guys

Communications Connectivity
Circuits C-level software

SDIO Wireless LAN Card

SD-Link11b

User's Manual

This section explains the symbols, signs and terminology used in this manual.

- A device with the C-guys Wireless SD-Link11b installed is called the Wireless LAN device.

- The following terminology is used in this manual to distinguish between an Ethernet 10/100BASE-T LAN and a Wireless LAN and should not be construed as generally accepted terminology outside this context.

   Ethernet LAN : A LAN connected by cables

   Wireless LAN : A LAN connected by radio signal

⚠ WARNING	The instructions with this sign indicate prohibited actions. Failure to follow the instructions shown with this sign may result in death or serious injury to the user.
⚠ CAUTION	Failure to follow the instructions shown with this sign may result in injury to the user or property damage.

WARNING

For your safety be sure to read, understand and follow the instructions below thoroughly before using the product.

This manual contains instructions concerning general operation of the computer to which the product is connected in addition to those concerning the product itself.

Strongly recommended : Follow the warning and caution instructions which are issued by the PC and peripheral manufactures.

Prohibit : Do not attempt to disassemble or repair the SD-Link11b. This may result in fire or electric shock.

Strongly recommended : Install this product away from children. Failure to do so may result in injury.

Prohibit : Do not handle the equipment with wet hands while it is in operation. This may result in electric shock.

Prohibit : Do not insert SD-Link11b to Non-compliant Equipment with SD/SDIO.

CAUTION

Please take note that our warranty will not cover any failures and problems of the computer, any losses and failures of data, or failures and problems of the product caused by misuse.

Strongly recommended : To prevent damage due to the static electricity touch a metal object such as a door handle or metal window before touching the device. Static electricity may result in damage to the equipment.

Strongly recommended : For usage of the PC and peripheral, refer to the product manual.

Strongly recommended : Remove the dust from all connectors. Dust may result in failure in performance.

Prohibit : Do not locate this product in the following locations. Doing so may result in electric shock or fire, or may adversely affect this product.

- Locations with strong magnetic fields or static electricity (may result in failure)

- Locations prone to vibration (may result in injury or damage)

- Locations in direct sunlight (may result in failure or deformation)

- Locations close to fire, or subject to heating (may result in failure or deformation)

- Locations with water leakage or current may result in failure or electric shock

- Locations with excessive dust (may result in failure)

We recommend that dual backup before and after updating of original data be created for unrecoverable important data in the device.

Data in the card may be damaged or lost in the following cases.

When the device is used incorrectly

When the device receives static electricity or electrical noise

When the device breaks down or is repaired

When the power is turned on immediately after the PC is turned off

When the device is damaged by natural disasters

Please note that C-guys, Inc. shall not be liable for any expenses incurred due to the damage or loss of hard disk data that may arise in the above cases or in any other case.

Table of Contents

1   Package Contents & System Requirements

1-1   Package

• One C-guys SD-Link11b (wireless LAN card)

• Manual (this document)
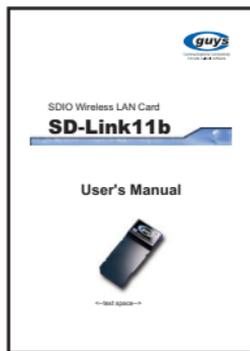
• Drivers and configuration utilities on CD-ROM

• Quick setup guide

If you miss any of these items please contact your reseller.

1-2 System Requirements

- PDA with Windows® Pocket PC 2002 and 2003 with at least 32 MB memory
- Secure Digital (SD) slot (Assuming SDIO host controller and driver are already installed)
- Microsoft® Active Sync® should be installed
- An IEEE802.11b or Wi-Fi approved Access Point/Base station

2   Introducing SD-Link11b Card

The SD-Link11b is a wireless network card that complies with the IEEE 802.11b standard on wireless LANs (Revision B).

2-1   SD-Link11b features and benefits

- Wi-Fi (Wireless Fidelity) certified (Expected in Q2/04).
- Supports data rates up to 11 Mbps.
- Fully compatible with any other wireless LAN system based on Direct Sequence Spread Spectrum (DSSS) radio technology that complies with the "IEEE 802.11b standard on wireless LANs (Revision B)".
- Automatic Transmit Rate Select mechanism in the transmit range of 11, 5.5, 2 and 1 Mbps.
- 128 bit Wired Equivalent Privacy (WEP) data encryption and WPA support (WPA will be optionally supported in Q2/04).
- Efficient Power Management.
- Roaming over multiple channels.
- Working range up to 400 meters in an open environment.
- Supports Ad-hoc and infrastructure modes for easy wireless communication.

2-2   SD-Link11b Wireless Network Scenarios

The SD-Link11b enables you to:

- Connect your computer to a Peer-to-Peer workgroup of wireless computing devices

- Connect your computer to a Small Office/Home Office (SOHO) network that includes Wi-Fi access points.

- Connect your computer to a Local Area Network (LAN) Infrastructure that includes the SD-Link11b, or other IEEE 802.11b compliant LAN systems

Wireless stations can be equipped with the SD-Link11b, but also with other WLAN PC Cards. Both the SD-Link11b and the WLAN PC Card share the same wireless functionality.

2-2-1   Peer-to-Peer (Ad-hoc) Workgroup

The Peer-to-Peer workgroup configuration enables you to quickly set up a small wireless workgroup, where the workgroup participants can exchange files using features like "Files and Printer Sharing" as supported by Microsoft® Networking.

You can use this option to setup a temporary or Ad-hoc network in environments where no access points are available (for example in Small Office/Home Office "SOHO" environments). As long as the stations are within range of one another, this is the easiest and least expensive way to set up a wireless network.

2-2-2   Home Networking

With C-guys' SD-Link11b, wireless access to the Internet or other devices is at your fingertips. All you need to do is connect the SD-Link11b to an existing access point that may be connected to the external Cable TV or xDSL modems and you are ready to :

- Share files and printers, and

- Access the Internet.

2-2-3   Enterprise Networking

With the Wi-Fi certified Access Point in the corporate network system, you can connect to a corporate Local Area Network (LAN) infrastructure to have wireless access to all network facilities. LAN Infrastructures may either be:

- Stand-alone wireless LANs.

- Wireless network infrastructures connected to an existing Ethernet network.

2-3   About the SD-Link11b CD-ROM

The SD-Link11b CD-ROM contains both software and documentation for the SD-Link11b card.

If you wish to install the SD-Link11b Driver software, turn to Chapter 3 "Installing your SD-Link11b Driver" and follow the instruction.

3 Installing your SD-Link11b Driver

3-1 Installation of the SD-Link11b Driver to the Pocket PC using Microsoft Active Sync®

In this section, the most popular method to install the driver is mentioned. Other methods to install the driver is similar to the driver update and it is explained in section 6.3.

1   Connect your PDA to your computer and make sure Active-Sync® has established for a connection between the two devices.

2   Insert the CD ROM to your PC. Installation wizard will pop up to choose the operating system.

3   Please select the operating system from the list below

For PocketPC 2002→click "Setup_us_eng_ppc2002.exe" file

For PcoketPC 2003→click "Setup_us_eng_ppc2003.exe" file

The language selection window will pop up as shown below.
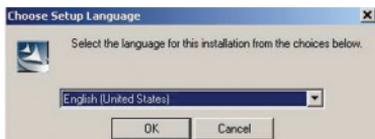
4   Click "OK" to proceed the installation. The following window should open.

5   Click "Next". Please read the following License Agreement.

6   Click "Yes" if you agree to the condition. You will see the following window.

7   Click "Yes" to begin transferring files to the PDA. The final window should pop up like below.

Application Downloading Complete

Please check your mobile device screen to see if additional steps are necessary to complete this installation.

OK

8 After completing the file transferrer, Click "OK".

C-Guys SD-Link11b - InstallShield Wizard

InstallShield Wizard Complete

Setup has finished installing C-Guys SD-Link11b on your computer.

< Back   **Finish**   Cancel
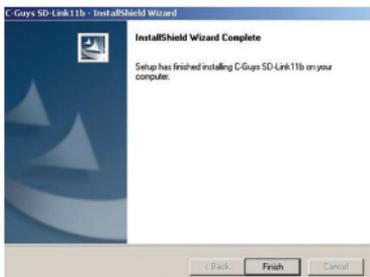
9 Click "Finish" to complete the driver installation.

To verify if the installation of the driver was completed successfully :

- Soft reset the PDA (push Soft-reset Button of PDA)

  * Some PDA may not require resetting but it should be safer to reset.

- Insert the SD-Link11b into the PDA

- Check the LED on the SD-Link11b. If steady red light is seen, the SD-Link11b is active.

- (Optional) To check the quality of the network connection, you should use the SD-Link11b configuration utility program as described in the next section

4 SD-Link11b Configuration Utility

4-1 Basic Setup

For the infrastructure operation without WEP, once the SD-Link11b card is inserted it should connect to the available AP automatically. If more than one AP is available then the driver should connect to the AP which has stronger signal strength. When the driver is loaded and if it is working normally Green Icon 📶 is displayed on the lower right of the PDA screen. Once it is observed, you are ready to connect to the Internet. Click Internet Explore icon to enjoy surfing. Other icons have different meaning and they are :

📶 (Red) icon indicates the network is not established.

📶 (Blue) icon indicates that the card is scanning for the nearest AP.

4-2   Advanced Setup

If the user requires specific set up, select menu and proceed. For obtaining the advanced setup menu, click icon, to access the pop-up utility shown below.

Fig 1. Top menu.

The menu options are :

• **Radio on**
• **Radio off**
• **Status**
• **Wireless Network**
• **Advanced Options**
• **About**

Radio on : turns the wireless radio on. LED of the card will be flickering for few seconds to establish the connection.

Radio off : turns off the radio. A pop-up window will ask for your confirmation. If confirmed, the Status Icon will be changed to look like this 🔌 (Red) Then SD-Link11b card will stop functioning.

Status : shows the current wireless network status like shown in Fig 2. The status screen also shows parameters about the wireless connection.

Wireless Network : shows the currently available networks.

Advanced Options : show the advanced configuration such as WEP and power save mode.

About : shows the driver version and the setup utility software version. As shown in Fig 7
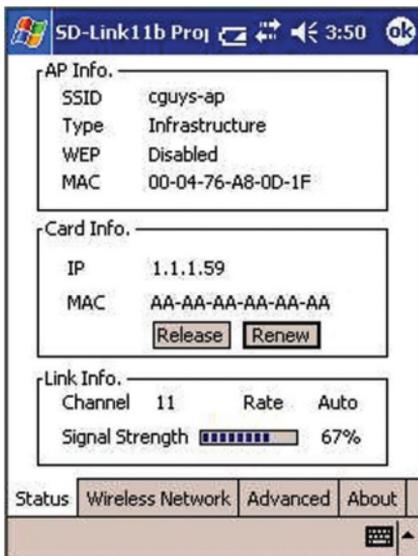
Fig 2. Status and information.

AP INFO : shows the current access point relevant information.

  SSID : shows the current access point name (ESS ID).

  Type : shows the current connection mode.

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WEP (Wired Equivalent Privacy) : shows the current WEP used in the AP. WEP can be enabled or disabled.

MAC : Shows the AP's MAC address that this card is communicating.

CARD INFO : shows the information about SD-Link11b card inserted such as,

IP - IP address of the card,

MAC - MAC address of the card.

Release Button : Releases the Current IP address

Renew Button : Renews the IP address

LINK INFO : shows the current wireless link information

Channel : shows the wireless radio channel currently used by the card.

Rate : shows the current transmit rate. This can be 1 Mbps, 2 Mbps, 5.5 Mbps, or 11 Mbps. Auto is automatic selection.

Signal Strength : gives signal strength of the received signal.

Advanced Options : shows advanced configuration settings available for SD-Link11b card.
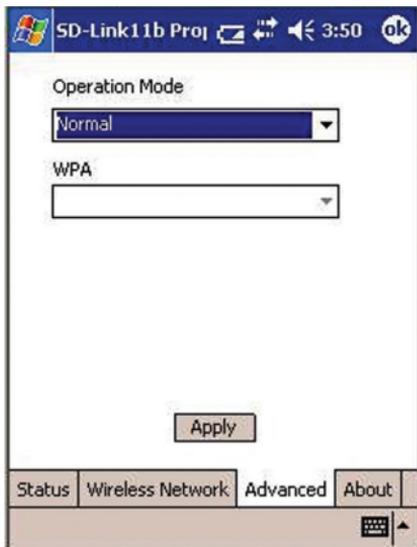
Fig 3. Advanced setup configuration

Operation Mode : shows 3 different operational options depending on applications. They are:

Normal - This is the default mode and power level and performance level are automatically selected.

Max Power Save - This option will give the best power savings but less emphasis on the performance.

Max performance - This option will give the best performance.

WPA : provides Wi-Fi protected access security measure (in the future optional). It can be either **Enabled** or **Disabled**.

User can change the settings by clicking **Apply** button.

Wireless Network : shows wireless networks available in the neighborhood. It is shown in Fig 4.
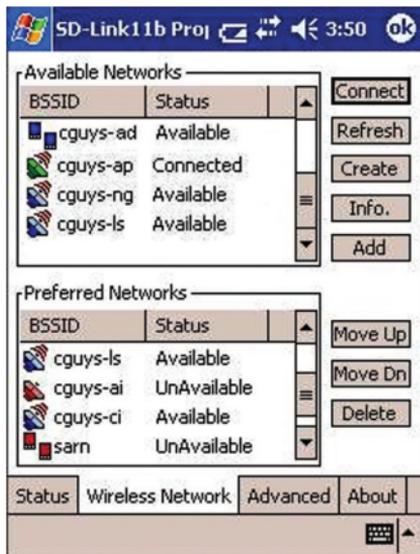
Fig 4. Wireless Network information

Available Networks : displays all the active infrastructure and Ad-hoc modes in the neighborhood. For the infrastructure mode's AP display, the currently communicating AP is listed first.

- **Connect Button** : Selects an AP and connect to the AP. Once the connection is established the AP requires user's information and the Fig 5. window will appear. Users must input required WEP key and click **Connect** to communicate. If multiple WEP keys are required, the index will show the requirement. If no WEP input is required, click **Connect** to connect without inputting the WEP key. Once **Connect** button is pressed, Fig 6 window will popup.

- **Refresh Button** : starts a new search for all available APs or peer-to-peer stations in the vicinity.

- **Create Button** : creates a new network and it will open the window shown in Fig 5. The user has to input all the information that is required to create new wireless network (e.g. Ad-hoc Network).

- **Info Button** : selects an AP and its relevant information regarding the AP.

- **Add Button** : Adds the currently selected AP from the **Available Networks** to **Preferred Networks**.

The user can also select an AP from the **preferred Networks** list. Once this is set, user can use the same name for quick connection or it is connected automatically.

Preferred Networks : displays the preferred wireless networks available.

Move Up - Moves the highlighted profile one line up to increase the association priority.

Move Down - Moves the highlighted profile one line down to decrease the association priority.

Delete - Deletes the selected profile.
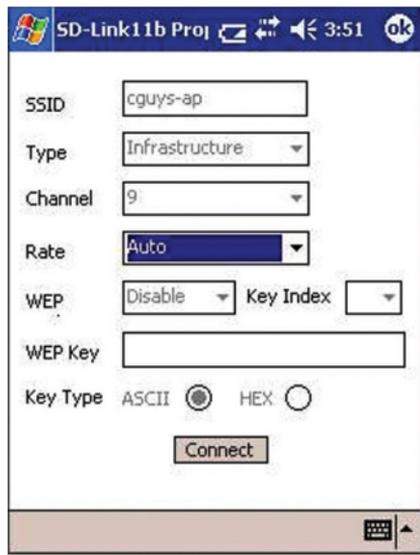
Fig 5. Connect Window

SSID : enters the SSID, this can be the Network ID or Access Point name.

Type : is network type, either **Ad-hoc or Infrastructure** will be selected.

>   **Note : Ad-hoc (or Peer-to-Peer) mode** is connection between two or more cards.

>   **Infrastructure** mode is connection between cards and an AP.

Channel : In Ad-hoc mode, select the channel in which user wants to create/join the network. In infrastructure mode, user can leave it blank or can enter AP's channel number. The default is auto.

Rate : sets the transmission data rate in the pull down menu. The default is auto which defines the rate automatically.

WEP : selects either **Enabled** or **Disabled** of the data encryption. The default is **Disabled**.

WEP Key

>   When WEP mode is **Enabled**, the user need to enter WEP key as shown.

>   64 bit (HEX) .... Maximum of 10 characters in Hexadecimal format

>   64 bit (ASCII) ..... Maximum of 5 characters in ASCII format

>   128 bit (HEX) ..... Maximum of 26 characters in Hexadecimal format

>   128 bit (ASCII) ... Maximum of 13 characters in ASCII format

Key Index : allows to select multiple WEP keys (Currently, only "0" is available. In the future upgrades)

>   Click **Connect Button** after entering all the necessary info to create new wireless network

>   Click on **Info Button** will bring the following window Fig 6
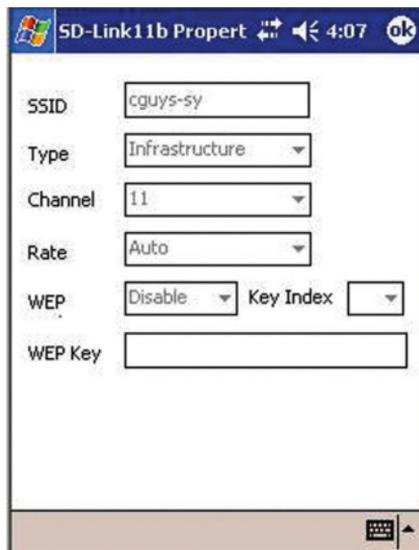
Fig 6. Connected network information

About page content is shown in Fig 7.
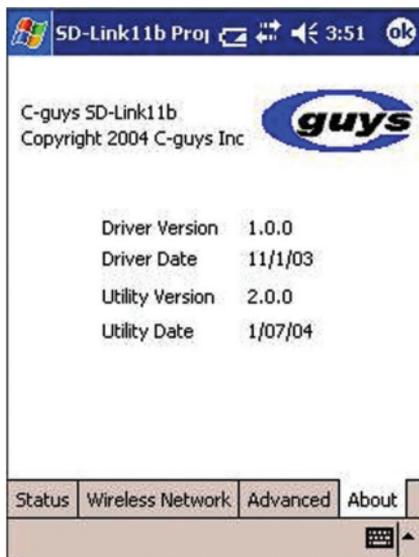
Fig 7. SD-Link11b card version information

Summary of Important Icons

- (Green) icon indicates the current AP is connected

- (Blue) icon indicates the current AP is available for wireless connection

- (Red) icon indicates the current AP is not available for wireless connection

- (Green) icon indicates Ad-hoc mode is established with current wireless connection

- (Blue) icon indicates Ad-hoc mode is on with current wireless connection

- (Red) icon indicates Ad-hoc mode is off with current wireless connection

5   SD-Link11b Specifications

NO	Item	Specification
1	Frequency Range	2412 – 2484 MHz (ISM band)
2	Tx Modulation	Direct Sequence Spread Spectrum, DSSS
3	Coding Modulation	DBPSK (1Mbps), DQPSK (2Mbps), CCK (5.5 & 11Mbps)
4	Media Access Control Method	CSMA/CA
5	Bus Type	SD (by CG-100 SDIO controller)
6	Standard	IEEE802.11b
7	Approval	FCC, part 15.247 (USA) EN 300.328 (Europe) TELEC STD-T33 / ARIB STD-T66 (Japan)
8	Antenna	Single
9	Input Power	3.3 VDC ± 0.2V
10	Tx Output Power	12dBm ± 2 dB
11	Power Consumption	< 250 mA typical < 280 mA receive < 10 mA power save mode < 1.5 mA deep sleep mode
12	Rx Sensitivity	-87 dBm @ 11 Mbps -91 dBm @ 5.5 Mbps -94 dBm @ 2 Mbps -96 dBm @ 1 Mbps
13	Temperature	0 - 55°C (operational) -20 - 80°C (storage)
14	Dimension in mm	55(L) x 24(W) x 2.1(T)
15	Weight	7g

6   Troubleshooting

6-1   Introduction

This chapter provides typical problems with their own specific troubleshooting tips.

6-2   Common Troubleshooting Tips

6-2-1   LED Activity

If you encounter difficulty using and/or installing your SD-Link11b product, the error may be related to various causes :

- Out-of range situation, which prevents the SD-Link11b from establishing a wireless connection with the network.

- Configuration mismatch, which prevents the SD-Link11b from establishing a wireless connection with the (correct) network.

- Absence of, or conflict of the SD-Link11b Driver .

- A problem or conflict with the SD-Link11b socket from powering on.

- A conflict of the SD-Link11b hardware with another device.

The starting point to troubleshoot problems with your SD-Link11b is looking at the LED activity of the SD-Link11b.

Table 6.2.1 below provides an overview of the various modes of operation and the associated LED activity. Table 6.2.1 also includes a number of troubleshooting hints, if required, that may help you solve the problem.

Table 6.2.1 LED Activity Table

Power LED	Description/Action
Continuous Red	Standard operational mode No action is required
Off	SD-Link11b power is not on, so it cannot transmit/receive data. The SD-Link11b may not be connected properly. Actions : - Check SD-Link11b connection. - Verify the device settings of the SD-Link11b to determine the conflict with other devices. If so, change the settings of either your SD-Link11b or the conflicting device to resolve the problem. - Verify the versions of the driver. - Consult the SD-Link11b **website at: http://www.c-guys.com** to see if newer versions are available and if so, upgrade the driver.

6-2-2   Cannot Connect To Network

If your SD-Link11b seems to be working fine, but you are not able to connect to the network, this error might be due to a configuration mismatch.

For example if LED of your SD-Link11b lights, the problem is likely to be caused by a configuration mismatch of :

- Network Name (The SD-Link11b Network Name is case-sensitive).

- Encryption Key

Other causes may be :

- No driver loaded.

- Station not authorized to access network.

- SD-Link11b defect.

The most common cause is simple mistake. First check whether the card is inserted properly or not. If the card is inserted properly, the connection icon (antenna) should be displayed. If you see the icon,

click that icon and check the status by clicking the status tab on the pop-up menu. Check whether any APs are available or not. If you see many APs, select any of one those APs and click connect. If you don't see any APs click Refresh Button. If you still don't see AP list after refreshing it is possible that no active AP is nearby. You may be in the dead zone. Move around or change the PDA orientations. It may help.

6-2-3   Cannot Edit Configuration Profile

If you want to add/edit the Configuration Profile of your SD-Link11b but the Client Manager icon is not visible, you may do the following :

- Insert the SD-Link11b card into the device. The Client Manager should pop-up. If nothing happens, the driver is not installed. Install the driver and restart the device. You should see the SD-Link11b icon in the lower right side.

6-2-4   Cannot Find the AP

Check the available access point in the neighborhood by clicking the wireless network tab in the utility. If the access point requires WEP key, input the same WEP key then try to connect again. If you do not know the WEP key, contact the system administrator to obtain the appropriate key.

For identifying the specific AP check the wireless networks available in the neighborhood. If the AP shows ESSID, use the same ESSID to connect the AP. ESSID is assigned to the specific AP for that purpose.

6-2-5   The System is Very Slow

Some devices with non-powerful CPU may suffer their performance significantly. If the system is very slow, check

- If you are opening many windows, close them

- Change the antenna orientation for better signal reception

- Check the signal strength if it is weak move toward the AP.

6-2-6 It Takes a Long Time to Shutdown

Unplug the SD-Link11b from the HP iPAQh2215 and View sonic V37 after turn off the host device will pop-up the Windows again. Similarly when the card is inserted while the system is off will pop-up Windows. This is because SD-Link11b card in or out triggers the system to wake up. If this happens, plug out the card and keep switch off for a few times until the system is completely off.

Leaving the SD-Link11b card in the system will not shut down the device (it is in hibernated condition).

6-2-7 SD-Link11b Does Not Operate After Returning From the Stand-by or Sleeping Mode

This may happen when the driver is not functioning. Reinstall the SD-Link11b driver again. If you have the same problem, please contact C-guys.

6-3 Upgrading Tips

6-3-1 Upgrading the SD-Link11b Driver

Upgrading the SD-Link11b Driver may be required in one of the following situations :

- You would like to use new features that have become available for your SD-Link11b.

- You installed a newer version of the Client Manager tool.

- Your Client Manager "Card Diagnostics" reported a Driver/Firmware mismatch.

CAUTION :

Upgrading the SD-Link11b Driver should be easy. But if you do not feel comfortable, please done it by a skilled LAN Administrator or support engineer who has a working knowledge of the Microsoft$^{®}$ operating systems.

A. Install from PC through USB cable.

1. Connect the PC and PDA via an USB cable.

2. Make sure the SD-link11b card is plugged out from PDA.

3. Login to http://www.c-guys.com/ by the PC, first.

4. Download the latest driver/updates as instructed and save it to your PC.

5. Open the Active Sync$^{®}$ (by Microsoft$^{®}$) program at both devices.

6. Double click the application which you saved.

7. The application will open and Active Sync$^{®}$ will start to transfer the driver.

8. The application will install the latest driver to your PDA.

9. When prompted for overwriting your files, click "YES".

10. Your new driver is ready.

B. Install wirelessly using the SD-link11b card.

1. Connect to the http://www.c-guys.com/ on your PDA.

2. Download the latest driver and save it.

3. Plug out your SD-link11b card from the PDA

4. Double click the application which you saved.

5. The application will install the latest driver

6. When prompted for overwriting your files click "YES".

7. Your new driver is ready.

C. Install using the SD-memory card.

1. Connect to the http://www.c-guys.com/ on your PC.

2. Download the latest driver and save it in the SD memory card.

3. Insert the SD memory into your PDA.

4. Double click the application which you saved.

5. The application will install the latest driver

6. When prompted for overwriting your files click "YES".

7. Your new driver is ready.

6-3-2   Removing the Driver

1. In your PDA, go to Start, then Settings.

2. Click on system Tab.

3. Click on Remove Programs Icon.

4. A new window will open and showing the Installed programs in your PDA.

5. Select on "C-guys SD-Link11b" and then click Remove button.

6. Click "YES" when prompted.

The driver is removed.

CAUTION :

Prior to deleting the files from your hard disk, it is important to remove the drivers as described above.

Failing to do so prevents the Windows operating system from cleaning the Windows Registry, which might lead to complications if you try to re-install the SD-Link11b Driver in the future.

If deleting the SD-Link11b Driver files was part of an "Upgrade Driver" routine, you can now (re-)install the new SD-Link11b Driver as described in Chapter 2 "Installing your SD-Link11b".

For more detail information:

http://www.c-guys.com/

7   Warranty

C-guys' 1 Year Warranty

C-guys, Inc. will repair or replace this SD-Link11b Card free of charge if it ever fails within 1 year from the date of purchase, subject to the conditions set forth below. The warranty applies only to the extent this SD-Link11b Card is used in devices that are compliant with the specifications of the appropriate standards organization. This warranty applies only to the original purchaser of the C-guys SD-Link11b Card who has proof of purchase, if requested.

This warranty is void if the SD-Link11b Card is not used in accordance with the product instructions or if C-guys determines that any failure has been caused by misuse, neglect, improper installation, repair, alteration or accident. C-guys bears no responsibility for failure or defect caused by any third party product or components whether authorized or not. C-guys does not recommend the use of its products in life support applications where in a failure or malfunction, the product may directly threaten life or injury. This product is intended for consumer end-use only; it is not intended for nor warranted for commercial applications.

If a product fails under the terms of this warranty C-guys will inspect the product and at its option, repair or replace the product. C-guys will ship out a product with equal to or greater capacity. C-guys' sole liability, and the exclusive remedy, for any acknowledged defect(s) shall be the repair or replacement of the product in question. C-guys may, at its sole option, replace the product with a refurbished product.

ALL STATUTORY OR IMPLIED WARRANTIES ARE HEREBY DISCLAIMED TO THE FULLEST EXTENT. C-GUYS SHALL NOT BE LIABLE UNDER ANY CIRCUMSTANCES FOR ANY INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOST DATA.