User's Guide

Mobiwave

BPA - D10
Bluetooth™ Protocol Analyzer

Check for regular software updates at
www.mobiwave.com

Partno : UML-SYDNEY00-0

Notices

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FCC Compliance

This equipment has been tested and found to comply with the limits of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions in this user's guide, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to other radio wave devices' reception, which can be confirmed by turning on and off of this equipment, the user will be required to take following measures to correct the interference.

- Re-orientate the receiving antenna of the affected devices.
- Increase the distance separation between this equipment and the affected devices.
- Connect this equipment to a power outlet on a circuit that is different from that of the affected devices.
- Consult the dealer of the affected devices for help.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

No special accessory is required to enable the equipment to comply with the emission limits.

In order to comply with FCC RF Exposure requirements, the Bluetooth Protocol Analyzer must be installed and operated in such a way so as to maintain a minimum 20 cm separation distance between the antenna and all persons, during normal operations.

EU Compliance

This equipment has been tested and found to comply with the EN 301 489-1 & 17, EN55022 (Class B), EN61000-3-2/3, EN61000-4-213/4/5/6/11, EN300 328-1 & 2.

Japan Compliance

VCCI Class B.

Bluetooth ™ Compliance

Bluetooth Qualification Body has successfully qualified this product on 18th January 2002. This product is for development and/or demonstration purpose only and it has not been tested for compliance with the Bluetooth System Specifications.

General Safety Summary

Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it. To avoid potential hazards, use this product only as specified.

Only qualified personnel should perform service procedures.

Observe All Terminal Ratings.

Do Not Operate With Suspected Failures. If you suspect there is damage to this product, have it inspected by qualified service personnel.

Do Not Operate in Wet/Damp Conditions.

Do Not Operate in an Explosive Atmosphere.

Keep Product Surfaces Clean and Dry.

Do Not Clean the Surfaces with Cleaning Agent.

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Mobiwave warrants that the products that it manufactures and sells will be free from defects in materials and workmanship for a period of one (1) year from the date of shipment. If a product proves defective during this warranty period, Mobiwave, at its option, either will repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product.

In order to obtain service under this warranty, Customer must notify Mobiwave of the defect before the expiration of the warranty period and make suitable arrangements for the performance of service. Customer shall be responsible for packaging and shipping the defective product to the service center designated by Mobiwave, with shipping charges prepaid. Mobiwave shall pay for the return of the product to Customer if the shipment is to a location within the country in which the Mobiwave service center is located. Customer shall be responsible for paying all shipping charges, duties, taxes, and any other charges for products returned to any other locations.

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Mobiwave shall not be liable for damage to other property caused by any defects in this product, damages based upon inconvenience, loss of use of the product, loss of time or data, commercial loss, or any other damages, whether special, incidental, consequential, or otherwise, whether under theory of contract, tort (including negligence), indemnity, product liability, or otherwise. In no event shall Mobiwave's liability exceed the total amount paid to Mobiwave for this product.

Mobiwave reserves the right to revise these specifications without notice or penalty.

Table of Content

CHAPTER

1

Overview

Introduction

Mobiwave BPA-D10 is a non-intrusive Bluetooth ™ protocol analyzer that allows real-time capturing, logging, decoding and displaying of the Bluetooth ™ wireless baseband and data packets. The protocol information is captured over the air and relayed to a host desktop PC or notebook through an Ethernet connection, allowing remote data logging and 'unlimited' storage capability.

The intuitive graphical user interface ensures ease of configuration, control and display of captured data. The search engine and advanced display filters help define the relevant information to be displayed, making data inspection much easier.

Bluetooth ™ Overview

Bluetooth wireless technology is set to revolutionize the personal connectivity market by providing freedom from wired connections. It is a specification for a small form factor, low cost radio solution providing links between mobile computers, mobile phones and other portable handheld devices, and connectivity to the Internet. The

Bluetooth Special Interest Group (SIG), comprised of leaders in the telecommunications, computing, and network industries, is driving the development of the technology and bringing it to market. The Bluetooth SIG includes promoter group companies 3Com, Agere, Ericsson, IBM, Intel, Microsoft, Motorola, Nokia and Toshiba, and more than 2000 Associate and Adopter member companies.

Features

- Bluetooth ™ v1.1 compliant
- Remote Information Collection
- Bluetooth ™ protocol information capture at radio level
- Data logging limited only by available disk space or operating system at the host
- Multiple synchronization methods
  - sync through slave inquiry
  - sync through master inquiry
  - sync via fake connection
- Point-to-point and point-to-multipoint/piconet
- Intuitive graphics user interface
- Protocol information representation for BASEBAND, LM, L2CAP, SDP, SDP Attribute Lists, TCS, RFCOMM, OBEX, AT Commands, HDLC and PPP levels
- Advanced search engine based on protocol layers or payload content
- Packet time stamping display in Bluetooth ™ native clock
- Advanced display filters (based on baseband packet, device, and protocol layers) for easy debugging
- Timer and book markers to assist debugging and timing measurements
- User customizable display colors for enhanced readability
- Saving of captured Bluetooth protocol information for offline viewing
- 10/100BaseT Ethernet interface
- Built-in DHCP client
- Status LED indicators display
- Antenna slot for safe storage of swivel antenna against damage
- Power-on self-diagnostics
- Power adapter with wide range AC power input

Software Requirements

Windows 98, Windows Millennium Edition, Windows NT 4.0 with Service Pack 6, or Windows 2000, Windows XP

Hardware Requirements

Pentium III, 450 MHz or above
128 MB of RAM
Minimum 100 MB of free space on hard drive
10/100BaseT Ethernet card
Screen display resolution of 1024x768 with 256 colors

CHAPTER

2

Getting Started

This section provides instructions on connecting the BPA-D10 hardware unit, and installing, uninstalling and starting the Mobiwave BPA-D10 software.

Packing List

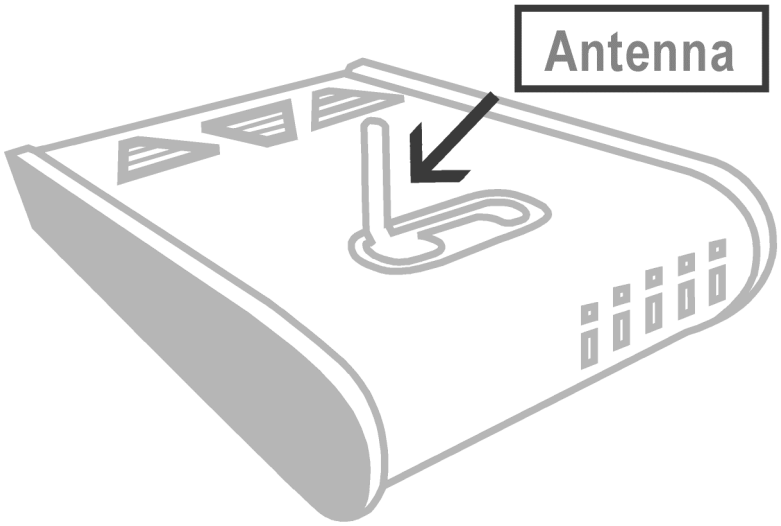
1. BPA-D10
2. Power Adaptor
3. Ethernet Cable Straight (Blue)
4. Ethernet Cable Cross (Red)
5. Installation CD
6. User's Guide
7. Quick Start Guide
8. Carry Bag

Setting up BPA-D10 Hardware

1 ■ Swivel the antenna to an upright position for maximum sensitivity. (figure 2.01)

Figure 2.01

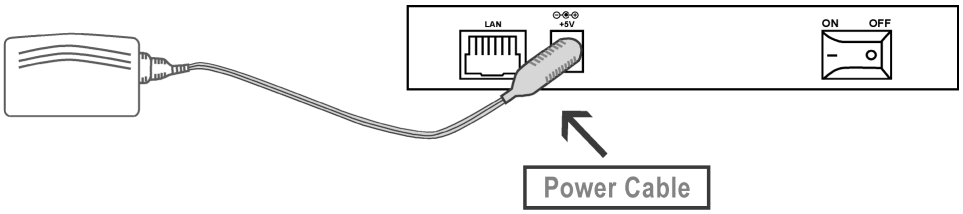
BPA-D10 antenna position



2 ■ Connect the power cable to the rear of the BPA-D10. (figure 2.02)

Figure 2.02

Connect power cable

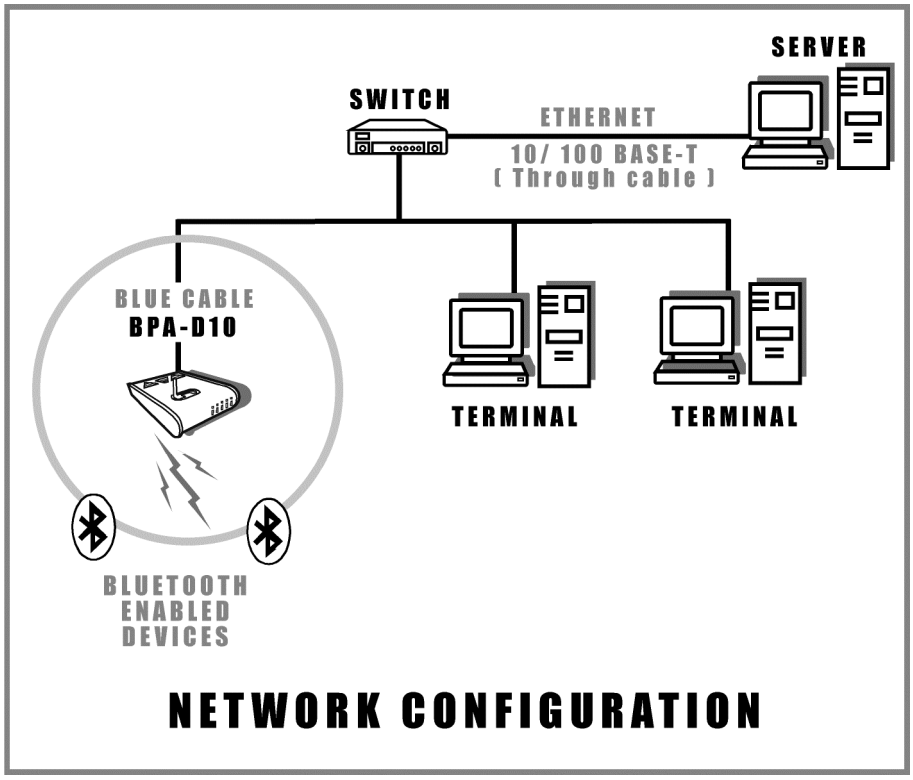


3■ The BPA-D10 can be setup in either network or standalone configuration. Network configuration is recommended on office network that has either a DHCP server or static IP. In the absence of DHCP server or static IP network, standalone configuration is recommended for the initial setup.

If the office network has a DHCP server or static IP network, then setting up the BPA-D10 is easy. Connect the Ethernet cable (blue in color) between the Ethernet port of the BPA-D10 and the Ethernet port of the office network. The PC should also be connected to the same office network subnet. (Figure 2.03) For static IP network, Step 4 below might be required; alternatively, the static IP of BPA-D10 could also be reprogrammed to suit the prevailing static IP network in the office.

==➔ Skip to Step 5.

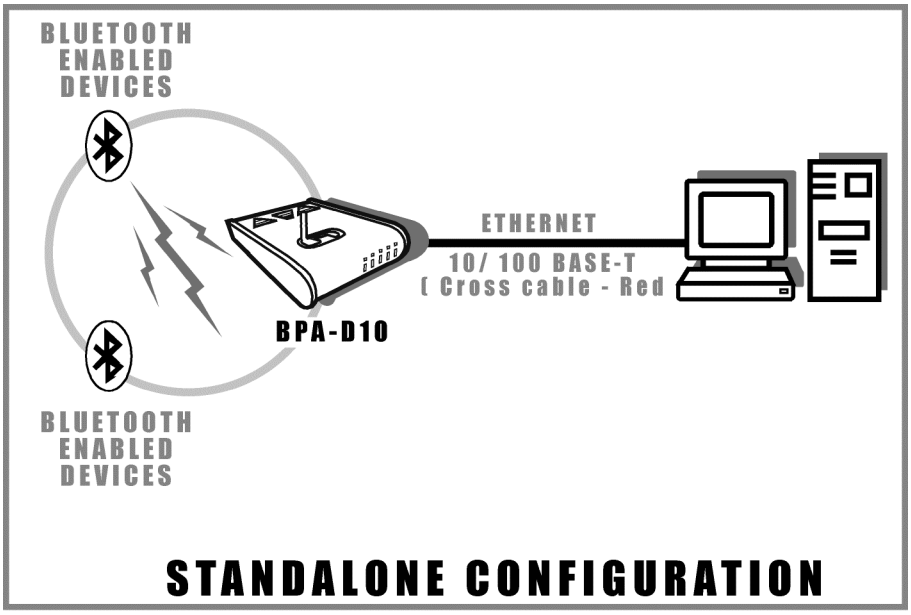
Figure 2.03
Networked configuration



Else,

To configure the BPA-D10 for standalone configuration, connect the Ethernet cross cable (RED in color) between the Ethernet port of the BPA-D10 to and the Ethernet port of the PC. (figure 2.04)

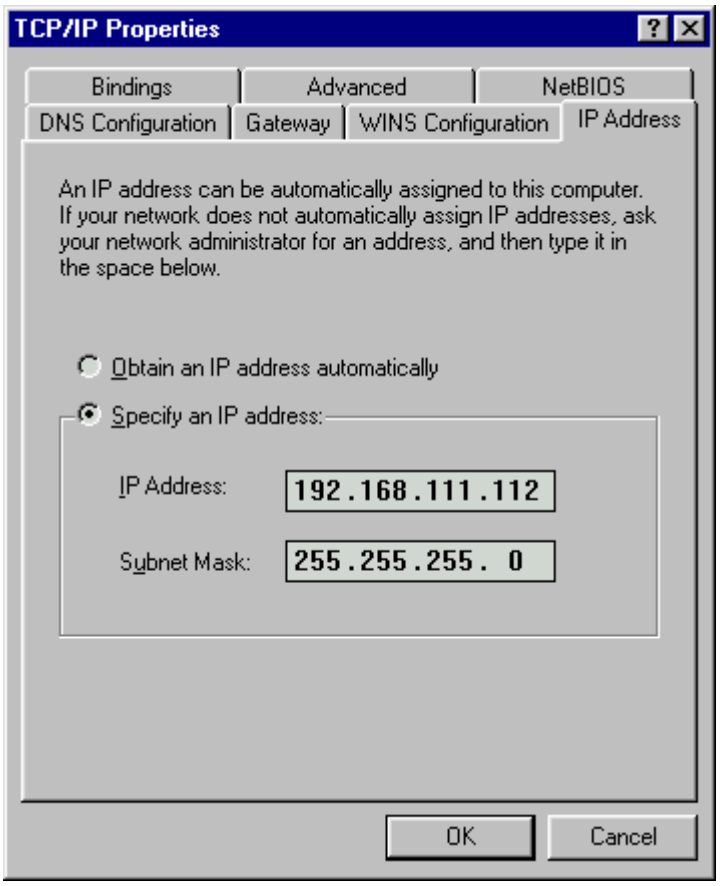
Figure 2.04
Standalone configuration



4 ■ Setup the TCP/IP setting of the PC to 192.168.111.112 with netmask of 255.255.255.0. (The BPA-D10 comes with a default IP address of 192.168.111.111 with netmask of 255.255.255.0). (figure 2.05)

Figure 2.05

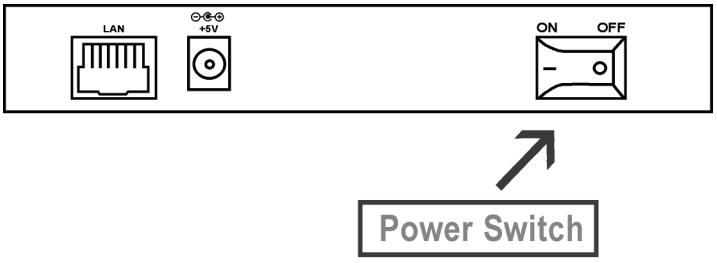
PC's TCP/IP properties for standalone configuration



5 ■ Turn on the power switch on the rear of the BPA-D10. (figure 2.06)

Figure 2.06

Turn on power switch



Installing Mobiwave BPA-D10 Program

1 ■ Insert the **Mobiwave BPA-D10 Installation** disk into the cd-rom drive.

2 ■ Double click on the program BPA-D10.msi in the cd-rom. Follow the instruction in the installation program.

3 ■ During setup, a directory *Mobiwave BPA-D10* will be created under the folder *Program Files* in the C drive. An icon **Mobiwave BPA-D10** will be created under *Programs* in the *Start Menu* subfolder of *Windows*.

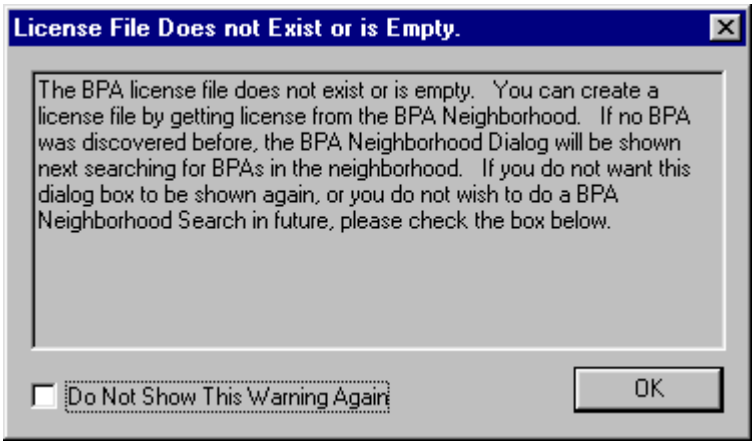
Installing the License File for BPA-D10

The BPA-D10 program needs a license file to enable it to make a connection to the BPA-D10 hardware. The following describe the steps to install the license file.

If you are using the Mobiwave BPA-D10 software for the first time, a license file dialog box will appear on the screen. (Figure 2.07). Click OK. Follow the steps below to install the license file for BPA-D10

Figure 2.07

License File Dialog box



1 ■ Select ***Start*** --> ***Programs*** --> ***Mobiwave BPA-D10*** or double click on the icon to start the BPA-D10 program. (figure 2.08)

Figure 2.08

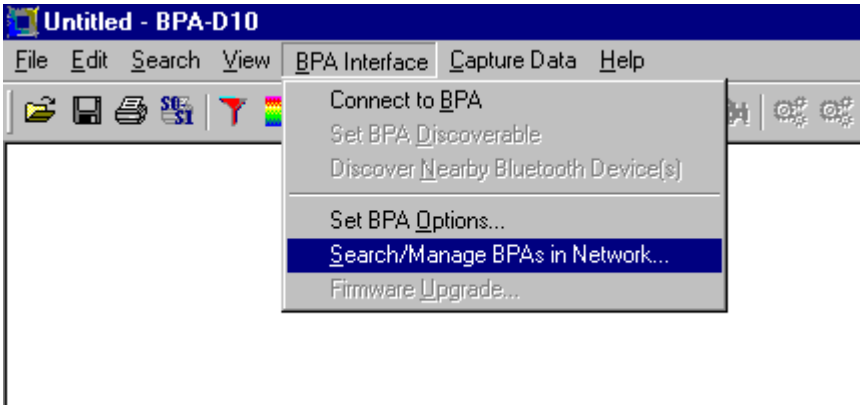
Mobiwave BPA-D10 icon

2 ■ Click the Menu option “BPA Interface” ==> ”Search/Manage BPAs in Network”. (figure 2.09)

.

Figure 2.09

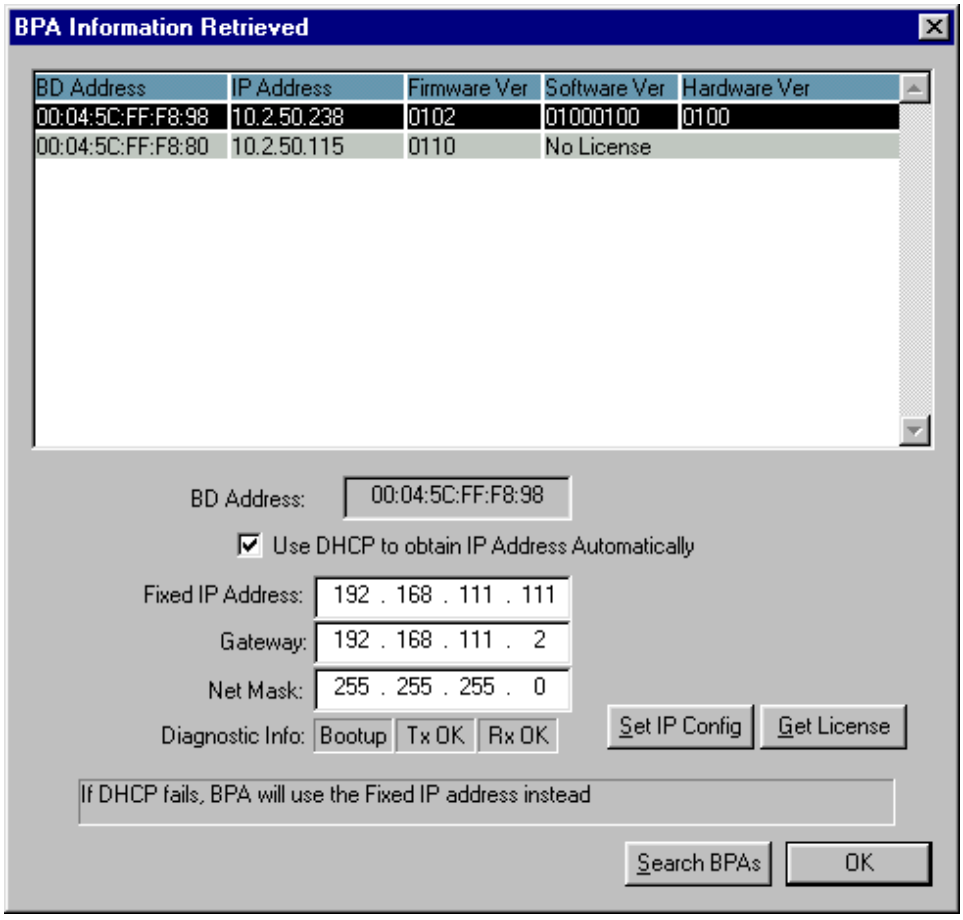
Menu Option “BPA Interface”



You will see the BPA Neighborhood window pop out. (figure 2.10)

Figure 2.10

BPA Neighborhood window

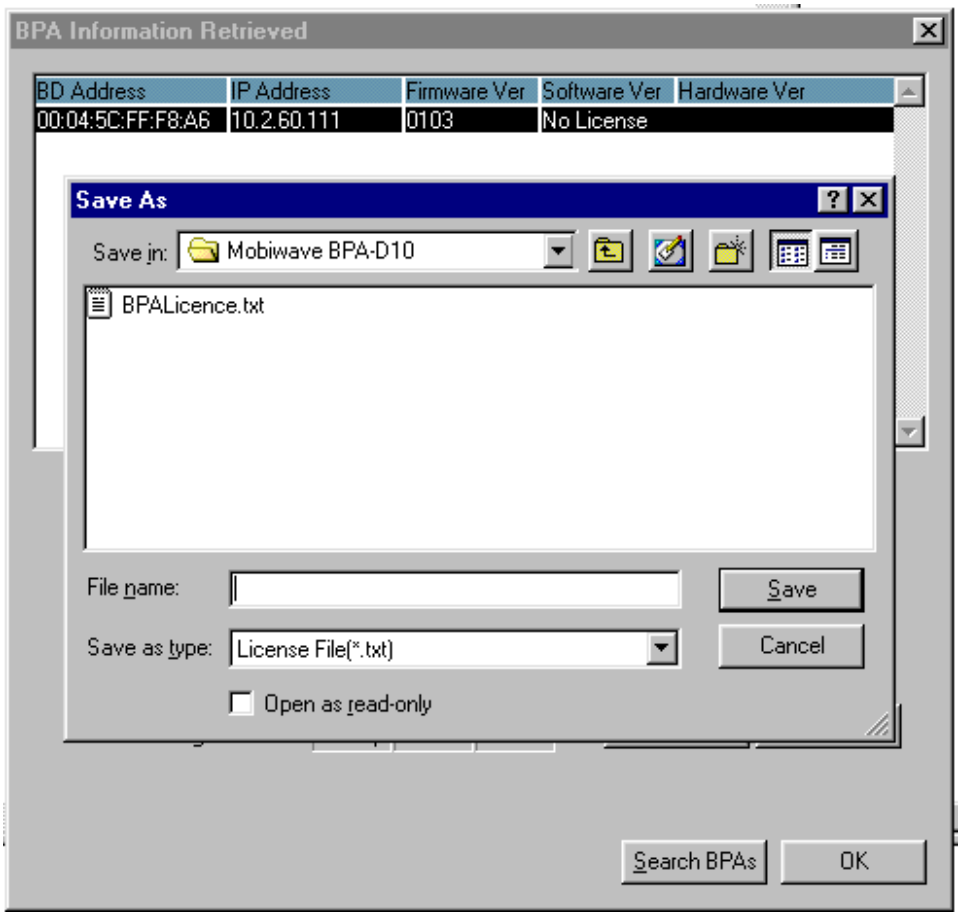


Click on Search BPAs. A list of BPAs detected on the network will be added to the BPA Neighborhood list box. Select any item on the list box and click the Get License Button.

If nothing appears on the list, that means the BPA-D10 program is not able to detect any BPAs on the network. You will need to check your BPA-D10 again to make sure it is setup properly.

3 ■ Save the license file in the Mobiwave BPA-D10 directory. (figure 2.11)

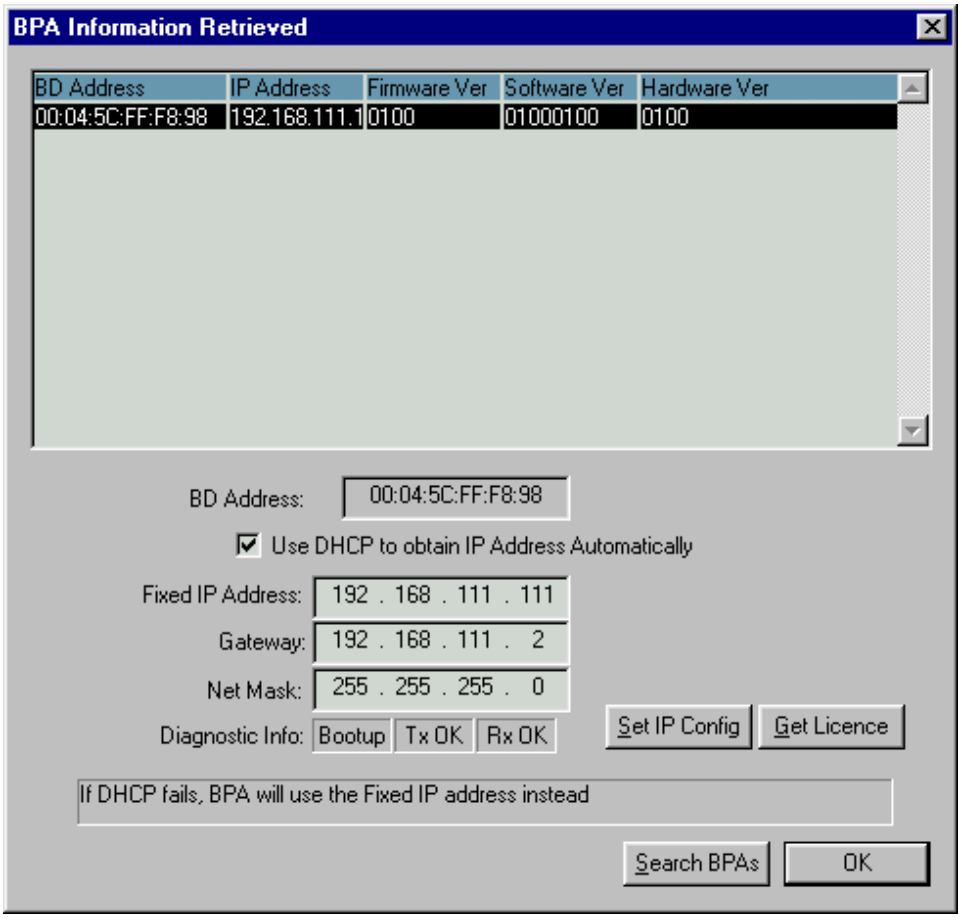
Figure 2.11
Save license file.



When the license file is installed properly, you will see the BPA Neighborhood Window displayed BPA-D10 Software Ver and Hardware Ver that the license file allowed the BPA-D10 program to work with (figure 2.12)

Figure 2.12

Save license file.



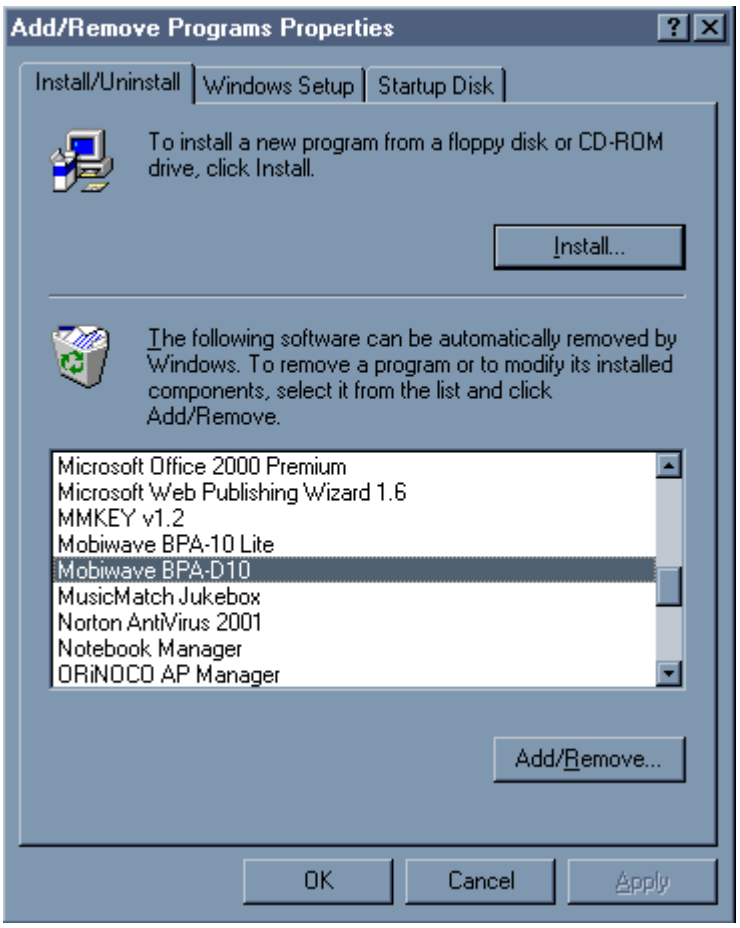
Uninstalling Mobiwave BPA-D10

1 ■ Select ***Start*** -->***Settings*** --> ***Control Panel*** --> ***Add/Remove Programs***

2 ■ Select **Mobiwave BPA-D10** from the list of installed software (figure 2.13).

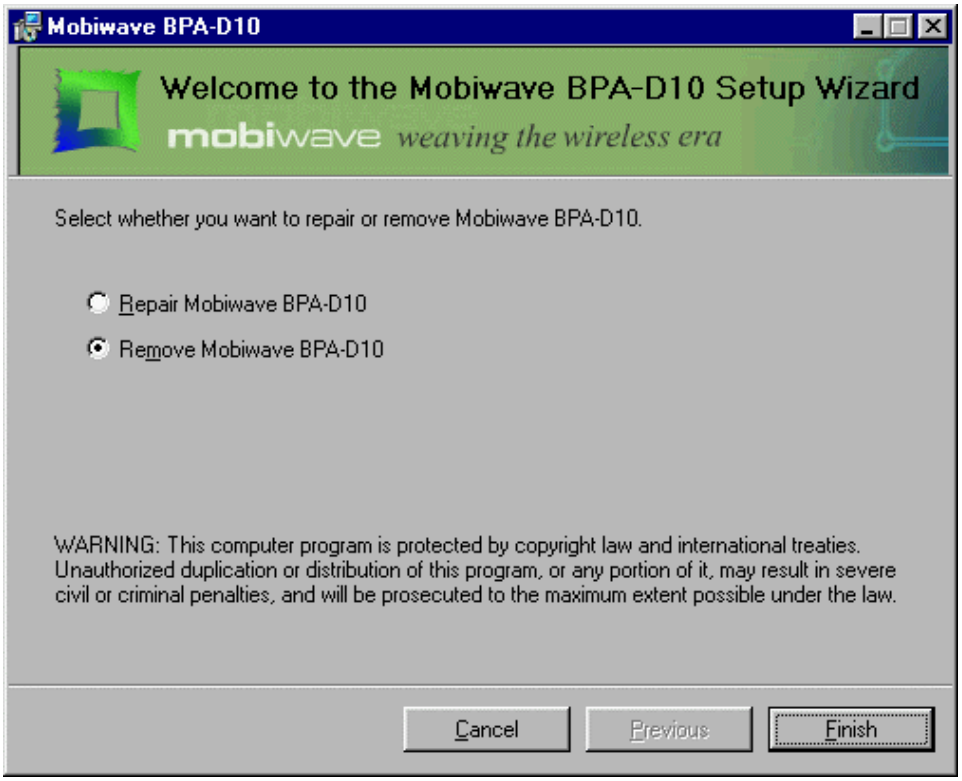
Figure 2.13

Selecting Mobiwave BPA-D10



3 ■ Click **Add/Remove….** The **Mobiwave BPA-D10** installer will display a window where you can choose to either repair or remove the installed program.

Figure 2.14
Setting the option for removal



4 ■ Click the radio button next to **Remove Mobiwave BPA-D10**.

5 ■ Click **Finish** to complete the removal process or **Cancel** to exit without removing the program.

Upgrading the Mobiwave BPA-D10

Mobiwave BPA-D10 is upgradeable for both software and firmware. For software and firmware updates, please refer to the Mobiwave website at http://www.mobiwave.com.

For the graphical user interface, simply uninstall the older version and install the latest version.

CAUTION	DO NOT turn off the power supply or disturb the LAN connection when performing firmware upgrading. Otherwise the BPA-D10 may be unusable.

For firmware flashing of the hardware -

1 ■ Connect to the targeted BPA-D10.

2 ■ **EITHER** Select Menu option ***BPA Interface → Firmware Upgrade...***

OR Press **ALT + *B* + *U***

3 ■ Select the file (with extension .out) to be flashed into the BPA-D10

4 ■ Click "Open".

Starting Mobiwave BPA-D10

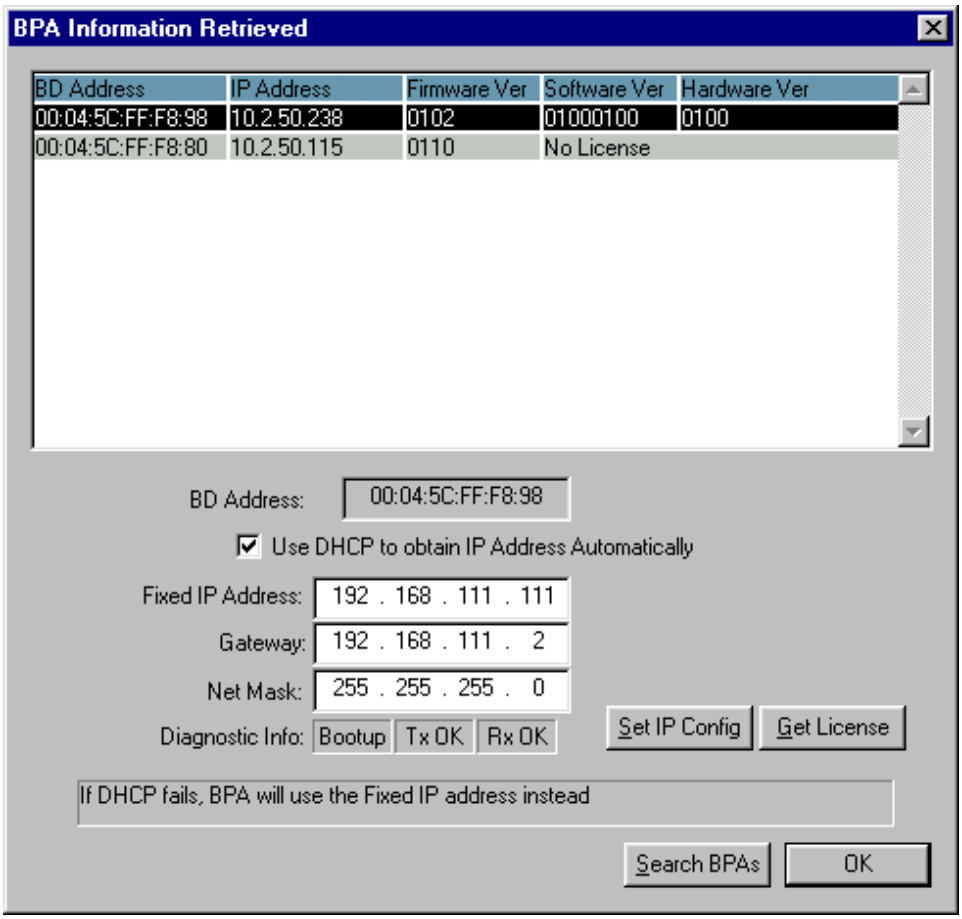
BPA-D10 is a networked device. Therefore it needs an IP address. BPA-D10 has a built in DHCP client which can obtain IP address dynamically from the DHCP server. If there is no DHCP server available it will automatically fall back to factory default fixed IP address of 192.168.111.111 with netmask of 255.255.255.0. . You will then need to use the BPA-D10 program to manually configure the network configuration for your BPA-D10 in order to use it on the network. You should check with your network administrator for the correct network setting to use.

To run the Mobiwave BPA-D10 software on your machine,

1 ■ Activate the "BPA Neighborhood" dialog box by selecting the Menu Option "BPA Interface"->"Search/Manage BPAs in Network". (figure 2.15)

Figure 2.15

BPA Neighborhood



2 ■ To configure the BPA hardware to obtain the IP address dynamically, click the *Use DHCP* checkbox.

To configure the BPA hardware to use a fixed IP address, type in the correct network information (e.g. Fixed IP Address, Gateway, Net Mask) and click **Set IP Config**. Ensure that the check box "Use DHCP to obtain IP address Automatically" is unchecked.

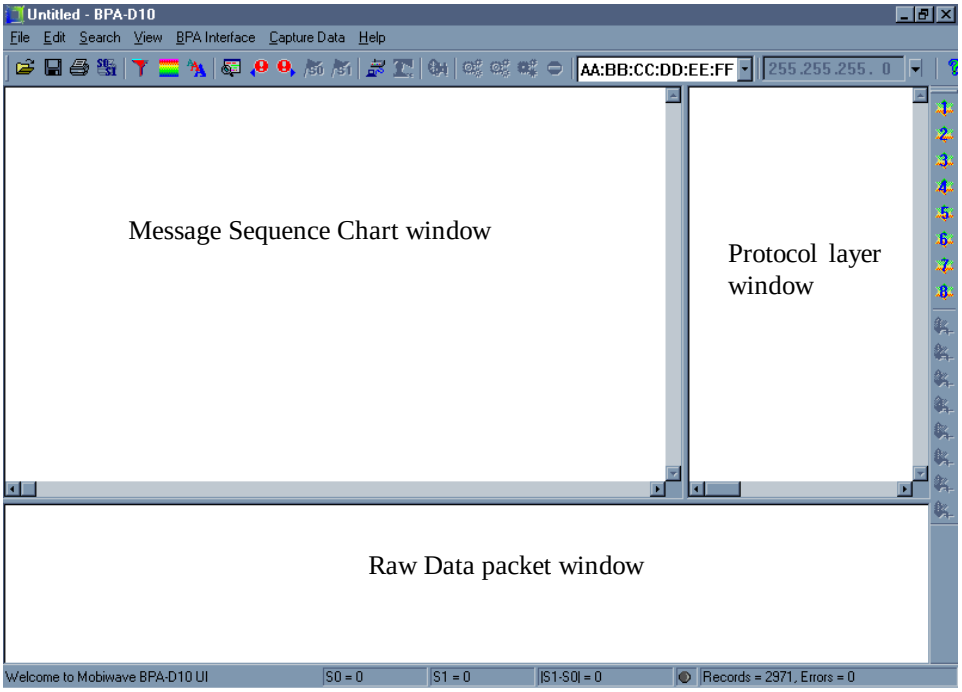
3 ■ Select the BPA-D10 by clicking on the BPA IP address item in the dialog box. The BPA-D10 selected will be highlighted.

4 ■ Click **OK**. This will bring you to the main screen **Mobiwave BPA-D10** , which has 3 windows, namely

- the Message Sequence chart (MSC) window for protocol exchanges
- the protocol layer window for decoded protocol fields
- the raw packet window for basic binary information

Figure 2.16

Main Screen of Mobiwave BPA-D10



Interpretation of MSC Window

In the MSC window, each baseband packet captured is decoded and displayed as an entry. Figure 2.17 shows an example of a baseband packet that was captured. Its contents are broken down and presented in showing all the protocols embedded in its data. In addition to the protocols, the following base band information is also displayed:

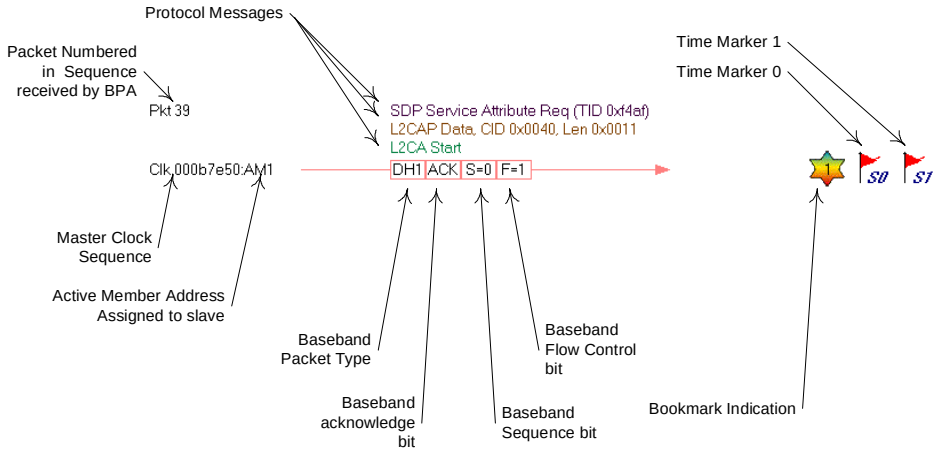
i) Master Clock Sequence;
ii) Active Member Address (AM_ADDR)

iii) Detailed breakdown of the packet header, i.e. packet type, acknowledgment, sequence and flow control;

In addition, for ease of tracking, each packet is tagged with a running packet number.

Figure 2.17

Example of a captured packet displayed in MSC Window.



LED Status Indicators

The table below describes the various states representation of the LED status indicators found on BPA-D10.

Table 2.01

Mobiwave BPA-D10's LED Status Indicators

LED Indicators	Functional Description	Color
TX	Active when BPA-D10 radio transceiver is transmitting information	Green
RX	Active when BPA-D10 radio transceiver is receiving information	Green
SYNC	When synchronized to target slave device	Amber
	When synchronized to target master device and during capturing of Bluetooth ™ information	Green
LAN	Configured as static IP and not connected to host.	Flashing Amber (approx. 1s interval)
	Configured as DHCP client and not connected to host	Flashing Amber (approx. 0.5s interval)
	Connected to host	Amber
PWR	Active when BPA-D10 powered on	Green
	During firmware upgrade	Flashing between Green-Amber

NOTE

Make connection to the BPA-D10 hardware only when the LAN LED is flashing. The flashing of the LAN LED will typically takes about 30 seconds from the time the hardware is turned on.

CHAPTER

3

Mobiwave BPA-D10 Basics

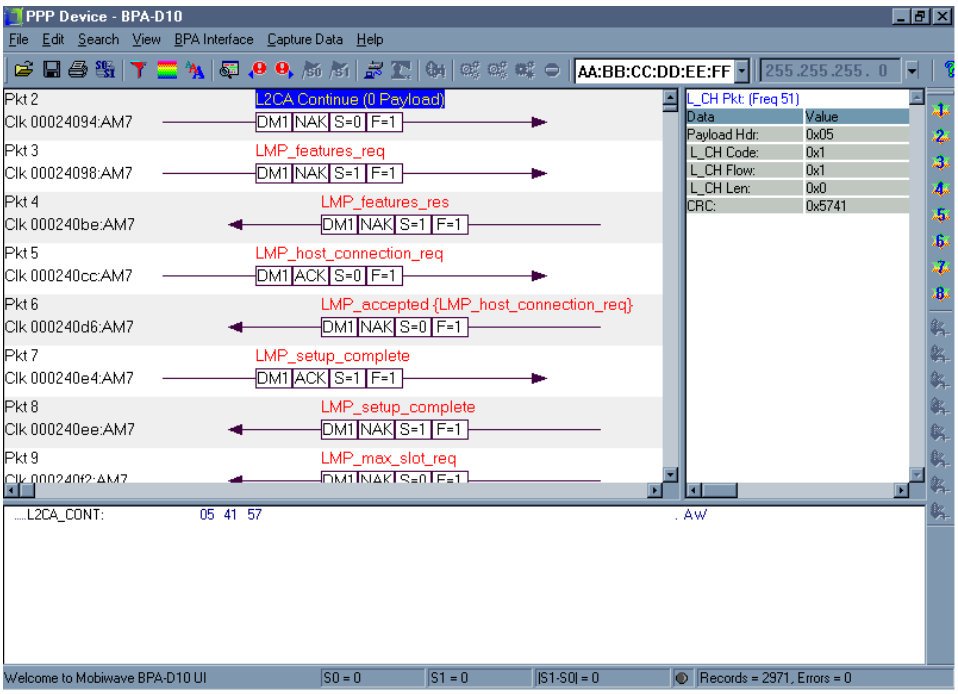
Mobiwave BPA-D10 is fully menu-driven and has 3 main windows. This section describes the functions of the windows and the 4 basic ways you can access the various functions of the software.

Windows in Mobiwave BPA-D10

Three core windows provide highly integrated views (figure 3.01).

Figure 3.01

Main Screen of Mobiwave BPA-D10



The MSC window displays an overview of the protocol exchanges in the form of message sequence chart in chronological order.

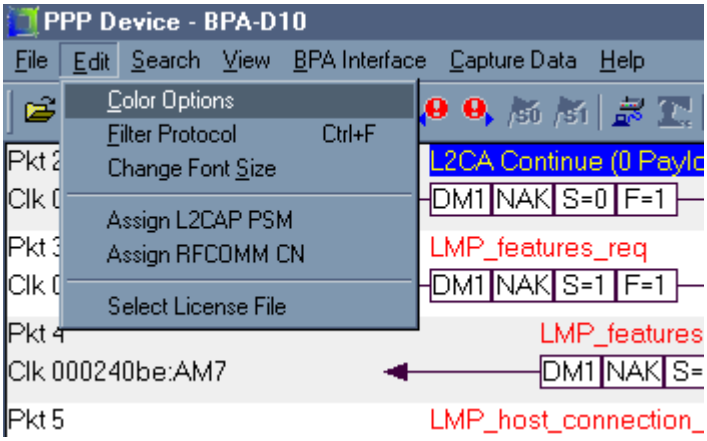
The protocol layer window shows details of the decoded protocol fields.

The raw data packet window displays the basic binary information in ASCII and hexadecimal format with collapsible 'tree branches' for optimal screen usage. Right clicking the mouse in this window could expand this window.

Using Menu Bars

You can select any function using pull-down menus which appear along the top of each screen (figure 3.02).

Figure 3.02
Selection using menu bars



The menu path to the desired function is represented as

- ***Menu bar item → submenu item***

EXAMPLE

- ***Edit → Color Options***

For the above, you have to first click the menu item ***Edit***, and then select ***Color Options***.

Using ALT Key Combinations

All operations in the menu bar have ALT keys assigned to them. These are indicated by the underlined letters in the menu bar (figure 3.03).

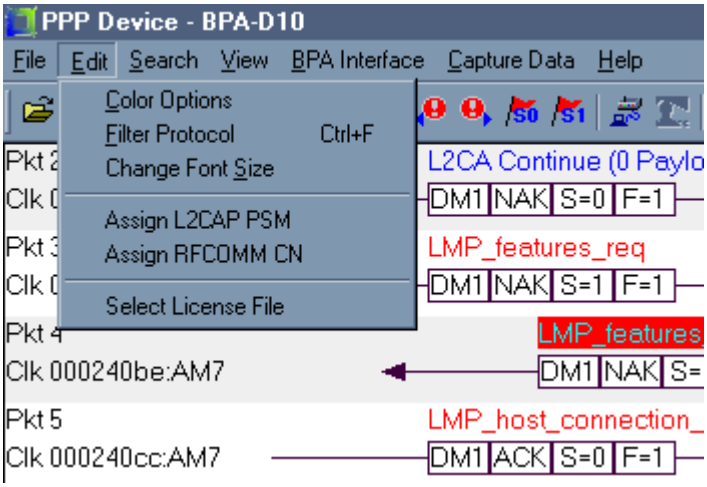
Example The BPA Interface function in the menu bar has the letter B underlined while the submenu item Set BPA Options has the letter O underlined. To select the BPA Interface function, press the ALT key and hold it down while you press the B key. The BPA Interface pull-down menu will appear. Then, while still holding down the ALT key, press the O key. This will bring up the BPA Options dialog.

ALT key combinations may consist of 2 or 3 keys. They are represented as -

ALT + ***letter1*** {+ ***letter2***} where *letter1* and *letter2* are letters of the alphabet

Figure 3.03

Selection using hot keys



EXAMPLE

- **ALT + *E* + *C***

For the above, you have to press the ALT key and hold it down while you press the letter E and then the letter C.

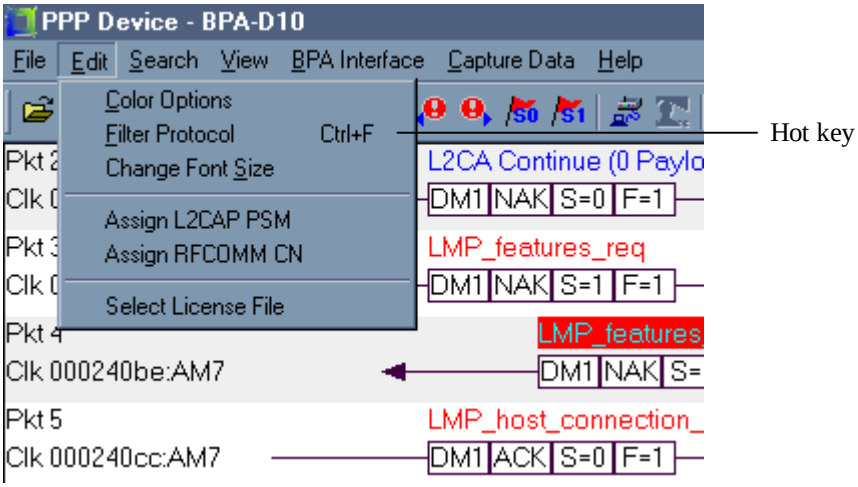
Using Hot Keys

Certain operations have hot keys assigned to them and these are indicated at the appropriate places in the pull-down menu (figure 3.04).

Example The function for changing the filter protocol is labeled with 'Ctrl + F'. This means you can perform that function by pressing the Ctrl key and holding it down while you press the F key.

Figure 3.04

Selection using hot keys



Hot keys consist of combinations of 2 keys, namely the **Ctrl** key and a letter, represented as -

Ctrl + ***letter*** where *letter* is a letter of the alphabet

Note that you have to press the **Ctrl** key and hold it down while you press the ***letter*** key.

EXAMPLE

- **Ctrl** + ***F***

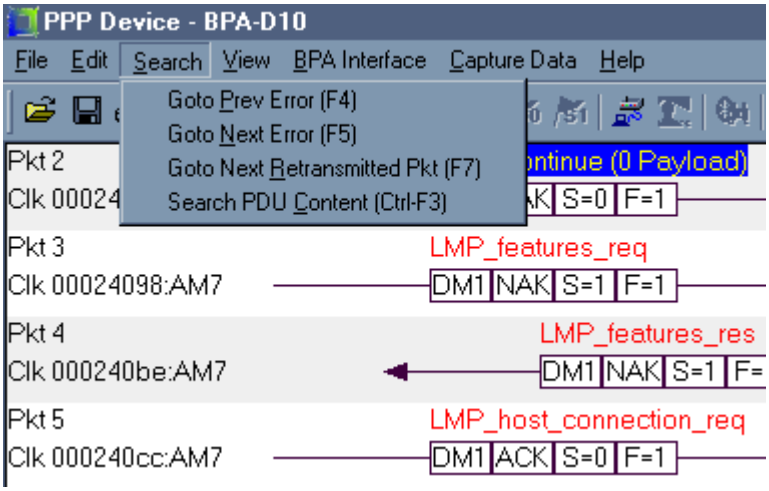
For the above, you have to press the Ctrl key and hold it down while you press the letter F.

Using Function Keys

Function keys have been assigned for frequently executed operations such as searching for the previous error **<F4>** and searching for the next error **<F5>** (figure 3.05). Function keys are represented as **<Fx>** where x is an integer.

Figure 3.05

Selection using function keys

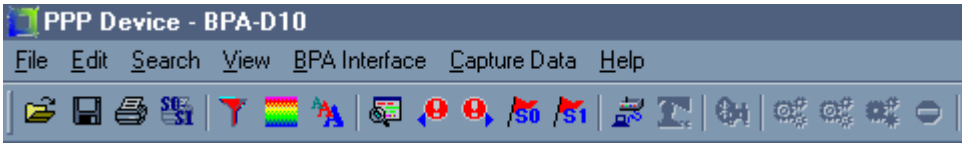


Using Graphical Icons

Some commands are represented by graphical icons in the toolbar for easier access (figure 3.06).

Figure 3.06

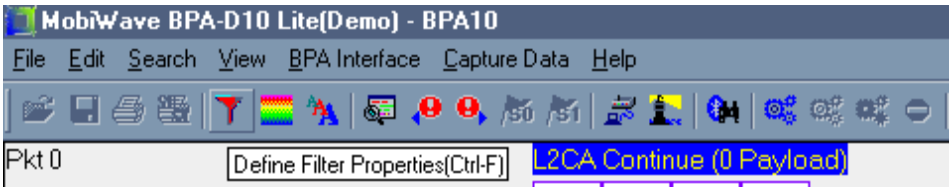
Graphical icons



If you place the cursor over an icon, the appropriate pop-up text will appear indicating the function of the icon (figure 3.07).

Figure 3.07

Pop-up text for graphical icons

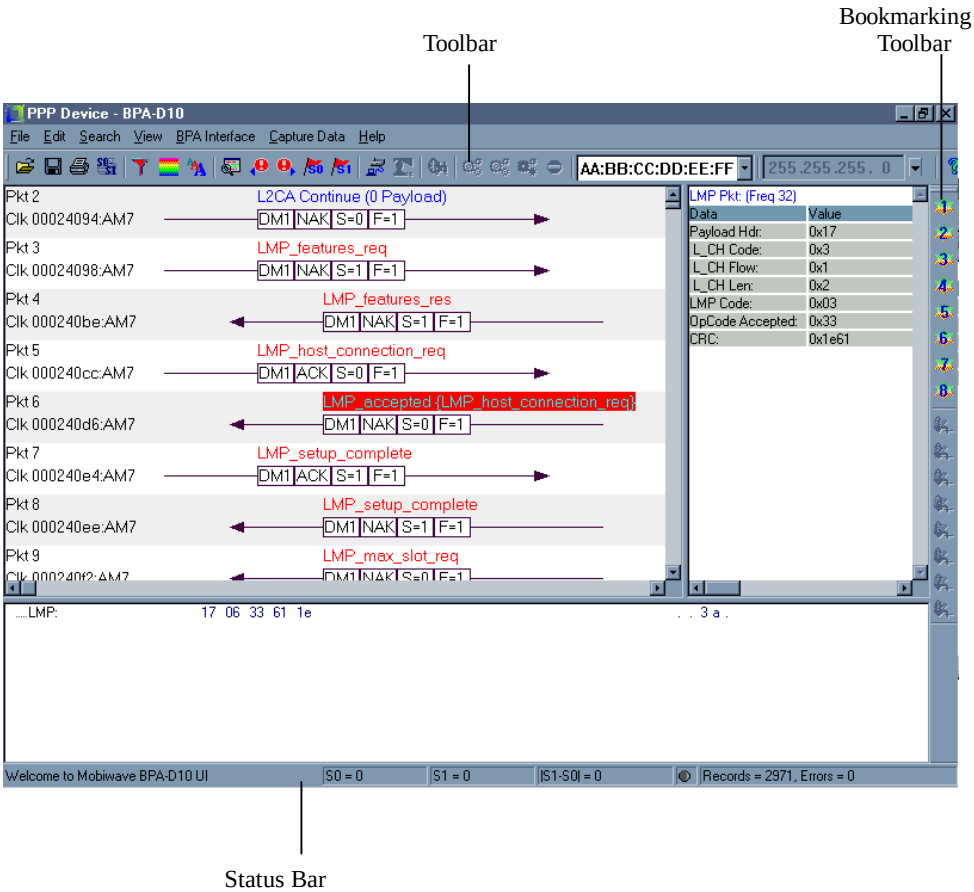


Setting Status Bar and Toolbars

You can set the status bar, the toolbar and the bookmarking toolbar on and off as desired.

Figure 3.08

Status Bar, Toolbar and Bookmarking Toolbar

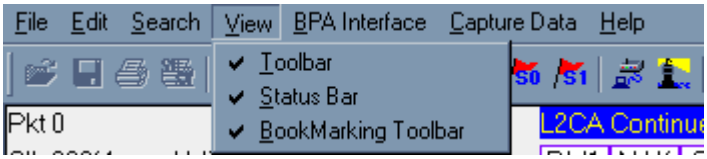


The turning on and off of a toolbar is a toggle function.

To turn a toolbar on, click **View** and select the appropriate item. This item should not have a tick next to it.

To turn a toolbar off, click **View** and select the appropriate item. This item should have a tick next to it.

Figure 3.09
Setting Status Bar and Toolbars



Printing Hardcopies

You can generate a hardcopy of the MSC window information. You can also specify the print area using the time markers, S0 and S1 or print the entire captured data file.

To print between the time markers, S0 and S1 -

1 ■ **EITHER** Select ***File → Print MSC bet S0/S1***

OR Press **ALT** + ***F*** + ***M***

To print the entire captured data file –

1 ■ **EITHER** Select ***File → Print…***

OR Press **ALT** + ***F*** + ***P***

OR Click .

In addition, user can specify the header for the printouts.

1 ■ Select ***File → Set Print Header…***

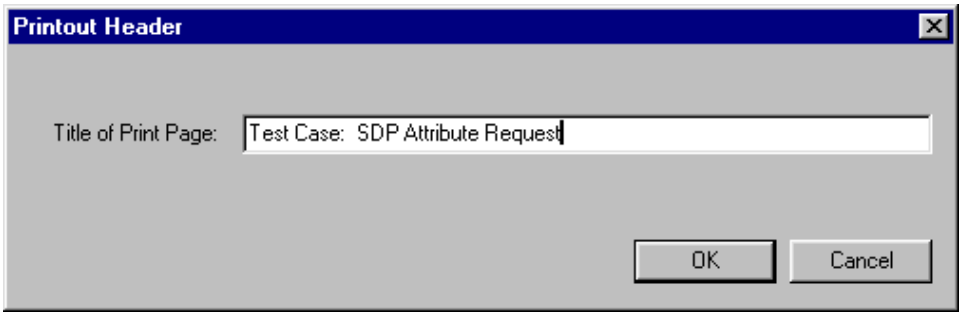
OR Press **ALT** + ***F*** + ***H***

2 ■ Enter the header for the Printout as shown in figure 3.10.

OR Press **ALT** + ***F*** + ***H***

Figure 3.10

Printout Header



An example of the printout is shown in figure 3.11

Figure 3.11

An example of the printed page

```
BPA-D10 Filename:  C:\Project\Test Case Use Files\Short File.bpa
Title  : Short Capture of Bluetooth Exchanges over the air

Pkt 15                                  L2CAP Conn Req , ID 0x05, PSM 0x0001, SCID
                                        L2CA Start
Clk 0046e500:AM1  ------------------>   DM1 | ACK | S=1 | F=1  ------------------>

Pkt 16                                  L2CA Continue (0 Payload Prev. Pkt
Clk 0046e58e:AM1  <------------------   DM1 | NAK | S=0 | F=1  <------------------

Pkt 17                                  L2CAP Conn Rsp, ID 0x05, DCID 0x00
                                        L2CA Start
Clk 0046e592:AM1  <------------------   DM1 | NAK | S=1 | F=1  <------------------

Pkt 18                                  L2CAP Cfg Req, ID 0xe5, DCID 0x00
                                        L2CA Start
Clk 0046e596:AM1  <------------------   DM1 | NAK | S=0 | F=1  <------------------
```

Viewing Offline

You can save the captured information for offline viewing and analysis. This allows sharing of data files for troubleshooting in different geographical locations.

1 ■ **EITHER** Select ***File*** → ***Save As…***

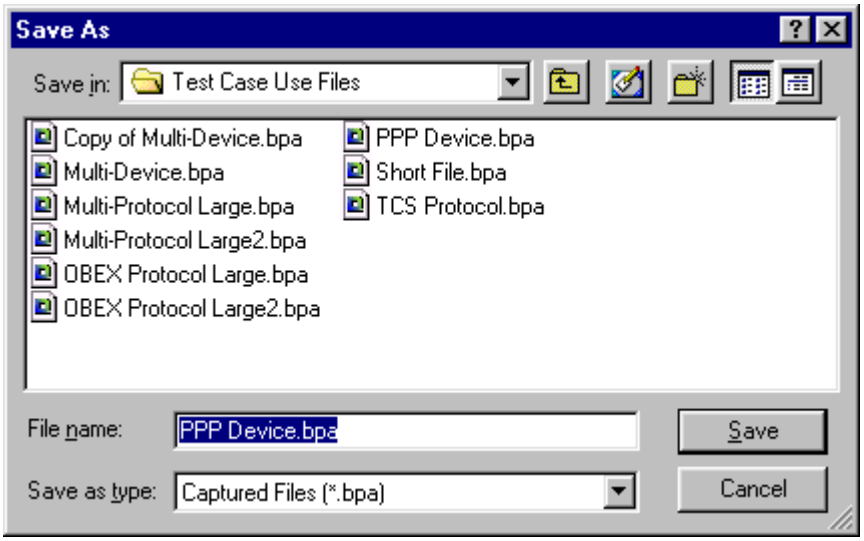
OR Press **ALT** + ***F*** + ***A***

OR Click  .

2 ■ In the Save As dialog, type in the desired file name and click OK.

Figure 3.12

Saving a data file



CHAPTER

4

Interfacing with the Hardware

This section describes the steps required to detect and connect to the BPAs available in the network. This must be done before the software can be used for capturing any data.

Searching and Managing BPAs

Before connecting to a BPA, you must first detect its presence in the network. The license for each individual BPA must also be selected before you are allowed to connect to the BPA.

You only need to discover the BPA once; the software will register the information.

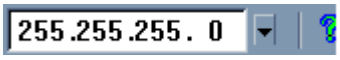
1 ■ **EITHER** Select ***BPA Interface*** → ***Search/Manage BPAs in Network***

OR Press **ALT + *B* + *S***

OR Click the down arrow next to the BPA IP address entry on the tool bar (figure 4.01).

Figure 4.01

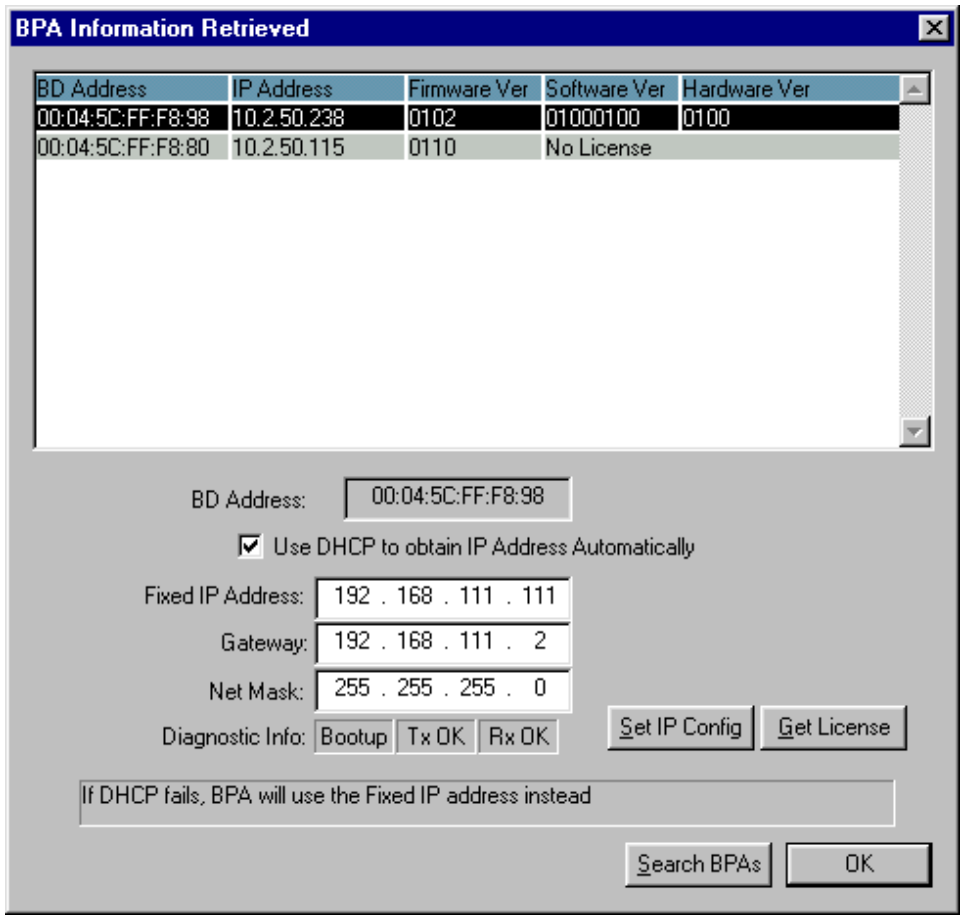
BPA IP address entry on the tool bar



2 ■ In the BPA Information dialog (figure 4.02), click **Search BPAs**. The Bluetooth Device Address as well as its IP address will be displayed.

Figure 4.02

BPA Information



3 ■ Select a BPA entry to edit its IP configuration or retrieved its license. You must have obtained the license for the BPA before you intend to connect.

NOTE

If this is the first time that you are retrieving the license, a dialog box will prompt you to save the license to a file. Subsequent retrieval of licenses is appended to this file.

4 ■ Click **OK**.

NOTE

If the DHCP fails in the BPA, it will fall back to the fixed IP address and its configuration. In addition, the software must do a search again if the BPA switched from fixed IP to DHCP mode.

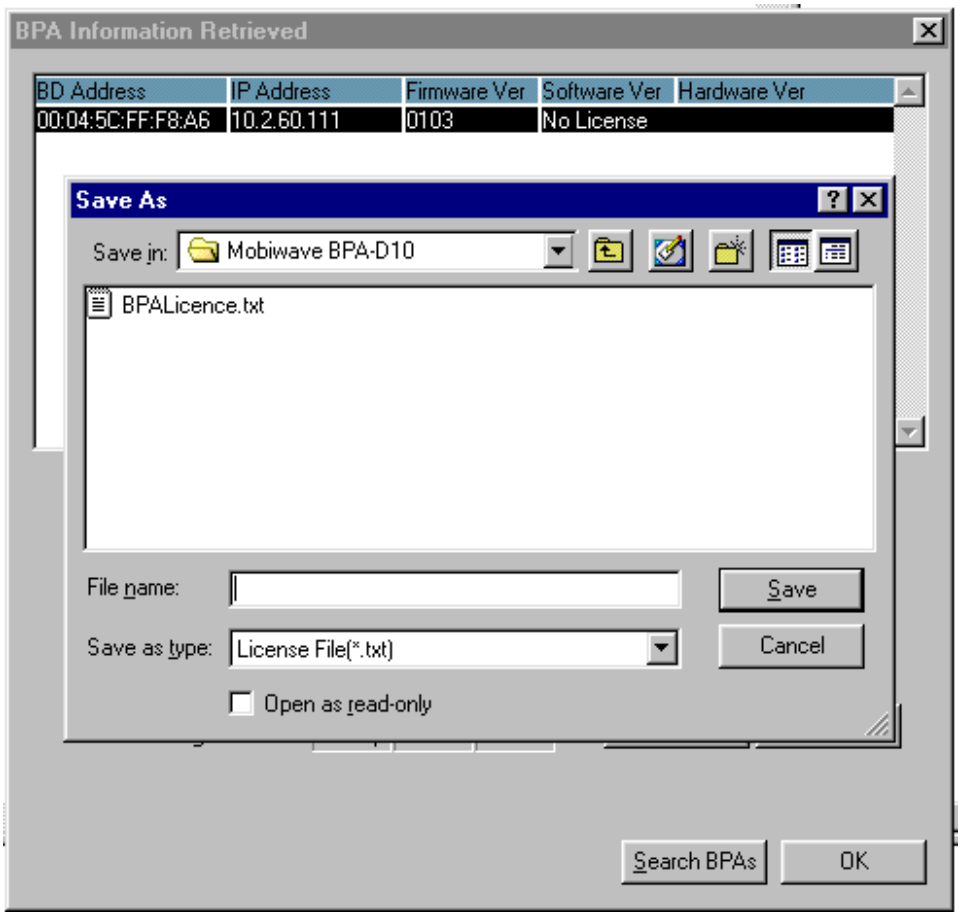
Managing the License file

The BPA uses a unique license management system.
To connect to a BPA, the software must have obtained the license from the BPA hardware itself; select a BPA entry in the list box shown in Figure 4.02 and click Get License to obtain the license from the BPA hardware. The software may have licenses for multiple BPAs. The file for storing these licenses is configurable.

If you are retrieving licenses for the very first time or the software could not locate the license file, you will be prompted to save the license to a designated file (figure 4.03).

Figure 4.03

Prompt to save license file.



Connecting to BPA

After detecting a BPA, it can then be connected to the Mobiwave BPA-D10 graphical interface via the local network.

1 ■ **EITHER** Select ***BPA Interface → Connect to BPA***

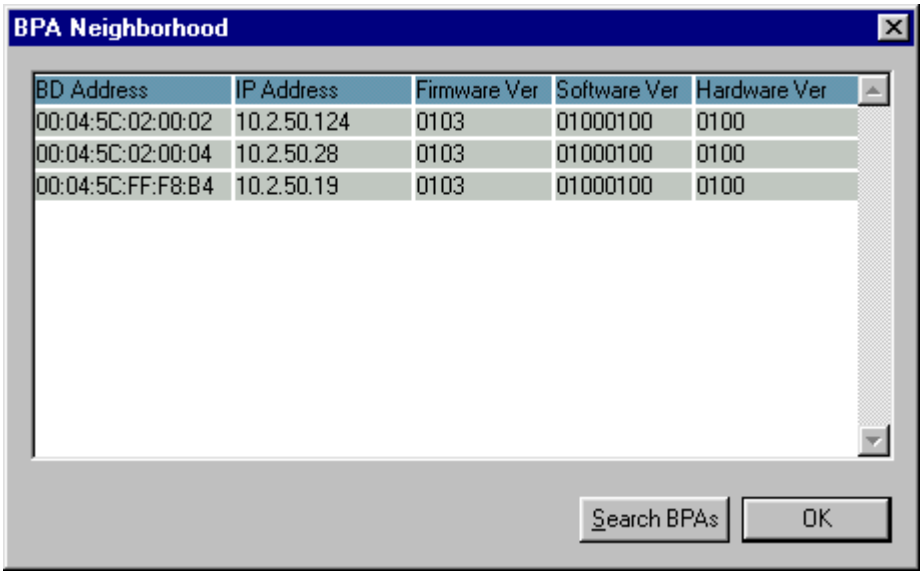
OR Press **ALT** + ***B*** + ***C***

OR Click the down arrow next to the BPA IP address entry on the tool bar to activate the BPA Neighborhood dialog box.

OR Click  .

This brings up the BPA Neighborhood dialog (figure 4.04), listing the Bluetooth Device and IP addresses of detected BPAs.

Figure 4.04
BPA Neighborhood



2 ■ Select a BPA entry. Click OK. The selected BPA entry's IP address will be displayed as the BPA IP address on the tool bar.

NOTE

The BPA Neighborhood dialog (figure 4.04) is a scaled-down version of the BPA Information dialog (figure 4.02).

Setting BPA Options

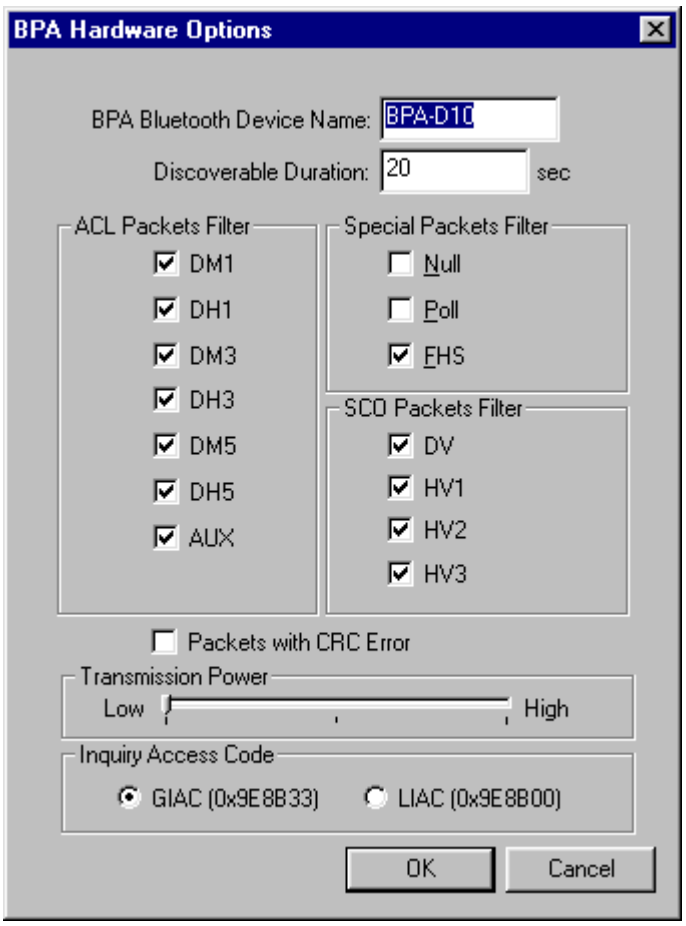
Mobiwave BPA-D10 allows you to set options for the BPA.

1 ■ **EITHER** Select ***BPA Interface → Set BPA Options***

OR Press **ALT + *B* + *O***

This brings up the BPA Options dialog (figure 4.05).

Figure 4.05
BPA Options



The options available are –

• **BPA Bluetooth Device Name** This is the user-friendly name of the BPA when it is in discoverable mode. Discoverable mode is necessary for capturing via fake connection.

• **Discoverable Duration** This is the length of time that the BPA will remain discoverable. During this discoverable period, all Neighboring Bluetooth devices can discover the BPA and its user-friendly name.

• **Packet Filters** The packet filters enable you to specify what packet types to capture. ACL, SCO and other special packet filters are available. When unchecked, a packet type will not be captured by BPA-D10. These unwanted packets cannot be recovered later.

• **Packets With CRC Errors** This is a packet filtering option. When checked, the BPA will return data that it has detected as having CRC errors. Erroneous packets are captured for statistical purpose (see figures 5.01 and 5.02)

• **Transmission Power** This option allow configuration of the transmission power when doing inquiry and sync-ing to the master or slave device when initiating a capturing session. For example, in an area populated with Bluetooth devices, reducing transmission power will restrict the number of Bluetooth Device Addresses (BD_Addr) returned during inquiry.

• **Inquiry Access Code** This dictates the inquiry access code GIAC (0x9E8B33) or LIAC (0x9E8B00)) that the BPA will send while locating Bluetooth devices within its Neighborhood.

Setting the BPA to be Discoverable

In order to capture data via fake connection, the Bluetooth piconet Master device must have the Bluetooth Device Address of the BPA. This function sets the BPA into discoverable mode so that the Master device can retrieved the BPA's Bluetooth Device Address.

1 ■ **EITHER** Select ***BPA Interface → Set BPA Discoverable***

OR Press **ALT + *B* + *D***

OR Click  .

NOTE	This option is only enable if the GUI is connected to the BPA hardware.

Discovering Nearby Bluetooth Devices

Before data capturing (via syncing to Master or Slave) can commence, the target Bluetooth device (Master or Slave respectively) must be discovered.

1 ■ **EITHER** Select ***BPA Interface → Discover Nearby Bluetooth Device(s)***

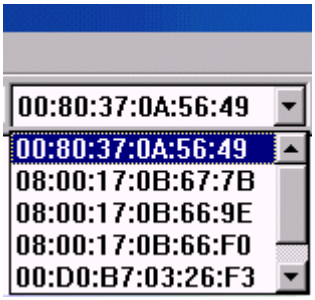
OR Press **ALT** + ***B*** + ***N***

OR Click  .

As devices are discovered, the Frequency Hopping Sequence (FHS) packet for each returned device is shown on the MSC Window while the Bluetooth Device Address of each device is appended to the IP address list (figure 4.05).

Figure 4.06

List of Bluetooth devices



NOTE

If no devices are returned, check to ensure that the Inquiry Access Code in the BPA Options dialog is set correctly (see **Setting BPA Options**).

Click  to stop this operation

CHAPTER

5

Capturing Data

There are currently 3 capturing methods available, namely

- capturing via fake connection
- capturing via syncing to the slave
- capturing via syncing to the master

Under most circumstances, at least one of the methods will be applicable for every data logging session.

The procedures for capturing data are classified as actions on the BPA GUI (represented by ⌘) or the Master Device User Interface (represented by ℳ).

Capturing Via Fake Connection

1 ⌘ **EITHER** Select ***BPA Interface → Connect to BPA***

OR Press **ALT** + ***B*** + ***B***

OR Click  .

2 ⌘ **EITHER** Select ***BPA Interface → Set BPA Discoverable***

OR Press **ALT** + ***B*** + ***D***

OR Click  .

3 ℳ Activate the Master Device to Inquiry mode, ensuring that both the BPA and the Slave device are discovered.

4 ⌘ [OPTIONAL]
If the BPA is still in the discoverable mode, repeat step 2 to set the BPA to non-discoverable mode. Alternatively, the BPA will timeout and set itself back into non-discoverable mode.

5 ⌘ **EITHER** Select ***Capture Data → Via Fake Connection***

OR Press **ALT** + ***C*** + ***F***

OR Click  .

6 ℳ From the master device user interface, attempt a connection to the BPA using its Bluetooth Device Address discovered. The Mobiwave BPA-D10 software will provide visual and audio indications to indicate that it is synced to the Master device.

7 ℳ Wait for connection failure on the master user interface before connecting to slave.

8 ⌘ℳ If no data comes through, click **Stop**  **,** stop the Bluetooth connection between the Master and Slave and repeat steps 5, 6 and 7.

N O T E	A Bluetooth device that has a long timeout on disconnection fail may not be suitable for use as Master in this method.

Capturing Via Syncing to Slave

1 ⌘ **EITHER** Select ***BPA Interface → Connect to BPA***

OR Press **ALT** + ***B*** + ***B***

OR Click  .

The status bar will indicate "Connecting to BPA" followed by "Connected".

2 ⌘ **EITHER** Select ***BPA Interface → Discover Nearby Bluetooth Device(s)***

OR Press **ALT** + ***B*** + ***N***

OR Click  .

The status bar should display "Discovering Bluetooth Devices" followed by "Searching for Devices".

3 ⌘ Click **Stop** once the targeted device (Slave) is found.

4 ⌘ Select the Bluetooth Device Address of the intended slave.

5 ⌘ **EITHER** Select ***Capture Data → Via Slave Address***

OR Press **ALT** + ***C*** + ***S***

OR Click  .

The status bar will indicate “Slave Synced” with audio feedback once the process is complete.

6 ⌘ Activate the connection from the Master Device.

The BPA's status bar should indicate "Capturing Data" and generate an audio feedback. If there is no visual and audio feedback, click **Stop**  , and repeat from step 4.

If there is no data coming in, click **Stop**  and repeat steps 5 and 6.

7 ⌘ To halt data capture, click **Stop**  .

NOTE

The BPA must execute an Inquiry and must have discovered the slave device before this method can be used.

Make sure that the Bluetooth Device Address (BD_ADDR) of the intended slave is captured.

Always disconnect the BPA before powering off the BPA hardware.

Capturing Via Syncing to Master

1 ⌘ **EITHER** Select ***BPA Interface → Connect to BPA***

OR Press **ALT** + ***B*** + ***B***

OR Click  .

The status bar will indicate "Connecting to BPA" followed by "Connected".

2 ⌘ **EITHER** Select ***BPA Interface → Discover Nearby Bluetooth Device(s)***

OR Press **ALT** + ***B*** + ***N***

OR Click  .

The status bar should display "Discovering Bluetooth Devices" followed by "Searching for Devices".

3 ⌘ Click **Stop**  once the targeted device (Master) is found.

4 ⌘ Select the Bluetooth Device Address of the intended Master.

5 ⌘ **EITHER** Select ***Capture Data → Via Master Address***

OR Press **ALT** + ***C*** + ***M***

OR Click  .

The status bar will indicate “Capturing Data” and there will also be audio feedback.

6 ℳ Activate the connection from the Master Device.

If there is no data coming in, click **Stop**  and repeat steps 5 and 6.

7 ⌘ To halt data capture, click **Stop**  .

NOTE

The BPA must execute an Inquiry and must have discovered the master device before this method can be used.

Make sure that the Bluetooth Device Address (BD_ADDR) of the intended master device is captured.

Stopping Data Capture

1 ⌘ **EITHER** Select ***Capture Data → Stop Data Capture***

OR Press **ALT** + ***C*** + ***D***

OR Click 

Which method to use?

When deciding on which capturing method to use, the following table can be used as a reference. Note that the table is not exhaustive and users must exercise their own judgments.

The following factors must be considered:

Is the Slave discoverable?
Is the Master discoverable?

The following table can be used as a guide for selecting the capturing methods.

Table: Guide for selecting Syncronization Method

	Master is discoverable	**Master is non-discoverable**
Slave is discoverable	All Methods	Sync to Slave or Fake Connection
Slave is non-discoverable	Sync to Master or Fake Connection	Fake Connection

Displaying Statistics

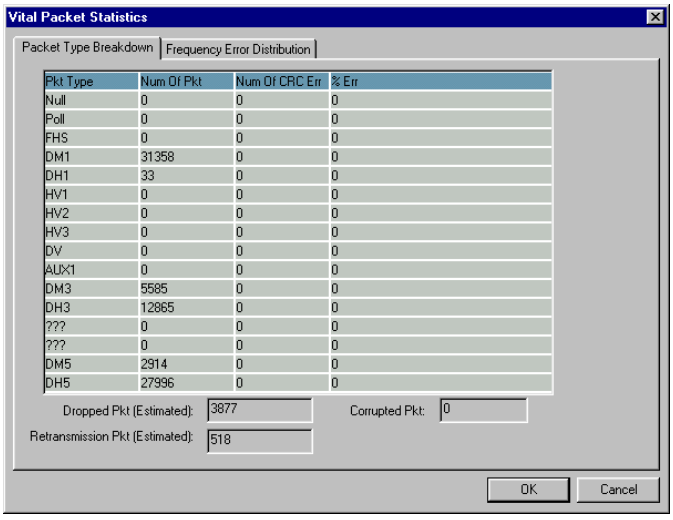
The BPA software offered packet statistics at a glance.

1 ■ Select ***Capture Data → Vital Packets Statistics***

2 ■ To view the details for the different packet types, click the Packet Type Breakdown tab (figure 5.01). This displays the number of packets captured, the number of CRC errors and the percentage error.

Figure 5.01

Packet Type Breakdown



NOTE

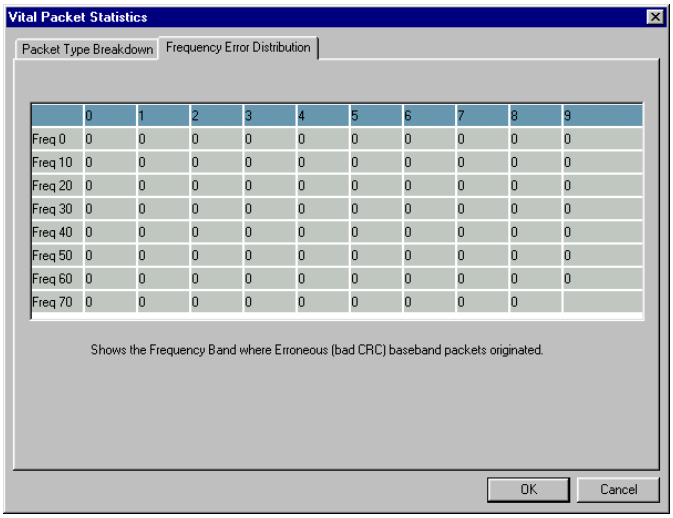
You must configure the BPA to return packets to tabulate the error distributions of the packets. This applies to both Packet Type Breakdown and Frequency Error Distribution.

Press Press **ALT** + ***B*** + ***O*** to set the BPA Options. Check *Packets with CRC Error*.

3 ■ To view the frequency error distribution, click the Frequency Error Distribution tab (figure 5.02). This table displays the number of CRC errors encountered in each RF Channel as defined in the Bluetooth Specifications Part A – Radio Specifications. It gives user a clear view of the RF Channel(s) that encounter the most interference/collisions.

Figure 5.02

Frequency Error Distribution

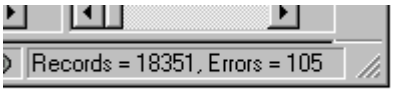


Error Detection and Calculation

Mobiwave BPA-D10 detects errors and indicates the error status at the bottom right corner of the UI.

Figure 5.03

Status bar with number of records and errors.



Errors are classified as:

i) Corrupted Packets, baseband packets with bad CRC;

ii) Drop Packets and;

iii) Illegal/unknown/incomplete protocol messages

Note that error classified under iii) could be due to i) and/or ii).

For example, a dropped packet may result in an incomplete L2CAP message, which leads to an incomplete OBEX message. Subsequently, there are a total of 3 errors.

CHAPTER

6

Customizing Captured Data Interface

The Mobiwave filter engine provides great flexibility in selecting the Bluetooth protocol information to display. The filtering rules may be based on

- The type of packets such as ACL and SCO
- Active member address (AM_ADDR)
- The protocol types such as LM, L_CH, L2CAP, RFCOMM, TCS, OBEX, HLDC and PPP.

Mobiwave BPA-D10 also allows you to customize the color scheme for the different protocol layers, Bluetooth devices, and the protocol headers and body of the raw data window.

This section describes how you can set

- Packet filters for easier debugging
- Protocol filters for easier debugging
- Font size to accommodate different screen sizes
- Text colors for the various protocols

Setting Packet Filters

To make it easier to debug a particular protocol layer or device, you can filter captured data based on

- Packet types (e.g. DH1, DH3)
- Active Member Addresses (AM_ADDR) or
- Protocol Layers

1 ■ **EITHER** Select ***Edit → Filter Protocol***

OR Press **ALT** + ***E*** + ***F***

OR Press **Ctrl** + ***F***

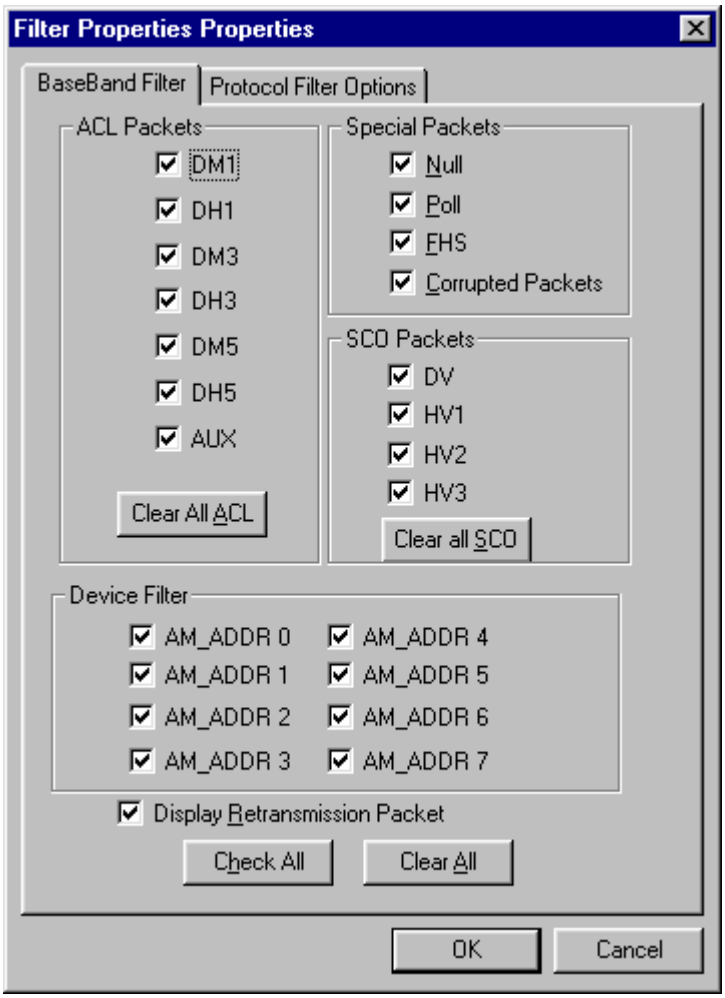
OR Click  .

This brings up the Filter Properties dialog (figure 6.01).

2 ■ Click the **Baseband Filter** tab.

Figure 6.01

Baseband Filters



3 ■ Check the boxes of the packet types you wish to display and/or uncheck those you do not wish to display. The packet types available are -

- ACL packets (DM1, DH1, DM3, DH3, DM5, DH5 and AUX)
- SCO packets (DV, HV1, HV2, HV3)
- Special packets (Null, Poll, FHS, corrupted packets)

To filter off all ACL packets, click the **Clear All ACL** button.

Similarly, to filter off all SCO packets, click the **Clear All SCO** button.

4 ■ Check the boxes of the devices (AM_ADDR0 to 7) you wish to display and/or uncheck those you do not wish to display.

5 ■ To display retransmitted packets, check the **Display Retransmission Packet** box or press **Alt + *R***. By displaying retransmitted packets, you will have an idea of the traffic and rate of retransmission within a Piconet.

6 ■ Click **OK** to complete the operation or **Cancel** to exit without changing the options.

TIP

To select all the packet types and device filters, click **Check All** or press **ALT + *H***.

To deselect all the packet types and device filters, click **Clear All** or press **ALT + *A***.

Setting Protocol Filters

You can also specify which protocol layers to display.

1 ■ **EITHER** Select ***Edit → Filter Protocol***

OR Press **ALT + *E* + *F***

OR Press **Ctrl + *F***

OR Click  .

This brings up the Filter Properties dialog (figure 6.02).

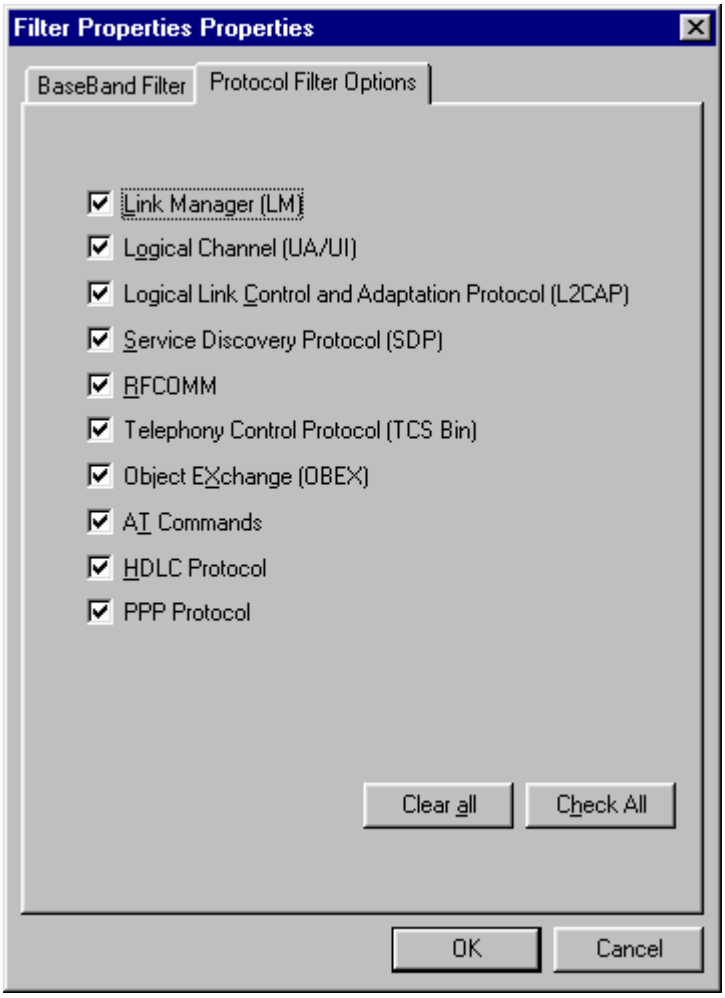
2 ■ Click the **Protocol Filter** tab.

3 ■ Check the boxes of the protocol filters you wish to use. The protocols available are –

- Link Manager (LM)
- Logical Channel (UA/UI)
- Logical Link Control and Adaptation Protocol (L2CAP)
- Service Discovery Protocol (SDP)
- RFCOMM
- Telephony Control Protocol (TCS Bin)
- Object Exchange (OBEX)
- AT Commands
- HDLC Protocol
- PPP Protocol

Figure 6.02

Protocol Filters Options



4 ■ Click **OK** to complete the operation or **Cancel** to exit without changing the options.

TIP

To remove all protocol filters, click **Clear All** or press **Alt + *A*.**

To include all protocol filters, click **Check All** or press **Alt + *H***.

Setting Font Size

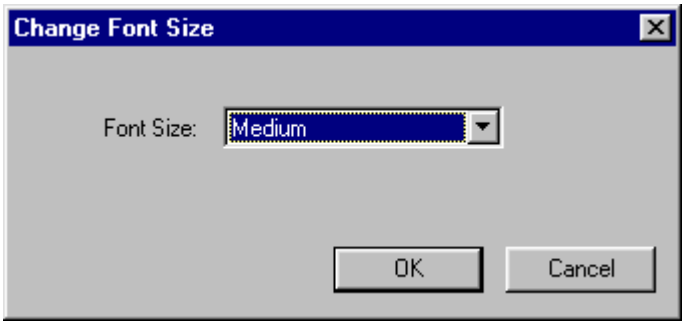
1 ■ **EITHER** Select ***Edit → Change Font Size***

OR Press **ALT + *E* + *S***

OR Click  .

This brings up the Change Font Size dialog (figure 6.03).

Figure 6.03
Changing Font Size



2 ■ Click the Font Size field to bring up a list of options, namely Small, Medium, Large.

3 ■ Select the desired font size.

4 ■ Click **OK** to complete the change or **Cancel** to exit without any change.

Setting Basic Text Colors

You can define the color of text displayed for each protocol. Each connection (referred to by AM_ADDR) has a configurable color assigned to its MSC arrow.

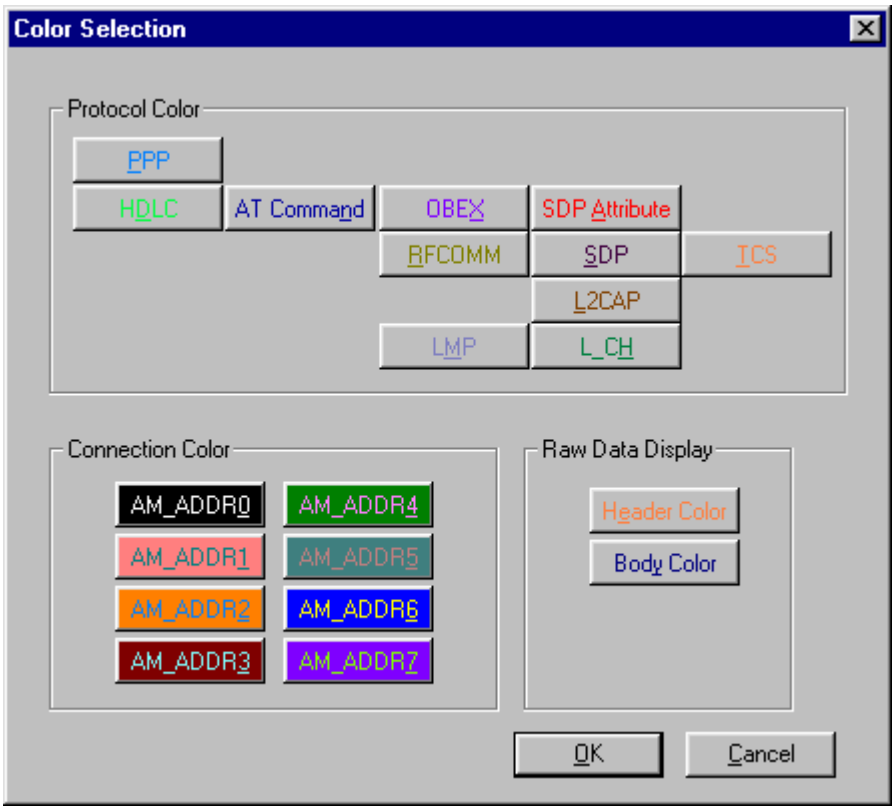
1 ■ **EITHER** Select ***Edit → Color Options***

OR Press **ALT** + ***E*** + ***C***

OR Click  .

This brings up the Color Selection dialog (figure 6.04).

Figure 6.04
Color Selection



2 ■ Click the protocol for which you wish to change the text color. This brings up a color palette for the selected protocol (figure 6.05).

Figure 6.05
Color Palette

3 ■ Click the color you wish to use for the text of the selected protocol.

4 ■ Click **OK** to set the color or **Cancel** to exit without any change.

5 ■ At the Color Selection dialog, click **OK** to complete the change or **Cancel** to exit without any change.

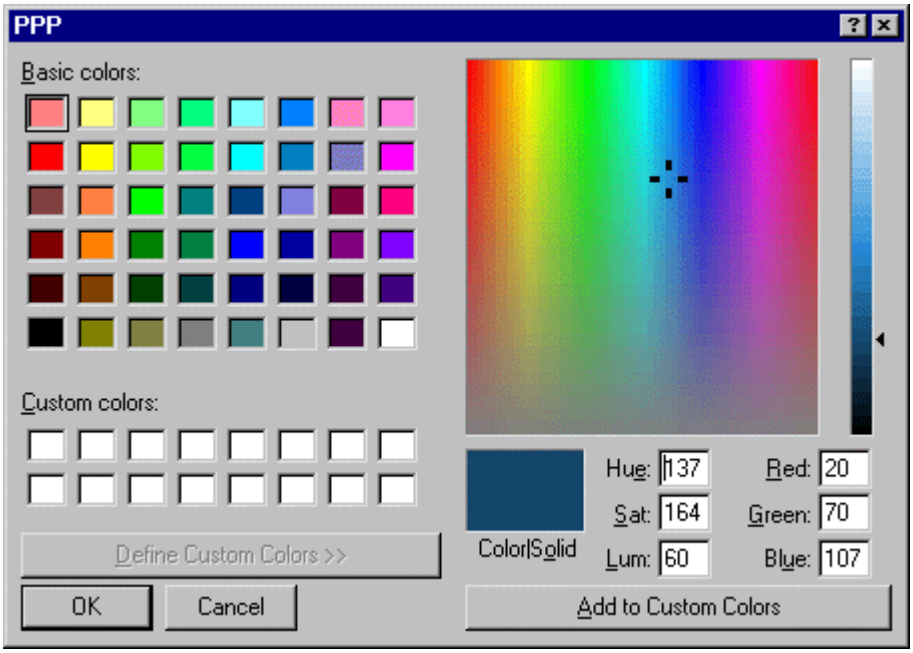
Setting Custom Text Colors

If the desired color is not available in the basic palette, you can define a custom color.

1 ■ Follow steps 1 and 2 of **Setting Basic Text Colors**.

2 ■ Click **Define Custom Colors** or press **ALT + *D***. This brings up an additional color definition section (figure 6.06).

Figure 6.06
Custom Color Definition



3 ■ Select a custom color using one of the following methods -
- clicking on the visual palette
- defining the hue, saturation and luminosity
- defining the red, green and blue color components

4 ■ Click **Add to Custom Colors** or press **ALT + *A***. The newly defined color will be added to the **Custom Colors** palette.

5 ■ Click the color in the custom palette that you wish to use for the text of the selected protocol.

6 ■ Click **OK** to set the color or **Cancel** to exit without any change.

7 ■ At the Color Selection dialog, click **OK** to complete the change or **Cancel** to exit without any change.

Assigning L2CAP Channel ID

Mobiwave BPA-D10 automatically deciphers the L2CAP protocols and determines the upper layer protocol that sits on top of a particular L2CAP Channel.

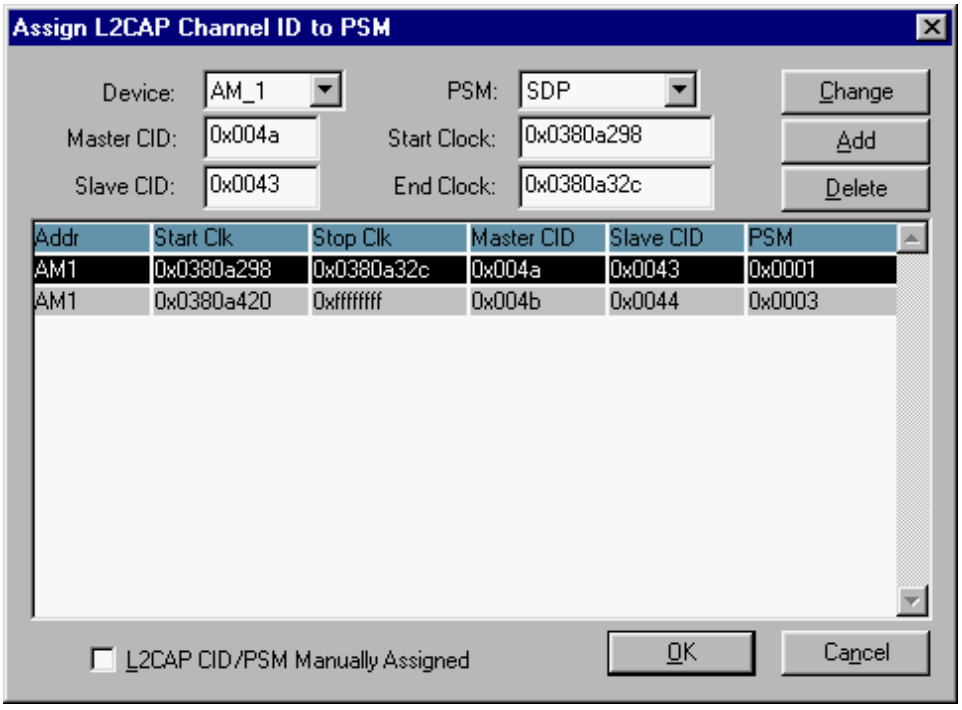
There may, however, be situations when these assignments need to be done manually, such as when the L2CAP Session was not completely captured over the air, or when the PSM assigned is not as specified in the Bluetooth Systems Specifications.

1 ■ Select ***Edit → Assign L2CAP PSM***

This brings up the *Assign L2CAP Channel ID to PSM* dialog (figure 6.07), which displays the L2CAP connections detected in the current captured session.

Figure 6.07

Assign L2CAP Channel ID to PSM



2 ■ To add a connection –

• Click the **Device** field and select a device (figure 6.08).

- Click the **PSM** field and select a PSM value (figure 6.09).
- Enter the **Master CID** and **Slave CID**
- Enter the **Start Clock and End Clock** values
- Click **Add**

Figure 6.08
Selecting a Device

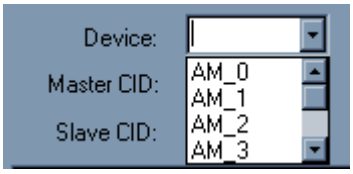
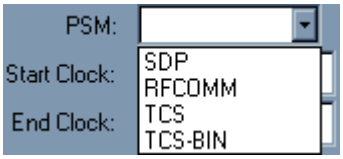


Figure 6.09
Selecting a PSM Value



To modify a connection –

- Click a connection in the list.
- Type the necessary changes in the appropriate fields.
- Click **Change**.

The system will update the changes in the respective fields.

To delete a connection –

- Click a connection in the list.
- Click **Delete**.

The system will delete the connection.

3 ■ Users can also reset the manual connections by unchecking *L2CAP CID/PSM Manually Assigned*. This will force the BPA-D10 GUI to use the CID/PSM assignment as captured in the data.

4 ■ Click **OK** to complete the operation or **Cancel** to exit without any change.

NOTE

When decoding, the BPA will match the device connection's (AM_ADDR) Master CID or Slave CID within the stipulated clock ticks and assigned it to the designated upper layer protocol.

Assigning RFCOMM DLCI to Profile

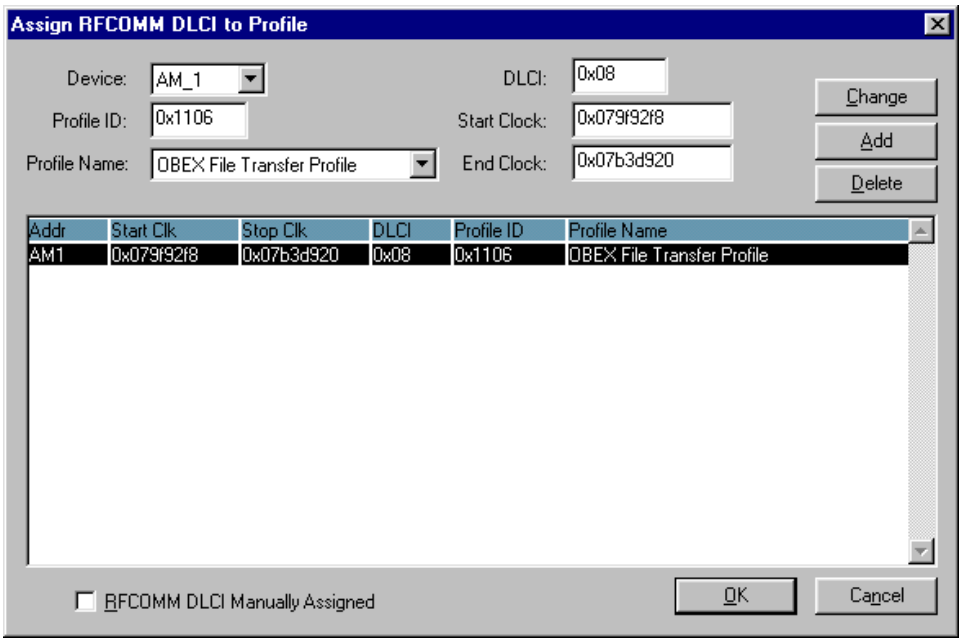
Mobiwave BPA-D10 automatically deciphers the SDP protocols and determines the service/profile on top of RFCOMM to decode. However, if there are no SDP sessions available, Mobiwave BPA-D10 will not be able to determine the profile/service in use. The RFCOMM Channel number then needs to be assigned manually.

1 ■ Select ***Edit → Assign RFCOMM CN***

This brings up the Assign RFCOMM DLCI to Profile dialog (figure 6.10) which displays the RFCOMM sessions detected in the current captured session.

Figure 6.10

Assign RFCOMM Channel to Profiles



2 ■ To add a connection –

- Click the **Device** field and select a device.
- Click the **Profile Name** field and select a profile name or enter a hexadecimal value for the **Profile ID** field.
- Enter the values for the **DLCI.**
- Enter the values for the **Start Clock and End Clock.**
- Click **Add**

To modify a connection –

- Click a connection in the list.
- Type the necessary changes in the appropriate fields.
- Click **Change**.

The system will update the changes in the respective fields.

To delete a connection –

- Click a connection in the list.
- Click **Delete**.

The system will delete the connection.

3 ■ If user would like to use the originally decipher information from the data capturing session, he should uncheck the “RFCOMM DLCI Manually assigned” option.

4 ■ Click **OK** to complete the operation or **Cancel** to exit without any change.

NOTE	BPA will match the device connection’s RFCOMM DLCI within the stipulated clock ticks to the designated upper layer protocol.

Setting Time Markers

Mobiwave BPA-D10 provides 2 time markers, S0 and S1, that allows you to measure the timing between any two points of interest in the captured Bluetooth protocols information.

1 ■ Click the packet you want to mark as the start of the timing period.

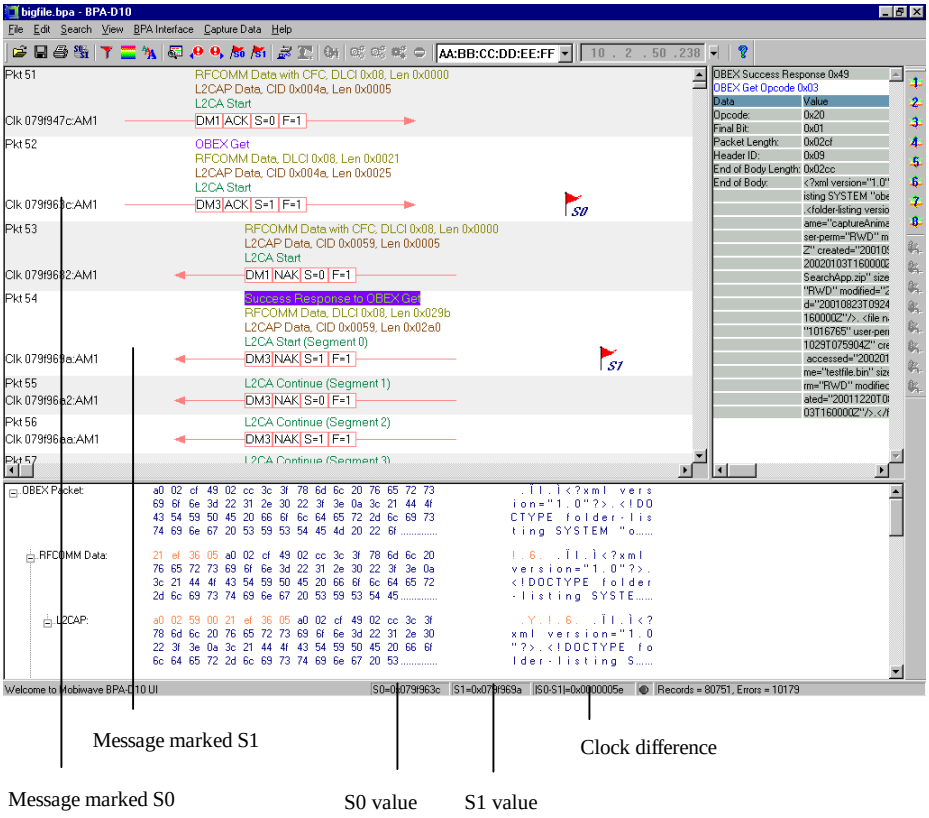
2 ■ Click 

to mark the packet as S0.

The clock value of the marked message appears on the status bar (figure 6.11).

Figure 6.11

Setting time markers



3 ■ Click the packet you want to mark as the end of the timing period.

4 ■ Click  to mark the packet as S1.

The clock value of the marked message appears on the status bar (figure 6.11). The clock difference between S0 and S1 is also displayed.

T I P

S0 and S1 can be used as demarcations for printing, i.e. printing the messages between S0 and S1 only by clicking  or **Alt+F+M**.

Setting Book Markers

Mobiwave BPA-D10 provides 8 book markers for easy access to certain areas of interest, eliminating the need for tedious scrolling in order to view different areas.

1 ■ Click the packet you want to bookmark.

2 ■ Click one of the bookmarks (figure 6.12) to assign it to the selected packet. Once a bookmark has been set, the corresponding Goto icon will be enabled (figure 6.13).

Figure 6.12

Bookmark

Figure 6.13

Goto bookmark

Clearing Book Markers

1 ■ **EITHER** Click the bookmarked packet and click on the corresponding bookmark. This toggles the bookmark off.

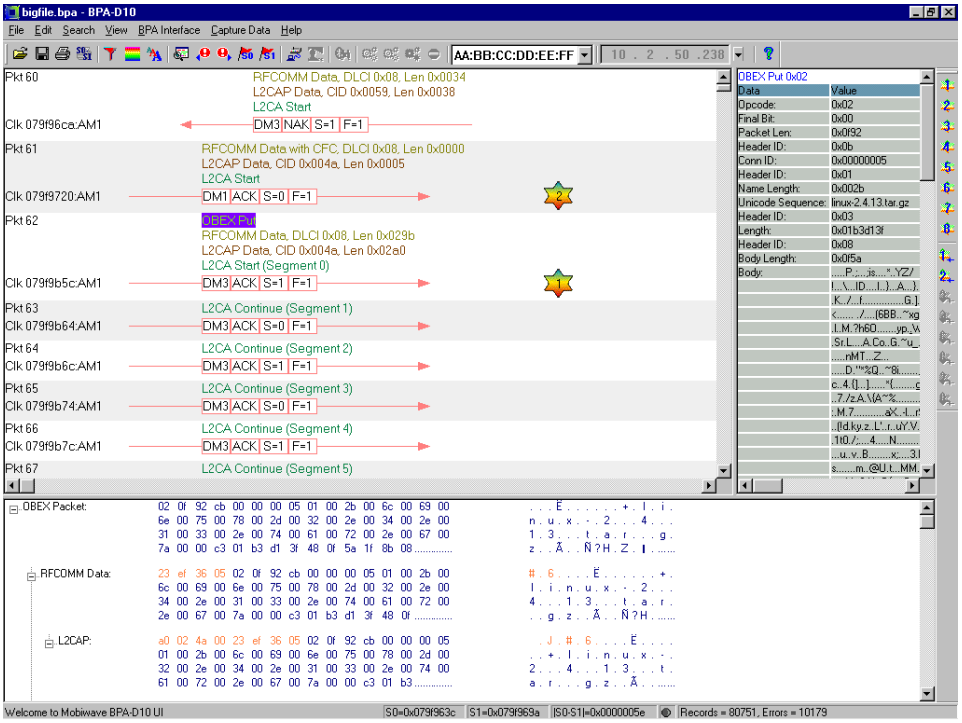
OR Select another packet you wish to bookmark and click on the bookmark you wish to clear. This sets the bookmark to the newly selected packet.

Using Book Markers

1 ■ Click the desired bookmark. The display will then highlight the tagged message.

Figure 6.14

Bookmark in action



CHAPTER

7

Using the Search Function

Mobiwave BPD-D10 allows you to search for errors easily through the forward and reverse search functions.

The errors include missing packets, packet assembly and segmentation, command and data fields, and missing and illegal data errors.

This section describes how you can use the Search function to

- locate errors
- locate retransmitted packets
- look for PDU content

Forward Searching of Errors

1 ■ **EITHER** Select ***Search → Goto Next Error***

OR Press **ALT** + ***S*** + ***N***

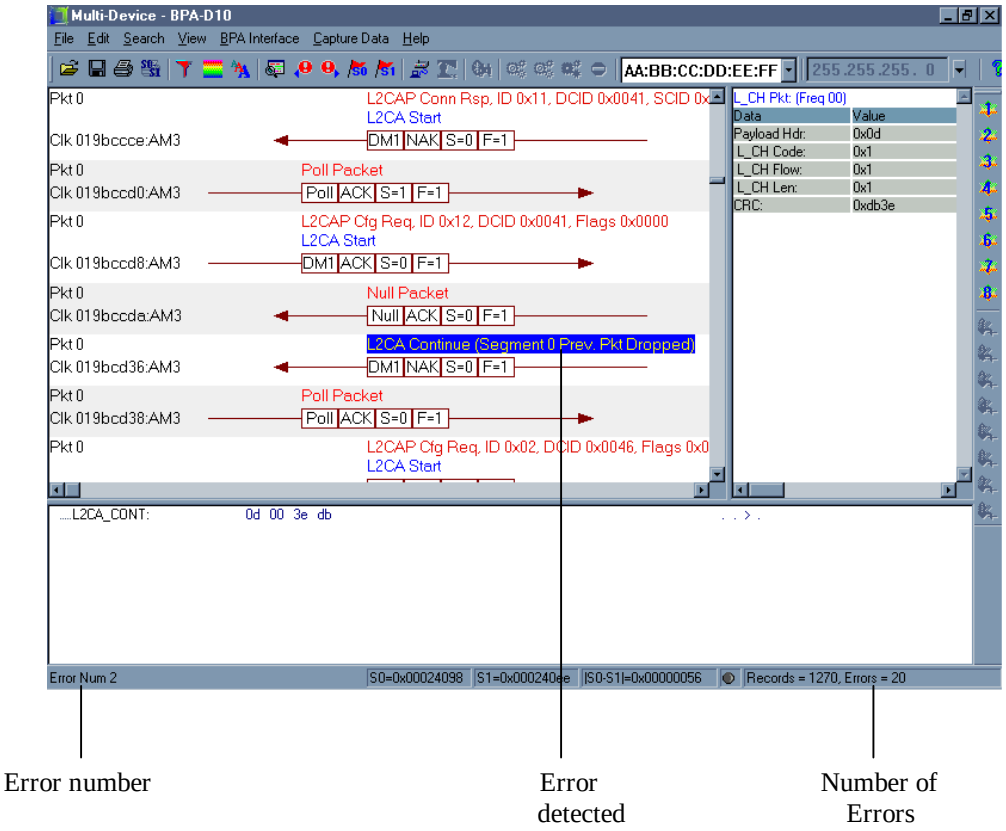
OR Press <**F5**>

OR Click  .

This brings you to the next error, which is highlighted (figure 7.01). The error number and error count are indicated on the status bar.

Figure 7.01

Erroneous Packet



Reverse Searching of Errors

1 ■ **EITHER** Select ***Search → Goto Prev Error***

OR Press **ALT + S + *P***

OR Press <**F4**>

OR Click .

This brings you to the previous error.

Searching of Retransmitted Packets

1 ■ **EITHER** Select ***Search*** → ***Goto Next Retransmitted Pkt***

OR Press **ALT** + ***S*** + ***R***

OR Press <**F7**>

This brings you to the next retransmitted packet (figure 7.02).

Figure 7.02
Retransmitted Packet

Searching by Protocol, Message or Data Pattern

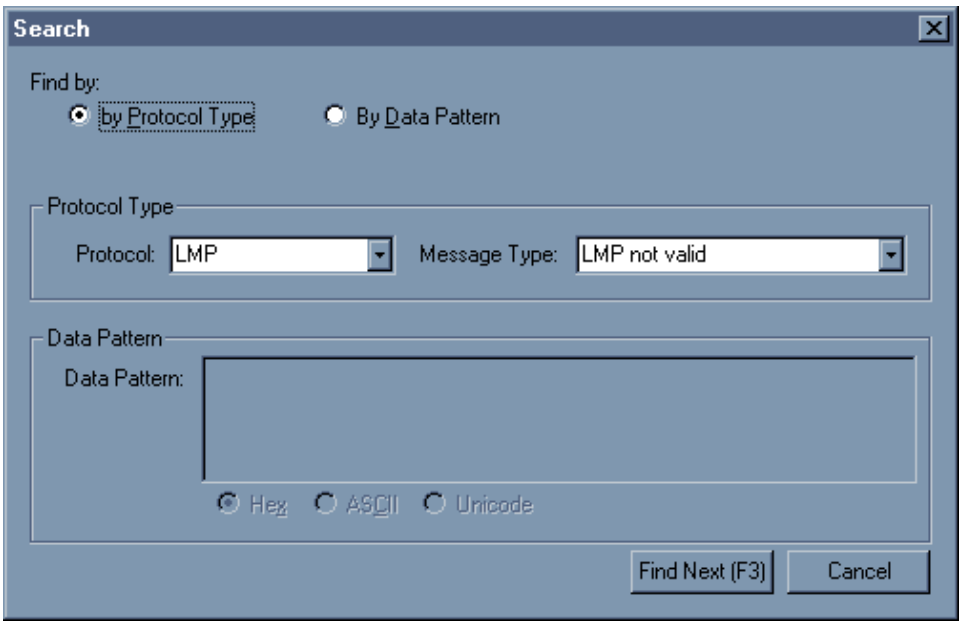
1 ■ **EITHER** Select ***Search*** → ***Search PDU Content***

OR Press **ALT** + ***S*** + ***C***

OR Press **SHIFT** + <**F3**>
OR Click  .

This brings up the Search dialog (figure 7.03).

Figure 7.03
Search



2 ■ To search by protocol –

• Click the radio button next to **by Protocol Type** (figure 7.03).
• Click the **Protocol** field and select the protocol (figure 7.04). • Click the **Message Type** field and select the message type (figure 7.05).

Figure 7.04
Selecting Protocol

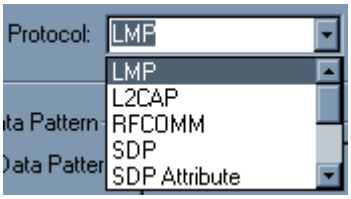
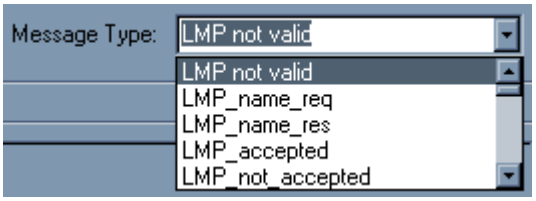


Figure 7.05
Selecting Message Type

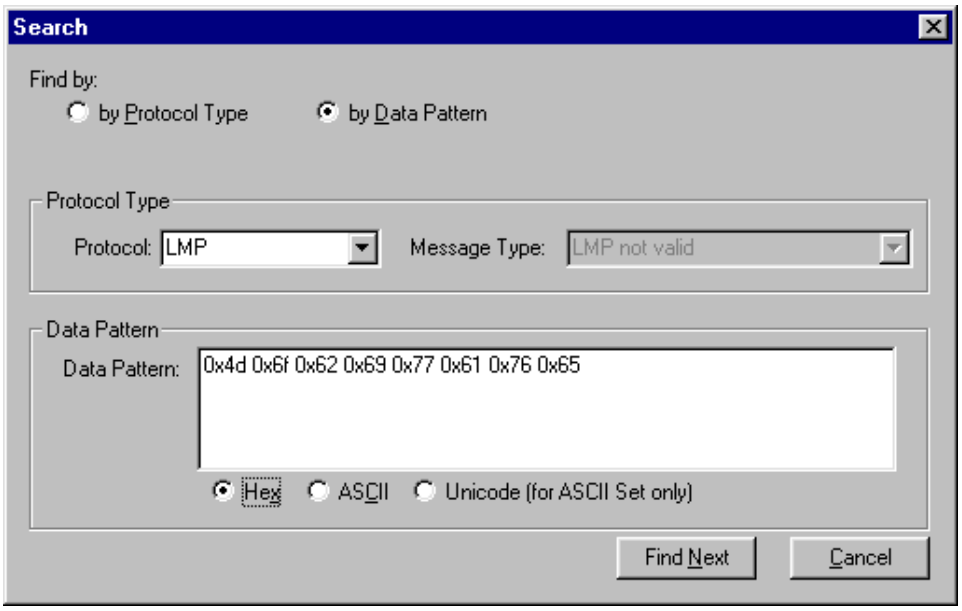


To search by data pattern –

- Click the radio button next to **By Data Pattern** (figure 7.06).
- Type the desired pattern in the **Data Pattern** field.
- Select Hex, ASCII or Unicode by click on the appropriate radio button.

Figure 7.06

Selecting Message Type



3 ■ **EITHER** Click Find Next

OR Press **<F3>**

The next packet that satisfies the stated conditions will be highlighted. Similarly the located data pattern is also highlighted on the Raw Data Window

APPENDIX

Appendix A

Technical Specification

This section lists the electrical, environmental, and physical characteristics of the Mobiwave BPA-D10.

Power Requirements

Peak : 5V @ 1.5A
Normal : 5V @ 0.7A

Radio Specifications

Transmitter power : +18 dBm (High)
+10 dBm (Medium)
0 dBm (Low)
Receiver sensitivity : < -80 dBm
Frequency range : 2.402 – 2.48 GHz

LEDs Display

PWR : Active when power is applied to Mobiwave BPA-D10
LAN : Active when Mobiwave BPA-D10 is connected to LAN
SYNC : Active when Mobiwave BPA-D10 synchronizes to Bluetooth devices under observation
RX : Active when radio transceiver is receiving data
TX : Active when radio transceiver is transmitting data

Certification

FCC 47CFR part 15.19
CE mark
VCCI

Environmental Specifications

Operating temperature	: 5^{O}C to $+50^{O}$C
Storage temperature	: -20^{O}C to $+80^{O}$C
Humidity	: < 80%

Mechanical

Dimensions:

- 22 x 16 x 5 cm (8.7 x 6.3 x 2.0 inches)

Weight:

- 1.1 kg (2.5 lbs)

Connectors:

- DC +5V input jack, center positive
- RJ45 (LAN port, 10/100BaseT)

Switches:

- Power on/off

Antenna:

- 2.4GHz external antenna

Keyboard Shortcuts

You can use keyboard shortcuts to access or activate many of the functions available in the user interface.

Function Performed	Press
Open a previously saved captured data file	CTRL + O
Print a hardcopy	CTRL + P
Post-filters on captured data	CTRL + F
Search	CTRL + F3
Search again	F3
Go to previous error	F4
Go to next error	F5
Go to next retransmitted packet	F7
View packet statistical information	CTRL + ALT + S
Bookmark	CTRL + 1..8
Go to boomark	ALT + 1..8

Troubleshooting Guide

The following is a list of possible situations that you may encounter during the use of BPA-D10. This will serve as reference for assistance before you contact our dealer or factory directly.

Possible Problems Encountered	Corrective Actions
Turn on the power switch on BPA-D10 and nothing happen	• Check that the power adaptor jack is connected to BPA-D10. • Check that the power adaptor is plugged into the power socket and is switch on. • If condition persists, please contact our nearest dealer or factory.
PWR indicator is on but failed to make a connection to BPA-D10 from the host	• Check that network cable is securely connected to BPA-D10. • Check that correct network cable is

	used; cross cable for direct host to BPA-D10 connection and straight cable for connection through LAN. • Ensure that the host has obtained a license from BPA-D10. • Ensure that the host and BPA-D10 are in the same network IP subnet. • Ensure that the attempt to make the connection only when the LAN LED is flashing.
LEN error dialog box appear	Change the network cable or to a shorter cable.
All 3 PWR, LAN and SYNC LED continuous lit in amber	Please contact our nearest dealer or factory.
Excessive packet retransmission, corrupted packet and dropped packet	• Prop up the swivel antenna. • Place the Bluetooth ™ devices under test and BPA-D10 closer to each other. • The Bluetooth ™ devices used might be defective or of poor quality. • The environment where the test is conducted might have too much RF noise. • Encryption could be active in Bluetooth ™ devices under test.
There is no audio feedback during synchronization to Bluetooth ™ device	• Check that the audio is not disabled on the host. • The audio playback volume setting might be too low.
Synchronization to Bluetooth ™ device is successful, however BPA-D10 fails to capture any data	• Check the correct synchronization method used. • Place the Bluetooth ™ devices under test and BPA-D10 closer to each other. • Follow-on link connection between Bluetooth ™ devices should be made immediately after synchronization. • Repeat the data capturing steps again.
BPA is found in network neighborhood. However, connection returns message "BPA is not available..."	Do a search again and check that the IP address of BPA-D10 is set correctly and conforms to the subnet addresses.
BPA-D10 hardware disconnected	• Check that the network cables connection are secure. • Change the network cable and try again. • Disable the standby mode at the host computer.