

D-Link[®]

DFE-580TX

10/100 Mbps PCI-Bus Fast Ethernet Server Card

Manual

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RECYCLABLE

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Introduction to D-Link Server Card Software 4.0

D-Link Server Card Software is a software-only solution that enables Windows NT, 2000, and Linux systems (sold separately) to load-balance network traffic across two or more network connections creating redundant data paths throughout the network. For a low per-system cost, you can simultaneously eliminate the risk of downtime due to a network failure while more than tripling your server's throughput.

D-Link Server Card Software is designed to work as a standalone solution or across the enterprise. D-Link Server Card Software can be deployed on key servers or workstations as a great low-cost solution to eliminate bottlenecks and provide enhanced fault tolerance. Alternatively, D-Link Server Card Software can be deployed across the enterprise to eliminate all single points of failure and create redundant data paths between any two points on the network for a complete end-to-end solution.

End-to-End Network Fault Tolerance

Unlike simple NIC trunking solutions that only detect link failures at the network adapter, D-Link Server Card Software peers deep into the network to detect faults and intelligently reroutes traffic based on where and what type of fault is detected. By pushing fault tolerance detection into the network, D-Link Server Card Software enables you to design a network so that there are no single points of failure between any two points. If a NIC, switch port, switch or cable fails, D-Link Server Card Software will detect it and instantly reroute traffic.

Eliminate Bottlenecks Throughout the Network

To increase network performance, D-Link Server Card Software distributes traffic among multiple network adapters on the server. The software assigns connections to different adapters in a round-robin fashion as users access the server. This process effectively broadens bandwidth by a factor equal to the number of adapters in the array. To the system, the multiple network connections appear as a single network interface with a single IP address. To any clients, the system appears immediately available without the delay of congestion typical during high-access periods.

Key Features

- Provides increased performance with network traffic load balancing.
- Performs load balancing on inbound and outbound traffic.
- Achieves over 2 Gbs with Gigabit adapter array or 380Mbs with a 4 100Mb adapter array.
- Provides instant failover without loss of data.
- Detects faults deep within the network and intelligently reroutes traffic.
- Can eliminate single points of failure between any two systems on the network.
- Remote management with Web-based Enterprise Manager.
- Compatible with any NIC card – not vendor-specific.
- Supports Ethernet, Fast Ethernet, Gigabit Ethernet.
- Provides detailed throughput graphing and reporting.
- Provides PCI Hot Plug support.
- Supports 802.3ad and FEC/GEC switch-based trunking.

Important Information

The following sections cover important information you need to successfully install D-Link Server Card Software. Please read this section carefully. This information is intended to help you get up and running quickly and minimize the "gotchas" that can waste hours of installation time.

What's New in D-Link Server Card Software v. 4.0

The 4.0 version of D-Link Server Card Software features three new enhancements:

- FEC/GEC and IEEE 802.3ad switch based trunking support. D-Link Server Card Software can now offload inbound load balancing to a switch that supports either the Cisco FEC/GEC or the IEEE 802.3ad trunking standard. This will enable D-Link Server Card Software to reduce its overhead slightly and achieve even greater throughput.
- Windows NT version updated with easy-to-use interface for viewing status and statistics of arrays.
- Enhanced failover support. D-Link Server Card Software has been enhanced so that it can peer deep into the network to identify faults and intelligently reroute traffic in the event of a failure.

Requirements

D-Link Server Card Software is an NDIS Intermediate driver that performs all of its functions in the Kernel mode of any Windows 2000/NT system. Because D-Link Server Card Software operates in kernel mode, it should work well with almost any server configuration and application. A few specific requirements, however, should be met before D-Link Server Card Software can operate on your server.

Operating Systems:

Microsoft Windows 2000 Professional, Server or Advanced Server
Microsoft Windows NT, service pack 4 or greater

Miscellaneous:

64 MB RAM; 2 MB hard disk space; SVGA video adapter; mouse or compatible pointing device

Recommended:

It is recommended that you install the latest Service Packs and/or Hot Fixes from Microsoft prior to installing D-Link Server Card Software. Refer to the Release Notes for the latest list of Service Packs and/or Hot Fixes that are required.

Hardware Driver Compatibility

D-Link Server Card Software has been tested for compatibility with an exhaustive list of network adapters and their drivers. To ensure optimal performance, it is recommended that you download the latest hardware drivers for your particular adapters from the manufacturer's web site.

Before You Install - A Checklist

Use this checklist to make sure your environment is set up correctly for D-Link Server Card Software to be installed properly. It is highly recommended you follow each of the steps in the order given.

- Windows 2000/NT is running properly.
- All NICs have been installed and checked for proper operation.
- All protocols, drivers, and network services are installed and operate correctly.
- The latest service pack or necessary Hot fixes from Microsoft have been installed.
- All cables, switches, and hubs are set up and working properly.

Important: **If a previous version of D-Link Server Card Software for Windows is installed on your system, you must uninstall it completely and REBOOT your system before installing D-Link Server Card Software v. 4.0.**

Quick Setup Guide

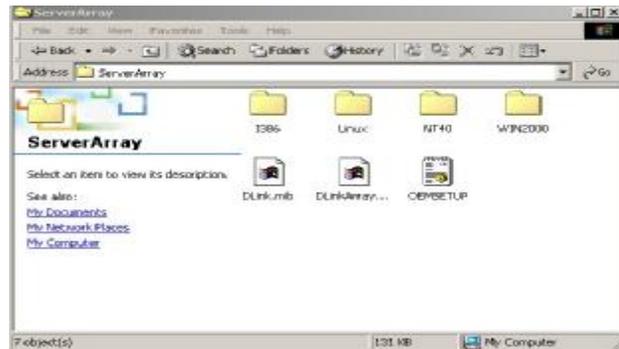
Installing D-Link Server Card Software

Step 1

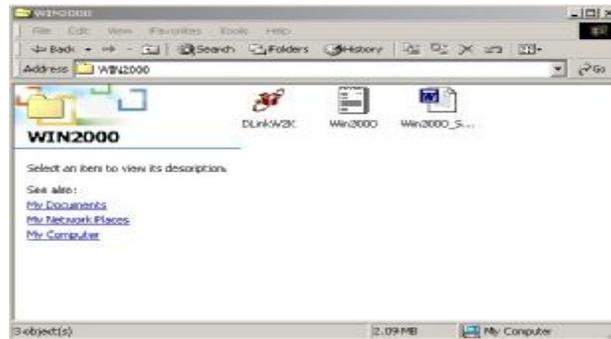
Launch the D-Link Server Card Software install shield package from the CD-ROM by double-clicking on **Server Array**,



then double-click on **WIN2000**.



Finally, double-click on **DLinkW2K**. The following window will appear, beginning the Installation Wizard.



Step 2

Select the destination directory in which you wish to install the D-Link Server Card Software support files. The default location is **c:\Program Files\D-Link Server Card Software**.



Step 3

Next, the setup program will create a folder off the Start Menu to access the main D-Link Server Card Software utility and documentation. The default folder is **\D-Link W2K** off the Programs folder on the Start Menu. Either accept the default or input a new folder name and click **Next**.



Note: This process may take several seconds. During setup, the screen at right may appear a few times. Click **Continue Anyway** to proceed.



Step 4

When setup is complete, the D-Link Server Card Software Properties dialog box will be displayed. This dialog allows you to configure all of the adapters that you want to add to the D-Link Server Card Software Array. Select (by clicking) the first adapter in the "Available Adapters" list at the top of the dialog and click **Add**.

Step 5

You will be prompted to give the new array a name. Simply type over "New Array" in the pull-down list in the middle of the dialog. In the example at the right, an array called "group1" was added.



Step 6

Next, you are asked if you want to use this adapter's protocol information (i.e. IP address, etc.) as the primary address for the array. If this is the primary IP of the machine you want advertised to clients, select **Yes**. Otherwise, select **No** and continue adding the other adapters to the array. When finished, click **OK**.

Note: The Group's (array's) IP information may be assigned or changed later to reflect the address of a computer, switch, or other connecting device.

- When prompted to use an adapter's protocol information, you can only select YES for one adapter per array. The adapter chosen to use its protocol information will become the PRIMARY adapter of the array.
- All available adapters must be assigned to an array. If you do not want load balancing or failover for a single adapter, assign it to a separate array by itself.

Step 7

When finished configuring the array, close the D-Link Server Card Software Properties dialog and return to the Setup program. Click the **Finish** button to complete the setup.

Verifying Protocol Information of the Array

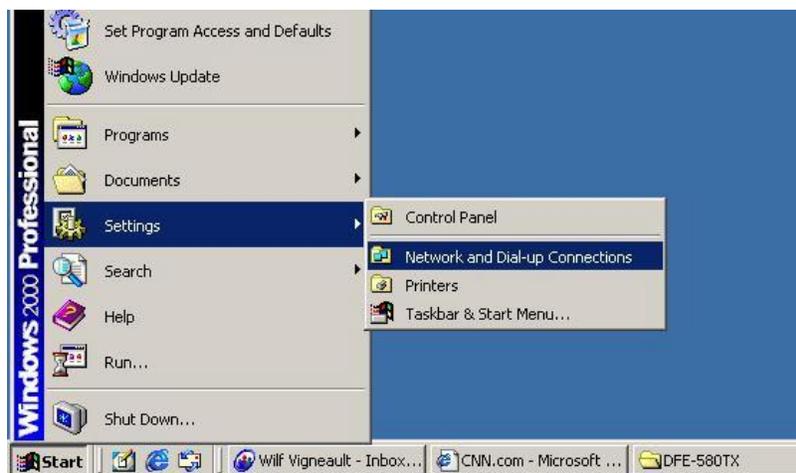
Once the setup program is complete, you will want to verify that the correct protocol information is configured for the array(s). D-Link Server Card Software installs its own virtual adapter for each array that is created.

To change or edit the IP address of the array, it is necessary to modify the Virtual Adapter's IP address. To verify the protocol information of the array under Windows, perform the following steps:

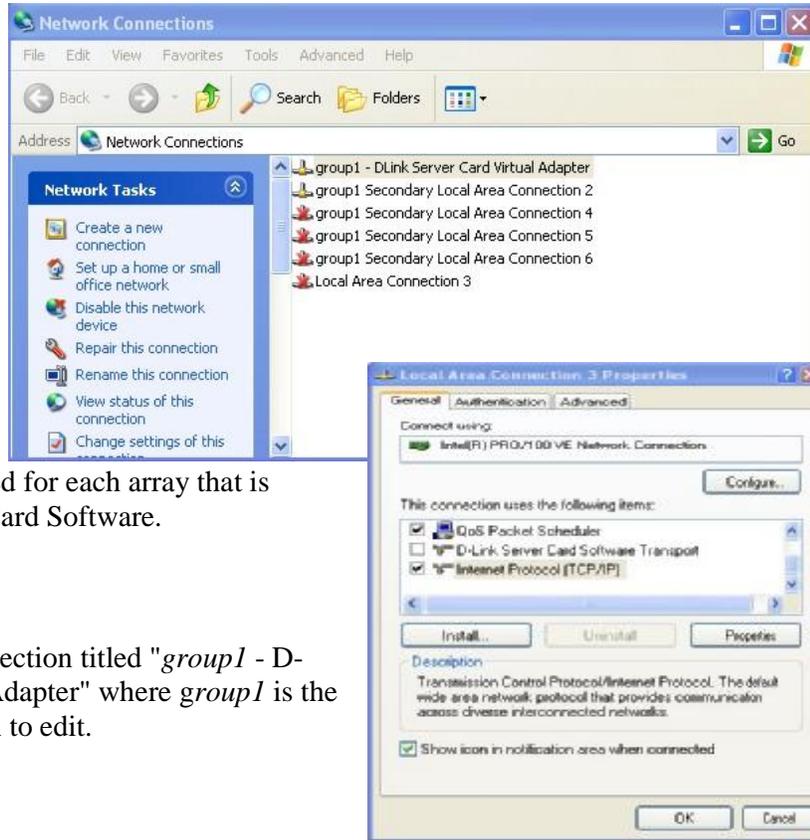
Step 1

From the Start Menu, select Settings, Control Panel, Network Connections.

Note:



When D-Link Server Card Software is installed, the title of each Local Area Connection is changed to reflect the D-Link Server Card Software array name it is associated with and its designation as either a *Primary* or *Secondary* adapter (connection). In addition, a Virtual Adapter connection is added for each array that is created in D-Link Server Card Software.



Step 2

Select the Local Area connection titled "*group1* - D-Link Server Card Virtual Adapter" where *group1* is the name of the array you wish to edit.

Step 3

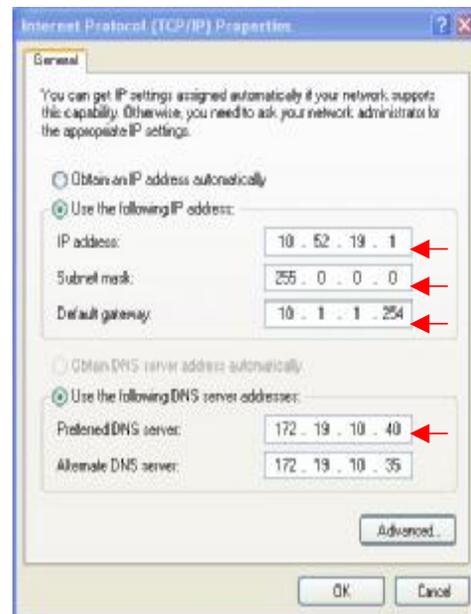
Right-click and select Properties. The following window will appear.

Step 4

Select Internet Protocol (TCP/IP) and click the Properties button.

Step 5

Verify that the correct IP information is listed for the Virtual Adapter. If needed, edit the IP address information as you would any other adapter.



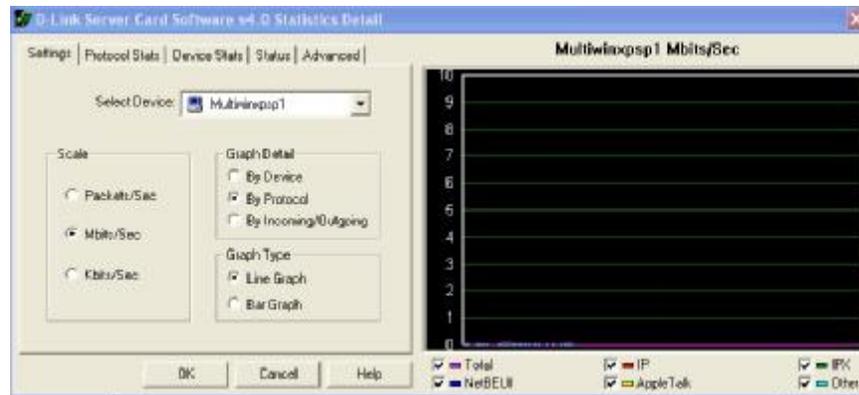
Important Note:

As well as the IP Address, the correct values must be entered for Subnet Mask, Default Gateway, and DNS Server. These values are available from your ISP.

Using the D-Link Server Card Software Statistics Utility

Launching the D-Link Server Card Software Statistics Utility

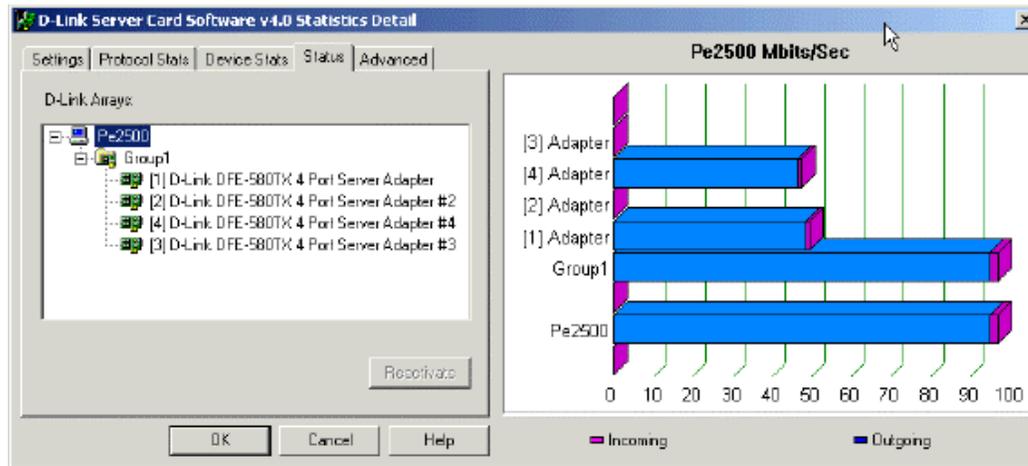
At any time, you can instantly gauge the status of any port in a D-Link Server Card Software array and view performance statistics on each array or individual ports. To view statistics and status information for D-Link Server Card Software, launch the main user interface from the Start Menu. If the default settings were used during setup, D-Link Server Card Software can be found in the **D-Link W2K** folder off the Start Menu. Double-click to bring up the following window:



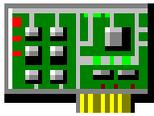
The D-Link Server Card Software Statistics Utility comprises five tabs on the upper left and a graph area on the right. The five tabs are labeled:

- **Settings** – used to configure the appearance of the graph on the right.
- **Protocol Stats** – displays detailed statistics in tabular form for all protocols for the selected device.
- **Device Stats** – displays detailed statistics in tabular form broken out by sub-component.
- **Status** – provides a tree view of all groups and adapters for the server and their current status.
- **Advanced** – allows for advanced configuration options used by the failover and load-balancing functions.

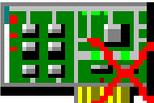
Status Tab - Viewing Adapter Status and Alerts



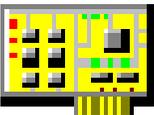
Within the Status tab, you can view the status of each adapter instantly. D-Link Server Card Software keeps track of five different states for each adapter in an array. These states are represented by different icons for the adapters in the tree view.



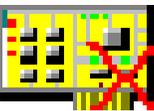
Green Adapter - Adapter's normal state. Adapter is working properly and has not failed.



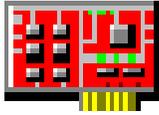
Green Adapter with Red X –Adapter has stopped working for the first time since the server was booted.



Yellow Adapter - Adapter is currently working properly. However, yellow state indicates there has been a failure previously. D-Link Server Card Software will automatically reactivate adapters that indicate that they are working properly again.



Yellow Adapter with Red X - Adapter is currently down and has been down multiple times before.



Red Adapter - Adapter has failed more than three times in one hour (default) and D-Link Server Card Software has pulled the adapter from the array. This state prevents D-Link Server Card Software from constantly failing over on faulty adapters that should be replaced.

NOTE:

D-Link Server Card Software will permanently remove an adapter if it determines that the adapter has failed more than three times in one hour (achieving the red state above). If you will be testing failover functionality, you may want to adjust this default. Otherwise, if you pull the wire on an adapter card more than three times, you will have to reactivate the adapter from the Advanced Tab to add the NIC back into the array. Refer to the **Advanced Configuration Options** below to change these defaults.

Whenever an adapter changes states, an event is logged to the Windows event log.

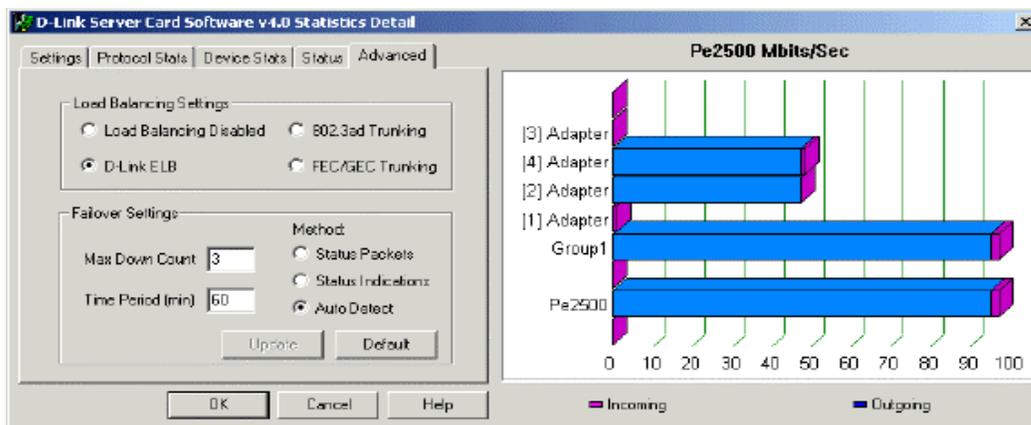
Reactivating Adapters

Normally, if an adapter fails but later indicates it is online again, D-Link Server Card Software will automatically add the adapter back into the array. However, if the adapter fails three times within one hour (default), D-Link Server Card Software will permanently remove the adapter from the array. These thresholds can be modified under the Failover Settings section in the Advanced tab (see below).

To reactivate a permanently removed adapter, select the adapter and press the Reactivate button. If there are no problems inserting the adapter, the adapter will then be added back to its array without needing to reboot. Caution should be used when reactivating an adapter. If the adapter has failed several times, the adapter may be experiencing intermittent hardware problems and may need to be replaced. An adapter with hardware problems may cause other network problems to occur on the network.

Advanced Tab - Advanced Configuration Options

The Advanced Tab in the D-Link Server Card Software interface allows for advanced configuration options used by the failover and load-balancing functions.



Load Balancing Settings

The Load Balancing Settings section allows you to select between the three supported load-balancing options or to disable load balancing all together.

Load Balancing Disabled

Selecting the checkbox next to "Load Balancing Disabled" will disable the load balancing function leaving D-Link Server Card Software to provide only failover across the adapters in the array. With this option checked, D-Link Server Card Software will normally send data only through the primary adapter unless a failover event is detected.

NOTE: Changing this setting requires a reboot before the change will take effect.

D-Link Server Card Software ELB (Enhanced Load Balancing)

D-Link Server Card Software ELB provides enhanced load balancing using our own proprietary load-balancing scheme designed to maximize both inbound and outbound load balancing while minimizing CPU overhead and latency in the network. Also, this option is the only load-balancing option that supports the simultaneous use of D-Link Server Card Software's award winning fault-tolerance features.

NOTE: The D-Link Server Card Software ELB is the only load balancing option that allows for the use of D-Link Server Card Software' award-winning fault tolerance features.

802.3ad Trunking support

Use the 802.3ad checkbox when establishing an 802.3ad trunk between the D-Link Server Card Software system and a switch that supports the IEEE 802.3ad trunking standard. When an 802.3ad trunk is established, inbound load balancing is offloaded to the switch.

Important: Please make sure your switch supports the IEEE 802.3ad trunking standard and not a proprietary trunking method. Also, make sure the ports are configured properly. If not, load balancing will not work properly if the 802.3ad option is selected.

When using 802.3ad for load balancing, D-Link Server Card Software's advanced failover functionality will be disabled and failover will be limited to the Status Indications method of failover.

FEC/GEC Trunking support

Use the FEC/GEC Trunking checkbox when establishing a trunk between D-Link Server Card Software and a Cisco switch that supports Fast Ether Channel (FEC) or Gigabit EtherChannel (GEC). When an FEC/GEC trunk is established, inbound load balancing is offloaded to the switch.

Important: Please make sure your switch supports the Cisco FEC/GEC trunking standard and the ports are configured properly. If not, load balancing will not work properly if the FEC/GEC Trunking option is selected.

When using the FEC/GEC option for load balancing, D-Link Server Card Software's advanced failover functionality will be disabled and failover will be limited to the Status Indications method of failover.

Failover Settings

The Failover Settings section provides options that control the failover function. Each setting is discussed below.

The first column of options sets the conditions to permanently remove adapters from the array. The setting for **Max Down Count** is the number of times an adapter must go down (and come back online) in the defined time period before being permanently removed. The default value for this field is 3. A value of zero (0) disables this feature so that an adapter can fail repeatedly without being permanently removed.

The setting for **Time Period** is the amount of time (in minutes) the **Max Down Count** setting must be exceeded before an adapter is permanently removed. The default value for this field is 60 minutes (1 hour).

The second column of settings control the method used to detect that an adapter has failed. The **Status Packets** method sends a status packet from one adapter to another in order to determine if the receiving adapter is available.

The **Status Indications** method uses NDIS functionality to have an adapter inform D-Link Server Card Software that an adapter has failed or is functioning properly again. Not all adapters support this method but it does provide for faster failover.

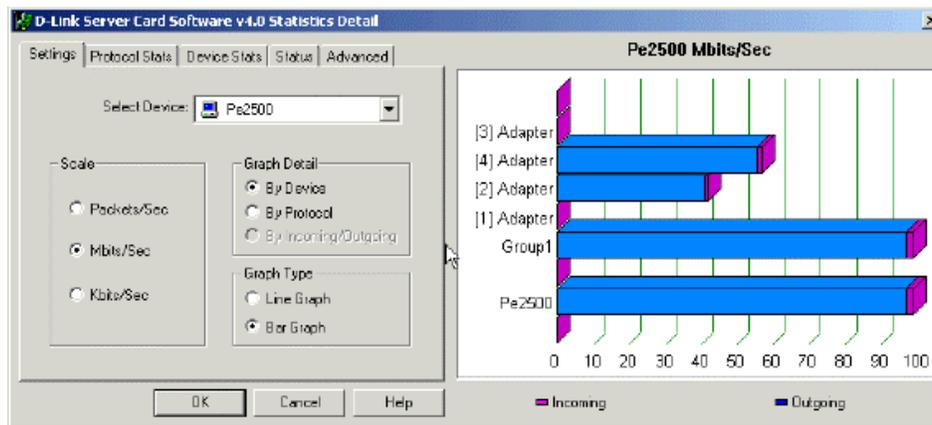
The **Auto Detect** method determines at system startup which method (Status Packets or Status Indications) should be used to provide the best failover method for the installed adapters.

After any setting has been changed, the Update button will become active. Once all changes have been made, press the Update button for the settings to automatically go into effect. No reboot is required and all settings are saved for use after rebooting. To restore all settings back to their default values, press the Default button. Press the Update button to have these settings go into effect. If any changes have been made and the OK button is pressed, the new settings will then automatically be applied.

Settings Tab - Adjusting the Graph Settings

D-Link Server Card Software also provides the ability to view detailed traffic statistics in real-time graphs and reports. The **Settings** tab allows you to customize how D-Link Server Card Software graphs and displays throughput data, as well as select which device to graph throughput data on. On this tab you can:

- Change the scale to Packets/Sec, Mbits/Sec or Kbits/sec.
- Further break out data by Incoming/Outgoing data, per adapter, or by protocol.
- Select between Bar Graph and Line Graph.
- Select the device whose data you wish to graph.



Scale

To change the scale of any chart or graph, simply selected the appropriate option under Scale on the Graph Settings Tab. With D-Link Server Card Software you can switch the scale from Packets per second, Megabits per second or Kbits per second.

Graph Detail

Graph Detail allows you to select how throughput totals are broken out for the currently selected device. You can choose to display breakout detail in three ways:

- **By Device** - Allows you to view throughput from all of the sub-components that make up a device. For instance, if the currently selected device is a Group (Array), then breakout totals will be displayed for each adapter that makes up that group.
- **By Protocol** - This option allows you to view totals for each protocol running on the currently selected device in addition to the total throughput of the device.
- **By Incoming/Outgoing** - This option allows you to view total incoming traffic to the device selected, total outgoing traffic in addition to the device's total overall throughput.

NOTE: This option is grayed out for Bar Chart type graphs since both incoming and outgoing traffic

detail is provided in the other two options for Bar graphs.

You can further customize the graph by selecting or unselecting each breakout component on the legend below the graph.

Graph Type

D-Link Server Card Software gives you two ways to view throughput data in real time – Line Graphs or Bar Charts.

Line Graph

The line graph gives you the ability to view data over time for total server throughput, by group, or adapter. Line graphs not only allow you to see total throughput for each device, but you can also view a variety of detailed statistics for each device including:

- Incoming and outgoing data
- Traffic for each protocol
- Traffic for each sub-component (i.e. adapters that make up an array)

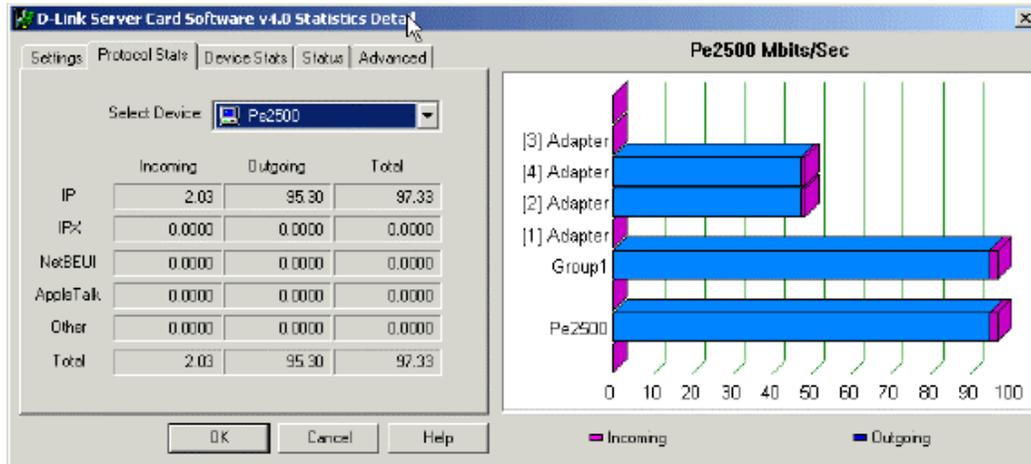
Bar Graph

The bar graph option allows you to view throughput data for all components or protocols on the server at once as well as overall throughput for the server. The bars in the graph show both incoming and outgoing data for each component. With the bar graph option selected, you have the ability to see graph detail by device or by protocol.

NOTE: With Bar graph selected, the Incoming/Outgoing option under graph detail will be grayed out since this data is already incorporated in the bar charts for both "By Device" and "By Protocol" options.

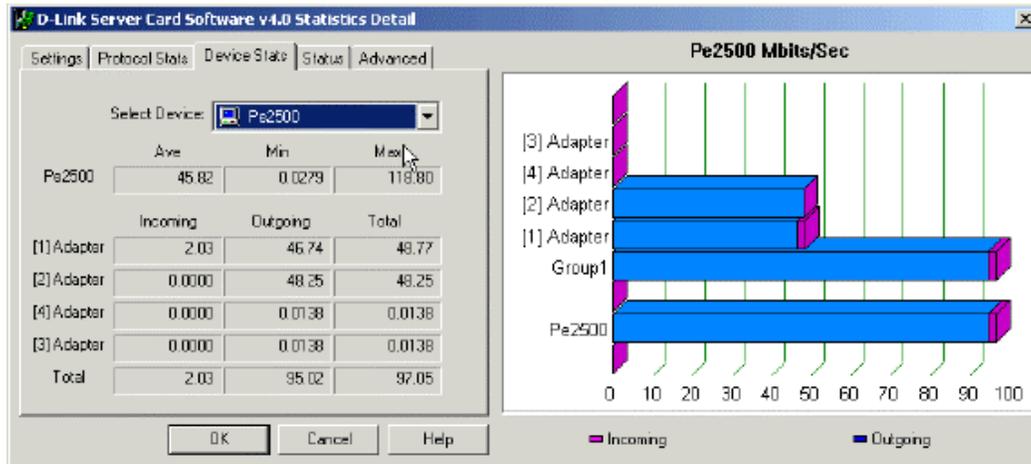
Protocol Stats Tab

The Protocol Stats Tab displays detailed statistics in tabular form for all protocols on the selected device. The device's total throughput statistics are shown as well as totals for IP, IPX, NetBEUI and AppleTalk protocols.



Device Stats Tab

The Device Stats tab shows detail statistics in tabular form broken out by sub-component. Average, minimum, and maximum values are displayed in the first row of data for the selected device. Throughput data for each sub-component of the device, along with the device total, are also displayed.



Editing D-Link Server Card Software Arrays

To reconfigure or change the D-Link Server Card Software array(s), you must access the properties page of the D-Link Server Card Software service. The D-Link Server Card Software service can be accessed from the properties page of any Local Area Connection in the Network and Dial-up Connections folder. This properties page contains the D-Link Server Card Software Setup dialog that was used during install to create the D-Link Server Card Software array(s). To edit or create new arrays, use the following steps:

Step 1

From the Start Menu, select *Settings*, *Control Panel*.

Step 2

Open *Network Connections*.

Step 3

Look for the LAN Connection titled "*Group* D-Link Server Card Software Virtual Adapter" where *Group* is the name of the array created in D-Link Server Card Software. **Right-click**, then

Step 4

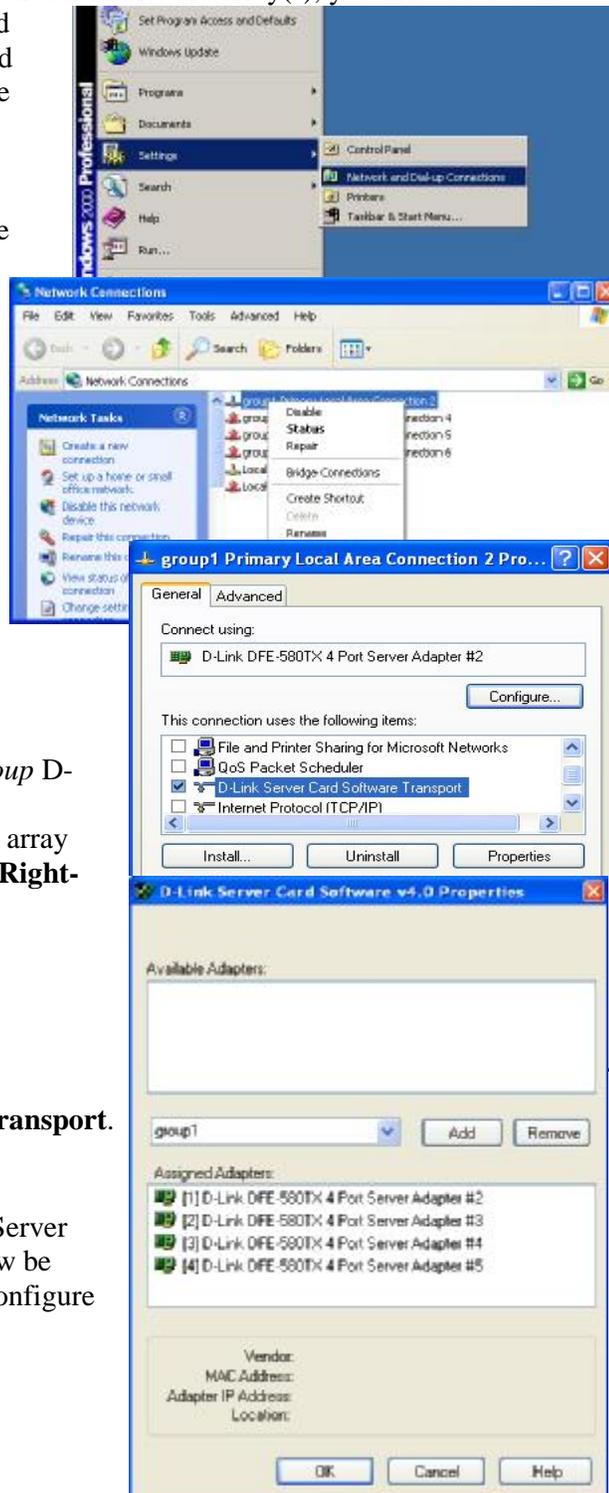
Select **Properties**.

Step 5

Select **D-Link Server Card Software Transport**.

Step 6

Click the Properties button. The D-Link Server Card Software Properties page should now be displayed. Use this window to edit or reconfigure adapter assignments.



Windows Event Log Messages

D-Link Server Card Software will report all adapter errors and state changes to the Windows Event Log. To view messages in the Event Log, use the Event Viewer supplied by Windows. Examples of all the events generated by D-Link Server Card Software are shown below:

Downed Adapter

The adapter <Adapter Name> in <Array Name> has lost network connectivity and has been removed from the D-Link Server Card Software Array.

Array has only one remaining Adapter

There is only one functioning adapter in <Array Name> left.

All Adapters in Array are down

All adapters in <Array Name> are down; therefore, users on this segment can no longer communicate to this computer.

Failed Adapter comes online again

The adapter <Adapter Name> in <Array Name> has regained network connectivity and has been inserted back into the D-Link Server Card Software Array.

Adapter has failed multiple times and is permanently removed

The adapter <Adapter Name> in <Array Name> has lost network connectivity and has been removed from the D-Link Server Card Software Array. The adapter has gone down <###> times in the past <###> minutes; therefore, the adapter will not be put back into the array. It is advisable that you investigate the cause of the lost connections and possibly replace the adapter or cable.



Limited Warranty (USA Only)

Subject to the terms and conditions set forth herein, D-Link Systems, Inc. ("D-Link") provides this Limited warranty for its product only to the person or entity that originally purchased the product from:

- D-Link or its authorized reseller or distributor and
- Products purchased and delivered within the fifty states of the United States, the District of Columbia, U.S. Possessions or Protectorates, U.S. Military Installations, addresses with an APO or FPO.

Limited Warranty: D-Link warrants that the hardware portion of the D-Link products described below will be free from material defects in workmanship and materials from the date of original retail purchase of the product, for the period set forth below applicable to the product type ("Warranty Period"), except as otherwise stated herein.

1-Year Limited Warranty for the Product(s) is defined as follows:

- Hardware (excluding power supplies and fans) One (1) Year
- Power Supplies and Fans One (1) Year
- Spare parts and spare kits Ninety (90) days

D-Link's sole obligation shall be to repair or replace the defective Hardware during the Warranty Period at no charge to the original owner or to refund at D-Link's sole discretion. Such repair or replacement will be rendered by D-Link at an Authorized D-Link Service Office. The replacement Hardware need not be new or have an identical make, model or part. D-Link may in its sole discretion replace the defective Hardware (or any part thereof) with any reconditioned product that D-Link reasonably determines is substantially equivalent (or superior) in all material respects to the defective Hardware. Repaired or replacement Hardware will be warranted for the remainder of the original Warranty Period from the date of original retail purchase. If a material defect is incapable of correction, or if D-Link determines in its sole discretion that it is not practical to repair or replace the defective Hardware, the price paid by the original purchaser for the defective Hardware will be refunded by D-Link upon return to D-Link of the defective Hardware. All Hardware (or part thereof) that is replaced by D-Link, or for which the purchase price is refunded, shall become the property of D-Link upon replacement or refund.

Limited Software Warranty: D-Link warrants that the software portion of the product ("Software") will substantially conform to D-Link's then current functional specifications for the Software, as set forth in the applicable documentation, from the date of original retail purchase of the Software for a period of ninety (90) days ("Warranty Period"), provided that the Software is properly installed on approved hardware and operated as contemplated in its documentation. D-Link further warrants that, during the Warranty Period, the magnetic media on which D-Link delivers the Software will be free of physical defects. D-Link's sole obligation shall be to replace the non-conforming Software (or defective media) with software that substantially conforms to D-Link's functional specifications for the Software or to refund at D-Link's sole discretion. Except as otherwise agreed by D-Link in writing, the replacement Software is provided only to the original licensee, and is subject to the terms and conditions of the license granted by D-Link for the Software. Software will be warranted for the remainder of the original Warranty Period from the date of original retail purchase. If a material non-conformance is incapable of correction, or if D-Link determines in its sole discretion that it is not practical to replace the non-conforming Software, the price paid by the original licensee for the non-conforming Software will be refunded by D-Link; provided that the non-conforming Software (and all copies thereof) is first returned to D-Link. The license granted respecting any Software for which a refund is given automatically terminates.

Non-Applicability of Warranty: The Limited Warranty provided hereunder for hardware and software of D-Link's products will not be applied to and does not cover any refurbished product and any product purchased through the inventory clearance or liquidation sale or other sales in which D-Link, the sellers, or the liquidators expressly disclaim their warranty obligation pertaining to the product and in that case, the product is being sold "As-Is" without any warranty whatsoever including, without limitation, the Limited Warranty as described herein, notwithstanding anything stated herein to the contrary.

Submitting A Claim: The customer shall return the product to the original purchase point based on its return policy. In case the return policy period has expired and the product is within warranty, the customer shall submit a claim to D-Link as outlined below:

- The customer must submit with the product as part of the claim a written description of the Hardware defect or Software nonconformance in sufficient detail to allow D-Link to confirm the same.
- The original product owner must obtain a Return Material Authorization ("RMA") number from the Authorized D-Link Service Office and, if requested, provide written proof of purchase of the product (such as a copy of the dated purchase invoice for the product) before the warranty service is provided.
- After an RMA number is issued, the defective product must be packaged securely in the original or other suitable shipping package to ensure that it will not be damaged in transit, and the RMA number must be prominently marked on the outside of the package. Do not include any manuals or accessories in the shipping package. D-Link will only replace the defective portion of the Product and will not ship back any accessories.
- The customer is responsible for all in-bound shipping charges to D-Link. No Cash on Delivery ("COD") is allowed. Products sent COD will either be rejected by D-Link or become the property of D-Link. Products shall be fully insured by the customer and shipped to **D-Link Systems, Inc., 53 Discovery Drive, Irvine, CA 92618**. D-Link will not be held responsible for any packages that are lost in transit to D-Link. The repaired or replaced packages will be shipped to the customer via UPS Ground or any common carrier selected by D-Link, with shipping charges prepaid. Expedited shipping is available if shipping charges are prepaid by the customer and upon request.

D-Link may reject or return any product that is not packaged and shipped in strict compliance with the foregoing requirements, or for which an RMA number is not visible from the outside of the package. The product owner agrees to pay D-Link's reasonable handling and return shipping charges for any product that is not packaged and shipped in accordance with the foregoing requirements, or that is determined by D-Link not to be defective or non-conforming.

What Is Not Covered: This limited warranty provided by D-Link does not cover: Products, if in D-Link's judgment, have been subjected to abuse, accident, alteration, modification, tampering, negligence, misuse, faulty installation, lack of reasonable care, repair or service in any way that is not contemplated in the documentation for the product, or if the model or serial number has been altered, tampered with, defaced or removed; Initial installation, installation and removal of the product for repair, and

shipping costs; Operational adjustments covered in the operating manual for the product, and normal maintenance; Damage that occurs in shipment, due to act of God, failures due to power surge, and cosmetic damage; Any hardware, software, firmware or other products or services provided by anyone other than D-Link; Products that have been purchased from inventory clearance or liquidation sales or other sales in which D-Link, the sellers, or the liquidators expressly disclaim their warranty obligation pertaining to the product. Repair by anyone other than D-Link or an Authorized D-Link Service Office will void this Warranty.

Disclaimer of Other Warranties: EXCEPT FOR THE LIMITED WARRANTY SPECIFIED HEREIN, THE PRODUCT IS PROVIDED "AS-IS" WITHOUT ANY WARRANTY OF ANY KIND WHATSOEVER INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NON-INFRINGEMENT. IF ANY IMPLIED WARRANTY CANNOT BE DISCLAIMED IN ANY TERRITORY WHERE A PRODUCT IS SOLD, THE DURATION OF SUCH IMPLIED WARRANTY SHALL BE LIMITED TO NINETY (90) DAYS. EXCEPT AS EXPRESSLY COVERED UNDER THE LIMITED WARRANTY PROVIDED HEREIN, THE ENTIRE RISK AS TO THE QUALITY, SELECTION AND PERFORMANCE OF THE PRODUCT IS WITH THE PURCHASER OF THE PRODUCT.

Limitation of Liability: TO THE MAXIMUM EXTENT PERMITTED BY LAW, D-LINK IS NOT LIABLE UNDER ANY CONTRACT, NEGLIGENCE, STRICT LIABILITY OR OTHER LEGAL OR EQUITABLE THEORY FOR ANY LOSS OF USE OF THE PRODUCT, INCONVENIENCE OR DAMAGES OF ANY CHARACTER, WHETHER DIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL (INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF GOODWILL, LOSS OF REVENUE OR PROFIT, WORK STOPPAGE, COMPUTER FAILURE OR MALFUNCTION, FAILURE OF OTHER EQUIPMENT OR COMPUTER PROGRAMS TO WHICH D-LINK'S PRODUCT IS CONNECTED WITH, LOSS OF INFORMATION OR DATA CONTAINED IN, STORED ON, OR INTEGRATED WITH ANY PRODUCT RETURNED TO D-LINK FOR WARRANTY SERVICE) RESULTING FROM THE USE OF THE PRODUCT, RELATING TO WARRANTY SERVICE, OR ARISING OUT OF ANY BREACH OF THIS LIMITED WARRANTY, EVEN IF D-LINK HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. THE SOLE REMEDY FOR A BREACH OF THE FOREGOING LIMITED WARRANTY IS REPAIR, REPLACEMENT OR REFUND OF THE DEFECTIVE OR NON-CONFORMING PRODUCT. THE MAXIMUM LIABILITY OF D-LINK UNDER THIS WARRANTY IS LIMITED TO THE PURCHASE PRICE OF THE PRODUCT COVERED BY THE WARRANTY. THE FOREGOING EXPRESS WRITTEN WARRANTIES AND REMEDIES ARE EXCLUSIVE AND ARE IN LIEU OF ANY OTHER WARRANTIES OR REMEDIES, EXPRESS, IMPLIED OR STATUTORY

Governing Law: This Limited Warranty shall be governed by the laws of the State of California. Some states do not allow exclusion or limitation of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the foregoing limitations and exclusions may not apply. This limited warranty provides specific legal rights and the product owner may also have other rights which vary from state to state.

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CE Mark Warning: This is a Class B product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

FCC Statement: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communication. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

For detailed warranty outside the United States, please contact corresponding local D-Link office.

Register online your D-Link product at <http://support.dlink.com/register/>

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FCC Warning

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CE Mark Warning

This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

Warnung!

Dies ist ein Produkt der Klasse A. Im Wohnbereich kann dieses Produkt Funkstörungen verursachen. In diesem Fall kann vom Benutzer verlangt werden, angemessene Massnahmen zu ergreifen.

Precaución!

Este es un producto de Clase A. En un entorno doméstico, puede causar interferencias de radio, en cuyo caso, puede requerirse al usuario para que adopte las medidas adecuadas.

Attention!

Ceci est un produit de classe A. Dans un environnement domestique, ce produit pourrait causer des interférences radio, auquel cas l'utilisateur devrait prendre les mesures adéquates.

Attenzione!

Il presente prodotto appartiene alla classe A. Se utilizzato in ambiente domestico il prodotto può causare interferenze radio, nel cui caso è possibile che l'utente debba assumere provvedimenti adeguati.

VCCI Warning

この装置は、クラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

BSMI Warning

警告使用者

這是甲類的資訊產品,在居住的環境中使用時,可能會造成射頻干擾,在這種情況下使用者會被要求採取某些適當的對策

Warranty and Registration for all Countries and Regions Except USA

Wichtige Sicherheitshinweise

Bitte lesen Sie sich diese Hinweise sorgfältig durch.

Heben Sie diese Anleitung für den spätern Gebrauch auf.

Vor jedem Reinigen ist das Gerät vom Stromnetz zu trennen. Verwenden Sie keine Flüssig- oder Aerosolreiniger. Am besten dient ein angefeuchtetes Tuch zur Reinigung.

Um eine Beschädigung des Gerätes zu vermeiden sollten Sie nur Zubehörteile verwenden, die vom Hersteller zugelassen sind.

Das Gerät ist vor Feuchtigkeit zu schützen.

Bei der Aufstellung des Gerätes ist auf sichern Stand zu achten. Ein Kippen oder Fallen könnte Verletzungen hervorrufen. Verwenden Sie nur sichere Standorte und beachten Sie die Aufstellhinweise des Herstellers.

Die Belüftungsöffnungen dienen zur Luftzirkulation die das Gerät vor Überhitzung schützt. Sorgen Sie dafür, daß diese Öffnungen nicht abgedeckt werden.

Beachten Sie beim Anschluß an das Stromnetz die Anschlußwerte.

Die Netzanschlußsteckdose muß aus Gründen der elektrischen Sicherheit einen Schutzleiterkontakt haben.

Verlegen Sie die Netzanschlußleitung so, daß niemand darüber fallen kann. Es sollte auch nichts auf der Leitung abgestellt werden.

Alle Hinweise und Warnungen die sich am Geräten befinden sind zu beachten.

Wird das Gerät über einen längeren Zeitraum nicht benutzt, sollten Sie es vom Stromnetz trennen. Somit wird im Falle einer Überspannung eine Beschädigung vermieden.

Durch die Lüftungsöffnungen dürfen niemals Gegenstände oder Flüssigkeiten in das Gerät gelangen. Dies könnte einen Brand bzw. Elektrischen Schlag auslösen.

Öffnen Sie niemals das Gerät. Das Gerät darf aus Gründen der elektrischen Sicherheit nur von autorisiertem Servicepersonal geöffnet werden.

Wenn folgende Situationen auftreten ist das Gerät vom Stromnetz zu trennen und von einer qualifizierten Servicestelle zu überprüfen:

Netzkabel oder Netzstecker sind beschädigt.

Flüssigkeit ist in das Gerät eingedrungen.

Das Gerät war Feuchtigkeit ausgesetzt.

Wenn das Gerät nicht der Bedienungsanleitung entsprechend funktioniert oder Sie mit Hilfe dieser Anleitung keine Verbesserung erzielen.

Das Gerät ist gefallen und/oder das Gehäuse ist beschädigt.

Wenn das Gerät deutliche Anzeichen eines Defektes aufweist.

Bei Reparaturen dürfen nur Originalersatzteile bzw. den Originalteilen entsprechende Teile verwendet werden. Der Einsatz von ungeeigneten Ersatzteilen kann eine weitere Beschädigung hervorrufen.

Wenden Sie sich mit allen Fragen die Service und Reparatur betreffen an Ihren Servicepartner. Somit stellen Sie die Betriebssicherheit des Gerätes sicher.

Zum Netzanschluß dieses Gerätes ist eine geprüfte Leitung zu verwenden. Für einen Nennstrom bis 6A und einem Gerätegewicht größer 3kg ist eine Leitung nicht leichter als H05VV-F, 3G, 0.75mm² einzusetzen.

WARRANTIES EXCLUSIVE

IF THE D-LINK PRODUCT DOES NOT OPERATE AS WARRANTED ABOVE, THE CUSTOMER'S SOLE REMEDY SHALL BE, AT D-LINK'S OPTION, REPAIR OR REPLACEMENT. THE FOREGOING WARRANTIES AND REMEDIES ARE EXCLUSIVE AND ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, EITHER IN FACT OR BY OPERATION OF LAW, STATUTORY OR OTHERWISE, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. D-LINK NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON TO ASSUME FOR IT ANY OTHER LIABILITY IN CONNECTION WITH THE SALE, INSTALLATION MAINTENANCE OR USE OF D-LINK'S PRODUCTS.

D-LINK SHALL NOT BE LIABLE UNDER THIS WARRANTY IF ITS TESTING AND EXAMINATION DISCLOSE THAT THE ALLEGED DEFECT IN THE PRODUCT DOES NOT EXIST OR WAS CAUSED BY THE CUSTOMER'S OR ANY THIRD PERSON'S MISUSE, NEGLIGENCE, IMPROPER INSTALLATION OR TESTING, UNAUTHORIZED ATTEMPTS TO REPAIR, OR ANY OTHER CAUSE BEYOND THE RANGE OF THE INTENDED USE, OR BY ACCIDENT, FIRE, LIGHTNING OR OTHER HAZARD.

LIMITATION OF LIABILITY

IN NO EVENT WILL D-LINK BE LIABLE FOR ANY DAMAGES, INCLUDING LOSS OF DATA, LOSS OF PROFITS, COST OF COVER OR OTHER INCIDENTAL, CONSEQUENTIAL OR INDIRECT DAMAGES ARISING OUT THE INSTALLATION, MAINTENANCE, USE, PERFORMANCE, FAILURE OR INTERRUPTION OF A D-LINK PRODUCT, HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY. THIS LIMITATION WILL APPLY EVEN IF D-LINK HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

IF YOU PURCHASED A D-LINK PRODUCT IN THE UNITED STATES, SOME STATES DO NOT ALLOW THE LIMITATION OR EXCLUSION OF LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

Limited Warranty

Hardware:

D-Link warrants each of its hardware products to be free from defects in workmanship and materials under normal use and service for a period commencing on the date of purchase from D-Link or its Authorized Reseller and extending for the length of time stipulated by the Authorized Reseller or D-Link Branch Office nearest to the place of purchase.

This Warranty applies on the condition that the product Registration Card is filled out and returned to a D-Link office within ninety (90) days of purchase. A list of D-Link offices is provided at the back of this manual, together with a copy of the Registration Card.

If the product proves defective within the applicable warranty period, D-Link will provide repair or replacement of the product. D-Link shall have the sole discretion whether to repair or replace, and replacement product may be new or reconditioned. Replacement product shall be of equivalent or better specifications, relative to the defective product, but need not be identical. Any product or part repaired by D-Link pursuant to this warranty shall have a warranty period of not less than 90 days, from date of such repair, irrespective of any earlier expiration of original warranty period. When D-Link provides replacement, then the defective product becomes the property of D-Link.

Warranty service may be obtained by contacting a D-Link office within the applicable warranty period, and requesting a Return Material Authorization (RMA) number. If a Registration Card for the product in question has not been returned to D-Link, then a proof of purchase (such as a copy of the dated purchase invoice) must be provided. If Purchaser's circumstances require special handling of warranty correction, then at the time of requesting RMA number, Purchaser may also propose special procedure as may be suitable to the case.

After an RMA number is issued, the defective product must be packaged securely in the original or other suitable shipping package to ensure that it will not be damaged in transit, and the RMA number must be prominently marked on the outside of the package. The package must be mailed or otherwise shipped to D-Link with all costs of mailing/shipping/insurance prepaid. D-Link shall never be responsible for any software, firmware, information, or memory data of Purchaser contained in, stored on, or integrated with any product returned to D-Link pursuant to this warranty.

Any package returned to D-Link without an RMA number will be rejected and shipped back to Purchaser at Purchaser's expense, and D-Link reserves the right in such a case to levy a reasonable handling charge in addition mailing or shipping costs.

Software:

Warranty service for software products may be obtained by contacting a D-Link office within the applicable warranty period. A list of D-Link offices is provided at the back of this manual, together with a copy of the Registration Card. If a Registration Card for the product in question has not been returned to a D-Link office, then a proof of purchase (such as a copy of the dated purchase invoice) must be provided when requesting warranty service. The term "purchase" in this software warranty refers to the purchase transaction and resulting license to use such software.

D-Link warrants that its software products will perform in substantial conformance with the applicable product documentation provided by D-Link with such software product, for a period of ninety (90) days from the date of purchase from D-Link or its Authorized Reseller. D-Link warrants the magnetic media, on which D-Link provides its software product, against failure during the same warranty period. This warranty applies to purchased software, and to replacement software provided by D-Link pursuant to this warranty, but shall not apply to any update or replacement which may be provided for download via the Internet, or to any update which may otherwise be provided free of charge.

D-Link's sole obligation under this software warranty shall be to replace any defective software product with product which substantially conforms to D-Link's applicable product documentation. Purchaser assumes responsibility for the selection of appropriate application and system/platform software and associated reference materials. D-Link makes no warranty that its software products will work in combination with any hardware, or any application or system/platform software product provided by any third party, excepting only such products as are expressly represented, in D-Link's applicable product documentation as being compatible. D-Link's obligation under this warranty shall be a reasonable effort to provide compatibility, but D-Link shall have no obligation to provide compatibility when there is fault in the third-party hardware or software. D-Link makes no warranty that operation of its software products will be uninterrupted or absolutely error-free, and no warranty that all defects in the software product, within or without the scope of D-Link's applicable product documentation, will be corrected.

D-Link® Offices

Australia	D-Link Australasia 1 Giffnock Avenue, North Ryde, NSW 2113, Sydney, Australia TEL: 61-2-8899-1800 FAX: 61-2-8899-1868 URL: www.dlink.com.au
Belgium	D-Link Belgium Rue des Colonies 11, B-1000 Brussels, Belgium TEL: 32 (0)2 517 7111 FAX: 32 (0)2 517 6500 URL: www.dlink-benelux.com
Brazil	D-Link Brasil Ltda. Av das Nações Unidas, 11857, cj 132 – Brooklin Novo São Paulo, Brasil 04578-000 TEL: (55 11) 5503-9320 FAX: (55 11) 5503-9321 URL: www.dlink.com.br
Canada	D-Link Canada 2180 Winston Park Drive, Oakville, Ontario, L6H 5W1 Canada TEL: 1-905-829-5033 FAX: 1-905-829-5223 URL: www.dlink.ca
Chile	D-Link South America (Sudamérica) Isidora Goyenechea 2934 Oficina 702 Las Condes Fono 2323185, Santiago, Chile TEL: 56-2-232-3185 FAX: 56-2-232-0923 URL: www.dlink.cl
China	D-Link China Room 507/508, Tower W1, The Towers, Oriental Plaza No. 1 East Chang An Ave., Dong Cheng District Beijing, 100738, China TEL: (86-010) 85182533 FAX: (86-010) 85182250 URL: www.dlink.com.cn
Denmark	D-Link Denmark Naverland 2, DK-2600 Glostrup, Denmark TEL: 45-43-96-90-40 FAX: 45-43-42-43-47 URL: www.dlink.dk
Egypt	D-Link Egypt 19 El-Shahed Helmy, El Masry, Al-Maza, Heliopolis, Cairo, Egypt TEL: 202-41-44-295 FAX: 202-41-56-704 URL: www.dlink-me.com
Finland	D-Link Finland Pakkalankuja 7A, 3 rd floor, 01510 Vantaa, Finland TEL: 358-9-2707-5080 FAX: 358-9-2707-5081 URL: www.dlink.fi
France	D-Link France Le Florilege, No. 2, Allée de la Fresnerie, 78330 Fontenay le Fleury, France TEL: 33-1-3023-8688 FAX: 33-1-3023-8689 URL: www.dlink-france.fr
Germany	D-Link Central Europe (D-Link Deutschland GmbH) Schwalbacher Strasse 74, D-65760 Eschborn, Germany TEL: 49-6196-77990 FAX: 49-6196-7799300 URL: www.dlink.de
India	D-Link India D-Link House, Kurla-Bandra Complex Rd., Off Cst Rd., Santacruz (East), Mumbai, 400 098 India TEL: 91-022-652-6696/6578/6623 FAX: 91-022-652-8914/8476 URL: www.dlink.co.in & www.dlink-india.com
Israel	D-Link Israel 11 Hamanofim Street, Ackerstein Towers, Regus Business Center P.O.B. 2148, Hertzliya-Pituach 46120, Israel TEL: 972-9-9715700 FAX: 972-9-9715601 URL: www.dlink.co.il
Italy	D-Link Mediterraneo Srl/D-Link Italia Via Nino Bonnet n. 6/B, 20154, Milano, Italy TEL: 39-02-2900-0676 FAX: 39-02-2900-1723 URL: www.dlink.it
Netherlands	D-Link Netherlands Weena 290, 3012 NJ Rotterdam, The Netherlands TEL: 31 (0)10 282 1445 FAX: 31 (0)10 282 1331 URL: www.dlink-benelux.com
Norway	D-Link Norway Karihaugveien 89, N-1086 Oslo TEL: 47-23-89-71-89 FAX: 47-22-30-90-85 URL: www.dlink.no
Russia	D-Link Russia Graftsky per., 14, floor 6, Moscow 129626 Russia TEL: 7 (095) 744-0099 FAX: 7 (095) 744-0099 #350 URL: www.dlink.ru
Singapore	D-Link International 1 International Business Park, #03-12 The Synergy, Singapore 609917 TEL: 65-6774-6233 FAX: 65-6774-6322 URL: www.dlink-intl.com
South Africa	D-Link South Africa Einstein Park II, Block B 102-106 Witch-Hazel Avenue Highveld Technopark, Centurion, Gauteng, Republic of South Africa TEL: 27-12-665-2165 FAX: 27-12-665-2186 URL: www.d-link.co.za

Spain	D-Link Iberia C/Sabino de Arana, 56 Bajos, 08028 Barcelona, Spain TEL: 34 93 409 0770 FAX: 34 93 491 0795 URL: www.dlink.es
Sweden	D-Link Sweden P. O. Box 15036, S-167 15 Bromma, Sweden TEL: 46-(0)8564-61900 FAX: 46-(0)8564-61901 URL: www.dlink.se
Taiwan	D-Link Taiwan 2F, No. 119, Pao-chung Road, Hsin-tien, Taipei, Taiwan TEL: 886-2-2910-2626 FAX: 886-2-2910-1515 URL: www.dlinktw.com.tw
Turkey	D-Link Turkey Regus Offices Beybi Giz Plaza, Ayazaga Mah. Meydan Sok. No. 28 Maslak 34396, Istanbul-Turkiye TEL: 90-212-335-2553 FAX: 90-212-335-2500 URL: www.dlink.com.tr
U.A.E.	D-Link Middle East P.O. Box 500376, Office No. 103, Building 3 Dubai Internet City, Dubai, United Arab Emirates TEL: 971-4-3916480 FAX: 971-4-3908881 URL: www.dlink-me.com
U.K.	D-Link Europe (United Kingdom) 4 th Floor, Merit House, Edgware Road, Colindale, London NW9 5AB United Kingdom TEL: 44-020-8731-5555 FAX: 44-020-8731-5511 URL: www.dlink.co.uk
U.S.A.	D-Link Systems, Inc. 17595 Mt. Herrmann, Fountain Valley, CA 92708, USA TEL: 1-714-885-6000 FAX: 1-866-743-4905 URL: www.dlink.com

Registration Card

Print, type or use block letters.

Your name: Mr./Ms _____
 Organization: _____ Dept. _____
 Your title at organization: _____ Telephone: _____ Fax: _____
 Organization's full address: _____
 Country: _____
 Date of purchase (Month/Day/Year): _____

Product Model	Product Serial No.	* Product installed in type of computer (e.g., Compaq 486)	* Product installed in computer serial No.

(* Applies to adapters only)

Product was purchased from:

Reseller's name: _____
 Telephone: _____ Fax: _____
 Reseller's full address: _____

Answers to the following questions help us to support your product:

- 1. Where and how will the product primarily be used?**
 Home Office Travel Company Business Home Business Personal Use
- 2. How many employees work at installation site?**
 1 employee 2-9 10-49 50-99 100-499 500-999 1000 or more
- 3. What network protocol(s) does your organization use ?**
 XNS/IPX TCP/IP DECnet Others _____
- 4. What network operating system(s) does your organization use ?**
 D-Link LANsmart Novell NetWare NetWare Lite SCO Unix/Xenix PC NFS 3Com 3+Open
 Banyan Vines DECnet Pathwork Windows NT Windows NTAS Windows '95
 Others _____
- 5. What network management program does your organization use ?**
 D-View HP OpenView/Windows HP OpenView/Unix SunNet Manager Novell NMS
 NetView 6000 Others _____
- 6. What network medium/media does your organization use ?**
 Fiber-optics Thick coax Ethernet Thin coax Ethernet 10BASE-T UTP/STP
 100BASE-TX 100BASE-T4 100VGAnyLAN Others _____
- 7. What applications are used on your network?**
 Desktop publishing Spreadsheet Word processing CAD/CAM Database management Accounting
 Others _____
- 8. What category best describes your company?**
 Aerospace Engineering Education Finance Hospital Legal Insurance/Real Estate Manufacturing
 Retail/Chainstore/Wholesale Government Transportation/Utilities/Communication VAR System
 house/company Other _____
- 9. Would you recommend your D-Link product to a friend?**
 Yes No Don't know yet
- 10. Your comments on this product?**

