Laird Connection Manager

Administrators Guide
Version 2.0

global solutions: local support™

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REVISION HISTORY

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INTRODUCTION

This document is intended for administrators of mobile devices that use a Laird 40-series radio and Laird software, called the Laird Connection Manager (LCM).

Note: For an overview of all Laird wireless LAN radios, refer to the Products page of the Laird website.

This LCM Administrator's Guide provides the following:

- Instructions on how to access LCM.
- Instructions for signing in as an administrator, and administrative functions.
- Detailed information regarding LCM windows including Status, Configuration, and Diagnostics.
- Detailed information on Wi-Fi profiles and global settings.
- Detailed information on Bluetooth devices and settings.
- Instructions on how to use the Laird System Tray icon (only available for Windows CE and Windows Mobile).

ACCESSING THE LAIRD CONNECTION MANAGER

This version of the LCM is available for Windows Embedded CE and Windows Mobile. The Laird Connection Manager can be downloaded from the software downloads tab of your radio's product page at lairdtech.com.

After installed, to access LCM from the Start menu, select **Programs > Laird > Laird Connection Manager**.

Note: The Laird directory includes the LCM application and a directory for the optional storage of security certificates.

LAIRD CONNECTION MANAGER: ADMINISTRATIVE FUNCTIONS

LCM has three tabbed windows which may be accessed from the bottom of the screen:

- Status Tab
- Configuration Tab
- Diagnostics Tab

To view a window, tap the applicable tab.

Status Tab

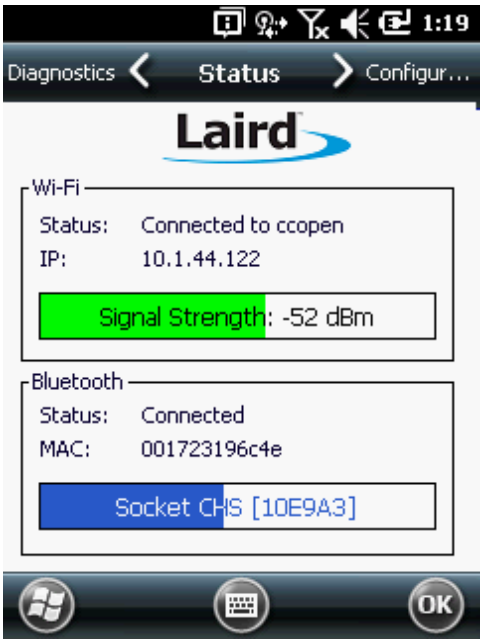

Figure 1: Status Tab

The Status tab is divided into Wi-Fi and Bluetooth sections. The Wi-Fi section provides status information on the radio's Wi-Fi connection between the client device and the access point to which it's associated. The Bluetooth section provides status information on the radio's Bluetooth connection between the client device and the destination device.

The Status tab displays the following sections:

- Status - Wi-Fi
- Status - Bluetooth

Figure 1 shows the LCM Main Window.

Status - Wi-Fi

The Wi-Fi section of the Status tab indicates the status of the Wi-Fi radio. It provides the following information:

Status	Indicates the current status of the Laird Wi-Fi radio. Connection statuses include: ▪ **Down:** The radio is not recognized by Laird software and therefore is not associated or authenticated. ▪ **Disabled:** The radio is disabled. To enable the radio, check the Wi-Fi check box located on the Configuration window. When the radio is disabled, it does not attempt to make a connection to an access point. ▪ **Not Associated:** The radio has not established a connection to an access point. ▪ **Associated:** The radio has established a connection to an access point but is not EAP authenticated. The radio cannot communicate unless it is associated and EAP authenticated. **Note:** If the Encryption type is set to WEP or Open (None), it can communicate (send data) while in the Associated state. ▪ **Connected to [SSID]:** The radio is connected to the named SSID.
IP Address	Displays the IP address of the Wi-Fi device.
Signal Strength	Displays the signal strength (or RSSI) in dBm.

Status - Bluetooth

The Bluetooth section of the Status tab provides the following information:

Status	Indicates the current status of the Laird Bluetooth radio. Connection statuses include: ▪ **Down:** The radio is not recognized by Laird software and therefore is not associated or authenticated. ▪ **Disabled:** The radio is disabled. To enable the radio, check the Bluetooth check box located on the Configuration window. When the radio is disabled, it does not attempt to make a connection to an access point. ▪ **Not Connected:** The radio is not connected to any Bluetooth devices. ▪ **Paired, Not Connected:** The radio has found a Bluetooth device but is not paired with it. ▪ **Connected:** The radio is connected to a Bluetooth device.
MAC	The local device's MAC address.
Signal Strength	Displays the signal strength.

Note: The Status window does not allow any changes, only to view current settings.

Configuration Tab

Figure 2: Configuration tab

The Configuration tab allows Wi-Fi and Bluetooth to be enabled and/or disabled. It also allows users to manage Wi-Fi profiles, Bluetooth devices, and scan for both. Admins are also able to change and edit profiles.

Note: When the ThirdPartyConfig profile is selected, a power cycle must be performed.

The Configuration tab displays the following sections:

- Configuration - Wi-Fi
- Configuration - Bluetooth

Configuration - Wi-Fi

Check on/off box	Check to enable or disable Wi-Fi
Active Profile	Displays the name of the active profile. Use the drop-down menu to select a different profile.
Manage Profiles	Allows user to change profiles and global configurations, and enables admin abilities.
Scan	Allows user to scan for available SSIDs. Click to view a list of APs that are broadcasting SSIDs select an SSID and create a profile for it. See Using Scan to Create a Profile for more information. When scanning for APs, the scan utility uses the criteria provided by the current profile. Therefore, the APs discovered are those that match a certain criteria. To see all access points, use the Default profile. When "Scan" is clicked, the scan window opens. The table in the Scan window displays available SSIDs, their respective RSSIs, and whether the SSID is secure. Double-click an SSID to give it a unique name. Click **Yes** to commit the name. Click**Cancel** to return to the Scan window.

Using Scan to Create a Profile

When you tap **Scan** on the Profile window, LCM displays a list of devices that are broadcasting SSIDs.

You can 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. Every five seconds, the Scan window updates the RSSI value for each of the APs in the list. To scan for new APs and view an updated list, tap **Refresh.**

If you are authorized as an administrator in LCM, you can create a profile for any SSID in the list. To create a profile, double-tap the row for the SSID or tap the row and then tap **Configure.**

If you tap **Yes** in the dialog box, the LCM creates a profile for that SSID, with the profile name being the name as the SSID. If the profile name of the SSID already exists, the user will be prompted to enter a unique name for the new profile. If the AP is using WEP, then LCM opens a dialog box in which you can specify WEP keys. If the AP is using EAP, then LCM opens a dialog box in which you can specify login credentials for the EAP type (which LCM assumes is LEAP). After you enter information on a dialog box, you return to the LCM Profile window, where you can view and edit profile settings. If you make any changes, then you must tap **Commit** to save the changes.

Note: If the Default profile is not modified, it does not specify an SSID, an EAP type, or a data encryption method. As a result, if the Default is the active profile, then the radio associates only to an AP that broadcasts its SSID and requires no EAP type and no encryption.

Wi-Fi Manage Profiles

There are three tabs listed under Manage Profiles:

- Wi-Fi - Profile
- Wi-Fi - Globals
- Wi-Fi - Admin

Wi-Fi - Profile

From the Profile window, an administrator can:

- Define up to 20 profiles, in addition to the special ThirdPartyConfig profile.
- Change profile settings.
- Delete any profile except the special ThirdPartyConfig and the active profile.

Profile changes are not saved to the profile until you click **Commit.**

Note: If the Default profile is not modified, it does not specify an SSID, and EAP type, or a data encryption method. As a result, if the Default is the active profile, then the radio associates only to an AP that broadcasts its SSID and requires no EAP type and no encryption.

The Profile tab displays the following properties and options:

Property and Value table	Table that displays the properties of each profile, and its respective value (see Table 1).
Profile drop down menu	Displays the current profile and a list of all profiles previously configured or used.

New	Creates a new profile with default settings.
Delete	Deletes currently selected profile from the list.
Value box	Displays the Value of a prospective Property.
Commit	Saves the changed value.

Table 1: Wi-Fi Profile Properties and Values

Profile Property	Value
Profile Name	The name of the radio profile in use. **Value:** Default
SSID	Service set identifier for the WLAN to which the radio connects. **Value:** A string of up to 32 characters **Default:** None
Client Name	The name assigned to the Laird Wi-Fi radio and the client device that uses it. **Value:** A string of up to 16 characters **Default:** None
Tx Power	The transmit power of the radio. **Values:** 10%, 25%, 50%, 75%, Maximum **Default:** Maximum
Power Save	Indicates the radio's current power save setting. Power save mode allows you to set the radio to its optimum power-consumption setting. **Values:** ▪ **CAM -** Constantly Awake Mode ▪ **Maximum -** Maximum power savings ▪ **Fast -** Fast power save mode ▪ **Default -** Fast **Note:** When Wi-Fi power save is set to CAM, Bluetooth does not function properly. This issue only applies to Laird 40 series radios.
Bit Rate	Indicates the bit rate used by a radio when interacting with a WLAN AP. ▪ **Value -** Auto (rate negotiated automatically with AP) or one of the following rates in megabits per second (Mbps): 1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, or 54. ▪ **Maximum -** Maximum defined for current regulatory domain. ▪ **Default -** Auto **Note:** If you select a specific bit rate, the radio connects to an AP only if it has the specified SSID configured with the selected bit rate as the only required rate. **Note:** This feature is not supported when using the SDC-MSD30AG and SDC-SSD30AG WLAN modules. When using the SDC-MSD30AG or SDC-SSD30AG modules, the Bit Rate option is unavailable. It defaults to Auto.

Radio Mode	Radio mode is an LCM Profile setting that indicates the use of 802.11a, 802.11g, 802.11b, and 802.11n frequencies and data rates when interacting with an access point, or the use of ad hoc mode to associate to a client radio instead of an access point. When LCM operates with a Laird 802.11g radio, an administrator can select from among the following radio mode values: **802.11g Radio Mode Values** ▪ **Default -** BG rates full ▪ **B rates only -** 1, 2, 5.5, and 11 Mbps ▪ **G rates only -** 6, 9, 12, 18, 24, 36, 48, and 54 Mbps ▪ **BG rates full -** All B and G rates ▪ **BG Subset -** 1, 2, 5.5, 6, 11, 24, 36, and 54 Mbps. This should only be used with Cisco APs running IOS in autonomous mode (without controllers). For Cisco APs that are tied to controllers and for non-Cisco APs, Laird recommends BG rates full. ▪ **Ad Hoc -** When selected, the Laird Wi-Fi radio uses ad hoc mode instead of infrastructure mode. In infrastructure mode, the radio associates to an AP. In ad hoc mode, the radio associates to another client radio that is in ad hoc mode and has the same SSID and, if configured, static WEP key ▪ **CAM -** Constantly Awake Mode When LCM operates with a Laird 802.11a/g radio, an administrator can select from the following radio mode values: **802.11a/g Radio Mode Values** ▪ **Default -** ABG rates full ▪ **B rates only -** 1, 2, 5.5, and 11 Mbps ▪ **G rates only -** 6, 9, 12, 18, 24, 36, 48, and 54 Mbps ▪ **BG rates full** All B and G rates ▪ **A rates only -** 6, 9, 12, 18, 24, 36, 48, and 54 Mbps (same as G rates) ▪ **ABG rates full -** All A rates and all B and G rates, with A rates (the 802.11a radio) preferred. ▪ **BGA rates full -** All B and G rates and all A rates, with B and G rates (the .11g radio) preferred. ▪ **BG Subset -** 1, 2, 5.5, 6, 11, 24, 36, and 54 Mbps. This should only be used with Cisco APs running IOS in autonomous mode (without controllers). For Cisco APs that are tied to controllers and for non-Cisco APs, Laird recommends BG rates full. ▪ **Ad Hoc -** When selected, the Laird Wi-Fi radio uses ad hoc mode instead of infrastructure mode. In infrastructure mode, the radio associates to an AP. In ad hoc mode, the radio associates to another client radio that is in ad hoc mode and has the same SSID and, if configured, static WEP key.
Auth Type	**Values:** Open, Shared, LEAP **Default:** Open
WPA	Enable and disable WPA protocol. **Values:** WPA, WPA2, None **Default:** None

Encryption	Scrambles transmitted data so that it can be read only by the intended receiver, which has the proper key to decrypt and, unscramble the encrypted data. In LCM, the Encryption setting in a profile can refer not just to an encryption method but also to an authentication method and an encryption key management protocol. **Values:** **Default:** None

Profile Setting	Authentication	Encryption	Key Management
None	None	None	None
TKIP	-	-	-
AES-CCMP	-	-	-
WEP	None	WEP	Static (in LCM)
CKIP	None	WEP+CKIP+CMIC	Static (in LCM)

Authentication	Verifying the identity of a station attempting to gain access to a network, or a network to which a station is trying to gain access. **Values:** LEAP, EAP-FAST, PEAP-MSCHAP, PEAP-GTC, EAP-TLS, EAP-TTLS, PEAP-TLS, PSK, None **Default:** None
Fast Reauth	Expedited WPA key handshake used to reduce roaming time to 125 msec or less. **Values:** None, LEAP, EAP-FAST, PEAP-MSCHAP, PEAP-GTC, EAP-TLS, EAP-TTLS, PEAP-TLS, PSK **Default:** None

Wi-Fi - Globals

Global settings include radio and security settings that are applied to all profiles in the LCM. Only administrators can edit and change global settings.

The Globals tab of the Wi-Fi configuration window displays the following sections:

Property and Value table	Displays various properties and their respective values (see Table 2).
Value box	Displays the current and available values for the selected property.
Commit	Saves the changed value. **Note:** When you tap **Commit**, a registry flush occurs for all settings.

Table 2: Wi-Fi Globals Properties and Values

Global Property	Value
Roam Trigger	Roam trigger indicates the signal strength (RSSI) (in dBm) at which the radio scans for an access point with a better signal strength. When scanning for a different access point, the radio looks for one with a RSSI at the indicated roam delta dBm level or stronger. **Value:** -50, -55, -60, -65, -70, -75, -80, -85, -90 or Custom (see "Custom Global Settings" for more information). **Default:** -70 **Note:** When reporting RSSI: The 10, 15, 20, 25 and 40 series Laird Wi-Fi radios use a Broadcom chip set. These radios return the absolute RSSI (a full signal) regardless of ambient noise. In high noise situations, it may be necessary to reduce the roam trigger level to compensate for this. The 30 series Laird Wi-Fi radios use a Qualcomm / Atheros chip set. These radios return the relative RSSI (a usable signal) above ambient noise. In high noise situations, it may be necessary to increase the roam trigger level to compensate for this (and add 'stickiness').
Roam Delta	Roam Delta indicates the signal strength (RSSI) level (in dBm) that the radio looks for in a different access point (after the roam trigger is met) before it attempts to roam to the new access point. **Value:** 5, 10, 15, 20, 25, 30, 35 or Custom (See "Custom Global Settings" for more information). **Default:** 10 seconds
Roam Period	Roam period indicates the amount of time a radio collects RSSI scan data (after association or a roam scan) before it considers roaming to a different access point. **Value:** 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60 or Custom (See "Custom Global Settings" for more information). **Default:** 10
BG Channel Set	Indicates the 2.4 GHz channels that the radio scans when contemplating a roam to determine what access points are available. BG channel set options include: **Values:** ▪ **Full** - The radio scans all 2.4 GHz channels. ▪ **1, 6, 11** - The radio scans the three most commonly used 2.4 GHz channels. ▪ **1,7,13** - The radio scans these three channels which are most commonly used in ETSI and MIC (formerly TELEC). ▪ **Custom** - If LCM displays a value of "Custom" for a global setting, then the operating system registry has been edited to include a value that is not available for selection on the Global window. ▪ **Default** – Full If the registry is edited but the user does not select **Custom**, LCM ignores the registry. If LCM displays a value other than Custom and the user selects **Custom**, LCM reverts to the value that it displayed before the user selected **Custom**.

DFS Channels	Indicates support (or lack of support) for 5 GHz (802.11a) channels where dynamic frequency selection (DFS) is required. This setting is supported in v2.0 and later. DFS Channels options include: ▪ **On** - Turns on support for 5 GHz channels where DFS is required. ▪ **Off** - Turns off support for 5 GHz channels where DFS is required. ▪ **Default** - Off
DFS Scan Time	Because passive scanning consumes a longer period of time, this feature enables you to determine the dwell (listen) time (in milliseconds, or ms) when passively scanning on a DFS channel. **Value:** A number between 20-500 milliseconds (ms) **Default:** 120 ms **Note:** When decreasing the scan time (to a value lower than the default) for DFS channels, corresponding changes in the infrastructure's beacon period are recommended. For optimal performance and reliability, Laird recommends a dwell time that is 1.5 times that of the beacon period. For example, if the DFS scan time is set to 30 ms, the beacon period should be adjusted to 20 ms. **Note:** If you adjust this parameter directly in the registry and configure it to a number outside of the 20-500 ms range, the setting value will return to the default (120 ms).
Ad Hoc Channel	Ad Hoc Channel indicates the channel to be used for an ad hoc connection if the active profile has a Radio Mode value of Ad Hoc. **Values:** ▪ **One of the 2.4 GHz channels** - (1-14) ▪ **One of the UNII-1 channels** - (36, 40, 44, 48) ▪ **Default** - 1 **Note:** If you select a channel that is not supported by your radio, then LCM uses the default channel setting (1) for this setting.
Aggressive Scan	When this setting is On and the current connection to an access point becomes tenuous, the radio scans for available access points more aggressively. Aggressive scanning complements and works in conjunction with the standard scanning that is configured through the Roam Trigger, Roam Delta, and Roam Period settings. Laird recommends that the Aggressive Scan global setting be On unless there is significant co-channel interference because of overlapping coverage from access points that are on the same channel. **Value:** On or Off **Default:** On

CCX features

CCX Features enables the use of the Cisco information element (IE) and CCX version number to authorize support for CCX features. CCX Features options are:

- **Full -** Use Cisco IE and CCX version number and enable support for all CCX features.
- **Optimized -** Use Cisco IE and CCX version number and enable support for 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.
- **Default -** Optimized

Note: For Laird 30AG (SDC-MSD30AG and SDC-SSD30AG) radio modules, this parameter is disabled. The default is Optimized.

WMM

WMM (Wi-Fi Multimedia) extensions for WLANs allow the prioritization of voice traffic. WMM enables or disables the use of WMM extensions.
Value: On or Off
Default: Off

Note: If you change the WMM global setting in LCM, you must do a power cycle or suspend/resume on the device to cause the change to take effect.

Note: For ABGN radios, this parameter is disabled.

Auth Server

Auth Server indicates the type of authentication server being used for EAP.
Values:

- **Type 1 -** Cisco Secure ACS or another server that uses PEAPv1 for PEAP with EAP-MSCHAPV2 (PEAP-MSCHAP).
- **Type 2 -** A different authentication server, such as Juniper Networks Steel Belted RADIUS, that uses PEAPv0 for PEAP-MSCHAP. Only allows authenticated PAC provisioning.
- **Default -** >Type 1

Note: IEEE 802.1X, which is the authentication component of WPA and WPA2, performs mutual authentication through an Extensible Authentication Protocol (EAP) type. With mutual authentication, the network authenticates the station and the station authenticates the network.

TTLS Inner Method

TTLS Inner Method indicates the authentication method that is used within the secure tunnel created by EAP-TTLS.
Values:

- Auto-EAP - Any available EAP method
- MSCHAP
- MSCHAPV2
- PAP
- EAP-MSCHAPV2- See MSCHAPV2

Default: Auto-EAP

PMK Caching

PMK (Pairwise Master Key) Caching indicates the type of PMK caching to use (Standard or OPMK) with a WPA2 encryption type. See the Laird Glossary section on "PMK Catching" for additional information.

Value: Standard or OPMK
Default: Standard

Note: When switching from Standard to OPMK, you must initiate a suspend resume of the device. Only tapping **Commit** does not cause the change to take effect.

Tx Diversity

Tx (Transmit) Diversity indicates how to handle antenna diversity when transmitting data to an access point. Antenna diversity refers to the use of multiple antennas to increase the odds that a functional signal is received.

Values:

- **Main only -** Indicates use of the main antenna only.
- **Aux only -** Indicates use of the auxiliary antenna only

  Note: Laird does not support the AUX antenna as a single-antenna solution.
- **On -** Indicates the use of diversity (both antennas).

Default - On

Note: For 30AG (MSD30AG and SSD30AG) radio modules, this parameter is disabled.

Rx Diversity

Rx (Receive) Diversity indicates how to handle antenna diversity when receiving data from an access point. Antenna diversity refers to the use of multiple antennas to increase the odds that a functional signal is received.

Values:

- **On-Start on Main -** Indicates use of the main antenna upon startup.
- **On-Start on Aux -** Indicates use of the auxiliary antenna upon startup.
- **Main Only -** Indicates use of the main antenna only.
- **Aux only -** Indicates use of the auxiliary antenna only.

  Note: Laird does not support the AUX antenna as a single-antenna solution.
- **Default -** On-Start on Main

  Note: For 30AG (MSD30AG and SSD30AG) radio modules, this parameter is disabled.

Frag Thresh

Frag Thresh (fragmentation threshold) indicates the packet size (in bytes) at which the packet is fragmented.

- **Value:** An integer (in bytes) from 256 to 2346.
- **Default:** 2346 bytes.

Note: For 30AG (SDC-MSD30AG and SDC-SSD30AG) radio modules, this parameter is disabled.

RTS Thresh	RTS Thresh (Request To Send Threshold) indicates the packet size (in bytes) at which a Request To Send (RTS) or Clear To Send (CTS) is required on the link. ▪ **Value:** An integer (in bytes) from 0 to 2347 ▪ **Default:** 2347 bytes **Note:** For 30AG (MSD30AG and SSD30AG) radio modules, this parameter is disabled.
LED	LED indicates whether or not an LED is used. This setting applies only to select Laird devices/radios. ▪ **Value**: On or Off ▪ **Default**: Off LED on = connected to network LED off = not connected to network. No flashing functionality is supported.
Tray Icon	Tray Icon allows you to enable or disable the System Tray icon. The tray icon provides a visual status for the device's Laird Wi-Fi radio and it enables the user to launch LCM. This service is available for Windows CE and Windows Mobile ONLY. See Appendix I: Using the Laird System Tray Icon for more information. ▪ **Value**: On or Off ▪ **Default**: On
Hide Passwords	Hide Passwords indicates whether or not security information is masked. If this setting is turned on, LCM (along with EAP authentication dialog boxes) masks credentials and other sensitive information. ▪ **Value**: On or Off ▪ **Default**: Off
Admin Password	Admin Password indicates the password that must be specified when the Admin Login button is tapped. ▪ **Value:** A string of up to 64 characters ▪ **Default:** SUMMIT (case sensitive)
Auth Timeout	Auth Timeout specifies the number of seconds (from 3 to 60) that Laird software waits for an EAP authentication request to succeed or fail. If authentication credentials are specified in the active profile and the authentication times out, then association will fail. If authentication credentials are not specified in the active profile and the authentication times out, then the user is re-prompted to enter authentication credentials. ▪ **Value:** An integer from 3 to 60 ▪ **Default:** 8

Certs Path	Certs Path indicates the directory location for certification(s) for EAP authentication and PAC files. A valid directory path can include up to 64 characters and the default depends on the type of device. ▪ **Value:** A valid directory path of up to 64 characters ▪ **Default:** Depends on device
Supplicant	Allows you to choose whether the Laird supplicant or another supplicant is used. ▪ **Value:** Summit, 3rd Party ▪ **Default:** Summit **Note:** If you select a 3rd party value, a non-Laird supplicant can be used (such as Microsoft Windows Zero Config).
Auto Profile	Auto profile enables you to activate or deactivate automatic profile selection. Tap **List** and use the dialog box to select a created profile. **Note:** Auto Profile is only available on Windows CE and Windows Mobile operating systems. When the facility is active and the Laird Wi-Fi radio makes its first attempt to associate to an AP (after a device startup or resume), LCM tries each profile, in order, until the radio associates to an AP. That profile becomes the active profile and remains the active profile until one of the following occurs: The device is suspended and resumed, power-cycled, or restarted, which causes the automatic profile selection process to restart. The user turns off the automatic profile selection facility and manually selects a different profile on the LCM Main window. **Note:** The profile list should not include any profiles with an Ad Hoc Radio Mode setting. **Note:** There is a limit of 19 profiles in the Auto Profile list. **Note:** Auto Profile is not available for the MSD30AG and SSD30AG modules.

Custom Global Settings

If LCM displays a value of "*Custom*" for a global setting, then the operating system registry has been edited to include a value that is not available for selection on the Global tab. Selecting **Custom** has no real effect. If LCM displays a value other than Custom, and you select the value of **Custom** and tap **Commit**, then LCM reverts to the value that is displayed before you selected **Custom**.

Note: There is a range of accepted values for each of these global settings. Any value placed on the registry outside of the following acceptable ranges will reset the value back to its default:

- Roam Trigger acceptable range: 50 to 90
- Roam Delta acceptable range: 1 to 35
- Roam Period acceptable range: 1 to 60
- BG Channel acceptable valid inputs: 001 to FFFF

Windows XP Logon and Authentication

On Windows XP, LCM supports two sets of logon options:

- Single Sign-On (SSO)- When selected, LCM uses the Windows username and password as the credentials for 802.1Z (EAP) authentication.
- Pre-Logon Connection- When selected, LCM uses specified and saved parameters and credentials to achieve 802.1X (EAP) authentication before Windows login.

To use logon options, follow these steps:

1. Select Logon Options in the Property area on the Global tab.
2. Click **Logon Options**.
3. Complete the dialog box or boxes that appear.

For more information on Windows XP Logon options, visit "Logon Options" in the Laird Knowledge Center.

Wi-Fi - Admin

The Admin tab of the Wi-Fi Configuration window provides the following options:

- Administrator Login- Apply administrative credentials.
- Administrator Password- Apply administrator password.
- Scan- Tap to view a list of APs that are broadcasting SSIDs.

Admin Login/Logout button- To log in as an administrator, click **Admin Login** and enter the administrator password in the dialog box. The default password is **SUMMIT** (case sensitive). Tap **Login**.

Click **Admin Logout > Logout** to log out as an administrator, leaving access to end-user functions only.

Note: The administrator password can be changed from the **Login** tab on the **Configuration > Manage Profiles > Globals** window.

Entering Credentials for EAP Authentication

There are no default values for credentials. If the credentials are not specified in the profile, then when the radio tries to associate using that profile, Laird software displays a dialog box that prompts the user to enter the credentials. Laird software populates the dialog box with the username and password supplied for the previous EAP authentication.

Important notes on entering credentials for EAP authentication:

- If the credentials specified in the profile do not match those in the authentication database, then when that profile is used:
  - If the EAP type is EAP-FAST or EAP-TLS, authentication fails.
  - If the EAP type is LEAP, PEAP-MSCHAP, PEAP-GTC, or EAP-TTLs, Laird software tries the credentials three times and then prompts the user to enter valid credentials. Once EAP authentication is passed, Laird software stores the valid credentials in the profile.
- When prompted with a dialog box, the user can enter valid credentials or cancel the operation:
  - If the user enters valid credentials and taps **OK**, the radio associates and authenticates.
  - If the user enters invalid credentials and taps **OK**, the radio associates but does not authenticate, and the user is re-prompted to enter credentials.

  - If the user taps **Cancel** or the user clears the credentials field and taps **OK**, then the radio does not attempt to associate with that profile until the user performs one of the following actions (while the profile is the active profile):
- Causes the device to go through a power cycle or suspend/resume.
- Disables and enables the radio or taps **Reconnect** in the Diagnostics tab.
- Modifies the profile and taps **Commit**.

Alternatively, the user can select another profile as the active profile and then switch back to the profile for which EAP authentication was cancelled.

- If the password stored in the profile or provided in the dialog box has expired in the authentication database, the authentication server may send an *"Expired Password"*(RFC 2759) message to the client. If the EAP type is PEAP-MSCHAP, PEAP-GTC, or EAP-TTLS, the Laird software handles that message by displaying a dialog box that prompts the user to enter the expired password and a new password. Laird software then uses the entered information to respond to the RFC 2759 message. If EAP authentication succeeds and the expired password was saved in the profile, then Laird software updates the profile with the new password.
- Any password provided for EAP authentication, whether in a profile or in an authentication dialog box, should not contain parenthesis. Neither LCM nor the dialog box flags a parenthesis as an invalid character, but the integrated supplicant treats parenthesis as delimiters and interprets the characters between a left parenthesis and a right parenthesis as a "true" password.

To save changes for the selected profile, tap **Commit**.

Note: When you tap **Commit**, a registry flush occurs for only that profile key.

Configuration - Bluetooth

The Bluetooth panel of the Configuration window displays the source device's Bluetooth settings. The following options are available:

Bluetooth checkbox	Check to enable or disable Bluetooth.
Discoverable checkbox	Check to enable or disable device from discoverability. Device is discoverable for 60 seconds before automatic turn-off.
Manage Devices	Allows a user to change profiles and global configurations, and enables administrative abilities.
Scan	Click the **Scan** button under *Bluetooth* to find a device. Remote devices in discoverable mode can then be discovered. After using **Scan** to find a device, an administrator can double-click and icon and begin the pairing process. Depending on the remote device, a user may be required to enter input to successfully pair with the remote device.

Bluetooth Manage Devices

From the **Manage Devices** window, an administrator can:

- Search for various Bluetooth devices in range
- Define the values of various properties

- Modify devices
- Delete devices
- Commit properties to values

Profile changes are not saved to the profile until you tap **Commit**.

There are four tabs listed under **Manage Devices**:

- Bluetooth - Devices
- Bluetooth - Settings
- Bluetooth - Local Services
- Bluetooth - Admin

By default, **Manage Devices** opens to the **Devices** tab.

Bluetooth - Devices

The Devices tab displays discoverable and previously-discovered devices. Additionally, this tab allows connection and disconnection with remote Bluetooth devices. The following options are available:

Devices name and services box	Displays Bluetooth devices in range and the connectivity of each device. Select the device or service and click **Connect** to enable it. The background of the service's icon changes from blue to green when it is enabled.
Pair/Unpair	Pair or unpair the selected radio or service with the selected device.
Connect/Remove	Connects or removes the selected device from the list; removing a device closes out any connections with the device and removes any pairing that occurred. **Note:** You must manually connect to services unless they are set to Auto Start.
Services/Settings	Displays service profiles for the selected device, or settings for the selected service.
Send File	Sends files to the selected device.

Bluetooth - Settings

The Settings tab allows configuration of Bluetooth devices. The following settings are available:

Property and Value table	Lists properties for the selected Bluetooth device. Property values can be changed in the value dropdown and saved with the Commit button.
Device drop-down	Selects the Bluetooth device to be explored in the Property and Value table.
New	Adds a new Bluetooth device.
Commit	Saves the changed value.
Value	Changes a value for a property. Select a property in the Property and Value table, and then change the value in the Value box.

Bluetooth Settings Properties and Values

Device Name	Friendly name of the remote device.
Address	The remote device's unique MAC address.

Service	Services available. **Note:** To manually insert a service, highlight **Service** and click the **Add** button. A list of services appears; these can be manually added to the device. Any services can be renamed in the Value box.
Service Name	The name of the service currently selected.
Service Type	The type of service currently selected.

Bluetooth - Local Services

The Local Services tab (formerly Bluetooth Globals) displays the source device's current Bluetooth services. The following subsections allow these values to be modified:

Service table	Lists the services available on a device, the state of Auto-Start, and the COM port number associated with the service.
Add Serial Service button	Manually adds a service to the Service table.
Delete	Deletes a selected service.
Settings	Shows specific settings for a selected service.

The Service table displays the following information:

- HID
- PAN
- OBEX Object Push
- BT Serial Port

Bluetooth - Admin

The Admin tab allows administrative access to advanced Bluetooth features. The following administrative functions are available:

- Administrator Login- Apply administrative credentials.
- Administrator Password- Apply administrative password.
- Scan- Tap to view a list of APs that are broadcasting SSIDs.

Admin Login/Logout button- To log in as an administrator, click **Admin Login** and enter the administrator password in the dialog box. The default password is **SUMMIT** (case sensitive). Click **Admin Logout** to log out as an administrator, leaving access to end-user functions only.

Note: The administrator password can be changed through the Admin Password function on the **Configuration > Manage Devices** window.

Diagnostics Tab

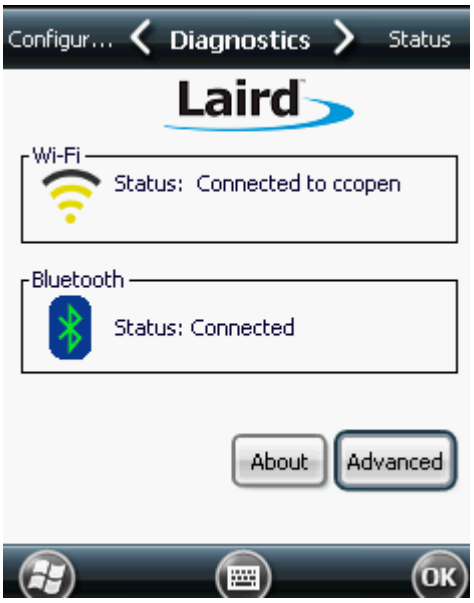

Figure 3: Diagnostics tab

The Diagnostics tab provides status information on the radio connection between the device and the access point to which it's associated.

The Diagnostics tab displays the following:

Wi-Fi	The Wi-Fi box in the Diagnostics tab indicates the current Wi-Fi status of the Laird Wi-Fi radio and any authentication. Status appears the same on the main LCM Status tab and in the Advanced section of Diagnostics under the **Status** dropdown selection. See Wi-Fi Status Window for details on individual status options.
Bluetooth	The Bluetooth box in the Diagnostics tab indicates the current Bluetooth status of the Laird Wi-Fi radio. Status also displays on the Status tab and in the Advanced section of Diagnostics, under the **Status** dropdown selection. See Status Window Bluetooth for details on individual status options.
About	The About button displays LCM information including: ▪ LCM software information ▪ Driver software
Advanced	Advanced settings for Wi-Fi, strength percentage, and quality percentage.

There is an icon for each Wi-Fi and Bluetooth connection, as described below:

- Wi-Fi Connected: Green radial pattern on white background.
- Wi-Fi Disconnected: White radial pattern on red background.
- Bluetooth Connected: Blue Bluetooth icon.
- Bluetooth Disabled: Red Bluetooth icon.

Advanced Diagnostics Window

The Advanced button opens the advanced settings window. There are three drop down options in the Wi-Fi tab:

- Wi-Fi - Status
- Wi-Fi - Ping Tools
- Wi-Fi - Debug

Wi-Fi - Status

The following describe the Wi-Fi Advanced Status window properties and options:

Profile	Indicates the current active LCM profile.
Status	Indicates the current Wi-Fi status of the Laird Wi-Fi radio. Status also displays on the Status and Diagnostics windows. See Status Wi-Fi for details on individual status options.
Device Information	Device information including the device name, IP address, MAC address, and transmit power.
AP Connection Information	Access point information including the associated access point's name, IP address, point, and MAC address. Also displayed in this section are the beacon period, DTIM, the connection channel, bit rate (in Mbps), signal strength (or RSSI) in dBm, and signal quality. **Note:** The AP connection will be lower with a ThirdPartyConfig profile (under Windows Zero Config) than with a standard profile.

Note: When a ping initiated from the Diagnostics tab is active, the Status window displays a ping indicator consisting of two lights that flash green (for a successful ping) or red (for an unsuccessful ping).

Wi-Fi - Ping Tools

The following describe the Wi-Fi Ping Tools Diagnostics tab properties and options:

Profile	Indicates the current active LCM profile.
IP Address	The IP of the device.
Destination	IP address of the remote device that the Laird Wi-Fi radio is connected to.
Ping Payload	The amount of data (in bytes) that is transmitted on a ping. ▪ **Values:** 32, 64, 128, 256, 512, 1024 ▪ **Default:** 32
Ping Delay ms	The amount of time (in milliseconds) between successive ping requests. ▪ **Value:** An integer from 0 to 7200000 ▪ **Default:** 1000 ms
Timeout ms	The amount of time (in milliseconds) that passes without a response before the ping request is considered a failure. ▪ **Value:** an integer from 1 to 30000 ▪ **Default:** 5000 ms

Start Ping/Stop Ping	Start a continuous ping to the IP address identified in the window. Information logs will appear in the output area at the bottom of the window. Once the button is tapped, its name and function changes to **Stop Ping**. Pings continue until you tap**Stop Ping**, move to a different LCM window, exit LCM, or remove the radio. **Note:** If your device has both a Laird Wi-Fi radio and another network adapter active, pings may go out over the non-Laird network adapter. **Note:** The access point's IP address is the default for a ping, although any valid IP address can be manually entered.
Release/Renew	Obtain a new IP address through DHCP release/renew. LCM logs all activity in the output area at the bottom of the Diagnostics tab.
(Re)connect	Initiate a reconnect of the radio: Disable and enable the radio, apply (or reapply) the current profile, attempt to associate to the wireless LAN, and attempt to authenticate to the wireless LAN. LCM logs all activity in the output area at the bottom of the window.

Wi-Fi - Debug

Profile	The name of the active profile.
Driver Debug checkbox	Enable or disable Driver Debug mode.
Drop-down menu	Specify the level and output of debug.
Regulatory Domain	Displays Wi-Fi rules according to country.

Using the Laird System Tray Icons (Windows CE and Windows Mobile only)

On Windows CE or Windows Mobile, Laird software includes a service that displays a Wi-Fi icon and a Bluetooth icon in the Windows System Tray. These icons provide a visual status for the device's Laird Wi-Fi and Bluetooth radios, and enable the user to launch LCM. This service is available only for Windows CE / Mobile.

LCM Wi-Fi Tray Icon

The software for the service is installed with other Laird software in a .cab file. The service is active only when all of the following are true:

- A Laird Wi-Fi radio is installed in the device or inserted in an external slot in the device.
- The device is active
- Windows Zero Config is not active
- The LCM Tray Icon global setting is On

When the service is active, it queries the driver every three seconds for the status of the connection for the active profile and displays one of the following icons:

	The Wi-Fi radio is not associated/authenticated to an access point.
	The signal strength (RSSI) for the current access point (to which the radio is associated) is -90 dBm or weaker, which means that a Laird 802.11b/g radio will operate at 802.11b data rates only.
	The RSSI for the current access point is stronger than -90 dBm but not stronger than -70 dBm, which means that a Laird Wi-Fi radio will operate at 802.11g or 802.11a data rates that are less than 54 Mbps

	The RSSI for the current access point is stronger than -70 dBm but not stronger than -50 dBm, which means that a Laird Wi-Fi radio should operate consistently at 54 Mbps
	The RSSI for the current access point is stronger than -50 dBm.

Tapping the icon launches the LCM. On most CE devices, the System Tray icon is not visible while LCM is running, although the service remains active.

Note: If LCM usually runs on the device, or if you want to maximize performance, then you should disable the System Tray icon service by setting the Tray Icon global setting to Off and power cycling the device.

LCM Bluetooth Tray Icon

The Bluetooth tray icon displays connectivity and power status for the Bluetooth radio. It displays one of the following:

	The Bluetooth radio is disabled, and therefore disconnected.
	The Bluetooth radio is enabled, but is not connected.
	The Bluetooth radio is connected to a device.

Tapping the icon launches the LCM. On most CE devices, the System Tray icon is not visible while LCM is running, although the service remains active.

Note: If LCM usually runs on the device, or if you want to maximize performance, then you should disable the System Tray icon service by setting the Tray Icon global setting to Off and power cycling the device.