Performing Diagnostics

This chapter explains how to use ACU to perform user-level diagnostics.

The following topics are covered in this chapter:

Overview of ACU Diagnostic Tools

The ACU diagnostic tools enable you to assess the performance of your client adapter within the wireless network. These tools perform the following functions:

- Display your client adapter's current status
- Display statistics pertaining to your client adapter's transmission and reception of data

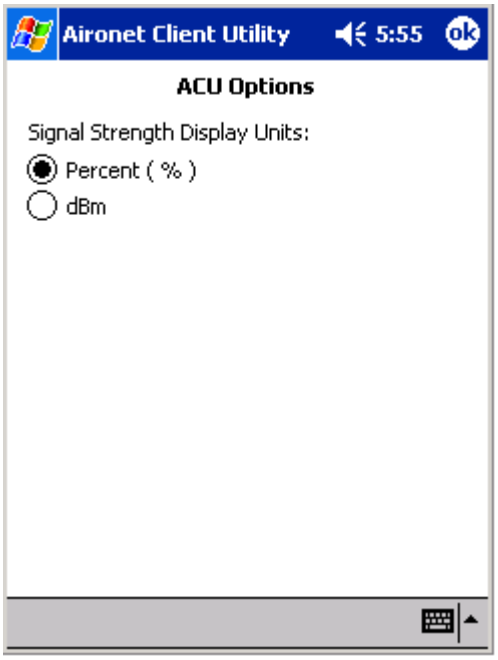
Setting Signal Strength Display Units

Follow the steps below to specify the units used to display signal strength on the ACU Status screen.

Step 1 Double-tap the **ACU** icon or select **Start > Programs > Cisco > ACU**. The Profiles screen appears.

Step 2 Tap the **Options** button. The ACU Options screen appears (see Figure 7-1).

Figure 7-1 ACU Options Screen



Step 3 Select one of the following options for Signal Strength Display Units:

- **Percent (%)**—Displays the signal strength as a percentage. This is the default setting.
- **dBm**—Displays the signal strength in decibels with respect to milliwatts.

Step 4 Tap **OK** to save your changes.

Viewing the Status of Your Client Adapter

Follow the steps below to view the current status of your client adapter.

Step 1 From the Profiles screen, tap the **Status** tab. The Status screen appears. Figure 7-2 shows the Status screen with the signal strength values displayed as percentages, and Figure 7-3 shows the same screen with the signal strength values displayed in decibels with respect to milliwatts (dBm).

Figure 7-2 Status Screen (with Signal Strength as a Percentage)

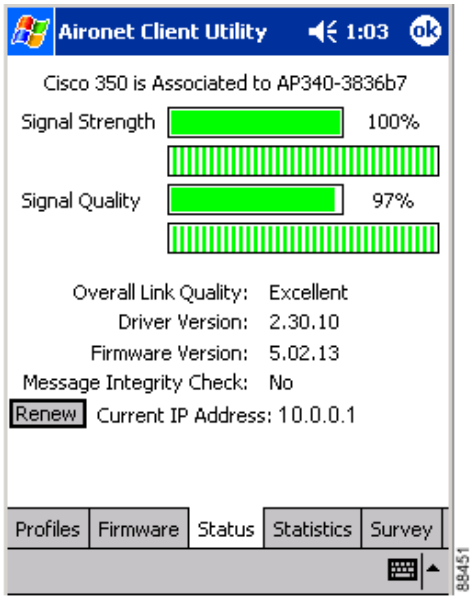


Figure 7-3 Status Screen (with Signal Strength in dBm)

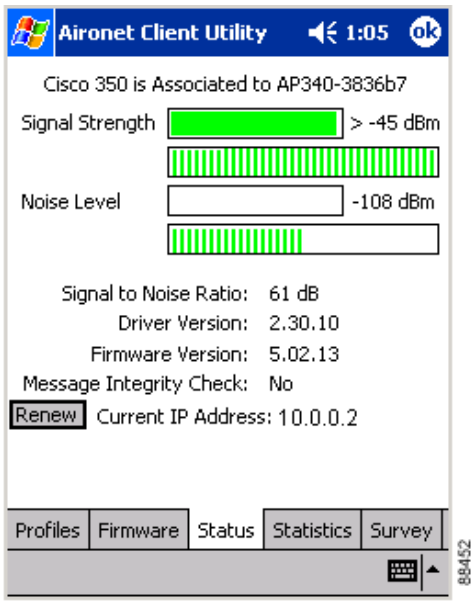


Table 7-1 interprets each element of the Status screen.

Table 7-1 Client Adapter Status

Status	Description
The first line of the Status screen	Indicates the operational mode of your client adapter and the name or MAC address of any associated access point. **Value:** Not Associated, Associated, Authenticated, or Ad Hoc Mode **Note** The access point name or MAC address is shown only if the client adapter is in infrastructure mode and Aironet Extensions are enabled (on access points running Cisco IOS release 12.2(4)JA or greater).
Signal Strength	The signal strength for all received packets. The higher the value and the more green the bar graph is, the stronger the signal. The histogram below the bar graph provides a visual interpretation of the current signal strength. Differences in signal strength are indicated by the following colors: green (strongest), yellow (middle of the range), and red (weakest). **Range:** 0 to 100% or –95 to –45 dBm
Signal Quality	The signal quality for all received packets. The higher the value and the more green the bar graph is, the clearer the signal. The histogram below the bar graph provides a visual interpretation of the current signal quality. Differences in signal quality are indicated by the following colors: green (highest quality), yellow (average), and red (lowest quality). **Range:** 0 to 100% **Note** This setting appears only if you selected signal strength to be displayed as a percentage. See the "Setting Signal Strength Display Units" section on page 7-2 for information.
Noise Level	The level of background radio frequency energy in the 2.4-GHz band. The lower the value and the more green the bar graph is, the less background noise present. **Range:** –100 to –45 dBm **Note** This setting appears only if you selected signal strength to be displayed in dBm. See the "Setting Signal Strength Display Units" section on page 7-2 for information.
Overall Link Quality	The client adapter's ability to communicate with the access point, which is determined by the combined result of the adapter's signal strength and signal quality. **Value:** Not Associated, Poor, Fair, Good, Excellent **Note** This setting appears only if you selected signal strength to be displayed as a percentage. See the "Setting Signal Strength Display Units" section on page 7-2 for information.

Table 7-1 Client Adapter Status (continued)

Status	Description
Signal to Noise Ratio	The difference between the signal strength and the current noise level. The higher the value, the better the client adapter's ability to communicate with the access point. **Range:** 0 to 90 dB **Note** This setting appears only if you selected signal strength to be displayed in dBm. See the "Setting Signal Strength Display Units" section on page 7-2 for information.
Driver Version	The version of the client adapter driver that is installed on your Windows CE device.
Firmware Version	The version of the firmware that is currently running on your client adapter.
Message Integrity Check	Indicates whether your client adapter is using message integrity check (MIC) to protect packets sent to and received from the access point. MIC prevents bit-flip attacks on encrypted packets. During a bit-flip attack, an intruder intercepts an encrypted message, alters it slightly, and retransmits it, and the receiver accepts the retransmitted message as legitimate. **Note** MIC is supported automatically by the client adapter's driver, but it must be enabled on the access point. **Value:** Yes or No
Current IP Address	The IP address of the client adapter. If your Windows CE device is set up to obtain an IP address from a DHCP server, you can press the Renew button to initiate a release and renew of the IP address. **Note** This parameter and the Renew button appear only on PPC 2002, HPC 2000, and CE .NET devices.

Step 2 Tap **OK** to exit the Status screen.

Viewing Statistics for Your Client Adapter

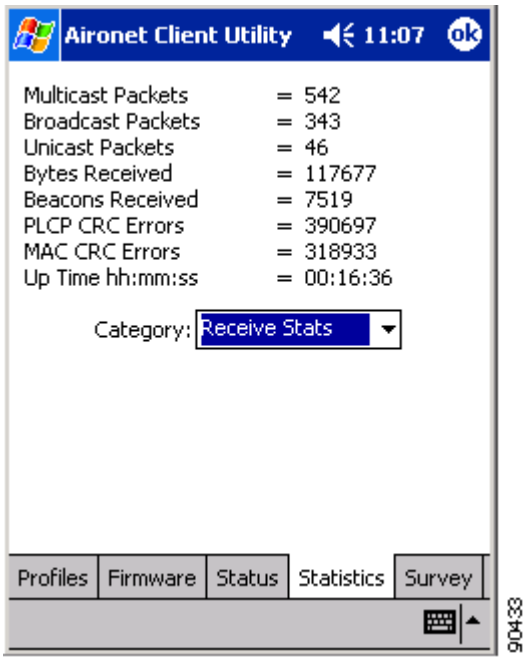
ACU enables you to view statistics that indicate how data is being received and transmitted by your client adapter. It also shows message integrity check (MIC) statistics if your client adapter's driver supports MIC and MIC is enabled on the access point.

Note The receive and transmit statistics are host statistics. That is, they show packets and errors received or sent by the Windows CE device. Link status tests from the access point or ACU site survey tool are performed at the firmware level; therefore, they have no effect on the statistics shown by the Statistics screen.

Follow the steps below to view your client adapter's statistics.

Step 1 From the Profiles screen, tap the **Statistics** tab. The Receive Statistics screen appears (see Figure 7-4).

Figure 7-4 Receive Statistics Screen



The statistics are calculated as soon as your client adapter is started.

Table 7-2 describes each receive statistic that is displayed for your client adapter.

Table 7-2 Receive Statistics

Statistic	Description
Multicast Packets	The number of multicast packets that were received successfully.
Broadcast Packets	The number of broadcast packets that were received successfully.
Unicast Packets	The number of unicast packets that were received successfully.
Bytes Received	The number of bytes of data that were received successfully.
Beacons Received	The number of beacon packets that were received successfully.
PLCP CRC Errors	The number of times the client adapter started to receive an 802.11 Physical Layer Convergence Protocol (PLCP) header but the rest of the packet was ignored due to a cyclic redundancy check (CRC) error in the header. **Note** CRC errors can be attributed to packet collisions caused by a dense population of client adapters, overlapping access point coverage on a channel, high multipath conditions from bounced signals, or the presence of other 2.4-GHz signals from devices such as microwave ovens, wireless handset phones, etc.

Table 7-2 Receive Statistics (continued)

Statistic	Description
MAC CRC Errors	The number of packets that had a valid 802.11 PLCP header but contained a CRC error in the data portion of the packet. **Note** CRC errors can be attributed to packet collisions caused by a dense population of client adapters, overlapping access point coverage on a channel, high multipath conditions from bounced signals, or the presence of other 2.4-GHz signals from devices such as microwave ovens, wireless handset phones, etc.
Up Time (hh:mm:ss)	The amount of time (in hours:minutes:seconds) since your client adapter was started. If the client adapter has been running for more than 24 hours, the time is displayed in days, hours:minutes:seconds.

Step 2 To view the transmit statistics for your client adapter, tap the arrow in the Category drop-down menu and select **Transmit Stats**. The Transmit Statistics screen appears (see Figure 7-5).

Figure 7-5 Transmit Statistics Screen

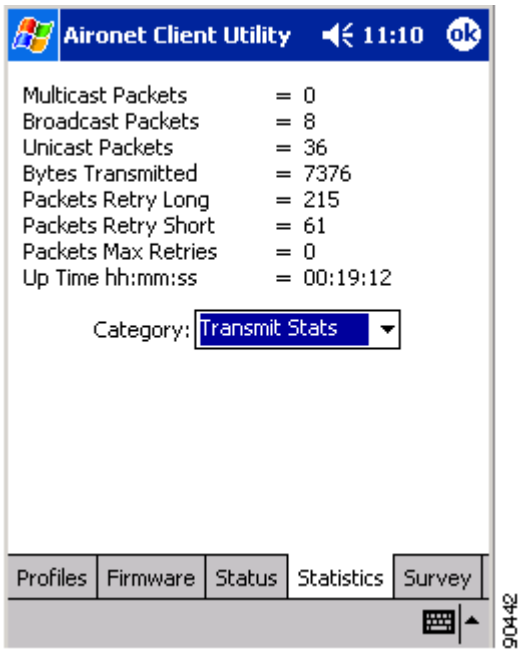


Table 7-3 describes each transmit statistic that is displayed for your client adapter.

Table 7-3 Transmit Statistics

Statistic	Description
Multicast Packets	The number of multicast packets that were transmitted successfully.
Broadcast Packets	The number of broadcast packets that were transmitted successfully.
Unicast Packets	The number of unicast packets that were transmitted successfully.
Bytes Transmitted	The number of bytes of data that were transmitted successfully.
Packets Retry Long	The number of normal data packets that were retransmitted.
Packets Retry Short	The number of request-to-send (RTS) packets that were retransmitted.
Packets Max Retries	The number of packets that failed to be transmitted successfully after exhausting the maximum number of retries.
Up Time (hh:mm:ss)	The amount of time (in hours:minutes:seconds) since your client adapter was started. If the client adapter has been running for more than 24 hours, the time is displayed in days, hours:minutes:seconds.

Step 3 To view the MIC statistics for your client adapter, tap the arrow in the Category drop-down menu and select **MIC Stats**. The MIC Statistics screen appears (see Figure 7-6).

Note The MIC Stats option is available only if your client adapter's driver supports MIC and only if MIC is enabled on the access point.

Figure 7-6 MIC Statistics Screen

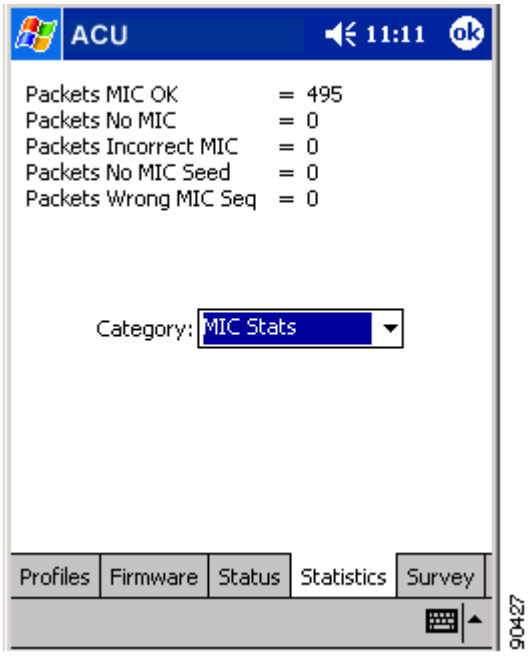


Table 7-4 describes each MIC statistic that is displayed for your client adapter.

Table 7-4 MIC Statistics

Statistic	Description
Packets MIC OK	The number of packets that were received successfully with a valid MIC.
Packets No MIC	The number of packets that were discarded due to no MIC being found.
Packets Incorrect MIC	The number of packets that were discarded due to an incorrect MIC value.
Packets No MIC Seed	The number of packets that were discarded due to no MIC seed being received.
Packets Wrong MIC Seq	The number of packets that were discarded due to the MIC sequence number being wrong.

Step 4 Tap **OK** to exit the Statistics screen.