure 8-17 shows how the three cradles can be cabled to a power supply unit in fast charging mode.



**Figure 8-17** *Fast Charging Mode Cable Connections*

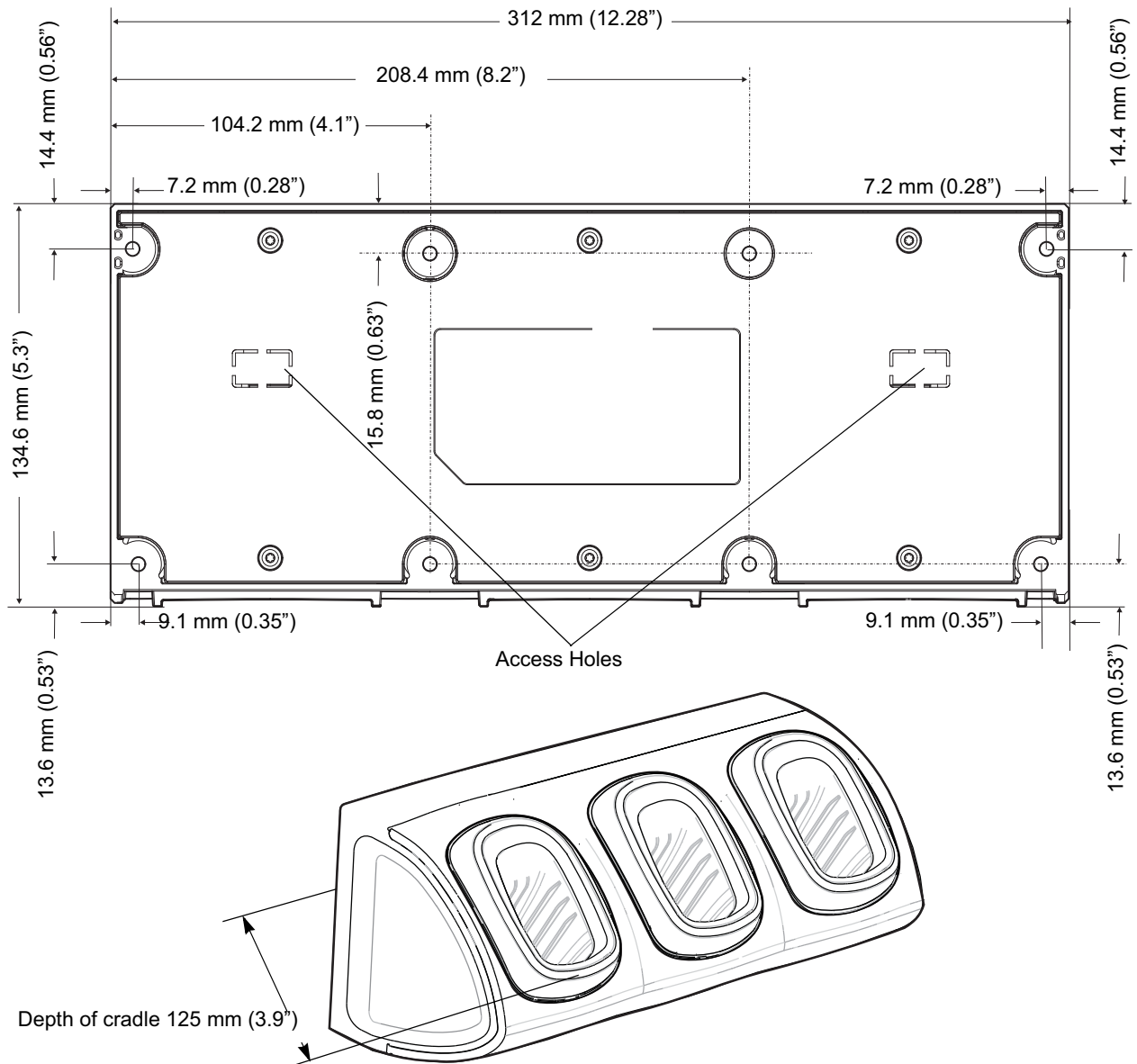
## Mounting the Three Slot Cradle on a Dispenser Wall

The cradle can be bolted to a dispenser wall or any supporting furniture using eight mounting holes. The back cover of the cradle has two access holes for routing power cables to \ from a power supply unit or adjacent cradle. *Figure 8-18* provides a mounting template for cradle installation.

Perform this procedure to mount the cradle on a dispenser wall:

- ✓ **CAUTION** DO NOT connect more than four cradles to a single power supply unit.  
DO NOT connect the power supply unit to power outlet until all installation steps are completed.
- ✓ **NOTE** The following procedure is an example installation of three slot cradles in fast charging mode - high density configuration.

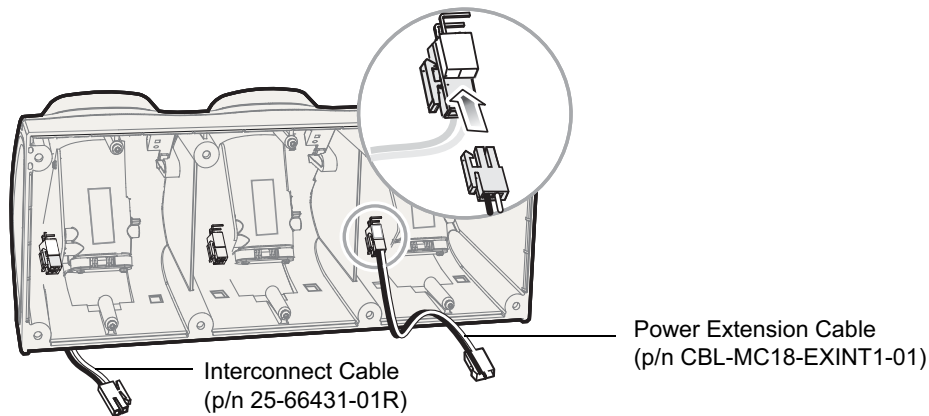
1. Use the wall mount template to plan and mark the screw locations on the dispenser wall.



**Figure 8-18** Three Slot Cradle - Mounting Template and Overall Depth

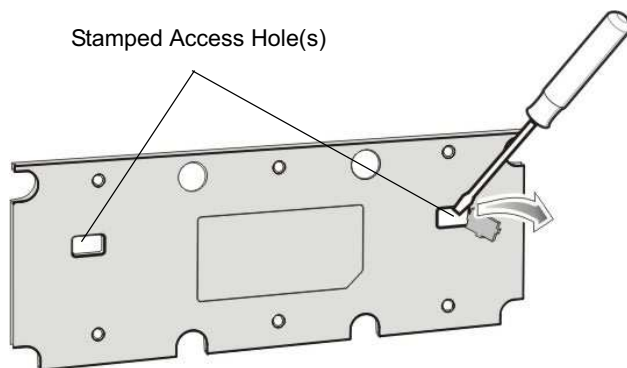


2. In all cradles, plug the power extension cable (p/n CBL-MC18-EXINT1-01) to free the connector on left slot.
3. Plug interconnect cable (p/n 25-66431-01R) to free connector on right slot.



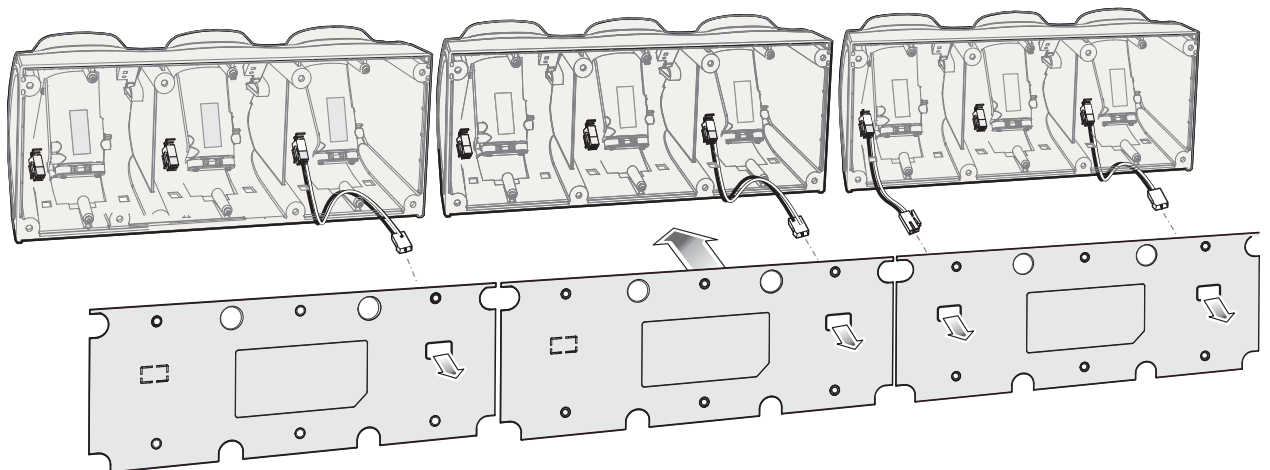
**Figure 8-19** Three Slot Cradle - Cable Connections

4. On all the back covers, knock-out the stamped access hole(s).



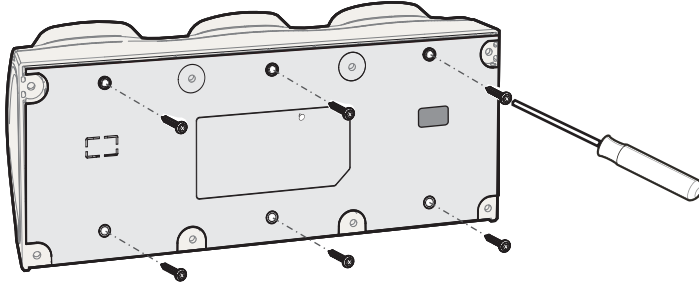
**Figure 8-20** Three Slot Cradle - Stamped Access Hole(s)

5. Route interconnect cables through access holes in back covers.



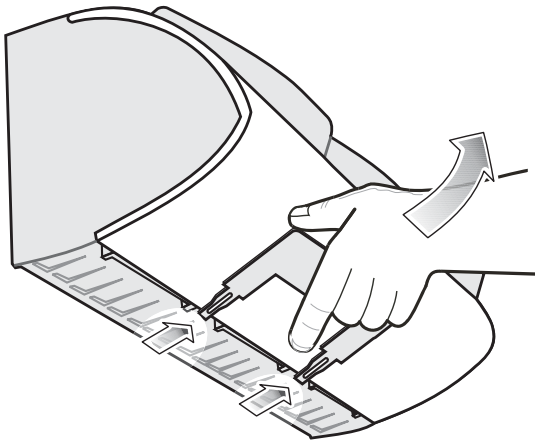
**Figure 8-21** Three Slot Cradle - Back Cover Cable Routs

- Secure the back covers to cradles using six T10 Torx screws (supplied) Torque screws to 6 Kgf-cm (5.2 in-lb).



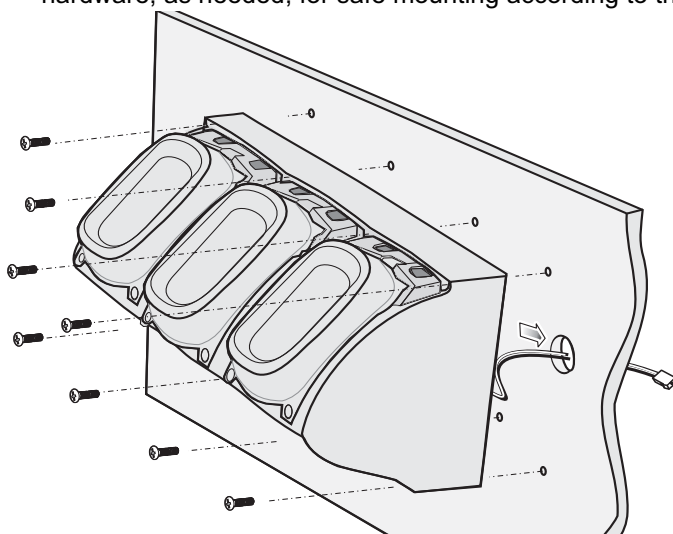
**Figure 8-22** Three Slot Cradle - Securing the Back Cover

- Insert the front cover removal tool into two slots, lever upwards and pull to remove front cover from cradle.



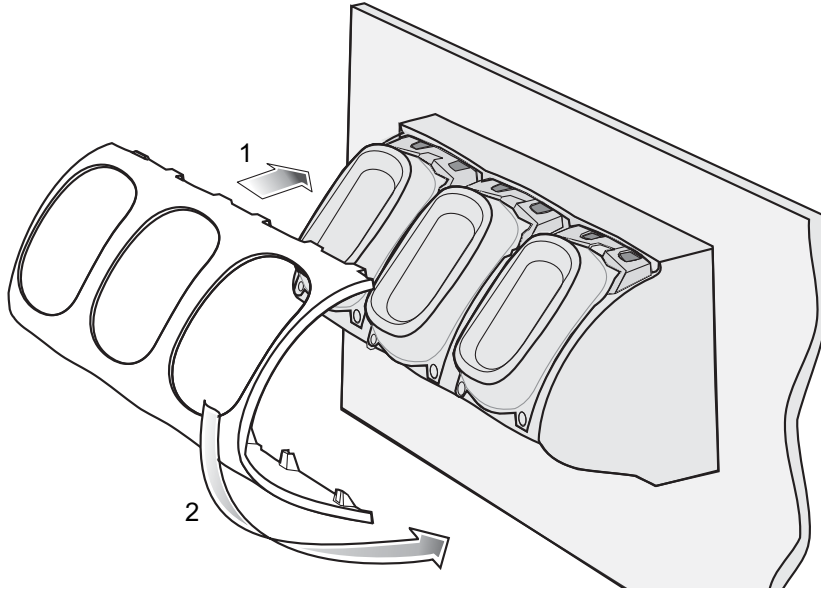
**Figure 8-23** Three Slot Cradle - Removing Front Cover

- Position the cradle on the dispenser wall and route all interconnect cables through the access holes in the dispenser wall.
- Fasten the cradle to the wall using eight screws (not supplied). Ensure to use additional wall mounting hardware, as needed, for safe mounting according to the wall type.



**Figure 8-24** Three Slot Cradle - Fastening the Cradle to a Wall

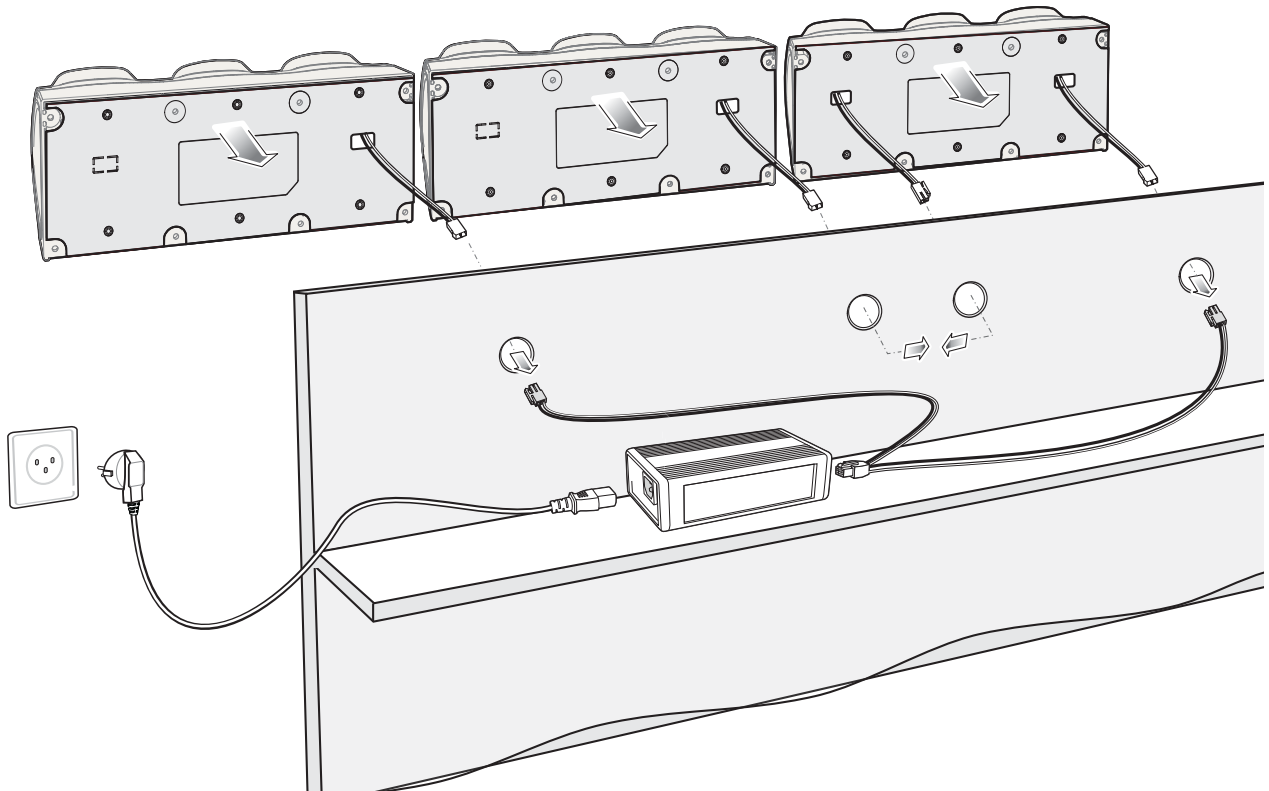
10. Insert tabs on upper side of front cover into slots on cradle and rotate cover down until it snaps into place.



**Figure 8-25** Three Slot Cradle - Connecting the Front Cover

11. Plug Power Extension Cable (p/n CBL-MC18-EXINT1-01) to interconnect cable (p/n 25-66431-01R).
12. Plug "Y" cable (25-67592-01R) to Interconnect cables (p/n 25-66431-01R).
13. Plug "Y" cable (25-67592-01R) to power supply unit.
14. Secure power supply unit (p/n PWRS-14000-241R) to the back of the dispenser wall.

15. Connect the power cord to the power supply unit and to a 110/220 VAC outlet.



**Figure 8-26** *Three Slot Cradle - Connection to Power Supply Unit*

16. Place the socket onto the cradle and secure the four screws.
17. Place the socket cover onto the cradle and secure the two screws.

## Mounting the Power Supply Unit

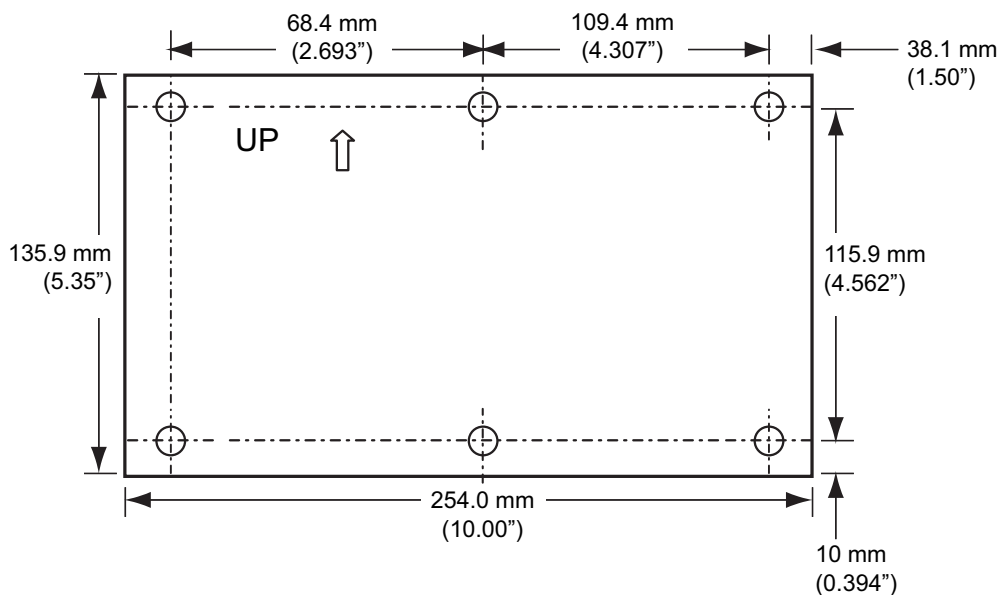
- ✓ **NOTE** The power supply unit should be mounted in landscape orientation. Power supplies must be mounted in their natural, landscape orientation. They contain fans and their vents must allow for the free flow of air.

- ✓ **IMPORTANT** The power supply unit is air cooled and requires circulation of free air around it. Do not enclose it in a small airtight enclosure other than plastic housing, p/n PSS-3PS04-00R.

The power supply can be housed in an optional plastic housing, p/n PSS-3PS04-00R, to match the cradles and hide bare power supplies and cables. This section provides the information required to mount the plastic housing

To install the power supply unit inside the plastic housing:

1. Use the mounting template of the power supply housing to plan and mark the screw locations on the dispenser wall.

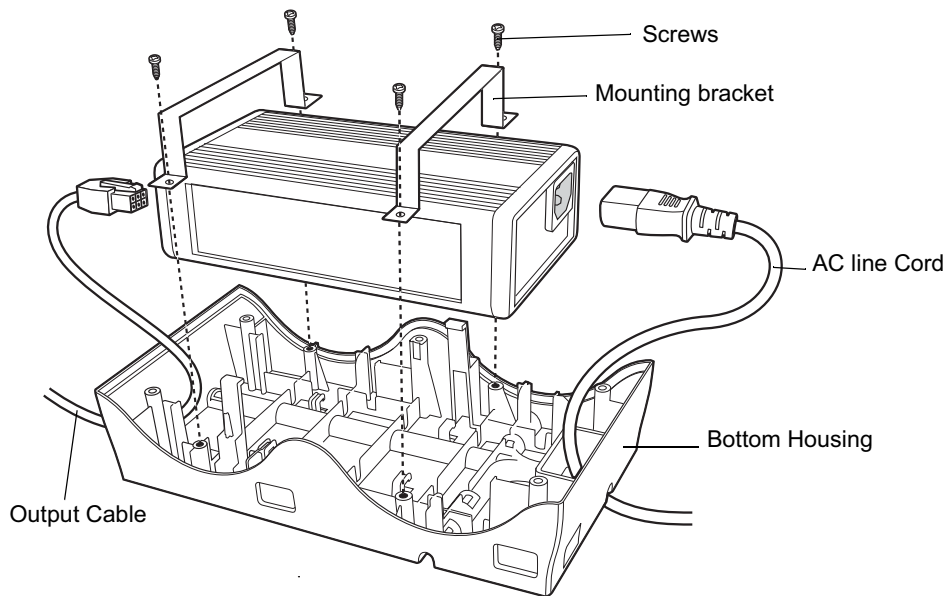


(View from Inside Housing)

The depth of the fully-assembled power supply decorative housing is 81.23 mm (3.198").

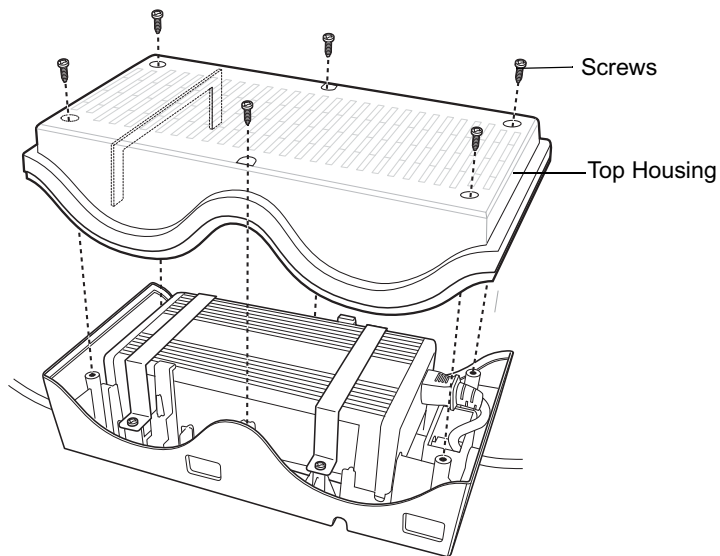
**Figure 8-27** Power Supply Housing Mounting Template

2. Feed cables through access holes in bottom housing.
3. Plug connectors into power supply.
4. Place power supply into bottom housing.
5. Place two mounting brackets over power supply and secure each mounting bracket with two screws.



**Figure 8-28** Power Supply Assembly

6. Align top housing over bottom housing and secure using six screws.



**Figure 8-29** Top Housing Installation

# CHAPTER 9 APPLICATION DEPLOYMENT

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## Software Installation on Development PC

To develop applications to run on the MC18, use one or all of the following:

- Microsoft Visual Studio 2005/2008
- Enterprise\_Mobility Developer Kit (EMDK) for C/C++
- Enterprise Mobility Developer Kit (EMDK) for .NET
- Enterprise Mobility Developer Kit (EMDK) for Pocket Browser
- Windows CE Platform PSDK for MC18No
- Active Sync v4.5/ WMDC v6.1
- Device Configuration Package (DCP) for 8 v99.45.00xx.

Refer to the *Developer Guide*, p/n 72E-71161-xx, for detailed information on the EMDKs.

The Windows CE Platform SDK for the MC18xxc50 is used in conjunction with the EMDK for C to create Windows CE applications for the MC18. The Platform SDK installs a new Windows CE device type and its associated libraries onto the development PC.

The Device Configuration Package (DCP) is required to create and download hex images that represent flash partitions to the MC18. The DCP includes the user documentation, flash partitions, Terminal Configuration Manager (TCM) and the associated TCM scripts.

### Device Configuration Package

Use this procedure to install the DCP for MC18xxc50:

1. Download the DCP from the Support Central web site, <http://www.motorolasolutions.com/support>:
  - a. On <http://www.motorolasolutions.com/support>, select *Software Downloads*.
  - b. Select *Mobile Computers* and then select *MC18*.
  - c. Select the *Device Configuration Package (DCP)*.
  - d. Save the .exe file to the development computer.

2. Locate the .exe file on the development computer, double-click the file, and follow the install screen prompts.
3. Once installed, access the major components of the DCP from the *Symbol Device Configuration Package (DCP)* for MC18xxc50 program group of the *Windows Start Menu*.

## Platform SDK

Different Platform SDKs are required for the Microsoft® Windows CE 7.0 Professional Core platforms.

Use this procedure to download and install the appropriate Platform SDK:

1. Download the appropriate Platform SDK from the Support Central web site, <http://www.motorolasolutions.com/support>:
  - a. On <http://www.motorolasolutions.com/support> select *Software Downloads*.
  - b. Select *Mobile Computers* and then select *MC18*.
  - c. Select the *Platform SDK*.
  - d. Save the .exe file to the development computer.
2. Run the file and follow the screen prompts to install.

## Enterprise Mobility Developer Kits

Use this procedure to install an EMDK:

1. Download the EMDK from the Support Central web site, <http://www.motorolasolutions.com/support>:
  - a. On <http://www.motorolasolutions.com/support>, select *Developer Downloads* and sign in.
  - b. Select *Mobile Computers* and then select *MC18*.
  - c. Select the latest version of the *Enterprise Mobility Developer Kit*.
  - d. Download the .exe file to the development computer.
2. Double-click the executable file and follow the install screen prompts.

## Installing Other Development Software

Developing applications for the MC18 may require installing other development software such as application development environments on the development PC. Follow the installation instructions provided with this software.



## Deployment

With the appropriate accessory, software, and connection, the MC18 can share information with the host device. This section provides information about installing software and files on the MC18.

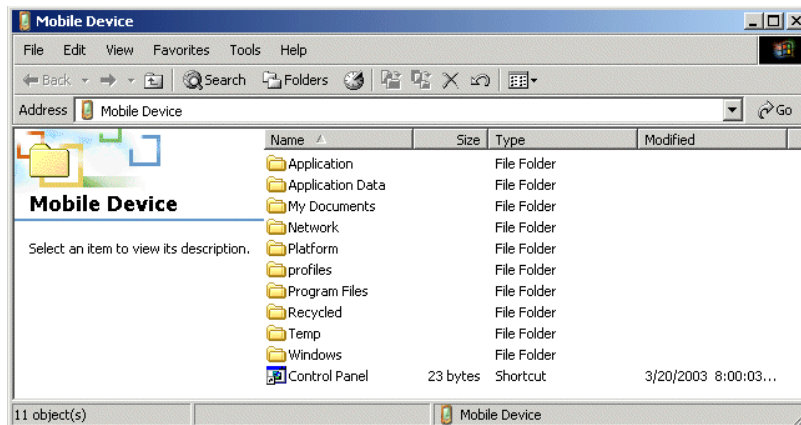
Download/install software using:

- ActiveSync / Windows Mobile Device Center
- IPL.

### ActiveSync

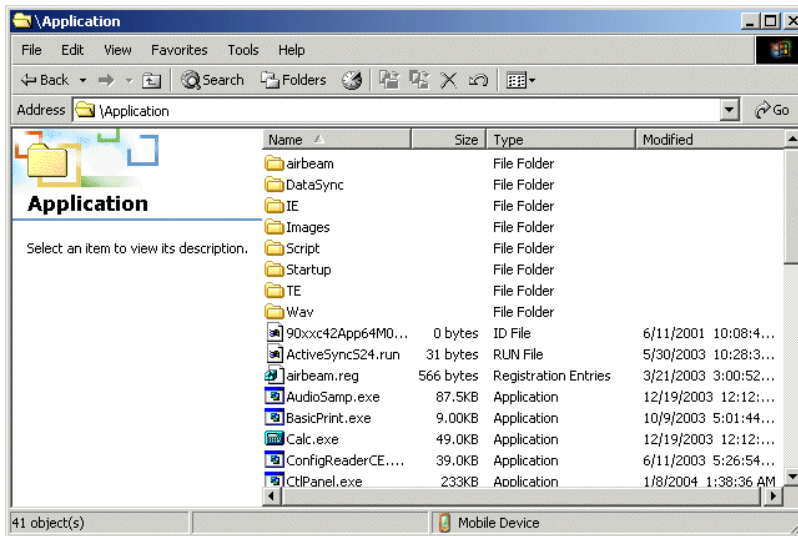
Use ActiveSync or Windows Mobile Device Center to copy files from a host computer to the MC18.

1. Ensure that ActiveSync or Windows Mobile Device Center is installed and that a partnership has been created, see [Chapter 4, Sync with Host Computer](#).
2. Connect the MC18 to the host computer using the cradle, see [Connecting the MC18 to a Host Computer on page 4-2](#) for connection information.
3. On the host computer, select **Start > All Programs > ActiveSync** (or **Windows Mobile Device Center**).
4. Select **Explore** (or **File Management**).



**Figure 9-1** ActiveSync Explorer

5. Double-click the folder to expand the contents of the folder.



**Figure 9-2** My Pocket PC Contents

6. Use Explorer to locate the host computer directory that contains the file to download. Touch that directory in the left pane to display its contents in the right pane.
7. Drag the desired file(s) from the host computer to the desired mobile device folder.
  - *Program Files* folder: files stored in this folder are discarded after a cold boot.
  - *Application* folder: files stored in this folder are retained after a cold boot.

## IPL

Use IPL to download files onto the MC18, to download customized flash file system partitions to the MC18 and load hex files to the flash memory of the MC18.

There are two types of updates supported by the MC18: partitions and files. The file system used by the MC18 is the same as the file system used on a desktop computer. A file is a unit of data that can be accessed using a file name and a location in the file system. When a file is replaced, only the contents of the previous file are erased. The operating system must be running for a file to be updated, so the IPL cannot perform individual file updates as it is a stand-alone program that does not require the operating system to be running.

A typical partition is a group of files, combined into a single “partition” that represents a specific area of storage. Examples of partitions are the flash file systems such as *Platform* or *Application*. (Using the desktop computer comparison, these partitions are roughly equivalent to a C: or D: hard disk drive.) In addition to the “hard disk” partitions, some partitions are used for single items such as the operating system, monitor, or splash screen. (Again using a desktop computer comparison, these partitions are roughly the equivalent of the BIOS or special hidden system files.) When a partition is updated, all data that was previously in its storage region is erased - i.e. it is not a merge but rather a replacement operation. Typically, the operating system is not running when partitions are updated, so IPL can perform partition updates.

Partition images for selected partitions can be created by TCM. All partition images suitable for use by IPL are in hex file format for transfer by TCM from the development computer to the MC18.

Upgrade requirements:

- The hex files to be downloaded (on development computer)
- A connection from the host computer and the MC18 (either serial or wireless)

- TCM (on development computer) to download the files.

Once these requirements are satisfied, the MC18 can be upgraded by invoking IPL and navigating the menus.

## Updating Images

The MC18 contains tools that update all operating system components. All updates are distributed as packages and/or hex images. Update packages can contain either partial or complete updates for the operating system. Symbol Technologies distributes the update packages on the Support Central Web Site, <http://www.motorolasolutions.com/support>.

Update an operating system component using one of the following:

- OS Update
- BootLoader
- MSP

### OSUpdate Loader

Operating system component can be downloaded to the MC18 using the Temp folder.

### Using the Temp Folder

To initiate an update using the MC18 Temp folder:

1. Go to the Support Central web site, <http://www.motorolasolutions.com/support> and download the appropriate update package.
2. Connect the MC18 to a host computer using. See [Connecting the MC18 to a Host Computer on page 4-2](#).
3. Select **Start > Settings > Control Panel**.
4. Select **System** icon.
5. Select **Memory** tab.



**Figure 9-3** System Properties - Memory Tab

6. Move the slider to the center position.

7. Select **OK**.
8. Using ActiveSync or Windows Mobile Device Center, copy the update package to the \Temp folder on the MC18.
9. On the MC18, use **Windows Explorer** and navigate to the \Temp folder.
10. Open the **OSUpdate** folder.
11. Select the file: 18X0c70Ben\_TEMP.
12. When the Update Loader application finds the appropriate file, it loads the package onto the MC18. A progress bar displays until the update completes.
13. When complete, the MC18 re-boots.

### Bootloader

Use Bootloader to download hex files to the MC18 from a host computer via USB.

### MC18

Use Bootloader to download customized flash file system partitions to the MC18 and load hex files to the flash memory of the MC18.

To load the hex files on to the MC18 using USB:

1. Download the USBDownload application from the Support Central web site. Follow the installation instructions with the application.
2. Connect the MC18 to a host computer using. See [Connecting the MC18 to a Host Computer on page 4-2](#).
3. On the host computer, launch the USBDownload application.



**Figure 9-4** USB Download Window

4. Simultaneously press the Power button and the 1 and 9 keys.

5. Immediately, as soon as the device starts to boot, press and hold the scan key. The Bootloader screen appears.

```
Select required operation
Download from SD card
Download from USB
Exit

Bootloader 1.02.0000
```

**Figure 9-5** *Bootloader Menu*

**CAUTION** To ensure a successful download, do not remove power from the MC18 while in Bootloader.

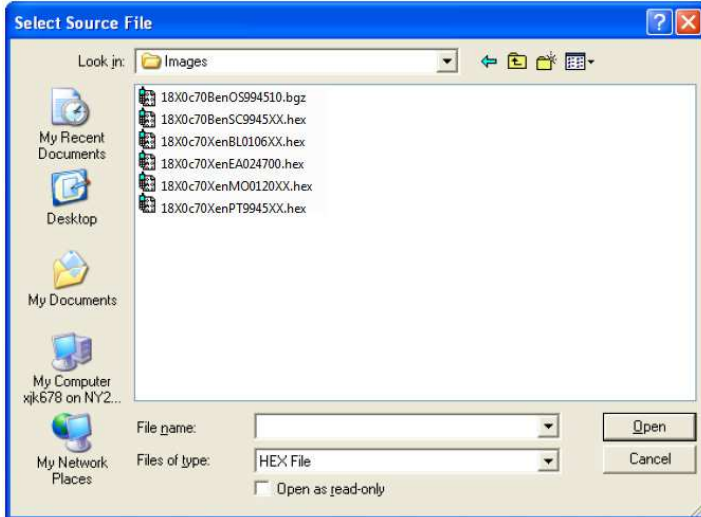
1. Use the scan key to select **Download from USB**.
2. The Bootloader displays the following:

```
Waiting for input. . .

Bootloader 1.02.0000
```

**Figure 9-6** *Waiting for Input*

**Figure 9-7** On the host computer, locate the hex files to download.

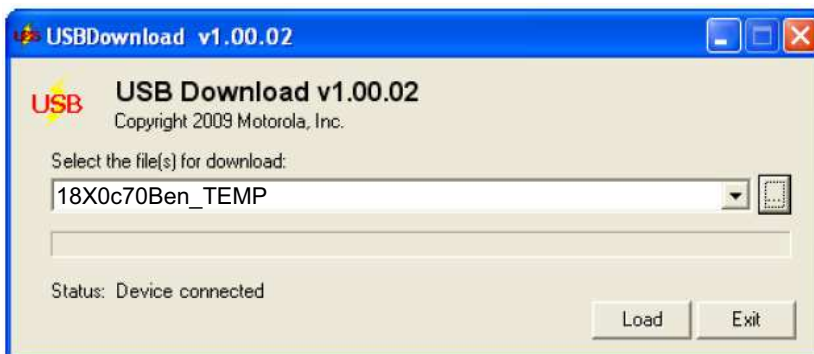


**Figure 9-8** Select Source File Window

**NOTE** One hex file or multiple hex files can be selected. To select multiple files, press the Ctrl key while selecting files.

If selecting multiple files to download, USBDownload reads the header of the file and identifies the file type. If the Partition table file is among the files selected, then USBDownload downloads that file first. Similarly, USBDownload downloads the CPLD file last.

1. Select the hex files and the click **Open**.



**Figure 9-9** Select Hex File(s)

2. Click the **LOAD** button. The hex file(s) is downloaded to the device.

```

Splash screen
#### (20)          100%
Download complete
in - 0.042 seconds
(1854142 bytes/second)

Hit Enter to Acknowledge

Bootloader 1.02.0000

```

**Figure 9-10** Download Complete Screen

3. On completion, press **ENTER** to return to the Bootloader main screen to select the next file to download.
4. To exit Bootloader, select **Exit** from the Bootloader main screen and press **ENTER**.

## Bootloader Error Detection

While receiving data, Bootloader performs many checks on the data to ensure that the data is received correctly. If an error is detected, Bootloader immediately aborts the download, and reports the error on an error screen.

This error message screen displays until a key is pressed. Once the screen is acknowledged, Bootloader returns to the main menu to wait for a new selection.

To find the probable cause of the error, use the error number and/or the error text displayed on the screen to look up the error in [Table 9-1](#).

**Table 9-1** IPL Errors

Error Text	Error Number	Probable Cause
Unknown error	-1	A general error occurred. Retry the download. If the failure persists, it is most likely due to a hardware failure; the MC18 requires servicing.
Cancelled by user	-2	The user canceled the download.
Can't open the source	-7	An error occurred opening the source device (either radio card or Serial port). Check source device connectivity and retry.
Can't open the destination	-8	An error occurred opening the destination device (either flash ROM or Power Micro). Retry the download. If the failure persists, it is most likely due to a hardware failure; the MC18 requires servicing.
Can't read from the source device	-9	The source device (either radio card or Serial port) could not be read from. Check source device connectivity and retry.
Can't write to the destination device	-10	The destination device (either flash ROM or Power Micro) could not be written to. Retry the download. If the failure persists, it is most likely due to a hardware failure; the MC18 requires servicing.

**Table 9-1** IPL Errors (Continued)

Error Text	Error Number	Probable Cause
Transmission checksum error	-11	An error occurred during transmission from the source device (either radio card or Serial port) and the checksum check failed. Check source device connectivity and retry.
Readback checksum error	-12	A checksum, generated from reading back data that was written to the destination device, was incorrect. An error during transmission or a write error to the destination device could cause this.
There is no more heap space available	-14	There is no more heap space available for the download procedure. Restart IPL and retry the download. If the failure persists, contact service with details of what is being downloaded.
Insufficient data available to complete record	-21	A Symbol HEX file download was attempted but the HEX file is invalid. Ensure the file is in Symbol HEX file format.
Invalid Symbol HEX file	-23	A Symbol HEX file download was attempted but the HEX file is invalid. Ensure the file is in Symbol HEX file format.
Unrecognized or unsupported HEX record	-24	The Symbol HEX file being downloaded contains an invalid or unrecognized HEX record. Ensure the file is in proper Symbol HEX file format.
Invalid data in HEX file	-25	The Symbol HEX file being downloaded contains invalid data. Ensure the file is in proper Symbol HEX file format with valid HEX data.
Exceeded max size	-26	The download file is too large to fit into the space allocated for it. Either make the file smaller or increase the space allocated for it by altering the partition table.
Partition is not valid on this device	-27	The downloaded file specifies a partition entry that does not exist on the device. Only download files that are valid for this device, or change the partition table so that the new file is valid on the device.
Wrong destination code	-28	A specific partition was chosen from the Main Menu (not Auto Select) but the file selected for download was for another partition. Ensure that the partition selected from the Main Menu matches the file selected for download.
File type does not support IPL Auto Select	-29	Monitor, Power Micro and Partition Table cannot be loaded with Auto Select. Select the appropriate area, and try again.
Non-contiguous record found	-30	A Symbol HEX file download was attempted but the HEX file is invalid. Ensure the file is in Symbol HEX file format.
Timed Out - No data	-31	IPL was waiting for data from the source device but timed out before receiving any. Check the source device connectivity and retry.



**Table 9-1** IPL Errors (Continued)

Error Text	Error Number	Probable Cause
Fail: Buffer Overrun	-32	The serial port device could not keep up with incoming data. Retry the serial download with a lower baud rate.
Partition Table not Valid	-33	The size of flash memory is different than that described in the partition table. Retry the download with the correct partition table file.
Invalid file format	-34	The file format is invalid. Only Symbol HEX files are supported by IPL.

---

## Mobility Services Platform

The MSP Client Software is a set of software components that come pre-installed on the MC18.

The MSP Client software consists of the following components:

The RD Client provides support for MSP Staging functionality, provides support for the MSP Legacy Staging process, and provides support for backward-compatible legacy MSP 2.x Legacy Staging functionality.

The MSP Agent provides MSP Provisioning functionality and Control functionality when used with MSP 3.2 Control Edition.

Refer to the Mobility Services Platform 3.2 User's Guide, p/n 72E-100158-06, for instructions for using the Rapid Deployment and MSP Agent clients.

---

## Creating a Splash Screen

A custom splash screen can be created and loaded onto the MC18. To create a custom splash screen:

1. Create a .bmp file using a graphic program with the following specifications:
  - Size: 216 (W) x 320 (H).
  - Colors: 256.
2. Modify the bitmap file and save.

To load the splash screen:

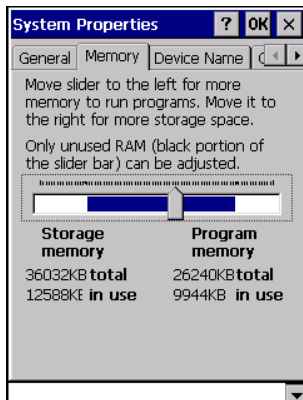
1. Convert the bmp file into a hex file using the OSUpdate Package Builder that is part of MSP.
2. Copy the hex file to the MC18 using BootLoader.

## OS Update

When operating system images are updated, new update images will be available as part of the Device Configuration Package (DCP) on the Support Central web site at: <http://supportcentral.motorola.com>.

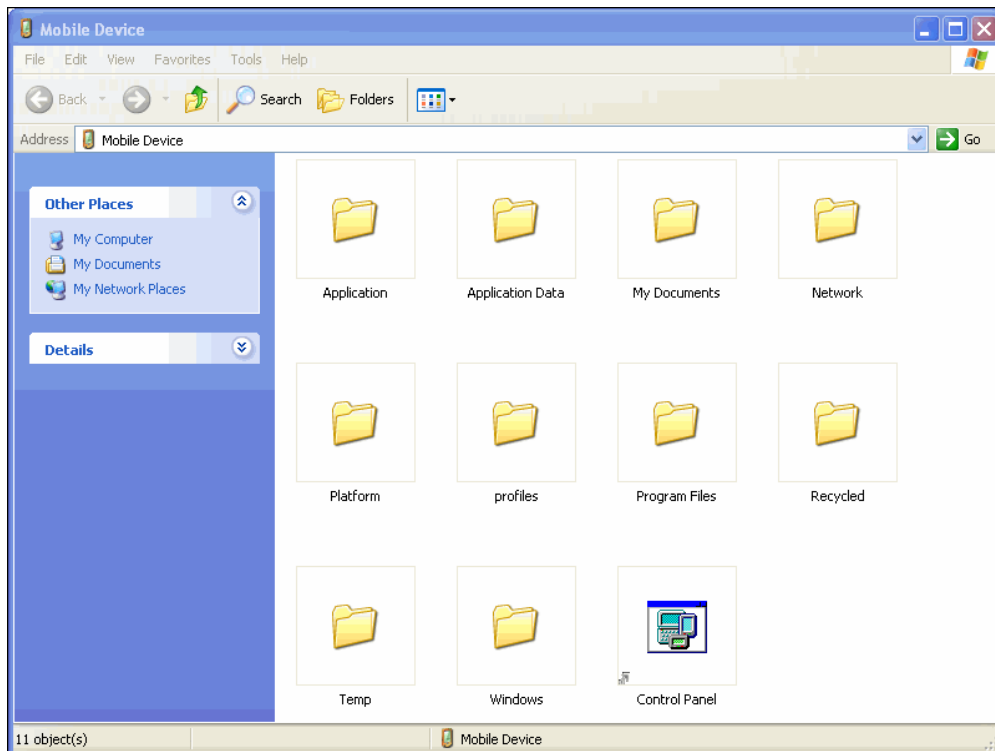
Use this procedure to load a new operating system using OS Update:

1. Download the latest DCP for the MC18 or MC18A from the Support Central web site. See for *Device Configuration Package on page 9-1* detailed instructions.
2. Connect the MC18 to a host computer (see *Connecting the MC18 to a Host Computer on page 4-2*).
3. Use a remote control software on the host computer to view the CE desktop (see *Connecting the MC18 to a Host Computer on page 4-2*) for more information.
4. Open your ActiveSyncRemoteDisplay application on your desktop to give you a remote view to the WinCE device.
5. Select **Start > Settings > Control Panel**. The **Control Panel** window appears.
6. Click the **System** icon. The **System Properties** window appears.
7. Click the **Memory** tab.
8. Move the slider bar towards the right to increase total **Storage memory** to around 36000KB total.



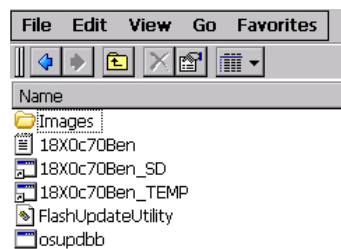
**Figure 9-11** Memory Tab

9. Select **OK** to close the **System Properties** window.
10. Close the **Control Panel** window.
11. On the host computer, open a **Windows Explorer** window and navigate to the C:\Program Files\Symbol Device Configuration Packages\MC18xxc50Ben\V1.x folder.
12. In the **ActiveSync** or **Windows Mobile device Center** window, click the **Explore** or **File Management** to explore the MC18 file directories.



**Figure 9-12** Explorer Window

13. Copy the `/OSupdate` folder to the `/Temp` folder on the MC18.
14. Using the remote control software, navigate to `/Temp/OSUpdate` folder on the MC18. Select **View > Details** to display the whole filename.



**Figure 9-13** Temp Directory

15. Double-click the `18X0c70Ben_TEMP` filename to launch the OSUpdate utility.
16. Once the update is completed the MC18 automatically cold boots.
17. Remove the MC18 from the cradle and re-insert after approximately one minute.

---

## Flash Storage

In addition to the RAM-based storage standard on Windows CE mobile computers, the MC18 is also equipped with a non-volatile Flash-based storage area which can store data (partitions) that can not be corrupted by a cold boot. This Flash area is divided into two categories: Flash File System (FFS) Partitions and Non-FFS Partitions.

### FFS Partitions

The MC18 includes two FFS partitions. These partitions appear to the MC18 as a hard drive that the OS file system can write files to and read files from. Data is retained even if power is removed.

The two FFS partitions appear as two separate folders in the Windows CE file system and are as follows:

- Platform: The Platform FFS partition contains Symbol-supplied programs and Dynamic Link Libraries (DLLs). This FFS is configured to include DLLs that control system operation. Since these drivers are required for basic MC18 operation, only experienced users should modify the content of this partition.
- Application: The Application FFS partition is used to store application programs needed to operate the MC18.

### Working with FFS Partitions

Because the FFS partitions appear as folders under the Windows CE file system, they can be written to and read like any other folder. For example, an application program can write data to a file located in the Application folder just as it would to the Windows folder. However, the file in the Application folder is in non-volatile storage and is not lost on a cold boot (e.g., when power is removed for a long period of time).

Standard tools such as ActiveSync or Windows Mobile Device Center can be used to copy files to and from the FFS partitions. They appear as the "Application" and "Platform" folders to the ActiveSync explorer. This is useful when installing applications on the MC18. Applications stored in the Application folder are retained even when the MC18 is cold booted.

There are two device drivers included in the Windows CE image to assist developers in configuring the MC18 following a cold boot: RegMerge and CopyFiles.

#### RegMerge.dll

RegMerge.dll is a built-in driver that allows registry edits to be made to the Windows CE Registry. Regmerge.dll runs very early in the boot process and looks for registry files (.reg files) in certain Flash File System folders during a cold boot. It then merges the registry changes into the system registry located in RAM.

Since the registry is re-created on every cold boot from the default ROM image, the RegMerge driver is necessary to make registry modifications persistent over cold boots.

RegMerge is configured to look in the root of two specific folders for .reg files in the following order:

- \Platform
- \Application

Regmerge continues to look for .reg files in these folders until all folders are checked. This allows folders later in the list to override folders earlier in the list. This way, it is possible to override Registry changes made by the

Platforms partitions folders. Take care when using Regmerge to make Registry changes. The DCP for MC18xxc50 contains examples of .reg files.

✓ **NOTE** Regmerge only merges the .reg files on cold boots. The merge process is skipped during a warm boot.

Typically, do not make modifications to registry values for drivers loaded before RegMerge. However, these values may require modification during software development. Since these early loading drivers read these keys before RegMerge gets a chance to change them, the MC18 must be cold booted. The warm boot does not re-initialize the registry and the early loading driver reads the new registry values.

Do not use Regmerge to modify built-in driver registry values, or merge the same Registry value to two files in the same folder, as the results are undefined.

### CopyFiles

Windows CE expects certain files to be in the Windows folder, residing in volatile storage. Windows CE maintains the System Registry in volatile storage. CopyFiles copies files from one folder to another on a cold boot. Files can be copied from a non-volatile partition (Application or Platform) to the Windows or other volatile partition during a cold boot. During a cold boot CopyFiles looks for files with a .CPY extension in the root of the Platform and Application FFS partitions (Platform first and then Application). These files are text files containing the source and destination for the desired files to be copied separated by ">". The following example from the file application.cpy is contained on the demo application partition included in the DCP for MC18xxc50.

Files are copied to the Windows folder from the Flash File System using copy files (\*.cpy) in the following order:

```
\Platform
  \Application
```

Example:

```
\Application\ScanSamp2.exe>\Windows\ScanSamp2.exe
```

This line directs CopyFiles to copy the ScanSamp2.exe application from the \Application folder to the \Windows folder.

### Non-FFS Partitions

Non-FFS Partitions include additional software and data pre-loaded on the MC18 that can be upgraded. Unlike FFS Partitions, these partitions are not visible when the operating system is running. They also contain system information. Non-FFS partitions include the following:

- Windows CE: The complete Windows CE operating system is stored on Flash devices. If necessary, the entire OS image may be downloaded to the MC18 using files provided by Symbol Technologies. The current OS partition on the MC18 is included as part of the TCM installation package. Any upgrades must be obtained from Symbol Technologies. This partition is mandatory for the MC18.
- Splash Screen: a bitmap smaller than 16 kb (and limited to 8 bits per pixel) is displayed as the MC18 cold boots.

✓ **NOTE** 8 bits per pixel only applies to splash screen images. Once Windows CE is running, the color density is 16 bits per pixel.

- IPL: This program interfaces with the host computer and allows downloading via cradle or serial cable any or all of the partitions listed above, as well as updated versions of IPL. Use caution downloading

updated IPL versions; incorrect downloading of an IPL causes permanent damage to the MC18. IPL is mandatory for the MC18.

- Partition Table: Identifies where each partition is loaded in the MC18.

### **Downloading Partitions to the MC18**

TCM is used to specify a hex destination file for each partition and download each file to the MC18. This download requires a program loader stored on the MC18. The MC18 comes with a program loading utility, Initial Program Loader (IPL), stored in the MC18's write-protected flash.

# CHAPTER 10 MAINTENANCE AND TROUBLESHOOTING

---

## Introduction

This chapter includes instructions on cleaning and storing the MC18, battery maintenance and provides troubleshooting solutions for potential problems during MC18 operating.

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## Maintaining the MC18

For trouble-free service, observe the following tips when using the MC18:

- Protect the MC18 from temperature extremes.
- Do not store or use the MC18 in any location that is extremely dusty, damp, or wet.
- Use a soft lens cloth to clean the scan exit window of the MC18. If the surface of the MC18 screen becomes soiled, clean it with a soft cloth moistened with a diluted window-cleaning solution. Do not use bleach or ammonia.
- Take care not to scratch the screen of the MC18.
- The display of the MC18 contains glass. Take care not to drop the MC18 or subject it to strong impact.

---

## Battery Safety Guidelines

- The area in which the MC18 units are charged should be clear of debris and combustible materials or chemicals. Particular care should be taken where the device is charged in a non-commercial environment.
- Do not use incompatible batteries and chargers. If you have any questions about the compatibility of a battery or a charger, contact Symbol Technologies Global Customer Support. See [Service Information on page xiv](#) for contact information.
- Do not crush, puncture, or place a high degree of pressure on the battery.
- Follow battery usage, storage, and charging guidelines found in the MC18 Quick Reference Guide.
- Improper battery use may result in a fire, explosion, or other hazard.

- To charge the mobile device battery, the battery and charger temperatures must be between +32°F and +104°F (0°C and +40°C)
- Do not disassemble or open, crush, bend or deform, puncture, or shred.
- Severe impact from dropping any battery-operated device on a hard surface could cause the battery to overheat.
- Do not short circuit a battery or allow metallic or conductive objects to contact the battery terminals.
- Do not modify or remanufacture, attempt to insert foreign objects into the battery, immerse or expose to water or other liquids, or expose to fire, explosion, or other hazard.
- Do not leave or store the equipment in or near areas that might get very hot, such as in a parked vehicle or near a radiator or other heat source. Do not place battery into a microwave oven or dryer.
- Battery usage by children should be supervised.
- Please follow local regulations to promptly dispose of used re-chargeable batteries.
- Do not dispose of batteries in fire.
- Seek medical advice immediately if a battery has been swallowed.
- In the event of a battery leak, do not allow the liquid to come in contact with the skin or eyes. If contact has been made, wash the affected area with large amounts of water and seek medical advice.
- If you suspect damage to your equipment or battery, call Symbol Technologies Global Customer Support to arrange for inspection. See [Service Information on page xiv](#) for contact information.

---

## Long Term Storage

When storing the MC18 for a long period of time it is recommended to remove the battery.

When returning the MC18 to everyday operation, install a fully charged battery.

---

## Cleaning



**CAUTION** Always wear eye protection.

Read warning label on compressed air and alcohol product before using.

If you have to use any other solution for medical reasons please contact Symbol Technologies for more information.



**WARNING!** Avoid exposing this product to contact with hot oil or other flammable liquids. If such exposure occurs, unplug the device and clean the product immediately in accordance with these guidelines.

## Materials Required

- Alcohol wipes
- Lens tissue
- Cotton tipped applicators



- Isopropyl alcohol
- Can of compressed air with a tube.

## Cleaning the MC18

### Housing

Using the alcohol wipes, wipe the housing including the scan key.

### Display

The display can be wiped down with the alcohol wipes, but care should be taken not to allow any pooling of liquid around the edges of the display. Immediately dried the display with a soft, non-abrasive cloth to prevent streaking.

### Scan Exit Window

Wipe the scan exit window periodically with a lens tissue or other material suitable for cleaning optical material such as eyeglasses.

### Power Connector

1. Remove the main battery from MC18. See [Removing the Battery on page 1-9](#).
2. Install the battery cover.
3. Dip the cotton portion of the cotton tipped applicator in isopropyl alcohol.
4. Repeat at least three times.
5. Use the cotton tipped applicator dipped in alcohol to remove any grease and dirt near the connector area.
6. Use a dry cotton tipped applicator and repeat steps 3 through 6.
7. Spray compressed air on the connector area by pointing the tube/nozzle about ½ inch away from the surface.



**CAUTION** Do not point nozzle at yourself and others, ensure the nozzle or tube is away from your face.

8. Inspect the area for any grease or dirt, repeat if required.

## Cleaning Cradle Connectors

Use this procedure to clean the connectors on a cradle:

1. Remove power from the cradle.
2. Dip the cotton portion of the cotton tipped applicator in isopropyl alcohol.
3. Rub the cotton portion of the cotton tipped applicator along the pins of the connector. Slowly move the applicator back-and-forth from one side of the connector to the other. Do not let any cotton residue on the connector.
4. All sides of the connector should also be rubbed with the cotton tipped applicator.

5. Spray compressed air in the connector area by pointing the tube/nozzle about ½ inch away from the surface.



**CAUTION** Do not point nozzle at yourself and others, ensure the nozzle or tube is pointed away from your face.

6. Ensure that there is no lint left by the cotton tipped applicator, remove lint if found.
7. If grease and other dirt can be found on other areas of the cradle, use lint free cloth and alcohol to remove.
8. Allow at least 10 to 30 minutes (depending on ambient temperature and humidity) for the alcohol to air dry before applying power to cradle.

If the temperature is low and humidity is high, longer drying time is required. Warm temperature and dry humidity requires less drying time.

## Cleaning Frequency

The cleaning frequency is up to the customer's discretion due to the varied environments in which the MC18 units are used. They may be cleaned as frequently as required. However when used in dirty environments it may be advisable to periodically clean the scanner exit window to ensure optimum scanning performance.

## Troubleshooting

### MC18

**Table 10-1** Troubleshooting the MC18

Problem	Cause	Solution
MC18 does not turn on.	Battery not charged.	Charge or replace the battery in the MC18.
	Battery not installed properly.	Ensure battery is installed properly. See <i>Installing the Battery on page 1-8</i> .
	System crash.	Perform a warm boot. If the MC18 still does not turn on, perform a cold boot. See <i>Resetting the MC18 on page 1-16</i> .
Battery did not charge.	Battery failed.	Replace battery. If the MC18 still does not operate, try a warm boot, then a cold boot. See <i>Resetting the MC18 on page 1-16</i> .
	MC18 removed from cradle before charging completed.	Insert the MC18 into the cradle and begin charging. The battery fully charges in approximately four hours.
	Ambient temperature of the cradle is too warm or too cold.	The ambient temperature must be between 0 °C and 40 °C (32 °F and 104 °F).
During data communication, no data was transmitted, or transmitted data was incomplete.	MC18 unplugged from host computer during communication.	Reconnect the programming cable to the host computer and re-transmit.
	Communication software was incorrectly installed or configured.	Ensure that Microsoft ActiveSync 4.5 / Windows Mobile Device Center 6.1 or greater is installed on the host computer.

**Table 10-1** Troubleshooting the MC18 (Continued)

<b>Problem</b>	<b>Cause</b>	<b>Solution</b>
MC18 turns itself off.	MC18 is inactive.	The MC18 turns off after a period of inactivity. If the MC18 is running on battery power, this period can be set to 1, 2, 3, 4, 5 minutes. If the MC18 is running on external power, this period can be set to 1, 2, 3, 5, 10, 15 and 30 minutes. Check the power settings by selecting <b>Start &gt; Settings &gt; Control Panel &gt; Power</b> icon > <b>Advanced</b> tab. Change the setting if you need a longer delay before the automatic shutoff feature activates.
	Battery is depleted.	Place the MC18 in the cradle to re-charge the battery.
	Battery is not inserted properly.	Insert the battery properly (see <a href="#">Installing the Battery on page 1-8</a> ).
	The MC18's battery is low and it powers down to protect memory content.	Place the MC18 in the cradle to re-charge the battery.
A message appears stating that the MC18 memory is full.	Too many files stored on the MC18.	Delete unused memos and records. You can save these records on the host computer.
	Too many applications installed on the MC18.	If you have installed additional applications on the MC18, remove them to recover memory. Select <b>Start &gt; Settings &gt; Control Panel &gt; Remove Programs</b> icon. Select the unused program and select <b>Remove</b> .
The MC18 does not accept scan input.	Scanning application is not loaded.	Verify that the MC18 is loaded with a scanning application. See the System Administrator.
	Unreadable bar code.	Ensure the symbol is not defaced.
	Distance between imager exit window and bar code is incorrect.	Move the MC18 closer or further from the bar code to the proper scanning range.
	MC18 is not programmed for the bar code.	Verify that the MC18 can read the type of bar code being scanned (See <a href="#">Technical Specifications</a> ). Ensure that the bar code parameters are set properly for the bar code being scanned.
	MC18 is not programmed to generate a beep.	Click <b>Start &gt; Programs &gt; CtPanel &gt; Audio Settings</b> and verify that a beep on a good decode is used and the <b>Beeper Volume</b> is not set to 0.
	Battery is low.	If the scanner is still not reading symbols, contact the distributor or service.

**Table 10-1** *Troubleshooting the MC18 (Continued)*

Problem	Cause	Solution
During USB data communications, no data was transmitted, or transmitted data was incomplete.	Incorrect cable connection.	See <a href="#">Connecting the MC18 to a Host Computer on page 4-2</a> .
	Communications software is not installed or configured properly.	Perform setup as described in <a href="#">Chapter 8, Cradle Installation</a> . Ensure that a sync program is installed on the host computer.
Cannot sync with Host Computer	Host computer not configured properly.	Ensure that sync program on the host computer is set to allow USB connections. See <a href="#">Chapter 4, Sync with Host Computer</a> for more information.

## Cradles

**Table 10-2** *Troubleshooting the Cradles*

Symptom	Possible Cause	Solution
MC18 battery is not charging.	MC18 was removed from cradle or cradle was unplugged from AC power.	Ensure cradle is receiving power. Ensure MC18 is seated correctly. Confirm main battery is charging. The battery fully charges in approximately four hours. View battery status by selecting <b>Start &gt; Settings &gt; Control Panel &gt; Power</b> icon.
	Battery is faulty.	Verify that other batteries charge properly. If so, replace the faulty battery (see <a href="#">Installing the Battery on page 1-8</a> ).
	The MC18 is not fully seated in the cradle.	Remove and re-insert the MC18 into the cradle, ensuring it is firmly seated.
	Ambient temperature of the cradle is too warm or too cold.	Move the cradle to an area where the ambient temperature is between 0 °C and 40 °C (32 °F and 104 °F).
It is taking longer than four hours to charge the MC18.	MC18 is not optimized for low radio signal strength.	Refer to <a href="#">Tips for Improving Battery Charge Time on page 6-3</a> for information on optimizing the MC18.



# APPENDIX A TECHNICAL SPECIFICATIONS

## Technical Specifications

The following tables summarize the MC18's intended operating environment and general technical hardware specifications.

**Table A-1** *Technical Specifications*

Item	Description
<b>Physical and Environmental Characteristics</b>	
Dimensions (H x L x W)	3.12 in. x 8.07 in. x 2.94 in. (7.95 cm x 20.5 cm x 7.47 cm)
Weight	297 g (10.47 oz) with battery
Keys	Single scan key
Display	Color LCD, 4",480x800 WVGA resolution, 16 bits/pixel RGB, 450 Nits LED backlight, capacitive touch screen
Speaker	2W speaker
Main Battery	"Gifted" battery, rechargeable 3.7 VDC Lithium Ion battery. Standard capacity: 2,590mAh.
<b>Performance Characteristics</b>	
CPU	TI OMAP4430 (MPA3), Dual Core, 800MHz
Operating System	Windows CE 7 Professional, Microsoft Internet Explorer CE 7
Memory	Configuration: Flash - 2GB, RAN - 512MB High Memory Configuration: Flash - 4GB, RAN - 1GB
Application Development	EMDK for C, EMDK for .NET extended to include MC18 specific APIs. EMDKs are available through Support Central web site

**Table A-1** *Technical Specifications (Continued)*

Item	Description
Data Capture Method	Imager (SE4710) with red LED Illumination and LED dot aim pattern. Imaging rate: 30 Frames per second, 1280p x 800p Imager Safety IEC/FDA Class 1 in accordance with IEC/EN 60825-1 & 21 CFR 1040.10 & 11 (Laser Notice No. 50)
<b>User Environment</b>	
Operating Temperature	0° C to 40° C (32° F to 104° F)
Storage Temperature	-20° C to 60° C (-4° F to 140° F)
Battery Charging Temperature	0° C to +40° C (32° F to 104° F) ambient temperature range.
Humidity	40° C (RH 10% - 95%) Non-condensing
Flammability	UL94V1
Drop Specification	Multiple 4 ft.(1.2 m) drops to tile linoleum over concrete across operating temperature range
Sealing	Liquid penetration per “A4T Casual Spill Test Spec” document number 71-98611-01. Applies ONLY with battery installed.
ESD	± 20k VDC air discharge ± 10k VDC contact discharge
<b>Interface/ Communications</b>	
WLAN radio	TI / 1273L - Wi-Fi IEEE® 802.11a/b/g/n with internal antenna Operating Channels: Channel 1 - 13 (2412 - 2472 MHz) Actual operating frequencies depend on regulatory rules and certification agency. Authentication: EAP-TTLS authentication with tunnel types CHAP, MSCHAP, MSCHAPv2, PAP, MD5, EAP-TLS, PEAP-TLS authentication with tunnel types TLS, MSCHAPv2, and GTC, LEAP, EAP-FAST authentication with tunnel types TLS, MSCHAPv2, and GTCon, EAP-AKA , WAPI Encryption: None, 128-bit AES, TKIP, WEP-128, WEP-40/65
Bluetooth Communications	TI / 1273L - MS stack 2.1
USB	USB 2.0 Client for Microsoft ActiveSync or Windows Mobile Device Center, for service and maintenance
<b>Regulatory</b>	
Electrical Safety	Certified to UL/cUL 60950-1, IEC 60950-1 ; IEC 62471:2006/EN62471:2008 (LED Safety Report)
EMI/RFI	North America: FCC Part 15 Subpart B class B Canada: ICES 003 Class B EU: EN55022 Class B, EN 301 489-1, EN301 489-17, EN61000-4-3/-3-2/-3-3



**Table A-1** *Technical Specifications (Continued)*

Item	Description
FCC	RF FCC Part 15 subpart C and E , RSS 210 Anex 8 and 9, EN 300 328, EN 301 893, AS/NZS 426
Electrical Safety/ Laser Safety	Certified to UL/cUL 60950-1, EN/IEC 60950-1 IEC 62471:2006 and EN 62471:2008 (LED Safety Report).
EMI/RFI	North America: FCC Part 15 Subpart B class B Canada: ICES 003 Class B EU: EN55022 Class B, EN 301 489-1, EN 301 489-17, EN61000-4-3/-3-2/-3-3 Australia: AS/NZS CISPR 22
Imager Decode Capability	<p>The SE4710 2D supports barcode symbologies listed below (The specific engine configuration is identified / readable in the system configuration).</p> <ul style="list-style-type: none"> <li>• Code 39: Trioptic Code 39</li> <li>UPC/EAN: UPCA (+ add-on), UPCE (+ add-on), UPCE1, EAN-8, EAN-13 (+ add-on), JAN-8 (Note: This is supported but not handled separately from EAN8 or EAN 13), JAN-13 (+ add-on), SBN / Bookland (+ISBN 13), ISSN, Coupon Codes including GS1 Databar Expanded Format.</li> <li>• Code 128: ISBT-128, UCC/EAN 128, GS1-128 (Note this is the new name for EANUCC-128)</li> <li>• Code 93</li> <li>• MSI</li> <li>• Codabar: ABC, Ames</li> <li>• 2 of 5: Interleaved 2 of 5 / ITF, Discrete 2 of 5, IATA, Chinese 2 of 5, Code 11, Matrix 2 of 5</li> <li>• Korean 3 of 5</li> <li>• RSS/GS1 data bar: GS1-DataBar (Previously known as RSS), GS1-DataBar Limited, GS1-DataBar Expanded (Including stacked)</li> <li>• 2D symbologies</li> <li>• PDF-417: Macro PDF, Macro Micro PDF, Composite, Composite C, Composite AB</li> <li>• Data Matrix: GS1-Datamatrix</li> <li>• QR code: Micro QR, GS1-QR code</li> <li>• Aztec</li> <li>• Maxicode</li> <li>• Han Xin (Chinese Sensible Code)</li> <li>• Postal codes: Linked Aztec, US Planet, US Postnet, US Intelligent Mail, Royal Mail 4 State, USPS 4CB/OneCode/Intelligent Mail, UPU FICS Postal, UK Postal, Japan Postal, Australian Postal, Canada Post, Netherlands KIX Code</li> <li>• Image capture</li> <li>• Signature capture</li> </ul>

## Three Slot Cradle

**Table A-2** *Cradle Specifications*

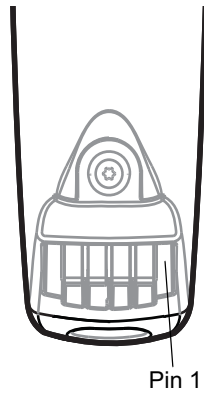
Item	Description
Operating Temperature	0° C to +50° C (32° F to 122° F)
Storage Temperature	-40° C to 70° C (-40° F to 158° F)
Battery Charging Temperature	0° C to +40° C (32° F to 104° F) ambient temperature
Humidity	5% to 95% non-condensing
Size (H x L x W)	129 mm x 134 mm x 310 mm (5 in x 5.2 in x 12.2 in)
Weight	
Power Supply	12.0 VDC,9.0 A
Electrostatic Discharge (ESD)	±15 kV air discharge, ± 8 kV contact discharge

## Single-Slot Cradle

**Table A-3** *Cradle Specifications*

Item	Description
Operating Temperature	0° C to +50° C (32° F to 122° F)
Storage Temperature	-40° C to 70° C (-40° F to 158° F)
Battery Charging Temperature	0° C to +40° C (32° F to 104° F) ambient temperature
Humidity	5% to 95% non-condensing
Size (L x W x H)	98 mm x 127 mm x 272 mm (4 in. x 5 in. x 10.7 in.)
Weight	652 g (23 oz)
Power Supply	12.0 VDC,9.0 A
Electrostatic Discharge (ESD)	±15 kV air discharge, ± 8 kV contact discharge

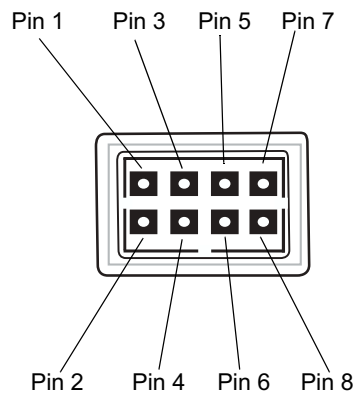
## MC18 Interface Connector Pin-Outs



**Figure A-1** Power Connector Pin-Outs

**Table A-4** Power Connector Pin-Outs

PIN	Signal Name	Function
1	GND	Ground
2	TX	Transmit Output to Cradle
3	RX	Receive Input from Cradle
4	+5V	Input power.



**Figure A-2** Sync Connector Pin-Outs

**Table A-5** Sync Connector Pin-Outs

PIN Number	Signal Name	Function
1	USB_PWR	+5 VDC
2	USBA0_OTG_DP	USB DATA +
3	Reserved	Not Used
4	USBA0_OTG_DM	USB DATA -

**Table A-5** Sync Connector Pin-Outs (Continued)

PIN Number	Signal Name	Function
5	Sys_Boot5	Not Used
6	GND	Forces system to cold boot from USB
7	UART4_TXD	Debug Transmit Output
8	UART4_RXD	Debug Receive Input

## Cable Specifications

### Power Supply Cable, Y-type

**Table A-6** Wire Run List & Specifications

Wire Color	AWG	Connector 1 Molex 39-01-2060 housing; 4x, 39-00-0211 contacts	Connector 2 Molex 39-01-2025 housing; 2x, 39-00-0211 contacts	Connector 3 Molex 39-01-2025 housing; 2x, 39-00-0211 contacts	Function
Red	16	1	1		(+) term
Black	16	6	2		(-) term
Red	16	2		1	(+) term
Black	16	5		2	(-) term

The 16 AWG wire should have the following specifications: UL1007, 300 Volt, PVC, -40° C to 80° C operating temperature.

### Cradle Interconnection Cable

**Table A-7** Wire Run List & Specifications

Wire Color	AWG	Connector 1 Molex 39-01-2025 housing; 2x, 39-00-0211 contacts	Connector 2 Molex 39-01-2025 housing; 2x, 39-00-0211 contacts	Function
Red	16	1	1	(+) term
Black	16	2	2	(-) term

The 16 AWG wire should have the following specifications: UL1007, 300 Volt, PVC, -40° C to 80° C operating temperature.



# APPENDIX B APP LAUNCHER CONFIGURATION

---

## Configuration

The menu on the **App Launcher** window can be modified to display and launch any application on the MC18.



**Figure B-1** *Default App Launcher Window*

Use this procedure to customize the **App Launcher** menu:

1. Sync the MC18 with a host computer (See [Chapter 4, Sync with Host Computer](#)).
2. Copy the file `launcher.reg` from the `/Application` folder on the MC18 to a local directory on the host computer.
3. Open the file using a text editor.

4. The following lists the five default menu items that appear on the App Launcher display. Note that Exit menu item is not listed in the registry file.

```
[HKEY_CURRENT_USER\Software\Symbol\Launcher\Default\Programs\Prog1]
"Description"="RD Client"
"Name"="\windows\rdclient.exe"
"Command"=""
```

```
[HKEY_CURRENT_USER\Software\Motorola\AppLauncher\Profiles\DefaultProf\Default\
Programs]
```

```
"Description"="SPB"
"Name"="\program files\SPB2_CE.exe"
"Command"=""
```

```
[HKEY_CURRENT_USER\Software\Symbol\Launcher\Default\Programs\Prog3]
"Description"="Device Info"
"Name"="\Windows\DeviceInfoApp.exe"
"Command"=""
```

```
[HKEY_CURRENT_USER\Software\Symbol\Launcher\Default\Programs\Prog4]
"Description"="MC18-Scan"
"Name"="\Application\MC18-Scan.EXE"
"Command"=""
```

```
[HKEY_CURRENT_USER\Software\Symbol\Launcher\Default\Programs\Prog5]
"Description"="Reset"
"Name"="\Windows\WarmBoot.EXE"
"Command"=""
```

Use this procedure to add a sixth item to the list, enter the following after the warm boot entry:

```
[HKEY_CURRENT_USER\Software\Symbol\Launcher\Default\Programs\Prog6]
"Description"="Control Panel"
"Name"="\Windows\CtlPanel.EXE"
"Command"=""
```

1. Save the registry file.
2. Copy the file back to the */Application* folder on the MC18.
3. Cold boot the MC18.



# GLOSSARY

---

## Numeric

- 802.11.** A group of wireless specifications developed by the Institute of Electrical and Electronics Engineers (IEEE). It specifies an over-the-air interface between a wireless client and a base station or between two wireless clients.
- 802.11b.** Operates in the 2.4 GHz Industrial, Scientific and Measurement (ISM) band (2.4 to 2.4835 GHz) and provides signaling rates of up to 11Mbit/sec. This is a very commonly used frequency. Microwave ovens, cordless phones, medical and scientific equipment, as well as Bluetooth devices, all work within the 2.4 GHz ISM band.
- 802.11g.** Similar to 802.11b, but this standard supports signaling rates of up to 54Mbit/sec. It also operates in the heavily used 2.4 GHz ISM band but uses a different radio technology to boost overall throughput. Compatible with the 802.11b.
- 802.11n.** Wireless networking standard that uses multiple antennas to increase data rates to improve network performance over the two previous standards—802.11a and 802.11g—with a significant increase in the maximum net data rate from 54 Mbit/s to 600 Mbit/s. It can be used in the 2.4 GHz or 5 GHz frequency bands.

---

## A

- Access Point.** Provides a bridge between Ethernet wired LANs and the wireless network. Access points are the connectivity point between Ethernet wired networks and devices (laptops, hand-held computers, point-of-sale terminals) equipped with a wireless LAN adapter card.
- Ad Hoc Mode.** A wireless network framework in which devices communicate directly with one another without using an access point.
- API.** Application Programming interface - An interface by means of which one software component communicates with or controls another. Usually used to refer to services provided by one software component to another, usually via software interrupts or function calls
- Association.** The process of determining the viability of the wireless connection and establishing a wireless network's root and designated access points. A MC18 associates with its wireless network as soon as it is powered on or moves into range.

---

## B

**Bar Code.** A pattern of variable-width bars and spaces which represents numeric or alphanumeric data in machine-readable form. The general format of a bar code symbol consists of a leading margin, start character, data or message character, check character (if any), stop character, and trailing margin. Within this framework, each recognizable symbology uses its own unique format. See **Symbology**.

**Bits per Second (bps).** Bits transmitted or received.

**Bit.** Binary digit. One bit is the basic unit of binary information. Generally, eight consecutive bits compose one byte of data. The pattern of 0 and 1 values within the byte determines its meaning.

**Byte.** On an addressable boundary, eight adjacent binary digits (0 and 1) combined in a pattern to represent a specific character or numeric value. Bits are numbered from the right, 0 through 7, with bit 0 the low-order bit. One byte in memory is used to store one ASCII character.

**boot or boot-up.** The process a computer goes through when it starts. During boot-up, the computer can run self-diagnostic tests and configure hardware and software.

---

## C

**CAM.** (Continuously Aware Mode) Mode in which the adapter is instructed to continually check for network activity.

**CHAP.** (Challenge Handshake Authentication Protocol) A type of authentication in which the authentication agent (typically a network server) sends the client program a random value that is used only once and an ID value. Both the sender and peer share a predefined secret. The peer concatenates the random value (or nonce), the ID and the secret and calculates a one-way hash using MD5. The hash value is sent to the authenticator, which in turn builds that same string on its side, calculates the MD5 sum itself and compares the result with the value received from the peer. If the values match, the peer is authenticated.

**Character.** A pattern of bars and spaces which either directly represents data or indicates a control function, such as a number, letter, punctuation mark, or communications control contained in a message.

**Character Set.** Those characters available for encoding in a particular bar code symbology.

**Cold Boot.** A cold boot restarts the MC18 and erases all user stored records and entries.

**COM port.** Communication port; ports are identified by number, e.g., COM1, COM2.

**Continuous Code.** A bar code or symbol in which all spaces within the symbol are parts of characters. There are no intercharacter gaps in a continuous code. The absence of gaps allows for greater information density.

**Cradle.** A cradle is used for charging the MC18 battery and for communicating with a host computer, and provides a storage place for the MC18 when not in use.

---

## D

**DCP.** See **Device Configuration Package**.

**Decode.** To recognize a bar code symbology (e.g., UPC/EAN) and then analyze the content of the specific bar code scanned.

**Decode Algorithm.** A decoding scheme that converts pulse widths into data representation of the letters or numbers encoded within a bar code symbol.

**Decryption.** Decryption is the decoding and unscrambling of received encrypted data. Also see, **Encryption** and **Key**.

**Depth of Field.** The range between minimum and maximum distances at which a scanner can read a symbol with a certain minimum element width.

**Device Configuration Package.** The Device Configuration Package provides flash partitions, Terminal Configuration Manager (TCM) and the associated TCM scripts. With this package hex images that represent flash partitions can be created and downloaded to the MC18.

---

## E

**EAN.** (European Article Number) This European/International version of the UPC provides its own coding format and symbology standards. Element dimensions are specified metrically. EAN is used primarily in retail.

**EAP.** (Extensible Authentication Protocol) A general authentication protocol used to control network access. Many specific authentication methods work within this framework.

**EAP-PEAP.** (Extensible Authentication Protocol-Protected Extensible Authentication Protocol) A mutual authentication method that uses a combination of digital certificates and another system, such as passwords.

**EAP-TLS.** (Extensible Authentication Protocol-Transport Layer Security) A mutual authentication method that uses digital certificates.

**Encoded Area.** Total linear dimension occupied by all characters of a code pattern, including start/stop characters and data.

**Encryption.** Encoding data to prevent it from being read by unauthorized people.

**ENQ (RS-232).** ENQ software handshaking is also supported for the data sent to the host.

**EMDK.** Enterprise Mobility Developer's Kit.

**Ethernet.** An IEEE standard network protocol that specifies how data is placed on and retrieved from a common transmission medium.

---

## F

**Flash Memory.** Flash memory is nonvolatile, semi-permanent storage that can be electronically erased in the circuit and reprogrammed.

**File Transfer Protocol (FTP).** A TCP/IP application protocol governing file transfer via network or telephone lines. See **TCP/IP**.

---

## G

**Gifted Batteries.** A battery with advanced features such as: advanced state of battery health, more accurate state of charge, elapsed time since first use by customer, time to fully charge, time to fully discharge, estimate of capacity if battery were fully charged and operated under present load conditions and temperature.

---

## H

**Hard Reset.** See **Cold Boot**.

**Hz.** Hertz; A unit of frequency equal to one cycle per second.

**Host Computer.** A computer that serves other mobile computers in a network, providing such services as computation, database access, supervisory programs and network control.

---

## I

**IEC.** International Electrotechnical Commission. This international agency regulates laser safety by specifying various laser operation classes based on power output during operation.

**IEEE Address.** See **MAC Address**.

**Internet Protocol Address.** See **IP**.

**Input/Output Ports.** I/O ports are primarily dedicated to passing information into or out of the MC18's memory.

**IP.** (Internet Protocol) The IP part of the TCP/IP communications protocol. IP implements the network layer (layer 3) of the protocol, which contains a network address and is used to route a message to a different network or subnetwork. IP accepts "packets" from the layer 4 transport protocol (TCP or UDP), adds its own header to it and delivers a "datagram" to the layer 2 data link protocol. It may also break the packet into fragments to support the maximum transmission unit (MTU) of the network.

**IP Address.** (Internet Protocol address) The address of a computer attached to an IP network. Every client and server station must have a unique IP address. A 32-bit address used by a computer on a IP network. Client workstations have either a permanent address or one that is dynamically assigned to them each session. IP addresses are written as four sets of numbers separated by periods; for example, 204.171.64.2.

---

## K

**Key.** A key is the specific code used by the algorithm to encrypt or decrypt the data. Also see, **Encryption** and **Decrypting**.

---

## L

**Imager.** A type of bar code reader that uses a camera.

**LCD.** See **Liquid Crystal Display**.

**LEAP.** (Lightweight Extensible Authentication Protocol) A mutual authentication method that uses a username and password system.

**LED Indicator.** A semiconductor diode (LED - Light Emitting Diode) used as an indicator, often in digital displays. The semiconductor uses applied voltage to produce light of a certain frequency determined by the semiconductor's particular chemical composition.

**Liquid Crystal Display (LCD).** A display that uses liquid crystal sealed between two glass plates. The crystals are excited by precise electrical charges, causing them to reflect light outside according to their bias. They use little electricity and react relatively quickly. They require external light to reflect their information to the user.

---

## M

**Mobile Computer.** In this text, mobile computer refers to the MC18. It can be set up to run as a stand-alone device, or it can be set up to communicate with a network, using wireless radio technology.

**MSCHAP.** (Microsoft Challenge Handshake Authentication Protocol) is the Microsoft version of CHAP and is an extension to RFC 1994. Like the standard version of CHAP, MS-CHAP is used for PPP authentication; in this case, authentication occurs between a PC using Microsoft Windows NT or Microsoft Windows 95 and a Cisco router or access server acting as a network access server (NAS).

---

## N

**Nominal.** The exact (or ideal) intended value for a specified parameter. Tolerances are specified as positive and negative deviations from this value.

**Nominal Size.** Standard size for a bar code symbol. Most UPC/EAN codes are used over a range of magnifications (e.g., from 0.80 to 2.00 of nominal).

---

## P

**Parameter.** A variable that can have different values assigned to it.

**PING.** (Packet Internet Groper) An Internet utility used to determine whether a particular IP address is online. It is used to test and debug a network by sending out a packet and waiting for a response.

**Programming Mode.** The state in which a scanner is configured for parameter values. See **Scanning Mode**.

---

## Q

**Quiet Zone.** A clear space, containing no dark marks, which precedes the start character of a bar code symbol and follows the stop character.

---

## R

**RAM.** Random Access Memory. Data in RAM can be accessed in random order, and quickly written and read.

**RF.** Radio Frequency.

**ROM.** Read-Only Memory. Data stored in ROM cannot be changed or removed.

**Router.** A device that connects networks and supports the required protocols for packet filtering. Routers are typically used to extend the range of cabling and to organize the topology of a network into subnets. See **Subnet**.

---

## S

**Scanning Mode.** The scanner is energized, programmed and ready to read a bar code.

**Scanning Sequence.** A method of programming or configuring parameters for a bar code reading system by scanning bar code menus.

**SDK.** Software Development Kit

**Shared Key.** Shared Key authentication is an algorithm where both the AP and the MU share an authentication key.

**Soft Reset.** See **Warm Boot**.

**Specular Reflection.** The mirror-like direct reflection of light from a surface, which can cause difficulty decoding a bar code.

**Subnet.** A subset of nodes on a network that are serviced by the same router. See **Router**.

**Substrate.** A foundation material on which a substance or image is placed.

**Symbol.** A scannable unit that encodes data within the conventions of a certain symbology, usually including start/stop characters, quiet zones, data characters and check characters.

**Symbology.** The structural rules and conventions for representing data within a particular bar code type (e.g. UPC/EAN, Code 39, PDF417, etc.).

---

## T

**TCP/IP.** (Transmission Control Protocol/Internet Protocol) A communications protocol used to internetwork dissimilar systems. This standard is the protocol of the Internet and has become the global standard for communications. TCP

provides transport functions, which ensures that the total amount of bytes sent is received correctly at the other end. UDP is an alternate transport that does not guarantee delivery. It is widely used for real-time voice and video transmissions where erroneous packets are not retransmitted. IP provides the routing mechanism. TCP/IP is a routable protocol, which means that all messages contain not only the address of the destination station, but the address of a destination network. This allows TCP/IP messages to be sent to multiple networks within an organization or around the world, hence its use in the worldwide Internet. Every client and server in a TCP/IP network requires an IP address, which is either permanently assigned or dynamically assigned at startup.

**TFTP.** (Trivial File Transfer Protocol) A version of the TCP/IP FTP (File Transfer Protocol) protocol that has no directory or password capability. It is the protocol used for upgrading firmware, downloading software and remote booting of diskless devices.

**TKIP.** (Temporal Key Integrity Protocol) A wireless encryption protocol that periodically changes the encryption key, making it harder to decode.

**Transmission Control Protocol/Internet Protocol.** See **TCP/IP**.

**TLS.** (Transport Layer Security) TLS is a protocol that ensures privacy between communicating applications and their users on the Internet. When a server and client communicate, TLS ensures that no third party may eavesdrop or tamper with any message. TLS is the successor to the Secure Sockets Layer (SSL).

**Trivial File Transfer Protocol.** See **TFTP**.

---

## U

**UDP.** (User Datagram Protocol) A protocol within the IP protocol suite that is used in place of TCP when a reliable delivery is not required. For example, UDP is used for real-time audio and video traffic where lost packets are simply ignored, because there is no time to retransmit. If UDP is used and a reliable delivery is required, packet sequence checking and error notification must be written into the applications.

---

## W

**Warm Boot.** A warm boot restarts the MC18 by closing all running programs. All data that is not saved to flash memory is lost.

**WAP.** (Wireless Application Protocol) A set of specifications, developed by the WAP Forum, that lets developers using Wireless Markup Language build networked applications designed for handheld wireless devices. WAP was designed to work within the constraints of these devices: a limited memory and CPU size, small, monochrome screens, low bandwidth and erratic connections.

**WEP.** Wired-Equivalent Privacy protocol was specified in the IEEE 802.11 standard to provide a WLAN with a minimal level of security and privacy comparable to a typical wired LAN, using data encryption.

**WPA.** Wi-Fi Protected Access is a data encryption specification for 802.11 wireless networks that replaces the weaker WEP. It improves on WEP by using dynamic keys, Extensible Authentication Protocol to secure network access, and an encryption method called Temporal Key Integrity Protocol (TKIP) to secure data transmissions.

**WPA2.** Wi-Fi Protected Access 2 is an enhanced version of WPA. It uses Advanced Encryption Standard instead of TKIP.

**WLAN.** Wireless local-area networks use radio waves instead of a cable to connect a user device, such as a mobile computer, to a LAN. They provide Ethernet connections over the air and operate under the 802.11 family of specifications developed by the IEEE.



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