Honeywell

MX9

Hand-Held Computer
Microsoft® Windows® Embedded CE 5 Operating System

Reference Guide

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Chapter 1: Introduction

The MX9 is a ruggedized handheld computer targeted for indoor and outdoor use. It is powered by a lightweight main battery that can be removed and replaced without the need for special tools. MX9 wireless connectivity is secured by user-configured encryption and authentication protocols.

The MX9 has an integrated keyboard, outdoor readable touch display, a tethered stylus, Microsoft® Windows® CE 5 operating system, and many wireless connection options.

The keypad is available in a 62-key or 38-key configuration. The 62-key keypad is also available in an IBM 5250 configuration. Bar code reader options are: an imager or laser scanner integrated in the MX9, or a handheld scanner tethered to the port at the base of the MX9, Bluetooth mobile bar code imagers and scanners, or the Honeywell Bluetooth ring scanner / ring imager.

Wireless network connection can be accomplished using a Summit WLAN 802.11 radio, WWAN, and Bluetooth. Desk and vehicle cradles, a trigger handle or handstrap, holsters with shoulder straps or belts, clear covers for cases and holsters, Bluetooth scanners and printer, standard and low temperature batteries, and battery chargers are among the many accessories available for the MX9.

Note: *Contact Technical Assistance for upgrade availability if your application or control panels are not the same as the application or control panels presented in this guide.*

This MX9 Reference Guide has been developed for a MX9 with a Microsoft® Windows® CE 5 Operating System.

End User License Agreement (EULA)

When a new MX9 starts up a EULA is displayed on the touch screen. It remains on the screen until the Accept or Decline button is tapped with a stylus.

Tap the Accept button to accept the EULA terms and the MX9 continues the startup process. The EULA is not presented to the user again.

Tap the Decline button to decline the EULA and the MX9 will reboot. It will continue to reboot until the Accept button is tapped with the stylus.

Note: *The EULA will be presented after any operating system upgrade or re-installation, including language-specific operating systems.*

Components

Front
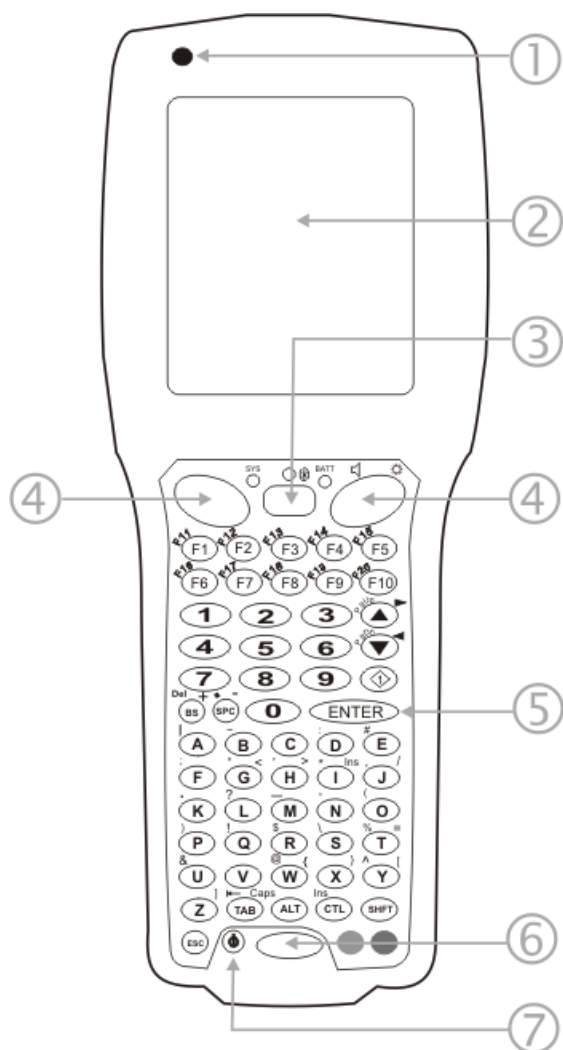
1. Microphone
2. Touch screen
3. Speaker
4. Scan buttons
5. Enter key
6. Scanner status LED
7. Power key

Note: The above list is the same on the 38 key MX9. Special keys are listed below.

Special Purpose Keys - 62 Key
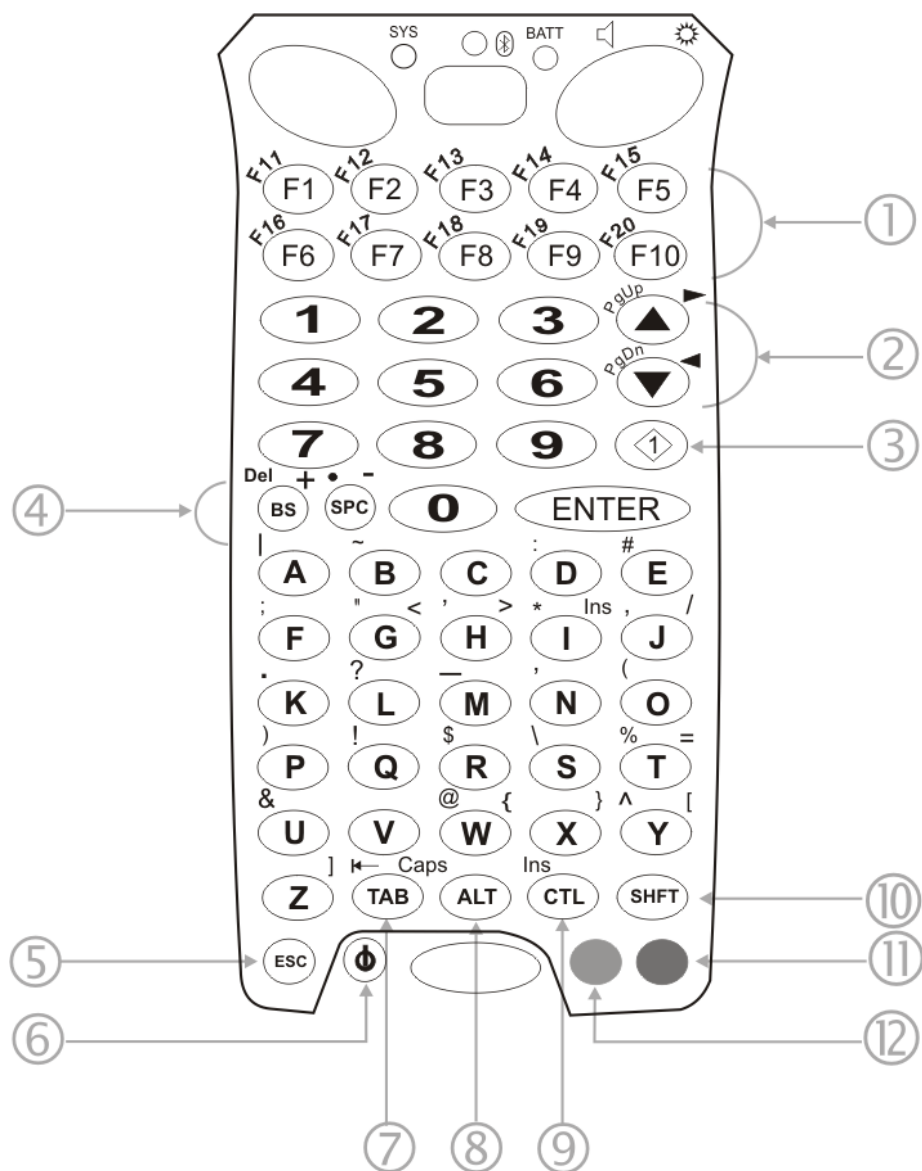
1. Function Keys
2. Cursor up and down Keys
3. Diamond 1 key
4. Backspace [BS] key and Space [SPC] key
5. Escape [ESC] key
6. Power key
7. Tab key
8. Alt key
9. Control [CTL] key
10. Shift [SHFT] key
11. Blue key
12. Orange key

Special Purpose Keys - 38 Key

1. Diamond 1 key
2. Function keys
3. Tab / Space / Backspace keys
4. Diamond 2 key
5. Orange key
6. Escape [ESC] key
7. Alpha key
8. Control [CTRL] key
9. Shift [SHIFT] key
10. Cursor up and down keys
11. Blue key
12. Alt key
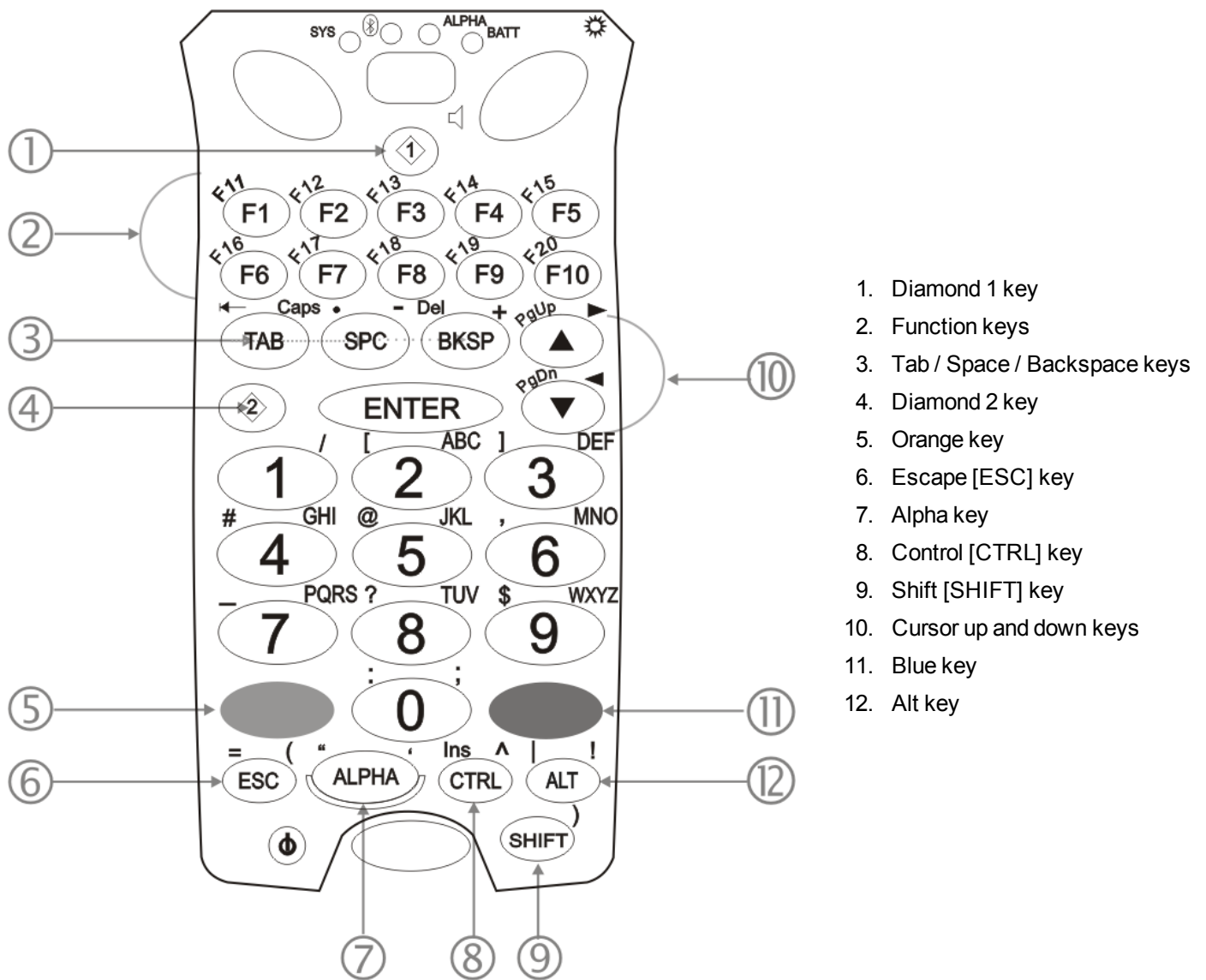
Top
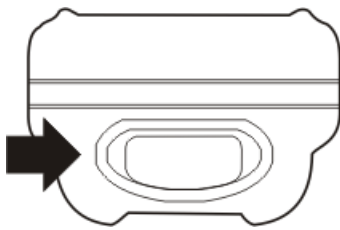
Bar code reader aperture

Bottom
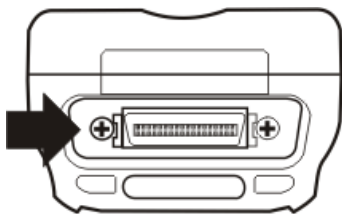
Input / Output Connector

Tethered boot cover not shown (covers I/O connector)

Back

Battery Bay
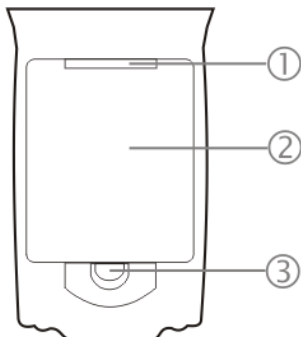
1. Battery Terminals
2. Battery Bay
3. Battery Bay Access Tab

Trigger Handle
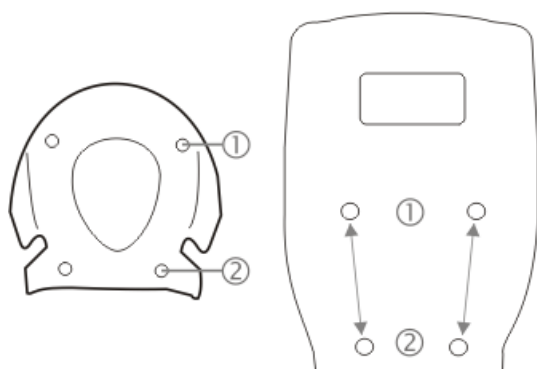
Trigger handle attach points
1. Upper
2. Lower
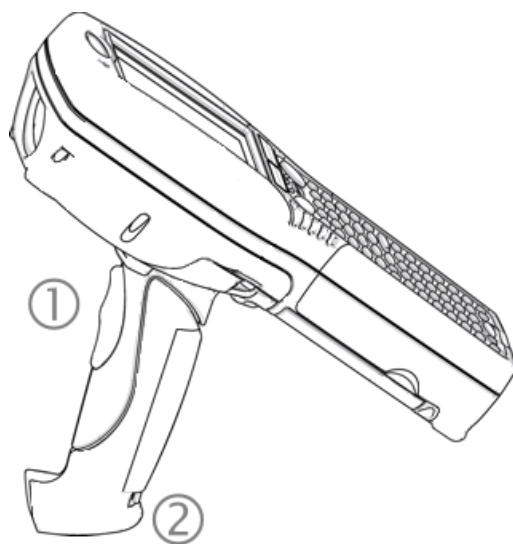
1. Trigger
2. Tether attach point
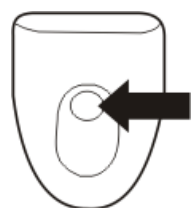
Stylus storage bay in handle

Handstrap
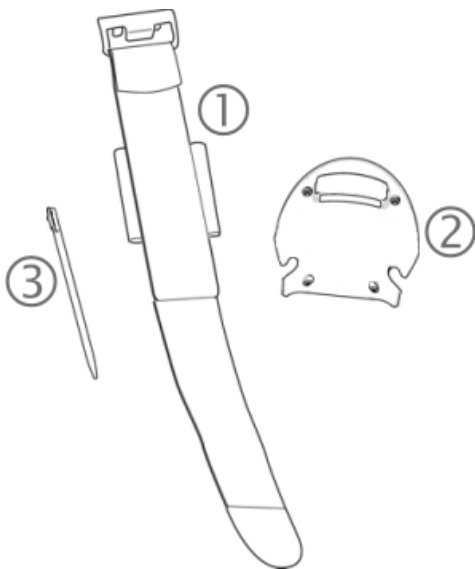
1. Handstrap
2. Handstrap Base
3. Stylus
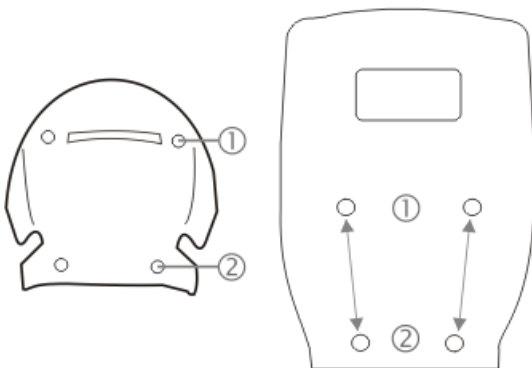
1. Attach - Upper Handstrap Base
2. Attach - Lower Handstrap Base
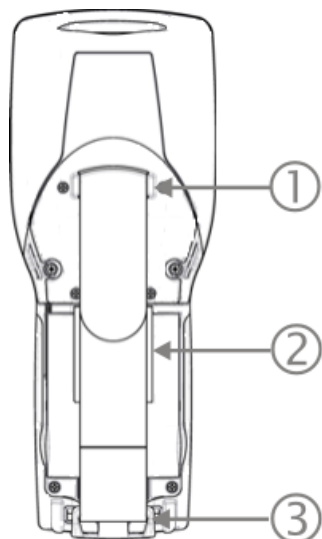
1. Handstrap Connector, Upper
2. Stylus Holder on Handstrap
3. Handstrap Connector, Lower

Label Locations
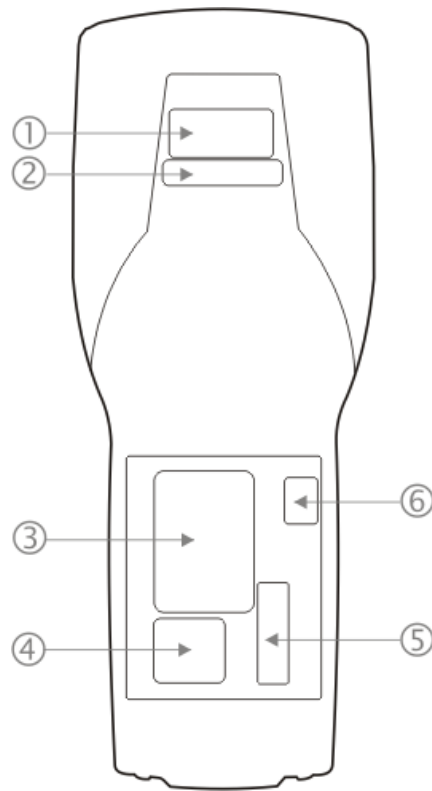
1. Laser Warning Label
2. Bluetooth Label
3. Product Identification Label
4. Java Label (if installed)
5. Windows CE License Label
6. Tamper Proof Label

The tamper-proof label covers the top right screw in the battery bay. The label states "Warranty void if removed or damaged". The battery pack will not deface the label as the battery pack does not touch the label.

Protect the Touch Screen when using a Holster / Carrycase

Holster without Handle
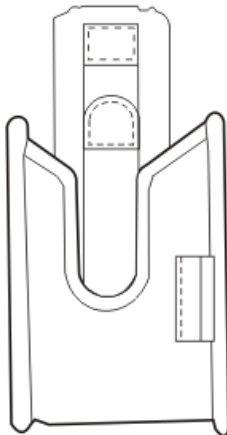
The MX9 is inserted upside-down in the holster with the touch screen facing the belt connecting the holster to the body.

Holster with Handle
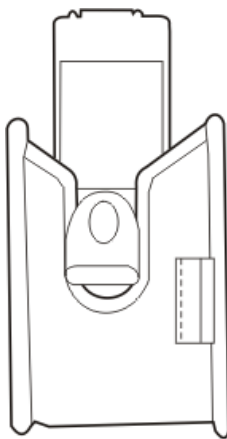
The MX9 is inserted upside-down in the holster with the touch screen facing the belt connecting the holster to the body. Guide the installed trigger handle into the trigger handle notch.

Carrycase
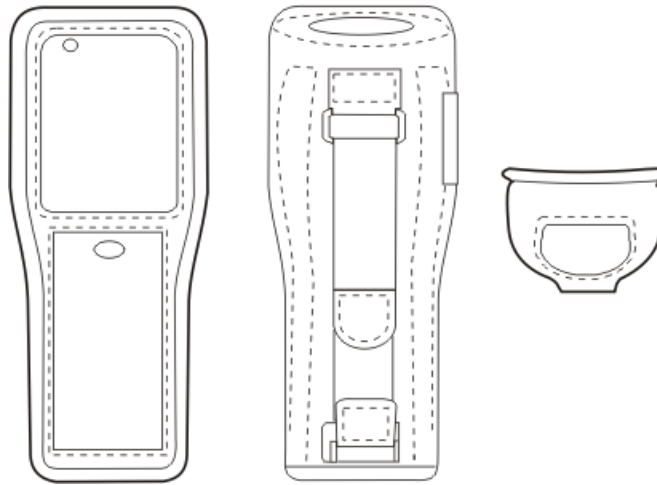
Remove the handstrap components from the MX9. Open the zippered case until there is enough space to insert the MX9 into the case. The touch screen must face forward so it, and the keypad, are visible through the windows in the carrycase.

Close the zippers. If desired, attach the handstrap components to the zippered case.

Installing the SIMM Card

Tools required: standard size Phillips screwdriver (not supplied).

Note: Installation or removal of accessories should be performed on a clean, well-lit surface. Protect the work surface, the MX9, and components from electrostatic discharge. Contact Technical Assistance for help when installing or removing a SIMM card.

The expansion slots in the MX9 are accessible via the hatch. The hatch can be opened using a standard size screwdriver. When the hatch is opened, the MX9 automatically shuts down. It is good practice to save any changes then perform an orderly shutdown to preserve RAM contents before opening the hatch.
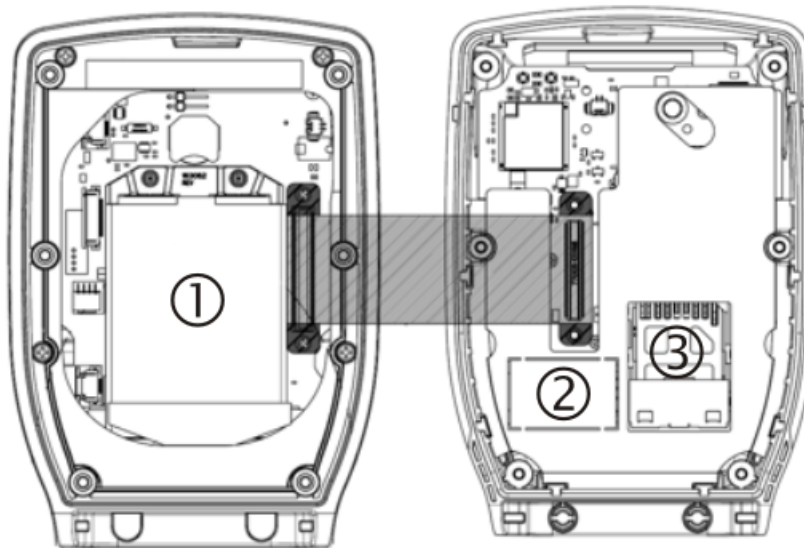
When the hatch is open during this procedure, do not remove any cables or allow them to kink.

1. Summit radio card located in the back half of the MX9 assembly.
2. SIMM card located in the front half of the MX9 assembly.
3. SD card located in the front half of the MX9 assembly.

When the hatch is being closed, carefully move cables and wires back into the cavity before securing the hatch.

Before securing the hatch completely, examine the seam between the front and back half of the MX9. If the gasket is off-center, loosen the screws a little, adjust the gasket and re-tighten the screws.

Press the Power button to turn the MX9 on.

Reboot

When the Windows desktop is displayed or an application begins, the power up (or reboot) sequence is complete.

Warmboot

A warmboot reboots the MX9 without erasing any registry data. Applications and data in RAM are preserved during a warmboot.

All registry configurations are automatically preserved. Any applications stored as .CAB files in the System folder and configured in the Registry to persist are reinstalled on boot up by the Launch utility.

Use the **Registry** control panel **Warmboot** button.

Note: There may be slight delays while the wireless client connects to the network, re-authorization for voice-enabled applications completes, Wavelink Avalanche management of the MX9 startup completes, or Bluetooth relationships establish or re-establish.

Restart (or Cold Boot)

The Restart (or cold boot) function reboots the device, erases all registry data, and user-specified settings. The factory default settings are restored when the MX9 powers on again.

Use the **Registry** control panel **Restart** button to set the registry back to Honeywell factory defaults. No other clearing is available or necessary.

Note: Because of the extreme nature of restart, Honeywell recommends using this command only as an emergency (or when instructed to do so as part of a specific MX9 procedure).

Startup Help

Can't change the date/time or adjust the volume.	AppLock is installed and may be running in User Mode on the MX9. AppLock user mode restricts access to the control panels.
Touch screen is not accepting stylus taps or needs recalibration.	Press <Ctrl>+<Esc> to force the Start Menu to appear. Use the tab, backtab and cursor keys to move the cursor from element to element.
MX9 seems to lockup as soon as it is warm booted.	There may be slight delays while the wireless client connects to the network, authorization for voice-enabled applications complete, and Bluetooth relationships establish or re-establish. When the desktop appears or an application begins, the MX9 is ready for use.
New MX9 main batteries don't last more than a few hours.	New batteries must be fully charged prior to first use. Li-Ion batteries (like all batteries) gradually lose their capacity over time (in a linear fashion) and never just stop working. This is important to remember – the MX9 is always 'on' even when in the Suspend state and draws a small amount of battery power at all times.
Keep losing ActiveSync connection between my host computer and the MX9.	When the MX9 enters Suspend Mode, all connections are closed to save battery power. When the MX9 wakes up, if ActiveSync connection does not automatically re-establish, disconnect the cable, wait 1-2 seconds and reconnect the cable.

Chapter 2: Hardware

System Hardware

Central Processing Unit

The CPU is a 806 MHz Marvell PXA-320 CPU. The operating system is Microsoft® Windows® CE 5. The OS image is stored on an internal SD flash card and is loaded into DRAM for execution.

Turbo mode switching is supported and turned on by default.

The MX9 supports the following I/O components of the core logic:

- One serial port (DTE) with appropriate power for a WAN radio
- One serial port (DTE) for an integrated laser decoder with RI
- USB 1.1 Host (capable) with power (5V @ 500mA)
- One SSP port (capable)
- One SDIO port for I/O expansion (capable)
- One SIM port for WAN
- One serial port (DTE) for interface with GPS receiver chip
- Non-decoding imager

System Memory

The MX9 supports 128 MB on-board RAM and 128 MB on-board Flash. Operating system and boot loader software image update is supported via expansion card and remote management via radio.

Internal flash is used for boot loader code and system low-level diagnostics code. Bootloader code is validated at system startup. The UUID required by CE 5.0 is stored in the boot flash. A second copy of the bootloader code is stored on the internal SD Flash drive, so that if a damaged bootloader is detected, it may be re-flashed correctly.

Internal SD Memory Card

The MX9 has one SD card interface for storage of operating system and program code, as well as persistent storage.

The internal SD flash card appears to the OS as a folder. This allows the contents to be manipulated via the standard Windows interface.

Video Subsystem

The touch screen display supports QVGA and 16 bit color depth, and is readable indoors or outdoors even in direct sunlight.

The display is transflective active matrix TFT and has a LED backlight.

A tethered stylus is included. The touch screen surface can be activated with the stylus or a gloved or bare finger.

The Cold Storage option includes a touch screen heater and a scan aperture heater to eliminate condensation. The heaters can be enabled or disabled by the user. Once enabled, the heaters will turn on whenever the ambient temperature warrants, for example, when moving into and out of freezers or refrigerated buildings.

Power Supply

The MX9 uses one of two batteries for operation. A Lithium-Ion (Li-Ion) standard battery has a 2400 mAh capacity. Low temperature Lithium-Ion (Li-Ion) batteries have a 2100 mAh capacity.

Input/Output Connector

A single external connector at the base of the MX9 provides the following signals:

- USB Host and USB Client
- RS232 with support for powering a tethered device (e.g., scanner or imager)
- Audio in and out for headset
- Power input
- Ethernet (only accessible when MX9 is secured in a cradle's docking bay)

The MX9 cables are designed to be securely connected to this port. This port is also used to connect the MX9 to the docking bay connector in cradles.

A tethered protective cap is provided to cover the external port when it is not in use.

Bluetooth

The MX9 contains Bluetooth version 2.0 with Enhanced Data Rate (EDR) up to 3.0 Mbit/s over the air. Bluetooth device connection (or pairing) can occur at distances up to 32.8 ft (10 meters) Line of Sight. The wireless client retains network connectivity while Bluetooth is active.

The user will not be able to select PIN authentication or encryption on connections to or from the MX9. However, the MX9 supports authentication requests from pairing devices. If a pairing device requests authentication or encryption, the MX9 displays a prompt for the PIN or passcode. Maximum encryption is 128 bit. Encryption is based on the length of the user's passcode.

The Bluetooth client can simultaneously connect to one Bluetooth scanner and one Bluetooth printer. Up to four Bluetooth devices can be paired and managed using the LXEZ Pairing control panel (Start > Settings > Control Panel > Bluetooth).

Bluetooth device connection supported on the MX9 includes:

- Bluetooth scanners / imagers
- Zebra printer models
- Honeywell Back of Hand Scanner

Bar code data captured by the Bluetooth scanner is manipulated by the settings in the MX9 Data Collection Wedge Properties control panel.

Multiple beeps may be heard during a bar code scan using a mobile Bluetooth scanner; beeps from the mobile Bluetooth scanner as the bar code data is accepted/rejected, and other beeps from the MX9 during final bar code data manipulation.

Audio Support

All Microsoft-supplied audio codecs are included in the OS image. The hardware codecs, the input and output analog voice circuitry and the system design are designed to support voice applications using a headset accessory cable.

802.11 b/g and a/b/g Wireless Client

The MX9 has an 802.11x network card that supports diversity with two internal antennas. The CPU board does not allow hot swapping the network card. Power management on the network card is set to static dynamic control.

WEP, WPA and LEAP are supported.

External Input/Output Port

A single external connector at the base of the MX9 provides the following signals:

- USB Host and USB Client
- RS232 with support for powering a tethered device (e.g., scanner or imager)
- Audio in and out for headset
- Power input
- Ethernet (accessible when MX9 is secured in a cradle's docking bay)

The MX9 cables are designed to be securely connected to this port. This port is used to connect the MX9 to the docking bay connector in cradles.

A tethered protective cap is provided to cover the external port when it is not in use.

COM Ports

COM Port	Used By	Default Power Setting	Communication Default
1	External serial	On	9600 baud, 8 bits, no parity, 1 stop bit
2	Bluetooth	On	9600 baud, 8 bits, no parity, 1 stop bit
3	WWAN	Off	9600 baud, 8 bits, no parity, 1 stop bit
4	Integrated Bar Code Reader	On	9600 baud, 8 bits, no parity, 1 stop bit
5	GPS	Off	9600 baud, 8 bits, no parity, 1 stop bit (Default baud rate is 4800 for NMEA communications)

Keypads

The MX9 keypad is either a 62-key full alphanumeric keypad or 38-key numeric-alpha.

The 62 key keypad has an ANSI or a 5250 overlay.

The keypad backlight default setting is to follow the display backlight setting until it is changed by the user.

See Also: "KeyMaps"

Modifier Keys

The modifier keys are located at the bottom of the keypad. The modifier keys are the orange key and the blue key.

A modifier key pressed after itself toggles that modifier mode off.

A modifier keypress cancels the other modifier's active state. Then the state of the modifier key that was pressed last becomes active. For example, if the Orange modifier state is active (MX9 is currently in Orange mode), pressing the Blue key cancels Orange mode and sets Blue mode active.

Once a modifier key is pressed, the modifier map state continues until another key is pressed.

The Orange and Blue keys do not need to be held down while another key is pressed.

Modifier keys do not auto-repeat.

Expansion Slots

- Summit radio card
- SIM card
- SD card

The expansion slots in the MX9 are accessible via the hatch. The hatch can be opened using a standard size screwdriver. When the hatch is opened, the MX9 automatically shuts down.

SD card configurations in 512MB, 1GB and 4GB are available from Honeywell.

Note: It is good practice to save your changes then perform an orderly shutdown to preserve RAM contents before opening the hatch.

Power Key Functions

The Power key is located at the bottom of the keypad, next to the Scanner LED.

The Power On/Off key is a momentary contact.

Behavior is as follows:

When the MX9 is in ...	Pressing the Power key ...
Off mode	boots the unit and sets it to the On mode
On mode	sets the unit in Suspend mode
Suspend mode	sets the unit in On mode
Critical Suspend mode	has no effect
Backlight off mode	sets the unit in Suspend mode
Display off mode	sets the unit in Suspend mode

Status LEDs

Several LEDs are located on the front of the MX9 above the integrated speaker. They are:

- **System Status LED** indicates power management status.
- **Battery Charging Status LED** indicates main battery charging status.
- **Alpha Mode Status LED** applies to the 38-key keypad only.
- **Bluetooth Status LED** applies to Bluetooth client functions.

System Status LED

Blinking Red	Battery power fail; critical suspend
Solid Red	Main battery low
Blinking Green	Display turned off
Yellow / Amber	Initial few seconds when Power key is pressed

Battery Charging Status LED

Off	No battery, no AC power, battery pack not plugged in or no AC power applied
Flashing Red	Fault, battery pack fault or failure
Yellow / Amber	Standby, battery pack temperature out of range
Red	Charging, battery pack charging (icon on touch screen)
Green	Charged, battery pack fully charged. Connected to external power.

Alpha mode Status LED

- Green when in alpha mode, 38-key keypad only.

Bluetooth Status LED

Blinking slowly	Bluetooth is active but not connected to a device.
Blinking medium	Bluetooth is paired and connected to a device.
Blinking fast	Bluetooth is discovering other Bluetooth devices.
Unlit	Bluetooth hardware has been turned off or does not exist in the MX9.

Scan Status LED

The integrated scanner, and imager, Scan Status LED is centered below the MX9 keypad, next to the Power button.

- Steady green indicates a good scan
- Steady red indicates a scan is in progress
- Steady yellow/amber indicates parameter changes are being written to the integrated scanner/imager engine

The Scan Status LED illuminates when a Scan button on the MX9 is depressed (scan in progress), or the trigger on the attached handle is pressed (scan in progress), or when the scanner/imager engine parameters have been changed and the changes are being saved (writing to scan engine). While the changes are being saved, the scanner/imager is inoperable.

- The MX9 Scan Status LED does not illuminate when the Scan button is pressed on a scanner cabled to the MX9 or cabled to an MX9 cradle communication port. The Scan LED on the cabled scanner/imager illuminates.
- The MX9 Scan Status LED does not illuminate when the Scan button is pressed on a wireless Bluetooth mobile scanner paired with the MX9. The Scan LED on the wireless Bluetooth mobile scanner/imager illuminates.

Note: *A scanned bar code can be accepted as a good scan or a bad scan by the MX9 bar code decoder (as configured). The pre-selected audible or tactile indicator is activated.*

Note: *The result of the host processing (as configured) of the good scan bar code data can indicate either accept or reject. If rejected, a bad scan indicator is activated if the host process has been configured to indicate audible or tactile accept or reject.*

Vibrate Indicator

The MX9 has a vibration motor.

It is user-configurable to vibrate on a good scan, bad scan, or via an API call. The vibrations from this motor are detectable under the handstrap at the rear of non-handle units or through the trigger handle when a trigger handle is installed.

Three vibration duration settings are provided for both good and bad scan. The settings can be assigned using tab. The default setting for both good scan and bad scan is Off.

Cold Storage

When the MX9 has been configured as a cold storage or low temperature device, a snowflake icon is located under the touch screen next to the product name.

The MX9, with its special low temperature battery and condensation controlling heaters is designed specifically for use in freezers and refrigerator environments including transitioning between the two.

See Also: "Main Battery Technical Specifications "

Heating Elements

Heating elements activate when ambient temperature drops below 0°C (32°F). Honeywell recommends using the stylus *only* when performing screen touch functions on the display when the temperature drops below freezing.

There may be some condensation as the MX9 moves in and out of cold storage areas. The condensation on the touch screen and the scan aperture quickly dissipates.

Although no user interaction is required to enable the heating elements, the automatically controlled heating elements can be enabled and disabled using the options in the Peripherals control panel.

Cables

Note: Do not connect or disconnect cables in a Hazardous location.

- I/O port to USB host and power pigtail for external power
- I/O port to USB client and power pigtail for external power
- I/O port to RS232 with power
- I/O port to RS232 without power
- I/O port to 4-wire headset connector with quick-disconnect capability.
- Ethernet Category 5 cable, 6ft / 2m. *(only the Cradle has an RJ-45 port for the Ethernet CatV cable)*

Cable connections are covered in more detail in the MX9 User's Guide.

Scanners and Imagers

Note: The maximum number of communication ports from which the Data Collection Wedge can simultaneously support input is three.

Integrated Bar Code Decoders

The MX9 may have any of the following bar code readers built in (integrated) and protected by the hatch:

- SE955 standard range laser scanner engine (bar code decoding only)
- SE1524 Lorax laser scanner engine (bar code decoding only)
- Hand Held Products (HHP) 5300SF laser imager engine (nondecoding)

A scan aperture heater is implemented for low temperature environments.

Tethered Bar Code Decoders

The external serial port at the base of the MX9 is used to connect (via serial tether) to bar code scanners as needed.

Bluetooth Client Bar Code Decoders

The Bluetooth Module in the MX9 can accept data from Bluetooth bar code readers.

GPS Module

The default setting for GPS is Off.

GPS (Global Positioning System) is a U.S. space-based radio navigation system that provides reliable positioning, navigation, and timing services on a continuous basis. The primary function of the embedded GPS module is to provide worldwide location to applications which are running on the MX9.

GPS presence is displayed on the Peripherals control panel. Using the GPS tab, GPS power can be toggled on or off only when a GPS is installed.

See Also: "GPS Receiver Technical Specifications"

Chapter 3: Power

Power Modes

On

When in the On state, the display (touch screen) is on. The keyboard, touch screen and all peripherals function normally. The display backlight is on until the User Idle timer expires. The display does not turn off until the System Idle timer expires.

Only interrupts classified as User Activity events will keep the unit in the On state.

MX9 User Activity Events are:

Note: These items are not configurable selections.

- Any key on the keypad except the Power key
- Incoming data through scanner port
- Touch screen tap
- Trigger pull

The user is presented with a Power applet in the Control Panel. One tab in the applet, Schemes, is designated for the power management timeouts. This tab displays three transition states, User Idle, System Idle and Suspend.

Additionally, the OS provides a Backlight tab on the Display control panel. The Backlight tab allows the user to select the same timeout ranges provided by the User Idle scheme timers. Any changes on the Display > Backlight tab will also change the Power > Schemes > User Idle timer, and vice-versa.

The backlight for the keypad (if enabled) will always follow the display backlight.

User Idle

When transitioning from the On power state to the User Idle power state, the keypad backlight (if enabled) is dimmed and the display backlight is dimmed. User Activity Events listed below will transition the system back to the On state.

User Idle timers are set using Start > Settings > Control Panel > Power > Schemes tab.

Only interrupts classified as System Activity events will keep the MX9 awake in this state until a deliberate user action to put the unit into Suspend or power Off occurs. An event must be specifically coded to wake up from this state.

The following User Activity events DO transition the unit from the User Idle state to On state:

Note: These items are not configurable selections

- Any key on the keypad except the Power key
- Incoming data through the scanner port
- Touch screen tap
- Unit docked in powered cradle
- Trigger pull
- Incoming Bluetooth connection or data on the virtual COM port
- Connection of USB Device to host port

Note: The scanner port is defined as a software (SW) port. Any hardware (HW) device that sends data to the software (SW) defined scanner port will transition the unit from User Idle to On.

The following events DO NOT wake the unit from the User Idle state or reset the timers:

- COM1 CTS
- Serial connection
- USB client connection to a host PC
- Power key press (transitions to Suspend)

Example: Bluetooth Voice will not transition the unit from User Idle to On. Bluetooth Scan data will transition the unit to On as it sends the data to the scanner port.

System Idle

After transitioning to the User Idle power state, the timer is started for the transition to System Idle. When this timer expires without any further user activity, the keypad backlight (if enabled) is turned off and the display is turned off. Only interrupts classified as System Activity events will wake the unit from System Idle to User Idle. Any activity classified as User Activity will transition from System Idle to On.

System Idle timers are set using Start > Settings > Control Panel > Power > Schemes tab.

The following System Activity events DO transition theMX9 from the System Idle state to User Idle state:

Note: These items are not configurable selections.

- RF Data
- Ethernet Data
- Serial Data
- USB Data

Note: Pressing and releasing the Power key while the MX9 is in the System Idle state will cause it to transition to the Suspend state.

Suspend

The Suspend mode is entered when (1) the unit is inactive for a predetermined period of time, (2) the user taps the Power key, or (3) Start > Suspend is chosen. Inactivity means that no devices are causing interrupts to reset the power state.

The Suspend timer is set using Start > Settings > Control Panel > Power Properties > Schemes tab.

By default, any of the primary events listed below will wake the unit and reset the User Idle, System Idle, and Suspend timers. Wake up events are all configurable via a Power Management API call.

When the unit wakes up, the User Idle, System Idle and the Suspend timers begin the countdown again. When any one of the above events occurs prior to the Suspend timer expiring, the timer starts the countdown again.

The first wakeup key press or touch is not sent to the operating system or running application. The first key press or touch is only used to wake up the unit and reset the timers. Once the unit has transitioned from the Suspend mode to the On mode, the unit, keyboard and touch screen function normally.

The transition to the Suspend power state occurs during the following events:

- Timeout of the User Idle, System Idle and Suspend inactivity timers.
- The Power key on the target device is pressed.
- An application program calls the Suspend function.

The MX9 will only resume from a suspended state if an interrupt occurs and the CPU has been programmed to wake when an interrupt occurs. An interrupt from any listed device transitions the OS back to the On state.

Suspend Primary Wake up Events

Wake up Events - all configurable via command line utility:

- Power key
- Touch screen
- Any integrated keypad touch
- Bluetooth connection capable
- USB client connection
- COMM CTS - Serial port handshaking - i.e., tethered scanners generate CTS which could wake up the unit
- Trigger pull (MX9with integrated bar code decoder only)
- Internal serial port device interrupt (WAN, etc. - only devices capable of signaling an interruptible GPIO, and that have a separate power supply)
- External power applied
- Real-Time Clock (RTC)(Win32 API call CeRunAppAtTime will not work if this is turned off)
- Detection of external microphone

Wake Up Event Default Settings

Enabled	Disabled
Power key	Bluetooth connection
Touch screen tap	COMM CTS
Integrated keypad key press	Internal serial port device IRQ
USB client connection	Push to talk on audio headset
External power applied	Detection of external microphone
Real-time clock	
Trigger handle trigger press	

Events that do NOT wake up from Suspend - these events are not available to be configured to wake the unit up from suspend

- External keyboard/mouse
- Ethernet (data or connection)
- USB Host (data or connection)
- USB client disconnection
- Serial data
- Internal Serial port handshaking (WAN, etc)
- 802.11 radio
- Docked signal (i.e., a non-powered cradle would not wake the MX9 up, but a powered cradle could be a wake up event if External Power is set to be a wake up event)
- MPF (Main Power Failure)
- Audio data
- Display data

Critical Suspend

The purpose of the Critical Suspend mode is to maintain data stored in RAM with minimum power consumption. If the Main Battery is removed, the Backup Battery is supplying power to the MX9 during Critical Suspend Mode. If Main Battery power is re-applied, the device will transition to Suspend mode. If Main Battery power is not made available before the Backup Battery is depleted, the unit enters Off Mode.

Off

The MX9 enters the Off Mode when the Main Battery and the Backup Battery are depleted or when Shutdown is selected from the Start menu.

Main Battery

Note: *New batteries must be fully charged prior to use.*

The MX9 is designed to work with a replaceable 2400 mAh Lithium-Ion (Li-Ion) battery pack from Honeywell. Under normal conditions it should last approximately eight hours before requiring a recharge.

MX9 low temperature 2100 mAh Lithium-Ion (Li-Ion) batteries (designed for freezer environments and with a blue label) have an average use time of 4 hours before requiring a recharge.

During very heavy scanning or wireless transmitter use, the operating time of the battery may be less.

A depleted battery can be hot-swapped with a fully charged battery after the MX9 is placed in Suspend mode. A battery charge level indicator on the taskbar displays the present battery charge to within 15% of the current battery capacity.

HazLoc versions of the MX9 require a screwdriver to remove the plate covering the battery release mechanism.

When the MX9 is docked in a powered cradle, the battery in the MX9 is recharged through the cradle connector in the docking bay. An extra Li-Ion battery pack can be recharged in a powered desktop cradle. The battery is fully recharged in a powered cradle in less than 4 hours. The MX9 can be Off, in use or in Suspend Mode while the battery is recharging.

Note: *When the main battery and backup power system are fully depleted, the MX9 turns off. The operating system reverts to the last saved registry settings when a fully powered battery is inserted and the MX9 is turned on.*

See Also: "Main Battery Technical Specifications "

External Power Supplies

External power supplies are available for the following:

- any I/O cable with a power connector
- desk cradle
- vehicle cradle
- car power adapter (CLA)
- Battery Charger

The indoor power supplies (e.g., AC/DC Adapters) use IEC320-C 14 AC power connectors.

The car power adapter uses the cigarette lighter adapter (CLA) and is powered by the vehicle's automotive 12V battery. The adapter power supply converts the input voltage into a voltage suitable to power the MX9 and charge the unit's internal backup battery.

The vehicle mount cradle uses a 36V, 24-60V or 70-150V DC-DC power supply.

Note: *The MX9 and desk cradle and battery charger use the same external power supply.*

AC/DC 15V Power Supply

The MX9 receives AC/DC power from the AC/DC (15 VDC - 4 Amp - 60 Watt) Power Supply. The MX9 external power connection is part of the serial cable assembly and the USB cable assembly.

The AC/DC Power Supply is connected to a wall outlet then to the power cable secured to the base of the MX9.

Note: *The Honeywell-approved AC Power Adapter is only intended for use in a 25°C (77°F) maximum ambient temperature environment.*

The indoor power supply has a IEC320-C 14 AC power connector.

When the power supply is receiving AC/DC power from the wall outlet, an LED on the power supply illuminates green. The green LED indicates the power supply is ready for use.

This AC/DC power supply is designated for:

- the MX9 I/O port multi-cables
- the MX9 desktop cradle
- the MX9 battery Charger

There are specific DC/DC power supply adapters for the MX9 vehicle cradle; do not use any other power supply with the vehicle cradle.

Car Power Adapter

The MX9 Car Power Adapter is a self-contained unit. The cable has one and a half feet of coiled cord and one and a half feet of straight cord. The coiled portion is on the end of the adapter. An LED on the adapter illuminates when the car power adapter is receiving vehicle input power.

The cigarette lighter adapter contains a power supply which converts the vehicle's nominal 12V to 15V, a voltage suitable to power the MX9 and charge the MX9 battery.

One end consists of a plug compatible with a standard vehicle cigarette lighter adapter (CLA). The Car Power Adapter has a standard size CLA plug that uses center positive (+12V) and sleeve ground. A replaceable fuse is provided on the input side.

The other end of the three foot cable connects to the MX9 36-pin I/O port. It has a security latch for stability when connected to the Car Power Adapter cable.

Replace CLA Fuse

Equipment needed: 5A fuse of the same size and amperage.

1. Remove the CLA from the cigarette lighter outlet on the vehicle.
2. Disconnect the cable from the MX9.
3. Unscrew the tip of the adapter end.
4. Replace the blown fuse with a fuse of the same rating and size.
5. Screw the tip back on to the adapter end, replacing any previously removed parts in the order in which they were removed.

Upon reassembling the cigarette lighter adapter with the new fuse, and plugging it into the cigarette lighter port on the vehicle -- if the LED on the CLA does not illuminate green, there may be a problem with your vehicle power source.

Chapter 4: Software

Operating System and Software Load

There are several different aspects to the setup, configuration and operation of the MX9. Many of the setup and configuration settings are dependent upon the optional features such as hardware and software installed on the unit. The examples found in this section are to be used as examples only, the configuration of your specific MX9 computer may vary. The following sections provide a general reference for the configuration of the MX9 and some of its optional features.

Operating System

Your MX9 operating system is Microsoft® Windows® CE 5. The MX9 operating system revision is displayed on the Desktop. This is the default setting for the Desktop Display Background.

Windows CE Operating System

Note: For general use instruction, please refer to commercially available Windows CE user's guides or the Windows CE on-line Help application installed with the MX9

This segment assumes the system administrator is familiar with Microsoft Windows options and capabilities loaded on most standard Windows computers.

Therefore, the sections that follow describe only those Windows capabilities that are unique to the MX9 and its Windows CE environment.

General Windows CE Keyboard Shortcuts

Use the keyboard shortcuts in the chart below to navigate with the MX9 keyboard. These are standard keyboard shortcuts for Windows CE applications.

Press these keys …	To …
CTRL + C	Copy
CTRL + X	Cut
CTRL + V	Paste
CTRL + Z	Undo
DELETE	Delete
SHIFT with any of the arrow keys	Select more than one item in a window or on the desktop, or select text within a document.
CTRL+A	Select all.
ALT+ESC	Cycle through items in the order they were opened.
CTRL+ESC	Display the Start menu.
ALT+Underlined letter in a menu name	Display the corresponding menu.
Underlined letter in a command name on an open menu	Carry out the corresponding command.
ESC	Cancel the current task.

The touch screen provides equivalent functionality to a mouse:

- A touch on the touch screen is equivalent to a left mouse click.
- Many items can be moved by the "drag and drop" method, touching the desired item, moving the stylus across the screen and releasing the stylus in the desired location.
- A double stylus tap is equivalent to a double click.
- A touch and hold is equivalent to a right mouse click[1].
- *Devices with Shift and Ctrl Keys* The Shift and Ctrl keys can be used with the touch screen for multiple selection of items.
    - To select disconnected items, press the Ctrl key and then touch each item to be selected in the set. Press the Ctrl key again to terminate this mode.
    - To select a connected set of items, press the Shift key, then touch the first item in the series. Touch the last item in the series. Press the Shift key again to terminate the selection mode.

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[1]Some applications may not support this right click method. Please review documentation for the application to see if it provides for right mouse click configuration.

Warmboot

A warmboot reboots the MX9 without erasing any registry data. Configuration settings and data in RAM are preserved during a warmboot. Network sessions are lost and any data in running applications that has not been previously saved may be lost. CAB files already installed remain installed.

There are several warmboot methods available:

- Using the Registry, select Start > Settings > Control Panel > Registry and tap the Warmboot button. The MX9 immediately warmboots.

- Using the Start menu, select Start > Run and type WARMBOOT in the text box. Press Enter. The MX9 immediately warmboots. The WARMBOOT text command is not case-sensitive. The text typed in the text box can be upper or lower case or a combination of upper and lower case letters.

- Using the keypad, press the Ctl key and release it, press the Alt key and release it, press the Del key combination and release it. The MX9 immediately warmboots.

Clearing Persistent Storage / Reset to Default Settings

Use the Registry control panel Restart button to set the MX9 registry back to factory defaults. No other clearing is available or necessary.

Folders Copied at Startup

The following folders are created in the System folder, they are copied at startup:

System\Desktop	copied to	Windows\Desktop
System\Favorites	copied to	Windows\Favorites
System\Fonts	copied to	Windows\Fonts
System\Help	copied to	Windows\Help
System\Programs	copied to	Windows\Programs
AppMgr	copied to	Windows\AppMgr
Recent	copied to	Windows\Recent

This function copies only the folder contents, no sub-folders.

The Windows\Startup folder is not copied on statup because copying this folder has no effect on the system or an incorrect effect.

Files in the Startup folder are executed, but only from System\Startup. Windows\Startup is parsed too early in the boot process so it has no effect.

Executables in System\Startup must be the actual executable, not a shortcut, because shortcuts are not parsed by Launch.

Saving Changes to the Registry

The MX9 saves the registry when you:

- Tap Start > Run then type Warmboot. Tap OK.
- Perform a Suspend / Resume function (by pressing the Pwr key and then pressing it again).

The registry save process takes 0 – 3 seconds. If nothing has been changed, nothing is saved (e.g., 0 seconds).

The registry is automatically saved every 10 seconds if anything has changed. It is also saved every tenth time the registry settings are changed. Registry settings are changed when control panel applet (e.g., Date/Time) parameters are changed by the user and a warm boot was not performed afterward.

Software Load

The software loaded on the MX9 consists of Microsoft® Windows® CE 5 OS, hardware-specific OEM Adaptation Layer, device drivers, Internet Explorer 6.0 for Windows CE browser and utilities. The software supported is summarized below:

- Full Operating System License: Includes all operating system components, including Microsoft® Windows® CE 5 kernel, file system, communications, connectivity (for remote APIs), device drivers, events and messaging, graphics, keyboard and touch screen input, window management, and common controls.
- Network and Device Drivers
- Bluetooth (Optional)

Note: Please contact your Honeywell representative for software updates and CAB files as they are released.

Software Applications

The following applications are included:

- WordPad
- Data Collection Wedge (bar code result manipulation)
- ActiveSync
- Transcriber
- Internet Explorer

Bluetooth (Optional)

Start > Settings > Control Panel > Bluetooth

Only installed on a Bluetooth equipped MX9. The System Administrator can Discover and Pair targeted Bluetooth devices for each MX9. The System Administrator can enable / disable Bluetooth settings and assign a Computer Friendly name for each MX9.

The Bluetooth control panel can also be accessed by double tapping the Bluetooth icon in the taskbar or on the desktop.

RFTerm (Optional)

Start > Programs > RFTerm

RFTerm is pre-loaded when ordered. The application can also be accessed by double clicking the RFTerm desktop icon.

Avalanche

The Wavelink Avalanche Enabler installation file is loaded on the MX9 by Honeywell; however, the device is not configured to launch the installation file automatically. The installation application must be run manually the first time Avalanche is used. Following installation, the Wavelink Avalanche Enabler will be an auto-launch application. This behavior can be modified by accessing the Avalanche Update Settings panel through the Enabler Interface.

Software Development

The *CE API Programming Guide* documents unique API calls for the MX9. It is intended as an addition to Microsoft Windows CE API documentation.

A Software Developers Kit (SDK) and additional information about software development can be found the Developer Portal. Contact Technical Assistance for more information.

Access Files on the SD/CF Card

Click the **My Device** icon on the Desktop then click the **System** icon.

A SD/CF card is used for permanent storage of the MX9 drivers, CAB files and utilities. It is also used for registry content back up.

CAB files, when executed, are not deleted.

Note: Always perform a warm reset (Start / Run / Warmboot) when exchanging one card for another.

MX9 Utilities

The following files are pre-loaded.

LAUNCH.EXE

Launch works in coordination with registry settings to allow drivers or applications to be loaded automatically into DRAM at system startup. Registry settings control what gets launched; see the App Note for information on these settings. For examples, you can look at the registry key

> HKEY_LOCAL_MACHINE \ Software \ LXE \ Persist

> Launch will execute .CAB files, .BAT files, or .EXE files.

App Note

> All applications to be installed into persistent memory must be in the form of Windows CE CAB files. These CAB files exist as separate files from the main installation image, and are copied to the CE device using ActiveSync, or using a Compact Flash ATA card. The CAB files are copied from ATA or using ActiveSync Explore into the folder System, which is the persistent storage virtual drive. Then, information is added to the registry, if desired, to make the CAB file auto-launch at startup.

The registry information needed is under the key HKEY_LOCAL_MACHINE \ Software \ LXE \ Persist, as follows. The main subkey is any text, and is a description of the file. Then 3 mandatory values are added:

> FileName is the name of the CAB file, with the path (usually \System).

> Installed is a DWORD value of 0, which changes to 1 once auto-launch installs the file.

> FileCheck is the name of a file to look for to determine if the CAB file is installed. This will be the name of one of the files (with path) installed by the CAB file. Since the CAB file installs into DRAM, when memory is lost this file is lost, and the CAB file must be reinstalled.

There are three optional fields that may be added:

1. Order is used to force a sequence of events. Order=0 is first, and Order=99 is last. Two items which have the same order will be installed in the same pass, but not in a predictable sequence.

2. Delay is used to add a delay after the item is loaded, before the next is loaded. The delay is given in seconds, and defaults to 0 if not specified. If the install fails (or the file to be installed is not found), the delay does not occur.

3. PCMCIA is used to indicate that the file (usually a CAB file) being loaded is a radio driver, and the PCMCIA slots should be started after this file is loaded. By default, the PCMCIA slots are off on powerup, to prevent the "Unidentified PCMCIA Slot" dialog from appearing. Once the drivers are loaded, the slot can be turned on. The value in the PCMCIA field is a DWORD, representing the number of seconds to wait after installing the CAB file, but before activating the slot (a latency to allow the thread loading the driver to finish installation). The default value of 0 means the slot is not powered on. The default values for the default radio drivers (listed below) is 1, meaning one second elapses between the CAB file loading and the slot powering up.

The auto-launch process proceeds as follows:

- The launch utility opens the registry database and reads the list of CAB files to auto-launch.

- First it looks for FileName to see if the CAB file is present. If not, the registry entry is ignored. If it is present, and the Installed flag is not set, auto-launch makes a copy of the CAB file (since it gets deleted by installation), and runs the Microsoft utility WCELOAD to install it.

- If the Installed flag is set, auto-launch looks for the FileCheck file. If it is present, the CAB file is installed, and that registry entry is complete. If the FileCheck file is not present, memory has been lost, and the utility calls WCELOAD to reinstall the CAB file.

- Then, the whole process repeats for the next entry in the registry, until all registry entries are analyzed.

- To force execution every time (for example, for AUTOEXEC.BAT), use a FileCheck of "dummy", which will never be found, forcing the item to execute.

- For persist keys specifying .EXE or .BAT files, the executing process is started, and then Launch will continue, leaving the loading process to run independently. For other persist keys (including .CAB files), Launch will wait for the loading process to complete before continuing. This is important, for example, to ensure that a .CAB file is installed before the .EXE files from the .CAB file are run.

- Note that the auto-launch process can also launch batch files (*.BAT), executable files (*.EXE), registry setting files (*.REG), or sound files (*.WAV). The mechanism is the same as listed above, but the appropriate CE application is called, depending on file type.

Note: *Registry entries may vary depending on software revision level and options ordered with the MX9.*

LAUNCH.EXE and Persistent Storage

If any of the following directories are created in the System folder, Launch automatically copies all of the files in these directories to the respective folder on the SD/CF drive:

- AppMgr
- Desktop
- Favorites
- Fonts
- Help
- Programs
- Recent

Note: Files in the Startup folder are executed, but only from System > Startup. They are not copied to another folder.

REGEDIT.EXE

Registry Editor – For best results use caution when editing the Registry and make a backup copy of the registry before changes are made.

REGLOAD.EXE

Double-tapping a registry settings file (e.g., REG) causes RegLoad to open the file and make the indicated settings in the registry. This is similar to how RegEdit works on a desktop PC. The .REG file format is the same as on the desktop PC.

REGDUMP.EXE

Registry dump – Saves a copy of the registry as a text file. The file, REG.TXT, is located in the root folder.

Note: The REG.TXT file is not saved in persistent storage. To use the REG.TXT file as a reference in the event of a restart, copy the file to the System folder on the MX9 or storing a copy of the REG.TXT file on a PC.

WARMBOOT.EXE

Double click this file to warm boot the computer (i.e., all RAM is preserved). It automatically saves the registry before rebooting which means configuration changes are not lost.

WAVPLAY.EXE

Double tapping a sound file (e.g., WAV) causes WavPlay to open the file and run it in the background.

MX9 Command-line Utilities

Command line utilities can be executed by Start > Run > [*program name*].

PrtScrn.EXE

Command line utility which performs a screen print and saves the file in .BMP format in the \System folder. Tap Start > Run and type **prtscrn** and tap OK, or press Enter. There is a 10 second delay before the screen print is made. The device beeps and the screen captured file (*scrnnnnn*.bmp) is placed in the \System folder. The numeric filename is incremented by 1 each time the PrtScrn function is activated. The command is not case-sensitive.

Desktop

Note: For general use instruction, please refer to commercially available Windows CE user's guides or the Windows on-line Help application installed in the mobile device.

The MX9 Desktop appearance is similar to that of a desktop PC running Windows XP or later.

At the bottom of the screen is the Start button. Tapping the Start Button causes the Start Menu to pop up. It contains the standard Windows menu options: Programs, Favorites, Documents, Settings, Help, and Run.

Desktop Icons

At a minimum, the desktop displays icons for My Device, Internet Explorer and the Recycle Bin. Following are a few of the other icons that may be on the MX9 Desktop. Please Contact Technical Assistance for the latest updates and upgrades for your operating system.

Icon	Function
	Access files and programs.
	Storage for files that are to be deleted.
	Discover and then pair with nearby discoverable Bluetooth devices.
	Storage for downloaded files / applications.
	Connect to the Internet/intranet (requires radio card and Internet Service Provider – ISP enrollment is not available from Honeywell).
	Used for accessing the appropriate wireless configuration, SCU (Summit Client Utility).
	The eXpress Scan utility allows an administrator to scan bar codes to provide the initial network and Avalanche Mobile Device Server address configuration. This eliminates the need to edit radio parameters manually on the windows device. eXpress Scan uses bar codes created with eXpress Config.
	RFTerm is an optional terminal emulation program for Honeywell devices with a Windows operating System. When RFTerm is installed, this icon is displayed on the desktop.
	A shortcut to the Remote Desktop Connection utility.
	Wavelink Avalanche Mobility Center (Avalanche MC) is a remote client management system that is designed to distribute software and configuration updates to monitored devices, including computers with Microsoft Windows CE. The enabler for Wavelink Avalanche is loaded on the mobile device but not installed. When the enabler is installed this icon is displayed on the desktop.

Icon	Function
	The demo version of Wavelink Telnet CE is installed on all devices. Contact Technical Assistance for licensing information. When installed, license details are maintained in the Wavelink tab in the License Viewer control panel.
	Start button. Access programs, select from the Favorites listing, documents last worked on, change/view settings for the control panel or taskbar, on-line help or run programs.

Taskbar
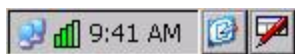
The number and type of icons displayed are based on the device type, installed options and configuration of the MX9.

My Device Folders

Folder	Description	Preserved upon Reboot?
Application Data	Data saved by running applications	No
My Documents	Storage for downloaded files / applications	No
Network	Mounted network drive	No
Program Files	Applications	No
System	Internal Flash Card (CAB file storage)	Yes
Storage Card or SD Card	Additional optional storage space	Yes
Temp	Location for temporary files	No
Windows	Operating System in Secure Storage	No

Wavelink Avalanche Enabler (Optional)

Note: If the user is NOT using Wavelink Avalanche to manage their mobile device, the Enabler should not be installed on the mobile device(s).

The following features are supported by the Wavelink Avalanche Enabler when used in conjunction with the Avalanche Manager.

After configuration, Enabler files are installed upon initial bootup and after a hard reset. Network parameter configuration is supported for:

- IP address: DHCP or static IP
- RF network SSID
- DNS hosts (primary, secondary, tertiary)
- Subnet mask
- Enabler update

Related Manual: *Using Wavelink Avalanche on Windows Computers*

The MX9 has the Avalanche Enabler installation files loaded, but not installed, on the mobile device when it is shipped. The installation files are located in the System folder on CE devices. The installation application must be run manually the first time Avalanche is used.

After the installation application is manually run, a reboot is necessary for the Enabler to begin normal performance. Following this reboot, the Enabler will by default be an auto-launch application. This behavior can be modified by accessing the *Avalanche Update Settings* panel through the *Enabler Interface*.

The designation of the mobile device to the Avalanche CE Manager is LXE_MX9.

Internet Explorer

Start > Programs > Internet Explorer

This option requires a radio card and an Internet Service Provider. There are a few changes in the Windows CE version of Internet Explorer as it relates to the general desktop Windows PC Internet Explorer options. Tap the "?" button to access Internet Explorer Help.

Start Menu Program Options

The following list represents the factory default program installation. Your system may contain different items from those shown below, based on the software and hardware options purchased.

Communication	Stores Network communication options
ActiveSync	Transfer files between a MX9 and a desktop computer
Connect	Run this command after setting up a connection
Start (or Stop) FTP Server	Begin / end connection to FTP server
Command Prompt	The command line interface in a separate window
eXpress Scan	Option. Requires Wavelink Avalanche option eXpress Config.
Internet Explorer	Access web pages on the world wide Internet
Microsoft WordPad	Opens an ASCII notepad
Remote Desktop Connection	Log on to a Windows Terminal Server
RFTerm	Option. Terminal emulation application.
Settings	Access to all Control Panels, a shortcut to the Network and Dialup Control Panel and access to Taskbar options.
Summit	Set Summit radio / network parameters
Transcriber	Enter data using the stylus on the touch screen
Wavelink Avalanche	Option. Remote management for networked devices
Windows Explorer	File management program

- If installed, RFTerm runs automatically at the conclusion of each reboot.
- If installed and enabled, AppLock runs automatically at the conclusion of each reboot.
- The wireless client connects automatically during each reboot.
- Bluetooth re-connects to nearby paired devices automatically at the conclusion of each reboot.

Communication

Start > Programs > Communication

ActiveSync

ActiveSync is pre-loaded on all mobile devices.

Using Microsoft ActiveSync you can copy files from your MX9 to your desktop computer , and vice versa.

Once an ActiveSync relationship (partnership) has been established with Connect (on a desktop computer), ActiveSync will synchronize using the wireless link, serial port, or USB on the MX9.

Connect and LXEConnect

Upon cabling your MX9 to the desktop/laptop, and ActiveSync on the desktop/laptop opens, if the Connect or LXEConnect installation does not open on your MX9, contact Technical Assistance.

Start FTP Server / Stop FTP Server

Start > Programs > Communication > Start (or Stop) FTP Server

These shortcuts call the Services Manager to start and stop the FTP server. The server defaults to Off (for security) unless it is explicitly turned on from the menu.

Summit

Start > Settings > Control Panel > Summit

Use this option to set up radio client profiles.

The Summit Control Panel can also be accessed by doubletapping the Summit icon in the taskbar or on the desktop.

Certs

The Certs option displays a readme file containing details on how the Summit Configuration Utility (SCU) handles certificates for WPA authentication.

Command Prompt

Start > Programs > Command Prompt
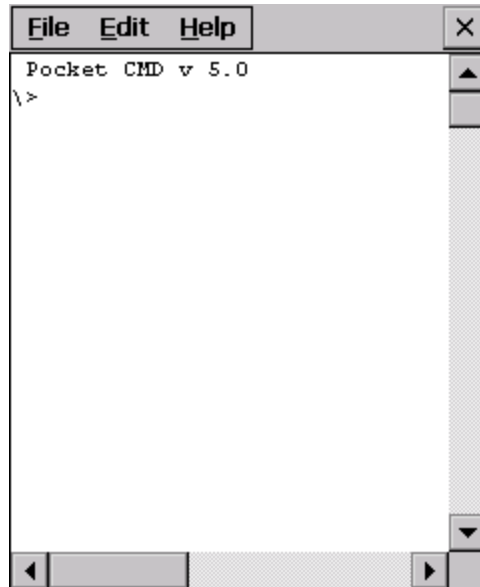
Type **help cmd** at the command prompt to view valid Pocket PC (Console) commands.

Exit the command prompt by typing **exit** at the command prompt or tap **File > Close.**

eXpress Scan

The eXpress Scan utility allows an administrator to scan bar codes to provide the initial network and Avalanche Mobile Device Server address configuration. This eliminates the need to edit radio parameters manually on the MX9.

eXpress Scan uses bar codes created with eXpress Config.

Internet Explorer

Start > Programs > Internet Explorer

This option requires a radio card and an Internet Service Provider. There are a few changes in the Windows CE version of Internet Explorer as it relates to the general desktop Windows PC Internet Explorer options. Tap the ? button to access Internet Explorer Help.

Microsoft WordPad

Start > Programs > Microsoft WordPad

Create and edit documents and templates in WordPad, using buttons and menu commands that are similar to those used in the desktop PC version of Microsoft WordPad.

By default WordPad files are saved as .PWD files. Documents can be saved in other formats e.g., .RTF or .DOC.

Tap the ? button to access WordPad Help.

Remote Desktop Connection

Start > Programs > Remote Desktop

There are few changes in the Windows CE version of Remote Desktop as it relates to the general desktop Windows PC Microsoft Remote Desktop options.

If installed, Remote Desktop on the MX9 can be accessed by **Start > Programs > Remote Desktop**.

Select a computer from the drop down list or enter a host name and tap the Connect button.

Tap the Options >> button to access the General, Display, Local Resources, Programs and Experience tabs. Tap the ? button to access Remote Desktop Connection Help.

Settings

Start > Settings

The Settings menu option may include the following:

Control Panel	All control panels
Network	Shortcut to the *Network and Dialup Connections* control panel. Connect to a network, create a new connection, and adjust parameters for client connections.
Taskbar	Set Taskbar parameters

Transcriber

To make changes to the Transcriber application, tap the keyboard icon in the status bar. Select Transcriber from the pop-up menu. Then open the Input control panel and tap the Options button. Transcriber Options (Start > Settings > Control Panel > Input Panel) are available only when Transcriber is selected as the active input method. Tap the "?" button or the Help button to access Transcriber Help.

Windows Explorer

Start > Programs > Windows Explorer

There are a few changes in the Windows CE version of Windows Explorer as it relates to the general desktop PC Windows Explorer options. Tap the "?" button to access Windows Explorer Help.

Taskbar

Start > Settings > Taskbar

There are a few changes in the Windows CE version of Taskbar as it relates to the general desktop PC Windows Taskbar options.

When the taskbar is auto hidden, press the Ctrl key then the Esc key to make the Start button appear.

Clicking the Taskbar option on the Settings menu displays theTaskbar General tab and the Taskbar Advanced tab.

See Also: "Taskbar Icons"

General Tab

Factory Default Settings

Always on Top	Enabled
Auto hide	Disabled
Show Clock	Enabled

Advanced Tab

```
Taskbar and Start Menu        OK  ×
┌─────────────────────────────────┐
│  General │ Advanced │            │
│                                  │
│   [recycle icon]                 │
│                                  │
│   Tap the Clear button to remove │
│   the contents of the Documents  │
│   Menu.                          │
│                                  │
│   [  Clear  ]                    │
│                                  │
│   ☐ Expand Control Panel         │
│                                  │
└─────────────────────────────────┘
```
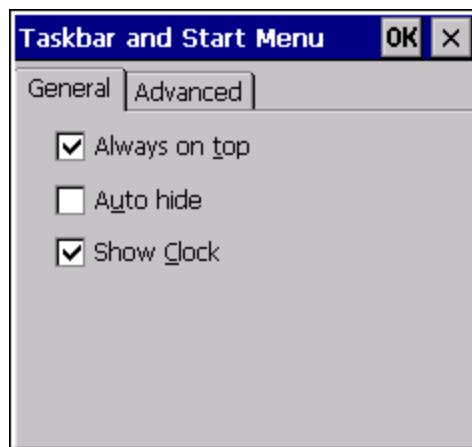
Expand Control Panel

Tap the checkbox to have the Control Panel folders appear in drop down menu format from the Settings > Control Panel menu option.

Clear Contents of Document Folder
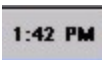
Tap the Clear button to remove the contents of the Document folder.

Taskbar Icons

As MX9 devices and applications open and change state, icons are placed in the Taskbar. In most cases, tapping the icon in the Taskbar opens the related application.

Refer to **Start > Help** for an explanation of standard Windows CE taskbar icons.

Following are a few of the MX9 and Honeywell unique taskbar icons that may appear in the Taskbar. These icons are in addition to the Windows CE taskbar icons.

✴ 🖧 🖧	Wireless Zero Config Inactive / Connected / Not Connected. Clicking on the icon opens the Wireless Zero Config utility.
🔵 🔵	Bluetooth connected / disconnected. Clicking the icon opens the Bluetooth control panel.
🔄	ActiveSync Connection
🌐	Cerdisp connected (displayed when LXEConnect is connected)
📶 📶	Summit Client signal indicator no signal/ excellent signal. Clicking on the icon opens the Summit Client Utility.
🔋 85	Battery charge indicator. Percent of battery charge is indicated.
🔋⚡	External power connected
1:42 PM	Current time. Clicking the time display opens the Date/Time control panel.
🖥	Click this icon to return to the Desktop.
🖧	AppLock switchpad.
⌨ 🖊 ✍	Input method, keyboard / input panel / transcriber
Ⓐ	CapsLock active
🔑	No modifier key is in focus
🔑	Orange modifier key active
🔑	Blue modifier key active
🔑	Shift modifier key active
🔑	Multiple modifier keys active, Shift plus Blue

Upgrade the Operating System

Introduction

Depending on the size of the operating system, the total time required for a successful upgrade may require several minutes.

The OS upgrade files are unique to your MX9 physical configuration and date of manufacture. OS upgrade files designed for one device configuration should not be used on a different device configuration.

OS and Language Options

Same Language to Same Language	During the upgrade process all settings revert to factory defaults. Parameters will need to be changed from factory defaults to your preferred values at the conclusion of the upgrade process.
Change Language during Upgrade Process	When changing from one language to another during the upgrade process, all files in the System folder will be deleted as the system is re-partitioned and all system settings are cleared. Parameters will need to be changed from factory defaults to your preferred values at the conclusion of the upgrade process.

Preparation

- Contact Technical Assistance to get the **OS upgrade files** from Honeywell.
- Put the upgrade files on a PC with ActiveSync capability.
- Use ActiveSync to backup MX9 user files and store them elsewhere before beginning an upgrade on the MX9.
- Copy the upgrade files from the PC to a SD card.
- Removing or installing the SD card should be performed on a clean, well-lit surface.
- Always perform MX9 updates when it has a fully charged main battery and/or a dependable external power source connected to the MX9.

Accessing the SD Card Slot

Tools required: standard size Phillips screwdriver (not supplied by Honeywell).

The expansion slots in the MX9 are accessible via the hatch. The hatch can be opened using a standard size screwdriver. When the hatch is opened, the MX9 automatically shuts down. It is good practice to save any changes then perform an orderly shutdown to preserve RAM contents before opening the hatch.
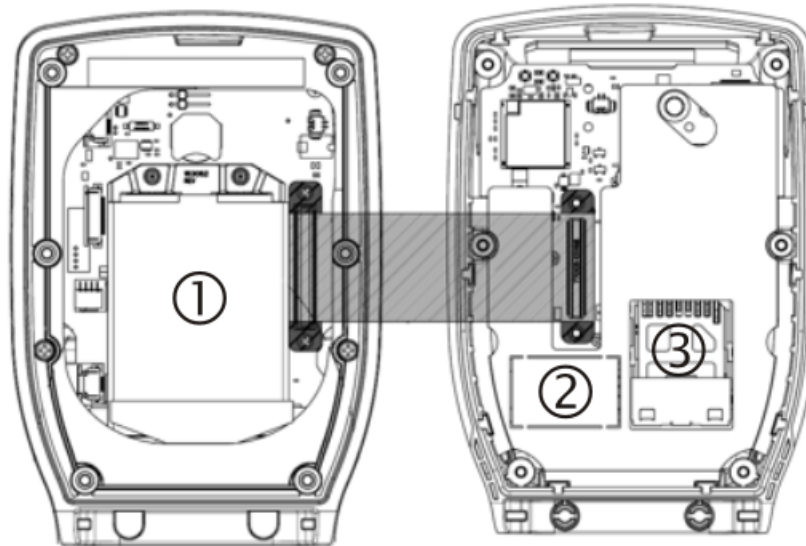
When the hatch is open during this procedure, do not remove any cables or allow them to kink.

1. Summit radio card located in the back half of the MX9 assembly.

2. SIMM card located in the front half of the MX9 assembly.

3. **SD card** located in the front half of the MX9 assembly.

Procedure

While the hatch is open slide the installed SD card out of the slot. The MX9 may not have a SD card in the slot because the OS is in flash.

1. Place the card with the new image files on it into the SD slot. The label on the SD card should be facing up.
2. Close the hatch. When the hatch is being closed, carefully move cables and wires back into the cavity before securing the hatch. Before securing the hatch completely, examine the seam between the front and back half of the MX9. If the gasket is off-center, loosen the screws a little, adjust the gasket and re-tighten the screws.
3. Press the Power button to turn the MX9 on.
4. The update run file in **My Device > Storage Card** automatically launches.
5. Important: If a failure occurs during the update, DO NOT RESTART (or coldboot). Follow the instructions on the screen to Exit the update utility then restart the update utility.
6. Do not touch the device until the install/update is complete.

When the process is finished, remove the SD card following the instructions in Accessing the SD Card Slot. When finished, press the Power button.

Check the OS update version by viewing the **About** or **About LXE** panels.

Note: *If the application displays "Update OS Image Failed" or "Update Boot Loader Image Failed", do not Restart the system manually. Perform a warm boot, then try the upgrade again. Restarting will cause a system crash, since there is no valid image in the MX9 system.*

Upgrade Help

The powered device won't boot up after the upgrade is finished.

Contact Technical Assistance if the device won't boot up after the upgrade is finished for re-imaging options.

Warning: Opening the device e.g., removing endcaps or access panels, etc. could void the user's authority to operate this equipment.

Battery State and OS Upgrade

A fully charged main battery must be installed in the MX9 prior to upgrading the operating system. A prompt may appear when the battery reaches Critical Low that informs the user there is not enough power in the main battery to perform the upgrade.

The operating system will not be able to execute the OS update when the battery level is too low (25% or less), as there is a high risk that the power remaining in the battery expires when executing the upgrade and the MX9 will be left in an inoperable state.

When main battery power level is too low, connect external power to the MX9 before performing the upgrade procedure. Do not disconnect external power before the process is complete.

Control Panel

Start > Settings > Control Panel or My Device > Control Panel link

Note: Change the language displayed on the touch screen by choosing Start > Settings > Control Panel > Keyboard and then the Key map drop down list.

Tap the ? button for Help when changing MX9 Control Panel options.

Option	Function
About	Software, hardware, versions and network IP. No user intervention allowed. Integrated scanner type is identified.
Accessibility	Customize the way the keyboard, audio, display or mouse function for users with hearing or viewing difficulties.
Administration	AppLock Administration utility.
Battery	View voltage and status of the main and backup batteries.
Bluetooth	Set the parameters for Bluetooth device connections.
Certificates	Manage digital certificates used for secure communication.
Data Collection (Wedge)	Wedge utility for data collected from bar code scans. Set data collection device, notifications, data stripping, prefix/suffix, and vibration (if installed) options. Assign baud rate, parity, stop bits and data bits for COM1 port. Assign collected data manipulation parameters.
Date/Time	Set Date, Time, Time Zone, and Daylight Savings.
Device Management	Allows a Device Management client (the device equipped with a Microsoft Windows CE operating system) to work with a Microsoft Systems Management Server.
Dialing	Connection setup for modem attached to COM port or Compact Flash slot.
Display	Set background graphic and scheme. Set touch screen and keypad backlight properties and timers.
Input Panel	Select the current key / data input method. Select custom key maps.
Internet Options	Set General, Connection, Security, Privacy, Advanced and Popups options for Internet connectivity.
Keyboard	Select a Key Map (or font). Set key repeat delay and key repeat rate.
KeyMap	Configure KeyMap keys, RunCmd and LaunchApp.
License Viewer	Displays license information for installed licensed applications.
Mixer	Adjust the input and output parameters – volume, sidetone, and record gain, for headphone, software and microphone.
Mouse	Set the double-tap sensitivity for stylus taps on the touch screen.
Network and Dial Up Options	Set network driver properties and network access properties.
Network Capture	Monitor and capture network activity.
Options	Set various device specific configuration options.

Option	Function
Owner	Set the mobile device owner details (name, phone, etc). Enter notes. Enable / disable Owner display parameters. Enter Network ID for the device – user name, password, domain.
Password	Set OS access password properties for signon and/or screen saver.
PC Connection	Control the connection between the mobile device and a local desktop or laptop computer.
Peripherals	Enable or disable touch screen heater and scanner window heater, if installed. Set the flashlight off timer if the flashlight is installed. Use the GPS panel to toggle the GPS receiver on and off.
Power	Set Power scheme properties. Review device status and properties.
Regional Settings	Set appearance of numbers, currency, time and date based on country region and language settings.
Registry	Load User Defaults, Save User Defaults, Load Factory Defaults, and Warmboot.
Remove Programs	Select to remove specific **user installed** programs in their entirety.
Stylus	Set double-tap sensitivity properties and/or calibrate the touch panel.
System	Review System and Computer data and revision levels. Adjust Storage and Program memory settings. Enter device name and description. Review copyright notices.
Terminal Server Client Licenses	Select a server client license from a drop down list.
Volume and Sounds	Enable / disable volume and sounds. Set volume parameters and assign sound WAV files to events.
WiFi	Set the parameters for a Summit client.
WWAN	Set parameters for the Wireless Wide Area Network client, if installed.

About

Start > Settings > Control Panel > About

The data cannot be edited by the MX9 user on these panels.

Tab	Contents
Software	GUID, Windows CE Version, OAL Version, Bootloader Version, Compile Version, FPGA Version and Language. Language indicates localized version.
Hardware	CPU Type, Codec Type, FPGA Version, Scanner type, Display, Flash memory, and DRAM memory
Versions	Revision level of software modules and .NET Compact Framework Version. Utilities, Drivers, Image, API, and Internet Explorer.
Network IP	Current network connection IP and MAC address. Only the first 2 adapters are shown (usually radio and ActiveSync). Bluetooth MAC address is shown (if installed).

Version window information is retrieved from the registry.

Version Tab and the Registry

Modify the Registry using the Registry Editor. For best results use caution when editing the Registry and make a backup copy of the registry before changes are made.

The registry settings for the Version tab are under HKEY_LOCAL_MACHINE \ Software \ LXE \ Version in the registry.

To add a user application to the Version panel, create a new string value under the HKLM\Software\LXE\Version key. The string name should be the Application name to appear in the Version window. The data for the value should be the version number to appear in the Version window .

Version strings can be equal to or less than 254 characters. Because the strings are displayed in a text box, any number can be accommodated, up to the 64K byte text box limitation.

Languages

The Software tab displays any languages built into the OS image. The languages built into the OS image are noted in the Language section of this tab:

- English only – No additional languages are built into the OS
- Japanese
- Simplified Chinese
- Traditional Chinese
- Korean

The above listed Asian languages are ordered separately and built-in to the OS image. Built-in languages are added to registry entries and are available immediately upon startup. Thai, Hebrew, Arabic and Cyrillic Russian languages are available in the (English only) default (extended) fonts.

Identifying Software Versions

The Versions tab displays the versions of many of the software programs installed. Not all installed software is included in this list and the list varies depending on the applications loaded on the MX9. The Image line displays the revision of the system software installed. Refer to the last three digits to determine the revision level.

MAC Address

The Network IP tab displays the MAC address of the network card.

Accessibility

Start > Settings > Control Panel > Accessibility

Customize the way the MX9 keyboard, sound, display, mouse, automatic reset and notification sounds function. There are a few changes from general Windows desktop Accessibility options.

Note: The keypad StickyKeys and StickyKeys Settings on the Keyboard panel are disabled as this setting, when enabled, interferes with Honeywell's assigned sticky key implementation.

The following exceptions are due to a limitation in the Microsoft Windows CE operating system:

- If the ToggleKeys option is selected, please note that the ScrollLock key does not produce a sound as the CapsLock and NumLock keys do.
- If the SoundSentry option is selected, please note that ScrollLock does not produce a visual warning as the CapsLock and NumLock keys do.

Tab	Contents
Keyboard	Sticky Keys - Disabled. ToggleKeys - Disabled by default. Tap the *Use ToggleKeys* checkbox to enable this option. Tap the Settings button to view or change parameters.
Sound	SoundSentry is disabled by default. Tap the *Use SoundSentry* checkbox to enable this option. Tap the Settings button to view or change parameters.
Display	High Contrast is disabled by default. Tap the *Use High Contrast* checkbox to enable this option. Tap the Settings button to view or change parameters.
Mouse	MouseKeys is disabled by default. Tap the *Use MouseKeys* checkbox to enable this option. Tap the Settings button to view or change parameters.
General	Automatic reset is disabled by default. Tap the *Turn off accessibility features* checkbox to enable this option and use the drop down option to assign a timer. Notification is enabled by default. Sounds are emitted when turning a feature on or off.

Administration - for AppLock

Introduction

AppLock is designed to be run on Honeywell certified Windows CE based devices only. AppLock is pre-installed on Windows devices.

MX9 AppLock is setup by the Administrator by tapping Start > Settings > Control Panel > Administration.

Configuration parameters are specified by the AppLock Administrator for the mobile device end-user. AppLock is password protected by the Administrator.

End-user mode locks the end-user into the configured application or applications. The end user can still reboot the mobile device and respond to dialog boxes. The administrator-specified applications are automatically launched in the specified order and run in full screen mode when the device boots up.

When the mobile device is reset to factory default values, for example after a cold reset, the Administrator may need to reconfigure the AppLock parameters.

The assumption, in this section, is that the first user to power up a new mobile device is the system administrator.

Note: AppLock Administrator Control panel file Launch option does not inter-relate with similarly-named options contained in other MX9 Control Panels.

Note: A few applications do not follow normal procedures when closing. AppLock cannot prevent this type of application from closing, but is notified that the application has closed. For these applications, AppLock immediately restarts the application (see Auto Re-Launch) which causes the screen to flicker. If this type of application is being locked, the administrator should close all other applications before switching to end-user mode to minimize the screen flicker.

Note: Contact Technical Assistance for upgrade availability if your application or control panels are not the same as the application or control panels presented in this guide.

Factory Default Settings - AppLock

Application Panel	
Filename	Blank
Title	Blank
Arguments	Blank
Order	1
Internet	Disabled
Global Key	Ctl+Spc / Ctrl+Spc
Global Delay	10 sec
Input Panel	Disabled
Launch Button Panel	
Auto at Boot	Enabled
Auto at Boot Retries	0
Auto at Boot Delay	10 sec
Auto Re-launch	Enabled
Auto Re-launch Retries	0
Auto Re-launch Delay	0 sec
Manual Launch	Disabled
Allow Close	Disabled
Security Panel	
Hotkey (Activation key) 62 key	Shft+Ctl+A
Hotkey (Activation key) 38 key	Shift+Ctrl+Alpha+2
Password	Blank
Status Panel	
Filename	\System\applock.txt
View Level	None
Log Level	None

Setup a New Device

Devices with the AppLock feature are shipped to boot in Administration mode with no default password, thus when the MX9 is first booted, the user has full access to the device and no password prompt is displayed. After the administrator specifies the applications to lock, a password is assigned and the device is rebooted or the hotkey is pressed, the device switches to end-user mode.

The process to configure a new device is as follows:

1. Connect an external power source to the device and press the Power button.
2. Adjust screen display, audio volume and other parameters if desired. Install accessories.
3. Tap Start > Settings > Control Panel > Administration icon.
4. Assign applications on the Application tab screen.
5. Assign a password on the Security tab screen.
6. Select a view level on the Status tab screen, if desired.
7. Tap OK
8. Press the hotkey sequence to launch AppLock and lock the configured application(s)
9. The device is now in end-user mode.

Administration Mode

Administration mode gives full access to the mobile device, hardware and software configuration options.

The administrator must enter a valid password (when a password has already been assigned) before access to Administration mode and configuration options are allowed. The administrator can configure the following options:

- Create/change the keystroke sequence to activate administrator access.
- Create/change the password for administrator access.
- Assign the name of the application, or applications, to lock.
- Select the command line of the application to lock.

In addition to these configuration options, the administrator can view and manage the status logs of AppLock sessions.

Administrator default values for this device are:

Administrator Hotkey	Shift+Ctrl+A
Password	None
Application path and name	None
Application command line	None

End User Mode

End-user mode locks the end-user into the configured application or applications. The end user can still reboot and respond to dialog boxes. Each application is automatically launched and runs in full screen mode when the device boots up.

The user cannot unintentionally or intentionally exit the application nor can the end user execute any other applications. Normal application exit or switching methods and all Microsoft defined Windows CE key combinations, such as close (X) icon, File Exit, File Close, Alt-F4, Alt-Tab, etc. are disabled. The Windows CE desktop icons, menu bars, task bar and system trays are not visible or accessible. Task Manager is not available.

If the end-user selects File/Exit or Close from the applications menu bar, the menu is cleared and nothing else happens; the application remains active. Nothing happens when the end-user clicks on the Close icon on the application's title bar and the application remains active.

Note: A few applications do not follow normal procedures when closing. AppLock cannot prevent this type of application from closing, but is notified that the application has closed. For these applications, AppLock immediately restarts the application which causes the screen to flicker. If this type of application is being locked, the administrator should close all other applications before switching to end user mode to minimize the screen flicker.

Windows accelerator keys such as Alt-F4 are disabled.

Passwords

A password must be configured. If the password is not configured, a new device switches into Administration mode without prompting for a password. In addition to the hotkey press, a mode switch occurs if inaccurate information has been configured or if mandatory information is missing in the configuration.

There are several situations that display a password prompt after a password has been configured.

If the configured hotkey is pressed, the password prompt is displayed. In this case the user has 30 seconds to enter a password. If a valid password is not entered within 30 seconds, the password prompt is dismissed and the device returns to end-user mode.

All other situations that present the password prompt do not dismiss the prompt -- this is because the other situations result in invalid end-user operation.

These conditions include:

- If inaccurate configuration information is entered by the administrator, i.e., an application is specified that does not exist.
- If the application name, which is mandatory for end-user mode, is missing in the configuration.
- Invalid installation of AppLock (e.g., missing DLLs).
- Corrupted registry settings.

To summarize, if an error occurs that prevents AppLock from switching to user mode, the password will not timeout and AppLock will wait until the correct password is entered.

Forgotten password?

See: AppLock Help

End-User Switching Technique

Note: The touch screen must be enabled.

```
Keyboard
─────────────
✔ RFTerm.EXE
✔ pword.exe
                  ⌐
```
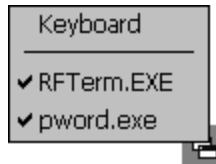
A checkmark indicates applications currently active or available for Launching by the user. When Keyboard is selected, the MX9 default input method (Input Panel, Transcriber, or custom input method) is activated.

The check to the left of the application name indicates that the application is active.

If the application is listed but does not have a checkmark to the left of the application name, this means the application is configured in AppLock and can be manually launched by clicking on the application name in the list.

Using a Stylus Tap

When the mobile device enters end-user mode, a Switchpad icon (it looks like three tiny windows one above the other) is displayed in the lower right corner of the display. The Switchpad is always visible on top of the application in focus. However, if only one application is configured in AppLock and the Input Panel is disabled the Switchpad is not visible.

When the user taps the Switchpad icon, a menu is displayed showing the applications available to the user. The user can tap an application name in the popup menu and the selected application is brought to the foreground. The previous application continues to run in the background. Stylus taps affect the application in focus only. When the user needs to use the Input Panel, they tap the Keyboard option. Input Panel taps affect the application in focus only.

See Also: Application Panel > Launch > Manual (Launch) and Allow Close

Using the Switch Key Sequence

One switch key sequence (or hotkey) is defined by the administrator for the end-user to use when switching between locked applications. This is known as the Activation key. The Activation key is assigned by the Administrator using the Global Key parameter. When the switch key sequence is pressed on the keypad, the next application in the AppLock configuration is moved to the foreground and the previous application moves to the background. The previous application continues to run in the background. End-user key presses affect the application in focus only.

See Also: Application Panel > Global Key

Hotkey (Activation hotkey)

The default Activation key is **Ctrl+Spc**. The key sequence switches the focus between one application and another. Data entry affects the application running in the foreground only. The system administrator may have assigned a different key sequence to use when switching applications.

Application Configuration

Settings > Control Panel > Administration icon

The default Administrator Hotkey sequence is **Shift+Ctrl+A**.

Administrator mode allows access to all features on the device. When the hotkey is pressed to switch into Administrator mode, a password prompt is displayed (if a password has been configured). A password must be entered within 30 seconds (and within three tries) or the password prompt is removed and the device remains in end-user mode with the focus returned to the locked application. Without entry of a valid password, the switch into Administrator mode will not occur.

The password prompt is displayed if a password has been configured. When the valid password is entered, the Administration Control panel is displayed. When a valid password is not entered within 30 seconds, the user is returned to the System Control Panel.

If a password has not been configured, the Administrator Control panel is displayed.

Note: Before setting up multiple instances of the same application, make sure the targeted software application will allow two instances to run at the same time.

Application Panel
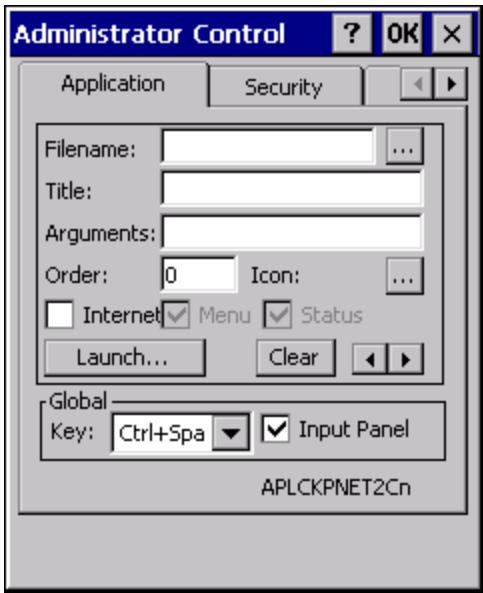
Use the Application tab options to select the applications to launch when the device boots up in End-user Mode.

If no application is specified when the Administrator Control Panel is closed, the mobile device reboots into Administrator mode. If a password has been set, but an application has not been specified, the user will be prompted for the password before entering administration mode. The password prompt remains on the display until a valid password is entered.

Option	Explanation
Filename	Default is blank. Move the cursor to the Filename text box and either type the application path or tap the Browse button (the … button). The standard Windows CE Browse dialog is displayed. After selecting the application from the Browse dialog, tap OK.
Title	Default is blank. Enter the Title to be associated with the application. The assumption is that multiple copies of the same application may need unique titles in order to differentiate them in the Switchpad.
Arguments	Default is blank. Enter the command line parameters for the application in the Arguments text box.
Order	Default is 1. Enter the Order in which the application is to be loaded or presented to the end-user. Applications are launched in lowest to highest number order and do not need to be sequential.
Internet	Default is Disabled. Enable the Internet checkbox to use the End-user Internet Explorer (EUIE.EXE) When the checkbox is enabled, the Internet Menu and Internet Status are available. See the section titled End-user Internet Explorer (EUIE) for more details.

Option	Explanation
Launch Button	See following section titled Launch Button. *Note:* *AppLock Administrator Control panel file Launch option does not inter-relate with similarly-named options contained in other Control Panels.*
Global Key	Default is Ctrl+Spc. Select the Global Key key sequence the end-user is to press when switching between applications. The Global Key default key sequence must be defined by the AppLock Administrator. The Global key is presented to the end-user as the Activation key.
Global Delay	Default is 10 seconds. Enter the number of seconds that Applications must wait before starting to run after reboot. *Note:* *Delay (Global) may not be available in all versions of AppLock. You can simulate a Global Delay function by setting a delay for the first application (lowest Order) launched and setting the delay to 0 for all other applications. See Boot Options.*
Input Panel	Default is Disabled. Enable (check) to show the Keyboard option on the Switchpad menu. When enabled the input panel cannot be enabled or disabled for each individual application, and is available to the user for all configured applications.
Clear Button	Tap the Clear button to clear all currently displayed Filename or Application information. The Global settings are not cleared.
Scroll Buttons	Use the left and right scroll buttons to move from application setup screen to application setup screen. The left and right buttons update the information on the screen with the previous or next configured application respectively.

Launch Button

*Note: The Launch button may not be available in all versions of Multi-AppLock. Contact Technical Assistance for
downloads and AppLock update availability.*

When clicked, displays the Launch options panel for the Filename selected on the Administration panel.
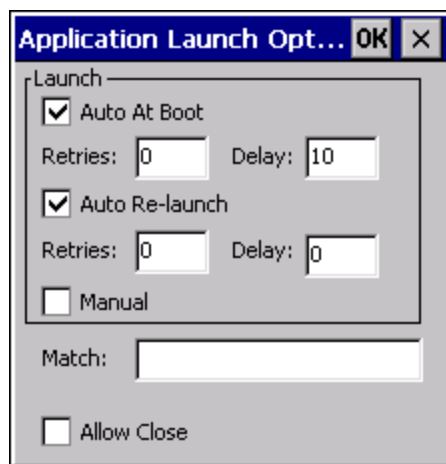
*Note: Launch order is determined by the Order specified in the Application tab. The Order value does not have to be
sequential.*

Auto At Boot
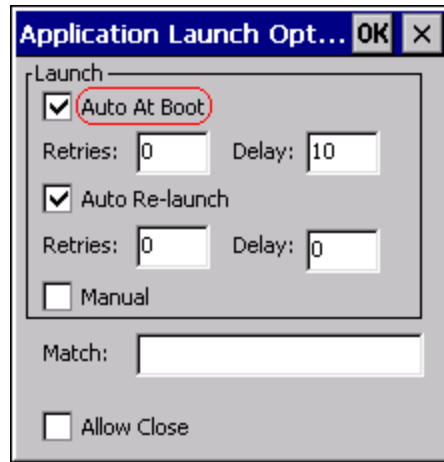
Default is Enabled.

Auto At Boot

When enabled, automatically launches (subject to the specified Delay in seconds) the application after the unit is rebooted. If a Delay in seconds is specified, AppLock waits for the specified period of time to expire before launching the application. The Delay default value is 10 seconds; valid values are between 0 "no delay" and a maximum of 999 seconds.

Retries

This is the number of times the application launch will be retried if a failure occurs when the application is automatically launched at bootup. Valid values are between 0 (no tries) and 99 tries or -1 for infinite. Infinite tries ends when the application successfully launches. The default is 0 retries.

Delay

This timer is the time that AppLock waits prior to the initial launch of the selected application when it is automatically launched at bootup. Delay default is 10 seconds. Valid values are between 0 seconds (no delay) and 999 seconds.

The Auto At Boot delay is associated for each application; it will be either a value specified by the Administrator or it will be the delay default value. At startup, when a delay has been assigned for each application, AppLock waits for the delay associated with the first application to expire before launching the first application then AppLock waits for the delay associated with the second application to expire before launching the second application. AppLock continues in this manner until all applications are launched.

Note: A "Global Delay" can be accomplished by setting a timed delay for the first application to be launched (by lowest Order number) and no delay (0 seconds) for all other applications.

Note: Launch order is determined by the Order specified in the Application tab. The Order value does not have to be sequential.

Auto Re-Launch
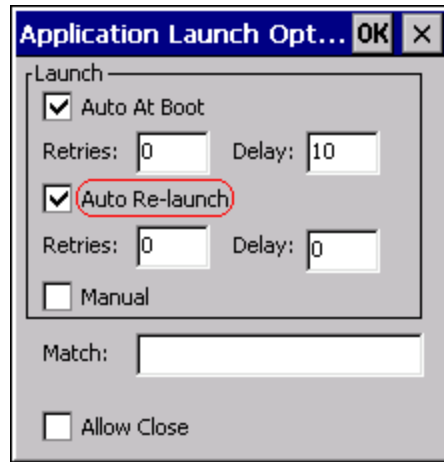
Auto Re-Launch

Default is Enabled.

When enabled for a specific application. automatically re-launches it (subject to the specified Auto Re-Launch Delay in seconds) after it terminates. This option allows the Administrator to disable the re-launch operation. AppLock cannot prevent all applications from closing. When an application that AppLock cannot prevent from closing terminates, perhaps because of an error condition, AppLock re-launches the application when this option is enabled.

Note: If Allow Close is enabled and both Auto Re-launch and Manual (Launch) are disabled, the application cannot be restarted for the end-user or by the end-user after the application terminates.

Retries

Default is 0 tries. Retries is the number of times AppLock will try to re-launch the application. The retry count is reset after an application is successfully launched and controlled by AppLock. Valid values are between 0 (no tries) and 99 tries or -1 for infinite. Infinite tries ends when the application successfully launches.

Delay

Default is 0 seconds (no delay). Delay is the amount of time AppLock waits prior to re-launching an application that has terminated. The delay is specified in seconds. Valid values are between 0 (no delay) and 99 seconds.

AppLock must also be configured to automatically re-launch an application. To AppLock, application termination by the end-user is indistinguishable from application termination for any other reason.

Manual (Launch)
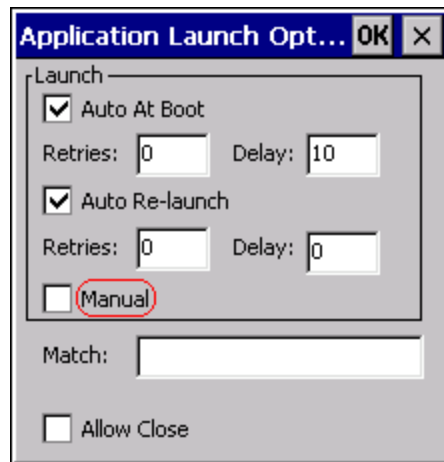
Default is Disabled. Enabling this option allows the end-user to launch the specified application(s). Upon bootup completion an application with Manual enabled is listed on the Switchpad accompanied by a checkmark that indicates the application is currently active or available for Launching. When an application name is tapped by the end-user, the application is launched (if inactive) and brought to the foreground.

Applications set up with Manual (Launch) enabled may or may not be launched at bootup. This function is based on the application's Auto At Boot setting. The applications have been listed as approved applications for end-user manual launch using the Switchpad menu structure. The approved applications are listed on the Switchpad. A checkmark indicates the applications active status.

When Manual (Launch) is disabled for an application, and Allow Close is enabled for the application, when the end-user closes the specific application it is no longer available (shown) on the Switchpad.

When Auto At Boot and Manual (Launch) are both disabled for a specific application, the application is 1) not placed on the list of approved applications for end-user manual launch and 2) never launched, and 3) not displayed on the Switchpad.

Allow Close
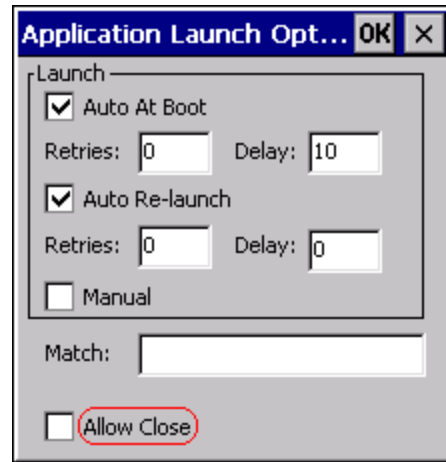
Default is Disabled. When enabled, the associated application can be closed by the end-user.

This option allows the administrator to configure applications that consume system resources to be terminated if an error condition occurs or at the end-user's request. Error conditions may generate a topmost popup requiring an end-user response, memory resource issues requiring an end-user response, etc. Also at the administrator's discretion, these types of applications can be started manually (see Manual [Launch]) by the end-user.

Match
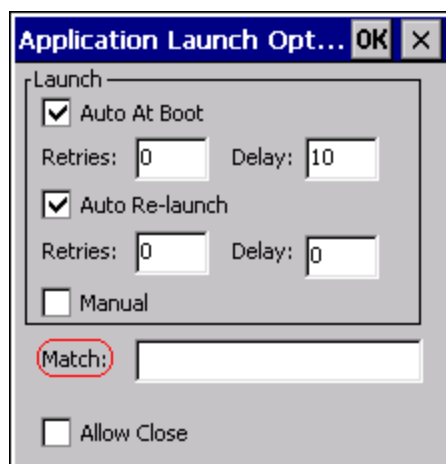
Default is blank (match is not used).

AppLock works by associating display windows with the launched process ID. If an application uses different process IDs for windows it creates, the Match field must be used.

Use the Match field to specify up to 32 characters of the class name for the application.

- DOS applications using a standard DOS display box should specify condev_appcls in the Match textbox.
- Remote Desktop (remote.exe) should specify TSSHELLWND in the Match textbox.

An update may be required to support locking remote.exe. Contact Technical Assistance for details.

End User Internet Explorer (EUIE)

AppLock supports applications that utilize Internet Explorer, such as .HTML pages and JAVA applications. The end user can run an application by entering the application name and path in Internet Explorer's address bar.

To prevent the end user from executing an application using this method, the address bar and Options settings dialog are restricted in Internet Explorer. This is accomplished by creating an Internet Explorer that is used in end user mode: End-user Internet Explorer (EUIE.EXE). The EUIE executes the Internet Explorer application in full screen mode which removes the address bar and status bar. The Options Dialog is also removed so the end user cannot re-enable the address bar.

The administrator specifies the EUIE by checking the Internet checkbox in the Application tab of the Administrator applet. The internet application should then be entered in the Application text box.

When the Internet checkbox is enabled, the Menu and Status check boxes are available.

Enabling the Menu checkbox displays the EUIE menu which contains navigation functions like Back, Forward, Home, Refresh, etc., functions that are familiar to most Internet Explorer users. When the Menu checkbox is blank, the EUIE menu is not displayed and Navigation functions are unavailable.

When the Status checkbox is enabled, the status bar displayed by EUIE gives feedback to the end-user when they are navigating the Internet.

If the standard Internet Explorer that is shipped with the mobile device is desired, it should be treated like any other application. This means that IEXPLORER.EXE should be specified in the Application text box and the internet application should be entered in the command line. In this case, do not check the Internet checkbox.

Security Panel

Hotkey

Specify the hotkey sequence that triggers AppLock to switch between administrator and user modes and the password required to enter Administrator mode. The default hotkey sequence is **Shift+Ctrl+A**.

A 2nd key keypress is an invalid keypress for a hotkey sequence.

Move the cursor to the Hot Key text box. Enter the new hot key sequence by first pressing the Shift state key followed by a normal key. The hotkey selected must be a key sequence that the application being locked does not use. The hotkey sequence is intercepted by AppLock and is not passed to the application.

Input from the keyboard or Input Panel is accepted with the restriction that the normal key must be pressed from the keyboard when switching modes. The hotkey sequence is displayed in the Hot key text box with "Shift", "Alt", and "Ctrl" text strings representing the shift state keys. The normal keyboard key completes the hotkey sequence. The hotkey must be entered via the keypad. Some hotkeys cannot be entered via the Input Panel. Also, hotkeys entered via the SIP are not guaranteed to work properly when switching operational modes.

For example, if the 'Ctrl' key is pressed followed by 'A', "Ctrl+A" is entered in the text box. If another key is pressed after a normal key press, the hotkey sequence is cleared and a new hotkey sequence is started.

A normal key is required for the hotkey sequence and is unlike pressing the normal key during a mode switch; this key can be entered from the SIP when configuring the key. However, when the hotkey is pressed to switch modes, the normal key must be entered from the keypad; it cannot be entered from the SIP.

Password

Move the cursor to the Password text box. The passwords entered in the Password and Confirm Password fields must match. Passwords are case sensitive.

When the user exits the Administrator Control panel, the two passwords are compared to verify that they match. If they do not match, a dialog box is displayed notifying the user of the error. After the user closes the dialog box, the Security Panel is displayed and the password can then be entered and confirmed again. If the passwords match, the password is encrypted and saved.

See Also: Passwords and AppLock Help

Options Panel

AppLock contains several types of delays and timeouts to accommodate different applications. Please note that the delays specified on the Launch panel are delays before AppLock attempts to start the specified application(s). The timesouts specified on this panel are delays after AppLock has attempted to launch the application.
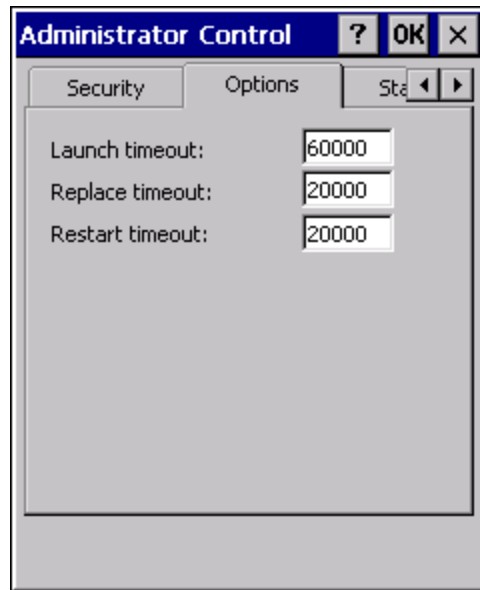
Launch timeout

This timeout specifies the period of time for AppLock to wait for the application to initially launch after the application has been called. For example, if the application takes time to launch and then initialize before a display a window is created, use this delay to specify the delay period.

Replace timeout

This timeout specifies the period of time for AppLock to wait after an initial screen (like a password prompt screen) is replaced by another application window.

Restart timeout

This specifies the period of time for AppLock to wait for an application to restart. If the application fails to restart automatically, AppLock then proceeds according to the options selected when the application was configured on the Application and Launch panels.

Status Panel

Use the Status panel to view the log of previous AppLock operations and to configure which messages are to be recorded during AppLock operation.

Status information is stored in a specific location on the storage device and in a specific logfile specified by the Administrator. For this reason, the administrator can configure the type of status information that is logged, as well as clear the status information.
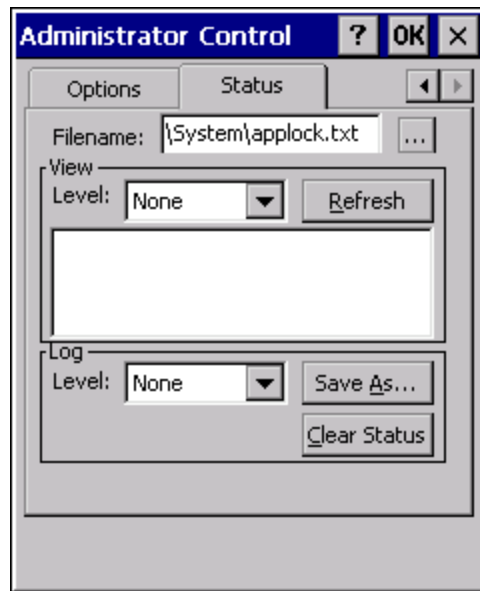
Move the cursor to the Filename text box and either type the logfile path or tap the Browse button (the … button). The standard Windows CE Browse dialog is displayed. After selecting the logfile from the Browse dialog, tap OK.

Note: If your Status Panel does not look like the figure shown above, you may have the Single Application version which does not have as many options.

View

Error - Error status messages are logged when an error occurs and is intended to be used by the administrator to determine why the specified application cannot be locked.

Process - Processing status shows the flow control of AppLock components and is mainly intended for Customer Support when helping users troubleshoot problems with their AppLock program.

Extended - Extended status provides more detailed information than that logged by Process Logging.

All - All messages are displayed.

Tap the Refresh button after changing from one view level to another. The filtered records are displayed, all others are not displayed.

Log

Note: If a level higher than Error is selected, the status should be cleared frequently by the administrator.

In addition to the three view levels the administrator can select that all status information be logged or turn off all status information logging completely. The system default is 'None'; however to reduce registry use, the administrator may want to select 'None' after verifying the configuration. Tap the Clear button to clear the status information from the registry.

- None
- Error
- Processing
- Extended
- All

Save As

When the 'Save As'… button is selected, a standard 'Save As' dialog screen is displayed. Specify the path and filename. If the filename exists, the user is prompted whether the file should be overwritten. If the file does not exist, it is created.

See Also: Error Messages

AppLock Help

The mobile device won't switch from Administration mode to end-user mode.

- If the configuration is valid for one application but not the other, the switch to end-user mode fails. AppLock stays in Administration mode and is stopped until the Administrator password is entered.
- If two copies of the same application are configured, but the application only allows one copy to run at a time, for example Microsoft Pocket Word, the switch to end-user fails. AppLock stays in Administration mode and is stopped until the Administrator password is entered.

The hotkey sequence needed is not allowed. What does this mean?

When the Administrator is selecting a hotkey sequence to use when switching user modes, the Administrator is not allowed to enter key combinations that are reserved by installed software applications. Honeywell has validated RFTerm key combinations ONLY.

When RFTerm is installed on the mobile device and an RFTerm restricted key sequence is specified as a hotkey sequence by the Administrator, the following error message is displayed in a message box:

```
Selected hotkey is not allowed. Please reenter.
```

When RFTerm is not installed on the mobile device, the RFTerm keys are not restricted from use.

Can't locate the password that has been set by the administrator?

Contact Technical Assistance.

AppLock Error Messages

Any messages whose first word is an 'ing' word is output prior to the action described in the message. For example, "Switching to admin-hotkey press" is logged after the administrator has pressed the hotkey but prior to starting the switch process.

For all operations that can result in an error, an Error level message is displayed when a failure occurs. These messages contain the word "failure". These messages have a partner Extended level message that is logged which contains the word "OK" if the action completed successfully rather than with an error.

For processing level messages, "Enter…" is logged at the beginning of the function specified in the message and "Exit…" is logged at the end (just before the return) of the function specified in the message.

Message	Explanation and/or corrective action	Level
Error reading hotkey	The hotkey is read but not required by AppLock.	LOG_EX
Error reading hotkey; using default	A hotkey is required. If there is a failure reading the hotkey, the internal factory default is used.	LOG_ERROR
App Command Line= <Command line>	Command line of the application being locked	LOG_ PROCESSING
App= <Application name>	Name of the application being locked	LOG_ PROCESSING
dwProcessID= <#>	Device ID of the application being locked	LOG_EX
Encrypt exported key len <#>	Size of encrypt export key	LOG_EX
Encrypt password length= <#>	The length of the encrypted password.	LOG_EX
Encrypted data len <#>	Length of the encrypted password	LOG_EX
hProcess= <#>	Handle of the application being locked	LOG_EX
Key pressed = <#>	A key has been pressed and trapped by the hotkey processing.	LOG_EX
****************	The status information is being saved to a file and the file has been opened successfully.	LOG_EX
Address of keyboard hook procedure failure	AppLock found the kbdhook.dll, but was unable to get the address of the initialization procedure. For some reason the dll is corrupted. Look in the \Windows directory for kbdhook.dll. If it exists, delete it. Also delete AppLock.exe from the \Windows directory and reboot the unit. Deleting AppLock.exe triggers the AppLock system to reload.	LOG_ERROR
Address of keyboard hook procedure OK	AppLock successfully retrieved the address of the keyboard filter initialization procedure.	LOG_EX
Alt pressed	The Alt key has been pressed and trapped by the HotKey processing.	LOG_EX
Alt	Processing the hotkey and backdoor entry	LOG_EX
Application handle search failure	The application being locked did not complete initialization.	LOG_ERROR
Application handle search OK	The application initialized itself successfully	LOG_ERROR
Application load failure	The application could not be launched by AppLock; the application could not be found or is corrupted.	LOG_ERROR
Backdoor message received	The backdoor keys have been pressed. The backdoor hotkeys provide a method for customer service to get a user back into their system without editing the registry or reloading the device.	LOG_ PROCESSING

Message	Explanation and/or corrective action	Level
Cannot find kbdhook.dll	The load of the keyboard filter failed. This occurs when the dll is missing or is corrupted. Look in the \Windows directory for kbdhook.dll. If it exists, delete it. Also delete AppLock.exe from the \Windows directory and reboot the unit. Deleting AppLock.exe triggers the AppLock system to reload.	LOG_ERROR
Converted Pwd	Converted password from wide to mbs.	LOG_EX
Could not create event EVT_HOTKEYCHG	The keyboard filter uses this event at the Administrator Control panel. The event could not be created.	LOG_ERROR
Could not hook keyboard	If the keyboard cannot be controlled, AppLock cannot process the hotkey. This failure prevents a mode switch into user mode.	LOG_ERROR
Could not start thread HotKeyMon	The keyboard filter must watch for hot key changes. The watch process could not be initiated.	LOG_ERROR
Ctrl after L or X	Processing the backdoor entry.	LOG_EX
Ctrl pressed	The Ctrl key has been pressed and trapped by the HotKey processing.	LOG_EX
Ctrl	Processing the hotkey and backdoor entry.	LOG_EX
Decrypt acquire context failure	Unable to decrypt password.	LOG_ERROR
Decrypt acquired context OK	Decryption process ok.	LOG_EX
Decrypt create hash failure	Unable to decrypt password.	LOG_ERROR
Decrypt created hash OK	Decryption process ok.	LOG_EX
Decrypt failure	Unable to decrypt password.	LOG_ERROR
Decrypt import key failure	Unable to decrypt password.	LOG_ERROR
Decrypt imported key OK	Decryption process ok.	LOG_EX
Encrypt acquire context failure	Unable to encrypt password.	LOG_ERROR
Encrypt acquire encrypt context failure	Unable to encrypt password.	LOG_ERROR
Encrypt acquired encrypt context OK	Encrypt password process successful.	LOG_EX
Encrypt create hash failure	Unable to encrypt password.	LOG_ERROR
Encrypt create key failure	Unable to encrypt password.	LOG_ERROR
Encrypt created encrypt hash OK	Encrypt password process successful.	LOG_EX
Encrypt export key failure	Unable to encrypt password.	LOG_ERROR
Encrypt export key length failure	Unable to encrypt password.	LOG_ERROR
Encrypt exported key OK	Encrypt password process successful.	LOG_EX
Encrypt failure	The password encryption failed.	LOG_ERROR
Encrypt gen key failure	Unable to encrypt password.	LOG_ERROR
Encrypt generate key failure	Unable to encrypt password.	LOG_ERROR

Message	Explanation and/or corrective action	Level
Encrypt get user key failure	Unable to encrypt password.	LOG_ERROR
Encrypt get user key ok	Encrypt password process successful.	LOG_EX
Encrypt hash data failure	Unable to encrypt password.	LOG_ERROR
Encrypt hash data from pwd OK	Encrypt password process successful.	LOG_EX
Encrypt length failure	Unable to encrypt password.	LOG_ERROR
Encrypt out of memory for key	Unable to encrypt password.	LOG_ERROR
Encrypted data OK	The password has been successfully encrypted.	LOG_EX
Enter AppLockEnumWindows	In order for AppLock to control the application being locked so it can prevent the application from exiting, AppLock launches the application and has to wait until it has created and initialized its main window. This message is logged when the function that waits for the application initialization is entered.	LOG_EX
Enter DecryptPwd	Entering the password decryption process.	LOG_ PROCESSING
Enter EncryptPwd	Entering the password encryption processing.	LOG_ PROCESSING
Enter FullScreenMode	Entering the function that switches the screen mode. In full screen mode, the taskbar is hidden and disabled.	LOG_ PROCESSING
Enter GetAppInfo	Processing is at the beginning of the function that retrieves the application information from the registry.	LOG_ PROCESSING
Enter password dialog	Entering the password dialog processing.	LOG_ PROCESSING
Enter password timeout	Entering the password timeout processing.	LOG_ PROCESSING
Enter restart app timer	Some application shut down before AppLock can stop it. In these cases, AppLock gets notification of the exit. When the notification is received, AppLock starts a timer to restart the application. This message logs that the timer has expired and the processing is at the beginning of the timer function.	LOG_ PROCESSING
Enter TaskbarScreenMode	Entering the function that switches the screen to non-full screen mode and enable the taskbar.	LOG_ PROCESSING
Enter ToAdmin	Entering the function that handles a mode switch into admin mode.	LOG_ PROCESSING
Enter ToUser	Entering the function that handles the mode switch to user mode	LOG_ PROCESSING
Enter verify password	Entering the password verification processing.	LOG_ PROCESSING
Exit AppLockEnumWindows-Found	There are two exit paths from the enumeration function. This message denotes the enumeration function found the application.	LOG_ PROCESSING
Exit AppLockEnumWindows-Not found	There are two exit paths from the enumeration function. This message denotes the enumeration function did not find the application.	LOG_ PROCESSING
Exit DecryptPwd	Exiting password decryption processing.	LOG_

Message	Explanation and/or corrective action	Level
		PROCESSING
Exit EncryptPwd	Exiting password encryption processing.	LOG_ PROCESSING
Exit FullScreenMode	Exiting the function that switches the screen to full screen.	LOG_ PROCESSING
Exit GetAppInfo	Processing is at the end of the function that retrieved the application information from the registry.	LOG_ PROCESSING
Exit password dialog	Exiting password prompt processing.	LOG_ PROCESSING
Exit password dialog-cancel	Exiting password prompt w/cancel.	LOG_ PROCESSING
Exit password dialog-OK	Exiting password prompt successfully.	LOG_ PROCESSING
Exit password timeout	Exiting password timeout processing.	LOG_ PROCESSING
Exit restart app timer	Processing is at the end of the timer function	LOG_ PROCESSING
Exit TaskbarScreenMode	Exiting the function that switches the screen mode back to normal operation for the administrator.	LOG_ PROCESSING
Exit ToAdmin	Exiting the function that handles the mode switch into admin mode.	LOG_ PROCESSING
Exit ToUser	Exiting the user mode switch function.	LOG_ PROCESSING
Exit ToUser-Registry read failure	The AppName value does not exist in the registry so user mode cannot be entered.	LOG_ PROCESSING
Exit verify password-no pwd set	Exiting password verification.	LOG_ PROCESSING
Exit verify password-response from dialog	Exiting password verification.	LOG_ PROCESSING
Found taskbar	The handle to the taskbar has been found so that AppLock can disable it in user mode.	LOG_ PROCESSING
Getting address of keyboard hook init procedure	AppLock is retrieving the address of the keyboard hook.	LOG_ PROCESSING
Getting configuration from registry	The AppLock configuration is being read from the registry. This occurs at initialization and also at entry into user mode. The registry must be re-read at entry into user mode in case the administration changed the settings of the application being controlled.	LOG_ PROCESSING
Getting encrypt pwd length	The length of the encrypted password is being calculated.	LOG_EX
Hook wndproc failure	AppLock is unable to lock the application. This could happen if the application being locked encountered an error after performing its initialization and shut itself down prior to being locked by AppLock.	LOG_ERROR
Hook wndproc of open app failure	The application is open, but AppLock cannot lock it.	LOG_ERROR
Hot key event creation failure	The Admin applet is unable to create the hotkey notification.	LOG_ERROR

Message	Explanation and/or corrective action	Level
Hot key pressed	Processing the hotkey and backdoor entry	LOG_EX
Hot key pressed	Processing the hotkey and backdoor entry	LOG_EX
Hot key set event failure	When the administrator changes the hotkey configuration the hotkey controller must be notified. This notification failed.	LOG_ERROR
Hotkey press message received	The user just pressed the configured hotkey.	LOG_PROCESSING
In app hook:WM_SIZE	In addition to preventing the locked application from exiting, AppLock must also prevent the application from enabling the taskbar and resizing the application's window. This message traps a change in the window size and corrects it.	LOG_EX
In app hook:WM_WINDOWPOSCHANGED	In addition to preventing the locked application from exiting, AppLock must also prevent the application from enabling the taskbar and resizing the application's window. This message traps a change in the window position and corrects it.	LOG_EX
Initializing keyboard hook procedure	AppLock is calling the keyboard hook initialization.	LOG_PROCESSING
Keyboard hook initialization failure	The keyboard filter initialization failed.	LOG_ERROR
Keyboard hook loaded OK	The keyboard hook dll exists and loaded successfully.	LOG_EX
L after Ctrl	Processing the backdoor entry.	LOG_EX
Loading keyboard hook	When AppLock first loads, it loads a dll that contains the keyboard hook processing. This message is logged prior to the load attempt.	LOG_PROCESSING
Open failure	The status information is being saved to a file and the file open has failed. This could occur if the file is write protected. If the file does not exist, it is created.	LOG_ERROR
Open registry failure	If the Administration registry key does not exist, the switch to user mode fails because the AppName value in the Administration key is not available.	LOG_ERROR
Opened status file	The status information is being saved to a file and the file has been opened successfully.	LOG_EX
Out of memory for encrypted pwd	Not enough memory to encrypt the password.	LOG_ERROR
pRealTaskbarWndProc already set	The taskbar control has already been installed.	LOG_EX
Pwd cancelled or invalid-remain in user mode	The password prompt was cancelled by the user or the maximum number of failed attempts to enter a password was exceeded.	LOG_EX
Read registry error-hot key	The hotkey registry entry is missing or empty. This is not considered an error. The keyboard hook uses an embedded default if the value is not set in the registry.	LOG_ERROR
Read registry failure-app name	AppName registry value does not exist or is empty. This constitutes a failure for switching into user mode.	LOG_ERROR
Read registry failure-Cmd Line	AppCommandLine registry entry is missing or empty. This is not considered an error since command line information is not necessary to launch and lock the application.	LOG_ERROR
Read registry failure-Internet	The Internet registry entry is missing or empty. This is not considered an error since the Internet value is not necessary to launch and lock the application.	LOG_ERROR
Registering Backdoor MSG	The AppLock system communicates with the keyboard hook via a user defined message. Both AppLock.exe and Kbdhook.dll register the message at initialization.	LOG_PROCESSING
Registering Hotkey MSG	The AppLock system communicates with the keyboard hook via a user defined message. Both Applock.exe and Kbdhook.dll register the message at initialization.	LOG_PROCESSING

Message	Explanation and/or corrective action	Level
Registry read failure at reenter user mode	The registry has to be read when entering user mode is the AppName is missing. This user mode entry is attempted at boot and after a hotkey switch when the administrator has closed the application being locked or has changed the application name or command line.	LOG_ERROR
Registry read failure at reenter user mode	The registry has to be read when switching into user mode. This is because the administrator can change the settings during administration mode. The read of the registry failed which means the Administration key was not found or the AppName value was missing or empty.	LOG_ERROR
Registry read failure	The registry read failed. The registry information read when this message is logged is the application information. It the Administration key cannot be opened or if the AppName value is missing or empty, this error is logged. The other application information is not required. If the AppName value is not available, AppLock cannot switch into user mode.	LOG_ERROR
Reset system work area failure	The system work area is adjusted when in user mode to cover the taskbar area. The system work area has to be adjusted to exclude the taskbar area in administration mode. AppLock was unable to adjust this area.	LOG_ERROR
Shift pressed	The Shift key has been pressed and trapped by the HotKey processing.	LOG_EX
Shift	Processing the hotkey and backdoor entry	LOG_EX
Show taskbar	The taskbar is now being made visible and enabled.	LOG_PROCESSING
Switching to admin-backdoor	The system is currently in user mode and is now switching to admin mode. The switch occurred because of the backdoor key presses were entered by the administrator.	LOG_PROCESSING
Switching to admin-hotkey press	The system is currently in user mode and is now switching to admin mode. The switch occurred because of a hotkey press by the administrator.	LOG_PROCESSING
Switching to admin-kbdhook.dll not found	The keyboard hook load failed, so AppLock switches to admin mode. If a password is specified, the password prompt is displayed and remains until a valid password is entered.	LOG_PROCESSING
Switching to admin-keyboard hook initialization failure	If the keyboard hook initialization fails, AppLock switches to admin mode. If a password is specified, the password prompt is displayed and remains until a valid password is entered.	LOG_PROCESSING
Switching to admin-registry read failure	See the explanation of the "Registry read failure" above. AppLock is switching into Admin mode. If a password has been configured, the prompt will be displayed and will not be dismissed until a valid password is entered.	LOG_PROCESSING
Switching to TaskbarScreenMode	In administration mode, the taskbar is visible and enabled.	LOG_EX
Switching to user mode	The registry was successfully read and AppLock is starting the process to switch to user mode.	LOG_PROCESSING
Switching to user-hotkey press	The system is currently in admin mode and is now switching to user mode. The switch occurred because of a hotkey press by the administrator.	LOG_PROCESSING
Taskbar hook failure	AppLock is unable to control the taskbar to prevent the locked application from re-enabling it.	LOG_ERROR
Taskbar hook OK	AppLock successfully installed control of the taskbar.	LOG_EX
Timeout looking for app window	After the application is launched, AppLock must wait until the application has initialized itself before proceeding. The application did not start successfully and AppLock has timed out.	LOG_ERROR
ToUser after admin, not at boot	The user mode switch is attempted when the device boots and after the administrator presses the hotkey. The mode switch is being attempted after a hotkey press.	LOG_EX

Message	Explanation and/or corrective action	Level
ToUser after admin-app still open	The switch to user mode is being made via a hotkey press and the administrator has left the application open and has not made any changes in the configuration.	LOG_EX
ToUser after admin-no app or cmd line change	If user mode is being entered via a hotkey press, the administrator may have left the configured application open. If so, AppLock does not launch the application again unless a new application or command line has been specified; otherwise, it just locks it.	LOG_EX
Unable to move desktop	The desktop is moved when switching into user mode. This prevents them from being visible if the application is exited and restarted by the timer. This error does not affect the screen mode switch; processing continues.	LOG_ERROR
Unable to move taskbar	The taskbar is moved when switching into user mode. This prevents them from being visible if the application is exited and restarted by the timer. This error does not affect the screen mode switch; processing continues.	LOG_ERROR
Unhook taskbar wndproc failure	AppLock could not remove its control of the taskbar. This error does not affect AppLock processing	LOG_ERROR
Unhook wndproc failure	AppLock could not remove the hook that allows monitoring of the application.	LOG_ERROR
Unhooking taskbar	In administration mode, the taskbar should return to normal operation, so AppLock's control of the taskbar should be removed.	LOG_EX
Unhooking wndproc	When the administrator leaves user mode, the device is fully operational; therefore, AppLock must stop monitoring the locked application.	LOG_EX
WM_SIZE adjusted	This message denotes that AppLock has readjusted the window size.	LOG_EX
X after Ctrl+L	Processing the backdoor entry.	LOG_EX
Ret from password <#>	Return value from password dialog.	LOG_EX
Decrypt data len <#>	Length of decrypted password.	LOG_EX
Window handle to enumwindows=%x	The window handle that is passed to the enumeration function. This message can be used by engineering with other development tools to trouble shoot application lock failures.	LOG_EX
WM_WINDOWPOSCHG adjusted=%x	Output the window size after it has been adjusted by AppLock	LOG_EX

Battery

Start > Settings > Control Panel > Battery

This panel is used to view the status and percentage of power remaining in the MX9 main battery. The data cannot be edited by the user.

 The battery gas gauge icon resides in the system tray and shows four levels of charge – 100%, 75%, 50%, 25%. At a point below 50%, the system status LED will turn yellow and the gas gauge icon will turn yellow. At a point below 25%, the system status LED will turn red and the gas gauge icon will turn red indicating the battery is low.

Jacked is shown in the Status box when the Main battery is receiving external power.

The main battery is charged/recharged when the MX9 is docked in a powered cradle or directly cabled to an external power source.
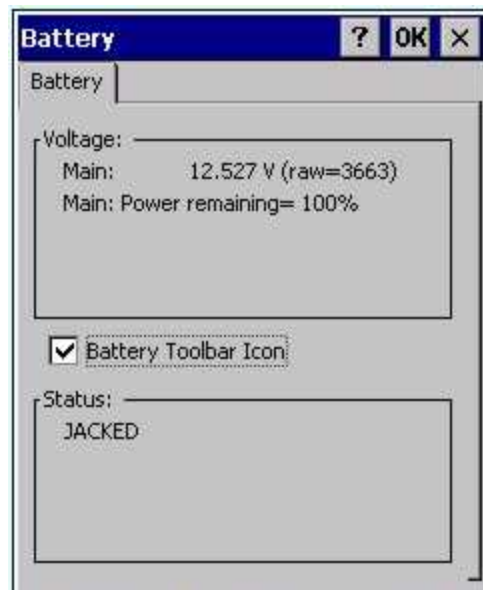
The backup battery draws power from the Main battery to maintain a charge. The backup battery voltage and percentage of power fluctuate continuously.

When there is no Main battery in the unit, the backup battery begins to discharge as it maintains RAM and other vital settings. After a Main battery is installed, the backup battery begins to draw power from the Main battery again.

Note: Frequent connection to an external power source, if feasible, is recommended to maintain backup battery charge status as the backup battery cannot be recharged by a dead or missing main battery.

Bluetooth

Start > Settings > Control Panel > Bluetooth

Note: Contact Technical Assistance for upgrade availability if your Bluetooth control panel is not the same as the control panels presented in this section.

Discover and manage pairing with nearby Bluetooth devices.

Factory Default Settings

Discovered Devices	None
Settings	
Turn Off Bluetooth	Enabled
Computer is connectable	Enabled
Computer is discoverable	Disabled
Prompt if devices request to pair	Enabled
Continuous search	Disabled
Filtered Mode	Enabled
Printer Port on COM 9:	Disabled (unchecked) by default in both Filtered and Non Filtered Modes. The option is dimmed in Non Filtered Mode.
Logging	Disabled
Computer Friendly Name	System Device Name
Reconnect	
Report lost connection	Enabled
Report when reconnected	Disabled
Report failure to reconnect	Enabled
Clear Pairing Table on boot	Disabled
Auto Reconnect on Boot	Enabled
Auto Reconnect	Enabled
OPP Setup	
Inbox	\My Device\My Documents\DefaultInbox
Outbox	\My Device\My Documents\DefaultOutbox
Write Capable	Enabled
Enable Notifications	Enabled
Disable LXEZ Pairing OPP	Unchecked, OPP is enabled

Bluetooth taskbar Icon state and Bluetooth device Icon states change as Bluetooth devices are discovered, paired, connected and disconnected. There may be audible or visual signals as paired devices re-connect with the MX9.

- The default Bluetooth setting is On.
- The MX9 cannot be discovered by other Bluetooth devices when the **Computer is discoverable** option is disabled (unchecked) on the Settings panel.
- Other Bluetooth devices cannot be discovered if they have been set up to be Non-Discoverable or Invisible.
- When **Filtered Mode** is enabled, the MX9 can pair with one Bluetooth scanner and one Bluetooth printer.
- When **Filtered Mode** is disabled, the MX9 can pair with up to four Bluetooth devices, with a limit of one scanner, one printer, two HID[1] devices (one Mouse, one Keyboard), one PAN[2] device, and one DUN[3] device connected at the same time.
- It is not necessary to disconnect a paired scanner and printer before a different scanner or printer is paired with the MX9.
- The target Bluetooth device should be as close as possible (up to 32.8 ft (10 meters) Line of Sight) to the MX9 during the pairing process.

Assumption: The System Administrator has Discovered and Paired targeted Bluetooth devices for the MX9. The MX9 operating system has been upgraded to the revision level required for Bluetooth client operation. An application (or API) is available that will accept data from serial Bluetooth devices.

Bluetooth Devices

The Bluetooth Devices tab displays any device previously discovered and paired with the MX9.

---
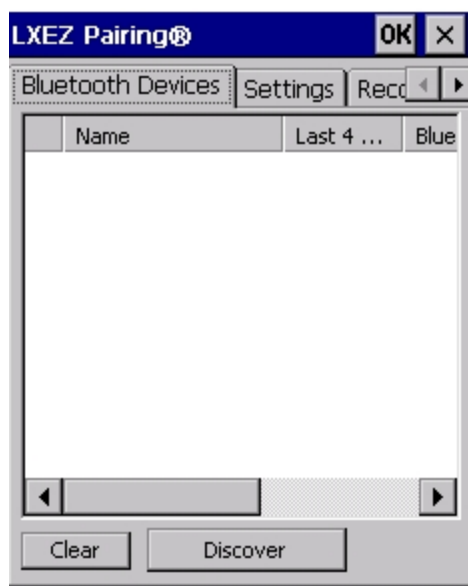
[1]Human Interface Device profiles used by Bluetooth keyboards, mice, pointing devices and remote monitoring devices.
[2]Personal Area Networking profile. Un-modified Ethernet payloads (using BNEP) can exchange packets between Bluetooth devices. PANU is a PAN User service that uses either the NAP or the GN service.
[3]Dial-Up Networking provides access to the Internet and other dial-up services using Bluetooth technology.

Discover

Tap the Discover button to locate all discoverable Bluetooth devices in the vicinity. The Discovery process also queries for the unique identifier of each device discovered.
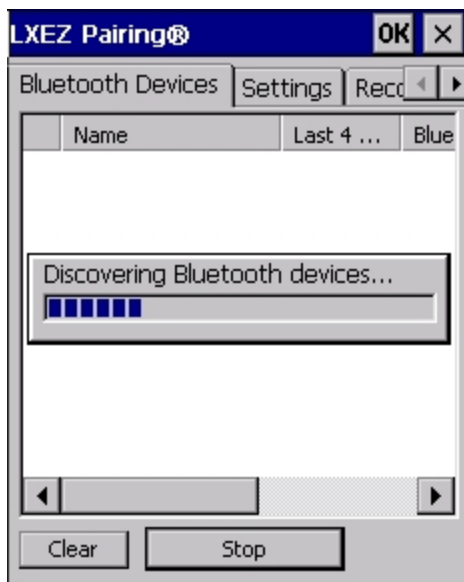
Stop Button

Tap Stop at any time to end the Discover and Query for Unique Identifier functions. Devices not paired are not shown after any reboot sequence.

Note: When an active paired device enters Suspend Mode, is turned Off or leaves the MX9 Bluetooth scanning range, the Bluetooth connection between the paired device and the MX9 is lost. There may be audible or visual signals as paired devices disconnect from the MX9.

Bluetooth Device List
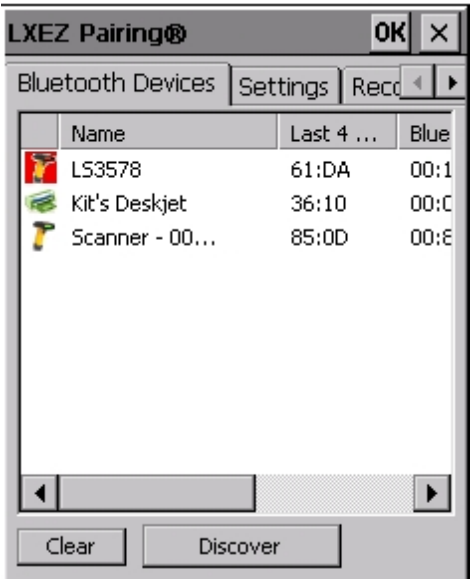
The discovered paired devices may or may not be identified with an icon. Discovered devices without an icon can be paired as a Scanner or a Printer. The Bluetooth panel assigns an icon to the device name.

The discovered paired devices may or may not be identified with an icon. Discovered devices without an icon can be paired as a Serial device, a Bluetooth scanner, a Bluetooth printer, a PAN, and a DUN connected at the same time. More than one HID device can be connected but only one Bluetooth mouse and one Bluetooth keyboard. The Bluetooth panel assigns an icon to the device name.

An icon with a red background indicates the device's Bluetooth connection is inactive.

An icon with a white background indicates the device is connected to the MX9 and the device's Bluetooth connection is active.

Double-tap a device in the list to open the device properties menu. The target device does not need to be active.

Clear Button

Deletes all devices from the Device table that are not currently paired. A dialog box is presented, "Delete all disconnected devices? Yes/No". Tap the Yes button to remove disconnected or deleted devices from the device table. The devices are removed from the Device table after any reboot sequence and when LXEZ Pairing is re-launched without a reboot sequence. Tap the No button to make no changes. See Clear Pairing Table on Boot.

Bluetooth Device Menu

Pre-requisite: The Discover button has been clicked and there are Bluetooth devices listed.

Click on a device in the list to highlight it. Double click the highlighted device to display the Bluetooth Device right click menu. The Bluetooth device does not need to be active.
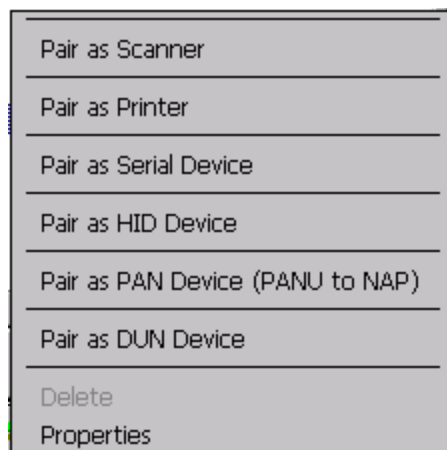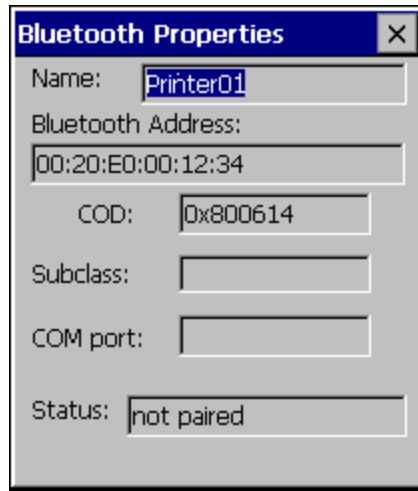
Pair as Scanner	Pair as Scanner
Pair as Printer	Pair as Printer
Delete	Pair as Serial Device
Properties	Pair as HID Device
	Pair as PAN Device (PANU to NAP)
	Pair as DUN Device
	Delete
	Properties
Filtered Mode Enabled	Filtered Mode Disabled

Right Click Menu Options

Pair as Scanner	Receive data from the highlighted Bluetooth scanner or Bluetooth imager.
Pair as Printer	Send data to the highlighted Bluetooth printer.
Pair as Serial Device	Communicate with the highlighted serial Bluetooth device. This option is available when Filtered Mode is disabled.
Pair as HID Device	Communicate with the highlighted HID (Human Interface Device). This option is available when Filtered Mode is disabled/unchecked.
Pair as PAN Device (PANU to NAP)	Communicate with the highlighted PAN (Personal Area Networking) device. This option is available when Filtered Mode is disabled/unchecked.
Pair as DUN Device	Communicate with the highlighted DUN (Dial-Up Networking) device. This option is available when Filtered Mode is disabled/unchecked.
Disconnect	Stop the connection between the MX9 and the highlighted paired Bluetooth device.
Delete	Remove an unpaired device from the Bluetooth device list. The highlighted device name and identifier is removed from the MX9 Bluetooth Devices panel after the user taps OK.
Properties	More information on the highlighted Bluetooth device.

Bluetooth Properties

Data on the Bluetooth Properties panel cannot be changed by the user. The data displayed is the result of the device Query performed during the Discovery process.

The Status dialog box reflects the current state of the highlighted device.

Settings
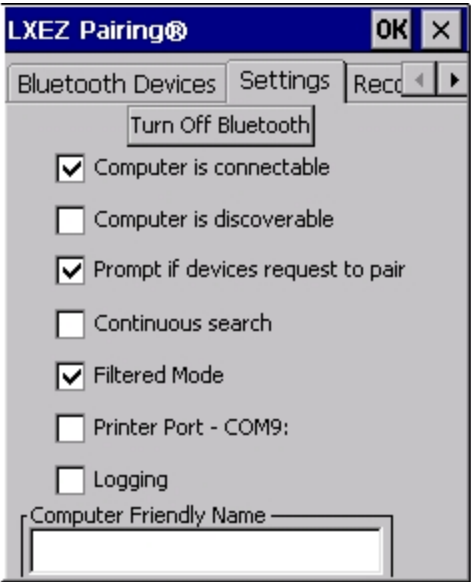
Note: These options can still be checked or unchecked whether Bluetooth connection is enabled or disabled.

Turn Off Bluetooth

Tap the button to toggle the Bluetooth client On or Off. The button title changes from *Turn Off Bluetooth* to *Turn On Bluetooth*.

Default

The default value is Bluetooth On.

Options

Option	Function
Computer is connectable	This option is Enabled by default. Disable this option to inhibit MX9 connection initiated by a Bluetooth scanner.
Computer is discoverable	This option is Disabled by default. Enable this option to ensure other devices can discover the MX9.

Option	Function
Prompt if devices request to pair	This option is Enabled by default. A dialog box appears on the MX9 screen notifying the user a Bluetooth device requests to pair with the MX9. The requesting Bluetooth device does not need to have been Discovered by the MX9 before the pairing request is received. Tap the Accept button or the Decline button to remove the dialog box from the screen. *Note: In some cases, if a Bluetooth device is already paired this setting cannot be changed. If this is the case, an error message is displayed and the option is not changed. The Bluetooth device must be disconnected before changing this setting.*
Continuous Search	This option is Disabled by default. When enabled, the Bluetooth connection never stops searching for a device it has paired with when the connection is broken (such as the paired device entering Suspend mode, going out of range or being turned off). When disabled, after being enabled, the MX9 stops searching after 30 minutes. This option draws power from the Main Battery.
Filtered Mode	This option is Enabled by default. Determines whether the Bluetooth client discovers and displays all serial Bluetooth devices in the vicinity (Filtered Mode is disabled/unchecked) or the discovery result displays Bluetooth scanners and printers only (Filtered Mode is enabled/checked). When Filtered Mode is disabled, the MX9 can pair with up to four Bluetooth devices, with a limit of one Bluetooth scanner, one Bluetooth printer, one PAN, and one DUN connected at the same time. More than one HID device can be connected but only one Bluetooth mouse and one Bluetooth keyboard. A Warmboot is required every time Filtered Mode is toggled on and off.
Printer Port - COM9	This option is Disabled by default. This option assigns Bluetooth printer connection to COM9 instead of COM19. To enable this option, Filtered Mode must be enabled.
Logging	This option is Disabled by default. When logging is enabled, the MX9 creates *bt_log.txt* and stores it in the /System folder. Bluetooth activity logging is added to the text file as activity progresses. A *bt_log_bak.txt* file contains the data stored by *bt_log.txt* prior to reboot. During a reboot process, the MX9 renames *bt_log.txt* to *bt_log_bak.txt*. If a file already exists with that name, the existing file is deleted, the new *bt_log_bak.txt* file is added and a new *bt_log.txt* is created.
Computer Friendly Name	Default: Computer System Name (System Panel > Device Name tab). The name, or identifier, entered in **this** space by the System Administrator is used exclusively by Bluetooth devices and during Bluetooth communication.

Reconnect

Note: These options can still be checked or unchecked whether Bluetooth connection is enabled or disabled.

Options

Option	Function
Report when connection lost	This option is Enabled (checked) by default.
	There may be an audio or visual signal when a connection between a paired, active device is lost.
	A visual signal may be a dialog box placed on the display notifying the user the connection between one (or all) of the paired Bluetooth devices has stopped. Tap the ok button to remove the dialog box from the screen.
Report when reconnected	This option is Disabled (unchecked) by default.
	There may be an audio or visual signal when a connection between a paired, active device is made.
	A visual signal may be a dialog box placed on the display notifying the user the connection between one (or all) of the paired Bluetooth devices has resumed. Tap the ok button to remove the dialog box from the screen.

Option	Function
Report failure to reconnect	This option is Enabled (checked) by default. The default time delay is 30 minutes. This value cannot be changed by the user. There may be an audio or visual signal when a connection between a paired, active device fails to re-connect. A visual signal may be a dialog box placed on the display notifying the user the connection between one (or all) of the previously paired Bluetooth devices has failed. Tap the X button or ok button to close the dialog box. Possible reasons for failure to reconnect: Timeout expired without reconnecting; attempted to pair with a device that is currently paired with another device; attempted to pair with a known device that moved out of range or was turned off; attempted to pair with a known device but the reason why reconnect failed is unknown.
Clear Pairing Table on Boot	This option is Disabled (unchecked) by default. When enabled (checked), all previous paired information is deleted upon any reboot sequence and no devices are reconnected. When enabled (checked) "Auto Reconnect on Boot" is automatically disabled (dimmed).
Auto Reconnect on Boot	This option is Enabled (checked) by default. All previously paired devices are reconnected upon any reboot sequence. When disabled (unchecked), no devices are reconnected upon any reboot sequence.
Auto Reconnect	This option is Enabled (checked) by default. This option controls the overall mobile Bluetooth device reconnect behavior. - When Auto Reconnect is disabled (unchecked), *Auto Reconnect on Boot* is automatically disabled and dimmed. - When Auto Reconnect is disabled (unchecked), no devices are reconnected in any situation. The status of *Auto Reconnect on Boot* is ignored and no devices are reconnected on boot. The status of *Clear Pairing Table on Boot* controls whether the pairing table is populated on boot. - When Auto Reconnect is enabled (checked) and *Auto Reconnect on Boot* is disabled (unchecked), devices are not reconnected on boot, but are reconnected in other situations (example: return from out-of-range). - When Auto Reconnect is enabled (checked) and *Clear Pairing Table on Boot* is enabled (checked), devices are not reconnected on boot, but are reconnected in other situations (example: return from out-of-range). The pairing table is cleared on boot. The status of *Auto Reconnect on Boot* is ignored and the option is automatically disabled (unchecked) and dimmed.

OPP Setup

Use this screen to setup the MX9 for Object Push Protocol (OPP).

Option	Information
Inbox	This is an alphanumeric field displaying the currently selected Inbox. • The Inbox is the location where files pushed to the MX9 from a remote client are stored. Use the browse button **...** to browse to and select the Inbox folder. • Use Windows Explorer to create a custom directory, if desired, before selecting the Inbox folder. The default Inbox is \My Device\My Documents\DefaultInbox.
Outbox	This is an alphanumeric field displaying the currently selected Outbox. • The Outbox is the location where files are stored to be pushed from the MX9 to a remote server. Use the browse button **...** to browse to and select the Outbox folder. • Use Windows Explorer to create a custom directory, if desired, before selecting the Outbox folder. The default Inbox is \My Device\My Documents\DefaultOutbox.

Option	Information
Write Capable	When checked, files may be written to the MX9. When unchecked, inbound files are rejected.
	This option is enabled (checked) by default.
Enable Notifications	When checked, the user is notified and may be prompted for a response when files are received by the MX9. When unchecked, inbound files are received with no notification to and no required action from the user.
	This option is enabled (checked) by default.
Disable LXEZ Pairing OPP	When checked, OPP is disabled in LXEZ Pairing. When unchecked, OPP is enabled in LXEZ Pairing.
	The default is unchecked, OPP is enabled for LXEZ Pairing.
	• Because only one application can use OPP at a given time, custom applications should disable OPP in LXEZ Pairing via an API call while the application is using OPP and restore this setting upon completion.
	• When this item is checked, the other parameter settings on this screen are unavailable (dimmed).

See Also: "Using OPP"

OPP Send

If LXEZ Pairing OPP is disabled, no file names or OPP servers are displayed on this tab. These areas are grayed out. Similarly the buttons on this tab are also inactive when LXEZ Pairing OPP is disabled.

Option	Information
Send Selected File From Outbox	This area displays the file listing from the currently selected Outbox. All files are shown (*.*). The most recently pushed file is highlighted, assuming that file is still present in the Outbox.
Select OPP Server from Remote Device List	This list displays the known OPP capable servers that the MX9 has previously discovered. The most recently paired server is selected and highlighted.

Buttons

Send - Tapping this button sends (pushes) the selected file to the remote (server) device.

Cancel - Tapping this button cancels the send process initiated by tapping the **Send** button.

Discover - Tapping this button initiates a discovery of OPP devices. Results of the discovery are shown in the OPP Server selection box.

See Also: "Using OPP"

About

This panel lists the assigned Computer Friendly Name (that other devices may discover during their Discovery and Query process), the Bluetooth MAC address, and software version levels. The data cannot be edited by the user.

Using Bluetooth

Start > Settings > Control Panel > Bluetooth   or   Bluetooth icon in taskbar   or   Bluetooth icon on desktop
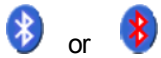
 or   Bluetooth taskbar icon

The MX9 default Bluetooth setting is Enabled.

The MX9 Bluetooth® module is designed to Discover and pair with nearby Bluetooth devices.

Prerequisite: The Bluetooth devices have been setup to allow them to be "Discovered" and "Connected/Paired". The System Administrator is familiar with the pairing function of the Bluetooth devices.

Bluetooth Devices Display - Before Discovering Devices
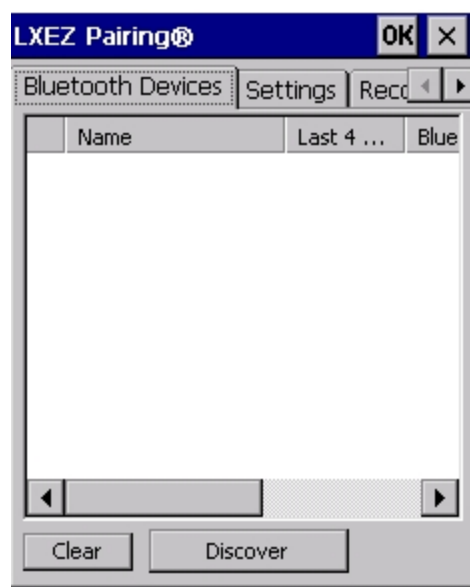
*Note: When **Filtered Mode** is enabled, only Honeywell Bluetooth printers or Bluetooth scanners/imagers are recognized and displayed in the Bluetooth panel. All other Bluetooth devices are ignored.*

Initial Configuration

1. Select **Start > Settings > Control Panel > Bluetooth** or tap the Bluetooth icon in the taskbar or on the desktop.
2. Tap the **Settings** Tab.
3. Change the **Computer Friendly Name** at the bottom of the Settings display. The Bluetooth MX9 default name is determined by the factory installed software version. Honeywell strongly urges assigning every MX9 a unique name (up to 32 characters) before Bluetooth Discovery is initiated.
4. Check or uncheck the MX9 Bluetooth options on the **Settings** and **Reconnect** tabs.
5. Tap the OK button to save your changes or the X button to discard any changes.

Subsequent Use

Note: *Taskbar and Bluetooth device Icon states change as Bluetooth devices are discovered, paired, connected and disconnected. A taskbar Bluetooth icon with a red background indicates Bluetooth is active and not paired with any device. A device icon with a red background indicates a disconnected paired device.*

1. Tap the **Bluetooth icon** in the taskbar or on the desktop to open the Bluetooth LXEZ Pairing application.

2. Tap the Bluetooth **Devices** tab.

3. Tap the **Discover** button. When the Bluetooth module begins searching for in-range Bluetooth devices, the button name changes to Stop. Tap the Stop button to cancel the Discover function at any time.

4. The discovered devices are listed in the Bluetooth **Devices** window.

5. **Highlight** a Bluetooth device in the Discovered window and double-tap to open the device properties menu.

6. Tap **Pair as Scanner** to set up the MX9 to receive scanner data.

7. Tap **Pair as Printer** to set up the MX9 to send data to the printer.

8. Tap **Serial Device** (when Filtered mode is disabled) to set up the MX9 to communicate with a Bluetooth serial device.

9. Tap HID Device to pair a HID device.

10. Tap PAN Device to pair a PAN device.

11. Tap DUN Device to pair a DUN device.

12. Tap **Disconnect** to stop pairing with the device. Once disconnected, tap **Delete** to remove the device name and data from the MX9 Bluetooth Devices list. The device is deleted from the list after the OK button is clicked.

13. Upon successful pairing, the selected device may react to indicate a successful connection. The reaction may be an audio signal from the device, flashing LED on the device, or a dialog box is placed on the MX9 display.

14. Whenever the MX9 is turned On, all previously paired, live, Bluetooth devices in the vicinity are paired, one at a time, with the MX9. If the devices cannot connect to the MX9 before the re-connect timeout time period expires (default is approximately 20 seconds for each paired device) there is no indication of the continuing disconnect state if Report Failure to Reconnect is disabled.

Bluetooth Indicators

The Bluetooth taskbar Icon state and Bluetooth LED state change as Bluetooth devices are discovered, paired, connected and disconnected.

There may be audible or visual signals as paired devices re-connect with the MX9.

Taskbar Icon	Legend
	MX9 is connected to one or more of the targeted Bluetooth device(s).
	MX9 is not connected to any Bluetooth device. MX9 is ready to connect with any Bluetooth device. MX9 is out of range of all paired Bluetooth device(s). Connection is inactive.

Note: When an active paired device enters Suspend Mode, is turned Off or leaves the MX9 Bluetooth scan range, the Bluetooth connection between the paired device and the MX9 is lost. There may be audible or visual signals as paired devices disconnect from the MX9.

Bluetooth LED	Legend
Blue, blinking slowly	Bluetooth is active but not connected to a device.
Blue, blinking medium	Bluetooth is paired and connected to a device.
Blue, blinking fast	Bluetooth is discovering other Bluetooth devices.
Off	Bluetooth hardware has been turned off or does not exist in theMX9.

AppLock, if installed, does not stop the end-user from using Bluetooth applications, nor does it stop authorized Bluetooth-enabled devices from pairing with the MX9 while AppLock is in control.

Bluetooth Bar Code Reader Setup

Please refer to the Bluetooth scanner manufacturer's User Guide; it may be available on the manufacturer's web site. Contact Technical Assistance for Bluetooth product assistance.

Honeywell supports several different types of bar code readers. This section describes the interaction and setup for a mobile Bluetooth laser scanner or laser imager connected to the MX9 using Bluetooth functions.

Prerequisites

- The MX9 has the Bluetooth hardware and software installed. An operating system upgrade may be required. Contact Technical Assistance for help.

- If the MX9 has a Bluetooth address identifier bar code label affixed, then Bluetooth hardware and software is installed.

- The mobile Bluetooth laser scanner / laser imager battery is fully charged.

- The MX9 main battery is fully charged. Alternatively, the MX9 may be in a powered cradle or cabled to AC/DC power.

- *Important: The bar code numbering examples in this segment are not real and should not be created or scanned with a Bluetooth scanner.*

- To open the LXEZ Pairing program, tap **Start > Settings > Control Panel > Bluetooth** or tap the Bluetooth icon on the desktop or tap the Bluetooth icon in the taskbar.

Locate the bar code label, similar to the one shown above, attached to the MX9. The label is the Bluetooth address identifier for the MX9.

The mobile Bluetooth scanner / imager requires this information before discovering, pairing, connecting or disconnecting can occur.

Note: The MX9 Bluetooth address identifier label should remain protected from damage (rips, tears, spills, soiling, erasure, etc.) at all times. It may be required when pairing, connecting, and disconnecting new Bluetooth bar code readers.

MX9 with Label

If the MX9 has a Bluetooth address bar code label attached, follow these steps:

1. Scan the Bluetooth address bar code label, attached to the MX9, with the Bluetooth mobile scanner.

2. If this is the first time the Bluetooth mobile scanner has scanned the MX9 Bluetooth label, the devices are paired. See section titled "Bluetooth Beep and LED Indications". If the devices do not pair successfully, go to the next step.

3. Open the LXEZ Pairing panel (Start > Settings > Control Panel > Bluetooth).

4. Tap **Discover.** Locate the Bluetooth scanner in the Discovery panel.

5. Double-tap the stylus on the Bluetooth **mobile device** in the list. The right-mouse-click menu appears.

6. Select **Pair as Scanner** to pair the MX9 with the Bluetooth mobile scanner.

The devices are paired. The Bluetooth mobile bar code reader responds with a series of beeps and an LED flashes. Refer to the following section titled "Bluetooth Beep and LED Indications".

Note: After scanning the MX9 Bluetooth label, if there is no beep and no LED flash from the Bluetooth mobile device, the devices are currently paired.

MX9 without Label

If the MX9 Bluetooth address bar code label does not exist, follow these steps to create a unique Bluetooth address bar code for the MX9:

First, locate the MX9 Bluetooth address by tapping Start > Settings > Control Panel > Bluetooth > About tab.
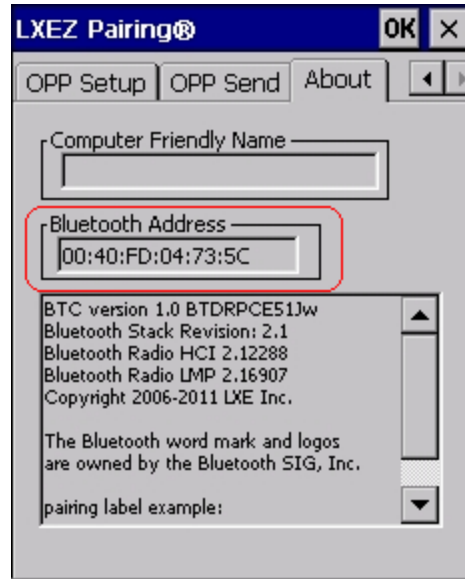
Next, create[1] a Bluetooth address bar code label for the MX9.

The format for the bar code label is as follows:

- Bar code type must be Code 128.
- FNC3 character followed by string Uppercase L, lowercase n, lowercase k, uppercase B and then the Bluetooth address (12 hex digits, no colons). For example, LnkB0400fd002031.

Create and print the label.

Scan the MX9 Bluetooth address bar code label with the Bluetooth bar code reader.

The devices are paired. The Bluetooth bar code reader responds with a series of beeps and LED flashes.

Note: After scanning the MX9 Bluetooth label, if there is no beep and no LED flash from the Bluetooth bar code reader, the devices are currently paired.

See Also: "Bluetooth Beep and LED Indications"

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[1]Free bar code creation software is available for download on the World Wide Web. Search using the keywords "bar code create".

Bluetooth Beep and LED Indications

Beep Type from Bluetooth Device	Behavior
Acknowledge label	1 beep
Label rejected	2 beeps at low frequency
Transmission error	Beep will sound high-low-high-low
Link successful	Beep will sound low-medium-high
Link unsuccessful	Beep will sound high-low-high-low

LED on Bluetooth Device	Behavior
Yellow LED blinks at 2 Hz	Linking in progress
Off	Disconnected or unlinked
Yellow LED blinks at 50 Hz	Bluetooth transmission in progress
Yellow LED blinks at the same rate as the paging beep (1 Hz)	Paging
Green LED blinks once a second	Disabled indication

Upon startup, if the scanner sounds a long tone, this means the scanner has not passed its automatic Selftest and has entered isolation mode. If the scanner is reset, the sequence is repeated. Contact Technical Assistance for assistance.

Bluetooth Printer Setup

The Bluetooth managed device should be as close as possible, in direct line of sight, with the MX9 during the pairing process.

1. Open the LXEZ Pairing Panel.
2. Tap **Discover**. Locate the Bluetooth printer in the Discovery panel.
3. Tap and hold the stylus (or doubletap) on the Bluetooth printer ID until the right-mouse-click menu appears.
4. Select **Pair as Printer** to pair the MX9 with the Bluetooth managed printer.

The devices are paired. The Bluetooth managed printer may respond with a series of beeps or LED flashes.

Please refer to the Bluetooth managed printer manufacturer's User Guide; it may be available on the manufacturer's web site. Contact Technical Assistance for Bluetooth product assistance.

Note: If there is no beep or no LED flash from the Bluetooth managed printer, the MX9 and the printer are currently paired.

Easy Pairing and Auto-Reconnect

The Bluetooth module can establish relationships with new devices after the user taps the Discover button. It can auto-reconnect to devices previously known but which have gone out of range and then returned within range. See Also: "Reconnect"

Note: Configuration elements are persistent and stored in the registry.

Setup the Bluetooth module to establish how the user is notified by easy pairing and auto-reconnect events.

AppLock, if installed, does not stop the end-user from using the Bluetooth application, nor does it stop other Bluetooth-enabled devices from pairing with the MX9 while AppLock is in control.

Using OPP

Pairing with an OPP Device

Prerequisites

- A remote device, such as a mobile phone, that supports OPP.
- OPP is enabled on the MX9.

How To

1. Place the remote device in discovery or visible mode.
2. Initiate discovery on the MX9 by tapping the **Discover** button on the **OPP Send** tab.
3. The MX9 discovers the remote device.
4. The MX9 attempts to send a file to the remote device.
5. The remote device prompts the user for a 4 digit PIN.
6. User enters the PIN.
7. The MX9 prompts the user for a 4 digit PIN.
8. User must enter the *same* PIN code as entered on the remote device.
9. The MX9 now pairs with the remote device.

Remote Device Pushes File to MX9

This section assumes that a device supporting OPP is paired with the MX9.

If a duplicate filename is received, LXEZ Pairing writes the file in the specified location, with an incremental number appended to the file name. For example, if a file named **file.jpg** is pushed to the MX9 and that filename already exists in the Inbox, LXEZ Pairing saves the new file as **file001.jpg**. If the same file is pushed again, it is saved as **file002.jpg**.

There are several scenarios based on configuration options on the **OPP Setup** tab.

Notifications enabled, MX9 is Write Capable

1. The OPP client initiates a connection to the MX9 by selecting a file to push to the MX9.
2. The MX9 user is notified that a File Push request has been issued from a remote device.
3. The MX9 user is prompted to accept or reject the incoming request.
4. If the user accepts the request:

    a. The file is pushed to the MX9.

    b. LXEZ Pairing notifies the user that a file has been received.

    c. The connection is closed by the remote device (OPP client).

5. If the user rejects the request:

    a. The file is not pushed to the MX9.

    b. The connection is closed.

Notifications enabled, MX9 is not Write Capable

1. The OPP client initiates a connection to the MX9 by selecting a file to push to the MX9.
2. The file is rejected silently (no notification to the MX9 user).

Notifications disabled, MX9 is Write Capable

1. The OPP client initiates a connection to the MX9 by selecting a file to push to the MX9.
2. The file is accepted silently (no notification to the MX9 user).

Notifications disabled, MX9 is not Write Capable

1. The OPP client initiates a connection to the MX9 by selecting a file to push to the MX9.
2. The file is rejected silently (no notification to the MX9 user).

MX9 Pushes File to Remote Device

This section assumes that a device supporting OPP is paired with the MX9.

The MX9 (OPP client) initiates a connection to the remote device (OPP server) by selecting a file to push to the remote device. The MX9 sends the file and disconnects. The remote device may prompt the user (of that remote device) to accept the incoming request depending on the security settings of the remote device. The prompt may be displayed more than once, or it may not be displayed at all.

Notifications enabled

The file is pushed to the remote device and the user of the MX9 is notified of the completion of the push.

Notifications disabled

The file is pushed to the remote device and the user of the MX9 is not notified of the completion of the push.

LXEZ Pairing and External Application

Because only one application can use the OPP service at a time, external applications that wish to use OPP should disable LXEZ Pairing OPP before using the OPP service and restore LXEZ Pairing OPP upon completion using available API calls (see the *CE API Programming Guide* for details). These API calls are the equivalent of checking or unchecking the Disable LXEZ Pairing OPP checkbox.

- If Disable LXEZ Pairing OPP is not checked, checking it causes LXEZ Pairing OPP to be disabled and the send and receive functionality is disabled.
- If Disable LXEZ Pairing OPP is checked, and no application has registered a callback, un-checking LXEZ Pairing OPP enables OPP functionality in LXEZ Pairing, and the send and receive functionality is enabled.
- If Disable LXEZ Pairing OPP is checked, and another application has registered a callback, un-checking Disable LXEZ Pairing OPP issues a dialog box which says "Another application is using OPP. Do you wish to force their disconnection? Doing so will force the other application to be unregistered." The application that has been forcibly unregistered receives a FORCED_UNREGISTER_RECEIVED event.

Certificates

Start > Settings > Control Panel > Certificates

Manage digital certificates used for secure communication.

Note: Digital certificates are date sensitive. If the date on the MX9 is incorrect, wireless authentication will fail.

The Certificates stores lists the certificates trusted by the MX9 mobile device user.

These values may change based on the type of network security resident in the client, access point or the host system.

Tap the **Import** button to import a digital certificate file.

Tap the **View** button to view a highlighted digital certificate.

Tap the **Remove** button to remove highlighted certificate files.

Tap the ? button and follow the instructions in the Windows CE Help file when working with trusted authorities and digital certificates.

Data Collection Wedge Introduction

Start > Settings > Control Panel > Data Collection

This software component is the interface between data collection devices such as bar code scanners, or imagers, integrated into your MX9, bar code scanners externally connected to it's COM port or bar code scanners wirelessly connected via Bluetooth to your MX9. This software component collects the data from the varied sources and presents it to applications on your MX9 in a transparent manner.

Note: When a HID enabled USB scanner is connected to the MX9 the scanned data is transmitted to the active window as keystroke messages. The data bypasses the data collection wedge. Any data handling to be applied to the scanned data, for example strip leading or trailing characters, must be programmed into the scan engine via configuration bar codes or handled by the application accepting the data.

Use the options on the control panels to set MX9 data collection keyboard wedge parameters, enable or disable allowed symbologies, set the active scanner port, and assign scan key settings.

Assign baud rate, parity, stop bits and data bits for available COM ports.

Parameters on the Main tab and the COM tab(s) apply to this device only.

Bar code manipulation parameter settings on the Data Options tab are applied to the incoming data resulting from successful bar code scans received by the MX9 for processing. The successful bar code scan data may be sent by

- an integrated scanner in the endcap,
- a wireless Bluetooth Handheld Scanner,
- or a tethered serial scanner.

Integrated scanner configuration can be changed using the Data Collection Control Panel or via the Scanner API functions. While the changed configuration is being stored, the Scanner LED is solid amber. The scanner is not operational during the configuration update.

Note: The integrated scan engine begins scanning when the designated Scan key on the MX9 is activated.

When using any bar code reader to scan the Reset All (or equivalent) bar code (available in the *Integrated Scanner Programming Guide*) with the MX9 integrated scan engine, the next step is to open the Data Collection panel on the MX9, click the OK button and then close it. This action will synchronize all scanner formats.

Bar Code Readers

Your MX9 may have any of the following integrated bar code readers:

- 2D Area Imager, 5300

- Short Range Laser Scanner, 955

- Multi-Range "LORAX" Laser, 1524ER

The MX9 can use the following external bar code readers:

- Tethered hand-held scanners are tethered to a serial port on the MX9 or cradle/dock and are configured by scanning the engine-specific bar codes in the scanner manufacturer's programming guide. The manufacturer's guides are usually shipped with the bar code reader.

- Wireless hand-held Bluetooth scanners are configured by scanning the engine-specific bar codes in the scanner manufacturer's programming guide. The manufacturer's guides are usually shipped with the bar code reader.

- The body worn Bluetooth Ring Scanner module may be using a Symbol 4400 Ring Imager or a Symbol 955 Ring Scanner. The Bluetooth Ring Scanner module is configured by scanning the bar codes in the *Bluetooth Ring Scanner Programming Guide*.

Return to Factory Default Settings

After scanning the engine-specific bar code to return the scanner/imager to factory default settings, the next step is to open the bar code wedge panel on the mobile device collecting the scanned data. Click the OK button to close the panel. This action will synchronize all scanner formats for your device.

Engine specific bar codes for integrated scanners are contained in the *Integrated Scanner Programming Guide*. They can be used to set or reset scan engine parameters by scanning a bar code, then saving the change. Symbol scan engines can be programmed using programming bar codes. Do not scan decoder engine configuration bar codes when Continuous Scan Mode is on. Configuration bar codes do not decode when scanned while Continuous Scan Mode is On.

The Hand Held Products 5300 Imager engine is programmed by using the HHP Properties button on the Data Options tab and the Advanced button available on many of the individual Symbology Settings screens to configure the Hand Held Products Imager engine. There are no configuration bar codes for the Hand Held Products Imager.

Data Processing Overview

Bar code data processing involves several steps. Some steps may be skipped during the processing depending on user selections on the Data Options control panels. The steps are presented below in the order they are performed on the scanned data.

1. Scanned data is tested for a **code ID** and length (Min/Max). If it matches, it is processed per the rules in place for that symbology. If the scan does not meet the criteria for that symbology, it is processed based on the settings for All. If a code ID is not found, the bar code data is processed based on the settings for All.

2. If the symbology is **disabled**, the scan is rejected.

3. Strip **leading** data bytes unconditionally.

4. Strip **trailing** data bytes unconditionally.

5. Parse for, and strip if found, **Data Options** strings.

6. Replace any **control characters** with string, as configured.

7. Add **prefix** string to output buffer.

8. If **Code ID** is *not* stripped, add saved **code ID** from above to output buffer.

9. Add processed **data string** from above to output buffer.

10. Add **suffix string** to output buffer.

11. Add a terminating **NUL** to the output buffer, in case the data is processed as a string.

12. If key output is enabled, start the process to output keys. If control characters are encountered:

    - If Translate All is set, key is translated to CTRL + char, and output.
    - If Translate All is not set, and key has a valid VK code, key is output.
    - Otherwise, key is ignored (not output).

13. If key output is disabled, a windows message is broadcast to notify listening applications that data is available.

The manipulated data is ready to be read by applications.

Factory Default Settings

Main Tab	
Device 1	Disabled
Device 2	Internal
Device 3	Disabled
Scan Mode - Continuous	Disabled
Same Symbol Timeout	Dimmed (1.0s)
Send Key Message (WEDGE)	Enabled
COM1 Tab (External serial port)	
Baud Rate	9600
Stop Bits	1
Parity	None
Data Bits	8
Power on Pin 9	Disabled
Notification Tab	
Enable Internal Scanner Sound	Enabled
Good Scan Vibration	Off
Bad Scan Vibration	Off
Processing Tab	
Enable buffered key output	Enabled
Same buffer limit	32
Delay between buffers	75 ms
Data Options	
Enable Code ID	None
Symbology Settings	All
Control Character Translate All	Disabled
Custom IDs	Name blank
HHP Properties	Options Disabled: Centering DecodeMode LinearRange AimTimer LeaveLightsOn

HHP - Hand Held Products

Main Tab

Start > Settings > Control Panel > Data Collection > Main tab

The parameters shown on these panels are only those that apply to the specific mobile device.
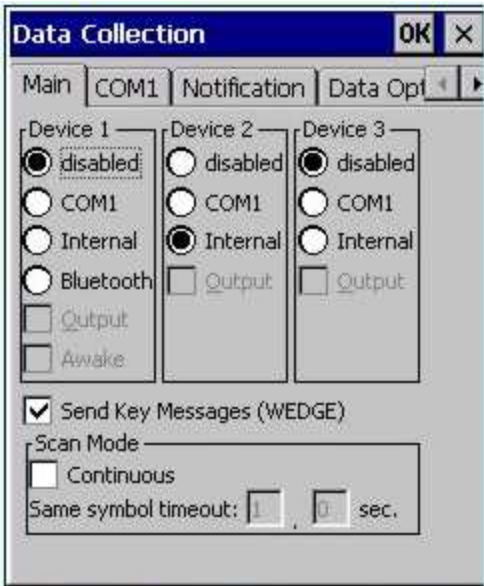
Device with Symbol Scanner
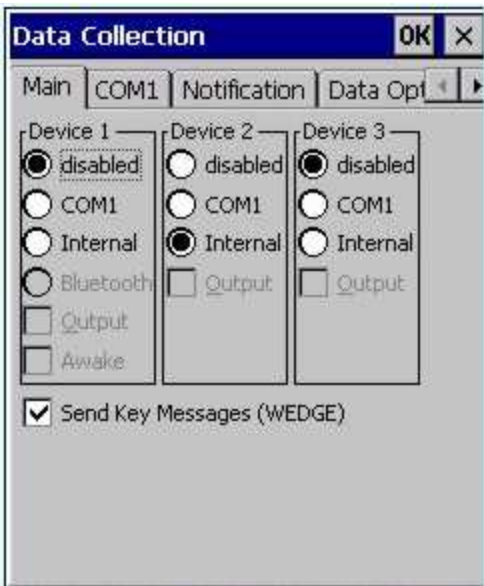
Device with Hand Held Products Imager

Note: The Scan Mode (Continuous Scan) section is only present if the MX9 has a Symbol integrated scanner.

Parameter	Function
Device 1,2,3	1 - Default is Disabled 2 - Default is Internal 3 - Default is Disabled The data collection **device** (laser scanner, laser imager, internal, external, or wireless).
Keep Awake	Default is Disabled.
Scan Mode	Default is Disabled. This box is only shown when the internal scanner is a Symbol scanner. See Continuous Scan Mode.
Send Key Messages (WEDGE)	Default: Enabled. When Send Key Messages (WEDGE) is checked any data collection scan is converted to keystrokes and sent to the active window. When this checkbox is not checked, the application will need to use the set of Scanner APIs to retrieve the data from the scanner driver. Note that this latter method is significantly faster than using Wedge.

Continuous Scan Mode

Start > Settings > Control Panel > Data Collection > Main Tab

Enabling Continuous Scan Mode will ensure the laser is always on and decoding.

Note: Continuous scan mode is only available if the MX9 is equipped with a Symbol scan engine. Do not scan decoder engine configuration bar codes when Continuous Scan Mode is on. Configuration bar codes do not decode when scanned while Continuous Scan Mode is On.

Caution:

⚠️   Laser beam is emitted continuously. Do not stare into the laser beam.

Set the *Timeout between same symbol* to a value sufficient to prevent the beeper from continuously beeping when a bar code is left in the scanner's field of view.

When the scanner is in continuous mode the trigger and scan buttons function as a scanner On/Off switch.

The scanner red LED will always be off in continuous mode.

The audio beeps and green LED work the same as they do for normal trigger mode.

If trigger mode, power mode, or timeout between same symbol parameters are changed using external configuration bar codes, the operating system automatically restores the parameters to their programmed settings upon a warm or cold boot and/or any change made in the control panel.

Toggling between continuous and normal trigger modes is in effect immediately upon pressing the OK button in this control panel, a warm boot is not required or necessary.

COM1 Tab

Start > Settings > Control Panel > Data Collection > COM1
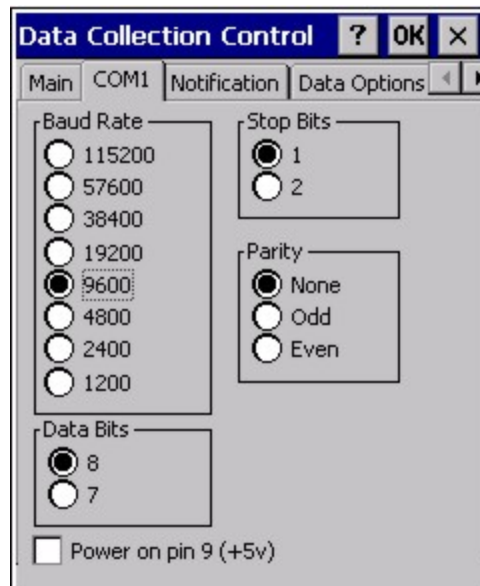
This panel sets communication parameters for any device connected to the external port.

Adjust the settings and click the OK button to save the changes. Any changes take effect immediately.

This panel does not configure the connected device. Please refer to the documentation for the external connected or wireless device for information on configuring the device.

Note: COM default values are restored after a cold boot or operating system upgrade.COM1 supports 5V switchable power on Pin 9 for tethered scanners.

Integrated laser scanner default values are 9600 Baud, 8 data bits, 1 stop bit and No parity. If these values are changed, the default values are restored after a cold boot or reimaging.

Power on Pin 9

To configure the COM port to supply power to an external scanner tethered to the COM1 port, check the checkbox for Power on Pin 9 (+5V). The default is Off (disabled).

The tethered external scanner is powered by the external device power source.

Wireless external scanners use their own power source.

Notification Tab

Start > Settings > Control Panel > Data Collection > Notification tab
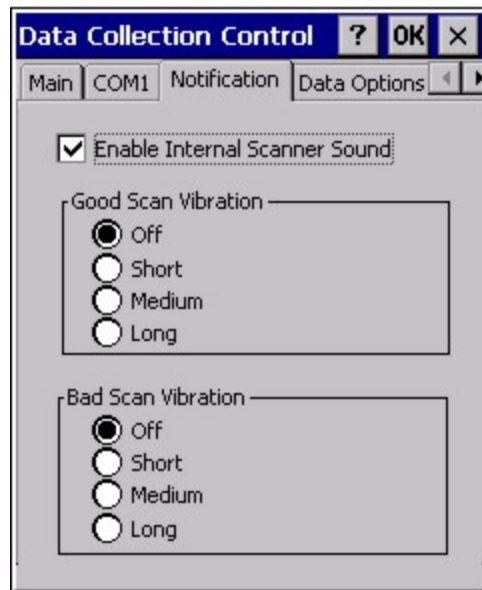
Internal Scanner Sound

This panel toggles internal scanner sounds on and off. Internal scanner sound, by default, is on (enabled).

Vibration

Vibration on the MX9 is activated when a scan is completed successfully or with a failure (scan key released before good scan, timeout, or rejected because of Data Options configuration). It is not activated when a trigger or scan key is pressed. The default setting for both Good Scan and Bad Scan vibration is Off.

Enable this parameter when a tactile response on a good scan or bad scan is desired. Scan sounds are accompanied by a tactile response when the internal scanner Sound parameter is enabled. Enable short, medium or long duration for each selection (good scan and bad scan).

When the MX9 does not have vibrate capability, any active vibration setting is ignored.

Data Options Tab

Start > Settings > Control Panel > Data Collection > Data Options tab

Bar code manipulation parameter settings on this tab are applied to the incoming data resulting from successful bar code scans sent to the MX9 for processing.

Note: The Data Options tab contains only those options available for one type of decoding engine.

The Data Options tab contains several options to control bar code processing. Options include:

- Defining custom Code IDs
- Disable processing of specified bar code symbologies
- Rejecting bar code data that is too short or too long
- Stripping characters including Code ID, leading or trailing characters and specified bar code data strings
- Replacing control characters
- Adding a prefix and a suffix.

MX9 with a Hand Held Products imager	MX9 with any other imager/scanner

Enable Code ID

Choose an option in the Enable Code ID drop-down box:

None	Disables transmission of a Code ID. The only entry in the Symbology combo box is **All**.
AIM ID	Transmits the AIM ID with each bar code. The combo box in the Symbology panel is populated with the known AIM ID symbologies for the scan engine in focus, plus any configured Custom code IDs.
Symbol ID	Transmits the Symbol ID with each bar code. The combo box in the Symbology panel is populated with the known Symbol ID symbologies for the scan engine in focus, plus any configured Custom code IDs.
HHP ID	The imager always transmits the (Hand Held Products) HHP ID with each bar code, so the Code ID is used to identify the bar code being processed. The combo box in the Symbology control panel is populated with the known HHP ID symbologies for that platform, plus any configured Custom code IDs.
Custom ID	Does not change the scanner's Code ID transmission setting. The combo box in the Symbology control panel is populated with any configured Custom code IDs.

Buttons

Symbology Settings	Individually enable or disable a bar code from being scanned, set the minimum and maximum size bar code to accept, strip Code ID, strip data from the beginning or end of a bar code, or (based on configurable Barcode Data) add a prefix or suffix to a bar code before transmission.
Ctrl Char Mapping	Define the operations the bar code data Wedge performs on control characters (values less than 0x20) embedded in bar codes.
Custom Identifiers	Defines an identifier that is at the beginning of bar code data which acts as a Code ID. After a Custom Identifier is defined, Symbology Settings can be defined for the identifier just like standard Code IDs.
HHP Properties	HHP Properties allows HHP global (not symbology specific) parameters to be configured. This button is only visible when a Hand Held Products 5300 imager is installed in the MX9.

See Also: "Data Processing Overview"

Data Options - Symbology Settings

Start > Settings > Control Panel > Data Collection > Data Options > Symbology Settings button

The Symbology selected in the Symbology drop-down list defines the symbology for which the data is being configured. The features available on the Symbology panel include the ability to

- individually enable or disable a bar code from scanning,
- set the minimum and maximum size bar code to accept,
- strip Code ID,
- strip data from the beginning or end of a bar code,
- or (based on configurable Barcode Data) add a prefix or suffix to a bar code.

The Code ID drop-down box only filters the available symbologies in the Symbology drop down box by the selected Code ID. This Code ID box does not enable or disable the Code ID as that function is controlled by the Enable Code ID box on the Data Options tab.

The Symbology drop-down box contains all symbologies supported based on the Code ID selected above. An asterisk appears in front of symbologies that have already been configured or have been modified from the default value.

Each time a Symbology is changed, the settings are saved as soon as the ok button is tapped. Settings are also saved when a new Symbology is selected from the Symbology drop-down list.

The order in which these settings are processed are:

- Min / Max
- Code ID
- Leading / Trailing
- Barcode Data
- Prefix / Suffix

*Note: When **Enable Code ID** is set to **None** on the Data Options tab and when **All** is selected in the Symbology field, **Enable** and **Strip Code ID** on the Symbology panel are grayed and the user is not allowed to change them, to prevent deactivating the scanner completely.*

When **All** is selected in the Symbology field and the settings are changed, the settings in this dialog become the defaults, used unless overwritten by the settings for individual symbologies. This is also true for Custom IDs, where the code IDs to be stripped are specified by the user.

Note: In Custom mode on the Data Options tab, any Code IDs **not** specified by the user will not be stripped, because they will not be recognized as Code IDs.

If a specific symbology's settings have been configured, a star (*) will appear next to it in the Symbology drop-down box, so the user can tell which symbologies have been modified from their defaults.

If a particular symbology has been configured, the entire set of parameters from that symbologies screen are in effect for that symbology. In other words, either the settings for the configured symbology will be used, or the default settings are used, not a combination of the two.

If a symbology has not been configured (does not have an * next to it) the settings for **All** are used which is not necessarily the default.

Advanced Button

If there are advanced configuration options for the selected symbology, an Advanced button is displayed in the lower right corner of the panel. Not all bar code symbologies have configuration parameters so the Advanced button is not present for all symbologies.

Because the Hand Held Products Imager does not support configuration bar codes, the Advanced function allows configuration parameters to be set for many of the supported bar codes.
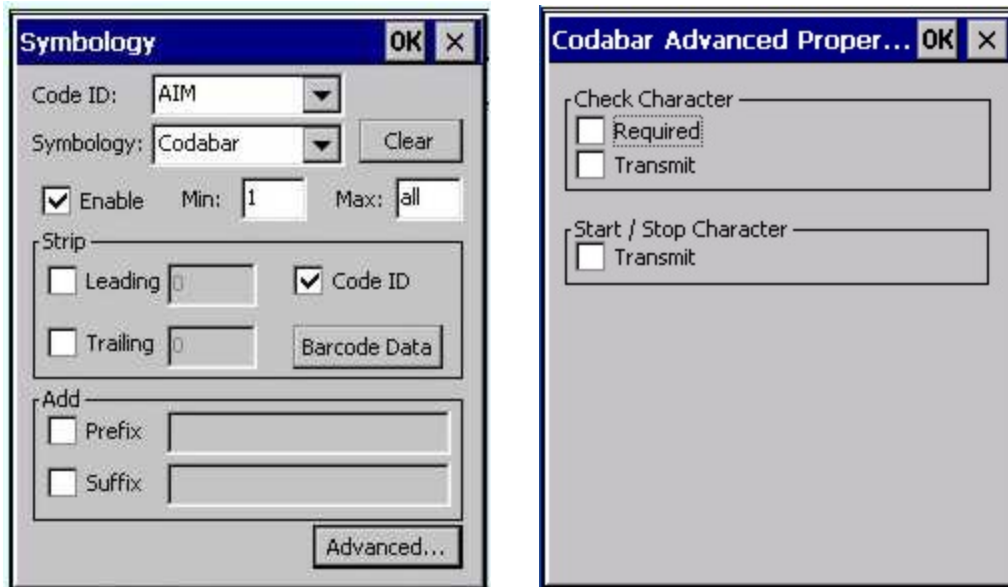
The Symbology drop-down box contains all symbologies **supported by the device selected on the Main tab**. An asterisk appears in front of symbologies that have already been configured or have been modified from the default value.

Each time a Symbology is changed, the settings are saved as soon as the OK button is clicked. Settings are also saved when a new Symbology is selected from the Symbology drop-down list.

Clear Button

Clicking this button will erase any programmed overrides, returning to the default settings for the selected symbology.

If **Clear** is pressed when **All** is selected as the symbology, a confirmation dialog appears:

then all symbologies are reset to their factory defaults, and all star (*) indications are removed from the list of Symbologies.

Click the Yes button or the No button.

Enable, Min, Max

Enable

This checkbox enables (checked) or disables (unchecked) the symbology field.

The scanner driver searches the beginning of the bar code data for the type of ID specified in the Data Options tab -- Enable Code ID field plus any custom identifiers.

When a code ID match is found as the scanner driver processes incoming bar code data, if the symbology is disabled, the bar code is rejected. Otherwise, the other settings in the dialog are applied and the bar code is processed.

If the symbology is disabled, all other fields on this dialog are dimmed.

If there *are customized settings*, uncheck the Enable checkbox for the All symbology. This results in disabling all symbologies *except* the customized ones.

Min

This field specifies the minimum length that the bar code data (not including Code ID) must meet to be processed.

Any bar code scanned that is less than the number of characters specified in the Min field is rejected. The default for this field is 1.

Max

This field specifies the maximum length that the bar code data (not including Code ID) can be processed. Any bar code scanned that has more characters than specified in the Max field is rejected. The default for this field is All (9999).

If the value entered is greater than the maximum value allowed for that symbology, the maximum valid length is used instead.

Strip Leading/Trailing Control

Start > Settings > Control Panel > Data Collection > Data Options tab > Symbology button

This group of controls determines what data is removed from the collected data before the data is buffered for the application. When all values are set, Code ID takes precedence over Leading and Trailing; Barcode Data stripping is performed last. Stripping occurs before the Prefix and Suffix are added, so does not affect them.
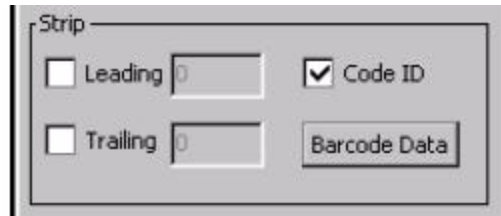
If the total number of characters being stripped is greater than the number of characters in the collected data, it becomes a zero byte data string.

If, in addition, Strip Code ID is enabled, and no prefix or suffix is configured, the processing will return a zero-byte data packet, which will be rejected.

The operation of each type of stripping is defined below:

Leading

This strips the number of characters specified from the beginning of the collected data (not including Code ID). The data is stripped unconditionally. This action is disabled by default.

Trailing

This strips the number of characters specified from the end of the collected data (not including Code ID). The data is stripped unconditionally. This action is disabled by default.

Code ID

Strips the Code ID based on the type code ID specified in the Enable Code ID field in the Data Options tab. By default, Code ID stripping is enabled for every symbology (meaning code IDs will be stripped, unless specifically configured otherwise).

Barcode Data Match List
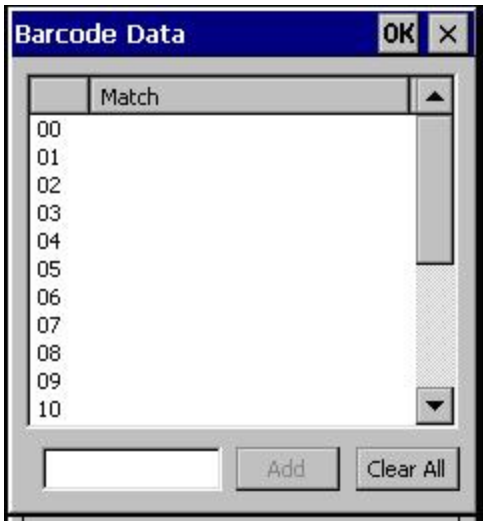
Barcode Data Panel

This panel is used to strip data that matches the entry in the Match list from the bar code. Enter the data to be stripped in the text box and tap the Insert or Add button. The entry is added to the Match list.

To remove an entry from the Match list, highlight the entry in the list and click the Remove button.

Click the OK button to store any additions, deletions or changes.

Bar Code Data Match Edit Buttons

Add	Entering data into the text entry box enables the Add button. Click the **Add** button and the data is added to the next empty location in the Custom ID list.
Insert	Click on an empty line in the Custom ID list. The **Add** button changes to **Insert**. Enter data into both the Name and ID Code fields and click the Insert button. The data is added to the selected line in the Custom IDs list.
Edit	Double click on the item to edit. Its values are copied to the text boxes for editing. The **Add** button changes to **Replace**. When Replace is clicked, the values for the current item in the list are updated.
Clear All	When no item in the Custom IDs list is selected, clicking the Clear All button clears the Custom ID list and any text written (and not yet added or inserted) in the Name and ID Code text boxes.
Remove	The **Clear All** button changes to a **Remove** button when an item in the Custom IDs list is selected. Click the desired line item and then click the Remove button to delete it. Line items are Removed one at a time. Contents of the text box fields are cleared at the same time.

● **Prefix** and **Suffix** data is always added on after stripping is complete, and is not affected by any stripping settings.

● If the stripping configuration results in a 0 length bar code, a good beep will still be emitted, since bar code data was read from the scanner.
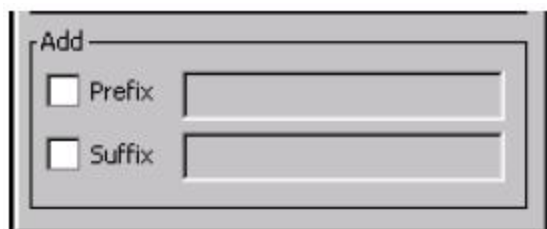
Match List Rules

The data in the match list is processed by the rules listed below:

- Strings in the list will be searched in the order they appear in the list. If the list contains *ABC* and *AB*, in that order, incoming data with *ABC* will match first, and the *AB* will have no effect.

- When a match between the first characters of the bar code and a string from the list is found, that string is stripped from the bar code data.

- Processing the list terminates when a match is found or when the end of the list is reached.

- If the wildcard *** is not specified, the string is assumed to strip from the beginning of the bar code data. The string *ABC** strips off the prefix *ABC*. The string **XYZ* will strip off the suffix *XYZ*. The string *ABC*XYZ* will strip both prefix and suffix together. More than one * in a configuration string is not allowed. (The User Interface will not prevent it, but results would not be as expected, as only the first * is used in parsing to match the string.)

- The question mark wildcard *?* may be used to match any single character in the incoming data. For example, the data AB?D will match ABCD, ABcD, or AB0D, but not ABDE.

- The data collected is saved per symbology configured. The Symbology selected in the Symbologies dialog defines the symbology for which the data is being configured.

- Note that the Code ID (if any are configured) is ignored by this dialog, regardless of the setting of **Strip: Code ID** in the Symbologies dialog. According to the sequence of events (specified above), the Code ID must not be included in the bar code data being matched, because when the matching test occurs, the Code ID has already been stripped. If Strip Code ID is disabled, then the bar code data to match must include the Code ID. If Strip Code ID is enabled, the data should not include the Code ID since it has already been stripped.

Add Prefix/Suffix Control

Start > Settings > Control Panel > Data Collection > Symbology button

Use this option to specify a string of text, hex values or hat encoded values to be added to the beginning (prefix) or the end (suffix) of the bar code data.

Up to 19 characters can be included in the string. The string can include any character from the keyboard plus characters specified by hex equivalent or entering in hat encoding. Please see *Hat Encoding* for a list of characters with their hex and hat-encoded values.

Use the **Escape** function to enter literal hex and hat values.

Add Prefix	To enable a prefix, check the Prefix checkbox and enter the desired string in the textbox.
	The default is disabled (unchecked) with a blank text string. When bar code data is processed, the Prefix string is sent to the output buffer before any other data.
	Because all stripping operations have already occurred, stripping settings do not affect the prefix. The prefix is added to the output buffer for the Symbology selected from the pull down list.
	If 'All' is selected, the prefix is added for any symbology that has not been specifically configured.
Add Suffix	To enable a suffix, check the Suffix checkbox and enter the desired string in the textbox.
	The default is disabled (unchecked) with a blank text string. When bar code data is processed, the Suffix string is sent to the output buffer after the bar code data.
	Because all stripping operations have already occurred, stripping settings do not affect the suffix. The suffix is added to the output buffer for the Symbology selected from the pull down list.
	If 'All' is selected, the suffix is added for any symbology that has not been specifically configured.

Note: Non-ASCII equivalent keys in Key Message mode are unavailable in this option. Non-ASCII equivalent keys include the function keys (e.g., F1), arrow keys, Page up, Page down, Home, and End.

Symbologies

The Code ID drop-down box filters the available symbologies, in the Symbology drop down box, by the selected Code ID.

When a Hand Held Products imager scan engine is installed, AIM, Custom and HHP symbologies are displayed. HHP does not support Symbol IDs.

When a Symbol scan engine is installed, AIM, Custom and Symbol symbologies are displayed. Symbol does not support HHP IDs (Hand Held Products).

Custom AIM IDs

Note: When the integrated scan engine is a Symbol scan engine, AIM IDs apply, but Advanced properties do not and the Advanced button is not available.

Symbol Engine
All
Codabar
Code11
Code 39
Code 93
Code 128
Discrete 2 of 5
EAN 128
Interleaved 2 of 5
MSI
Other
PDF417
Plessey
RSS14
UPC/EAN

The Data Collection Wedge does not manage mutually exclusive option selections. The user is responsible for understanding the options that can co-exist for the data collection device. The documentation provided from the manufacturer of the scanner/imager being managed describes the interaction between symbologies and their configurations.

HHP Symbologies

Advanced properties are available when an integrated Hand Held Products imager is installed. Advanced properties are applicable regardless of the ID type selected (AIM or HHP). HHP = Hand Held Products.

Not all HHP symbologies have Advanced options. Click the symbology link in the table below for the symbology Advanced options.

Symbology	
All	MicroPDF
Aztec	MSI
BPO	OCR
Codabar	Other
CodaBlock	PDF417
Code 11	Plessey
Code 32	Posi
Code 39	Postnet
Code 49	QR
Code 93	RSS
Code 128	Strt25
Composite	Strt32
Coupon	Telepen
DataMatrix	TLC
EAN8	Trioptic39
EAN13	UPCA
EAN128	UPCE0
GenCode128	UPCE1
IATA25	CANPOST
IDTag	AUSPOST
Interleaved 2 of 5	JapanPost
ISBT-1	Planet
Matrix 2 of 5	DutchPost
Maxicode	ChinaPost
Mesa	Code16K
	Usps4cb

The Data Collection Wedge does not manage mutually exclusive option selections. The user is responsible for understanding the options that can co-exist for the data collection device. The documentation provided from the manufacturer of the scanner/imager being managed describes the interaction between symbologies and their configurations.

Codabar - Advanced Properties
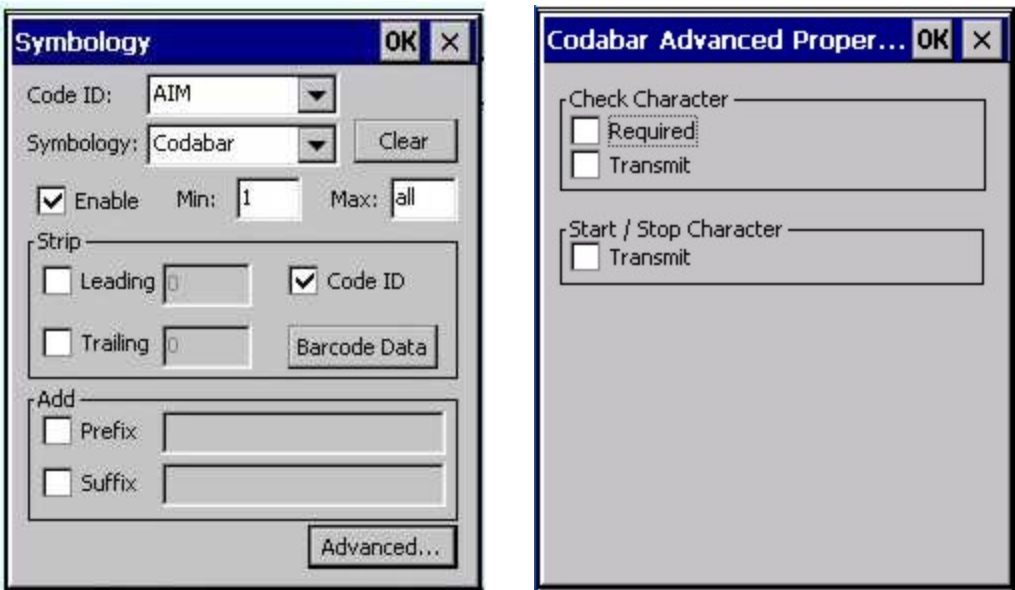
Start > Settings > Control Panel > Data Collection > Data Options

Option	Default Value
Check Character	Required : Disabled Transmit : Disabled
Start / Stop Character	Transmit : Disabled

Code11 - Advanced Properties

Start > Settings > Control Panel > Data Collection > Data Options

Option	Default Value
Check Digits Required	Required : Disabled

Code39 - Advanced Properties
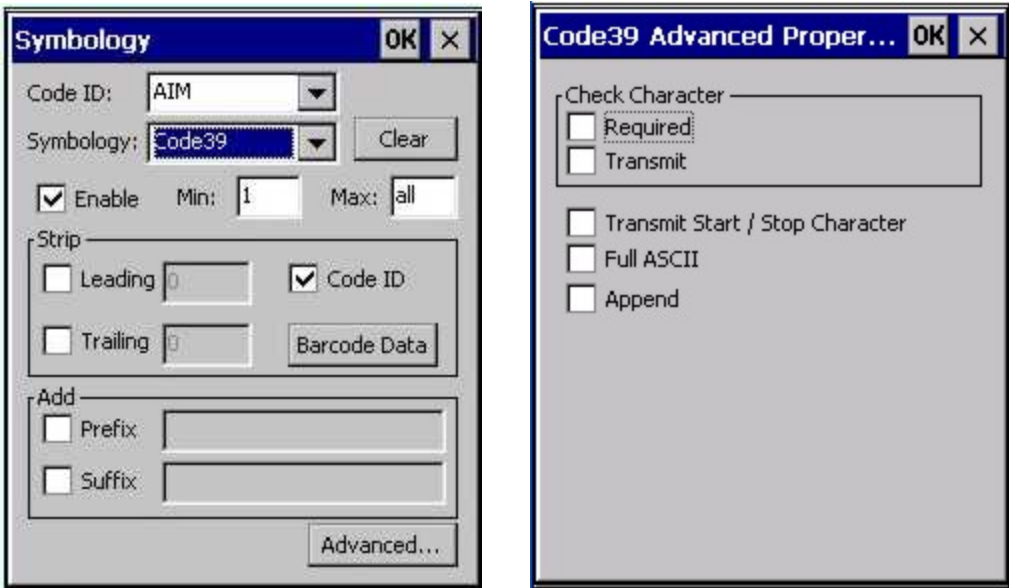
Start > Settings > Control Panel > Data Collection > Data Options

Option	Default Value
Check Character	Required : Disabled Transmit : Disabled
Start / Stop Character	Transmit : Disabled
Full ASCII	Disabled
Append	Disabled

EAN8 - Advanced Properties

Start > Settings > Control Panel > Data Collection > Data Options

Option	Default Value
Transmit Check Character	Enabled
Read 2-Digit	Disabled
Read 5-Digit	Disabled
Required	Disabled
Insert Separator	Enabled

EAN13 - Advanced Properties
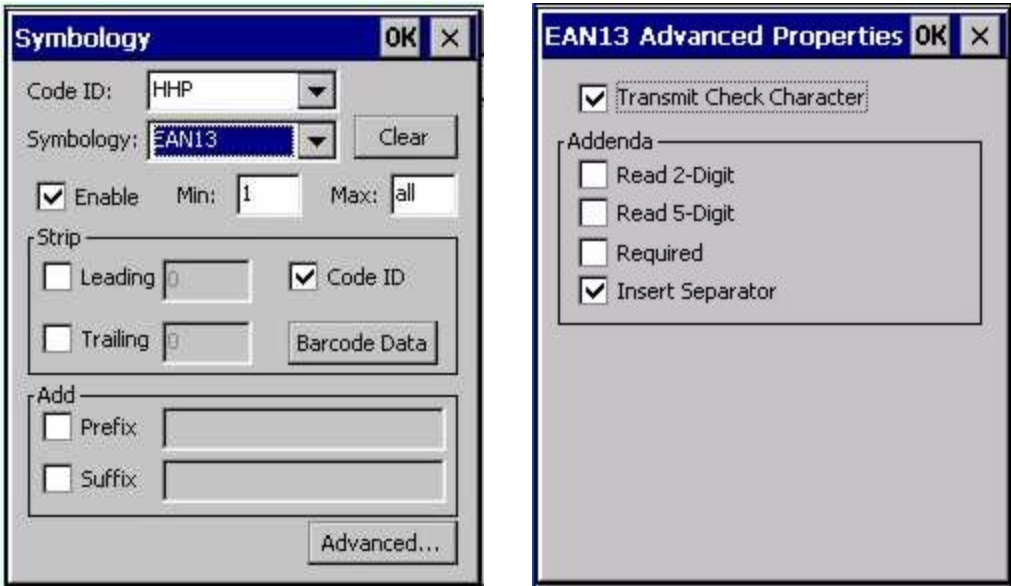
Start > Settings > Control Panel > Data Collection > Data Options

Option	Default Value
Transmit Check Character	Enabled
Read 2-Digit	Disabled
Read 5-Digit	Disabled
Required	Disabled
Insert Separator	Enabled

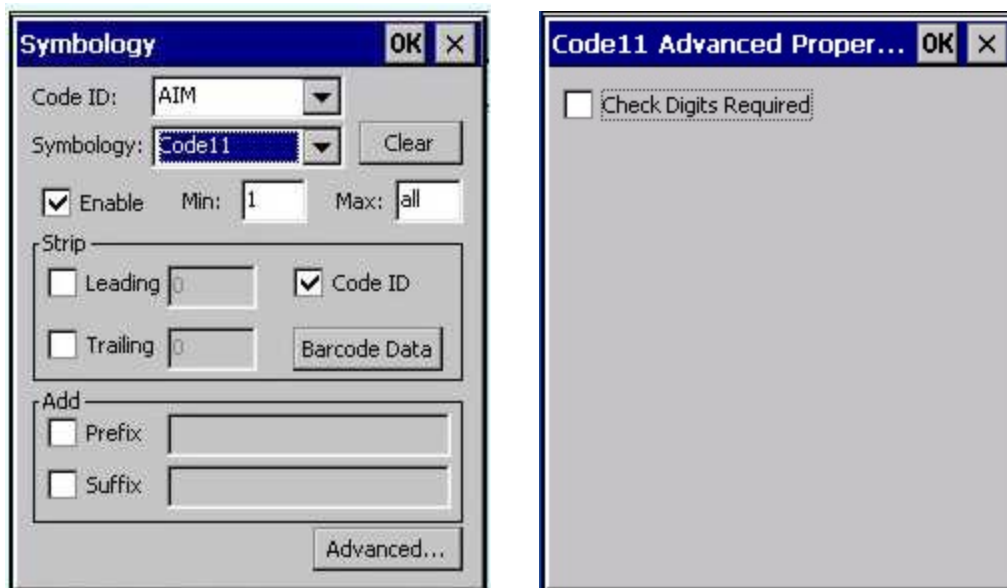## Interleaved 2 of 5 - Advanced Properties

Start > Settings > Control Panel > Data Collection > Data Options
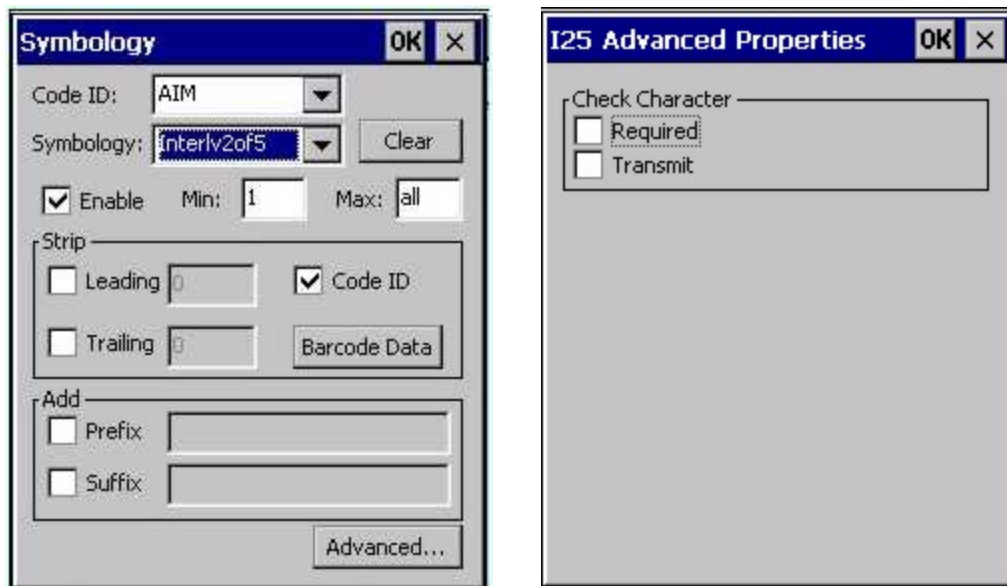
Option	Default Value
Check Character	Required : Disabled Transmit : Disabled

Mesa - Advanced Properties

Start > Settings > Control Panel > Data Collection > Data Options
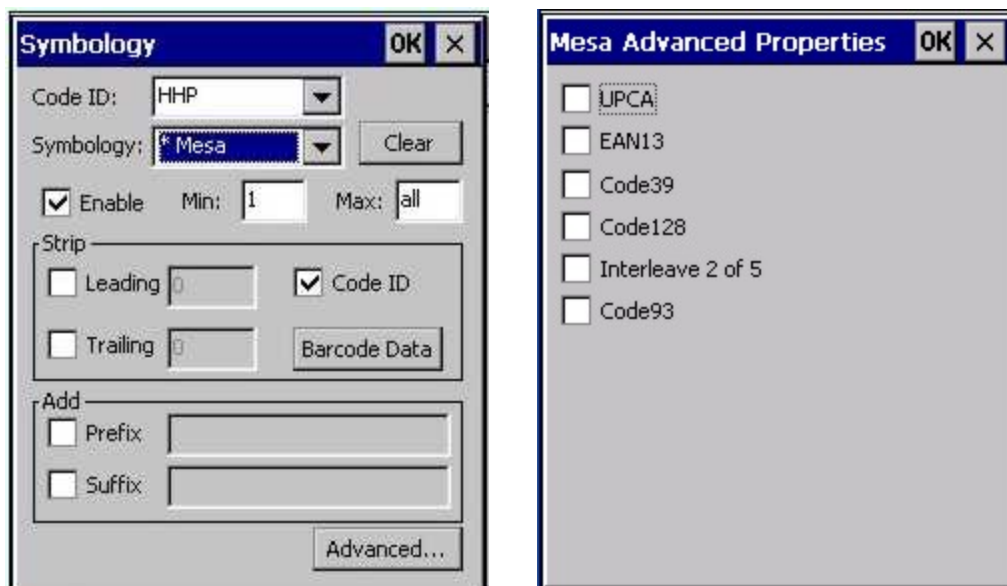
Option	Default Value
UPCA	Disabled
EAN13	Disabled
Code39	Disabled
Code128	Disabled
Interleaved 2 of 5	Disabled
Code93	Disabled

When the Mesa symbology is chosen on the Symbology panel (the Enable checkbox is checked) the Advanced button must be clicked and the desired Mesa Advanced Properties sub-symbology selected.

When Mesa is disabled on the Symbology panel (the Enable checkbox is cleared), click the Advanced button and uncheck all parameters or sub-symbologies, on the Mesa Advanced Properties panel.

MSI - Advanced Properties

Start > Settings > Control Panel > Data Collection > Data Options
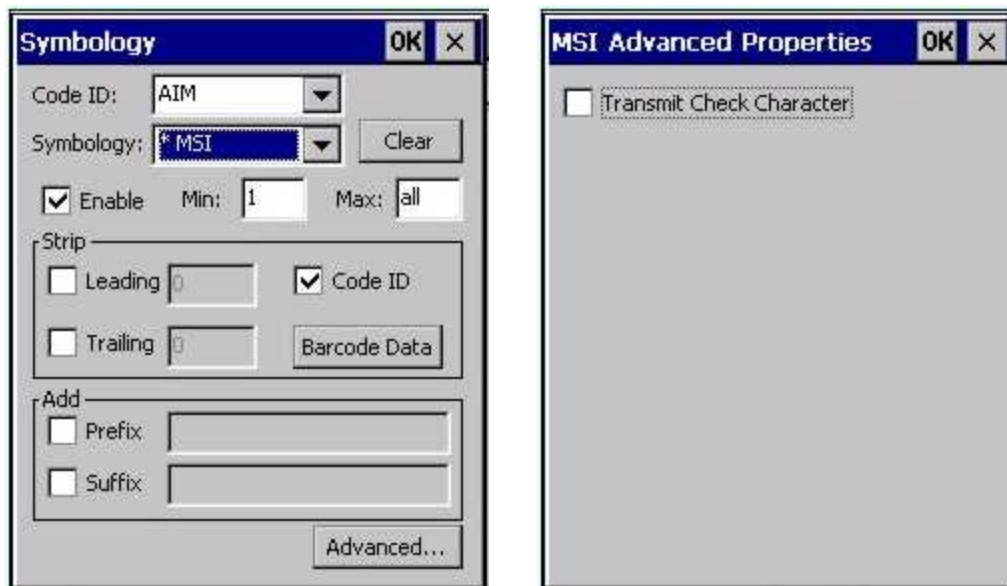
Option	Default Value
Transmit Check Character	Disabled

OCR Properties - Advanced

Start > Settings > Control Panel > Data Collection > Data Options

Option	Default Value
Font	Disabled
Direction	Left to Right
Template	ddddddd
Group G	Blank
Group H	Blank
Check	Blank

Planet - Advanced Properties

Start > Settings > Control Panel > Data Collection > Data Options
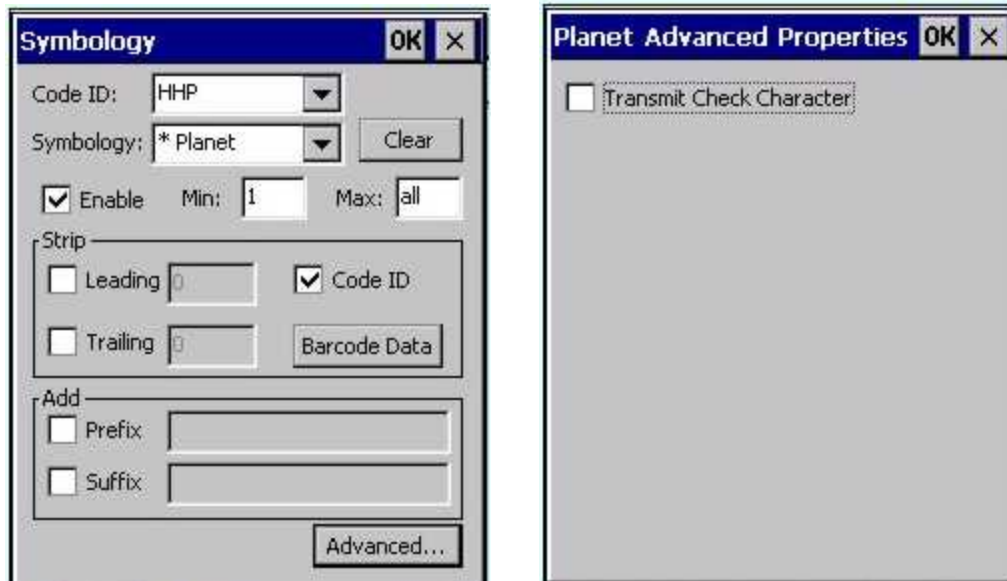
Option	Default Value
Transmit Check Character	Disabled

Posicode - Advanced Properties

Start > Settings > Control Panel > Data Collection > Data Options
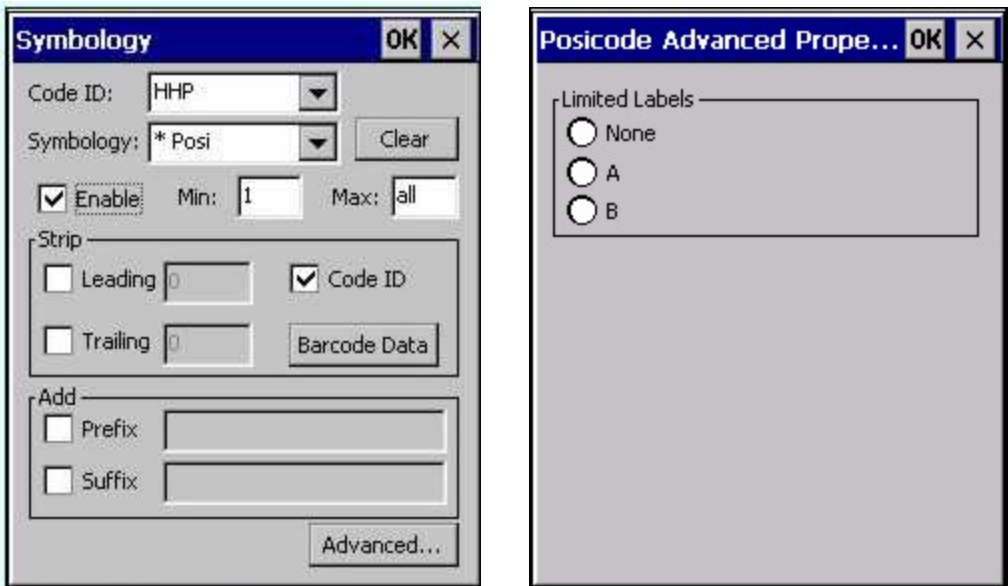
Option	Default Value
Limited Labels - None	Disabled
Limited Labels - A	Disabled
Limited Labels - B	Disabled

Telepen - Advanced Properties

Start > Settings > Control Panel > Data Collection > Data Options
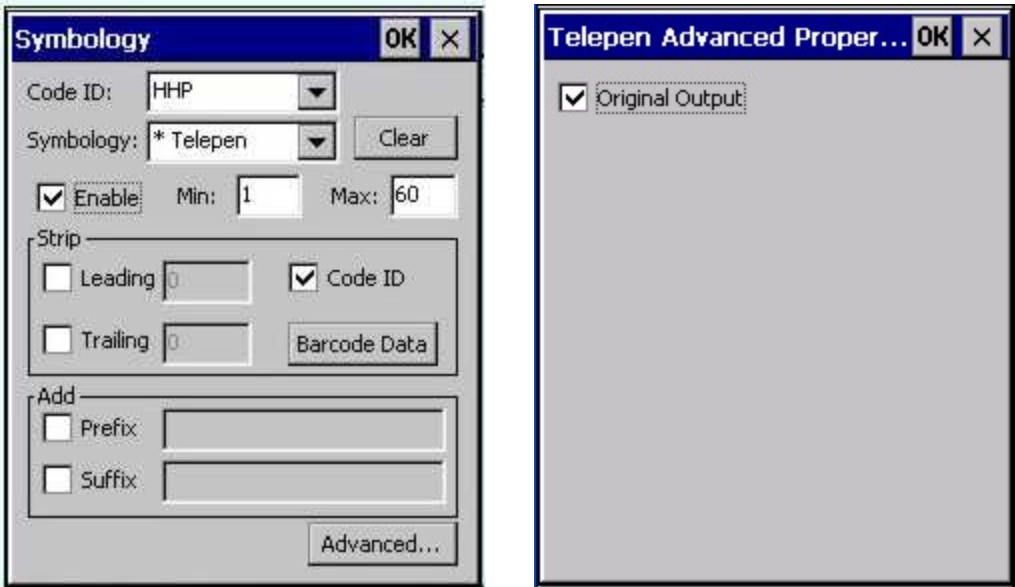
Option	Default Value
Original Output	Enabled

UPCA- Advanced Properties
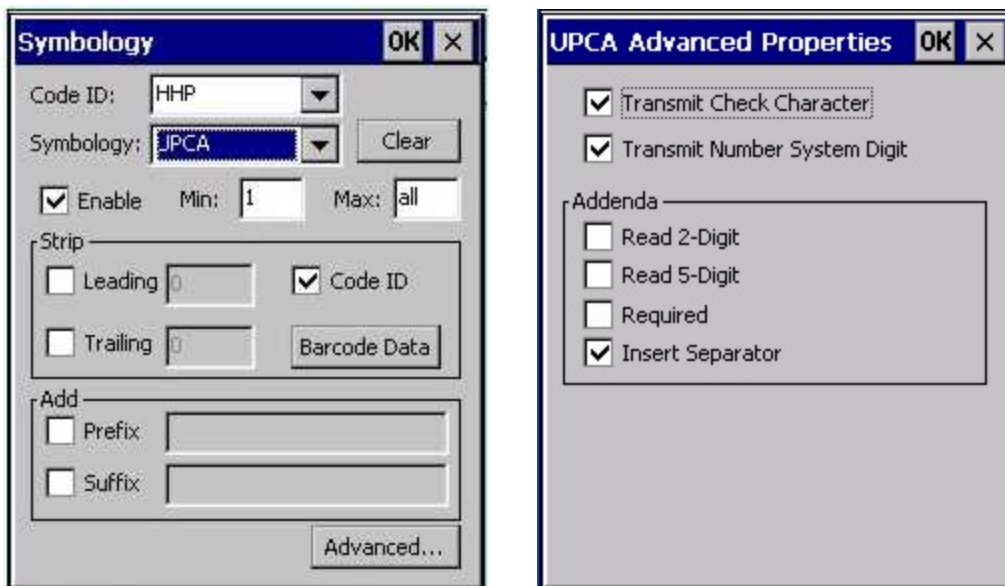
Start > Settings > Control Panel > Data Collection > Data Options

Option	Default Value
Transmit Check Character	Enabled
Transmit Number System Digit	Enabled
Addenda - Read 2-digit	Disabled
Addenda - Read 5-digit	Disabled
Addenda - Required	Disabled
Insert Separator	Enabled

UPCE0- Advanced Properties

Start > Settings > Control Panel > Data Collection > Data Options

- For a device with a Hand Held Products Imager, UPCE0 and UPCE1 are enabled as the same symbology at the scanner; therefore the only way for the UPCE1 configuration to be used is if UPCE0 is disabled. When UPCE0 is disabled, it will be scanned by the scanner, but rejected by DCWedge.
- The UPCE0 and UPCE1 parameters are always set to match each other. Therefore if a change is made to a parameter to either the EPCE0 or UPCE1 Advanced Properties that same change is automatically made to the Advanced Properties for the other symbology.

Option	Default Value
Transmit Check Character	Enabled
Transmit Number System Digit	Enabled
Expand Version E	Disabled
Addenda - Read 2-digit	Disabled
Addenda - Read 5-digit	Disabled
Addenda - Required	Enabled
Insert Separator	Disabled

UPCE1- Advanced Properties

Start > Settings > Control Panel > Data Collection > Data Options

- For a device with a Hand Held Products Imager, UPCE0 and UPCE1 are enabled as the same symbology at the scanner; therefore the only way for the UPCE1 configuration to be used is if UPCE0 is disabled. When UPCE0 is disabled, it will be scanned by the scanner, but rejected by DCWedge.
- The UPCE0 and UPCE1 parameters are always set to match each other. Therefore if a change is made to a parameter to either the EPCE0 or UPCE1 Advanced Properties that same change is automatically made to the Advanced Properties for the other symbology.

Option	Default Value
Transmit Check Character	Enabled
Transmit Number System Digit	Enabled
Expand Version E	Disabled
Addenda - Read 2-digit	Disabled
Addenda - Read 5-digit	Disabled
Addenda - Required	Enabled
Insert Separator	Disabled

Ctrl Char Mapping

The Ctrl Char Mapping button (Control Character Mapping) activates a dialog to define the operations the Data Collection Wedge performs on control characters (values less than 0x20) embedded in bar codes.
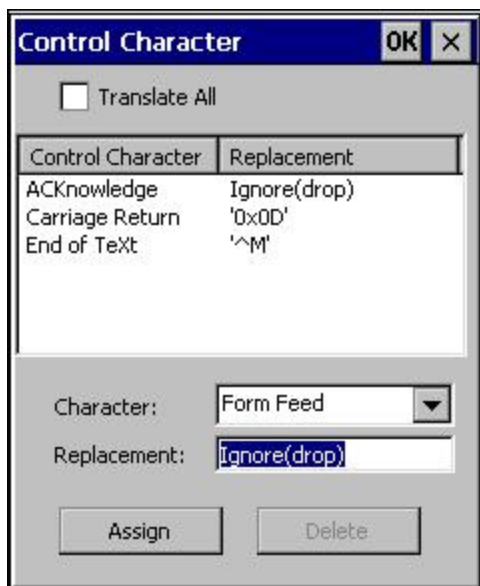
Control characters can be replaced with user-defined text which can include hat encoded or hex encoded values.

In key message mode, control characters can also be translated to their control code equivalent key sequences.

Translate All

When **Translate All is checked**, unprintable ASCII characters (characters below 20H) in scanned bar codes are assigned to their appropriate CTRL code sequence when the bar codes are sent in Character mode.

The wedge provides a one-to-one mapping of control characters to their equivalent control+character sequence of keystrokes. If control characters are translated, the translation is performed on the bar code data, prefix, and suffix before the keystrokes are simulated.

Parameters

Translate All

This option is grayed unless the user has Send Key Messages (WEDGE) on the Main tab selected.

In Key Message mode, when this option is enabled, control characters embedded in a scanned bar code are translated to their equivalent control key keystroke sequence (13 [0x0d] is translated to Control+M keystrokes as if the user pressed the CTRL, SHIFT, and m keys on the keypad).

Additionally, when Translate All is disabled, any control code which has a keystroke equivalent (enter, tab, escape, backspace, etc.) is output as a keystroke.

Any control code without a keystroke equivalent is dropped.

Character

This is a drop down combo box that contains the control character name. Refer to the Character drop down box for the list of control characters and their names.

When a character name is selected from the drop down box, the default text *Ignore (drop)* is shown and highlighted in the Replacement edit control. *Ignore (drop)* is highlighted so the user can type a replacement if the control character is not to be ignored.

Once the user types any character into the Replacement edit control, reselecting the character from the Character drop down box redisplays the default *Ignore (drop)* in the Replacement edit control.

Replacement

The edit control where the user types the characters to be assigned as the replacement of the control character.

Replacements for a control character are assigned by selecting the appropriate character from the Character drop down box, typing the replacement in the Replacement edit control (according to the formats defined above) and then clicking the button. The assigned replacement is then added to the list box above the Assign button.

For example, if Carriage Return is replaced by Line Feed (by specifying ^J or 0x0A) in the configuration, the value 0x0d received in any scanned bar code (or defined in the prefix or suffix) will be replaced with the value 0x0a.

The Wedge then sends Ctrl+J to the receiving application, rather than Ctrl+M.

List Box

The list box shows all user-defined control characters and their assigned replacements.

All replacements are enclosed in single quotes to delimit white space that has been assigned.

Assign Button

Click this button when you want to assign the characters in the Replacement text box to the character in the Character drop down box.

Delete Button

This button is grayed unless an entry in the list box is highlighted.

When an entry (or entries) is highlighted, and the Delete button is clicked, the highlighted material is deleted from the list box.

Custom Identifiers

Code IDs can be defined by the user. This allows processing parameters to be configured for bar codes that do not use the standard AIM IDs, HHP IDs or Symbol IDs or for bar codes that have data embedded at the beginning of the data that acts like a Code ID.

These are called **custom Code ID**s and are included in the Symbology drop down box in the Symbology dialog, unless **Enable Code ID** is set to **None**. When the custom Code ID is found in a bar code, the configuration specified for the custom Code ID is applied to the bar code data.

It is intended that custom code IDs are used to supplement the list of standard code IDs (if **Enable Code ID** is set to **AIM, Symbol** or **HHP**), or to replace the list of standard code IDs (if **Enable Code ID** is set to **Custom).**

When **Enable Code ID** is set to **None**, custom code IDs are ignored.

Note: Custom symbologies will appear at the end of the list in the Symbology dialog, and are processed at the beginning of the list in the scanner driver itself. This allows custom IDs based on actual code IDs to be processed before the code ID itself.

*Note: When **Strip: Code ID** is enabled, the entire custom Code ID string is stripped (i.e., treated as a Code ID).*

The dialog box shown below allows the custom Code IDs to be configured. When incoming data is checked for a custom ID code, the list is compared in the order displayed in this dialog box.
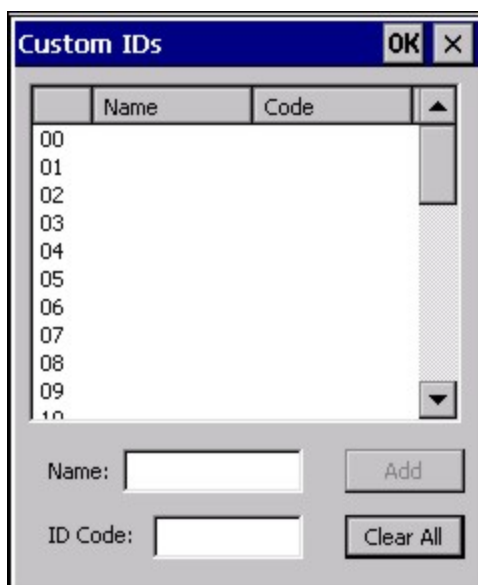
After adding, changing and removing items from the Custom IDs list, click the OK button to save changes and return to the Barcode panel.

Parameters

Name text box

Name is the descriptor that is used to identify the custom Code ID. Names must be unique from each other; however, the Name and ID Code may have the same value. Name is used in the Symbology drop down box to identify the custom Code ID in a user-friendly manner. Both Name and ID Code must be specified in order to add a custom Code ID to the Custom IDs list.

ID Code text box

ID Code defines the data at the beginning of a bar code that acts as an identifier (the actual Code ID). Both Name and ID Code must be specified in order to add a custom Code ID to the Custom IDs list.

Buttons

Add

Entering data into both the Name and ID Code fields enables the Add button. Click the Add button and the data is added to the next empty location in the Custom ID list.

Insert

Click on an empty line in the Custom ID list. The Add button changes to Insert. Enter data into both the Name and ID Code fields and click the Insert button. The data is added to the selected line in the Custom IDs list.

Edit

Double click on the item to edit. Its values are copied to the text boxes for editing. The Add button changes to Replace. When Replace is clicked, the values for the current item in the list are updated.

Clear All

When no item in the Custom IDs list is selected, clicking the Clear All button clears the Custom ID list and any text written (and not yet added or inserted) in the Name and ID Code text boxes.

Remove

The Clear All button text changes to a Remove button when an item in the Custom IDs list is selected. Click the desired line item and then click the Remove button to delete it. Line items are Removed one at a time. Contents of the text box fields are cleared at the same time.

Control Code Replacement Examples

Configuration Data	Translation	Example Control Character	Example Configuration	Translated Data
Ignore (drop)	The control character is discarded from the bar code data, prefix and suffix	ESCape	Ignore (drop)	0x1B in the bar code is discarded.
Printable text	Text is substituted for Control Character.	Start of TeXt	STX	0x02 in a bar code is converted to the text STX.
Hat-encoded text	The hat-encoded text is translated to the equivalent hex value.	Carriage Return	^M	Value 0x0d in a bar code is converted to the value 0x0d.
Escaped hat-encoded text	The hat-encoding to pass through to the application.	Horizontal Tab	\^I	Value 0x09 in a bar code is converted to the text ^I.
Hex-encoded text	The hex-encoded text is translated to the equivalent hex value.	Carriage Return	0x0A	Value 0x0D in a bar code is converted to a value 0x0A.
Escaped hex-encoded text	The hex-encoding to pass through to the application.	Vertical Tab	\0x0A or 0\x0A	Value 0x0C is a bar code is converted to text 0x0A

See Also: "Hat Encoding"

Bar Code Processing Examples

The following table shows examples of stripping and prefix/suffix configurations. The examples assume that the scanner is configured to transmit an AIM identifier.

		Symbology			
	All	**EAN-128(]C1)**	**EAN-13(]E0)**	**Intrlv 2 of 5(]IO)**	**Code93**
Enable	Enabled	Enabled	Enabled	Enabled	Disabled
Min length	1	4	1	1	
Max length	all	all	all	10	
Strip Code ID	Enabled	Enabled	Disabled	Enabled	
Strip Leading	3	0	3	3	
Strip Bar code Data		*123	1*	456	
Strip Trailing	0	0	3	3	
Prefix	aaa	bbb	ccc	ddd	
Suffix	www	xxx	yyy	zzz	

Provided that the wedge is configured with the above table, below are examples of scanned bar code data and results of these manipulations.

Bar Code Symbology	Raw Scanner Data	Resulting Data
EAN-128	]C11234567890123	bbb1234567890xxx
EAN-128	]C111234567890123	bbb11234567890xxx
EAN-128	]C1123	*< rejected > (too short)*
EAN-13	]E01234567890987	ccc]E04567890yyy
EAN-13	]E01231234567890987	ccc]E0234567890yyy
EAN-13	]E01234	ccc]E0yyy
I2/5	]I04444567890987654321	***< rejected >** (too long)*
I2/5	]I04444567890123	ddd7890zzz
I2/5	]I0444	dddzzz
I2/5	]I022245622	ddd45zzz
Code-93	]G0123456	***< rejected >** (disabled)*
Code-93	]G0444444	***< rejected >** (disabled)*
Code-39	]A01234567890	aaa4567890www
Code-39 full ASCII	]A41231234567890	aaa1234567890www
Code-39	]A4	***< rejected >** (too short)*

Note: Rejected bar codes generate a bad scan beep. In some cases, the receipt of data from the scanner triggers a good scan beep (from the external scanner), and then the rejection of scanned bar code data by the processing causes a bad scan beep on the same data.

HHP Properties

Start > Settings > Control Panel > Data Collection > Data Options tab

Use these options to configure Hand Held Products (HHP) Imager parameters.
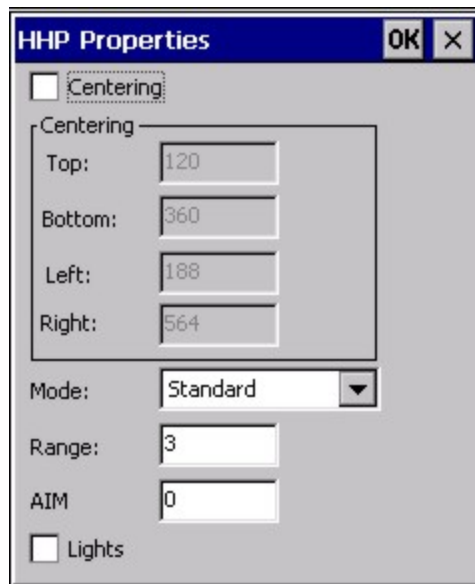
Centering default is Disabled.

Decode mode default is Standard.

Linear Range default is 3.

Aim Timer default is 0 (no time).

Imager's lights and aimer are disabled for the scan duration.

Centering

Start > Settings > Control Panel > Data Collection > HHP Properties button

The centering feature is used to allow the user to accurately scan a selected bar code among a group of bar codes that are located closely together. When centering is turned on, the imager will only decode bar codes that intersect the centering window defined by the user. The centering window must intersect the center of the bar code.

The default centering settings define a 60 pixel square area in the center of the imager's field of view.

Default centering settings and allowable minimum and maximum settings are listed below.

Centering	Enable
Default	0
Valid	1 Enable
	0 Disable

Enable or disable Centering feature. When disabled, the following values are ignored.

Position	Default	Minimum	Maximum
CenteringTop	120	0	239
CenteringBottom	360	240	479
CenteringLeft	188	0	319
CenteringRight	564	320	639

DecodeMode

Start > Settings > Control Panel > Data Collection > HHP Properties button

Default	1
Valid	1 = Normal mode
	2 = Aggressive Linear Decode (ALD)
	4 = Quick Omni

In Normal mode the imager will decode both linear and 2-D symbologies.

In Aggressive Linear Decode mode the imager will only read linear symbologies in this mode, but decoding these is faster and more accurate than Normal Mode.

In Quick Omni mode the imager searches for a bar code in a reduced field located around the center of the image. Decoding is faster in this mode, but the user must center the aiming line over the bar code to be read. Both linear and 2-D symbologies can be read in this mode.

LinearRange

Start > Settings > Control Panel > Data Collection > HHP Properties button

| Default | 3 |
| Valid | 1 - 6 |

1 specifies that the linear range that is searched for a readable label is a tight vertical range near the aimer.

6 specifies that the entire height of the image is to be searched.

AimTimer

Start > Settings > Control Panel > Data Collection > HHP Properties button

Duration of the imager aim beam in 0.1 second increments.

| Default | 0 |
| Valid | 0 = 50 (0 – 5 seconds) |

If a value greater than 50 is entered, the aim duration is set to the maximum time of 5 seconds.

LeaveLightsOn

Start > Settings > Control Panel > Data Collection > HHP Properties button

| Default | 0 |
| Valid | 0 = Off, 1 = On |

Specifies if the imager's lights and aimer should be left on during the entire decode process.

If Off, the lights are turned on only during image capture, then turned off while the imager attempts to process and decode the bar code.

If On, the aimer and lights remain turned on during the entire process.

In Aggressive Linear Decode mode, set this parameter to 1 to improve the aimer visibility.

Processing Tab

The Processing tab contains a user configurable key delay that applies to scanned bar codes as they are input when Remote Desktop is the application with the input focus.

Factory Default Settings

Enable buffered key output	Enabled
Same buffer limit (characters)	32
Delay between (key) buffers	75 ms

Note: Settings on this panel have no effect when RFTerm is the application with the input focus.
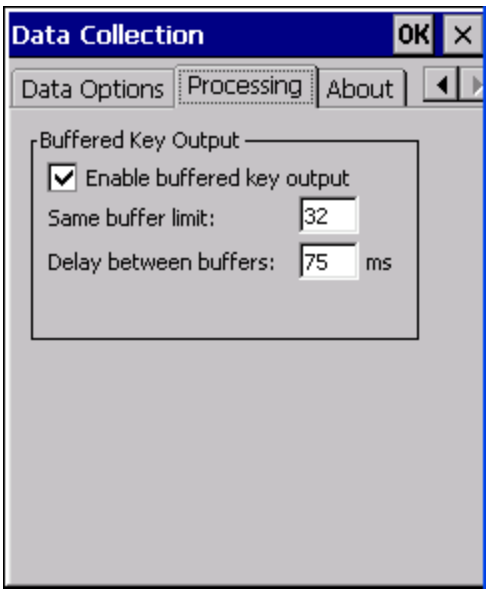
Enable buffered key output

Default is enabled (checked). Click the checkbox to turn off buffered key output.

Same buffer limit

Default is 32 ms. Raise or lower this value as desired.

Delay between (key) buffers

Specifies the number of milliseconds to delay after each character in the scanned bar code is processed as a keystroke. This value may need to be adjusted depending on the network traffic in the environment. The default value is 75 ms. Valid value is from 0 to 9999. A zero value is No Delay between characters.

About Tab

Start > Settings > Control Panel > Data Collection > About tab

This tab displays the Data Collection Wedge driver version installed in the MX9. The version number shown in the image below is used only as an example, your version number will be different.
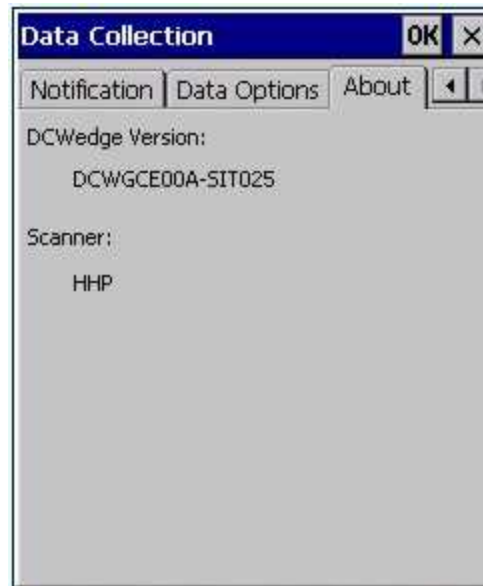
It also lists the type of scanner/imager installed. Valid scanner / imager types are:

HHP - Hand Held Products 53XX 2D Imager

Symbol - Symbol laser scanner

Blank - No integrated scanner

Length Based Bar Code Stripping

Use this procedure to create symbology rules for two bar codes with the same symbology but with different discrete lengths. This procedure is not applicable for bar codes with variable lengths (falling between a maximum value and a minimum value).

Example 1:

- A normal AIM or Symbol symbology role can be created for the desired bar code ID.
- Next, a custom bar code symbology must be created using the same Code ID as the original AIM or Symbol ID rule and each rule would have unique length settings.

Example 2:

For the purposes of this example, the following sample bar code parameters will be used – EAN 128 and Code 128 bar codes. Some of the bar codes start with '00' and some start with '01'. The bar codes are different lengths.

- 34 character length with first two characters = "01" (strip first 2 and last 18)
- 26 character length with first two characters = "01" (strip first 2 and last 10)
- 24 character length with first two characters = "01" (strip first 2 and last 8). This 24 character bar code is Code 128.
- 20 character length with first two characters = "00" (strip first 0 (no characters) and last 4)

On the Data Options tab, set Enable Code ID to AIM.

Create four custom IDs, using 1 for EAN 128 bar code and 0 for Code 128 bar code.

- c1 = Code = ']C1'
- c2 = Code = ']C1'
- c3 = Code = ']C0' (24 character bar code is Code 128)
- c4 = Code = ']C1'
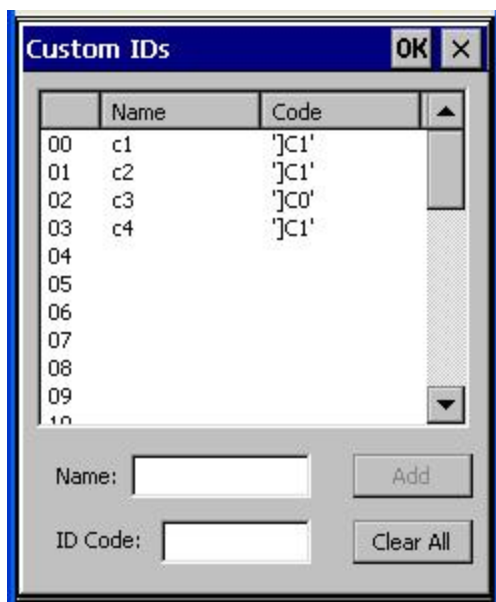
AIM custom symbology setup is assigned in the following manner:

- c1 min length = 34, max length = 34, strip leading 2, strip trailing 18, Code ID enabled, Barcode Data = "01"
- c2 min length = 26, max length = 26, strip leading 2, strip trailing 10, Code ID enabled, Barcode Data = "01"

- c3 min length = 24, max length = 24, strip leading 2, strip trailing 8, Code ID enabled, Barcode Data = "01"
- c4 min length = 20, max length = 20, strip leading 0, strip trailing 4, Code ID enabled, Barcode Data = "00"

Add the AIM custom symbologies. Refer to the previous section *Symbology Settings* for instruction.

Click the Barcode Data button.

Click the Add button.

Add the data for the match codes.

Refer to the previous section for instruction.

Scan a bar code and examine the result.

Hat Encoding

Hat Encoded Characters Hex 00 through AD

Desired ASCII	Hex Value	Hat Encoded	Desired ASCII	Hex Value	Hat Encoded
NUL	0X00	^@	ESA	87	~^G
SOH	0X01	^A	HTS	88	~^H
STX	0X02	^B	HTJ	89	~^I
ETX	0X03	^C	VTS	8A	~^J
EOT	0X04	^D	PLD	8B	~^K
ENQ	0X05	^E	PLU	8C	~^L
ACK	0X06	^F	RI	8D	~^M
BEL	0X07	^G	SS2	8E	~^N
BS	0X08	^H	SS3	8F	~^O
HT	0X09	^I	DCS	90	~^P
LF	0X0A	^J	PU1	91	~^Q
VT	0X0B	^K	PU2	92	~^R
FF	0X0C	^L	STS	93	~^S
CR	0X0D	^M	CCH	94	~^T
SO	0X0E	^N	MW	95	~^U
SI	0X0F	^O	SPA	96	~^V
DLE	0X10	^P	EPA	97	~^W
DC1 (XON)	0X11	^Q		98	~^X
DC2	0X12	^R		99	~^Y
DC3 (XOFF)	0X13	^S		9A	~^Z
DC4	0X14	^T	CSI	9B	~^[
NAK	0X15	^U	ST	9C	~^\\
SYN	0X16	^V	OSC	9D	~^]
ETB	0X17	^W	PM	9E	~^^
CAN	0X18	^X	APC	9F	~^ (Underscore)
EM	0X19	^Y	(no-break space)	A0	~ (Tilde and Space)
SUB	0X1A	^Z	¡	A1	~!
ESC	0X1B	^[	¢	A2	~"
FS	0X1C	^\\	£	A3	~#
GS	0X1D	^]	¤	A4	~$
RS	0X1E	^^	¥	A5	~%
US	0X1F	^ (Underscore)	¦	A6	~&
	0X7F	^?		A7	~'
	80	~^@	¨	A8	~(
	81	~^A	©	A9	~)
	82	~^B	ª	AA	~*
	83	~^C	«	AB	~+
IND	84	~^D	¬	AC	~,
NEL	85	~^E	(soft hyphen)	AD	~- (Dash)
SSA	86	~^F	×	D7	~W
®	AE	~. (Period)	Ø	D8	~X
¯	AF	~/	Ù	D9	~Y
°	B0	~0 (Zero)	Ú	DA	~Z
±	B1	~1			

Hat Encoded Characters Hex AE through FF

Desired ASCII	Hex Value	Hat Encoded		Desired ASCII	Hex Value	Hat Encoded
²	B2	~2		Û	DB	~[
³	B3	~3		Ü	DC	~\\
´	B4	~4		Ý	DD	~]
µ	B5	~5		Þ	DE	~\^
¶	B6	~6		ß	DF	~_ (Underscore)
·	B7	~7		à	E0	~`
¸	B8	~8		á	E1	~a
¹	B9	~9		â	E2	~b
º	BA	~:		ã	E3	~c
»	BB	~;		ä	E4	~d
¼	BC	~<		å	E5	~e
½	BD	~=		æ	E6	~f
¾	BE	~>		ç	E7	~g
¿	BF	~?		è	E8	~h
À	C0	~@		é	E9	~i
Á	C1	~A		ê	EA	~j
Â	C2	~B		ë	EB	~k
Ã	C3	~C		ì	EC	~l
Ä	C4	~D		í	ED	~m
Å	C5	~E		î	EE	~n
Æ	C6	~F		ï	EF	~o
Ç	C7	~G		ð	F0	~p
È	C8	~H		ñ	F1	~q
É	C9	~I		ò	F2	~r
Ê	CA	~J		ó	F3	~s
Ë	CB	~K		ô	F4	~t
Ì	CC	~L		õ	F5	~u
Í	CD	~M		ö	F6	~v
Î	CE	~N		÷	F7	~w
Ï	CF	~O		ø	F8	~x
Ð	D0	~P		ù	F9	~y
Ñ	D1	~Q		ú	FA	~z
Ò	D2	~R		û	FB	~{
Ó	D3	~S		ü	FC	~|
Ô	D4	~T		ý	FD	~}
Õ	D5	~U		þ	FE	~~
Ö	D6	~V		ÿ	FF	~^?

Date / Time

Start > Settings > Control Panel > Date/Time - or - Time in Desktop Taskbar

Use this MX9 panel to set Date, Time, Time Zone, and assign a Daylight Savings location.

Factory Default Settings

Current Time	Midnight
Time Zone	GMT-05:00
Daylight Savings	Enabled

There is very little functional change from general desktop or laptop Date/Time Properties options.

Double-tapping the time displayed in the Desktop Taskbar causes the Date/Time Properties screen to appear.

The Sync button activates a utility that will set the clock using a network time server.

Device Management

Start > Settings > Control Panel > Device Management

Allows a Device Management client (the device equipped with a Microsoft Windows CE operating system) to work with a Microsoft Systems Management Server.

Specify the server name or IP address of management server and check the checkbox if a secure connection is to be used.

Refer to the Microsoft.com website for more information on device management for Windows CE equipped devices.

Dialing

Start > Settings > Control Panel > Dialing

Set dialup properties for internal modems (not supplied or supported on the MX9 by Honeywell).

Factory Default Settings

Location	Work
Area Code	425
Tone Dialing	Enabled
Country/Region	1
Disable Call Waiting	Disabled (blank)

Display

Start > Settings > Control Panel > Display

The display might also called the touch screen.

Select the desktop background image and appearance scheme for the MX9. Using the options on the Backlight tab, set the display backlight and keypad backlight timers when running on battery or external power.

Adjust the settings and tap the OK button to save the changes. Saved changes take effect immediately.

Factory Default Settings

| Background	
Image	Windows CE
Image on background	Disabled
Appearance	
Schemes	Windows Standard
Backlight	
Battery power and user idle	3 seconds
Battery power and System idle	15 seconds
Battery power, idle, Suspend	5 minutes
External power and user idle	2 minutes
External power and System idle	2 minutes
External power, idle, Suspend	2 minutes
Backlight Brightness	Maximum

Background

There is very little change from general desktop PC Display Properties / Background options. Select an image from the drop down list (or tap the Browse button to select an image from another folder) to display on the Desktop, and then tap the OK button to save the change. The change takes effect immediately.

Appearance
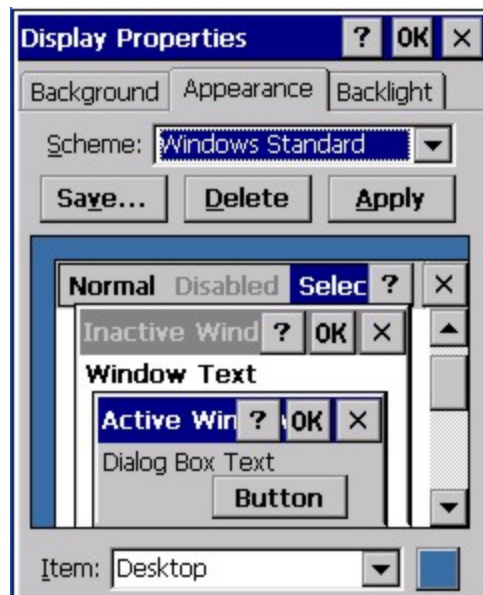
There is very little change from general desktop PC Appearance options. Select a scheme from the drop down list and make changes to the parameters. The default is High Contrast White for monochrome displays and Windows Standard for color displays. Tap the Save button to save any changes, renaming the scheme if desired. Tap the Delete button to delete schemes. Tap the Apply button to apply the selected scheme to the display.

Backlight
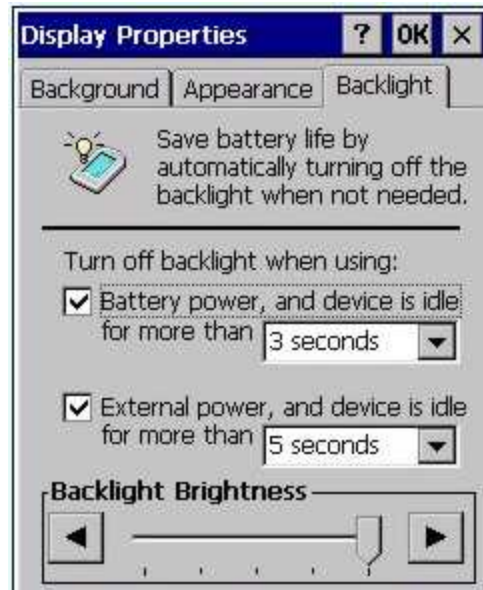
The backlight settings use the default timeouts and is synchronized to the User Idle setting in the Schemes tab in the Power control panel. When the backlight timer expires, the touch screen backlight is dimmed, not turned off. When both checkboxes are unchecked, the backlight never turns off (or dims). Default values are 3 seconds for Battery, 2 minutes for External and both the check boxes are enabled.

When the **keypad backlight** is set to *Follow the touch screen backlight*, the keypad backlight turns off when the touch screen backlight dims.

Adjust **backlight brightness** by moving the slider. Changes are in effect immediately.

Touch screen display backlight brightness **adjust mode** is entered by pressing the **Blue + Scan** key combination.

After this, the up and down arrow keys brighten or dim the backlight. Pressing any key other than up arrow or down arrow exits the brightness adjustment mode.

Additional characteristics:

- There is no separate brightness level indication except for the actual brightness of the display.
- Once the maximum (or minimum) brightness is reached by repeated presses of the up (or down) key, the display will cease getting brighter (or dimmer) and saturate at that maximum (or minimum brightness).
- Continuously pressing the up or down arrow keys does not cause an automatic repeat of the up (or down) arrow key.
- The brightness setting is stored in the registry and is recalled at power on.
- The number of steps from maximum brightness to minimum dimness is five. At minimum dimness level, the display is still viewable.
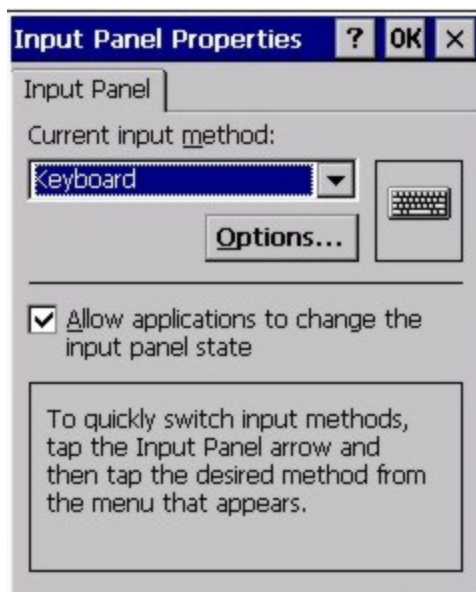
Input Panel

Start > Settings > Control Panel > Input Panel

Set the current MX9 keys and data input method.

Factory Default Settings

Input Method	Keyboard
Allow applications to change input panel state	Enabled
Options button	
Keys	Small keys
Use gestures	Disabled

Use this panel to make the Input Panel (on-screen keyboard) or the physical keypad primarily available when entering data on any screen.

Selecting **Keyboard** enables both.

Tap the Options button to set the size of the keys displayed on-screen and whether Transcriber gestures are enabled or disabled.

Note: Contact *Technical Assistance* for language packs as they become available.

Internet Options

**Start > Settings > Control Panel > Internet Options**

Set options for MX9 Internet connectivity.

Select a tab. Tap the ? button for help using Windows CE Help installed in your mobile device. Adjust the settings and tap the OK button. The changes take effect immediately.

Factory Default Settings

General tab	
Start Page	http://www.honeywellaidc.com/
Search Page	http://www.google.com
User Agent	Default (Windows CE)
Cache Size	512Kb
Clear Cache	Button enabled
Clear History	Button enabled
Connection tab	
Use LAN	Disabled
Autodial Name	USB Client
Proxy Server	Disabled
Bypass Proxy	Disabled
Security tab	
Internet	Default site (See Note)
Privacy tab	
First party cookies	Accept
Third party cookies	Prompt
Session cookies	Always allow
Advanced tab	
Stylesheets	Enabled
Theming Support	Enable
Multimedia	All options enabled
Security	All options enabled
Popups tab	
Block popups	Disabled
Display notification	Enabled
Use same window	Disabled

Note: **Security Tab**: Use the **Settings** button to set ActiveX control, scripting and plug-in behavior for each zone (Internet, Local intranet, Trusted Sites, Restricted Sites). Use the Site button to add sites to each zone.
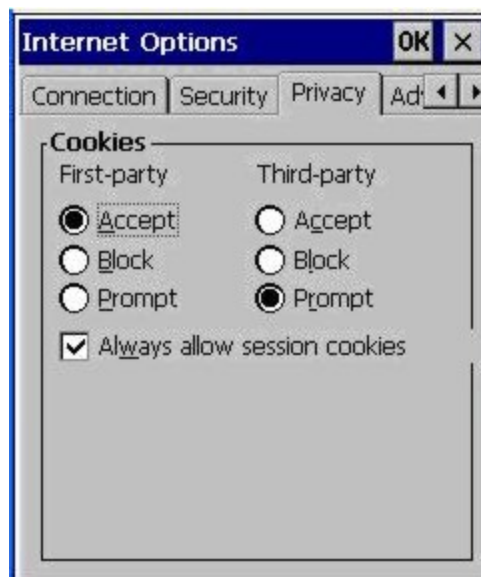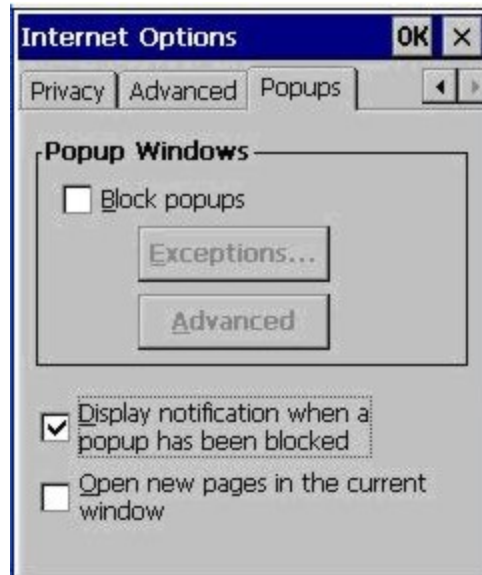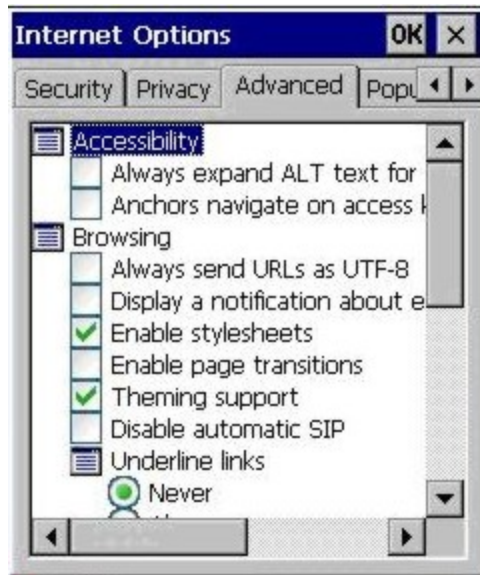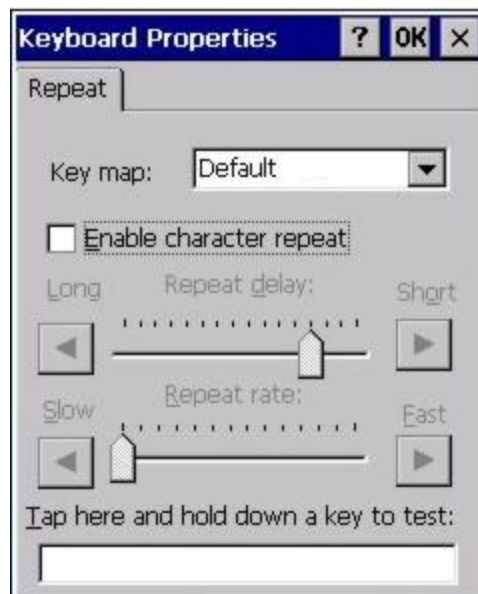
Keyboard

Start > Settings > Control Panel > Keyboard

Set keypad key map, keypad key repeat delay, and key repeat rate.

Factory Default Settings

Repeat Tab	
Key map	Default (or Default MX9)
Repeat character	Enable
Repeat Delay	Short
Repeat Rate	Slow

Select a key map using the drop down list. Adjust the character repeat settings and tap the OK button to save the changes.

When new key maps, or fonts, are added to the registry, they are available immediately and the font name is in the Keyboard Properties Key map drop down list. Only one font at a time can be selected. The fonts affect the screen display, they do not affect any virtual (touch screen) key taps.

See **About > Software > Language** tab for the name of any installed fonts.

Languages and Fonts[1]

See Also: Regional Settings for instruction for setting User Interface Language and Default Input Language.

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[1]Fonts are available in the following languages (in separate part numbers) for each language: Simplified Chinese, Traditional Chinese, Korean, Japanese.
Tahoma font is on every unit and includes English (default), European (French, Spanish, German, Portuguese), Scandinavian languages, Arabic, Cyrillic, Greek, Hebrew, and Thai.

KeyMap

Start > Settings > Control Panel > KeyMap Icon

Use this control panel option to assign key functions to mappable keys available on your MX9, determine application launch sequences and program command Run sequences.

Note: KeyMap Control Panel options LaunchApp and RunCmd do not inter-relate with similarly-named options contained in other Control Panel applets. For example, the AppLock Administrator Control panel file Launch option.

Factory Default Values

KeyMap		
Modifier Mode	None	
Key	Diamond 1	Remap to – Field Exit
Edit String	Field Exit	String – Empty
Launch		
App1	Empty	
App2	Empty	
App3	Empty	
App4	Empty	
App/Opt	EXE	
RunCmd		
Cmd1	Empty	
Cmd2	Empty	
Cmd3	Empty	
Cmd4	Empty	
File/Parm	FILE	

KeyMap Tab

| 62 Key Keypad | 38 Key Keypad |

Assign settings by clicking radio buttons and selecting keys from the drop down boxes. Tap the OK button when finished. The changes take effect immediately.

How to Remap a Single Key

1. Select the modifier key from the Modifier Mode options.
2. Select the key to be remapped from the Key pulldown list.
3. Select the value from the remapped key from the Remapped Key pulldown list.
4. Click **OK** to save the result and close the Keypad Control.

Remap a Key to a Unicode Value

1. Select the modifier key from the Modifier Mode options.
2. Select the key to be remapped from the Key pulldown list.
3. Select **Unicode** from the Remapped Key pulldown list.
4. There are two Unicode text boxes located on the lower part of this tab. Enter the Unicode value in the left textbox and the Unicode character is displayed in the right textbox.
5. Click **OK** to save the result and close the control panel.

How to Remap a Key Sequence

1. Select the modifier key from the Modifier Mode options.
2. Select the key to be remapped from the Key pulldown list.
3. Select **Key Sequence** from the Remapped Key pulldown list.
4. Select the first key for the multiple key sequence from the pulldown list.
5. Press the **Add** button to add the key to the multiple key sequence shown in the Key Sequence box. Repeat this step until all keys desired have been added to the key sequence. If necessary, use the **Clear** button to erase all entries in the Key Sequence box.
6. Click **OK** to save the result and close the Keypad Control.

Note: A key can only be used once in a multiple key sequence. For example, an F1 key added to a key sequence means an F1 key cannot be used again in the same key sequence.

Remap a Key to a Sequence of Unicode Values

Up to 16 Unicode values may be specified for the key sequence. The sequence can consist of keys and Unicode values.

1. Select the modifier key from the Modifier Mode options.
2. Select the key to be remapped from the Key pulldown list.
3. Select **Key Sequence** from the Remapped Key pulldown list.
4. Select **Unicode** from the Key Sequence pulldown list.
5. There are two Unicode text boxes located on the lower part of this tab. Enter the Unicode value in the left textbox and the Unicode character is displayed in the right textbox.
6. Press the **Add** button to add the key to the multiple key sequence shown in the Key Sequence box.
7. Repeat steps 4 through 6 until all desired characters have been added to the key sequence. If necessary, use the **Clear** button to erase all entries in the Key Sequence box.
8. Click **OK** to save the result and close the control panel.

How to Remap an Application

1. Select the modifier key from the Modifier Mode options.
2. Select the key to be remapped from the Key pulldown list.
3. Select Launch App1-4 from the remapped key from the Remapped Key pulldown list.
4. Click on the LaunchApp tab.
5. Make sure the EXE radio button is selected.
6. In the text box (App1-4) corresponding to the number selected for Launch App1-4, enter the application to launch.
7. If any parameters are needed for the application, click on the OPT radio button. This clears the text box (though the application name is saved). Enter the desired parameters in the appropriate text box.
8. Click OK to save the result and close the Keypad Control.
9. If the KeyMap tab is accessed again, the application plus any specified parameters is displayed in the Key Sequence text box when the remapped key is again selected.

How to Remap a Command

1. Select the modifier key from the Modifier Mode options.
2. Select the key to be remapped from the Key pulldown list.
3. Select RunCmd 1-4 from the remapped key from the Remapped Key pulldown list.
4. Click on the RunCmd tab.
5. Make sure the FILE radio button is selected.
6. In the text box (Cmd1-4) corresponding to the number selected for RunCmd1-4, enter the desired command.
7. If any parameters are needed for the command, click on the PARM radio button. This clears the text box (though the command is saved). Enter the desired parameters in the appropriate text box.
8. Click OK to save the result and close the Keypad Control.
9. If the KeyMap tab is accessed again, the command plus any specified parameters is displayed in the Key Sequence text box when the remapped key is again selected.

LaunchApp Tab

The default for all text boxes is Null or " ". The text boxes accept string values only.

Note that executables and parameters are not checked for accuracy by the keyboard driver. If the launch fails, the MX9 emits a single beep, if the launch is successful, it is silent.
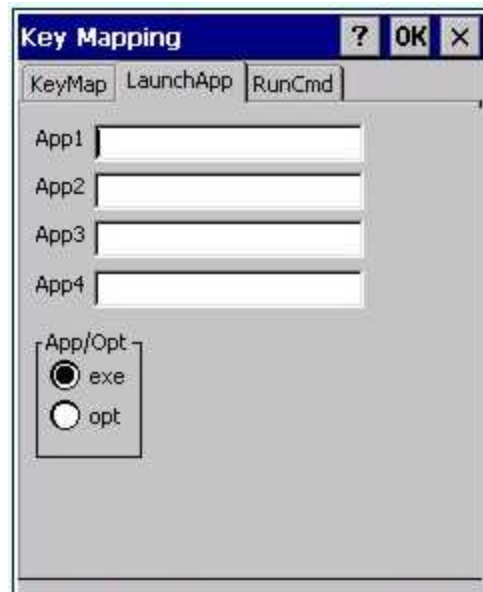
The Launch App command is defined for use by system administrators. These instructions are parsed and executed directly by the keyboard driver.

1. Place the cursor in the text box next to the App you wish to run, e.g., App1, App2.
2. Enable the EXE radio button if the application is an EXE file.
3. Enter the name of the executable file.
4. Enable the OPT radio button to add options or parameters for the executable file in the same text box. Switching from EXE to OPT clears the text box (but the information previously entered is stored), allowing parameter entry.

Tap the OK button when finished. The changes take effect immediately.

The result of the application (exe) and options (opt) entries are displayed on the KeyMap tab in the Key Sequence box when the key mapped to the LauchApp is selected.

RunCmd Tab

The default for all text boxes is Empty, Null or " ". The text boxes accept string values only.

Note that executables and parameters are not checked for accuracy by the keyboard driver. If the launch fails, the MX9 emits a single beep, if the launch is successful, the mobile device is silent.
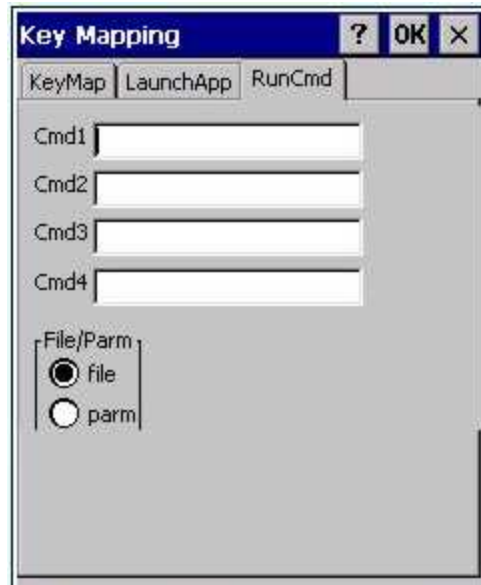
The Run Cmd command is defined for use by system administrators. These instructions call the ShellExecuteEx API, which opens documents directly.

1. Place the cursor in the text box next to the Cmd you wish to run, e.g., Cmd1, Cmd2.

2. Enable the file radio button and enter the name of the file.

3. Enable the PARM radio button to add parameters for file/exe execution in the same text box.

Tap the OK button when finished. The changes take effect immediately.

License Viewer

Start > Settings > Control Panel > License Viewer

Use this option to view software license registration details, and service contract length for a MX9. Information on the License Viewer tabs is unique for each MX9.

Note: Following image is a sample screen.

Your License Viewer control panel may show more tabs, e.g., RFTerm, depending on the number of software applications running on the MX9 that require a license. Contact Technical Assistance for software updates and releases as they become available.
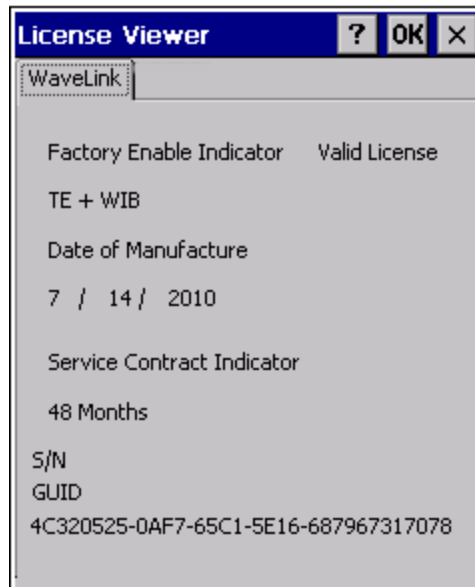
Software and driver version information is located in the About control panel. Copyright information is located in the System control panel.

Mixer

Start > Settings > Control Panel > Mixer

The MX9 has a speaker and a microphone. They are active when a headset is not connected to the device.

The microphone is located to the left of the oval logo at the top of the unit. The speaker (audio) is located above the keypad.

Use the settings on these panels to adjust the volume, record gain and sidetone for microphone input, speaker and speaker output.

Headsets can be enabled, disabled and selected using these panels.

Factory Default Settings

Output	
Speaker Volume	0 dB
Headset Volume	-13.5dB
Headset Selection	Default
Input	
Input Selection	None
Record Gain	0 dB
Record Boost	+12 dB
Sidetone	0 dB

Output Panel
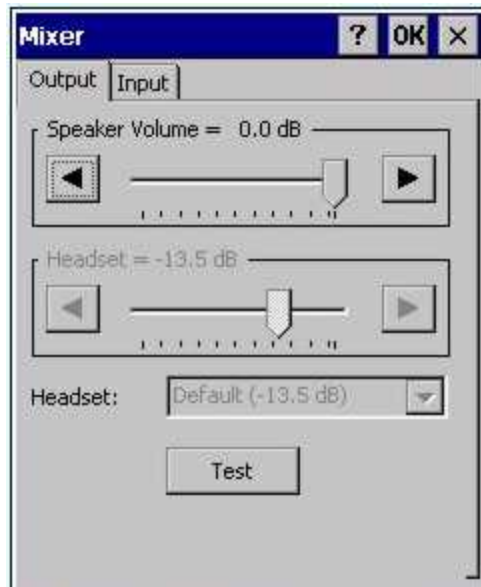
Tap and hold the Output sliders and move them either left or right, or tap the left and right arrows, to adjust Speaker volume decibel level. Tap the drop down list arrow to select the type of headset currently attached to the unit. This will load a predetermined limit value; the headphone setting cannot exceed the predetermined values.

Input Panel
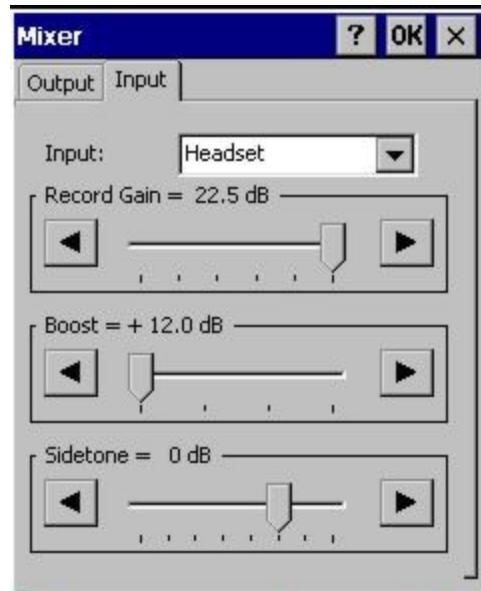
To enable the headset, select **Headset** in the Input Selection combo box. To disable the headset, select **None** in the Input Selection combo box.

Note: The list of input selections and headset selections is stored in the registry. Both WAN and Bluetooth are included in the input list in the registry, but with the disabled flag set, they do not appear in the list.

Mouse

Start > Settings > Control Panel > Mouse

Use this option to set the double-tap sensitivity for stylus taps on the MX9 touch screen.
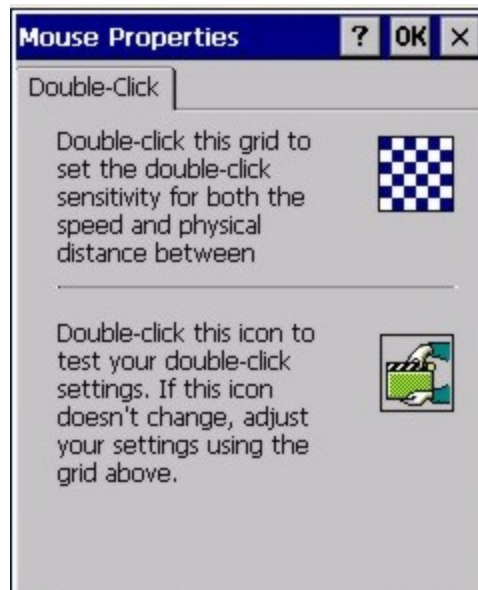
MX9 Options

Start > Settings > Control Panel > MX9 Options

Set options unique to your device, such as keypad backlight, Status Popup taskbar icon display and CapsLock.

It may be necessary to warmboot the MX9 after making desired changes. A pop up window indicates if a warmboot is required.

Note: Contact Technical Assistance if there is no icon corresponding to this item in the Control Panel.

Communication

Options on this tab configure communication options for the MX9.
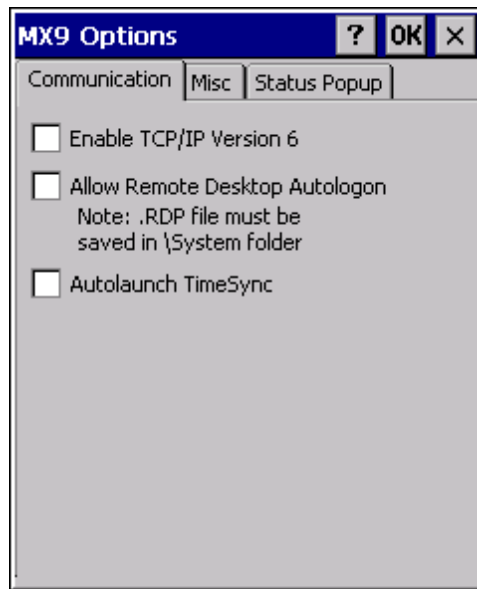
Enable TCP/IP Version 6

By default, IPv6 is disabled on the MX9. Check this checkbox to enable IPv6.

Allow Remote Desktop Autologon

By default, Remote Desktop Autologon is disabled. Check this checkbox to enable Remote Desktop Autologon.

Note: The .RDP file must be saved in the \System folder. When prompted, use the Save As button to save the .RDP file is the \System directory. If the .RDP file is saved in the default root folder location, the .RDP file will not persist across a warmboot.

Autolaunch TimeSync

By default, TimeSync does not automatically run on the MX9. To enable TimeSync to run automatically on the MX9, check this checkbox.

Synchronize with a Local Time Server

By default, GrabTime synchronizes via an Internet connection. To synchronize with a local time server:

1. Use ActiveSync to copy GrabTime.ini from the My Device > Windows folder on the mobile device to the host PC.
2. Edit the copy of GrabTime.ini on the host PC. Add the local time server's domain name to the beginning of the list of servers. You can optionally delete the remainder of the list.
3. Copy the modified GrabTime.ini file to the My Device > System folder on the mobile device.

The System/GrabTime.ini file takes precedence over the Windows/GrabTime.ini file. System/Grabtime.ini also persists after a coldboot; Windows/Grabtime.ini does not persist.

Misc

Options on this tab configure device specific options. Note that options not available on the MX9 are dimmed or grayed out.
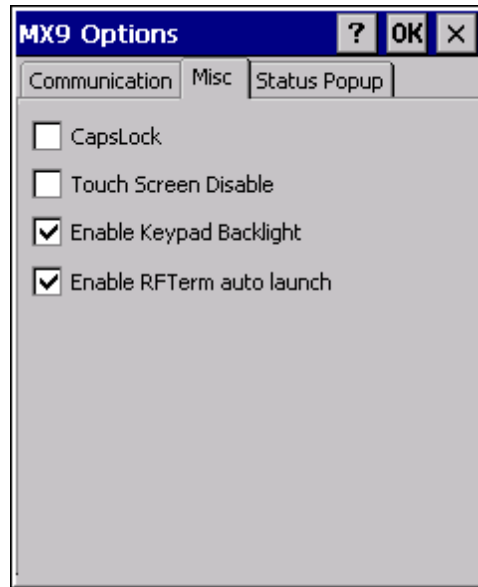
CapsLock

By default, CapsLock is disabled after a warmboot. To enable CapsLock after a warmboot, check this checkbox.

Touch Screen Disable

By default, the MX9 touch screen is enabled. To disable the touch screen after a warmboot, check this checkbox.

Enable Keypad Backlight

The keypad backlight default setting is to follow the display backlight setting until it is changed by the user.
Uncheck the checkbox to disable the keypad backlight.

Enable RFTerm Auto Launch

This option is enabled by default. This option, when disabled (unchecked) stops RFTerm from launching at bootup. When RFTerm is not installed or has not been added to the registry *Launch* sequence, this checkbox is ignored at bootup.

Status Popup

Options on this tab configure the Status Popup window. When the Status popup window is displayed, it is placed on top of the window in focus and hides any data beneath it. It is closed by pressing the assigned Status User or Status Admin key sequence.
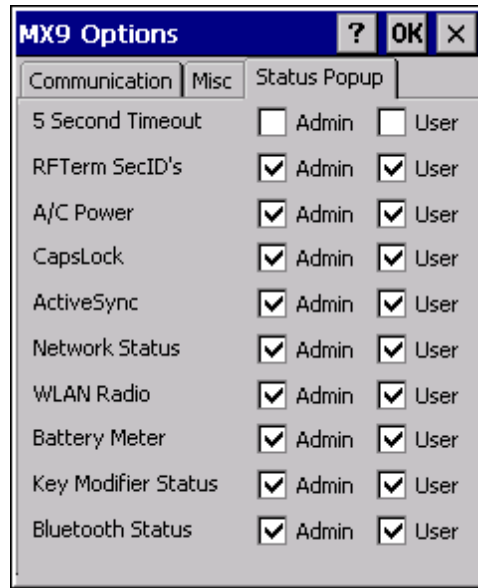
Using the key mapping control panel, the System Administrator must first assign a **Status User** key sequence for the end-user when they want to toggle the Status Popup Window on or off.

The System Administrator must also assign a **Status Admin** key sequence to perform the same function. Status popup window display options (taskbar icons) are assigned on the Status Popup tab. E.g., AC Power, ActiveSync, WLAN radio, CapsLock, Network status, Bluetooth status, etc.

The default for the User and Admin status popup windows is to show all status information. The 5 second timeout to remove the status popup from the display is disabled by default for the User and Admin status popup windows.

Network and Dialup Options

Start > Settings > Control Panel > Network and Dialup Connections

Set MX9 network driver properties and network access properties. Select a connection to use, or create a new connection.
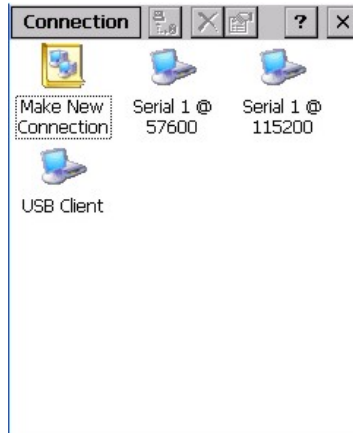
Create a New Connection

1. On the mobile device, select **Start > Settings > Control Panel > Network and Dialup Connections**. A window is displayed showing the existing connections.
2. Assuming the connection you want does not exist, double-tap **Make New Connection**.
3. Give the new connection an appropriate name (My Connection @ 9600, etc.). Tap the **Direct Connection** radio button. Tap the **Next** button.
4. From the popup menu, choose the port you want to connect to. Only the available ports are shown.
5. Tap the **Configure...** button.
6. Under the Port Settings tab, choose the appropriate baud rate. Data bits, parity, and stop bits remain at 8, none, and 1, respectively.
7. Under the **Call Options** tab, be sure to turn off Wait for dial tone, since a direct connection will not have a dial tone. Set the timeout parameter (default is 5 seconds). Tap **OK**.
8. **TCP/IP Settings** should not need to change from defaults. Tap the **Finish** button to create the new connection.
9. Close the **Remote Networking** window.
10. To activate the new connection select **Start > Settings > Control Panel > PC Connection** and tap the **Change Connection…** button.
11. Select the new connection. Tap **OK** twice.
12. Close the Control Panel window.
13. Connect the desktop PC to the mobile device with the appropriate cable.
14. Click the desktop **Connect icon** to test the new connection.

You can activate the connection by double-tapping on the specific connection icon in the Remote Networking window, but this will only start an RAS (Remote Access Services) session, and does not start ActiveSync properly.

Network Capture

Start > Settings > Control Panel > Network Capture

Note: Verify the date and time before using the logging utilities to ensure meaningful data.

The Network Capture panels provide configuration options for logging utilities.

Two types of logging are configurable:

Netlog is a Windows CE utility that monitors network traffic. Netlog creates a .CAP file that can be read using Microsoft Windows Network Monitor or any compatible tool that supports .CAP files.

NDISLog monitors the the NDIS interface between the Summit radio and the NDIS driver. This utility creates a .TXT log file.

**Factory Default Settings**

Netlog	
Command	options
pkt_size in bytes	5000
cap_size in bytes	500000
.cap file	\netlog
Promiscuous Mode	Disabled
NDISLog	
Command	stop
file	\ndislog.txt

Netlog

Use this control panel to configure the Netlog utility. By configuring Netlog using the control panel, Netlog remains running across a warmboot. However, please note that:

- Netlog first stores data to a file named netlog0.cap, then netlog1.cap. Any time the current file reaches maximum size, Netlog switches to the other file.
- If the log file is stored in the root directory, any previous data is lost and a new log file started after the warmboot.
- If the log file is stored in \System, all previous data is saved across the warmboot.
- If Netlog is enabled across the warmboot, a series of brief popups may be displayed during the boot cycle. No user interaction is required.
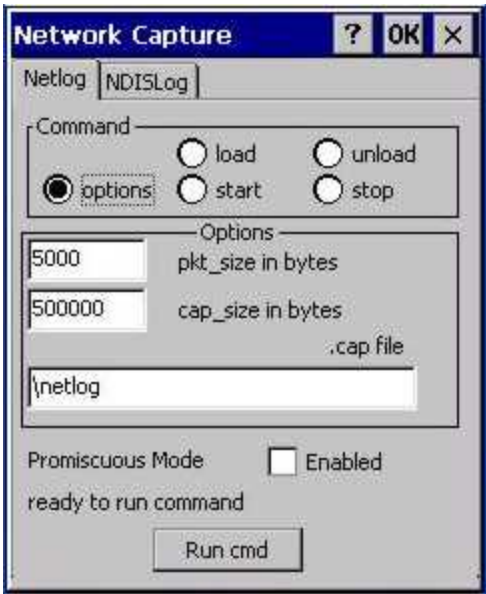
Command

Command	Function
options	Specifies the option to perform. See the table below for the option parameters and values.
load	Loads and starts Netlog.
start	Starts the Netlog process of logging the network traffic.
stop	Stops Netlog from logging network traffic.
unload	Unloads Netlog.

Options

Options	Function
pkt_size in bytes	Specifies the maximum packet size captured in bytes. This option should only be run after you have called **load** and **stop**. Default is 5000.
cap_size in bytes	Specifies the maximum size of Netlog0.cap or Netlog1.cap in bytes. This option should only be run after you have called **load** and **stop**. Default is 500,000.
.cap file	Specifies the name of the file to which network traffic information is saved. This option should only be run after you have called **load** and **stop**. Default is \netlog.

Run cmd

Performs the command selected. For example, to run Netlog and modify the packet size do the following:

Select **load** from the Commands list and click the **Run cmd** button.

Select **stop** from the Commands list and click the **Run cmd** button.

Select **options** from the Commands list, enter the new packet size in the Options list and click the **Run cmd** button.

NDISlog

NDISLog creates a .TXT file that can be viewed with any text editor program that supports .TXT files.

Command

Command	Function
start	Starts logging the network traffic.
stop	Stops logging network traffic.

file

Specifies the name of the file to which NDISLog information is stored.

Save File

Stores the file name.

Run cmd

Performs the selected start or stop command.

Owner

Start > Settings > Control Panel > Owner

Set the MX9 owner details. The Network ID is used when logging into a remote network.

Factory Default Settings

Identification	
Name	Blank
Company	Blank
Address	Blank
Telephones	Blank
Display owner ID at power-on	Disabled
Notes	
Notes	Blank
Display notes at power-on	Disabled
Network ID	
User Name	Blank
Password	Blank
Domain	Blank

Enter user name, password and domain to be used when logging into network resources.

Password

Start > Settings > Control Panel > Password

Use this panel to set MX9 user access to control panels and power up password properties.

Important: This password must be entered before performing a Load Factory Defaults.

Contact Technical Assistance if entering a power-on or screen saver password does not allow you to disable this password protection or perform a Load Factory Defaults.

Factory Default Settings

Password	Blank
Enter password at Power On	Disabled
Enter password at Remote Desktop Screen Saver	Disabled

Enter the password in the Password text box, then press Tab and type the password again to confirm it.

Enable the power-on checkbox and, if desired, the screensaver checkbox.

A changed/saved password is in effect immediately.

Notes:

- The password and password settings are saved during a warm boot and a cold boot.
- The screensaver password affects the Remote Desktop screensaver only.
- After a password is assigned and saved, each time a Settings > Control Panel option is selected, the user will be required to enter the password before the Control Panel will open.
- The screensaver password is the same as the power-on password. They are not set independently.
- A screensaver password cannot be created without first enabling the "Enable password protection at power-on" checkbox.
- The screensaver password is not automatically enabled when the "power-on" checkbox is enabled.

PC Connection

Start > Settings > Control Panel > PC Connection

Use these options to control a cabled connection (USB, serial) between the MX9 and a nearby desktop/laptop computer.

Factory Default Settings

Enable direct connection	Enabled
Connect using	USB Client
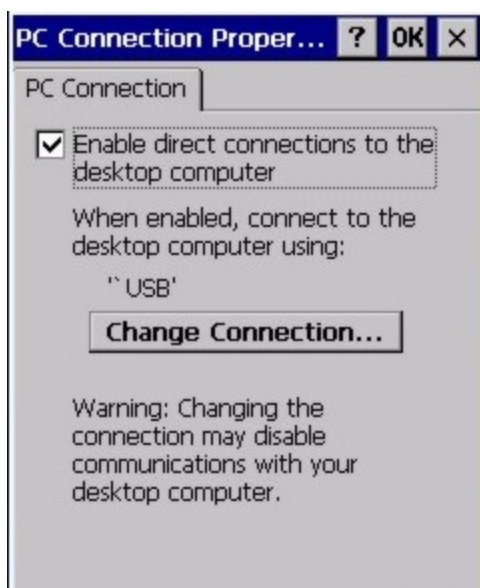
Unchecking the **Enable direct connections** checkbox disables ActiveSync on the MX9.

Tap the **Change Connection** button to change the direct connect setting.

Tap the drop down box to view a list of pre-configured connection settings.

Peripherals

Start > Settings > Control Panel > Peripherals

These panels are used to enable and disable the touch screen and scanner window heaters, and they are also used to set the time limit for the flashlight. Using the GPS tab, power to the GPS can be toggled on or off.

Factory Default Settings

Heaters	
Touch screen heater	Enabled
Scanner window heater	Enabled
Flashlight	
Turn flashlight off after	1 minute
GPS	
GPS Power	ON when installed / OFF when not installed

Heaters

Note: Setting has no effect if the heater is not installed.

Click the radio button to enable or disable the heater.

Flashlight

Note: Setting has no effect if the flashlight is not installed.

Select an option to set the timeout for the flashlight. Options are:

- 1 minute
- 2 minutes
- 3 minutes

GPS

GPS presence is displayed on the GPS panel. Power can be toggled on or off only when a GPS is installed. The default setting is Off.

Power

Start > Settings > Control Panel > Power

The MX9 power mode timers are cumulative.

The System Idle timer begins the countdown after the User Idle timer has expired and the Suspend timer begins the countdown after the System Idle timer has expired.

When the User Idle timer is set to "Never", the power scheme timers never place the device in User Idle, System Idle or Suspend modes (even when the device is idle).

The Display > Backlight setting is synchronized with the User Idle setting in the Schemes tab in the Power control panel.

Factory Default Settings

Battery Tab	
Turbo Mode	Enabled
Schemes Tab	
Battery Power - User Idle Timeout	3 seconds
Battery Power - System Idle Timeout	15 seconds
Battery Power - Suspend Timeout	5 minutes
AC Power - User Idle Timeout	2 minutes
AC Power - System Idle Timeout	2 minutes
AC Power - Suspend Timeout	5 minutes
Device Status Tab	No user interaction
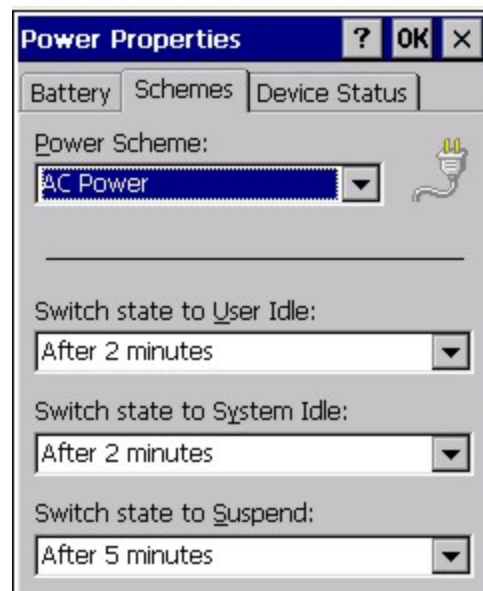
Because of the cumulative effect, and using the Battery Power Scheme Defaults listed above:

- The backlight turns off after 3 seconds of no activity,
- The display turns off after 18 seconds of no activity (15 sec + 3 sec),
- And the device enters Suspend after 5 minutes and 18 seconds of no activity.
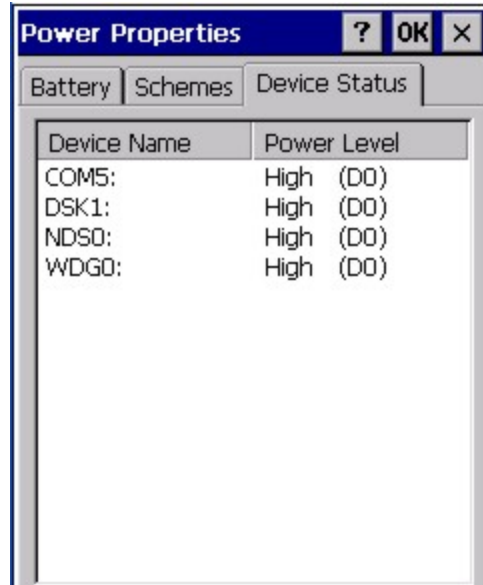- If the User Idle timer is set to Never, the power scheme timers never place the device in User Idle, System Idle or Suspend modes.

Regional and Language Settings

Start > Settings > Control Panel > Regional Settings

Set the appearance of numbers, currency, time and date based on regional and language settings. Set the MX9 user interface language and the default input language.

Factory Default Settings

Region	
Locale	English (United States)
Number	123,456,789.00 / -123,456,789.00 neg
Currency	$123,456,789.00 pos / ($123,456,789.00) neg
Time	h:mm:ss tt (tt=AM or PM)
Date	M/d/yy short / dddd,MMMM,dd,yyyy long
Language	
User Interface	English (United States)
Input	
Language	English (United States)-US
Installed	English (United States)-US
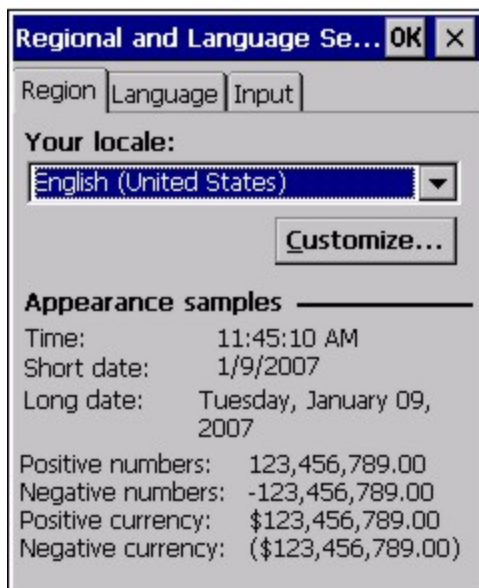
Registry

Start > Settings > Control Panel > Registry

Choose an MX9 software reload scheme.

Tab	Contents
Load User Defaults	When clicked, a standard load file dialog is opened, to allow the user to pick a Registry Save (.RSG) file. The applet then copies the specified User registry file to the Active registry. The user is asked to verify a reboot, and then the applet does a warmboot to activate the new registry. Load User Defaults takes 20 seconds from SD card, or 10 seconds from internal flash.
Save User Defaults	When clicked, a standard Save File dialog is opened, to allow the user to name the Registry Save (.RSG) file. The applet then copies the Active registry to the specified User registry file. Save User Defaults takes 30 seconds to save to SD card, or 10 seconds to save to internal flash.
Load Factory Defaults	The applet copies the Factory Default registry from the OS to the Active registry (by deleting the current registry). The user is asked to verify a reboot, and then the applet does a restart to activate the factory default registry. If a user password has been set, the applet warns the user that the password will be erased, and asks them to enter it before the reboot is allowed.
Warmboot	When clicked, the OS does a registry flush (Active registry saved to Flash registry hive), and then a warmboot.
Restart	When clicked, the OS does a registry flush, and then a restart.

Remove Programs

Start > Settings > Control Panel > Remove Programs

Note: Lists programs installed in RAM that have been marked for removal.

Select a program and tap Remove. Follow the prompts on the screen to uninstall MX9 user-installed only programs. The change takes effect immediately.

Files stored in the **My Documents** folder are not removed using this option.
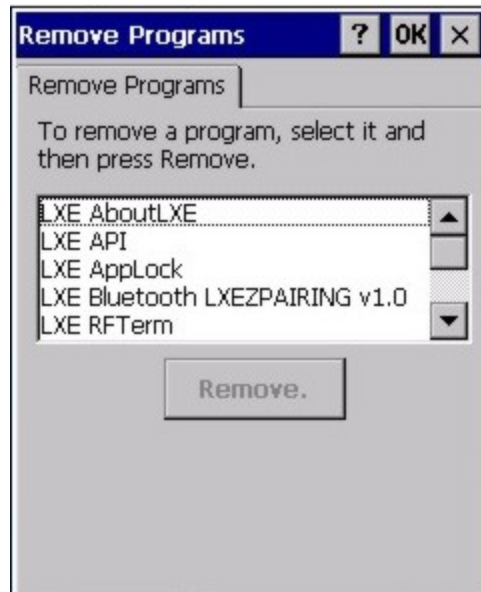
Note: Do not remove Honeywell-installed programs using this option. Contact Technical Assistance for assistance if Honeywell installed programs must be deleted.

Stylus

Start > Settings > Control Panel > Stylus

Use this control panel option to set stylus double-tap sensitivity properties and calibrate the MX9 touch panel when needed.
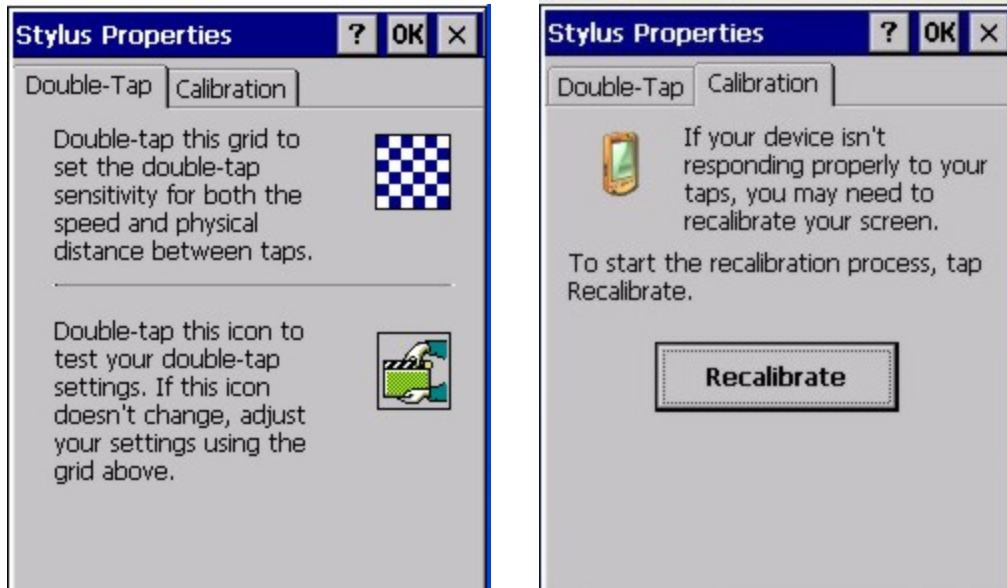
Double Tap

Follow the instructions on the screen and tap the OK button to save any double tap changes.

Calibration Tab

Calibration involves tapping the center of a target. If you miss the center, keep the stylus on the screen, slide it over the target's center, and then lift the stylus.

To begin, tap the **Recalibrate** button on the screen with the stylus. Press and hold the stylus on the center of the target as it moves around the screen. Press the Enter key to keep the new calibration setting or press the Esc key to revert to the previous calibration settings.

System

Start > Settings > Control Panel > System

Use these MX9 panels to:

- Review System and mobile device data and revision levels.
- Adjust Storage and Program memory settings.
- Assign a device name and device descriptor.

Factory Default Settings

General	No user interaction
Memory	1/3 storage, 2/3 program memory
Device Name	Unique to equipment type
Device Description	LXE_*unique to equipment type*
Copyrights	No user interaction

General Tab

System: This screen is presented for information only. The System parameters cannot be changed by the user.

Computer: The processor type is listed. The type cannot be changed by the user. Total computer memory and the identification of the registered user is listed and cannot be changed by the user.

Memory sizes given do not include memory used up by the operating system. For example, a system with 128 MB may only report 99 MB memory, since 29 MB is used by the operating system. This is actual DRAM memory, and does not include internal flash used for storage.

Memory Tab
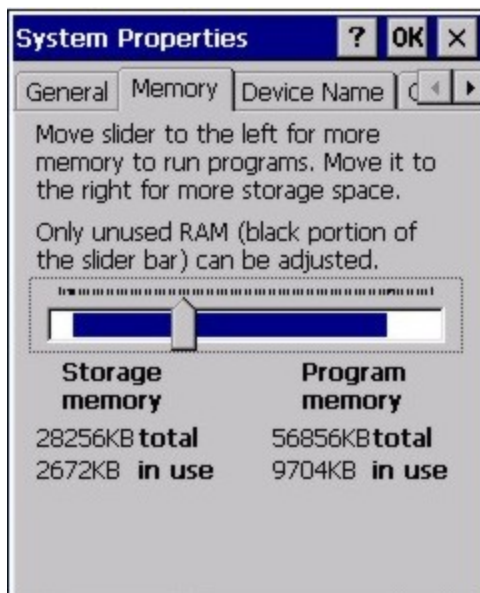
Move the slider to allocate more memory for programs or storage. If there isn't enough space for a file, increase the amount of storage memory. If the mobile device is running slowly, try increasing the amount of program memory.

Device Name Tab

The device name and description can be changed by the user. Enter the name and description using either the keypad or the Input Panel and tap OK to save the changes. This information is used to identify the MX9 to other computers and devices.

Copyrights Tab
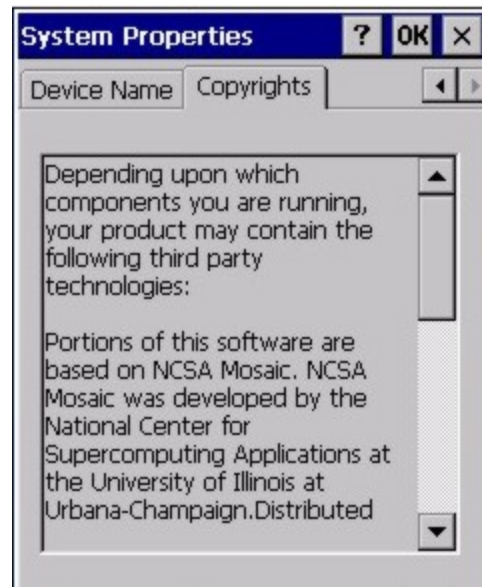
This screen is presented for information only. The Copyrights information cannot be changed by the user.

Terminal Server Client Licenses

Start > Settings > Control Panel > Terminal Server Client Licenses

```
┌─────────────────────────────────────────┐
│ Terminal Server Client Licenses    [ X ] │
│                                          │
│ Stored Licenses: [              ] [ ▼ ]  │
│                                          │
│     [  Delete  ]      [  Save...  ]      │
│                                          │
│  ┌──────────────────────────────┐ [▲]   │
│  │ No Licenses found             │       │
│  │                               │       │
│  │                               │       │
│  │                               │       │
│  │                               │ [▼]   │
│  └──────────────────────────────┘       │
│            [  Close  ]                    │
└─────────────────────────────────────────┘
```

Any licenses stored on the MX9 appear in the drop down list. Select a license and tap the Close button. The license is available for use immediately.

Volume and Sounds

Start > Settings > Control Panel > Volume & Sounds

Note: An application may override the control of the speaker volume. Turning off sounds saves power and prolongs battery life.

Set volume parameters and assign sound WAV files to CE events using these options.

You can also select / deselect sounds for key clicks and screen taps and whether each is loud or soft.

As the volume scrollbar is moved between Loud and Soft, the MX9 emits a tone each time the volume increases or decreases.

Volume must be enabled when you want to adjust volume settings using keypad keys.

Factory Default Settings

Volume	
Events	Enabled
Application	Enabled
Notifications	Disabled
Volume	Middle of Bar
Key click	Disabled
Screen tap	Disabled
Sounds	
Scheme	LOUD!
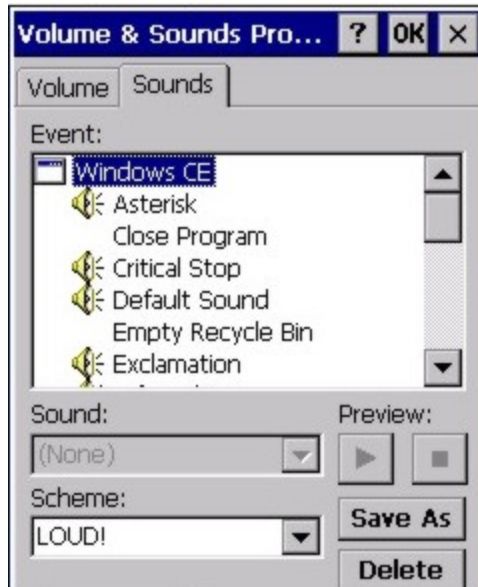
The volume setting is stored in the registry and is recalled at power on.

Note: Rejected bar codes generate a bad scan beep. In some cases, the receipt of data from the scanner triggers a good scan beep from a tethered scanner, and then the rejection of scanned bar code data by the bar code processing causes a bad scan beep from the mobile device on the same data.

Good Scan and Bad Scan Sounds

Good scan and bad scan sounds are stored in the Windows directory, as SCANGOOD.WAV and SCANBAD.WAV. These are unprotected WAV files and can be replaced by a WAV file of the user's choice.

By default a good scan sound on the MX9 is a single beep, and a bad scan sound is a double beep.

WiFi Control Panel

Start > Settings > Control Panel > WiFi or click the Summit Client Utility icon

Use this option to set parameters and manage profiles for the wireless client pre-loaded on your MX9. See the Summit Client Utility for more information.

WWAN

Start > Settings > Control Panel > WWAN

These panels can be used to set the parameters for the Wireless Wide Area Network (WWAN) on the MX9. The WWAN is a form of wireless network that utilizes a cellular network instead of the spread spectrum network most used by Wireless Local Area Networks (WLAN).

Factory Default Settings

Connection tab	
Status	Not Connected
Connect button	Dimmed
Admin Login button	Enabled
Network tab	
Phone, Username, Password, APN	Blank
TCP/IP tab	
DHCP	Enabled, dimmed
DNS	Enabled, dimmed
Addresses	Pre-populated, dimmed
Autoconnect tab	
Automatically connect - turned On	Disabled, dimmed
Automatically reconnect	Enabled, dimmed
Admin tab	
Admin Factory Default Password	LXEWWAN
Enable Radio button	Dimmed
PIN (Personal Identification Number)	Enabled, Blank
PUK (Personal Unblocking Key)	Disabled, Dimmed

Initial Setup
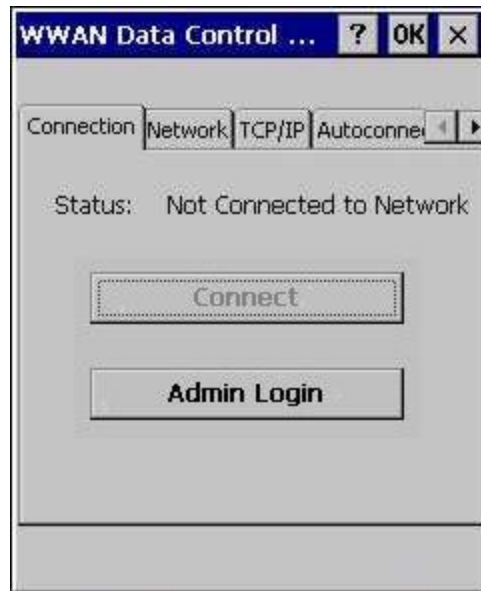
1. Enable the radio by clicking the **Admin Login** button on the Connection panel (the Connect button is dimmed).
2. Enter the password in the Admin Password Entry popup text box. The default case-sensitive password is LXEWWAN. The Connect button is enabled.
3. Click the **Connect** button to begin a connection with a WWAN.
4. Fill in the appropriate fields displayed on the remaining tab panels of the WWAN control panel.

Connection

The Connect button controls Connect/Disconnect operation and the caption of the button changes based on the connection status. The Connect button is dimmed when the radio is disabled or absent.

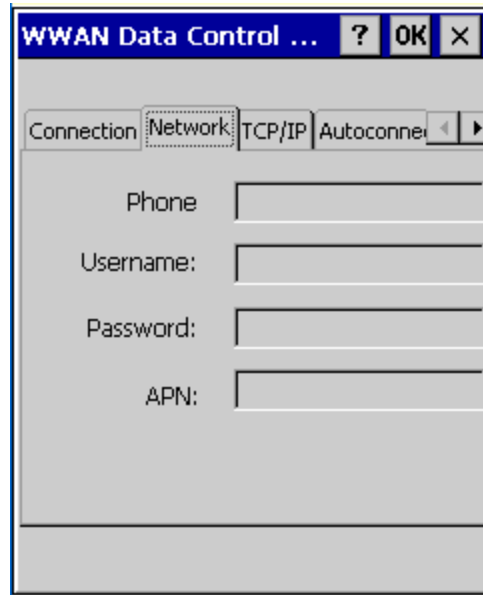Click the Connect button to begin a connection with a WWAN. The button caption changes to Disconnect.

Clicking the Admin Login button displays the Admin Password Entry popup text box. After password entry is successful, the button caption changes to Admin Logout.

Entering an incorrect password causes an error message to be displayed.Enter the password in the popup text box and click the OK button.

Admin Login causes all dimmed buttons and configurable fields on Network, TCP/IP, Autoconnect, and Admin tabs to be enabled.

Network

Enter the following information for the MX9:

- Phone (data access number)
- Username
- Password
- APN (Access Point Name)

Note: Some fields may not require an entry. Contact your system administrator for the information needed.

TCP/IP

The TCPIP tab contains a checkbox for indicating that TCP/IP parameters are to be obtained from the network DHCP server.

This tab also contains fields for entering a static IP address and the addresses of the primary and secondary DNS servers, if DHCP and DNS are not used.
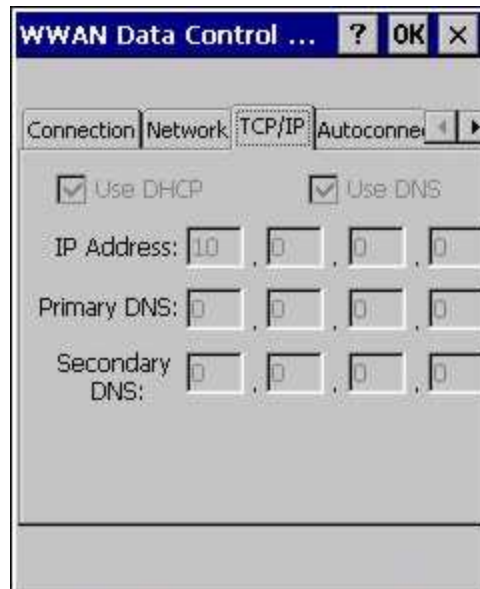
Click the checkbox to enable or disable DHCP and/or DNS. When the **Use DHCP** checkbox is enabled, the static IP address is disabled. When the **Use DNS** checkbox is enabled, the DNS address fields are disabled.

If DHCP and DNS are not used, enter the addresses for:

- Static IP Address
- Primary DNS server
- Secondary DNS server

Autoconnect

The Autoconnect tab contains two checkboxes.
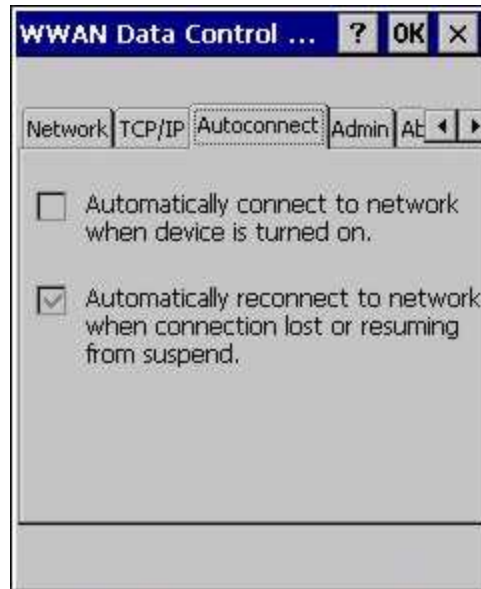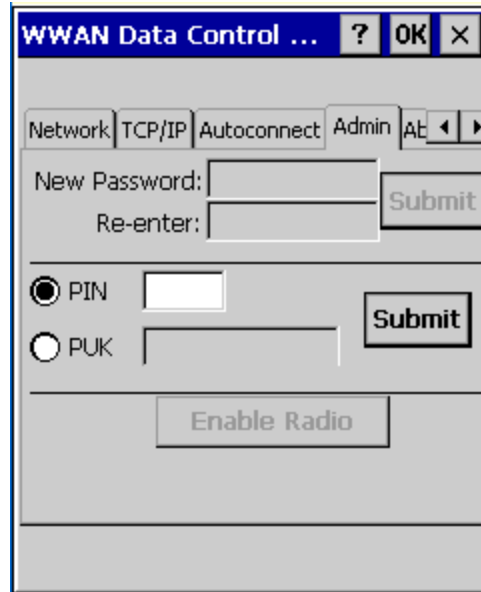
Automatically connect to network when device is turned on. When this checkbox is enabled (checked) the radio automatically connects to the network when the device is turned on (power button is pressed).

Automatically reconnect to network when connection lost or resuming from suspend. When this checkbox is enabled, the radio automatically attempts to reconnect to the network when it is resumed after being in the suspend state. Automatic reconnection applies whether Autoconnect is on or off.

Admin

The Admin tab provides the ability to change the configuration password (see the Connection panel), enter Identification numbers for the SIM card, and provides a button to disable/enable the radio.

Password

Enter a new password, then re-enter the same password. Click Submit to save the new password.

Click the Enable Radio button to turn the radio On or Off. When the radio is Off, the Admin password will need to be entered before the radio can be set to On.

PIN (Personal Identification Number)

The PIN is a unique sequence of numbers stored on the SIM card.

If the radio is enabled and the SIM card requires a PIN, a connection will not occur until the PIN is entered successfully. After entering the PIN code, tap the Submit button. A message is displayed with either Success or the number of retries allowed before the SIM card PIN number entry is locked from further use.

If the radio is disabled, entering and submitting the PIN saves the PIN value on the MX9. The next time the radio is enabled and requires a PIN, the saved PIN will be sent and a PIN will not need to be entered again.

PUK (Personal Unblocking Key)

The PUK is a unique sequence of alpha characters displayed on the SIM card. A default PUK code is not available. After entering the PUK code, tap the Submit button. A message is displayed with either Success or the number of retries allowed before the SIM card PUK entry is locked from further use.

Enable/Disable Radio button

Click the Enable Radio button to turn the radio On or Off. If the radio is currently enabled, the button is labeled Disable Radio. If the radio is currently disabled, the button is labeled Enable Radio.

About

The About tab displays information about the WWAN radio and the current network connection. The About tab displays the SW Version, FW Version and Serial Number of the radio if there is a WAN radio installed in the device. the Local Phone Number shows the subscriber's own number from the SIM card. The current radio enable/disable status is displayed.

The Carrier entry displays the carrier configuration of the SIM card. In addition to the data shown in the dialog box below, the SW Version is displayed as well. The version matches the corresponding version in the **Start > Settings > Control Panel > About > Versions** dialog box. All fields in the About dialog box are read-only. This information is available to all users without requiring the configuration password.
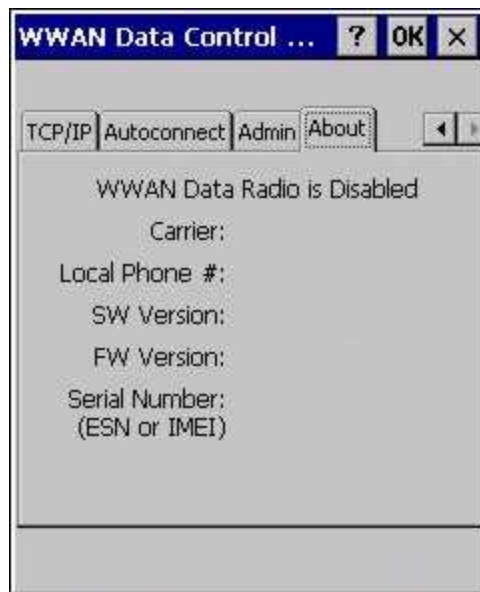
Some of the information shown on this panel can be edited, after logging in, on previous panels:

- Enable Radio
- Carrier Name
- Local Phone Number

Chapter 5: Using ActiveSync

Introduction

Once a relationship (partnership) has been established with Connect (on a desktop computer), ActiveSync will synchronize using the wireless link, serial port, or USB on the MX9.

Requirement : ActiveSync (version 4.5 or higher for **Windows XP** desktop/laptop computers) must be resident on the host (desktop/laptop) computer. **Windows Mobile Device Center** (version 6.1 or higher) is required for a **Windows Vista/Windows 7** desktop/laptop computer. ActiveSync and Windows Mobile Device Center for the PC is available from the Microsoft website. Follow their instructions to locate, download and install ActiveSync or Windows Mobile Device Center on your desktop computer.

Note: For readability in this section, ActiveSync will be used in instructions and explanations. If you have a Windows Vista or Windows 7 operating system on your desktop/laptop, replace ActiveSync with Windows Mobile Device Center.

Using Microsoft ActiveSync, you can synchronize information on your desktop computer with the MX9 and vice versa. Synchronization compares the data on your mobile device with your desktop computer and updates both with the most recent data.

For example, you can:

- Back up and restore your device data.
- Copy (rather than synchronize) files between your device and desktop computer.
- Control when synchronization occurs by selecting a synchronization mode. For example, you can synchronize continually while connected to your desktop computer or only when you choose the synchronize command.

By default, ActiveSync does not automatically synchronize all types of information. Use ActiveSync Options to specify the types of information you want to synchronize. The synchronization process makes the data (in the information types you select) identical on both your desktop computer and your device.

When installation of ActiveSync is complete on your desktop computer, the ActiveSync Setup Wizard begins and starts the following processes:

- connect your device to your desktop computer,
- set up a partnership so you can synchronize information between your device and your desktop computer, and
- customize your synchronization settings.

Because ActiveSync is already installed on your device, your first synchronization process begins automatically when you finish setting up your desktop computer in the ActiveSync wizard. For more information about using ActiveSync on your desktop computer, open ActiveSync, then open ActiveSync Help.

MX9 without Touch Screen

For a MX9, the touch screen can be disabled. It may be easier to configure the MX9 using ActiveSync and LXEConnect rather than using the MX9 keyboard only.

Initial Setup

The initial setup of ActiveSync must be made via a USB or serial connection. When there is a Connect icon on the desktop, this section can be bypassed.

Partnerships can only be created using direct serial or a USB cable connection.

After the partnerships are established, ActiveSync communication can be initiated using:

- USB
- Serial
- Wireless

Connect via USB

The default connection type is **USB Client**

To change the connection type or to verify it is set to USB, select

Start > Settings > Control Panel > PC Connection

USB Client

This will set up the mobile device to use the USB port. Tap OK and ensure the check box for "Allow connection with desktop computer when device is attached" is checked.

Tap OK to return to the Control Panel. If desired, any control panel windows may be closed.

IMPORTANT – DO NOT PUT THE MOBILE DEVICE INTO SUSPEND WHILE CONNECTED VIA USB. The device will be unable to connect to the host PC when it resumes operation.

Connect the correct cable to the PC (the host) and the mobile device (the client) as detailed below. USB will start automatically when the USB cable is connected, not requiring you to select "Connect" from the start menu.

Cable for USB ActiveSync Connection:

MX9051CABLE - MX9 USB Client Cable Assembly (ActiveSync connection)

- Connect the I/O connector to the I/O port on the bottom of the MX9
- The USB client type A plug on the MX9 cable connects to a USB port on a PC or laptop.
- It is not necessary to connect the power receptacle to the MX9 power adapter in order to use ActiveSync. Do not allow the device to enter Suspend while connected.

1. USB client type A plug
2. Power receptacle
3. I/O connector

Serial Connection

The connection type must be changed to **Serial 1 @ 57600**.

To change the connection type select

Start > Settings > Control Panel > PC Connection

Tap the Change button. From the popup list, choose

Serial 1 @ 57600

This will set up the mobile device to use the serial port. Tap OK and ensure the check box for "Allow connection with desktop computer when device is attached" is checked.

Tap OK to return to the Control Panel. If desired, any control panel windows may be closed.
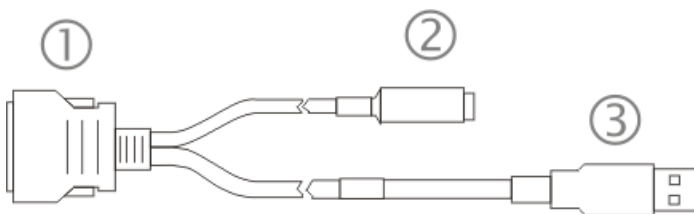
Select Start > Settings > Scanner and ensure the integrated scanner is set to a port that is NOT the same as the ActiveSync port.

Connect the correct cable to the PC (the host) and the mobile device (the client). Select "Connect" from the Start Menu on the client (Start > Programs > Communications > Connect).

Note: Run "Connect" when the "Get Connected" wizard on the host PC is checking COM ports to establish a connection for the first time.

Cable for Serial ActiveSync Connection

MX9055CABLE - MX9 Serial Cable Assembly (ActiveSync connection)

- Connect the I/O connector to the I/O port on the bottom of the MX9.
- The serial port on the MX9 cable connects to a COM port on a PC or laptop.
- It is not necessary to connect the power receptacle to the MX9 power adapter in order to use ActiveSync. Do not allow the MX9 to enter Suspend while connected.
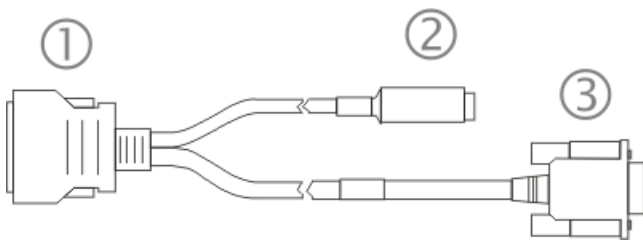
1. I/O connector
2. Power receptacle
3. Serial connector

Wireless Connection

Note: You must establish a partnership with a desktop computer prior to running ActiveSync on the mobile device. The initial partnership must be done using direct serial or USB cable connection.

Once the relationship is established using the serial port, the ActiveSync link in the Start Menu gives a choice of connections, one of which is Network.

Select **Start > Settings > Programs > Communication > ActiveSync**. From the popup list, choose Network and then tap the Connect button.

Synchronizing from the Mobile Device

To synchronize using a wireless LAN card, you must have set up ActiveSync on your desktop computer and completed the first synchronization process before you initiate synchronization from your device.

To initiate synchronization from your MX9, tap **Start > Programs > Communication > ActiveSync** to begin the process.

Tap **Sync** to connect and synchronize. View synchronization status.

Tap **Tools** to synchronize or change synchronization settings. View connection status.

Tap **Stop** to stop synchronization.

Tap **Start > Help** for context-sensitive help.

Explore

From the ActiveSync Dialog on the Desktop PC, tap the Explore button, which allows you to explore the mobile device from the PC side, with some limitations. You can copy files to or from the mobile device by drag-and-drop. You will not be allowed to delete files or copy files out of the \Windows folder on the mobile device. (Technically, the only files you cannot delete or copy are ones marked as system files in the original build of the Windows image. This, however, includes most of the files in the \Windows folder).

Backup Data Files using ActiveSync

Use the following information to backup data files from the mobile device to a desktop or laptop PC using the appropriate cables and Microsoft's ActiveSync.

Prerequisites

A partnership between the mobile device and ActiveSync has been established.

Serial Port Transfer

- A desktop or laptop PC with an available serial port and a mobile device with a serial port. The desktop or laptop PC must be running Windows XP or greater.
- Null modem cable with all control lines connected. Use the null modem cable part number listed in Connect and Communicate.

USB Transfer

- A desktop or laptop PC with an available USB port and a mobile device with a USB port. The desktop or laptop PC must be running Windows XP or greater.
- Use the specific USB cable as listed in Connect Via USB.

Connect

Connect the modem cable to the PC (the host) and the mobile device (the client). Select "Connect" from the Start Menu on the mobile device (Start > Programs > Communications > Connect).

Note: Run "Connect" when the "Get Connected" wizard on the host PC is checking COM ports to establish a connection for the first time.

Note: USB synchronization will start automatically when the cable is connected, not requiring you to select "Connect" from the Start menu.

Disconnect

USB Connection

- Disconnect the cable from the mobile device.
- Tap the status bar icon in the lower right hand corner of the status bar. Then tap the Disconnect button.

IMPORTANT – DO NOT PUT THE MOBILE DEVICE INTO SUSPEND WHILE CONNECTED VIA USB. The device will be unable to connect to the host PC when it resumes operation.

Serial Connection

- Disconnect the cable from the mobile device.
- Put the mobile device into Suspend.
- Tap the status bar icon in the lower right hand corner of the status bar. Then tap the Disconnect button.

Network Connection

- Put the mobile device into Suspend.
- Tap the status bar icon in the lower right hand corner of the status bar. Then tap the Disconnect button.

ActiveSync Help

ActiveSync on the host says that a device is trying to connect, but it cannot identify it

One or more control lines are not connected. This is usually a cable problem, but on a laptop or other device, it may indicate a bad serial port.

If the MX9 is connected to a PC by a cable, disconnect the cable from the MX9 and reconnect it again.

Check that the correct connection is selected (Serial or USB "Client" if this is the initial ActiveSync installation).

See Also: "Cold Boot and Loss of Host Reconnection".

ActiveSync indicator on the host (disc in the toolbar tray) turns green and spins as soon as you connect the cable, before tapping the Connect icon (or REPLLOG.EXE in the Windows directory).

One or more control lines are tied together incorrectly. This is usually a cable problem, but on a laptop or other device, it may indicate a bad serial port.

ActiveSync indicator on the host turns green and spins, but connection never occurs

Baud rate of connection is not supported or detected by host. Check that the correct connection is selected (Serial or USB "Client" if this is the initial ActiveSync installation).

-or-

Incorrect or broken data lines in cable.

ActiveSync indicator on the host remains gray

Solution 1: ActiveSync icon on the PC does not turn green after connecting USB cable from MX9.

1. Disconnect MX9 USB cable from PC.
2. Suspend/Resume or Restart the MX9.
3. In ActiveSync > File > Connection Settings on PC disable Allow USB Connections and click OK.
4. Re-enable Allow USB Connections on the PC and click OK.
5. Reconnect USB cable from MX9 to PC.

Solution 2: The host doesn't know you are trying to connect. May mean a bad cable, with no control lines connected, or an incompatible baud rate. Try the connection again, with a known good cable.

Cold Boot and Loss of Host Re-connection

ActiveSync assigns a partnership between a client and a host computer. A partnership is defined by two objects – a unique computer name and a random number generated when the partnership is first created. An ActiveSync partnership between a unique client can be established to two hosts.

When the mobile device is cold booted, the random number is deleted – and the partnership with the last one of the two hosts is also deleted. The host retains the random numbers and unique names of all devices having a partnership with it. Two clients cannot have a partnership with the same host if they have the same name. (Control Panel > System > Device Name)

If the cold booted mobile device tries to reestablish the partnership with the same host PC, a new random number is generated for the mobile device and ActiveSync will insist the unique name of the mobile device be changed. If the mobile device is associated with a second host, changing the name will destroy that partnership as well. This can cause some confusion when re-establishing partnerships with hosts.

Configuring the MX9 with LXEConnect

LXEConnect allows a user to view the MX9 screen remotely from a PC using an ActiveSync connection:

Requirement : ActiveSync (version 4.5 or higher for **Windows XP** desktop/laptop computers) must be resident on the host (desktop/laptop) computer. **Windows Mobile Device Center** (version 6.1 or higher) is required for a **Windows Vista/Windows 7** desktop/laptop computer. ActiveSync and Windows Mobile Device Center for the PC are available from the Microsoft website. Follow their instructions to locate, download and install ActiveSync or Windows Mobile Device Center on your desktop computer.

Note: For readability in this section, ActiveSync will be used in instructions and explanations. If you have a Windows Vista or Windows 7 operating system on your desktop/laptop, replace ActiveSync with Windows Mobile Device Center.

ActiveSync is already installed on the MX9. The MX9 is preconfigured to establish a USB ActiveSync connection to a PC when the proper cable is attached to the MX9 and the PC.

If the MX9 uses a serial port for ActiveSync, it will be necessary to configure the MX9 to use the serial port. Complete details on the proper cables and port configuration are included in Initial Setup.

Install LXEConnect

1. Install Microsoft ActiveSync on a PC with a USB port. For details, please see Initial Setup.
2. Power up the MX9.
3. Connect the MX9 to the PC using the proper connection cable. Once connected, the ActiveSync dialog box appears. If using the USB connection, the ActiveSync connection is automatically established. If using a serial connection, it is necessary to initiate the connection from the MX9.
4. Select "No" for partnership when prompted. Dismiss any ActiveSync dialog boxes warning a partnership is not set up. It is not necessary to establish a partnership to use LXEConnect. However, if a partnership is desired for other reasons, one may be established now. More details on partnerships are included in ActiveSync Help.
5. When the ActiveSync screen appears, select Explore.
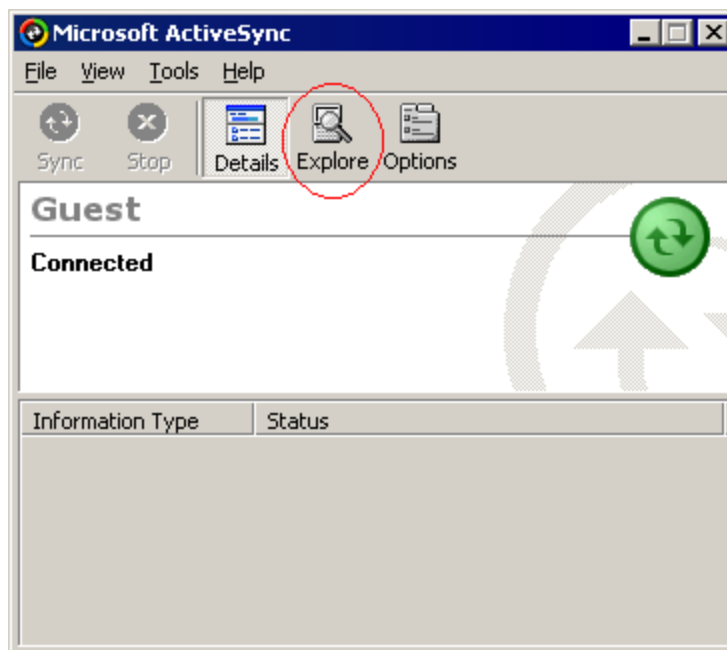
6. An explorer window is displayed for the MX9. Browse to the \System\LXEConnect folder. Contact Technical Assistance for the necessary files if this folder is not present.
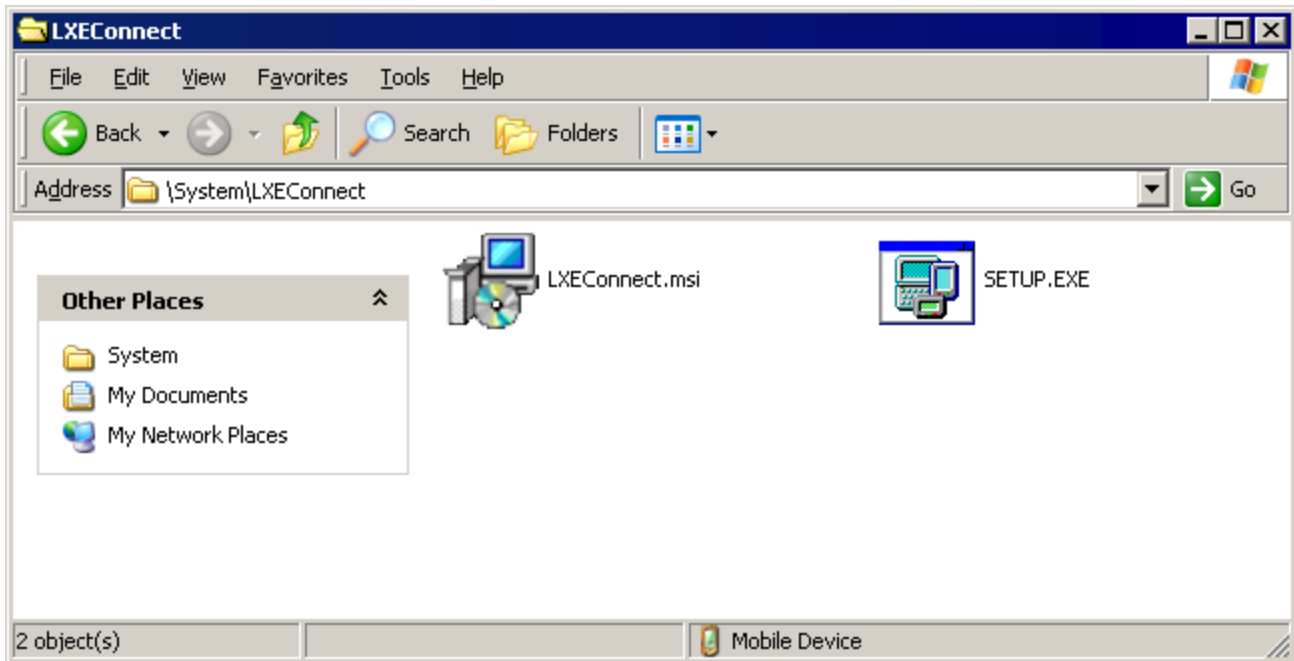
7. Select and copy the LXEConnect.msi and Setup.exe files from the MX9 to the user PC. Note the location chosen for the files.

8. Close the ActiveSync explorer dialog box. Do not disconnect the MX9 ActiveSync connection.

9. Execute the setup.exe file that was copied to the user PC. This setup program installs the LXEConnect utility.
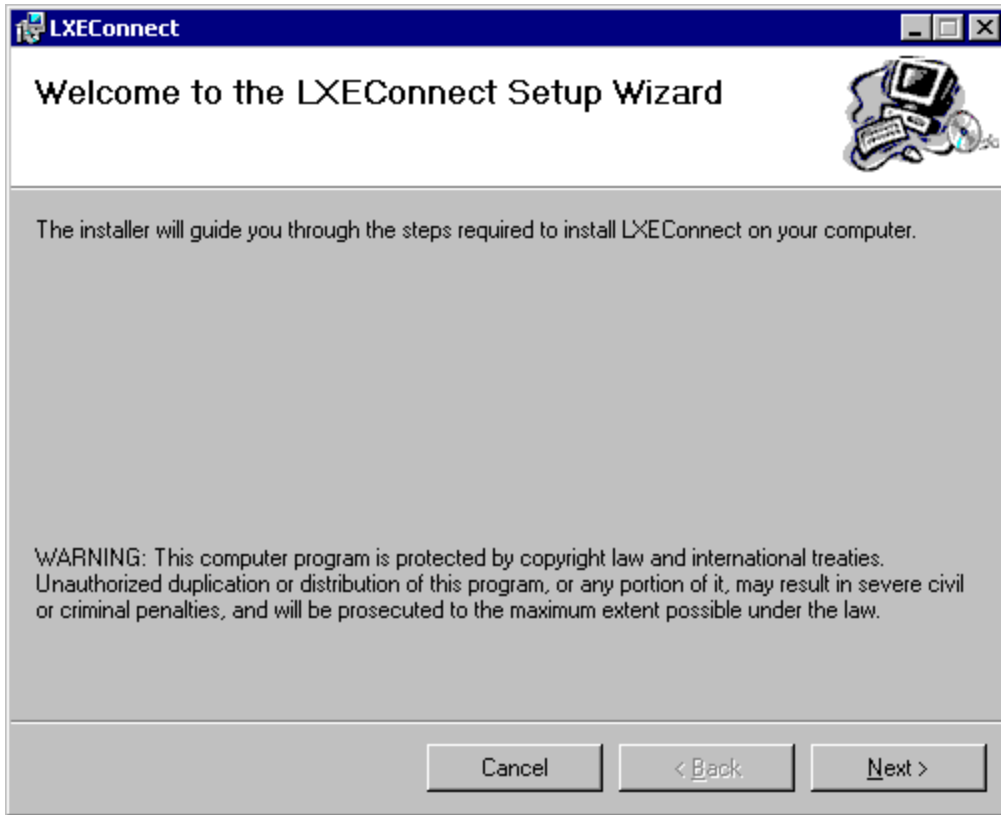
10. Follow the on screen installation prompts. The default installation directory is C:\Program Files\LXE\LXEConnect.

11. When the installation is complete, create a desktop shortcut to the following file: C:\Program Files\LXE\LXEConnect\LXEConnect.exe. If a different directory was selected during installation, please substitute the appropriate directory.

12. LXEConnect is now installed and ready to use.

Using LXEConnect

1. If an ActiveSync connection has not been established, connect the MX9 to the PC.

2. Double-click the LXEConnect icon that was created on the desktop.

3. LXEConnect launches.

4. Click the OK button to dismiss the About CERDisp dialog box on the MX9 desktop by clicking the OK button in the LXEConnect window on the PC desktop. The dialog box automatically times out and disappears after approximately 30 seconds.

5. The MX9 can now be configured from the LXEConnect window. Input from the PC's mouse and keyboard are recognized as if they were attached to the MX9.

6. When the remote session is completed, terminate the LXEConnect program by selecting File > Exit or clicking on the X in the upper right hand corner to close the application, then disconnect the ActiveSync cable.

Note: After using LXEConnect, the MX9 cannot go into Suspend mode until after a warmboot. If using Power Management on a MX9, always warmboot the MX9 when finished using LXEConnect.

Chapter 6: Enabler Installation and Configuration

Introduction

This section discusses Honeywell supported features with Wavelink Avalanche Mobile Device Servers. This section is split into three basic areas:

- Installation
- User Interface
- Enabler Configuration

Installation

To use the Wavelink Avalanche MC System, the following items are required:

- A desktop or laptop PC on which to install the Avalanche MC Console.
- A desktop or laptop PC on which to install the Avalanche Mobile Device Server (this can be the same PC where the Avalanche MC Console is installed).
- Wavelink Avalanche MC Console 4.2 or later.
- A Wavelink Device License for each client device.

To use Avalanche Remote Control, the follow additional items are required:

- Wavelink Remote Control plug-in, 2.0 or later
- A Wavelink Remote Control License for each client device

Installing the Enabler on Honeywell Devices

Honeywell devices have the Avalanche Enabler installation files loaded, but not installed, on the mobile device when it is shipped. The installation files are located in the \System folder on Windows devices.

Note: ***Important:*** *If the user is NOT using Wavelink Avalanche to manage their mobile device(s), the Enabler should not be installed on the mobile device(s). Doing so results in unnecessary delays when booting the device.*

The Avalanche Enabler installation file LXE_ENABLER.CAB is loaded on the MX9 by Honeywell; however, the device is not configured to launch the Enabler installation file automatically. The installation application must be run manually the first time Avalanche is used.

After installation, the Enabler runs as a background application monitoring for updates.

This behavior can be modified by accessing the Avalanche Update Settings panel through the Enabler Interface.

The RMU.CE.CAB file is placed on the device during manufacturing in the \System\RMU folder.

During the Enabler installation process, the Enabler checks for the RMU.CE.CAB file in the \System folder.

- If present, it assumes the RMU.CE.CAB file is already installed and continues.
- If the file RMU.CE.CAB file is not present, it looks for the file in the \System\RMU folder.
- If present, the Enabler copies the file to the \System folder and installs it.

At this point, the OS will automatically install the Remote Management Utility (RMU) after the MX9 reboots.

Enabler Uninstall Process

To remove the Avalanche Enabler from the MX9:

- Delete the Avalanche folder located in the \System directory.
- Warm boot the MX9.

The Avalanche folder cannot be deleted while the Enabler is running. See Stop the Enabler Service.

If sharing errors occur while attempting to delete the Avalanche folder, warm boot the MX9, immediately delete the Avalanche folder, and then perform another warm boot.

Stop the Enabler Service

To stop the Enabler from monitoring for updates from the Mobility Center Console:

1. Open the Enabler Settings Panels by tapping the Enabler icon on the MX9 desktop.
2. Select **File > Settings**.
3. Select the **Startup/Shutdown** tab.
4. Select the **Do not monitor or launch Enabler** parameter to prevent automatic monitoring upon startup.
5. Select **Stop Monitoring** for an immediate shutdown of all Enabler update functionality upon exiting the user interface.
6. Click the **OK** button to save the changes.
7. **Reboot** the MX9 if necessary.

Update Monitoring Overview

There are three methods by which the Enabler on the MX9 can communicate with the Mobile Device Server running on the host machine.

- Wired via a serial cable between the Mobile Device Server PC and the MX9.
- Wired via a USB connection, using ActiveSync, between the Mobile Device Server PC and the MX9.
- Wirelessly via the MX9 2.4GHz radio and an access point

After installing the Enabler on the MX9 the Enabler searches for a Mobile Device Server, first by polling all available serial ports and then over the wireless network.

The Enabler running on the MX9 will attempt to access COM1, COM2, and COM3. "Agent not found" will be reported if the Mobile Device Server is not located or a serial port is not present or available (COM port settings can be verified using the bar code wedge panels on the MX9).

The wireless connection is made using the default wireless [radio] interface on the mobile device therefore the MX9 must be actively communicating with the network for this method to succeed.

If a Mobile Device Server is found, the Enabler automatically attempts to apply all wireless and network settings from the active profile. The Enabler also automatically downloads and processes all available packages.

If the Enabler does not automatically detect the Mobile Device Server, the IP address of the Mobile Device Server can be entered on the Connect tab of the Enabler setup. Please see Enabler Configuration for details.

Mobile Device Wireless and Network Settings

Once the connection to the Mobile Device Server is established, the MX9 Enabler attempts to apply all network and wireless settings contained in the active profile.

The success of the application of settings is dependent upon the local configuration of control parameters for the Enabler.

These local parameters cannot be overridden from the Avalanche MC Console.

The default Enabler adapter control settings are:

- Manage network settings – enabled
- Use Avalanche network profile – enabled
- Manage wireless settings – disabled for Windows devices

To configure the Avalanche Enabler management of the network and wireless settings:

1. Open the Enabler Settings Panels by tapping the **Enabler icon** on the desktop.
2. Select **File > Settings**.
3. Select the **Adapters** tab.
4. Choose settings for the **Use Manual Settings** parameter.
5. Choose settings for **Manage Network Settings**, **Manage Wireless Settings** and **Use Avalanche Network Profile**.
6. Click the **OK button** to save the changes.
7. **Reboot** the device.

Preparing a Device for Remote Management

Two additional utilities are necessary for remote management.

- The **Remote Management Utility (RMU)** must be installed on all mobile devices first – then you can control mobile device reboot, storage RAM adjustment, real-time updates and Avalanche Enabler properties. If the RMU is not already installed on the MX9, see Using Wavelink Avalanche to Upgrade System Baseline.
  If in doubt, verify RMU.CE.CAB exists in the \System folder. If the RMU.CE.CAB file is present when the Enabler is installed, the RMU is also installed.

  Important: If the OS package includes double-byte Asian fonts, the storage RAM property of the RMU must be higher than the default value (40MB).

  If the amount of storage RAM is too low, the Enabler returns a "Mobile unit out of resources" error.

  To determine the minimum value required, inspect the RMU.StorageRAM>=*nn* parameter in the Criteria field for the OS package. Generally, this setting should be approximately 40 MB above the amount of RAM in use on the device for a standard OS and 50MB above the amount of RAM in use for an OS with Asian fonts.

  For example, if after installing all the software, the device shows 5MB in use, this setting should be about 45MB for a standard OS, 55 MB for an Asian font OS.

- Use the **Wireless Configuration Application (WCA)** when you want to remotely manage the Summit client device. This utility is downloaded and installed in addition to the Remote Management Utility. The WCA is included when the Summit radio driver software is updated. The WCA is automatically installed when the radio driver is updated.

If the Remote Management Utility (RMU) is not present on the MX9, see Using Wavelink Avalanche to Upgrade System Baseline.

Using Wavelink Avalanche to Upgrade System Baseline

This procedure assumes the Avalanche Enabler is already installed on the MX9 and is already in communication with the Avalanche MC Console.

Part 1 – Bootstrapping the RMU

1. Install the RMUCEbt package into the Avalanche MC Console. Do NOT include the Reboot option as part of the configuration (i.e., the **Reboot button** in the "Reboot Options" branch must be unbolded).
2. Enable ONLY the RMUCEbt package in the Avalanche MC Console and update the devices. The Remote Management Utility (RMU) is downloaded and automatically installed.
3. **Disable** the RMUCEbt package in the Avalanche MC Console.
4. For each device, **double-click** on the device to open the Client Controls dialog box.
5. Check the **Delete Orphaned Packages** checkbox and click the **Update Now** button.
6. After the sync completes, uncheck **Delete Orphaned Packages** and close the dialog box.

Part 2 – Installing Packages

1. **Enable** the RMUCE package in the Avalanche MC Console.
2. **Enable** all remaining packages and send them down. It is important that you include the new OS package in this group (be sure to include the Enabler). If the radio is to be managed remotely, it is important to include the radio package in this group so that after the reboot the radio can automatically associate. If the radio package is not sent, the device loses connection to the network and manual configuration of the radio parameters is required.
3. Set the Reboot setting for the OS package to **Auto**.
4. After all packages are downloaded (this may take several minutes) the RMU is launched. The RMU processes all the downloaded packages. If the radio package was downloaded, the Wireless Configuration Application (WCA) is launched to process the new radio settings.
5. After the RMU finishes installing all the packages, the device is automatically coldbooted (assuming the Reboot setting was set to Auto in Step 3).
6. After the Device completes the coldboot, the RMU is autoinstalled by the OS and the previously downloaded packages are restored. Assuming at least one package has registry settings that were restored, and that package was set to reboot (either auto or prompt), the RMU then performs an automatic warmboot.
7. After the warmboot, the device is configured.
8. If the device will no longer be monitored by Wavelink Avalanche, you may remove the Enabler to eliminate boot up delays, if desired. Even if the Enabler is removed, the installed packages and their configurations continue to be restored with every reboot by the RMU.

Version Information on Mobile Devices

The VersionInfo.EXE file is included in the Remote Management Utility package downloaded to the MX9. It is stored in the \Program Files\RMU folder. When VersionInfo.EXE is opened, a dialog box is presented to the MX9 user displaying:

- Remote Management Utility (RMU) version
- Wireless Configuration Application (WCA) version

VersionInfo displays the version for each utility only after that utility has been executed at least once.

User Interface

The Enabler can be configured and controlled manually through the user interface on the MX9. This section details the functionality that can be controlled by the user or system administrator.

Parameters and Screen Displays

Screen displays shown in this section are designed to present the end-user with information graphically.

Placement of information on the screen displays may be split between one or many tabbed panels.

Standard Avalanche Enabler parameters that are not supported by Honeywell may be missing or dimmed (visible but unable to be edited) on the tabbed panels or screen displays.

Enabler Configuration

Depending on the version of the Enabler running on the MX9, the desktop Enabler icon may look like one of the following:

The Enabler user interface application is launched by clicking either the **Enabler Settings icon** on the desktop or Taskbar or by selecting **Avalanche Enabler** from the Programs menu.

The opening screen presents the MX9 user with the connection status and a navigation menu.

Note: Some parameters and features described in this section may not be available if you are not running the latest version of the Enabler. Contact Technical Assistance for upgrades.

File Menu Options

Connect	The Connect option under the File menu allows the user to initiate a manual connection to the Mobile Device Server. The connection methods, by default, are wireless and COM connections. Any updates available will be applied to the MX9 immediately upon a successful connection.
Scan Config	*The Scan Configuration feature is not supported.* The Scan Config option under the File menu allows the user to configure Enabler settings using a special bar code that can be created using the Avalanche MC Console utilities. Refer to the Wavelink Avalanche Mobility Center User Guide for details.
Settings	The Settings option under the File menu allows the MX9 user to access the control panel to locally configure the Enabler settings. The Enabler control panel is, by default, password protected. **Input Settings Password** ✕ OK The default Settings password is **system** The password is not case-sensitive.

Avalanche Update using File > Settings

Use these menu options to setup the Avalanche Enabler on the MX9. For best results change the settings and save the changes (reboot) before connecting to the network.

Alternatively, the Mobile Device Server can be disabled until needed (refer to the **Wavelink Avalanche Mobility Center User's Guide** for details).

Menu Options

Note: Your MX9 screen display may not be exactly as shown in the following menu options. Contact Technical Assistance for version information and upgrade availability.

Connection	Enter the IP Address or host name of the Mobile Device Server. Set the order in which serial ports or RF connections are used to check for the presence of the Mobile Device Server.
Execution	*Not available in this release*. Use AppLock, which is resident on each device.
Server Contact	Setup synchronization, scheduled Mobile Device Server contact, suspend and reboot settings.
Data	Control when data is transferred between the device and the Mobile Device Server.
Preferences	Set options for Enabler startup or shutdown and logging. Replaces Startup/Shutdown tab in some versions of Enabler.
Taskbar	Set options for Taskbar. Replaces Startup/Shutdown tab in some versions of Enabler.
Scan Config	This option allows the user to configure Enabler settings using a special bar code that is created by the Avalanche MC Console. *Scan Config not currently supported.*
Display	Set up the Windows display at startup, on connect and during normal mode. The settings can be adjusted by the user.
Shortcuts	Add, delete and update shortcuts to user-allowable applications.
SaaS	Configure the Enabler to connect with Avalanche on Demand.
Adapters	Enable or disable network and wireless settings. Select an adapter and switch between the Avalanche Network Profile and manual settings.
Status	View the current adapter signal strength and quality, IP address, MAC address, SSID, BSSID and Link speed. The user cannot edit this information.

Connection
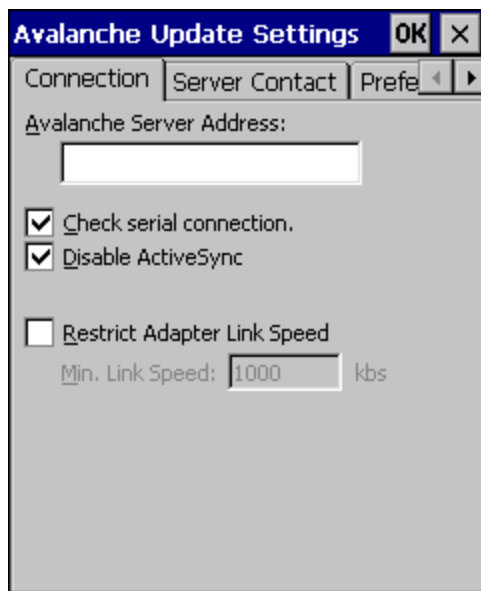
|	
Avalanche Server Address	Enter the IP Address or host name of the Mobile Device Server assigned to the MX9.
Check Serial Connection	Indicates whether the Enabler should first check for serial port connection to the Mobile Device Server before checking for a wireless connection to the Mobile Device Server.
Disable ActiveSync	Disable ActiveSync connection with the Mobile Device Server.
Restrict Adapter Link Speed	Default is disabled. Minimum Link Speed dimmed.

Server Contact
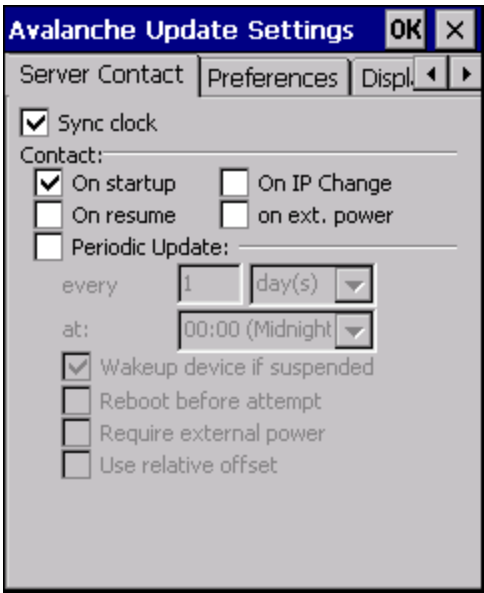
Note: Your MX9 screen display may not be exactly as shown above. Contact Technical Assistance for upgrade availability and version information.

| Sync Clock	Reset the time on the MX9 based on the time on the Mobile Device Server host PC.
Contact	On Startup – Connect to the Mobile Device Server when the Enabler is accessed.
	On Resume – Connect to the Mobile Device Server when resuming from Suspend mode.
	On IP Change – Connect to the Mobile Device Server when the IP address of the MX9 changes.
	On Ext. Power – Initiate connection to the Mobile Device Server when the device is connected to an external power source, such as based on a docking event.
Contact Periodically / Periodic Update	Allows the administrator to configure the Enabler to contact the Mobile Device Server and query for updates at a regular interval.
Wakeup device if sus-pended	If the time interval for periodic contact with the Mobile Device Server occurs, a mobile device that is in Suspend Mode can wakeup and process updates.
Reboot before attempt	Reboot mobile device before attempting to contact Mobile Device Server.
Require external power	Only connect when the mobile device has external power.
Use relative offset	Dimmed.

Data
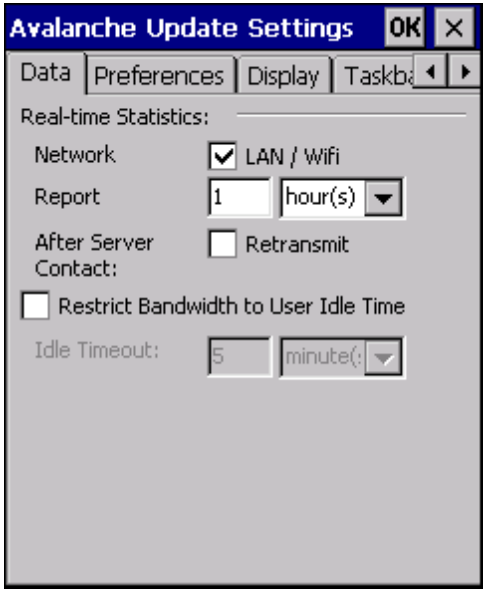
The Data tab controls when data is transferred between the MX9 and the Mobile Device Server.

Real-time Statistics / Network	When checked, the statistics are transmitted over the network by the Enabler.
Report	Specifies the Report Interval, how frequently the Enabler reports statistics to the Mobile Device Server.
Retransmit After Server Contact	Specifies if the device sends statistics to the Mobile Device Server immediately following a connection to the server.
Restrict Bandwidth to User Idle Time	When enabled, periodic updates from the Mobile Device Server are postponed until the MX9 has been idle for the specified period of time. The default is disabled.
Idle timeout	Specify the length of time the device must be idle before a periodic update can run, used when the parameter above is enabled.

Preferences

For best results, use *AppLock* to manage the taskbar. AppLock is resident on each mobile device.
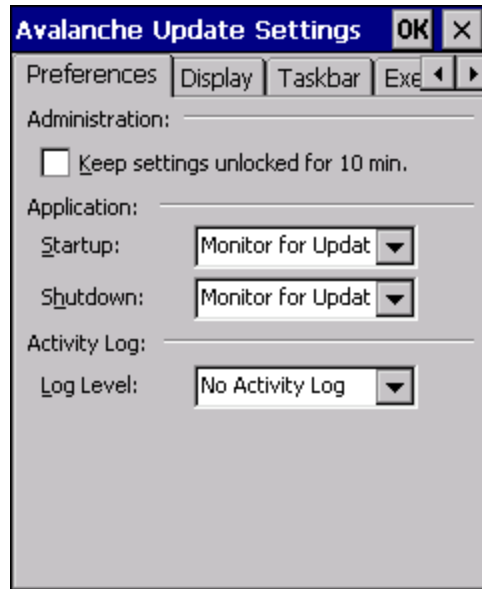
Administration

By default, *Keep settings unlocked for 10 minutes* is disabled (checkbox is blank).

Application

Startup	Behavior of the Enabler when the MX9 boots up. The default is Monitor for Updates. • Do not Monitor - When the device boots, do not launch the Enabler application and do not attempt to connect to the Mobile Device Server. • Monitor for Updates - Attempt to connect to the Mobile Device Server and process any updates that are available. Do not launch the Enabler application. • Launch User Interface - Attempt to connect to the Mobile Device Server and process any updates that are available. Launch the Enabler application.
Shutdown	Behavior of the monitor when the Enabler is exited. The default is Monitor for Updates. • Monitor for Updates - Attempt to connect to the Mobile Device Server and process any updates that are available. Do not launch the Enabler application. • Exit Application - Terminates the monitor (requires successful password entry if a password has been configured).

Activity Log

|	
Log Level	Use this option to control the level of detail recorded in the log file. The default is No Activity Log. • No Activity Log - No log file is written. • Critical - Only critical errors written to the log files. • Error - Communication or configuration problems are written to the log file along with critical messages. • Warning - Possible operation problems are written to the log file along with critical and error messages. • Info - Operational information is written to the log file. • Debug - The most detailed log file.
Display Level	Use this option to control the level of detail shown on the main Enabler screen. The default is Basic Output. • Basic Output - General information is displayed. • Critical - Critical errors are displayed in addition to those above. • Error - Communication or configuration problems are displayed in addition to those above. • Warning - Possible operation problems are displayed in addition to those above. • Info - Operational information is displayed in addition to those above. • Debug - The most detailed list is displayed. .

Display
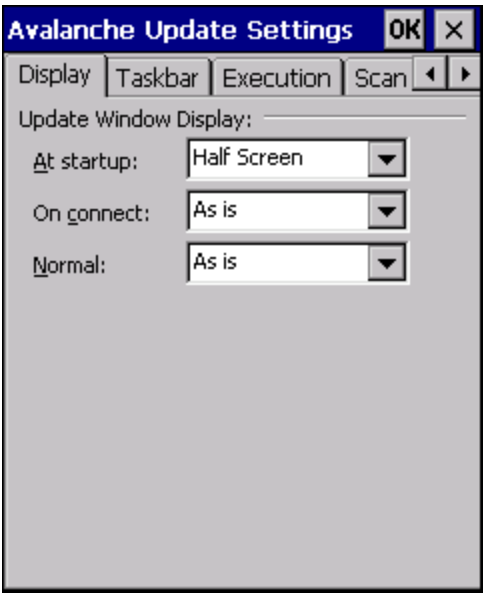
Update Window Display

The user interface for the Enabler can be configured to dynamically change based on the status of the MX9 connection with the Mobile Device Server.

At startup	Default is Half Screen. Options are Half screen, Hidden or Full screen.
On connect	Default is As Is. Options are As is, Half screen, or Full screen.
Normal	Default is As Is. Options are Half screen, Hidden or As Is.

Taskbar

For best results use AppLock to manage the taskbar. AppLock is resident on each mobile device.
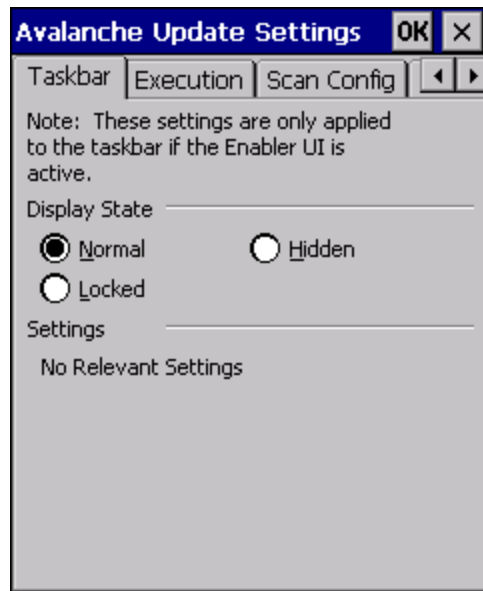
The Display State options control the appearance of the taskbar while using the Enabler interface.

- Normal - taskbar is visible, taskbar icons function normally.
- Hidden - taskbar is not displayed
- Locked - taskbar is visible, but most icons are hidden or for information only.

Execution

Note the dimmed options on this MX9 panel. This menu option is designed to manage downloaded applications for automatic execution upon startup.

| Auto-Execute Selection	An application that has been installed with the Avalanche Management system can be run automatically following each boot.
Select Auto-Execute App	The drop-down box provides a list of applications that have been installed with the Avalanche Management System.
Delay before execution	Time delay before launching Auto-Execute application.

Scan Config

Use eXpress Config and eXpress Scan for this function. eXpress Scan is included with the updated MX9 enablers.
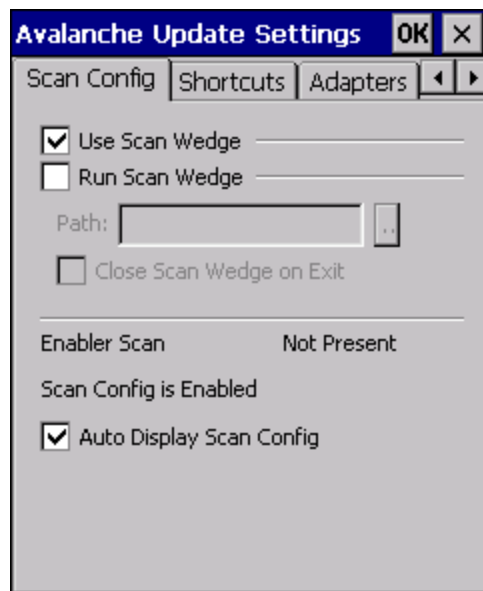
Scan Config functionality is a standard option of the Wavelink Avalanche MC system but is *not currently supported*.
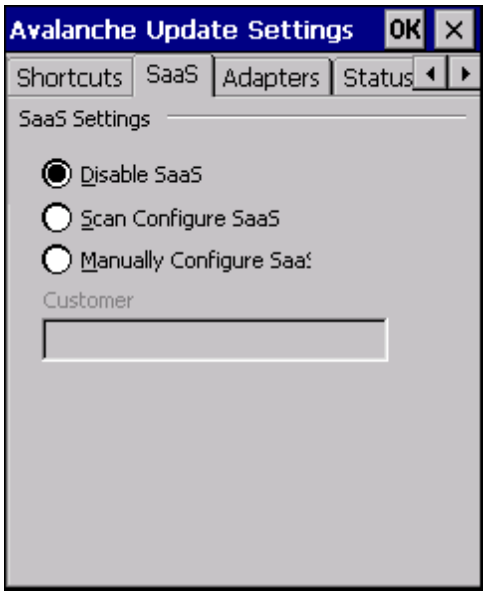
Shortcuts

For best results use AppLock for this function. AppLock is resident on each mobile device.
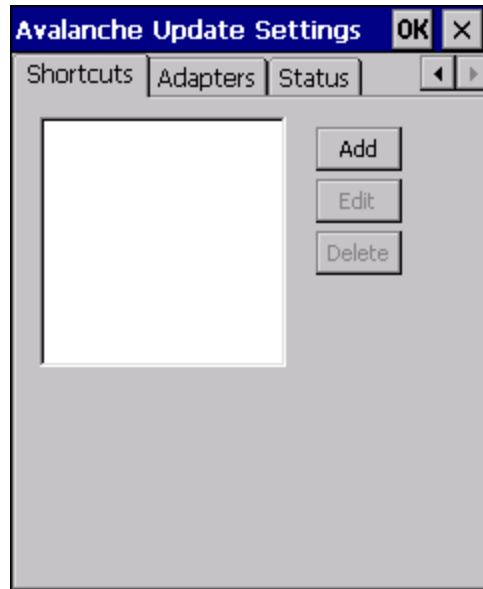
Configure shortcuts to other applications on the MX9. Shortcuts are viewed and activated in the Programs panel. This limits the user's access to certain applications when the Enabler is controlling the mobile device display.
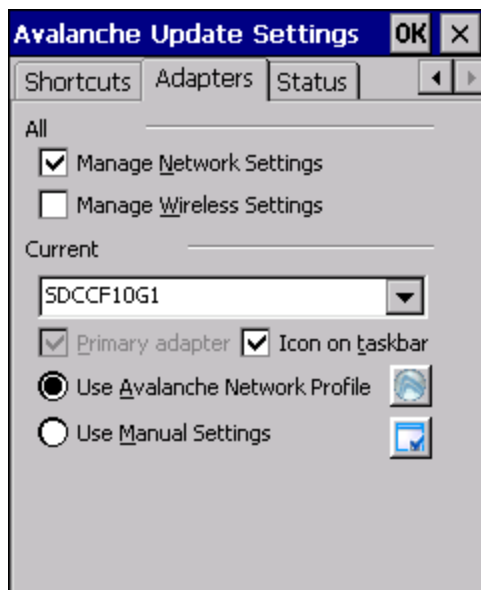
SaaS

Use to configure the Enabler to connect with Avalanche on Demand. This is a Software-as-a-Service version of Avalanche. Using either of the SaaS configuration options below assumes the user has registered with Wavelink.
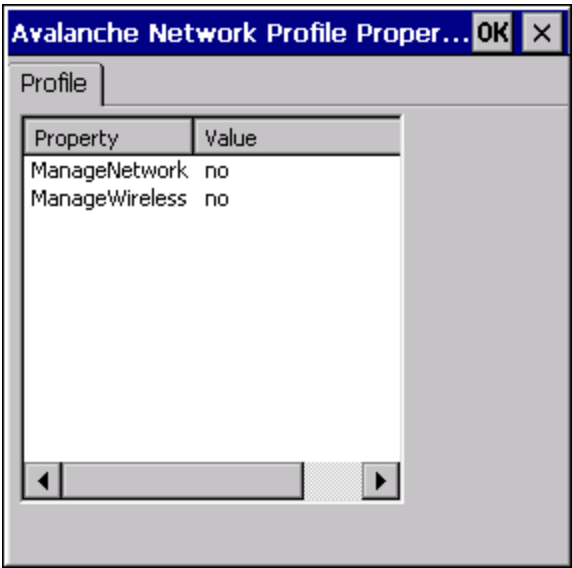
Disable SaaS	No SaaS connection is used.
Scan Configure SaaS	Scan bar codes printed from within the Avalanche Console to configure the Enabler for the SaaS connection.
Manually Configure SaaS	Manually enter the SaaS connection information. Enter the server address on the Connection tab and the customer ID in the Company textbox.

Adapters

Note: Review the network settings configuration utilities and the default values before setting All Adapters to Enable in the Adapters applet.

Manage Network Settings	When enabled, the Enabler will control the network settings. This parameter cannot be configured from the Avalanche Mobility Center Console and is enabled by default.
Manage Wireless Settings	When enabled, the Enabler will control the wireless settings. This parameter cannot be configured from the Avalanche Mobility Center Console and is disabled by default. For Summit clients, Manage Wireless Settings should not be checked as Honeywell configuration packages provide more radio configuration options.
Current Adapter	Lists all network adapters currently installed on the MX9.
Primary Adapter	Indicates if the Enabler is to attempt to configure the primary adapter (active only if there are multiple network adapters).
Icon on taskbar	Places the Avalanche icon in the Avalanche taskbar that may, optionally, override the standard Windows taskbar.
Use Avalanche Network Profile	The Enabler will apply all network settings sent to it by the Mobile Device Server.

Avalanche Icon (varies by Enabler version)	Selecting the Avalanche Icon will access the Avalanche Network Profile tab which will display current network settings.
Use Manual Settings	When enabled, the Enabler will ignore any network or wireless settings coming from the Avalanche MC Console and use only the network settings on the MX9.
Properties Icon	Selecting the Properties icon displays the Manual Settings Properties dialog applet. From here, the user can configure Network, DNS and Wireless parameters using the displays shown below:

Note: A reboot may be required after enabling or disabling these options.

Enabling "Manage Wireless Settings" for Summit Client devices is not recommended.

Note: When you download a profile that is configured to manage network and wireless settings, the Enabler will not apply the manage network and wireless settings to the adapter unless the global Manage wireless settings and Manage network settings options are enabled on the Adapters panel. Until these options are enabled, the network and wireless settings are controlled by the third-party software associated with these settings.

Status

The Status panel displays the current status of the MX9 network adapter selected in the drop down box. Note the availability of the Windows standard Refresh button.

When the Windows Refresh button is tapped, the signal strength, signal quality and link speed are refreshed for the currently selected adapter. It also searches for new adapters and may cause a slight delay to refresh the contents of the drop-down menu.
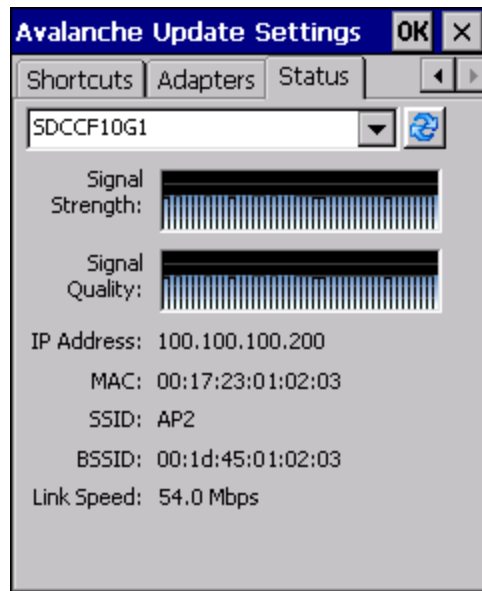
Link speed indicates the speed at which the signal is being sent from the adapter to the MX9. Speed is dependent on signal strength.

Exit

The Exit option is password protected. The default password is **leave**. The password is not case-sensitive.
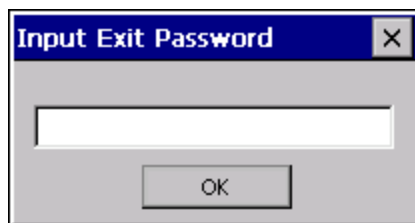
Depending on the behavior chosen for the Shutdown parameter, the following screen may be displayed:

Note: The icon on the screen above may differ based on the version of the Enabler installed on the MX9.

Change the option if desired. Tap the X button to cancel Exit. Tap the OK button to exit the Avalanche applet.

Using Remote Management

1. Configure the radio to connect to the network running the Mobile Device Server. After the MX9 is connected, proceed to step 2.

2. If it is desired to configure the radio using the Summit package, add the configured package to the Wavelink Avalanche MC Console and enable it.

3. Verify RMU.CE.CAB exists in the \System\RMU folder.

4. Double click the MX9 enabler CAB file in the \System folder.

5. The enabler automatically launches after installation and contacts the Mobile Device Server. The Avalanche MC Console connected to that Mobile Device Server identifies the remote device and performs a sync. This downloads any available packages available for the MX9.

Using eXpress Scan

eXpress Scan Desktop Icon

If the MX9 has an eXpress Scan icon on the desktop, eXpress Scan may be used for the initial configuration of the device.

If the eXpress Scan icon is not present on the desktop, install the Enabler. If the icon is still not present, the Enabler must be updated.

If the eXpress Scan icon is present, follow these steps to configure the MX9 to connect with the wireless network and the Mobile Device Server.

Step 1: Create Bar Codes

Bar codes are created with the eXpress Config utility on the desktop/laptop computer, not the mobile device. Depending on the bar code length and the number of parameters selected, eXpress Config generates one or more bar codes for device configuration. The bar codes contain configuration parameters for the wireless client in the mobile device and may also specify the address of the Mobile Device Server.

Bar codes should be printed at a minimum of 600 dpi.

Step 2: Scan Bar Codes

For each mobile device to be configured, please follow these instructions.

Start eXpress Scan on the MX9 by double clicking the eXpress Scan icon.

Enter the bar code password, if any.
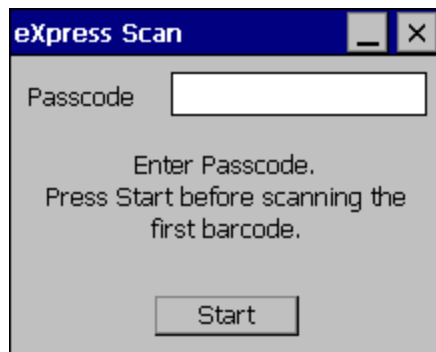
Click Start.

Bar code 1 must be scanned first. The scanned data is displayed in the "Data" text box. The password, if any, entered above is compared to the password entered when the bar codes were created.
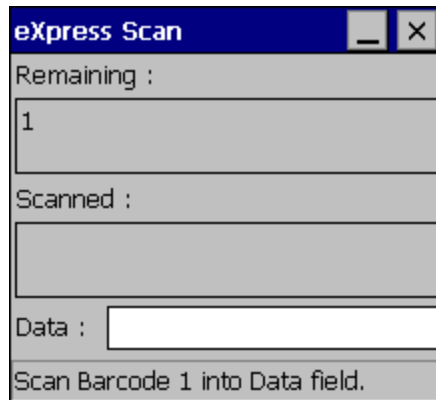
If the passwords match, the bar code data is processed and the screen is updated to reflect the number of bar codes included in the set.

If the passwords do not match, an error message is displayed. The current screen can be closed using the X box in the upper right corner. The password can be re-entered and Bar code 1 scanned again.
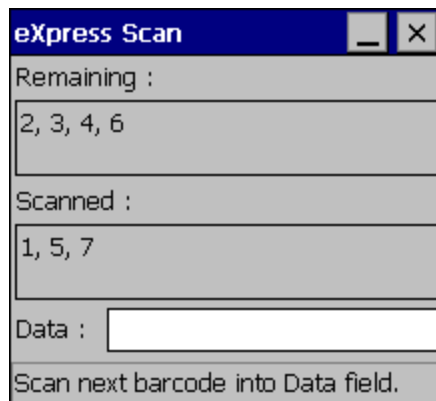
The remaining bar codes may be scanned in any order. After a bar code is scanned, that bar code is removed from the "Remaining:" list and placed in the "Scanned:" list.

Step 3: Process Completion

After the last bar code is scanned, the settings are automatically applied.

Once configured, the MX9 is warmbooted. Once connected to the wireless network and the Mobile Device Server, any software updates and additional configuration data are downloaded.

Chapter 7: Wireless Network Configuration

Introduction

The Summit client device is either an 802.11g radio, capable of both 802.11b and 802.11g data rates or an 802.11a radio, capable of 802.11a, 802.11b and 802.11g data rates. The radio can be configured for no encryption, WEP encryption or WPA security.

Security options supported are

- None
- WEP
- LEAP
- WPA-PSK
- WPA/LEAP
- PEAP-MSCHAP
- PEAP-GTC
- EAP-TLS
- EAP-FAST

Complete configuration options are detailed in the Summit Client Utility.

Important Notes

	It is important that all dates are correct on the MX9 and host computers when using any type of certificate. Certificates are date sensitive and if the date is not correct authentication will fail.
⚠	It may be necessary to upgrade radio software in order to use certain Summit Client Utility (SCU) features. Contact Technical Assistance for help.
⚠	When using the 802.11a radio, the U-NII 1 band is the preferred band for indoor operation. For regulatory domains in which the U-NII 3 band is allowed, the following channels are supported: 149, 157 and 161. The AP must be configured accordingly.

After making any changes to the wireless configuration, warmboot the MX9.

Summit Client Utility

Note: When making changes to profile or global parameters, the device should be warmbooted afterwards.

Start > Programs > Summit > SCU *or*

SCU Icon on Desktop *or*

Summit Tray Icon (if present) *or*

Wi-Fi Icon in the Windows Control Panel (if present)

The Main Tab provides information, admin login and active profile selection.

Profile specific parameters are found on the Profile Tab. The parameters on this tab can be set to unique values for each profile. This tab was labeled Config in early versions of the SCU.

The Status Tab contains information on the current connection.

The Diags Tab provides utilities to troubleshoot the radio.

Global parameters are found on the Global Tab. The values for these parameters apply to all profiles. This tab was labeled Global Settings in early versions of the SCU.

Help

Help is available by clicking the ? icon in the title bar on most SCU screens.

The SCU help may also be accessed by selecting Start > Help and tapping the Summit Client Utility link. The SCU does not have to be accessed to view the help information using this option.

Summit Tray Icon

The Summit tray icon provides access to the SCU and is a visual indicator of radio status.

The Summit tray icon is displayed when:

- The Summit radio is installed and active
- The Windows Zero Config utility is not active
- The Tray Icon setting is On

Click the icon to launch the SCU. Use the tray icon to view the radio status:

	The radio is not currently associated or authenticated to an Access Point
	The signal strength for the currently associated/authenticated Access Point is less than -90 dBm
	The signal strength for the currently associated/authenticated Access Point is -71 dBm to -90 dBm
	The signal strength for the currently associated/authenticated Access Point is -51 dBm to -70 dBm
	The signal strength for the currently associated/authenticated Access Point is greater than -50 dBm

Wireless Zero Config Utility and the Summit Radio

- The WZC utility has an icon in the toolbar that looks like networked computers with a red X through them, indicating that Wireless Zero Config application is enabled but the connection is inactive at this time (the device is not connected to a network). The WZC icon may not be visible until control is passed to the WZC utility as described below.
- You can use either the Wireless Zero Configuration Utility or the Summit Client Utility to connect to your network. Use the Summit Client Utility to connect to your network. The Wireless Zero Configuration Utility cannot control the complete set of security features of the radio.

How To: Use the Wireless Zero Config Utility

1. Select **ThirdPartyConfig** in the Active Profile drop down list as the active profile (see Main Tab).
2. Open the Registry panel and click Warmboot.

The Summit Client Utility passes control to Wireless Zero Config and the WZC Wireless Information control panel. Using the options in the Wireless Zero Config panels, setup radio and security settings. There may be a slight delay before the Wireless Zero Config icon indicates the status of the connection.

How to: Switch Control to SCU

1. To switch back to SCU control, select any other profile in the SCU Active Config drop down list, except **ThirdPartyConfig**.
2. Open the Registry panel and click Warmboot.

Radio control is passed to the SCU.

Main Tab

Start > Programs > Summit > Main tab

Factory Default Settings

Admin Login	SUMMIT
Radio	Enabled
Active Config/Profile	Default
Regulatory Domain	FCC or ETSI

The Main tab displays information about the wireless client device including:

- SCU (Summit Client Utility) version
- Driver version
- Radio Type (BG is an 802.11 b/g radio, ABG is an 802.11 a/b/g radio).
- Regulatory Domain
- Copyright Information can be accessed by tapping the About SCU button
- Active Config profile / Active Profile name
- Status of the client (Down, Associated, Authenticated, etc).

The **Active Profile** can be switched without logging in to Admin mode. Selecting a different profile from the drop down list does not require logging in to Administrator mode. The profile must already exist. For best results perform a Suspend/Resume function after changing profiles. Profiles can be created or edited after the Admin login password has been entered and accepted.

When the profile named "ThirdPartyConfig" is chosen as the active profile, the Summit Client Utility passes control to Windows Zero Config for configuration of all client and security settings for the network module.

The **Disable Radio** button can be used to disable the network card. Once disabled, the button label changes to Enable Radio. By default the radio is enabled.

The **Admin Login** button provides access to editing wireless parameters. Profile and Global may only be edited after entering the Admin Login password.

The password is case-sensitive.

Once logged in, the button label changes to Admin Logout. To logout, either tap the **Admin Logout** button or exit the SCU without tapping the **Admin Logout** button.

Auto Profile

Auto Profile allows the user to configure a list of profiles that the SCU can search when a radio connection is lost. After using the Profile tab to create any desired profiles, return to the Main tab. To specify which profiles are to be included in Auto Profile, click the **List** button.
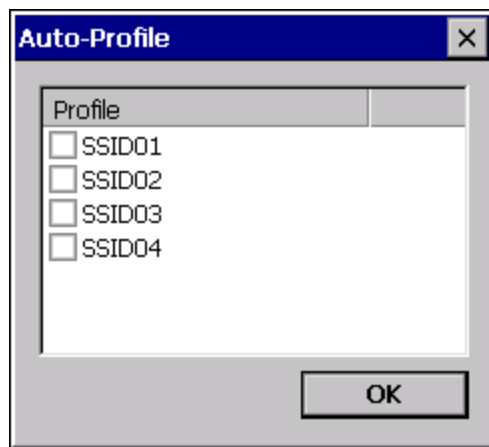
The Auto Profile selection screen displays all currently configured profiles. Click on the checkbox for any profiles that are to be included in Auto Profile selection then click ok to save.

To enable Auto Profile, click the **On** button on the **Main** tab.

When Auto Profile is On, if the radio goes out of range from the currently selected profile, the radio then begins to attempt to connect to the profiles listed under Auto Profile.

The search continues until:

- the SCU connects to and, if necessary, authenticates with, one of the specified profiles or
- the Off button is clicked to turn off Auto Profile.

Note: Do not include any profiles with an Ad Hoc Radio Mode in this listing.

Admin Login

To login to Administrator mode, tap the **Admin Login** button.

Once logged in, the button label changes to Admin Logout. The admin is automatically logged out when the SCU is exited. The Admin can either tap the **Admin Logout** button, or the **OK** button to logout. The Administrator remains logged in when the SCU is not closed and a Suspend/Resume function is performed.

Enter the Admin password (the default password is SUMMIT and is case sensitive) and tap **OK**. If the password is incorrect, an error message is displayed.

The Administrator default password can be changed on the Global tab.

The end-user can:

- Turn the radio on or off on the Main tab.
- Select an active Profile on the Main tab.
- View the current parameter settings for the profiles on the Profile tab.
- View the global parameter settings on the Global tab.
- View the current connection details on the Status tab.
- View radio status, software versions and regulatory domain on the Main tab.
- Access additional troubleshooting features on the Diags tab.

After Admin Login, the end-user can also:

- Create, edit, rename and delete profiles on the Profile tab.
- Edit global parameters on the Global tab.
- Enable/disable the Summit tray icon in the taskbar.

Profile Tab

Start > Programs > Summit > Profile tab

Note: Tap the Commit button to save changes before leaving this panel or the SCU. If the panel is exited before tapping the Commit button, changes are not saved!
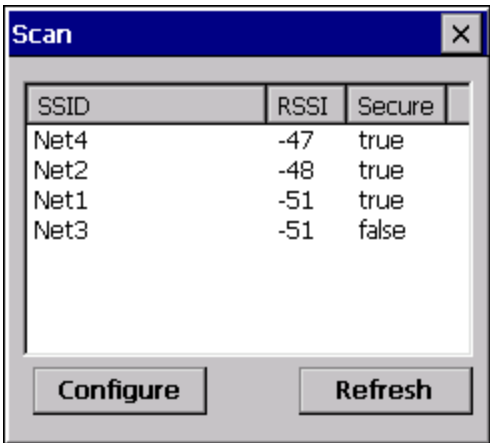
Factory Default Settings

Profile	Default
SSID	Blank
Client Name	Blank
Power Save	Fast
Tx Power	Maximum
Bit Rate	Auto
Radio Mode	See Profile Parameters for default
Auth Type	Open
EAP Type	None
Encryption	None

When logged in as an Admin (see Admin Login), use the Profile tab to manage profiles. When not logged in as an Admin, the parameters can be viewed, and cannot be changed. The buttons on this tab are dimmed if the user is not logged in as Admin. The Profile tab was previously labeled Config.

Buttons

Button	Function
Commit	Saves the profile settings made on this screen. Settings are saved in the profile.
Credentials	Allows entry of a username and password, certificate names, and other information required to authenticate with the access point. The information required depends on the EAP type.
Delete	Deletes the profile. The current active profile cannot be deleted and an error message is displayed if a delete is attempted.
New	Creates a new profile with the default settings (see Profile Parameters) and prompts for a unique name. If the name is not unique, an error message is displayed and the new profile is not created.
Rename	Assigns a new, unique name. If the new name is not unique, an error message is displayed and the profile is not renamed.
Scan	Opens a window that lists access points that are broadcasting their SSIDs. Tap the Refresh button to view an updated list of APs. Each AP's SSID, its received signal strength indication (RSSI) and whether or not data encryption is in use (true or false). Sort the list by tapping on the column headers. If the scan finds more than one AP with the same SSID, the list displays the AP with the strongest RSSI and the least security. If you are logged in as an Admin, tap an SSID in the list and tap the Configure button, you return to the Profile window to recreate a profile for that SSID, with the profile name being the same as the SSID (or the SSID with a suffix such as "_1" if a profile with the SSID as its name exists already).
WEP Keys / PSK Keys	Allows entry of WEP keys or pass phrase as required by the type of encryption.

Note: Unsaved Changes – The SCU will display a reminder if the Commit button is not clicked before an attempt is made to close or browse away from this tab.

Important – The settings for Auth Type, EAP Type and Encryption depend on the security type chosen.

Profile Parameters

Parameter	Default	Explanation
Edit Profile	Default	A string of 1 to 32 alphanumeric characters, establishes the name of the Profile. Options are Default or ThirdPartyConfig.
SSID	Blank	A string of up to 32 alphanumeric characters. Establishes the Service Set Identifier (SSID) of the WLAN to which the client connects.
Client Name	Blank	A string of up to 16 characters. The client name is assigned to the network card and the device using the network card. The client name may be passed to networking wireless devices, e.g., Access Points.
Power Save	Fast	Power save mode is On. Options are: Constantly Awake Mode (CAM) power save off, Maximum (power saving mode) and Fast (power saving mode). When using power management, use FAST for best throughput results.
Tx Power	Maximum	Maximum setting regulates Tx power to the Max power setting for the current regulatory domain. Options are: Maximum, 50mW, 30mW, 20mW, 10mW, 5mW, or 1mW.
Bit Rate	Auto	Setting the rate to Auto will allow the Access Point to automatically negotiate the bit rate with the client device. Options are: Auto, 1 Mbit, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48 or 54 Mbit.
Auth Type	Open	802.11 authentication type used when associating with the Access Point. Options are: Open, LEAP, or Shared key.
EAP Type	None	Extensible Authentication Protocol (EAP) type used for 802.1x authentication to the Access Point. Options are: None, LEAP, EAP-FAST, PEAP-MSCHAP, PEAP-GTC, PEAP-TLS, EAP-TTLS, or EAP-TLS. *Note: EAP Type chosen determines whether the Credentials button is active and also determines the available entries in the Credentials pop-up window.*
Encryption	None	Type of encryption to be used to protect transmitted data. Available options may vary by SCU version. Options are: None, WEP (or Manual WEP), WEP EAP (or Auto WEP), WPA PSK, WPA TKIP, WPA CCKM, WPA2 PSK, WPA2 AES, or WPA2 CCKM. CKIP is not supported on the MX9. *Note: The Encryption type chosen determines if the WEP Keys / PSK Keys button is active and also determines the available entries in the WEP or PSK pop-up window.*

Parameter	Default	Explanation

Radio Mode	BG radio: BG Rates Full Or A radio: BGA Rates Full	Specify 802.11a, 802.11b and/or 802.11g rates when communicating with the AP. The options displayed for this parameter depend on the type of radio (802.11b/g or 802.11a/b/g) installed in the mobile device.
		
		Options:
		
		    B rates only (1, 2, 5.5 and 11 Mbps)
		    BG Rates Full (All B and G rates)
		    G rates only (6, 9, 12, 18, 24, 36, 48 and 54 Mbps)
		    BG optimized or BG subset (1, 2, 5.5, 6, 11, 24, 36 and 54 Mbps)
		    A rates only (6, 9, 12, 18, 24, 36, 48 and 54 Mbps)
		    ABG Rates Full (All A rates and all B and G rates with A rates preferred)
		    BGA Rates Full (All B and G rates and all A rates with B and G rates preferred)
		    Ad Hoc (when connecting to another client device instead of an AP)
		
		Default:
		
		    BG Rates Full (for 802.11b/g radios)
		    BGA Rates Full (for 802.11a/b/g radio)
		
		Note: BG radio only – Previous SCU versions may have the default set as BG Rates Full. Depending on the SCU version, either BG Optimized or BG subset is the default.

It is important the **Radio Mode** parameter correspond to the AP to which the device is to connect. For example, if this parameter is set to G rates only, the MX9 may only connect to APs set for G rates and not those set for B and G rates.

The options for the Radio Mode parameter should be set, based on the antenna configuration, as follows:

Antenna Configuration	Radio Mode
A Main and BG Main	ABG Rates Full BGA Rates Full
A Main and A Aux	A Rates Only
BG Main and BG Aux	B Rates Only G Rates Only BG Rates Full BG Subset

Contact Technical Assistance if you have questions about the antenna(s) installed on your MX9.

Status Tab

Start > Programs > Summit > Status tab
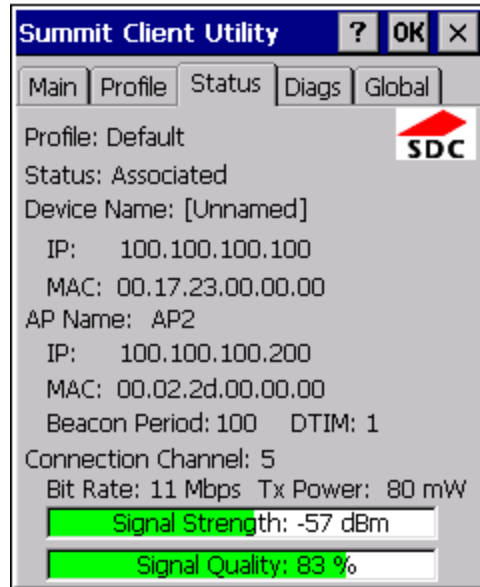
This screen provides information on the radio:

- The profile being used.
- The status of the radio card (down, associated, authenticated, etc.).
- Client information including device name, IP address and MAC address.
- Information about the Access Point (AP) maintaining the connection to the network including AP name, IP address and MAC address.
- Channel currently being used for wireless traffic.
- Bit rate in Mbit.
- Current transmit power in mW.
- Beacon period – the time between AP beacons in kilomicroseconds. (one kilomicrosecond = 1,024 microseconds)
- DTIM interval – A multiple of the beacon period that specifies how often the beacon contains a delivery traffic indication message (DTIM). The DTIM tells power saving devices a packet is waiting for them. For example, if DTIM = 3, then every third beacon contains a DTIM.
- Signal strength (RSSI) displayed in dBm and graphically
- Signal quality, a measure of the clarity of the signal displayed in percentage and graphically.

There are no user entries on this screen.

Note: After completing radio configuration, it is a good idea to review this screen to verify the radio has associated (no encryption, WEP) or authenticated (LEAP, any WPA), as indicated above.

Diags Tab

Start > Programs > Summit > Diags tab
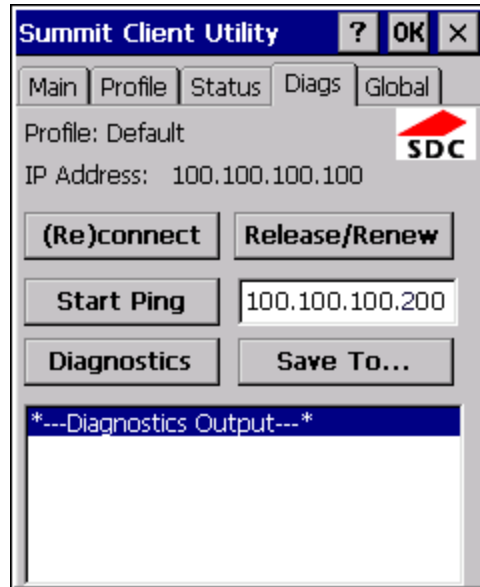
The Diags screen can be used for troubleshooting network traffic and radio connectivity issues.

- **(Re)connect** – Use this button to apply (or reapply) the current profile and attempt to associate or authenticate to the wireless LAN. All activity is logged in the Diagnostic Output box on the lower part of the screen.
- **Release/Renew** – Obtain a new IP address through release and renew. All activity is logged in the Diagnostic Output box. If a fixed IP address has been assigned to the radio, this is also noted in the Diagnostic Output box. Note that the current IP address is displayed above this button.
- **Start Ping** – Start a continuous ping to the IP address specified in the text box to the right of this button. Once the button is clicked, the ping begins and the button label changes to **Stop Ping**. Clicking the button ends the ping. The ping also ends when any other button on this screen is clicked or the user browses away from the Diags tab. The results of the ping are displayed in the Diagnostic Output box.
- **Diagnostics** – Also attempts to (re)connect to the wireless LAN. However, this option provides more data in the Diagnostic Output box than the (Re)connect option. This data dump includes radio state, profile settings, global settings, and a list of broadcast SSID APs.
- **Save To…** – Use this to save the results of the diagnostics to a text file. Use the explorer window to specify the name and location for the diagnostic file. The text file can viewed using an application such as WordPad.

Global Tab

Start > Programs > Summit > Global tab

The parameters on this panel can only be changed when an Admin is logged in with a password. The current values for the parameters can be viewed by the general user without requiring a password.

Note: Tap the Commit button to save changes. If the panel is exited before tapping the Commit button, changes are not saved!

Factory Default Settings

Roam Trigger	-65 dBm
Roam Delta	5 dBm
Roam Period	BG: 10 sec. A: 5 sec.
BG Channel Set	Full
DFS Channels	Off
Ad Hoc Channel	1
Aggressive Scan	On
CCX Features	BG: Off A: Optimized
WMM	Off
Auth Server	Type 1
TTLS Inner Method	Auto-EAP
PMK Caching	Standard
WAPI	Off (dimmed)
TX Diversity	BG: On A: Main Only
RX Diversity	BG: On-Start on Main A: Main Only
Frag Threshold	2346
RTS Threshold	2347
LED	Off
Tray Icon	On
Hide Passwords	On
Admin Password	SUMMIT (or blank)
Auth Timeout	8 seconds
Certs Path	System
Ping Payload	32 bytes

Ping Timeout	5000 ms
Ping Delay ms	1000 ms
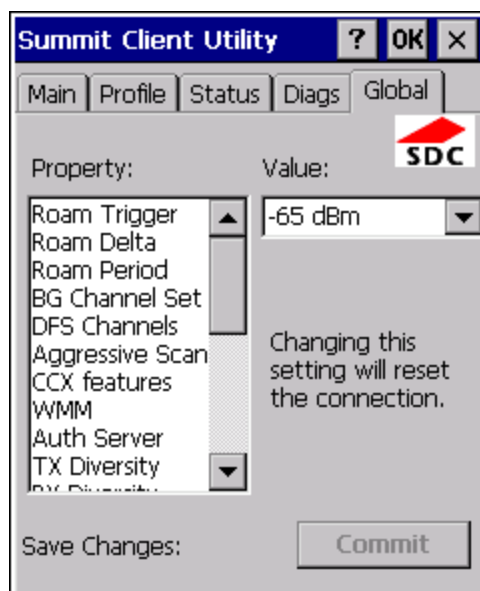
Custom Parameter Option

The Custom option is not supported. The parameter value is displayed as "Custom" when the operating system registry has been edited to set the Summit parameter to a value that is not available from the parameter's drop down list. Selecting Custom from the drop down list has no effect. Selecting any other value from the drop down list will overwrite the "custom" value in the registry.

Global Parameters

Parameter	Default	Function
Roam Trigger	-65 dBm	If signal strength is less than this trigger value, the client looks for a different Access Point with a stronger signal. Options are: -50 dBm, -55, -60, -65, -70, -75, -80, -85, -90 dBm or Custom.
Roam Delta	5 dBm	The amount by which a different Access Point signal strength must exceed the current Access Point signal strength before roaming to the different Access Point is attempted. Options are: 5 dBm, 10, 15, 20, 25, 30, 35 dBm or Custom.
Roam Period	BG: 10 sec. A: 5 sec.	The amount of time, after association or a roam scan with no roam, that the radio collects Received Signal Strength Indication (RSSI) scan data before a roaming decision is made. Options are: 5 sec, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60 seconds or Custom.
BG Channel Set	Full	Defines the 2.4GHz channels to be scanned for an AP when the radio is contemplating roaming. By specifying the channels to search, roaming time may be reduced over scanning all channels. Options are: Full (all channels) 1,6,11 (the most commonly used channels) 1,7,13 (for ETSI and TELEC radios only) Custom.
DFS Channels	Off	Support for 5GHZ 802.11a channels where support for DFS is required. Options are: On, Off. *Note: Not supported (always off) in some releases.*
Ad Hoc Channel	1	Use this parameter when the Radio Mode profile parameter is set to Ad Hoc. Specifies the channel to be used for an Ad Hoc connection to another client device. If a channel is selected that is not supported by the by the radio, the default value is used. Options are: 1 through 14 (the 2.4GHz channels) 36, 40, 44, 48 (the UNII-1 channels)
Aggressive Scan	On	When set to On and the current connection to an AP weakens, the radio aggressively scans for available APs. Aggressive scanning works with standard scanning (set through Roam Trigger, Roam Delta and Roam Period). Aggressive scanning should be set to On unless there is significant co-channel interference due to overlapping APs on the same channel. Options are: On, Off
CCX Features	BG: Off A: Optimized	Use of Cisco Compatible Extensions (CCX) radio management and AP specified maximum transmit power features. Options are: Full - Use Cisco IE and CCX version number, support all CCX features. The option known as "On" in previous versions. Optimized –Use Cisco IE and CCX version number, support all CCX features except AP assisted roaming, AP specified maximum transmit power and radio management. Off - Do not use Cisco IE and CCX version number.

Parameter	Default	Function
		Cisco IE = Cisco Information Element.
WMM	Off	Use of Wi-Fi Multimedia extensions. Options are: On, Off Devices running Windows XP can change the default value. Devices running all other OS cannot change the default value.
Auth Server	Type 1	Specifies the type of authentication server. Options are: Type 1 (ACS server) and Type 2 (non-ACS server)
TTLS Inner Method	Auto-EAP	Authentication method used within the secure tunnel created by EAP-TTLS. Options are: AUTO-EAP (Any available EAP method), MSCHAPV2, MSCHAP, PAP, CHAP, EAP-MSCHAPV2
PMK Caching	Standard	Type of Pairwise Master Key (PMK) caching to use when WPA2 is in use. PMK caching is designed to speed up roaming between APs by allowing the client and the AP to cache the results of 802.1X authentications, eliminating the need to communicate with the ACS server. Standard PMK is used when there are no controllers. The reauthentication information is cached on the original AP. The client and the AP use the cached information to perform the four-way handshake to exchange keys. Opportunistic PMK OPMK) is used when there are controllers. The reauthentication information cached on the controllers. The client and the controller behind the AP use the cached information to perform the four-way handshake to exchange keys. If the selected PMK caching method is not supported by the network infrastructure, every roam requires full 802.11X authentication, including interaction with the ACS server. If the active profile is using WPA2 CCKM, the global PMK Caching setting is ignored and the client attempts to use CCKM. Options are: Standard, OPMK *Note: This change does not take effect until after a Suspend/Resume cycle.*
WAPI	Off	The default is Off and dimmed (cannot be changed).
TX Diversity	BG: On A: Main Only	How to handle antenna diversity when transmitting packets to the Access Point. Options are: Main only (use the main antenna only), Aux only (use the auxiliary antenna only), or On (use diversity or both antennas).

The options for the TX Diversity parameter should be set, based on the antenna configuration, as follows:

Antenna Configuration	TX Diversity
A Main and BG Main	Main Only
A Main and A Aux	On
BG Main and BG Aux	On

Contact Technical Assistance if you have questions about the antenna(s) installed on your MX9.

Parameter	Default	Function
RX Diversity	BG: On-Start on Main A: Main Only	How to handle antenna diversity when receiving packets from the Access Point. Options are: Main Only (use the main antenna only), Aux Only (use the auxiliary antenna only), On-start on Main (on startup, use the main antenna), or On-start on Aux (on startup, use the auxiliary antenna).

The options for the RX Diversity parameter should be set, based on the antenna configuration, as follows:

Antenna Configuration	RX Diversity
A Main and BG Main	Main Only
A Main and A Aux	On-start on Main
BG Main and BG Aux	On-start on Main

Contact Technical Assistance if you have questions about the antenna(s) installed on your MX9.

Parameter	Default	Function
Frag Thresh	2346	If the packet size (in bytes) exceeds the specified number of bytes set in the fragment threshold, the packet is fragmented (sent as several pieces instead of as one block). Use a low setting in areas where communication is poor or where there is a great deal of wireless interference. Options are: Any number between 256 bytes and 2346 bytes.
RTS Thresh	2347	If the packet size exceeds the specified number of bytes set in the Request to Send (RTS) threshold, an RTS is sent before sending the packet. A low RTS threshold setting can be useful in areas where many client devices are associating with the Access Point. Options are: Any number between 0 and 2347.
LED	Off	The LED on the wireless card is not visible to the user when the wireless card is installed in a sealed mobile device. Options are: On, Off.
Tray Icon	On	Determines if the Summit icon is displayed in the System tray. Options are: On, Off
Hide Password	On	When On, the Summit Config Utility masks passwords (characters on the screen are displayed as an *) as they are typed and when they are viewed. When Off, password characters are not masked. Options are: On, Off.
Admin Password	SUMMIT (or Blank)	A string of up to 64 alphanumeric characters that must be entered when the Admin Login button is tapped. If Hide Password is On, the password is masked when typed in the Admin Password Entry dialog box. The password is case sensitive. This value is masked when the Admin is logged out. Options are: none.
Auth Timeout	8 seconds	Specifies the number of seconds the Summit software waits for an EAP authentication request to succeed or fail. If the authentication credentials are stored in the active profile and the authentication times out, the association fails. No error message or prompting for corrected credentials is displayed. If the authentication credentials are not stored in the active profile and the authentication times out, the user is again prompted to enter the credentials. Options are: An integer from 3 to 60.

Parameter	Default	Function
Certs Path	System	A valid directory path, of up to 64 characters, where WPA Certificate Authority and User Certificates are stored on the mobile device when not using the Windows certfcates store. For best results make sure the Windows folder path exists before assigning the path in this parameter. See Certificates for instructions on obtaining CA and User Certificates. This value is masked when the Admin is logged out. Options are: none. For example, when the valid certificate is stored as My Computer/System/MYCERTIFICATE.CER, enter System in the Certs Path text box as the Windows folder path.
Ping Payload	32 bytes	Maximum amount of data to be transmitted on a ping. Options are: 32 bytes, 64, 128, 256, 512, or 1024 bytes.
Ping Timeout ms	5000	The amount of time, in milliseconds, that a device will be continuously pinged. The Stop Ping button can be tapped to end the ping process ahead of the ping timeout. Options are: Any number between 0 and 30000 ms.
Ping Delay ms	1000	The amount of time, in milliseconds, between each ping after a Start Ping button tap. Options are: Any number between 0 and 30000 ms.

Note: Tap the Commit button to save changes. If this panel is closed before tapping the Commit button, changes are not saved!

Sign-On vs. Stored Credentials

When using wireless security that requires a user name and password to be entered, the Summit Client Utility offers these choices:

- The Username and Password may be entered on the Credentials screen. If this method is selected, anyone using the device can access the network.
- The Username and Password are left blank on the Credentials screen. When the device attempts to connect to the network, a sign on screen is displayed. The user must enter the Username and Password at that time to authenticate.

How to: Use Stored Credentials

1. After completing the other entries in the profile, click on the **Credentials** button.
2. Enter the Username and Password on the Credentials screen and click **the OK** button.
3. Click the **Commit** button.
4. For LEAP and WPA/LEAP, configuration is complete.
5. For PEAP-MSCHAP and PEAP-GTC, importing the CA certificate into the Windows certificate store is optional.
6. For EAP-TLS, import the CA certificate into the Windows certificate store. Also import the User Certificate into the Windows certificate store.
7. Access the Credentials screen again. Make sure the **Validate server** and **Use MS store** checkboxes are checked.
8. The default is to use the entire certificate store for the CA certificate. Alternatively, use the **Browse** button next to the CA Cert (CA Certificate Filename) on the Credentials screen to select an individual certificate.
9. For EAP-TLS, also enter the User Cert (User Certificate filename) on the credentials screen by using the **Browse** button.
10. If using EAP FAST and manual PAC provisioning, input the PAC filename and password..
11. Click the **OK** button then the **Commit** button.
12. If changes are made to the stored credentials, click **Commit** to save those changes before making any additional changes to the profile or global parameters.
13. Verify the device is authenticated by reviewing the Status tab. When the device is property configured, the Status tab indicates the device is Authenticated and the method used.

Note: See Configuring the Profile for more details.

Note: If invalid credentials are entered into the stored credentials, the authentication will fail. No error message is displayed and the user is not prompted to enter valid credentials.

How to: Use Sign On Screen

1. After completing the other entries in the profile, click on the **Credentials** button. Leave the Username and Password blank. No entries are necessary on the Credentials screen for LEAP or LEAP/WPA.

2. For PEAP-MSCHAP and PEAP-GTC, importing the CA certificate into the Windows certificate store is optional.

3. For EAP-TLS, import the CA certificate into the Windows certificate store. Also import the User Certificate into the Windows certificate store.

4. Access the Credentials screen again. Make sure the **Validate server** and **Use MS store** checkboxes are checked.

5. The default is to use the entire certificate store for the CA certificate. Alternatively, use the Browse button next to the CA Cert (CA Certificate Filename) on the Credentials screen to select an individual certificate.

6. For EAP-TLS, also enter the User Cert (User Certificate filename) on the credentials screen by using the **Browse** button.

7. Click the **OK** button then the **Commit** button.

8. When the device attempts to connect to the network, a sign-on screen is displayed.

9. Enter the Username and Password. Click the **OK** button.
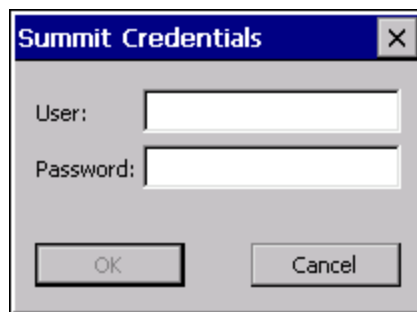
10. Verify the device is authenticated by reviewing the Status tab. When the device is property configured, the Status Tab indicates the device is Authenticated and the method used.

11. The sign-on screen is displayed after a reboot.

Note: See Configuring the Profile for more details.

If a user enters invalid credentials and clicks **OK**, the device associates but does not authenticate. The user is again prompted to enter credentials.

If the user clicks the **Cancel** button, the device does not associate. The user is not prompted again for credentials until:

- the device is rebooted,
- the radio is disabled then enabled,
- the **Reconnect** button on the Diags Tab is clicked or
- the profile is modified and the **Commit** button is clicked.

Windows Certificate Store vs. Certs Path

*Note: It is important that all dates are correct on the MX9 and host computers when using any type of certificate.
        Certificates are date sensitive and if the date is not correct authentication will fail.*

User Certificates

EAP-TLS authentication requires a user certificate. The user certificate must be stored in the Windows certificate store.

- To generate the user certificate, see Generating a User Certificate.
- To import the user certificate into the Windows certificate store, see Installing a User Certificate.
- A Root CA certificate is also needed. Refer to the section below.

Root CA Certificates

Root CA certificates are required for EAP/TLS, PEAP/GTC and PEAP/MSCHAP. Two options are offered for storing these certificates. They may be imported into the Windows certificate store or copied into the Certs Path directory.

How To: Use the Certs Path

1. See Generating a Root CA Certificate and follow the instructions to download the Root Certificate to a PC.
2. Copy the certificate to the specified directory on the mobile device. The default location for Certs Path is \System. A different location may be specified by using the Certs Path global variable. Please note the location chosen for certificate storage should persist after a reboot.
3. When completing the Credentials screen for the desired authentication, do not check the **Use MS store** checkbox after checking the **Validate server** checkbox.
4. Enter the certificate name in the CA Cert textbox.
5. Click **OK** to exit the Credentials screen and then **Commit** to save the profile changes.

How To: Use Windows Certificate Store

1. See Generating a Root CA Certificate and follow the instructions to download the Root Certificate to a PC.

2. To import the certificate into the Windows store, See Installing a Root CA Certificate.

3. When completing the Credentials screen for the desired authentication, be sure to check the **Use MS store** checkbox after checking the **Validate server** checkbox.

4. The default is to use all certificates in the store. If this is OK, skip to the last step.

5. Otherwise, to select a specific certificate click on the **Browse (…)** button.

6. Uncheck the **Use full trusted store** checkbox.

7. Select the desired certificate and click the **Select** button to return the selected certificate to the CA Cert textbox.

8. Click **OK** to exit the Credentials screen and then **Commit** to save the profile changes.

Configuring the Profile

Use the instructions in this section to complete the entries on the Profile tab according to the type of wireless security used by your network. The instructions that follow are the minimum required to successfully connect to a network. Your system may require more parameters than are listed in these instructions. Please see your system administrator for complete information about your network and its wireless security requirements.

To begin the configuration process:

- On the Main Tab, click the Admin Login button and enter the password.
- For best results edit the default profile with the parameters for your network. Select the Default profile from the pull down menu.
- Make any desired parameter changes as described in the applicable following section determined by network security type and click the **Commit** button to save the changes.

IMPORTANT – Remember to click the Commit button after making changes to ensure the changes are saved. Many versions of the SCU display a reminder if the Commit button is not clicked before an attempt is made to close or browse away from the tab in focus if there are unsaved changes.

If changes are made to the *stored credentials*, click Commit to save those changes first before making any additional changes.

No Security

To connect to a wireless network with no security, make sure the following profile options are used.

- Enter the **SSID** of the Access Point assigned to this profile
- Set **EAP Type** to **None**
- Set **Encryption** to **None**
- Set **Auth Type** to **Open**

Once configured, click the **Commit** button.

Ensure the correct Active Profile is selected on the Main tab and warmboot. The SCU Main tab shows the device is associated after the radio connects to the network.

WEP

To connect using WEP, make sure the following profile options are used.

- Enter the **SSID** of the Access Point assigned to this profile
- Set **EAP Type** to **None**
- Set **Encryption** to **WEP** or **Manual WEP** (depending on SCU version)
- Set **Auth Type** to **Open**

Click the **WEP keys/PSKs** button.

Valid keys are 10 hexadecimal or 5 ASCII characters (for 40-bit encryption) or 26 hexadecimal or 13 ASCII characters (for 128-bit encryption). Enter the key(s) and click **OK**.

Once configured, click the **Commit** button.

Ensure the correct Active Profile is selected on the Main tab and warmboot. The SCU Main tab shows the device is associated after the radio connects to the network.

LEAP

To use LEAP (without WPA), make sure the following profile options are used.
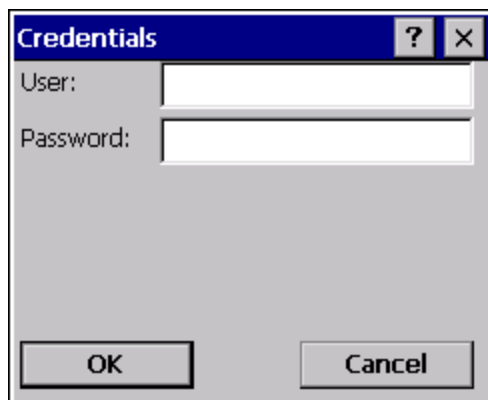
- Enter the **SSID** of the Access Point assigned to this profile
- Set **EAP Type** to **LEAP**
- Set **Encryption** to **WEP EAP** or **Auto WEP** (depending on SCU version)
- Set **Auth Type** as follows:
    - If the Cisco/CCX certified AP is configured for open authentication, set the **Auth Type** radio parameter to **Open**.
    - If the AP is configured to use shared key or passphrase, set the Auth Type radio parameter to **Shared**.
    - If the AP is configured for network EAP only, set the **Auth Type** radio parameter to **LEAP**.

See Sign-On vs. Stored Credentials for information on entering credentials.

To use Stored Credentials, click on the **Credentials** button. No entries are necessary for Sign-On Credentials as the user will be prompted for the Username and Password when connecting to the network.

Enter the Domain\Username (if the Domain is required), otherwise enter the Username.

Enter the password.

Click **OK** then click the **Commit** button.

Ensure the correct Active Profile is selected on the Main tab and warmboot. The SCU Main tab shows the device is associated after the radio connects to the network.
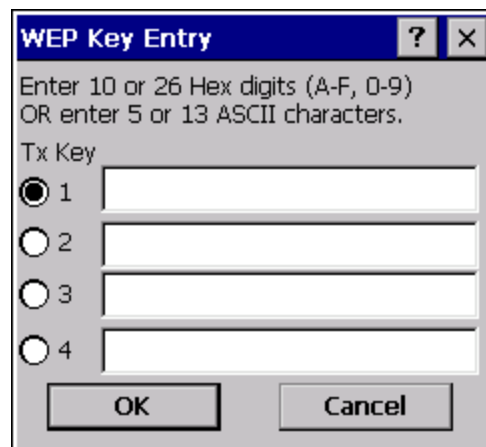
PEAP/MSCHAP

To use PEAP/MSCHAP, make sure the following profile options are used.

- Enter the **SSID** of the Access Point assigned to this profile
- Set **EAP Type** to **PEAP-MSCHAP**
- Set **Encryption** to **WPA TKIP**
- Set **Auth Type** to **Open**

To use another encryption type, select WPA CCKM, WPA2 AES or WPA2 CCKM for encryption and complete other entries as detailed in this section.

See Sign-On vs. Stored Credentials for information on entering credentials.

Click the **Credentials** button.

- No entries except the CA Certificate Filename are necessary for Sign-On Credentials as the user will be prompted for the User Name and Password when connecting to the network.
- For Stored Credentials, User, Password and the CA Certificate Filename must be entered.

Enter these items as directed below.

Enter the Domain\Username (if the Domain is required), otherwise enter the Username.

Enter the password.

Leave the CA Certificate File Name blank for now.

Click **OK** then click **Commit**. Ensure the correct Active profile is selected on the Main Tab.

See Windows Certificate Store vs. Certs Path for more information on certificate storage.

Once successfully authenticated, import the CA certificate into the Windows certificate store. Return to the Credentials screen and check the **Validate server** checkbox.

If using the Windows certificate store:

- Check the **Use MS store** checkbox. The default is to use the Full Trusted Store.
- To select an individual certificate, click on the **Browse** button.
- Uncheck the **Use full trusted store** checkbox.
- Select the desired certificate and click Select. You are returned to the Credentials screen.

If using the Certs Path option:

- Leave the **Use MS store** box unchecked.
- Enter the certificate filename in the CA Cert textbox.

Click **OK** then click **Commit**.

The device should be authenticating the server certificate and using PEAP/MSCHAP for the user authentication.
Ensure the correct Active Profile is selected on the Main tab and warmboot. The SCU Main tab shows the device is associated after the radio connects to the network.

Note: The date must be properly set on the device to authenticate a certificate.

PEAP/GTC

To use PEAP/GTC, make sure the following profile options are used.

- Enter the **SSID** of the Access Point assigned to this profile
- Set **EAP Type** to **PEAP-GTC**
- Set **Encryption** to **WPA TKIP**
- Set **Auth Type** to **Open**

To use another encryption type, select WPA CCKM, WPA2 AES or WPA2 CCKM for encryption and complete other entries as detailed in this section.

See Sign-On vs. Stored Credentials for information on entering credentials.

Click the **Credentials** button.

- No entries except the CA Certificate Filename are necessary for Sign-On Credentials as the user will be prompted for the User Name and Password when connecting to the network.

Enter these items as directed below.

Enter the Domain\Username (if the Domain is required), otherwise enter the Username.

Enter the password.

Leave the CA Certificate File Name blank for now.

Click **OK** then click **Commit**. Ensure the correct Active Profile is selected on the Main Tab.

See Windows Certificate Store vs. Certs Path for more information on certificate storage.

Once successfully authenticated, import the CA certificate into the Windows certificate store. Return to the Credentials screen and check the **Validate server** checkbox.

If using the Windows certificate store:

- Check the **Use MS store** checkbox. The default is to use the Full Trusted Store.
- To select an individual certificate, click on the **Browse** button.
- Uncheck the **Use full trusted store** checkbox.
- Select the desired certificate and click **Select**. You are returned to the Credentials screen.

If using the Certs Path option:

- Leave the **Use MS store box** unchecked.
- Enter the certificate filename in the CA Cert textbox.

Click **OK** then click **Commit**.

The device should be authenticating the server certificate and using PEAP/GTC for the user authentication.
Ensure the correct Active Profile is selected on the Main tab and warmboot. The SCU Main tab shows the device is associated after the radio connects to the network.

Note: *The date must be properly set on the device to authenticate a certificate.*

WPA/LEAP

To use WPA/LEAP, make sure the following profile options are used.

- Enter the **SSID** of the Access Point assigned to this profile
- Set **EAP Type** to **LEAP**
- Set **Encryption** to **WPA TKIP**
- Set **Auth Type** as follows:
    - If the Cisco/CCX certified AP is configured for open authentication, set the **Auth Type** radio parameter to **Open**.
    - If the AP is configured to used shared key or passphrase, set the AuthType radio parameter to **Shared**.
    - If the AP is configured for network EAP only, set the **Auth Type** radio parameter to **LEAP**.

To use another encryption type, select WPA CCKM, WPA2 AES or WPA2 CCKM for encryption and complete other entries as detailed in this section.

See Sign-On vs. Stored Credentials for information on entering credentials.

To use Stored Credentials, click on the **Credentials** button. No entries are necessary for Sign-On Credentials as the user will be prompted for the Username and Password when connecting to the network.

Enter the Domain\Username (if the Domain is required), otherwise enter the Username.

Enter the password.

Click **OK** then click the **Commit** button.

Ensure the correct Active Profile is selected on the Main tab and warmboot. The SCU Main tab shows the device is associated after the radio connects to the network.

EAP-FAST

To use EAP-FAST, make sure the following profile options are used.

- Enter the **SSID** of the Access Point assigned to this profile
- Set **EAP Type** to **EAP-FAST**
- Set **Encryption** to **WPA TKIP**
- Set **Auth Type** to **Open**

To use another encryption type, select WPA CCKM, WPA2 AES or WPA2 CCKM for encryption and complete other entries as detailed in this section.
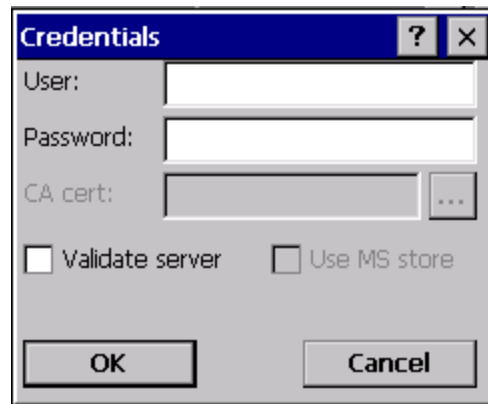
The SCU supports EAP-FAST with automatic or manual PAC provisioning. With automatic PAC provisioning, the user credentials, whether entered on the saved credentials screen or the sign on screen, are sent to the RADIUS server. The RADIUS server must have auto provisioning enabled to send the PAC provisioning credentials to the MX9.

For automatic PAC provisioning, once a username/password is authenticated, the PAC information is stored on the MX9. The same username/password must be used to authenticate each time. See the note below for more details.
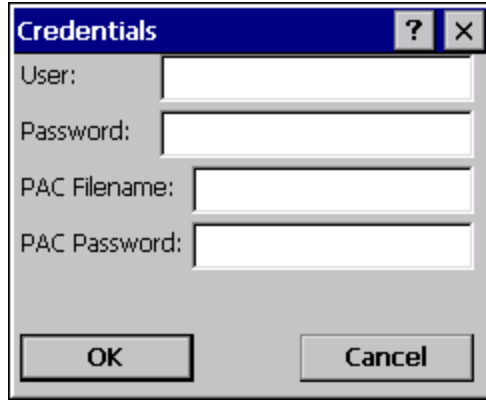
For manual PAC provisioning, the PAC filename and Password must be entered.

See Sign-On vs. Stored Credentials for information on entering credentials.

The entries on the Credentials screen are determined by the type of credentials (stored or sign on) and the type of PAC provisioning (automatic or manual).

Click on the **Credentials** button.

To use Stored Credentials, click on the **Credentials** button. No entries are necessary for Sign-On Credentials with automatic PAC provisioning as the user will be prompted for the Username and Password when connecting to the network.

Credentials dialog box with fields: User:, Password:, PAC Filename:, PAC Password:, and OK / Cancel buttons.

To use Sign-On credentials:

- Do not enter a User and Password as the user will be prompted for the Username and Password when connecting to the network.

To use Stored Credentials:

- Enter the Domain\Username (if the Domain is required), otherwise enter the Username.
- Enter the password.

To use Automatic PAC Provisioning:

- No additional entries are required.

To use manual PAC Provisioning:

- Enter the PAC Filename and PAC Password.
- The PAC file must be copied to the directory specified in the Certs Path global variable. The PAC file must not be read only.

Tap **OK** then click the **Commit** button.

Ensure the correct Active Profile is selected on the Main tab and warmboot. The SCU Main tab shows the device is associated after the radio connects to the network.

Note: When using Automatic PAC Provisioning, once authenticated, there is a file stored in the \System directory with the PAC credentials. If the username is changed, that file must be deleted. The filename is autoP.00.pac.

EAP-TLS

To use EAP-TLS, make sure the following profile options are used.

- Enter the **SSID** of the Access Point assigned to this profile
- Set **EAP Type** to **EAP-TLS**
- Set **Encryption** to **WPA TKIP**
- Set **Auth Type** to **Open**

To use another encryption type, select WPA CCKM, WPA2 AES or WPA2 CCKM for encryption and complete other entries as detailed in this section.
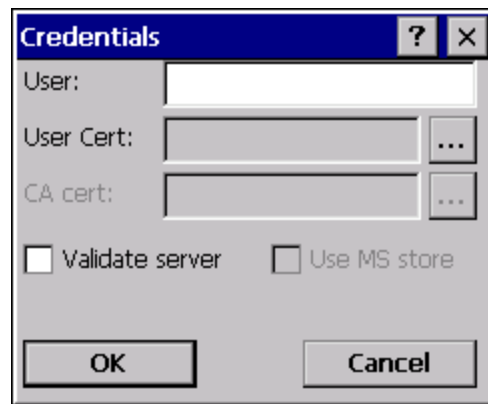
See Sign-On vs. Stored Credentials for information on entering credentials.

Click the **Credentials** button.

- No entries except the User Certificate Filename and the CA Certificate Filename are necessary for Sign-On Credentials as the user will be prompted for the User Name and Password when connecting to the network.
- For Stored Credentials, User, Password and the CA Certificate Filename must be entered.

Enter these items as directed below.

Enter the Domain\Username (if the Domain is required), otherwise enter the Username.

Select a user certificate from the Windows certificate store. Use the **Browse** button to locate the User Cert from the certificate store. Highlight the desired certificate and press the **Select** button. The name of the certificate is displayed in the User Cert box.

Some versions of the SCU require a User Cert password. If this entry field is present, enter the password for the user certificate in the User Cert pwd box.

If there are no user certificates in the Windows certificate store, follow these instructions to generate and install the user certificate.

See Windows Certificate Store vs. Certs Path for more information on CA certificate storage.

Check the **Validate server** checkbox.

If using the Windows certificate store:

- Check the **Use MS store** checkbox. The default is to use the Full Trusted Store.

- To select an individual certificate, click on the **Browse** button.

- Uncheck the **Use full trusted store** checkbox.

- Select the desired certificate and click **Select**. You are returned to the Credentials screen.

If using the Certs Path option:

- Leave the Use MS store box unchecked.

- Enter the certificate filename in the CA Cert textbox.

Click **OK** then click **Commit**.

The MX9 should be authenticating the server certificate and using EAP-TLS for the user authentication.
Ensure the correct Active Profile is selected on the Main tab and warmboot. The SCU Main tab shows the device is associated after the radio connects to the network.
See Certificates for information on generating a Root CA certificate or a User certificate.

Note: The date must be properly set on the device to authenticate a certificate.

WPA PSK

To connect using WPA/PSK, make sure the following profile options are used:

- Enter the **SSID** of the Access Point assigned to this profile
- Set **EAP Type** to **None**
- Set **Encryption** to **WPA PSK** or **WPA2 PSK**
- Set **Auth Type** to **Open**

Click the **WEP keys/PSKs** button.
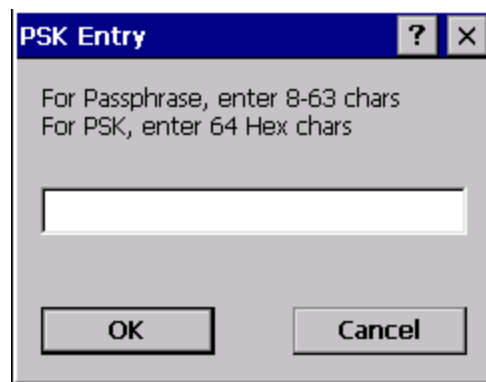
This value can be 64 hex characters or an 8 to 63 byte ASCII value. Enter the key and click **OK**.

Once configured, click the **Commit** button.

Ensure the correct Active Profile is selected on the Main tab and warmboot. The SCU Main tab shows the device is associated after the radio connects to the network.

Certificates

Note: *Please refer to the Security Primer to prepare the Authentication Server and Access Point for communication.*

Note: *It is important that all dates are correct on the MX9 and host computers when using any type of certificate. Certificates are date sensitive and if the date is not correct authentication will fail.*

Quick Start

Root Certificates are necessary for EAP-TLS, PEAP/GTC and PEAP/MSCHAP.

1. Generate a Root CA Certificate and download it to a PC.

2. Connect the MX9 to the desktop PC using ActiveSync and copy the certificate to the MX9 \System folder.

3. Install the Root CA Certificate.

User Certificates are necessary for EAP-TLS

1. Generate a User Certificate and Private Key file and download it to a PC.

2. Connect the MX9 to the desktop PC using ActiveSync and copy the certificate and private key file to the MX9 \System folder.

3. Install the User Certificate and Private Key file.

4. After installation, perform a Suspend/Resume.

5. Verify installation.

Generating a Root CA Certificate

Note: *It is important that all dates are correct on the MX9 and host computers when using any type of certificate. Certificates are date sensitive and if the date is not correct authentication will fail.*

The easiest way to get the root CA certificate is to use a browser on a PC to navigate to the Certificate Authority. To request the root CA certificate, open a browser to

http://<CA IP address>/certsrv.

Sign into the CA with any valid username and password.

Microsoft Certificate Services

Welcome

Use this Web site to request a certificate for your Web browser, e-mail client, or other program. By using a certificate, you can verify your identity to people you communicate with over the Web, sign and encrypt messages, and, depending upon the type of certificate you request, perform other security tasks.

You can also use this Web site to download a certificate authority (CA) certificate, certificate chain, or certificate revocation list (CRL), or to view the status of a pending request.

For more information about Certificate Services, see Certificate Services Documentation.

Select a task:
Request a certificate
View the status of a pending certificate request
Download a CA certificate, certificate chain, or CRL

Click the **Download a CA certificate, certificate chain or CRL** link.

Make sure the correct root CA certificate is selected in the list box.

Microsoft Certificate Services   Home

Download a CA Certificate, Certificate Chain, or CRL

To trust certificates issued from this certification authority,
install this CA certificate chain.

To download a CA certificate, certificate chain, or CRL, select the
certificate and encoding method.

CA certificate:

    Current

Encoding method:

    ⊙ DER
    ○ Base 64

Download CA certificate
Download CA certificate chain
Download latest base CRL
Download latest delta CRL

Click the **DER** button.

To download the CA certificate, click on the **Download CA certificate** link.
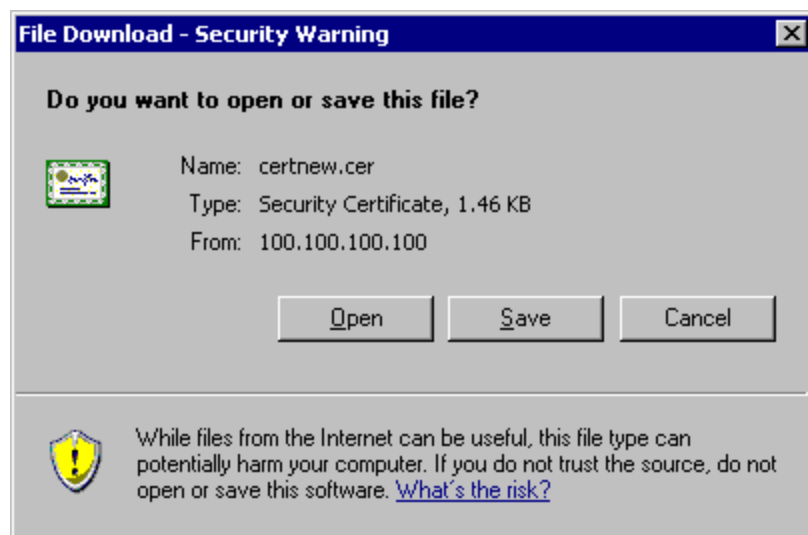
Click the **Save** button and save the certificate. Make sure to keep track of the name and location of the certificate.

Install the certificate on the MX9.

Installing a Root CA Certificate

Note: This section is only if the Windows certificate store is used. If the certificate store is not used, copy the certificate to the \System folder or other path specified in the Summit Certs global parameter.

Copy the certificate file to the MX9. Import the certificate by navigating to **Start > Control Panel > Certificates**.

Certificates

Tap the **Import** button.
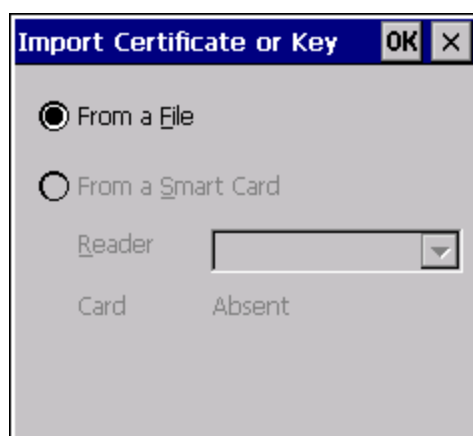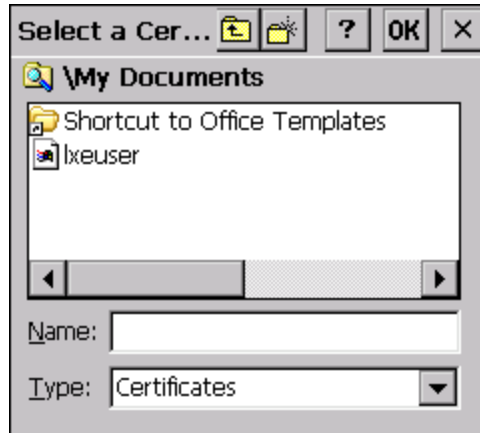
Make sure **From a File** is selected and tap **OK**.

Using the explorer buttons, browse to the location where you copied the certificate, select the certificate desired and tap **OK**.
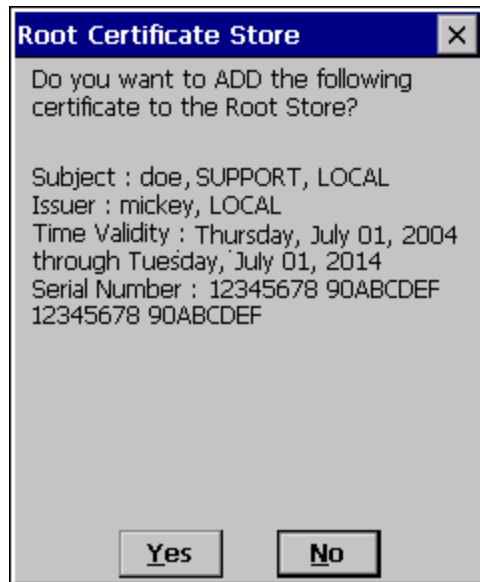
Tap **Yes** to import the certificate.

Once the certificate is installed, return to the proper authentication section, earlier in this manual.

Generating a User Certificate

The easiest way to get the user certificate is to use a browser on a PC to navigate to the Certificate Authority. To request the user certificate, open a browser to

http://<CA IP address>/certsrv.

Sign into the CA with the username and password of the person who will be logging into the mobile device.

This process saves a user certificate and a separate private key file. Windows CE equipped devices such as the MX9 require the private key to be saved as a separate file rather than including the private key in the user certificate.

Microsoft Certificate Services   **Home**

Welcome

Use this Web site to request a certificate for your Web browser, e-mail client, or other program. By using a certificate, you can verify your identity to people you communicate with over the Web, sign and encrypt messages, and, depending upon the type of certificate you request, perform other security tasks.

You can also use this Web site to download a certificate authority (CA) certificate, certificate chain, or certificate revocation list (CRL), or to view the status of a pending request.

For more information about Certificate Services, see Certificate Services Documentation.

Select a task:
   Request a certificate
   View the status of a pending certificate request
   Download a CA certificate, certificate chain, or CRL

Click the **Request a certificate** link.

Microsoft Certificate Services   **Home**

Request a Certificate

Select the certificate type:
   User Certificate

Or, submit an advanced certificate request.

Click on the **advanced certificate request** link.

Microsoft Certificate Services   Home

Advanced Certificate Request

The policy of the CA determines the types of certificates you can request. Click one of the following options to:

Create and submit a request to this CA.

Submit a certificate request by using a base-64-encoded CMC or PKCS #10 file, or submit a renewal request by using a base-64-encoded PKCS #7 file.

Request a certificate for a smart card on behalf of another user by using the smart card certificate enrollment station.
Note: You must have an enrollment agent certificate to submit a request on of another user.

Click on the **Create and submit a request to this CA** link.

Microsoft Certificate Services

Advanced Certificate Request

Certificate Template:

[User ⌄]

Key Options:

⦿ Create new key set   ◯ Use existing key set

CSP: [Microsoft Enhanced Cryptographic Provider v1.0 ⌄]

Key Usage: ⦿ Exchange

Key Size: [1024]   Min: 384   (common key sizes: 512 1024 2048 4096 8192 16384)
Max:16384

⦿ Automatic key container name   ◯ User specified key container name

☑ Mark keys as exportable

    ☑ Export keys to file

    Full path name: [user1key.pvk]

☐ Enable strong private key protection

☐ Store certificate in the local computer certificate store
Stores the certificate in the local computer store instead of in the user's certificate store. Does not install the root CA's certificate. You must be an administrator to generate or use a key in the local machine store.

Additional Options:

Request Format: ⦿ CMC   ◯ PKCS10

Hash Algorithm: [SHA-1 ⌄]
Only used to sign request.

☐ Save request to a file

Attributes: [   ]

Friendly Name: [   ]

[Submit >]

For the **Certificate Template**, select **User**.

Check the **Mark keys as exportable** and the **Export keys to file** checkboxes.

Type the full path on the local PC where the private key is to be copied. Also specify the private key filename.

Be sure to note the name used for the private key file, for example LXEUSER.PVK. The certificate file created later in this process must be given the same name, for example, LXEUSER.CER.

DO NOT check to use strong private key protection.

Make any other desired changes and click the **Submit** button.
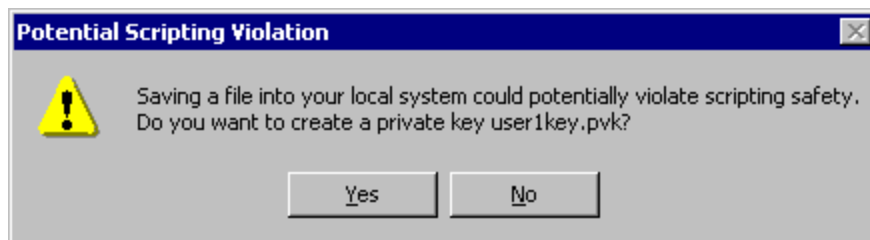
If any script notifications occur, click the "**Yes** button to continue the certificate request.

When prompted for the private key password:

- Click **None** if you do not wish to use a password, or
- Enter and confirm your desired password then click **OK**.

Microsoft Certificate Services   Home

Certificate Issued

The certificate you requested was issued to you.

⊙ DER encoded or ○ Base 64 encoded
Download certificate
Download certificate chain

Click the **Download certificate** link.

File Download - Security Warning

Do you want to open or save this file?

Name: certnew.cer
Type: Security Certificate, 1.46 KB
From: 100.100.100.100

[Open]   [Save]   [Cancel]

While files from the Internet can be useful, this file type can potentially harm your computer. If you do not trust the source, do not open or save this software. What's the risk?
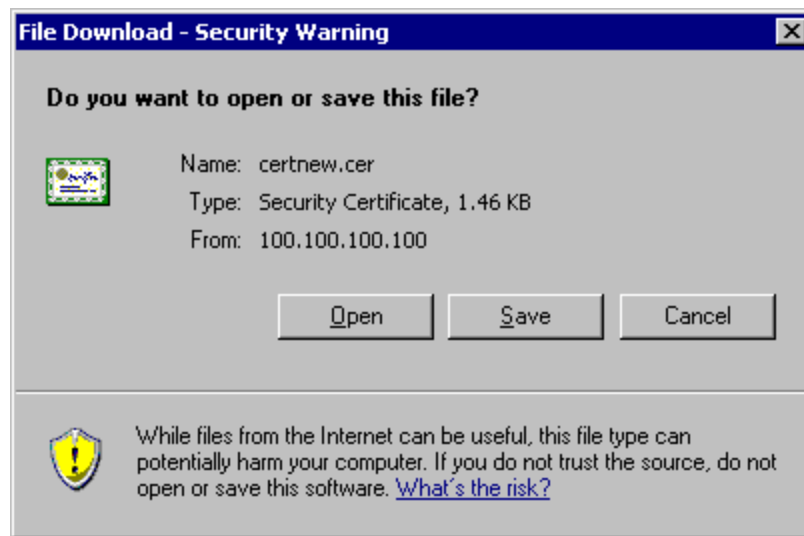
Click **Save** to download and store the user certificate to the PC. Make sure to keep track of the name and location of the certificate. The private key file is also downloaded and saved during this process.

Be sure use the same name for the certificate file as was used for the private key file. For example, it the private key was saved as LXEUSER.PVK then the certificate file created must be given the same name, for example, LXEUSER.CER.

Install the user certificate.

Installing a User Certificate

Copy the certificate and private key files to the MX9. Import the certificate by navigating to **Start > Control Panel > Certificates**.

Certificates

Select **My Certificates** from the pull down list.

Tap the **Import** button.
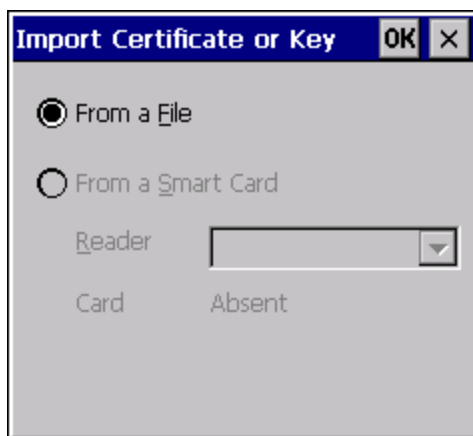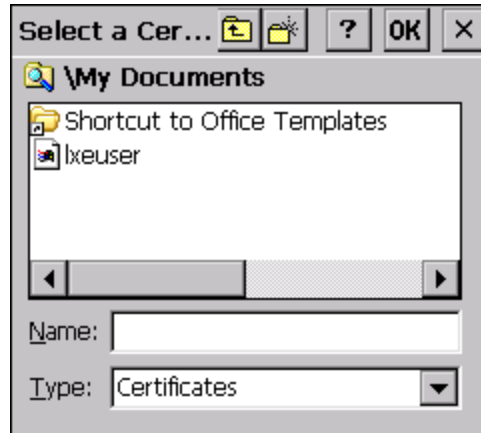
Make sure **From a File** is selected and tap **OK**.

Using the explorer buttons, browse to the location where you copied the certificate, select the certificate desired and tap **OK**. The certificate is now shown in the list.
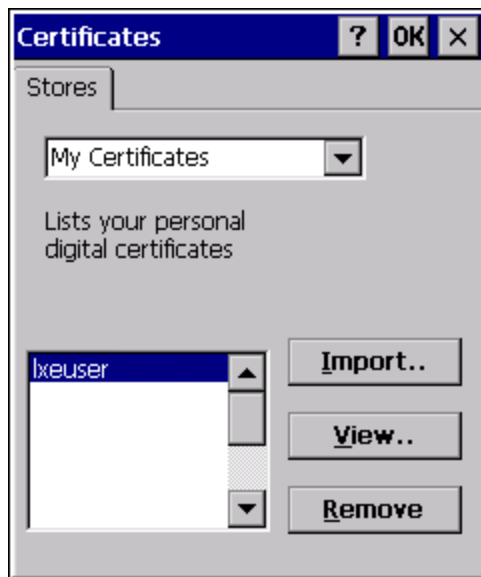
With the certificate you just imported highlighted, tap **View**.

From the Field pull down menu, select **Private Key**.
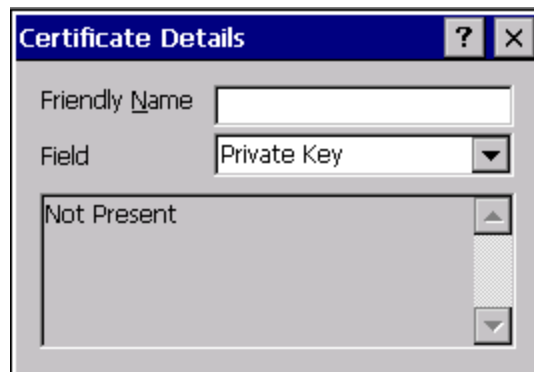
- If the private key is present, the process is complete.
- If the private key is not present, import the private key.

To import the private key, tap **OK** to return to the Certificates screen.

Tap import.
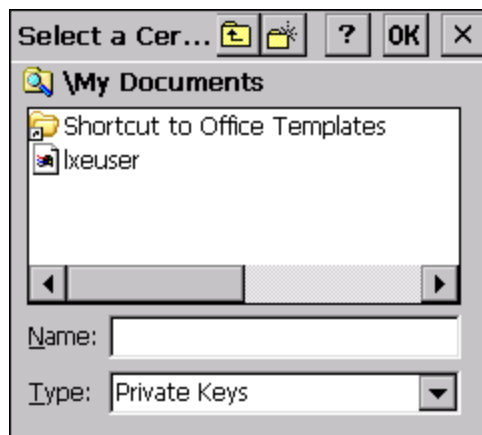
Using the explorer buttons, browse to the location where you copied the private key file, change the Type pull down list to **Private Keys**, select the certificate desired and tap **OK**. Enter the password for the certificate if appropriate.

Verify Installation

Tap on **View** to see the certificate details again.

The private key should now say Present. If it does not, there is a problem. Possible items to check:

- Make sure the certificate was generated with a separate private key file, as shown earlier in this section. If the certificate was not generated with a separate private key file, generate a new certificate and follow the import process again.
- Make sure the certificate and private key file have the same name, for example LXEuser.cer for the certificate and LXEuser.pvk for the private key file. If the file names are not the same, rename the private key file and import it again.

Chapter 8: KeyMaps

Introduction

The keypad is available in a 62-key or 38-key configuration. The 62-key keypad is also available in an IBM 5250 configuration.

- When using a sequence of keys that includes a sticky key, press the sticky key first, release it, then press the rest of the key sequence.
- Sticky keys do not need to be held down while pressing the next (or desired) key.
- When using a sequence of keys that includes the Orange or Blue keys, press the color key first then the rest of the key sequence.
- Alphabetic keys default to lower case letters. Press the Shft/Shift key, then the alphabetic key for an uppercase letter.

Note: *In general, sticky keys refer to those keys that, when pressed once and released, are still in effect and affect the function of the next key pressed.*

62-Key Keypad KeyMap

The following keypad keymap is used on an MX9 that is not running a Terminal Emulator. Terminal emulators use a separate keymap.

A modifier key pressed after itself toggles that modifier key off.

Modifier keys pressed following any other modifier key clears earlier modifier keys.

Any key press, other than the up arrow or down arrow, exits the volume control and backlight control.

To get this function	Press these keys in this order			Result / Notes
Windows key	CTL	ESC		*Windows Start menu*
On (when Off)	Power			*Power On*
Suspend toggle (when On)	Power			*Suspend or Resume mode*
Volume Up	Orange	Right Scan	Up Arrow	*Volume increases*
Volume Up	Blue	V	Up Arrow	*Volume increases*
Volume Down	Orange	Right Scan	Down Arrow	*Volume decreases*
Volume Down	Blue	V	Down Arrow	*Volume decreases*
Display Backlight Lighter	Blue	Right Scan	Up Arrow	*Backlight lighter*
Display Backlight Darker	Blue	Right Scan	Down Arrow	*Backlight darker*
Alt mode	ALT			*Alt mode*
Ctl mode	CTL			*Control mode*
Escape	ESC			*Escape*
Space	SPC			*Space*

To get this function	Press these keys in this order			Result / Notes
Enter	Enter			*Enter*
Capslock toggle	Blue	TAB		*Capslock is on or off*
Mapped Diamond 1 Key	Diamond 1			*Use the Keymap Control Panel to change default*
Mapped Diamond 2 Key	Blue	Diamond 1		*Use the Keymap Control Panel to change default*
Uppercase Alpha toggle	SHFT			*Shifted letter*
Back space	BS (Backspace)			*Back one space*
Tab	TAB			*Tab*
Backtab	Orange	TAB		*Backtab*
Cursor Up	Up Arrow			*Cursor up one line*
Cursor Down	Down Arrow			*Cursor down one line*
Cursor Right	Blue	Up Arrow		*Cursor right one space*
Cursor Left	Blue	Down Arrow		*Cursor left one space*
Insert	Blue	I (letter i)		*Insert mode*
Insert	Orange	CTL		*Insert mode*
Delete	Orange	BS		*Delete one character*
Home	Orange	SHFT	Down Arrow	*Home*
End	Orange	SHFT	Up Arrow	*End*
Page up	Orange	Up Arrow		*Up 1 screen*
Page down	Orange	Down Arrow		*Down 1 screen*
F1	F1			*F1 mode*
F2	F2			*F2 mode*
F3	F3			*F3 mode*
F4	F4			*F4 mode*
F5	F5			*F5 mode*
F6	F6			*F6 mode*
F7	F7			*F7 mode*
F8	F8			*F8 mode*
F9	F9			*F9 mode*
F10	F10			*F10 mode*
F11	Blue	F1		*F11 mode*

To get this function	Press these keys in this order			Result / Notes
F12	Blue	F2		*F12 mode*
F13	Blue	F3		*F13 mode*
F14	Blue	F4		*F14 mode*
F15	Blue	F5		*F15 mode*
F16	Blue	F6		*F16 mode*
F17	Blue	F7		*F17 mode*
F18	Blue	F8		*F18 mode*
F19	Blue	F9		*F19 mode*
F20	Blue	F10		*F20 mode*
F21	SHFT	F1		*F21 mode*
F22	SHFT	F2		*F22 mode*
F23	SHFT	F3		*F23 mode*
F24	SHFT	F4		*F24 mode*
a	A			*a (lowercase is the default)*
b	B			*b*
c	C			*c*
d	D			*d*
e	E			*e*
f	F			*f*
g	G			*g*
h	H			*h*
i	I			*i*
j	J			*j*
k	K			*k*
l	L			*l*
m	M			*m*
n	N			*n*
o	O			*o*
p	P			*p*
q	Q			*q*
r	R			*r*
s	S			*s*
t	T			*t*

To get this function	Press these keys in this order			Result / Notes
u	U			*u*
v	V			*v*
w	W			*w*
x	X			*x*
y	Y			*y*
z	Z			*z*
A	SHFT	A		*A*
B	SHFT	B		*B*
C	SHFT	C		*C*
D	SHFT	D		*D*
E	SHFT	E		*E*
F	SHFT	F		*F*
G	SHFT	G		*G*
H	SHFT	H		*H*
I	SHFT	I		*I*
J	SHFT	J		*J*
K	SHFT	K		*K*
L	SHFT	L		*L*
M	SHFT	M		*M*
N	SHFT	N		*N*
O	SHFT	O		*O*
P	SHFT	P		*P*
Q	SHFT	Q		*Q*
R	SHFT	R		*R*
S	SHFT	S		*S*
T	SHFT	T		*T*
U	SHFT	U		*U*
V	SHFT	V		*V*
W	SHFT	W		*W*
X	SHFT	X		*X*
Y	SHFT	Y		*Y*
Z	SHFT	Z		*Z*
1	1			*1*
2	2			*2*

To get this function	Press these keys in this order			Result / Notes
3	3			*3*
4	4			*4*
5	5			*5*
6	6			*6*
7	7			*7*
8	8			*8*
9	9			*9*
0 (zero)	0			*0 (zero)*
. (period)	Orange	SPC		*Period*
. (period)	Orange	K		*Period*
-	Blue	SPC		*Dash or minus sign*
/	Blue	J		*Reverse Solidus or Backslash*
\	Orange	S		*Solidus or Forward slash*
[	Blue	Y		*Left square bracket*
]	Blue	Z		*Right square bracket*
'	Orange	N		*Acute accent or single quote or apostrophe*
,	Orange	J		*Comma*
;	Orange	F		*Semicolon*
=	Blue	T		*Equal sign*
!	Orange	Q		*Exclamation mark*
!	SHFT	1 (number)		*Exclamation mark*
@	Orange	W		*At sign*
@	SHFT	2 (number)		*At sign*
#	Orange	E		*Number sign*
#	SHFT	3 (number		*Number sign*
$	Orange	R		*Dollar sign*
$	SHFT	4 (number)		*Dollar sign*
%	Orange	T		*Percent sign*
%	SHFT	5 (number)		*Percent sign*
^	Orange	Y		*Caret or circumflex*
^	SHFT	6 (number)		*Caret or circumflex*
&	Orange	U		*Ampersand*

To get this function	Press these keys in this order			Result / Notes
&	SHFT	7 (number)		*Ampersand*
*	Orange	I (alpha i)		*Asterisk*
*	SHFT	8 (number)		*Asterisk*
(	Orange	O (alpha o)		*Left parenthesis*
(	SHFT	9 (number)		*Right parenthesis*
)	Orange	P		*Left parenthesis*
)	SHFT	0 (zero)		*Right parenthesis*
"	Orange	G		*Double quote*
{	Blue	W		*Curly left brace*
}	Blue	X		*Curly right brace*
|	Orange	A		*Vertical bar or Pipe*
~	Orange	B		*Tilde*
<	Blue	G		*Less than mark*
>	Blue	H		*Greater than mark*
:	Orange	D		*Colon*
+	Blue	BS (Backspace)		*Plus sign*
?	Orange	L		*Question mark*
_	Orange	M		*Underscore or horizontal bar*
Enter	ENTER			*Enter*

62-Key 5250 Keypad Overlay KeyMap
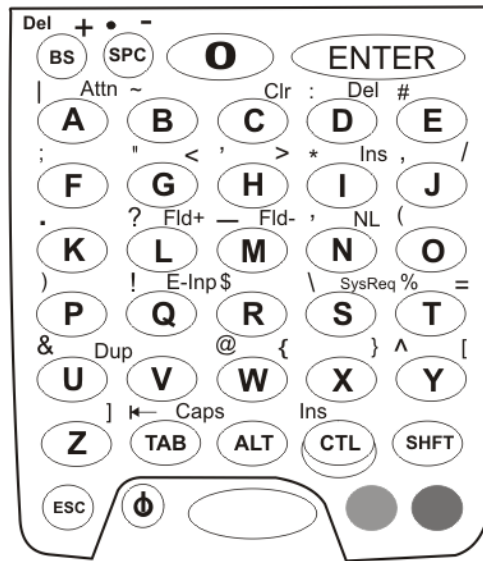
To get this function	Press these keys in this order			Result / Notes
Attention (Attn)	CTL	A		5250 Attn
Clear (Clr)	CTL	C		5250 Clr
Delete (Del)	CTL	D		5250 Del
Duplicate (Dup)	CTL	U		5250 Dup
Erase Input (E-Inp)	CTL	Q		5250 E-Inp
Field Exit (Enter)	Diamond 1			5250 Field Exit
Fld - (Field Minus)	CTL	M		5250 Fld -
Fld + (Field Plus)	CTL	L		5250 Fld +
Ins (Insert)	CTL	I (capital i)		5250 Ins
NL (New Line)	CTL	N		5250 NL
SysReq (System)	CTL	S		5250 SysReq
The following are ANSI keymaps				
Windows key	CTL	ESC		*Windows Start menu*
On (when Off)	Power			*Power On*
Suspend toggle (when On)	Power			*Suspend or Resume mode*
Volume Up	Orange	Right Scan	Up Arrow	*Volume increases*
Volume Up	Blue	V	Up Arrow	*Volume increases*
Volume Down	Orange	Right Scan	Down Arrow	*Volume decreases*
Volume Down	Blue	V	Down Arrow	*Volume decreases*

To get this function	Press these keys in this order			Result / Notes
Display Backlight Lighter	Blue	Right Scan	Up Arrow	*Backlight lighter*
Display Backlight Darker	Blue	Right Scan	Down Arrow	*Backlight darker*
Alt mode	ALT			*Alt mode*
Ctl mode	CTL			*Control mode*
Escape	ESC			*Escape*
Space	SPC			*Space*
Enter	Enter			*Enter*
Capslock toggle	Blue	TAB		*Capslock is on or off*
Mapped Diamond 1 Key	Diamond 1			*Use the Keymap Control Panel to change default*
Mapped Diamond 2 Key	Blue	Diamond 1		*Use the Keymap Control Panel to change default*
Uppercase Alpha toggle	SHFT			*Shifted letter*
Back space	BS (Backspace)			*Back one space*
Tab	TAB			*Tab*
Backtab	Orange	TAB		*Backtab*
Cursor Up	Up Arrow			*Cursor up one line*
Cursor Down	Down Arrow			*Cursor down one line*
Cursor Right	Blue	Up Arrow		*Cursor right one space*
Cursor Left	Blue	Down Arrow		*Cursor left one space*
Insert	Blue	I (letter i)		*Insert mode*
Insert	Orange	CTL		*Insert mode*
Delete	Orange	BS		*Delete one character*
Home	Orange	SHFT	Down Arrow	*Home*
End	Orange	SHFT	Up Arrow	*End*
Page up	Orange	Up Arrow		*Up 1 screen*
Page down	Orange	Down Arrow		*Down 1 screen*
F1	F1			*F1 mode*
F2	F2			*F2 mode*
F3	F3			*F3 mode*
F4	F4			*F4 mode*
F5	F5			*F5 mode*
F6	F6			*F6 mode*
F7	F7			*F7 mode*
F8	F8			*F8 mode*

To get this function	Press these keys in this order			Result / Notes
F9	F9			*F9 mode*
F10	F10			*F10 mode*
F11	Blue	F1		*F11 mode*
F12	Blue	F2		*F12 mode*
F13	Blue	F3		*F13 mode*
F14	Blue	F4		*F14 mode*
F15	Blue	F5		*F15 mode*
F16	Blue	F6		*F16 mode*
F17	Blue	F7		*F17 mode*
F18	Blue	F8		*F18 mode*
F19	Blue	F9		*F19 mode*
F20	Blue	F10		*F20 mode*
F21	SHFT	F1		*F21 mode*
F22	SHFT	F2		*F22 mode*
F23	SHFT	F3		*F23 mode*
F24	SHFT	F4		*F24 mode*
a	A			*a (lowercase is the default)*
b	B			*b*
c	C			*c*
d	D			*d*
e	E			*e*
f	F			*f*
g	G			*g*
h	H			*h*
i	I			*i*
j	J			*j*
k	K			*k*
l	L			*l*
m	M			*m*
n	N			*n*
o	O			*o*
p	P			*p*
q	Q			*q*
r	R			*r*
s	S			*s*
t	T			*t*

To get this function	Press these keys in this order			Result / Notes
u	U			u
v	V			v
w	W			w
x	X			x
y	Y			y
z	Z			z
A	SHFT	A		A
B	SHFT	B		B
C	SHFT	C		C
D	SHFT	D		D
E	SHFT	E		E
F	SHFT	F		F
G	SHFT	G		G
H	SHFT	H		H
I	SHFT	I		I
J	SHFT	J		J
K	SHFT	K		K
L	SHFT	L		L
M	SHFT	M		M
N	SHFT	N		N
O	SHFT	O		O
P	SHFT	P		P
Q	SHFT	Q		Q
R	SHFT	R		R
S	SHFT	S		S
T	SHFT	T		T
U	SHFT	U		U
V	SHFT	V		V
W	SHFT	W		W
X	SHFT	X		X
Y	SHFT	Y		Y
Z	SHFT	Z		Z
1	1			1
2	2			2
3	3			3
4	4			4
5	5			5

To get this function	Press these keys in this order			Result / Notes
6	6			*6*
7	7			*7*
8	8			*8*
9	9			*9*
0 (zero)	0			*0 (zero)*
. (period)	Orange	SPC		*Period*
. (period)	Orange	K		*Period*
-	Blue	SPC		*Dash or minus sign*
/	Blue	J		*Reverse Solidus or Backslash*
\	Orange	S		*Solidus or Forward slash*
[	Blue	Y		*Left square bracket*
]	Blue	Z		*Right square bracket*
'	Orange	N		*Acute accent or single quote or apostrophe*
,	Orange	J		*Comma*
;	Orange	F		*Semicolon*
=	Blue	T		*Equal sign*
!	Orange	Q		*Exclamation mark*
!	SHFT	1 (number)		*Exclamation mark*
@	Orange	W		*At sign*
@	SHFT	2 (number)		*At sign*
#	Orange	E		*Number sign*
#	SHFT	3 (number		*Number sign*
$	Orange	R		*Dollar sign*
$	SHFT	4 (number)		*Dollar sign*
%	Orange	T		*Percent sign*
%	SHFT	5 (number)		*Percent sign*
^	Orange	Y		*Caret or circumflex*
^	SHFT	6 (number)		*Caret or circumflex*
&	Orange	U		*Ampersand*
&	SHFT	7 (number)		*Ampersand*
*	Orange	I (alpha i)		*Asterisk*
*	SHFT	8 (number)		*Asterisk*
(	Orange	O (alpha o)		*Left parenthesis*
(	SHFT	9 (number)		*Right parenthesis*

To get this function	Press these keys in this order			Result / Notes
)	Orange	P		*Left parenthesis*
)	SHFT	0 (zero)		*Right parenthesis*
"	Orange	G		*Double quote*
{	Blue	W		*Curly left brace*
}	Blue	X		*Curly right brace*
|	Orange	A		*Vertical bar or Pipe*
~	Orange	B		*Tilde*
<	Blue	G		*Less than mark*
>	Blue	H		*Greater than mark*
:	Orange	D		*Colon*
+	Blue	BS (Backspace)		*Plus sign*
?	Orange	L		*Question mark*
_	Orange	M		*Underscore or horizontal bar*
Enter	ENTER			*Enter*

38-key Keypad KeyMap

The following keypad keymap is used on an MX9 that is not running a Terminal Emulator. Terminal emulators use a separate keymap.

A modifier key pressed after itself toggles that modifier key off.

Any key press, other than a modifier key following any modifier key *unsticks* the modifier keys.

Any key press, other than up or down arrow, exits volume control mode or backlight control mode

To get this function	Press these keys in this order			Result / Notes
Windows key	CTRL	Esc		*Windows Start menu*
On (when Off)	Power			*Power On*
Suspend toggle (when On)	Power			*Suspend or Resume mode*
Volume Up	Orange	Right Scan	Up Arrow	*Volume increases*
Volume Down	Orange	Right Scan	Down Arrow	*Volume decreases*
Display Backlight Lighter	Blue	Right Scan	Up Arrow	*Backlight lighter*
Display Backlight Darker	Blue	Right Scan	Down Arrow	*Backlight darker*
Scan (Right)	Right Scan			*Activate decoder*
Scan (Left)	Left Scan			*Activate decoder*
Alt mode	ALT			*Alt mode*
Ctrl mode	CTRL			*Control mode*
Escape	Esc			*Escape*
Space	SPC			*Space*
Enter	Enter			*Enter*
Capslock toggle	Blue	TAB		*Capslock is on or off*
Mapped Diamond 1 Key	Diamond 1			*Use the Keymap Control Panel to change default*
Mapped Diamond 2 Key	Diamond 2			*Use the Keymap Control Panel to change default*
Uppercase Alpha toggle	SHIFT			*Shifted letter*
Back space	BKSP			*Back one space*
Tab	TAB			*Tab*
Backtab	Orange	TAB		*Backtab*
Cursor Up	Up Arrow			*Cursor up one line*

To get this function	Press these keys in this order			Result / Notes
Cursor Down	Down Arrow			*Cursor down one line*
Cursor Right	Blue	Up Arrow		*Cursor right one space*
Cursor Left	Blue	Down Arrow		*Cursor left one space*
Insert	Orange	CTRL		*Insert mode*
Delete	Orange	BKSP		*Delete one character*
Home	Orange	SHIFT	Down Arrow	*Home*
End	Orange	SHIFT	Up Arrow	*End*
Page up	Orange	Up Arrow		*Up 1 screen*
Page down	Orange	Down Arrow		*Down 1 screen*
F1	F1			*F1 mode*
F2	F2			*F2 mode*
F3	F3			*F3 mode*
F4	F4			*F4 mode*
F5	F5			*F5 mode*
F6	F6			*F6 mode*
F7	F7			*F7 mode*
F8	F8			*F8 mode*
F9	F9			*F9 mode*
F10	F10			*F10 mode*
F11	Blue	F1		*F11 mode*
F12	Blue	F2		*F12 mode*
F13	Blue	F3		*F13 mode*
F14	Blue	F4		*F14 mode*
F15	Blue	F5		*F15 mode*
F17	Blue	F7		*F17 mode*
F18	Blue	F8		*F18 mode*
F19	Blue	F9		*F19 mode*
F20	Blue	F10		*F20 mode*
F21	SHIFT	F1		*F21 mode*
F22	SHIFT	F2		*F22 mode*
F23	SHIFT	F3		*F23 mode*
F24	SHIFT	F4		*F24 mode*
a	Alpha	2		*a*
b	Alpha	22		*b*

To get this function	Press these keys in this order			Result / Notes
c	Alpha	222		c
d	Alpha	3		d
e	Alpha	33		e
f	Alpha	333		f
g	Alpha	4		g
h	Alpha	44		h
i	Alpha	444		i
j	Alpha	5		j
k	Alpha	55		k
l	Alpha	555		l
m	Alpha	6		m
n	Alpha	66		n
o	Alpha	666		o
p	Alpha	7		p
q	Alpha	77		q
r	Alpha	777		r
s	Alpha	7777		s
t	Alpha	8		t
u	Alpha	88		u
v	Alpha	888		v
w	Alpha	9		w
x	Alpha	99		x
y	Alpha	999		y
z	Alpha	9999		z
A	SHFT	Alpha	2	A
B	SHFT	Alpha	22	B
C	SHFT	Alpha	222	C
D	SHFT	Alpha	3	D
E	SHFT	Alpha	33	E
F	SHFT	Alpha	333	F
G	SHFT	Alpha	4	G
H	SHFT	Alpha	44	H
I	SHFT	Alpha	444	I
J	SHFT	Alpha	5	J

To get this function	Press these keys in this order			Result / Notes
K	SHFT	Alpha	55	*K*
L	SHFT	Alpha	555	*L*
M	SHFT	Alpha	6	*M*
N	SHFT	Alpha	66	*N*
O	SHFT	Alpha	666	*O*
P	SHFT	Alpha	7	*P*
Q	SHFT	Alpha	77	*Q*
R	SHFT	Alpha	777	*R*
S	SHFT	Alpha	7777	*S*
T	SHFT	Alpha	8	*T*
U	SHFT	Alpha	88	*U*
V	SHFT	Alpha	888	*V*
W	SHFT	Alpha	9	*W*
X	SHFT	Alpha	99	*X*
Y	SHFT	Alpha	999	*Y*
Z	SHFT	Alpha	9999	*Z*
1	1			*1*
2	2			*2*
3	3			*3*
4	4			*4*
5	5			*5*
6	6			*6*
7	7			*7*
8	8			*8*
9	9			*9*
0 (zero)	0			*0 (zero)*
. (period)	Orange	SPC		*Period*
-	Blue	SPC		*Dash or minus sign*
/	Blue	1		*Reverse Solidus or Backslash*
\	Orange	1		*Solidus or Forward slash*
[	Orange	2		*Left square bracket*
[	Blue	2		*Left square bracket*

To get this function	Press these keys in this order			Result / Notes
]	Orange	3		*Right square bracket*
]	Blue	3		*Right square bracket*
'	Orange	Alpha		*Acute sign or single quote or apostrophe*
,	Orange	6		*Comma*
;	Blue	0 (zero)		*Semicolon*
=	Orange	Esc		*Equal sign*
!	Blue	ALT		*Exclamation mark*
!	SHFT	1 (number)		*Exclamation mark*
@	Orange	5		*At sign*
@	SHFT	2 (number)		*At sign*
#	Orange	4		*Number sign*
#	SHFT	3 (number)		*Number sign*
$	Orange	9		*Dollar sign*
$	SHFT	4 (number)		*Dollar sign*
%	SHFT	5 (number)		*Percent sign*
^	Blue	CTRL		*Caret or circumflex*
^	SHFT	6 (number)		*Caret or circumflex*
&	SHFT	7 (number)		*Ampersand*
*	Orange	Diamond 1		*Asterisk*
*	SHFT	8 (number)		*Asterisk*
(	Blue	Esc		*Left parenthesis*
(	SHFT	9 (number)		*Right parenthesis*
)	Blue	SHIFT		*Left parenthesis*
)	SHIFT	0 (zero)		*Right parenthesis*
"	Blue	Alpha		*Double quote*
{	Blue	4		*Curly left brace*
}	Blue	5		*Curly right brace*
|	Orange	ALT		*Vertical bar*
~	Blue	9		*Tilde*
<	Blue	7		*Less than mark*
>	Blue	8		*More than mark*
:	Orange	0 (zero)		*Colon*
+	Blue	BKSP (Backspace)		*Plus sign*

To get this function	Press these keys in this order			Result / Notes
?	Orange	8		*Question mark*
_	Orange	7		*Underscore or horizontal bar*

Chapter 9: Technical Specifications

Processor	Marvell PXA-320 / 806 MHz
Memory	128MB on-board RAM / 128 on-board Flash
Expansion slots	SD expansion slot for flash memory (128MB / 512MB / 1GB / and 4 GB supported) Internal CF slot for Summit a/b/g radio, protected inside device.
Operating System	Microsoft® Windows® CE 5
Radio Modules	802.11 a/b/g radio / WWAN / Bluetooth / GPS receiver
Integrated Scanner / Imager	Symbol 955I Short Range Symbol 1524 Lorax scan engine Hand Held Products 5300SF Imager
Display technology	TFT / Active Matrix / Transflective / LED backlight
Touch screen actuation force	10 grams min to 80 grams max
Standard Battery	2400mAhr (room temperature)
Low Temperature Battery	2200mAhr (room temperature)
Backup Power	SuperCap is used for backup, no backup "battery" is used.
External I/O Port Functions	External Power In USB Host USB Client RS232 RS232 w/5V 4-wire Audio 10/100 BaseT Ethernet (Ethernet port available in cradle)
Internal I/O Ports	One serial port (DTE) with appropriate power for a WAN radio One serial port (DTE) for an integrated laser decoder USB 1.1 Host (capable) with power (5V @ 500mA) One SSP port (capable) One SD port for I/O expansion (capable) One SIM port for WAN One serial port (DTE) for interface with GPS receiver chip One camera port for non-decoding imager

Dimensions and Weight

Dimensions and weights for MX9 configurations.

Length (overall)	9.94 in / 25.2 cm
Width at Display	3.87 in / 9.8 cm
Depth at display/scanner	2.67 in / 6.8 cm
Width at keypad	2.94 in / 7.5 cm
Depth at keypad	1.78 in / 4.5 cm
Configured with battery, scanner, Bluetooth, 802.11x radio, handstrap and stylus	34.75 oz / .9.85 kg
Configured with battery, Bluetooth, handstrap and stylus	30.6 oz / .87 kg
Configured with battery, scanner, Bluetooth, 802.11x radio, trigger handle and stylus	37.83 oz / .1.072 kg

Environmental Specifications

Standard Operating Temperature	-4°F to 140°F (-20°C to 60°C) [non-condensing]
Freezer Operating Temperature	-22°F to 140°F (-30°C to 60°C) [with heater or other additions as required]
Storage Temperature	-4°F to 158°F (-20°C to 70°C) [non-condensing]
Operating Humidity	5% to 95% non-condensing. This does not apply to cold storage areas where condensation will appear.
Water and Dust	IEC 60529 compliant to IP67
Vibration	Based on MIL Std 810D
Bluetooth Range	32.8 feet (10 meters) Direct line of sight only

Main Battery Technical Specifications

Standard Battery Operating Temperature Range	-20°C to + 60°C (-4°F to 140°F) non-condensing
Standard Battery Storage Temperature Range	-20°C to + 70°C (-4°F to 158°F) to non-condensing
Low Temperature Battery Operating Temperature Range	-30°C to + 60°C (-22°F to 140°F) non-condensing
Low Temperature Battery Storage Temperature Range	-30°C to + 70°C (-22°F to 158°F) non-condensing
Operating Humidity	5% to 95% non-condensing at 40°C (104°F)
Ingress Protection Enclosure Rating	Compliant to IP67
Charge Cycles	500 minimum
Discharge Time (Average)	Standard: 8 hours Low Temperature: 5 hours
Discharge Current (Average)	< 300mA
Charging low-voltage cut-off	3.9A nominal

Wireless Radio

Two wireless radios are available:

- Summit CF 802.11b/g (2.4GHz)
- Summit CF 802.11a/b/g (5 GHz)

These radios support antenna diversity and are WiFi certified.

For 2.4 GHz frequency band, the site survey limit is -75 dBm signal strength, 15 dB SNR as measured by Honeywell.

For 5 GHz frequency band, the site survey limit is -65 dBm signal strength, 15 dB SNR as measured by Honeywell.

The noise levels for each of the radios (as measured by the MX9 appropriate antenna) is less than or equal to the values specified in the table below for the frequency band specified:

WLAN Radio Type	Noise Level (dBm)	Channel Band-width	Frequency Band
802.11 b/g	- 95 dBm	20 MHz	2.4 GHz - 2.483 GHz
802.11a/b/g	- 85 dBm	20 MHz	5.15-5.35GHz (FCC UNII 1 and UNII 2), 5.725-5.825GHz (FCC UNII 3)

WLAN Radio Type	Channels
802.11 b/g	1-11 FCC, 1-13 ETSI
802.11a/b/g	FCC: 1-11, 36, 40 ,44, 48, 149, 153, 157, 161 ETSI: 1-13, 36, 40, 44 ,48

Bluetooth System Compatibility

Bluetooth specification Version 2.0 + EDR . Supports Bluetooth Enhanced Data Rate (EDR)

- Supports UART
- Class 2 – 2.5mW (4dBm) output power
- Supports the 921 kbps baud rate
- Adaptive Frequency Hopping – AFH
- Backward compatibility with Bluetooth 1.1 and 1.2

WWAN Radio

Note: Only one radio at a time can be in an MX9.

The MX9 provides an 802.11a/b/g WWAN radio and supports GSM/EDGE.

Carriers are AT&T in the US (GSM) and RTTE Europe.

GSM radios are shipped on deactivated SIM cards.

AC/DC Wall Adapter

The AC/DC Power Adapter is only intended for use in a 25°C (77°F) maximum ambient temperature environment.

Input Power Switch	None
Power "ON" Indicator	LED
Input Fusing	Thermal Fuse
Input Voltage	100 VAC min – 240 VAC max
Input Frequency	50 - 60 Hz
Input Connector	Three prong wall plug with ground
Output Connector	AC wall adapter has a 5.5mm barrel connector. It connects to the I/O cables which transition power to the D connector.
Output Voltage	15 VDC
Output Current	4 Amps max
Output Power	60 Watt max
Charging low-voltage cut-off	3.9A nominal
Operating Temperature	32° F to 100° F / -0° C to 40° C
Storage Temperature	-4° F to 140° F / -20° C to 60° C
Weight	250 grams

GPS Receiver Technical Specifications

The GPS receiver COM port is turned off by default. The COM port is 5, defaults are 9600 baud, 8 bits, no parity, 1 stop bit. COM5 default baud rate is 4800 for NMEA communication. GPS COM settings are stored in the registry.

Frequency Band

Channel bandwidth is 2 MHz. Frequency band is 1574.42 GHz to 1576.42 GHz.

Serial Interface

The GPS module supports serial interface for data communication. Transmission (TX) and Reception (RX) signals are implemented to send commands and to receive GPS data. Honeywell designs use UART B on the module for communication.

The default baud rate for the NMEA 0183 protocol is 9600 bps, 8 bits, Parity None, 1 Stop. The baud rate can be increased to 115Kbps.

Accuracy

Position to within 10 meters, 2D Root Mean Square (RMS) and 5 meters 2D RMS, Satellite Based Augmentation System (SBAS) corrected.

Velocity to within 24 meters per second.

SBAS is compatible with the Wide Area Augmentation System (WAAS) satellite signal augmenter (United States) and the EGNOS satellite signal augmenter (Europe).

Protocol

The module outputs the following messages:

- GGA - GPS Fix Data
- RMS - Recommended Minimum Specific GPS Data
- GSA - GPS DOP and Active Satellites
- GSV - GPS Satellites in View
- GLL - Geographic Position Latitude/Longitude
- VTG - Course over Ground and Ground Speed.

The GPS module supports NMEA 0183 protocol and SiRF Binary Protocol.

Chapter 10: Technical Assistance

If you need assistance installing or troubleshooting your device, please contact us by using one of the methods below:

Knowledge Base: www.hsmknowledgebase.com

Our Knowledge Base provides thousands of immediate solutions. If the Knowledge Base cannot help, our Technical Support Portal (see below) provides an easy way to report your problem or ask your question.

Technical Support Portal: www.hsmsupportportal.com

The Technical Support Portal not only allows you to report your problem, but it also provides immediate solutions to your technical issues by searching our Knowledge Base. With the Portal, you can submit and track your questions online and send and receive attachments.

Web form: www.hsmcontactsupport.com

You can contact our technical support team directly by filling out our online support form. Enter your contact details and the description of the question/problem.

Telephone: www.honeywellaidc.com/locations

For our latest contact information, please check our website at the link above.

Product Service and Repair

Honeywell International Inc. provides service for all of its products through service centers throughout the world. To obtain warranty or non-warranty service, please visit www.honeywellaidc.com and select **Support > Contact Service and Repair** to see your region's instructions on how to obtain a Return Material Authorization number (RMA #). You should do this prior to returning the product.

Limited Warranty

Honeywell International Inc. ("HII") warrants its products to be free from defects in materials and workmanship and to conform to HII's published specifications applicable to the products purchased at the time of shipment. This warranty does not cover any HII product which is (i) improperly installed or used; (ii) damaged by accident or negligence, including failure to follow the proper maintenance, service, and cleaning schedule; or (iii) damaged as a result of (A) modification or alteration by the purchaser or other party, (B) excessive voltage or current supplied to or drawn from the interface connections, (C) static electricity or electro-static discharge, (D) operation under conditions beyond the specified operating parameters, or (E) repair or service of the product by anyone other than HII or its authorized representatives.

This warranty shall extend from the time of shipment for the duration published by HII for the product at the time of purchase ("Warranty Period"). Any defective product must be returned (at purchaser's expense) during the Warranty Period to HII factory or authorized service center for inspection. No product will be accepted by HII without a Return Materials Authorization, which may be obtained by contacting HII. In the event that the product is returned to HII or its authorized service center within the Warranty Period and HII determines to its satisfaction that the product is defective due to defects in materials or workmanship, HII, at its sole option, will either repair or replace the product without charge, except for return shipping to HII.

EXCEPT AS MAY BE OTHERWISE PROVIDED BY APPLICABLE LAW, THE FOREGOING WARRANTY IS IN LIEU OF ALL OTHER COVENANTS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, ORAL OR WRITTEN, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT.

HII'S RESPONSIBILITY AND PURCHASER'S EXCLUSIVE REMEDY UNDER THIS WARRANTY IS LIMITED TO THE REPAIR OR REPLACEMENT OF THE DEFECTIVE PRODUCT WITH NEW OR REFURBISHED PARTS. IN NO EVENT

SHALL HII BE LIABLE FOR INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, AND, IN NO EVENT, SHALL ANY LIABILITY OF HII ARISING IN CONNECTION WITH ANY PRODUCT SOLD HEREUNDER (WHETHER SUCH LIABILITY ARISES FROM A CLAIM BASED ON CONTRACT, WARRANTY, TORT, OR OTHERWISE) EXCEED THE ACTUAL AMOUNT PAID TO HII FOR THE PRODUCT. THESE LIMITATIONS ON LIABILITY SHALL REMAIN IN FULL FORCE AND EFFECT EVEN WHEN HII MAY HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH INJURIES, LOSSES, OR DAMAGES. SOME STATES, PROVINCES, OR COUNTRIES DO NOT ALLOW THE EXCLUSION OR LIMITATIONS OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

All provisions of this Limited Warranty are separate and severable, which means that if any provision is held invalid and unenforceable, such determination shall not affect the validity of enforceability of the other provisions hereof. Use of any peripherals not provided by the manufacturer may result in damage not covered by this warranty. This includes but is not limited to: cables, power supplies, cradles, and docking stations. HII extends these warranties only to the first end-users of the products. These warranties are non-transferable.

The duration of the limited warranty for the MX9 is 1 year.

The duration of the limited warranty for the MX9 Desktop Cradle is 1 year.

The duration of the limited warranty for the MX9 Vehicle Cradle is 1 year.

The duration of the limited warranty for the MX9 Battery Charger is 1 year.

The duration of the limited warranty for the MX9 2400mAh Li-Ion and 2100mAh Li-Ion Battery is 6 months.

The duration of the limited warranty for the MX9 AC power supply and cables is 1 year.

The duration of the limited warranty for the MX9 DC-DC Converter and cable is 1 year.

The duration of the limited warranty for the MX9 cables (USB, Serial, Communication, Power) is 1 year.

The duration of the limited warranty for the MX9 fabric accessories (e.g., belt, case, holster) is 90 days.

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