

IBM OS/2 Warp USB Ethernet Driver.
Version 1.4, 2003/05/17F.

This OS/2 Warp Hardware Info sheet contains information for the Universal Serial Bus (USB) Ethernet Device

Driver Support for OS/2 Warp and eComStation. The official readme written by IBM is once again totally incomplete, so you should consider this document as a total replacement for the readme provided by IBM.

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1. Introduction

1.1 General

USB Ethernet adapters give more mobility to laptop and also desktop computers network connectivity. The OS/2 USB Ethernet support is limited to adapters based on Kawasaki LSI KL5KUSB101 and LSI KL5KUSB101b chipsets. Most Base10-T USB network cards use this chipset. This driver will NOT work for network cards equipped with other chipsets!

If you've got a Software Choice or a Passport Advantage subscription, then you can download USBETHER.EXE from the OS/2 Warp Device Driver Pak OnLine website. This USBETHER.EXE device driver package provides you with IBM's most current support for Universal Serial Bus (USB) Ethernet devices on the OS/2

Operating System in a self-extracting compressed format. When you unzipped the file, you will notice three files:

- USBETHER.TXT Limited IBM readme.
- USBETHR.NIF Network adapter configuration file.
- USBETHR.OS2 NDIS compliant network adapter driver.

1.2 System Requirements

- The USBETHR.OS2 driver is designed to work with any Kawasaki LSI KL5KUSB101-based USB Ethernet adapter, however specific vendor/device IDs must be specified during installation;
- Supported USB host controller. For a listing of compatible and tested USB controllers, visit the OS/2 Warp Compatible Hardware List (www.os2warp.be). The basic USB support (USBASIC) OS/2 Warp device drivers must be installed and loaded;
- OS/2 Warp 3, OS/2 Warp 4 (Merlin), OS/2 Warp Server for e-business (Aurora), OS/2 Warp 4 Convenience Packages 1 and 2 (MCP1, MCP2), OS/2 Warp Server for e-business Convenience Packages 1 and 2 (ACP1, ACP2). Any version eComStation is also supported. Drivers won't work on any other OS/2 version.

2. USB-Ethernet Support

2.1 USB-Ethernet Installation with regular IBM OS/2

1. First, make sure you've downloaded the USBETHER.EXE file from the OS/2 Warp Device Driver Pak OnLine website. This self-extracting file only contains the USB NDIS compliant network adapter driver. **YOU ALREADY NEED TO HAVE USB BASE STACK DRIVER PACKAGE (USBASIC.EXE) INSTALLED!**
2. To begin installing the USB Ethernet Device Driver, you must expand the file into its three component files by:

- a. Double-clicking the USBETHER.EXE file object, when you're not working in command-line interface (CLI). The three files will be created in the same directory or folder the USBETHER.EXE file is in.
- b. Or you can open an OS/2 windows, change the active directory to the directory where the USBETHER.EXE file is stored, and the typing **usbether** at the OS/2 command prompt, followed by pressing the **ENTER** button on your keyboard.

Once the USBETHER.EXE file is expanded, please continue with the USB Installation Instructions.

3. Open MPTS - Network Adapters and Protocol Services (click right mouse button on desktop, select **system setup** menu, double click on MPTS icon in System Setup window). Next, press the **Configure** button. Select **LAN adapter and protocols** and press **Configure** button. Press **Other adapters** button. Specify a path to the USB Ethernet adapter driver files (use default path A: if the files were copied to floppy disk in drive A:). Finally, press **OK**. If the path was correct, and the files were found, they will now be copied to your hard disk automatically.
4. After the driver and configuration file(s) have been copied to your hard disk, you must add the driver to your configuration in MPTS.
5. See *FIGURE1*. In the **Network Adapters** field, select the **USB EThErnet Adapter**. Click the **Add** button below the field. Now the driver will appear in the **Current Configuration** field.
6. Now the most important part: you must specify the Vendor ID and the Device ID for your network card. These hexadecimal specifications can be found in the section **Listing of tested USB Ethernet Adapters**, to be found later in this document. If you are using the 3COM USB Network Interface 3C19250, then you shouldn't change these IDs, and you should skip this step of installation.
How should you do this? Select **USB EThErnet Adapter** listed in the **Current Configuration** field, and click the **Edit** button. That causes a

similar thing as shown in *FIGURE2*. In the **Parameters for USB EThErnet Adapter** dialog box, click in the **USB Vendor ID** field, and change the value so that it matches your adapter's one. Then do the same for **Product ID** field. When finished, confirm the changes by clicking the **OK** button. Note that you needn't include the "0x" in front when entering the IDs.

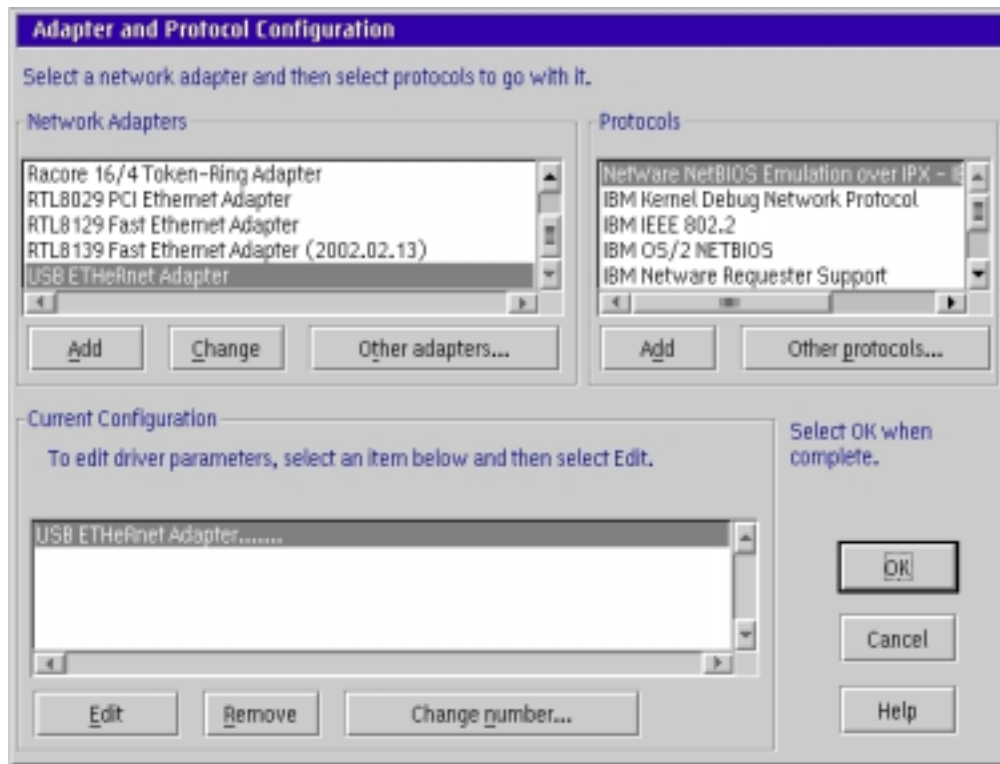


Figure 1: The Adapter and Protocol Configuration dialog box.

7. Add the required protocols from the **Protocols** list to the USB Ethernet adapter. You can do this by selecting the appropriate network interface card (NIC) in the **Current Configuration** field, selecting a protocol in the Protocols field, and clicking **Add**. The associated protocol should appear indented underneath the NIC to which it was assigned. You can change the protocol setting by selecting the assigned protocol in the **Current Configuration** field, and clicking the **Edit** button.
8. Press **OK** button to close **Adapter and Protocol Configuration** dialog box.

9. Press **Close** button to close **Configure** dialog box.
10. Press **Exit** button to close MPTS utility.
11. Reboot the system.

This completes the installation procedure. You can install any other USB device drivers and after that you must REBOOT the system.

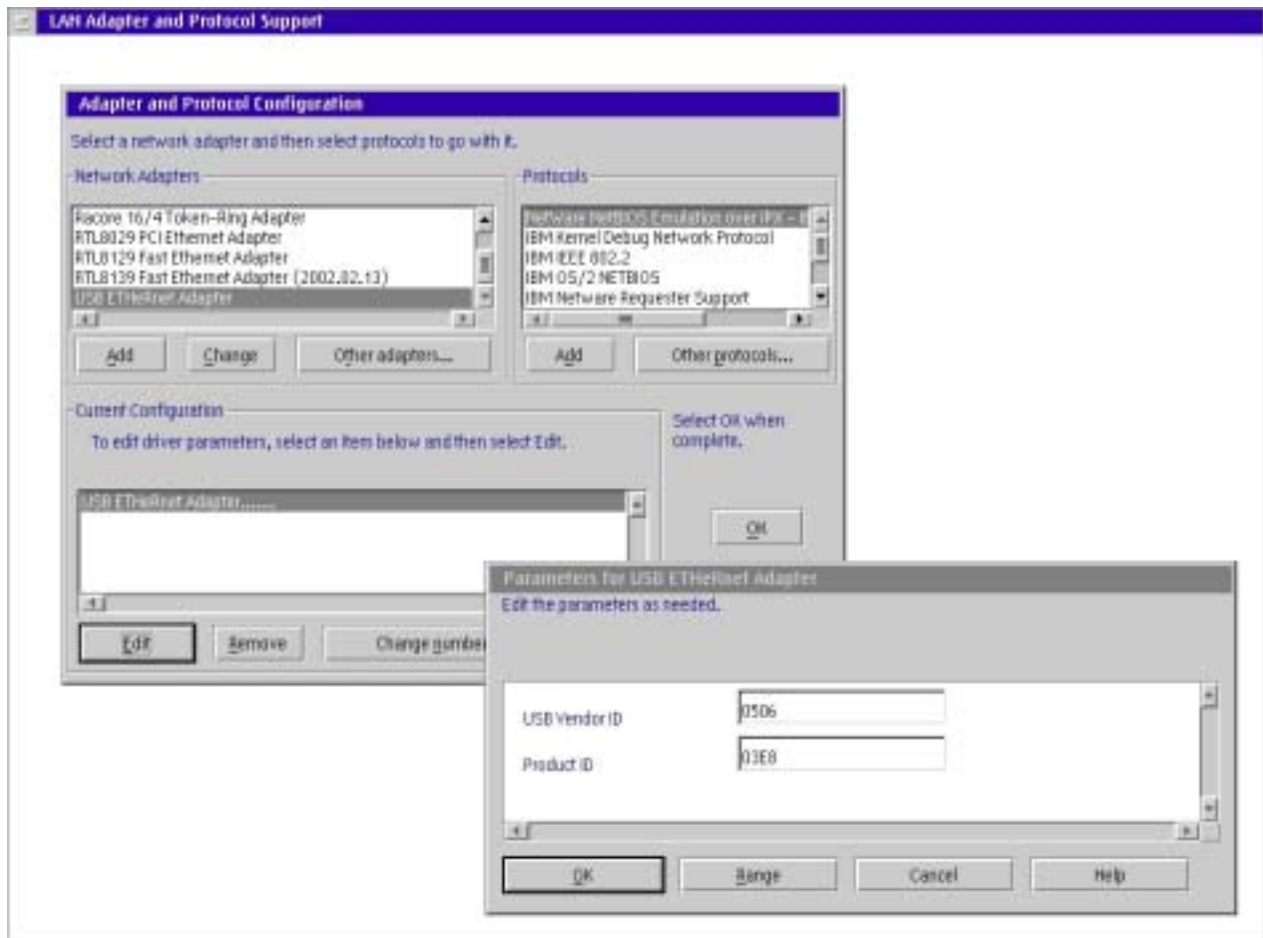


Figure 2: In the lower-right corner: Enter VendorID and productID.

2.2 USB Ethernet Installation with eComStation 1.1

This section will be ONLY applicable if you have the desire to configure your USB Ethernet Card while installing eComStation 1.1 to your computer system. If eCS is already installed, you should go ahead as was described in the previous section, thus using MPTS. eComStation 1.1 comes with a brand new even more powerful installer, which was developed in cooperation with IBM using OS/2's unique CID technology. eCS 1.1 is a very complete and up-to-date product, and it includes all drivers available via SoftWare Choice.

This section will tell you what to do once you've reached the **Network adapters and protocols** screen during installation of the eCS 1.1 operating system, where you can configure your NICs. This section won't however cope with the entire eCS 1.1 installation! We take for granted that you perform an advanced installation. The image below shows you the appropriate part of setup we are going to study here:

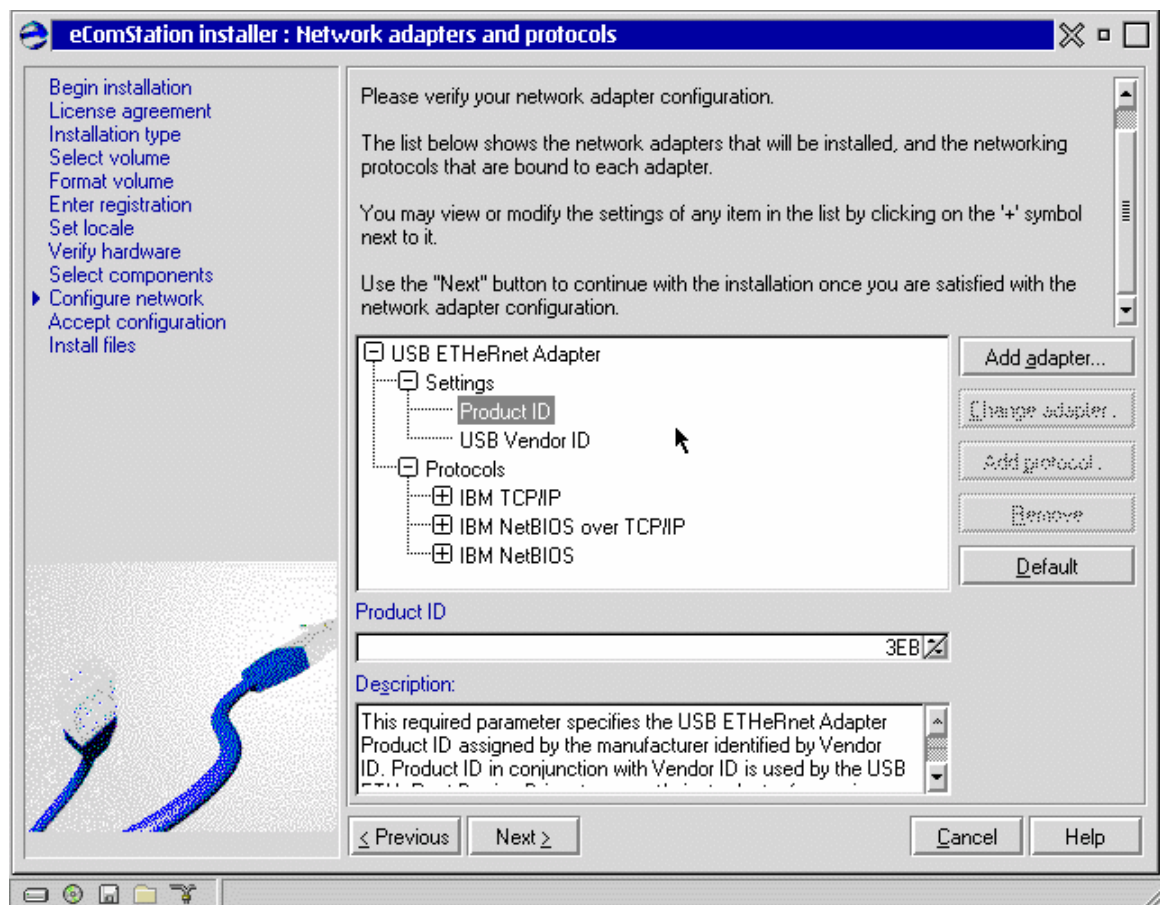


FIGURE3: network configuration during eCS 1.1 install.

Perhaps the eCS 1.1 installer doesn't detect your USB Ethernet card automatically, though this rarely happens. If this is the case, proceed as follows: click the **Add adapter** button. (Should a wrong network card be listed, then click the name of the wrong NIC, and instead of using the **Add adapter** button, use the **Change adapter** button.) A dialog box appears. Scroll to the bottom of the list of available NIC drivers. There you will see **USB ETHeRnet driver**. Click on its listing, and then click the **OK** button. Now you can add the desired protocols by using the **Add protocol** button (analogous to this action in previous section). Should you feel lost at any time, then you can always read the **Description** right above the lower navigation buttons. By clicking the **Help** button, an extensive online help library lies within your grasp.

Once the driver has been added, you must specify the vendor and device IDs. To accomplish this, just click the indented entries **Product ID** and **USB Vendor ID** to enter respectively the device and manufacturer IDs. Where can you enter the hexadecimal numbers? In the image above, you see the field **Product ID** (will change automatically in **USB Vendor ID** if you click the **USB Vendor ID** entry under the heading of the USB Ethernet NIC). You can either specify these IDs by clicking the up and down arrows at the right of the field, but this only increments the already listed value with one unit. To enter the IDs manually, double-click on the hexadecimal number already listed, which will cause the hex number to be selected. Just type the desired ID number, and this will appear in the field.

Once this all has been finished, click the **Next** button at the bottom of the screen to continue installation.

You can also skip NIC configuration during setup, and then later - once OS is installed - configure your network using MPTS.

2.3 USB Ethernet Device Driver Parameters

When you have finished the installation of the USB ETHeRnet device driver, the following line will be placed in config.sys:

```
DEVICE=drive:\IBMCOM\MACS\USBETHR.OS2
```

Where drive: is the drive letter of the OS/2 boot partition on your system.

PARAMETER	FUNCTION
/V (recommended)	Verbose Mode, displays driver information during

OS/2 initialization. If the driver was successfully loaded, then the message "USB Ethernet driver installed!" should appear whenever the driver was loaded correctly. Unfortunately, this option is NOT really exciting; it doesn't tell if the USB adapter is not connected, and it doesn't produce reasonable error-handling messages.

/N:ethName

Driver name can be specified as ethName, where ethName is required driver's name - USBETHR1, USBETHR2, USBETHR3 or other. USBETHR driver defaults drivers name to "USBETHR" or last unused name in form of "USBETHR" in case "USBETHR" is already used.

/M:maxNetworkAdapters

Specifies the number of network adapters accepted for service.

2.4 USB Ethernet Uninstall Instructions

1. Open MPTS - Network Adapters and Protocol Services (click right mouse button on desktop, select **System Setup** menu, double click on MPTS icon in System Setup window).
2. Press **Configure** button.
3. See *FIGURE1*. Select **LAN adapter and protocols** and press **Configure** button.
4. Select all protocols associated with USB Ethernet adapter in **Current Configuration** adapter list, press **Remove** button for each protocol. Confirm that you want to delete the protocol when a confirmation dialog box appears.
5. Then all the attached protocols are removed from the network cards you want to remove, select the **USB ETHeRnet** adapter in **Current Configuration** adapter list, press **Remove** button. Confirm by clicking

OK in the confirmation dialog box.

6. Press **OK** button to close **Adapter and Protocol Configuration** dialog.
7. Press **Close** button to close **Configure** dialog.
8. Press **Exit** button to close MPTS utility.
9. Reboot the operating system.

3. Listing of Tested USB Ethernet Adapters

IBM only tested three devices that work with this driver. Officially this is stated by Big Blue:

The USB Ethernet Adapter Driver provides OS/2 support for selected chip sets that meet the USB 1.0 or USB 1.1 specification. OS/2 USB Ethernet support is limited to adapters based on Kawasaki LSI KL5KUSB101 chipset. Support software was tested on 3COM USB Network Interface (3C19250), D-Link Corp. USB Ethernet Adapter (DSB-650) and ADS Technologies Inc. USB Ethernet Adapter (USB-10BT).

These devices work, of course, but there are many more USB network adapters that work great with this device driver! In the following table, you'll find a list of USB Ethernet devices that have been tested thoroughly for the OS/2 Warp Compatible Hardware List Project. You can get support for the three devices tested by IBM directly with IBM Customer Support, but they will refuse to help you for other devices. Should you have any hardware troubles with those network cards, browse to the OS/2 Compatible Hardware List webpage and there you will find support.

In the following table, you will find the compatible devices and their respective Vendor and Product IDs:

Adapter	Vendor ID	Product ID
3COM USB network interface 3C19250	0x0506	0x03e8
3COM HomeConnect Ethernet USB adapter	0x0506	0x11f8

ADS Technologies Inc. USB to Ethernet adapter USB-10BT	0x06e1	0x0008 or 0x0009
Accton Cheetah USB 10/100 Adapter USB220-EC	0x083a	0x0220
Accton Cheetah USB 10/100 Adapter USB320-EC	0x083a	0x0320
AOX Endpoints USB Ethernet adapter 101	0x03e8	0x0008
ATEN USB UC10T network adapter	0x0557	0x2002
ATEN USB to Ethernet adapter 10BaseT UC-110T	0x0557	0x4000
ASANTE FriendlyNET Home USB to Ethernet adapter	0x10bd	0x1427
Corega EtherUSB-T USB network adapter	0x07aa	0x0001
DLink Corp USB Ethernet adapter DSB-650C	0x2001	0x4000
DLink Corp USB to Ethernet adapter DU-E10	0x07b8	0x4000
DLink Corp USB DSB-H3E Ethernet network adapter	0x2001	0x0008
Entrega E45 Ethernet adapter USB	0x1645	0x0005
I/O DATA USB-ET/T USB network adapter	0x04bb	0x0901
Jaton USB to Ethernet adapter XpressNET 10Base-T	0x087d	0x5704
Linksys USB10T Ethernet network adapter	0x066b	0x2202
Mobility USB PortSmith Express Ethernet adapter	0x1342	0x0204
Netgear EA101 USB Ethernet adapter	0x0846	0x1001
Netgear EA101c USB Ethernet adapter	0x0846	0x1002
NTT-TE MN128 USB to Ethernet adapter	0x0785	0x0002
Optus@Home UEP1045A USB to Ethernet	0x0565	0x0003
Peracom Enet USB Ethernet	0x0565	0x0002
Peracom Enet2 USB Ethernet	0x0565	0x0005
Peracom EN-1045A USB Ethernet adapter	0x0565	0x1045
Planex USB UE-10T 10Mbps	0x07e3	0x0001
Shark Pocket Adapter USB	0x13d2	0x0400
Silicom USB Ethernet adapter U2E	0x1485	0x0001
SMC Corp 2102USB network adapter	0x0707	0x0100
SMC Corp 2202USB network adapter	0x0707	0x0100
Thomas&Betts Corp 10Mbps USB Ethernet	0x05d7	0x0099
Xircom PortGear USB to Ethernet adapter	0x1645	0x8005

If you think you've got a device with the Kawasaki KLSI5USB101b chip, try it out. To get the manufacturer and device IDs, use the USB Recourse Manager, available via Netlabs. How to install and configure this utility?

- Unzip the usbres.zip into x:\os2, where x is the driver on which OS/2 is installed;
- Add the statement "DEVICE=c:\os2\usbresmg.sys" to your CONFIG.SYS;
- Reboot your system;
- From an OS/2 prompt type **usbres**;
- Now you will get a listing of devices attached to your computer's USB port(s);
- Right-click the device and choose the option **View Device Report**;
- A small windows now opens and lists all technical information. From here, you can also see the IDs

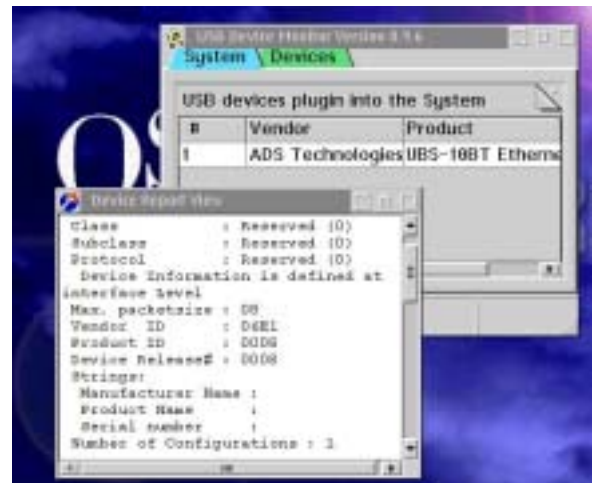


Figure 4: USB Resource Manager

You will soon find out whether the device works or not. If the manufacturer assured you that the Kawasaki chip is used, contact OS/2 CHL Helpdesk.

Note that if you're using eCS 1.1, USB Recourse Manager may already be installed on your system. Try typing **usbres** from an eCS Command Prompt, which should launch the application if installed.

4. Code Discussion

```
[USBETHR]
Type = NDIS_SINGL
Title = "USB ETherNet Adapter"
// Specifies the name as it will appear in the Network Adapters field
// in MPTS. You can change it to "USB Ethernet" :)
Version = 1.1
// Specifies the version of the USBETHernet driver
DriverName = USBETHR$
// Specifies the name under which the system will call the USB ethernet
// card; see it as an IRQ, but then in software terms.
```

```
[File]
Name = USBETHR.OS2
// Specifies the filename that contains the driver for the NIC.

[VendorID]
Display = "USB Vendor ID"
// This causes the field "USB Vendor ID" to appear in the Edit
// Properties dialog box of the NIC
Type = HexNum
// Means that the field "USB Vendor ID" must be specified using
// hexadecimal notation.
Default = 0506
// Initially, when you didn't change the vendor ID, 3Com is selected
// (3com has code 0506).
Range = 1 - FFFF
// Specifies the range in which the vendor ID lies. This means you can
// enter values from 0001 to FFFF.
Optional = No
// Marks the field as NOT optional, so field MUST be filled in before
// driver can load correctly.
Editable = Yes
// Sets a flag so that the vendor ID field can be edited.
Help="This required parameter specifies the USB ETHeRnet Adapter
      Vendor ID assigned by the USB. Vendor ID in conjunction with
      Product ID is used by the USB ETHeRnet Device Driver to
      accept/reject adapter for service. At present the driver supports
      adapters with embedded Kawasaki LSI KL5KUSB101 chip. The default
      vendor is 3Com."
// Sets the default help text to appear on screen when the user
// requests help.

[ProductID]
Display = "Product ID"
// This causes the field "Product ID" to appear in the Edit Properties
// dialog box of the NIC.
Type = HexNum
// Means that the field "USB Vendor ID" must be specified using
// hexadecimal notation.
Default = 03E8
// Initially, when you didn't change the product ID, the 3Com 3C19250
// USB network card is being setup.
Range = 1 - FFFF
// Specifies the range in which the product ID lies. This means you
// can enter values from 0001 to FFFF.
Optional = No
// Marks the field as NOT optional, so the field MUST be assigned a
// value before using the driver.
Editable = Yes
// Sets a flag so that the vendor ID field can be edited.
Help="This required parameter specifies the USB ETHeRnet Adapter
      Product ID assigned by the manufacturer identified by Vendor ID.
      Product ID in conjunction with Vendor ID is used by the USB
      ETHeRnet Device Driver to accept/reject adapter for service. At
      present the driver supports adapters with embedded Kawasaki LSI
      KL5KUSB101 chip. The default product is 3Com USB Network
      Interface (3C19250)."
```

```
// Sets the default help text to appear on screen when the user
// requests help.
```

5. Appendix B: Linux Driver

Normally, all of these devices should also work on the Linux platform using the Kaweth device driver. Project homepage: <http://sourceforge.net/projects/kaweth/>. The Kaweth driver is a similar project set up to support virtually any USB Ethernet network card that is equipped with a Kawasaki KLSI-101b chipset. The driver is also included in many Linux distributions, and is really simple to get up and running.

OS/2 CHL tested the Linux-equivalent of this driver on a PC with Gentoo Linux. Of course, the driver should also work with other Linux distributions.

Since the driver was already present in the Linux kernel (and it should be in many major distributions), installation was rather simple. To install you need the Kernel Source, which is downloadable at www.kernel.org. We tested it with Kernel version 2.4.20.

Please refer to the excellent readme included with the driver for further information.

Steps to be accomplished in order to get USB Ethernet running:

1. Extract the kernel sources in /usr/src/linux-<kernel version>/ (you shouldn't do this if the kernel sources are already there)

```
# cd /usr/src/
# tar xvzf /path/to/kernel-<version>.tar.gz
```

2. Start kernel configuration

```
# cd /usr/src/linux-<kernelversion>/
# make menuconfig
```

3. Enable USB Network adaptor support

Enter "USB Support" in the kernel configuration menu
Enable "Support for USB" by typing "Y", a "*" shows up.

```
# USB Support
# <*> Support for USB
```

4. Enable the USB network card driver

Enter the section "USB Network adaptors"

Enable the kernel driver "USB KLSI KL5USB101-based Ethernet device support (EXPERIMENTAL)" by typing "Y" to embed in the kernel or "M" to compile it as a loadable module.

```
USB Network adaptors
USB KLSI KL5USB101-based Ethernet device support (EXPERIMENTAL)
```

5. Final steps

Now continue the usual kernel compilation process, if you don't know how please refer to other HOW-TO's about kernel compilation. When the configuration is complete the compilation process is started with the following commands.



```
# make dep clean bzImage modules modules_install
```



Afterwards, install the kernel-image and reboot.

Note that when you compiled the driver as a module you can load it now by executing the "insmod" command.

6. Appendix C: USB Terminology

There often seems to be some misunderstanding related to USB terminology when discussing the Universal Serial Bus technology. That's why a brief and clear overview is given here:

<p>USB</p> 	<p>Port for attaching USB printers, scanners, mice and digital cameras. Maximal transfer rates of 1 ½ Mbps (Mega Bits Per Second). This variant of USB is also referred to as "low speed USB"; maximum of some 700KBps. USB 1.0 is practically non-existing, and USB 1.1 is present everywhere. 1.1 is called "full-speed" USB and has rates of 12Mbps, that is a little less than 1 ½ MBps.</p>
<p>USB 2.0</p> 	<p>New port for attaching USB printers, scanners, mice and digital cameras (planned to be replacement of USB 1.1). Maximal transfer speed of 480Mbps or</p>

	<p>60MBps (40 times faster as USB 1.1). If you attach a USB 1.1 device on a USB 2.0 controller, then that device will function correctly, but at USB 1.1 transfer rates. IF YOU PURCHASE A DEVICE WITH USB 2.0, THAT DOESN'T ALWAYS MEAN YOU GET HI-SPEED (480Mbps)! USB 2.0 contains all existing speeds: low (1 ½ Mbps), full (12Mbps) and high (480Mbps).</p>
<p>USB OTG</p>	<p>Addition to USB 2.0: USB On-The-Go. Peer to peer USB; using this technology, USB devices can communicate with one each other without intervention of the PC.</p>
<p>Hi-Speed USB</p> 	<p>New standard for USB devices. Increases the data transfer rates from 12Mbps to 480Mbps (60MBps) on Hi-Speed USB controllers. Backwards compatible with the original USB; uses the same wires!</p>
<p>Firewire</p> 	<p>New port for branching devices, in particular video devices. At present, hardware manufacturers tend to release other devices for this bus. Sony accept this technology under the name iLink. 12 ½ to 50 MBps.</p>
<p>UHCI; Universal Host Controller Interface</p>	<p>One particular direction in the USB controller interfaces. It is used by Intel and VIA chipsets. Other brands also can be compatible with UHCI. This is the real standard for USB 1.1. nVidia nForce is also UHCI.</p>
<p>OHCI; Open Systems Host Controller Interface</p>	<p>Another particular direction used mainly by SiS,ALI, Opti, Cyrix (Gnode).</p>
<p>EHCI; Enhanced Host Controller Interface</p>	<p>A direction that enables USB 2.0, more to say USB Hi-Speed.</p>

7. Appendix D: Copyright Information

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