

APOLLO

Windows XP Embedded
Development Kit
Quickstart Manual



 **EuroTech Ltd**

A MEMBER OF THE EUROTECH GROUP

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Revision History

<i>Manual</i>	<i>PCB</i>	<i>Date</i>	<i>Comments</i>
Issue A	v1ix	27 th June 2005	First full release of manual.
Issue B		6 th January 2006	Major updates to unpacking and connecting information.
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Issue D	v1ix & v2ix	17 th July 2007	Minor updates to flash size.
Issue E	v1ix & v2ix	16 th October 2007	Minor updates, Eurotech Ltd rebranding.

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For contact details, see page [49](#).



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Important notice

Eurotech Ltd's Windows XP Embedded Development Kit is supplied with an Evaluation Version of the Windows XP Embedded operating system under the terms of the Windows Embedded Kitting Program. The Development Kit does not include a Certificate of Authenticity (COA) license label, which is no longer required. The use of the Evaluation Version of Windows XP Embedded is subject to your acceptance of the terms of the end user license agreement with Microsoft.

The Windows XP Embedded operating system has been configured to run on the Eurotech Ltd APOLLO processor. A copy of the operating system image is included on the Development Kit DVD and may be used to restore the image on the flash disk supplied with your APOLLO Development Kit. The operating system image on the DVD may also be used to create production copies of the supplied operating system.

The Windows XP Embedded product may be used in your product under one of the following license options:

- If you purchase boards or systems from Eurotech Ltd with the operating system pre-loaded onto a flash disk, Eurotech Ltd can supply Windows XP Embedded licenses. The Microsoft OEM Customer License Agreement signed by Eurotech Ltd states that we must supply the Windows XP Embedded software pre-installed onto our equipment or drives. The license label is attached to the flash disk module. Please contact Eurotech Ltd for information about license label costs.
- If you intend to use the Windows XP Embedded operating system image supplied by Eurotech Ltd and purchase the Windows XP Embedded licenses directly from your local Microsoft distributor, you must sign an OEM Customer License Agreement, which is supplied by your Microsoft distributor. You are responsible for installing the operating system on the Eurotech Ltd product and applying the license label to your finished product. Contact your local Microsoft distributor for license label costs.
- If you intend to build your own version of the operating system and then purchase Windows XP Embedded licenses, you must purchase a copy of the authoring tools Windows Embedded Studio (consisting of Target Designer and Component Designer) and sign an OEM Customer License Agreement. Windows Embedded Studio is only available from a Microsoft distributor, it is not supplied by Eurotech Ltd. Please contact your local Microsoft OEM distributor for price information and to obtain your OEM Customer License Agreement. On receipt of the signed OEM Customer License Agreement, Microsoft (or the distributor) will issue you with a PID number, which is an electronic key that allows you to create a specific operating system from your Target Designer tool set. You must buy licenses for Windows XP Embedded images you have created using Target Designer. You are responsible for installing the operating system onto the Eurotech Ltd product and applying the license label to your finished product.

For more information about the End User License Agreement, see [Appendix B - End User License Agreement \(EULA\)](#), page [50](#).

Introduction

Eurotech Ltd's Windows XP Embedded Development Kit is designed to provide a complete environment and thus allow software engineers to concentrate on the development of their application. The remainder of this manual describes the Windows XP Embedded Development Kit. More information about the features available within Windows XP Embedded can be found on the Microsoft Windows Embedded Development Centre web site, at www.microsoft.com.

This Development Kit supports Windows XP Embedded SP2 Feature Pack 2007.

Handling your board safely

Anti-static handling

The boards in this Development Kit contain CMOS devices. These could be damaged in the event of static electricity being discharged through them. Please observe anti-static precautions at all times when handling circuit boards. This includes storing boards in appropriate anti-static packaging and wearing an earthed wrist strap when handling them.

Battery

The board contains a Lithium non-rechargeable battery. Do not short-circuit the battery or place it on a metal surface where the battery terminals could be shorted.

If the battery needs to be replaced, please ensure that the new part conforms to the same specification.

Packaging

Should a board need to be returned to Eurotech Ltd, please ensure that it is adequately packed, preferably in the original packing material.

Electromagnetic Compatibility (EMC)

The APOLLO is classified as a component with regard to the European Community EMC regulations. It is the user's responsibility to ensure that systems using the board comply with the appropriate EMC standards.

About this manual

This manual is designed to help you get your APOLLO up and running as quickly as possible. It explains the components of your APOLLO Development Kit and tells you how to unpack and connect the board. It also explains, amongst other things, the use of Windows XP Embedded in the board, and how you can transfer images to the board.




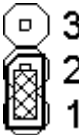



Related documents

This kit also includes a DVD with a copy of this manual and a copy of the APOLLO Technical Manual. Copies of any other manuals that may be referred to from time to time are also normally included on the DVD.

Conventions

Symbols

The following symbols are used in this guide:

Symbol	Explanation
	Note - information that requires your attention.
	Tip - a handy hint that may provide a useful alternative or save time.
	Caution – proceeding with a course of action may damage your equipment or result in loss of data.
	Jumper fitted across pins 1 and 2.
	Jumper fitted across pins 2 and 3.
	Jumper is fitted.
	Jumper is not fitted.

Getting started

What's in the kit?

Eurotech Ltd's APOLLO Windows XP Embedded basic kit comprises the following items:

- APOLLO processor board (fitted with Gigabit Ethernet):
 - 1.6GHz Intel Pentium M CPU.
 - 512MB PC2700 DDR RAM.
- Low profile 180W Flex ATX power supply (100V - 240V AC Input).
- 2GB Intel USB Flash Disk module pre-loaded with Windows XP Embedded SP2.
- US, UK or European power cord.
- 2m RS-232 Null modem cable.
- Breakout cable for GPIO header (with un-terminated wires).
- Ultra-ATA -100 IDE cable (80 conductors).
- 1 x serial adapter cable for COM3 and COM4 (RS-232 ports).
- 1 x serial adapter cable for COM4 (RS-422/485).
- 2m CAT-5e cross-over Ethernet cable (suitable for Gigabit Ethernet).
- SPDIF (Sony/Philips Digital Interface) optical cable assembly for high quality audio channels.
- APOLLO Windows XP Embedded Development Kit DVD.
- APOLLO interface board for power control switch, reset button, activity indicators, USB and Firewire (IEEE1394) ports - supplied with interconnecting cables.
- 256MB USB Flash Disk.

The following items are also included with the flat panel kit:

- AUO 15" Colour XGA 1024 x 768 pixel TFT flat panel display.
- Backlight Inverter module (including 1m connecting cable).
- 1m LVDS flat panel adapter cable for APOLLO.
- 1m serial cable for touchscreen interface.
- 15" 8 wire analogue touchscreen.
- Eurotech Ltd TSC1 touchscreen controller module.

What else do I need?

- A USB or PS/2 keyboard.
- A USB or PS/2 mouse.
- A VGA monitor (if not using the flat panel kit).
- A development system with the following:
 - Microsoft Windows XP Professional.
 - DVD-ROM drive.

If you intend to run Microsoft Windows Embedded Studio, your development system must also have the following:

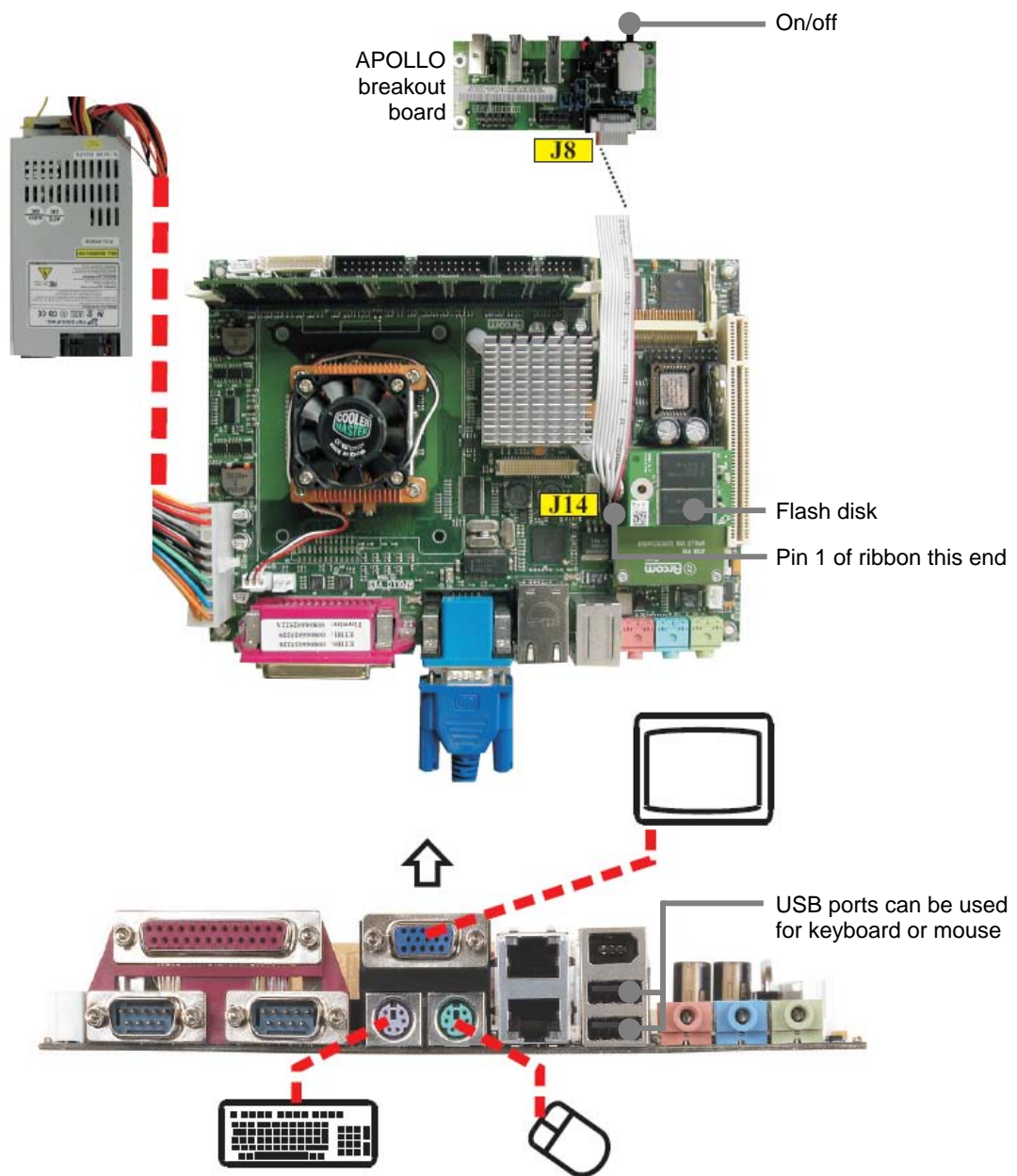
- 728MHz or higher processor.
- 512MB of RAM; 1GB or more recommended.
- Microsoft Windows 2000 Professional with Service Pack 4 or later, or Windows XP Professional with Service Pack 1 or later.
- CD-ROM or DVD-ROM drive.
- 3GB of free disk space.
- VGA or higher resolution monitor; 1024x768 display recommended.
- Microsoft Internet Explorer 5.5 or later.
- A Win32 development tool to develop your application, such as Microsoft Visual C++, Microsoft Visual Studio .NET 2005 or Microsoft Visual Basic.

Unpacking and connecting up

Eurotech Ltd's Windows XP Embedded Development Kits are shipped 'ready to run'. You simply remove the various items from their packaging and connect them up.

Using a VGA monitor

If you are using a VGA monitor, you can get started quickly and ensure everything is connected properly by referring to the diagram and procedure below.



To unpack and connect up the APOLLO, follow these steps:

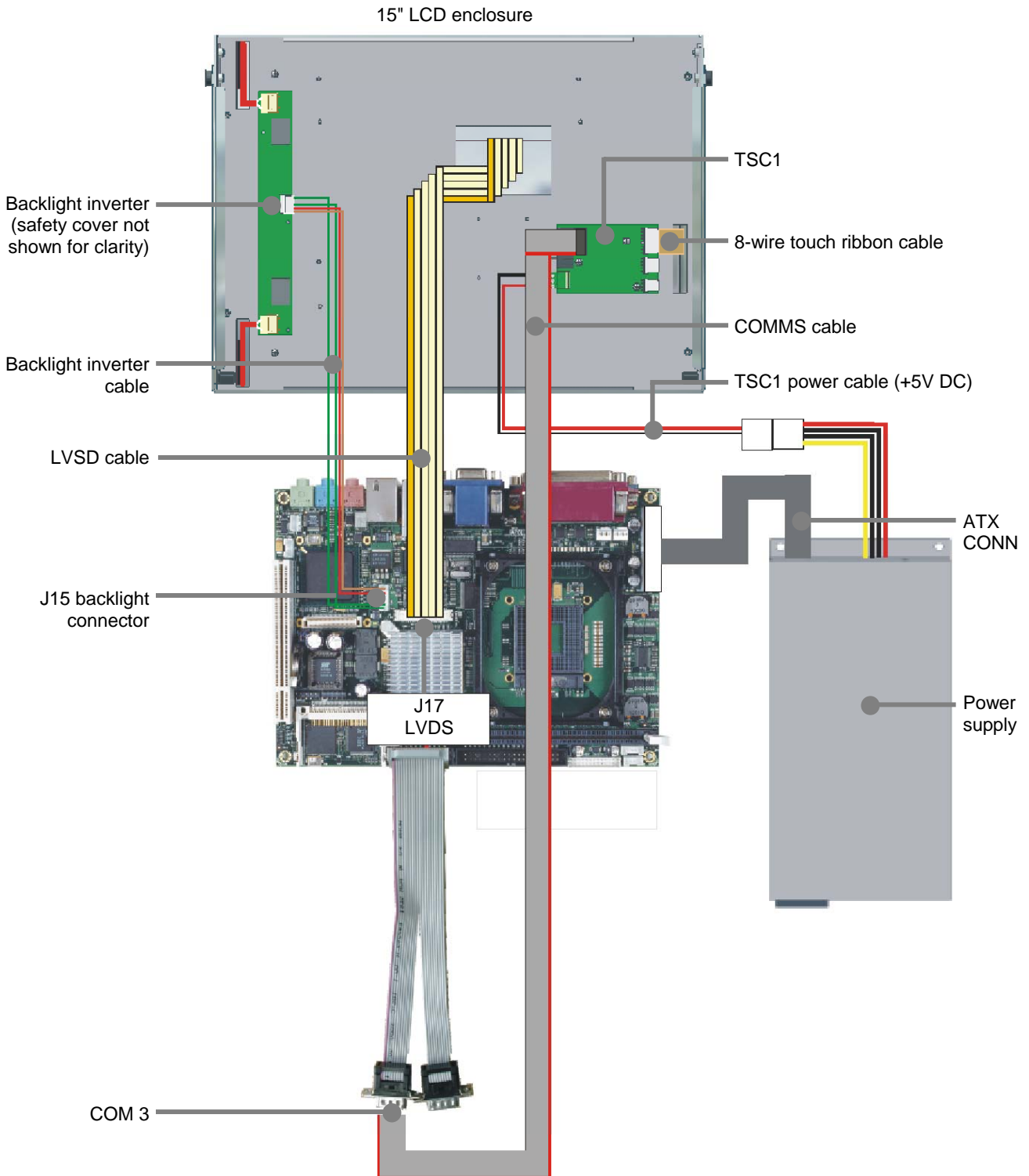
- 1 Remove the APOLLO CPU board from its packaging and place it on a static-free work surface.
- 2 Plug a mouse into the green socket or one of the USB headers on the APOLLO.
- 3 Plug a keyboard into the purple socket or one of the USB headers on the APOLLO.
- 4 Plug a VGA monitor into the rear socket, as shown in the diagram on the preceding page.
- 5 Plug the ATX Power Supply Unit (PSU) cable into the socket, as shown in the diagram on the preceding page.
- 6 Connect up the breakout board, as shown in the diagram on the preceding page.
- 7 Fit the appropriate power lead to the PSU.



The power switch is located on the APOLLO breakout board.

Using a flat panel monitor

If you are using a flat panel monitor, you can get started quickly by referring to the following diagram and procedure. For details of connections for the mouse, keyboard and breakout board, see the diagram on page [11](#).



To unpack and connect up the APOLLO, follow these steps:

- 1 Plug one end of the flat panel interface cable into the APOLLO flat panel connector J17 LVDS, and the other end into the flat panel.
- 2 Plug one end of the flat panel backlight cable into the APOLLO backlight connector J15 B/L, and plug the other end into the backlight inverter.



Make sure the power is off while connecting the LCD, as the backlight inverter generates high voltages.

- 3 If the touchscreen is to be used:
 - Use the serial adapter cables provided to connect the 9-way D-type on the TSC1 to COM3 (J22) on the APOLLO.
 - Connect the touchscreen to the TSC1 using the 8-way ribbon cable.



Pin 1 is marked on the touchscreen and the cable, but it can be difficult to see.

- Connect the TSC1 to the power supply.

BIOS settings

The BIOS on the APOLLO is from Phoenix Technologies. Should you need to reset the BIOS, follow these steps:

- 1 Reset the board and press **F2**. The BIOS set up screen is displayed.
- 2 Use the **Right Arrow** key on your keyboard to select **Exit**.
- 3 Use the **Down Arrow** key on your keyboard to select **Load Setup Defaults** and press **Enter**. The following message is displayed:

```
Setup Confirmation
Load default configuration now?
[Yes]      [No]
```

- 4 Press **Enter**. **Exit Saving Changes** is highlighted.
- 5 Press **Enter**. The following message is displayed:

```
Setup Confirmation
Save configuration changes and exit
now?
[Yes]      [No]
```

- 6 Press **Enter**. The APOLLO reboots with the default BIOS settings.



We use these settings when assembling the APOLLO and recommend that you use them if you need to reset the BIOS.

Flat panels

The default BIOS can be used to drive a 15" AUO TFT flat panel (part number G150XG01), as supplied in the flat panel variant of the Development Kit.

For information about other flat panels supported by the APOLLO, contact Eurotech Ltd technical support. See [Appendix A – Contacting Eurotech Ltd](#), page 49.

Touchscreen

The flat panel version of the Development Kit is supplied with a touchscreen. A driver for the touchscreen is included, but is not enabled by default as it utilises a COM port. A shortcut is provided on the desktop to make it straightforward to start the touchscreen driver.

To use the touchscreen on your flat panel, follow these steps:

- 1 Ensure the APOLLO is powered off and the touchscreen is fixed securely to the flat panel.
- 2 Ensure that all electrical connections for the touchscreen and touchscreen controller are made.



Make sure that the touchscreen data wires are kept away from the power wires for the LCD backlight and inverter, as this can cause interference and erratic behaviour from the touchscreen.

- 3 Connect a +5V supply to the touchscreen controller, using the supplied cable.
- 4 Connect the touchscreen to the TSC1, using the 8-wire connector.



Pin 1 is marked on the touchscreen with an arrow. The 8-wire ribbon cable must be orientated so the red wire is connected to pin 1.

- 5 Connect the output of the TSC1 to serial port COM3 (J22) on the APOLLO board.
- 6 Make sure that jumpers **LK2**, **LK3**, **LK4** and **LK6** are fitted on the TSC1, so that it is operating in 10-bit mode.
- 7 Switch the APOLLO on and allow it to boot into Windows XP.
- 8 Using a mouse, double-click the Touchscreen Driver icon on the desktop.

The touchscreen and TSC1 are configured and calibrated as part of Eurotech Ltd's production process, so are ready to use. If the touchscreen needs to be recalibrated, launch the calibration process by selecting **Run** from the **Start** menu and typing "**arctouch -c**".

If you download a new XP image to the APOLLO, the calibration routine is carried out the first time the touchscreen driver is run.

To make the touchscreen driver start automatically every time Windows XP Embedded starts, copy the shortcut on the desktop to the **Startup** folder on the **Start** menu.

For more details, refer to the document Touchscreen.html. This is on the DVD that accompanies this Development Kit, in the folder **Documentation\Datasheets\TSC1**.

Using the supplied Windows XP Embedded image

When switched on, the APOLLO loads the installed copy of Windows XP Embedded. This may take up to two minutes. When loading is complete, the Windows XP Embedded desktop appears. You do not need to enter a user name and password, because Windows XP Embedded is set up to login automatically.



The default username and password used in the automatic login are as follows:

Username: **Administrator**

Password: **Administrator**

At this point the APOLLO behaves in much the same way as the normal desktop versions of Windows XP (Home and Professional), but with fewer applications available. Commands and utilities can be run from the **Start** menu in the normal way.

Networking

The version of Windows XP Embedded installed on the flash disk contains a driver for the on-board Ethernet controller and Microsoft TCP/IP networking. It also contains a DHCP client that automatically configures TCP/IP to run on your network. If you don't use a DHCP server for network configuration you must configure TCP/IP manually from the control panel.

If the APOLLO is connected to a workgroup-based network it appears in the network neighbourhood under the name 'WORKGROUP'. The name assigned to the machine begins with **APOLLO** followed by a random series of characters unique to your system (generated by Windows XP Embedded). This means the name format is APOLLO-xxxxxxx, where xxxxxx is the random part of the name, for example APOLLO-QF7V7CIN0.

To find out the name assigned to your APOLLO, follow these steps:

- 1 Open a **Command Prompt** on Windows XP Embedded by selecting **Start** → **All Programs** → **Accessories** → **Command Prompt**.
- 2 Type **ipconfig /all** at the **Command Prompt**.

The **Host Name** assigned to your APOLLO is the first item reported.



Other useful information is also displayed in the output of the **ipconfig /all** command, such as the IP address assigned to the Ethernet adapters.

Files and folders on the APOLLO can be shared, allowing easy access from another system. To share a folder on the APOLLO:

- 1 Right-click on the folder.
- 2 Select **Sharing and Security**.
- 3 Assign a name to the share.

If you want to join the APOLLO to an XP domain-based network, you must change from a workgroup to a domain-based network and enter the name of the domain you wish to join. To do this, follow these steps:

- 1 Select **Start** → **Control Panel** → **System** → **Computer Name** → **Change** → **Domain**.
- 2 Enter the name of the domain you want to join and click on **OK**.

You are asked for the user name and password of an account with permission to join the domain. You need to obtain this information from your network administrator.

- 3 Enter the user name and password, and click on **OK**. Once the APOLLO appears in your network neighbourhood, files can be copied to and from the board in the same way as with any other desktop system on the network.

Enhanced Write Filter (EWF)

RAM-Reg Enhanced Write Filter (EWF) allows you to protect the operating system so that any writes to the flash memory are not permanent. Instead, they are redirected to an overlay in RAM memory so that whilst the operating system is running they appear permanent, but when it is shutdown or rebooted the RAM overlay writes are discarded and the operating system reverts to the same state it was in at the previous boot.

The Standard XPe image is supplied with RAM-Reg EWF functionality included but disabled. A utility called Eurotech Ltd EWF Manager is located on the desktop and in the **Start** menu. This utility can be used to enable and control the status of EWF.

When the status of the EWF is changed, the update will not happen immediately. The change only takes effect as the operating system is shut down. When you exit Eurotech Ltd EWF Manager, you may be prompted to restart the machine to apply any changes.

An API is included that allows the user to query and control the status of EWF from within their application. Full details of the functions and structures, along with some sample code, can be found at www.msdn.microsoft.com.

File Based Write Filter (FBWF)

File Based Write Filter (FBWF) is very similar to Enhanced Write Filter, except that instead of protecting the entire flash disk, it allows the user to be selective about which folders and files are protected, and thereby 'poke holes' in the protection for certain folders which might require write access e.g. log files.

A command-line application called FBWFMGR is included to allow you to manage which folders and files are excluded from the write protection offered by FBWF.

To enable FBWF open a **Command Prompt** and type the following:

fbwfmgr /enable

Just enabling FBWF will not be enough to protect the flash disk. You must tell FBWF which volume it should be enabled for. To do this, type the following:

fbwfmgr /addvolume c:

If you wanted to exclude a folder called **C:\logfiles**, from the FBWF protection. To do this, type the following:

fbwfmgr /addexclusion c: \logfiles

To remove the exclusion, type the following:

fbwfmgr /removeexclusion c: \logfiles

To disable FBWF, type the following:

fbwfmgr /disable



File Based Write Filter cannot be used at the same time as Enhanced Write Filter. If both are enabled simultaneously, EWF will take priority and protect the entire flash disk.

Application development

From an application development viewpoint, Windows XP Embedded behaves in the same way as desktop Windows XP. This means you can use the full range of Microsoft development tools including, for example, Visual Basic, Visual C++, and so on. The Windows XP Professional versions of the software development and driver Development Kits can also be used with Windows XP Embedded.

Remote debugging for Microsoft Visual Studio 6

A copy of MSVCMON.EXE, Microsoft's remote debugging tool for Visual Studio 6, is included on the APOLLO, in the folder C:\Windows\System32. A shortcut to MSVCMON.EXE is available on the desktop, called **VS6 Remote Debugging**. To debug applications on the APOLLO, follow these steps:

- 1 Launch MSVCMON.EXE by double-clicking on the **VS6 Remote Debugging** shortcut on the desktop and then clicking on **Connect**.
- 2 Build your application on your host system in the normal way, using tools such as Visual C++.
- 3 Select **Debug Remote Connection** from the **Build** menu within Visual C++ on your development machine, and then select **Network (TCP/IP)**.
- 4 Click on **Settings** and enter the name or IP address of your APOLLO system.

When the debug session is started from Visual C++, the code actually runs on the APOLLO. For further details visit Microsoft's developer network site at www.msdn.microsoft.com and search for 'debugging remote applications'.

Remote debugging for Microsoft Visual Studio .NET 2005

You can debug applications developed in Microsoft Visual Studio .NET 2005, by running the **Remote Components Setup** from your Visual Studio .NET 2005 installation media.

To install full remote debugging support from your Visual Studio .NET CD/DVD follow these instructions:

- 1 Insert the Visual Studio CD/DVD into a CD/DVD drive connected to the APOLLO.
- 2 On the **Start** menu, choose **Run**.
- 3 Type the following (assuming your CD/DVD drive is D:):
D:\vs\Remote Debugger\x86\rdbgsetup.exe

The installer will run through the installation procedure. When prompted, do not install remote debugging as a service.

Visual Studio .NET 2005 remote debugging support is installed onto the APOLLO. For more information and an example of how to use remote debugging, please refer to the APOLLO XP Embedded Development Kit DVD.

Device drivers

As a general rule, it should be possible to install any device driver in Windows XP Embedded that is available for Windows XP Professional. The same technique for installing the driver in Windows XP Professional will also usually work under Windows XP Embedded.

To install the device driver, follow the device manufacturer's instructions for installing the device under Windows XP Professional.



Many of the base system drivers are not included in the Standard XPe image, to preserve disk space. If you try to install a device, which the manufacturer states is natively supported by Windows XP, or relies on a base Windows XP component, Windows XP Embedded may not recognise it. The missing driver files can often be copied from a standard Windows XP Professional SP2 installation on another computer.

.NET framework

Microsoft's .NET Framework v2.0 is included in the StandardXPe image. To develop .NET applications that run on this image, use Microsoft Visual Studio .NET 2005, which supports application development for .NET Framework v2.0.

To perform remote debugging with applications that require the .NET Framework, additional remote debugging tools must be installed on the APOLLO. These tools require approximately 50MB of disk space, so are not installed by default. For an explanation of the installation procedure, see [Remote debugging for Microsoft Visual Studio .NET 2005](#), page 20.

Changing the startup logo

The Windows XP Embedded image supplied with this Development Kit includes a custom startup logo, which appears between the BIOS screen and the Microsoft Windows XP splash screen on startup. This logo can be changed to a custom image of your own, and can also be set to replace the Microsoft Windows splash screen if you want it to stay on the screen for longer.

To change the logo, you must replace the file called **boot.bmp** in the **C:\Windows** folder of the flash disk. Your new logo must comply with the following rules:

- The image size must be exactly 640 x 480.
- The colour depth must be 4bit (16 colours).
- The file must be in the Windows Bitmap (BMP) format. If you wish to save disk space, an RLE encoded BMP is recommended.

By default, the logo is configured as a quick boot logo, which appears for a few seconds as the APOLLO begins to boot. You can change the length of time for which the logo appears on the screen by following these instructions:

- 1 Select **Start** → **Control Panel** → **System** → **Advanced** → **Startup and Recovery** → **Settings** → **Edit**.

The hidden system file boot.ini is displayed in **Notepad** for you to edit.

- 2 Change the last line to select the duration you want the boot logo to be displayed on the screen, as follows:

- No boot logo. Windows XP Embedded boots without displaying a custom logo. The BIOS screen is displayed then replaced by a quick progress bar across the bottom of the screen, followed by the **Starting Microsoft Windows** screen. To achieve this, type:

```
multi(0)disk(0)rdisk(0)partition(1)WINDOWS="Microsoft Windows XP Embedded" /fastdetect
```

- Quick boot logo. The custom logo is displayed briefly (for approximately 3 seconds) during start up, replacing the progress bar that appears between the BIOS screen and the Microsoft Windows XP splash screen. To achieve this, type:

```
multi(0)disk(0)rdisk(0)partition(1)WINDOWS="Microsoft Windows XP Embedded" /fastdetect /bootlogo:boot.bmp
```

- Extended boot logo. The custom logo replaces the progress bar and the Windows XP splash screen. It appears after the BIOS screen and stays until the desktop and mouse cursor appear (approximately 30 seconds). If you choose this logo, the image is static and there is no progress bar to indicate that Windows is loading. We therefore recommend that you include some text at the bottom of the image saying, 'Please wait...'. To achieve this, type:

```
multi(0)disk(0)rdisk(0)partition(1)WINDOWS="Microsoft Windows XP Embedded" /fastdetect /bootlogo:boot.bmp /noGUIboot
```

- 3 When you have made your changes, click on **File** → **Save**.

When the APOLLO is next booted, the new boot logo settings will be used.

If you are using the **Extended boot logo** you may want your logo still to be displayed once Windows has booted past the startup splash screen, and the mouse cursor has appeared. Setting the following registry keys will keep it on the screen for longer and set it as the default wallpaper:

```
[HKEY_CURRENT_USER\Control Panel\Desktop]
"Wallpaper"="C:\Windows\boot.bmp"
```

```
[HKEY_USERS\.DEFAULT\Control Panel\Desktop]
"Wallpaper"="C:\Windows\boot.bmp"
```

If you want to change the blue background (which is shown briefly as the mouse appears during the boot process) to black, you can do so with the following registry setting:

```
[HKEY_USERS\.DEFAULT\Control Panel\Colors]  
"Background"="0 0 0"
```



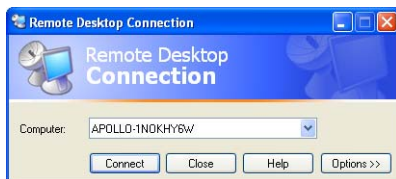
Editing the registry incorrectly can cause serious problems that may require reinstalling Windows XP Embedded on your APOLLO. Eurotech Ltd cannot guarantee that problems resulting from the incorrect editing of the registry can be solved.

Remote desktop connection

During the development of applications that are to run on a system without a display (headless systems), Microsoft Remote Desktop Connection can be used to communicate with the APOLLO. Remote Desktop Connection enables the desktop of the headless system to be displayed in a window on the development system. The Remote Desktop tools are provided as standard with Windows XP Professional. Users of other Windows versions can download them from www.microsoft.com.

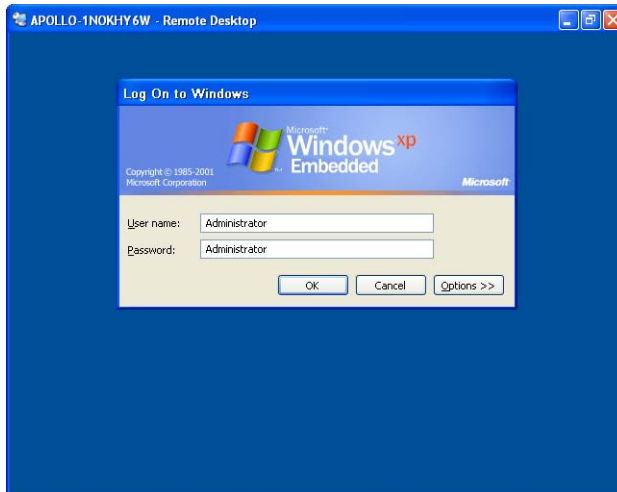
To view the desktop of the APOLLO, you must initiate the connection as follows:

- 1 Select **Start** → **All Programs** → **Accessories** → **Communication** → **Remote Desktop Connection**. The **Remote Desktop Connection** window is displayed:

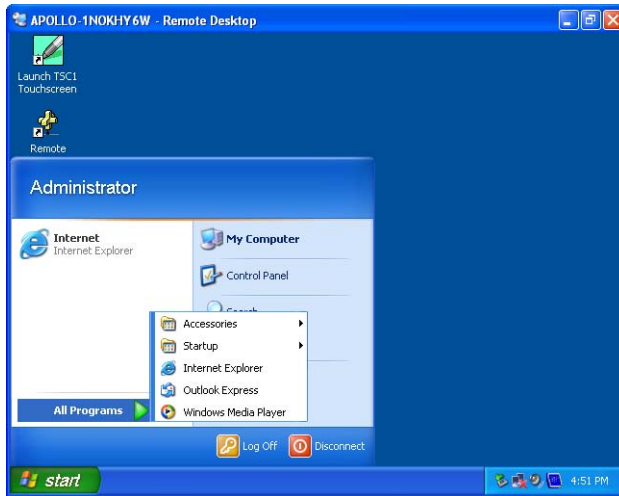


You can modify the **Options** if required, before connecting through Remote Desktop.

- 2 Type in the remote computer name and click on **Connect**. Remote Desktop initiates communication to the APOLLO and displays a log on box. This can take up to 30 seconds.
- 3 Enter the user name **Administrator** and password **Administrator**. These are case sensitive:



The APOLLO's desktop is displayed in a window on the host development system. You can use this window as if your keyboard and mouse were plugged directly into the APOLLO:



To shutdown the remote system, at the command prompt on Remote Desktop run **shutdown -s**.

To restart the remote system, run **shutdown -r** at the command prompt.

Support software on the Development Kit DVD

The Development Kit is supplied with a DVD, which contains a number of support programs and an example image. This software is designed to help you develop your application and to create a version of Windows XP Embedded that best suits your project requirements.

The Development Kit DVD is divided into five main areas:

- **Sample Images:** A pre-built Windows XP Embedded image.
- **Documentation:** This Quickstart manual, the APOLLO processor manual, and datasheets.
- **Target designer extensions:** Components and configurations for Microsoft Target Designer to allow you to rebuild the same image, customise, or create your own image.
- **Development Tools:** Tools to help create and build new images.
- **APOLLO Tools:** Additional tools for the APOLLO board.

When you insert the DVD in your development system it autoruns. A HTML page is displayed describing various parts of the DVD.

If this page does not appear, use Windows Explorer to select the DVD and then double-click on the file **readme.htm**.

Sample image

The Eurotech Ltd Windows XP Embedded Development Kit includes a sample Windows XP Embedded image called StandardXPe. The Standard XPe image is the same as the image installed on the flash disk for the APOLLO board in the Development Kit.

Further details about the image are provided below:

Summary: Includes a broad array of components to support a wide base of applications/uses.

Approximate image size: 600MB (1.3GB Remaining)

Contains:

- Standard Windows XP kernel (Service Pack 2).
- .NET framework v2.0.
- EWF (Enhanced Write Filter).
- FBWF (File Based Write Filter)
- Intel Embedded Graphics driver
- Intel Network drivers
- Full system administration.
- TCP/IP version 6, including Winsock & command line utilities.
- Native code remote debugging for Microsoft Visual Studio 6.
- RAS with support for dial in, dial out and VPN.
- Simple Network Management Protocol (SNMP).
- Full domain and workgroup participation with file and print sharing.
- Internet Information Services (IIS) including support for ASP and ASP.NET.
- Touchscreen.
- Bluetooth device support.
- CD writing support.
- DirectX 9.0c.
- Remote administration.
- USB storage and input device support.
- Message Queuing (MSMQ).
- Windows Management Instrumentation (WMI).
- Windows Media Player 10.

The Standard XPe image is supplied on the DVD in two different formats.

- The **Binary** folder contains a single file, which is a binary image for use with the flash disk supplied with the Development Kit. This image will *not* work with most CompactFlash or flash disks from other manufacturers.
- The **Source** folder contains the same files, which are in the binary image, but can be used with another manufacturer's CompactFlash or flash disk (of the same size) if you wish.

In addition to the two file formats, there are two different versions of each image, created at different points during the creation of the image:

- The **sealed** version of the image is intended for general use. The very first time a sealed image is booted up, it always generates a new Security ID (SID) and a new network name for the system. This ensures that when more than one APOLLO is connected to the same network, each one is unique.
- The **nonsealed** version of the image has not been sealed yet. This is only to be used if you wish to create a master image, for example a custom image where you have installed your own application. Once you are happy with the image you can seal it and clone it. Any clones will then generate a new Security ID (SID) and a new network name when they are first booted up.

For instructions on how to install a **Binary** image see [Reinstalling the supplied Windows XP Embedded image](#) on page [29](#).

For instructions on how to install a **Source** image see [Transferring a new image to the APOLLO](#), page [37](#).



Do not use the **NONSEALED** image for anything other than creating a master image. If more than one **NONSEALED** image is connected on the same network, problems occur because they have the same SID and network name.

For general use, always use the **SEALED** version of the image.

Reinstalling the supplied Windows XP Embedded image

If you wish to reinstall Windows XP Embedded for the APOLLO board as it was supplied with this Development Kit, you can do so using the Development Kit DVD provided. To do this, follow these steps:

- 1 Connect a DVD reader to the IDE connector on the APOLLO.
- 2 Power on the APOLLO, and press F2 to enter the BIOS.
- 3 Navigate to the **Boot** section using the → and ← arrow keys, and make sure that **CD-ROM Drive** is selected as the first boot device. If you need to change the order, you can do so using the + and – keys.
- 4 At this point, insert the APOLLO Windows XP Embedded Development Kit DVD into the DVD reader.
- 5 Navigate to the Exit section using the → and ← arrow keys, select **Exit Saving Changes** and press **Enter**.
- 6 It will take approximately 3 minutes to boot the image of XP Embedded contained on the DVD.



If a window appears with the message “This disk or device contains more than one type of content. What do you want Windows to do?” click the **Cancel** button.

- 7 Click on the **START** button, and select **COMMAND PROMPT**.
- 8 Refer to the screenshot on the following page and type the commands show in red to determine the drive letters allocated to each drive.



The Intel USB Flash Disk is the device, which is 1956MB in total size. In the example shown on the following page, it has the drive letter E: assigned to it, and is highlighted in blue. If your Intel USB Flash Disk does not have a drive letter allocated, you will need to follow the instructions in the [Preparing a new Intel USB Flash Disk module](#) section, page [37](#).

For this example we will assume that the drive letters are the same as shown in the screenshot. If they differ on your system, you will have to change the commands accordingly.

- 9 Change to your DVD drive by typing **D:**
- 10 Change directory to the folder containing the APOLLO XP Embedded image by typing: **CD\IMAGE\BINARY**

- 11 Type the following command to begin programming the Intel USB Flash Disk with the image that was originally preloaded onto the APOLLO:
\\TOOLS\CFCLONE\CFCLONE SEALED.BIN E:
- 12 When the Intel USB Flash Disk has been programmed, type **EXIT**.
- 13 Click on the **START** button, and select **TURN OFF COMPUTER**.
- 14 Power on the APOLLO, and press F2 to enter the BIOS.
- 15 Navigate to the **Boot** section using the → and ← arrow keys, and make sure that **Hard Disk** is selected as the first boot device. If you need to change the order, you can do so using the + and – keys.
- 16 Navigate to the Exit section using the → and ← arrow keys, select **Exit Saving Changes** and press **Enter**.

Windows runs through the final part of its 'First Boot'. It takes approximately 5 minutes for the desktop to appear. Once this is complete, the APOLLO is back to its original factory settings.



Incorrect use of the CFCLONE tool could result in you overwriting any other disks connected to your APOLLO. Make sure that you follow the instructions carefully, and are specifying the correct drive for the Intel USB Flash Disk.

```

C:\ Command Prompt
Microsoft Windows XP [Version 5.1.2600]
<C> Copyright 1985-2001 Microsoft Corp.
C:\>diskpart

Microsoft DiskPart version 5.1.3565

Copyright (C) 1999-2003 Microsoft Corporation.
On computer: APOLLO

DISKPART> list volume

   Volume ###  Ltr  Label          Fs          Type          Size      Status       Info
   -----  ---  -
   Volume 0          D  WINDOWS XPE  CDFS        DUD-ROM       669 MB
   Volume 1          C  CD_BOOT      FAT          Partition     259 MB  Healthy     System
   Volume 2          E  APOLLO WinX  NTFS        Partition    1956 MB  Healthy

DISKPART> exit

Leaving DiskPart...

C:\>
    
```

Setting up Windows Embedded Studio

Eurotech Ltd's Windows XP Embedded APOLLO Development Kit is supplied with a pre-built image of the Windows XP Embedded operating system. In cases where the pre-built image doesn't offer suitable functionality, Microsoft Windows XP Embedded Studio can be used to customise the existing image or to create a completely new one.

The Target Designer extensions supplied on the Development Kit DVD support Windows XP Embedded SP2 Feature Pack 2007.

Target Designer extensions for the following devices and utilities are supplied on the support DVD:

- Intel network controller drivers.
- Intel embedded graphics driver.
- Vinyl AC97 codec for sound support
- Atmel Trusted Platform Module
- PCI Uart driver (COM3 and COM4)
- Eurotech Ltd ArcTouch touchscreen application.
- Eurotech Ltd Enhanced Write Filter Manager application.
- Startup logo.
- Microsoft Foundation Class Library for Visual Studio 2003.
- Microsoft Visual C++ Native Remote Debugging Tools.
- Microsoft TweakUI application.

The DVD also contains configuration information for Microsoft Windows XP Embedded Studio that enables the pre-built image to be reproduced or used as the basis for a custom configuration.



A copy of Microsoft Windows XP Embedded Studio which consists of Target Designer and Component Designer is included as part of the Development Kit. These tools let you create time-limited (120 days) evaluation versions of the XP Embedded operating system.

A full copy of Microsoft Windows XP Embedded Studio, must be obtained from a Microsoft distributor.

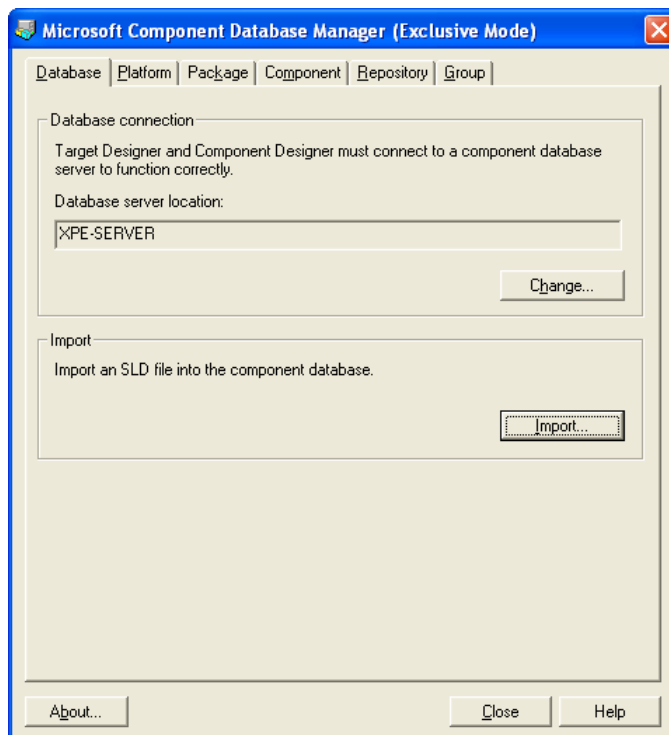
Installation

Install Microsoft Windows XP Embedded Studio SP2 Feature Pack 2007 on the development PC and then install the APOLLO Target Designer Extensions package from the APOLLO Windows XP Embedded Development Kit DVD.

Target Designer extensions

To import Target Designer extensions, follow these steps:

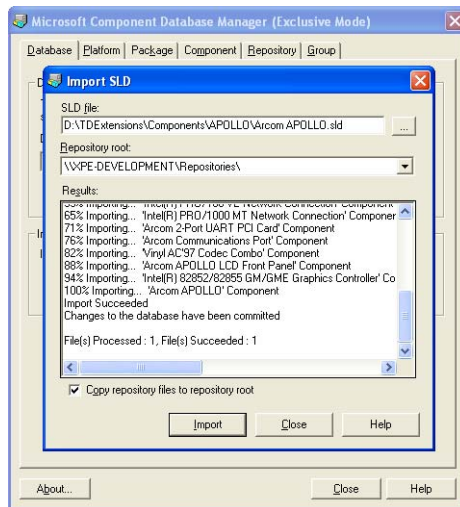
- 1 Make sure you have write access to the Repositories folder (which is in the Windows Embedded Data folder). If you don't, create a share with your user name by right-clicking on the Repositories folder and then selecting **Properties** → **Sharing**.
- 2 Start Target Designer and select **Component Database Manager** from the **Tools** menu. The **Component Database Manager** window is displayed:



Target Designer extensions are stored in files with an **.SLD** extension.

- 3 Click on **Import**. The **Import SLD** dialog box is displayed.
- 4 Select the file **Arcom APOLLO.sld** from the following folder:
C:\Arcom\APOLLO\TDExtensions\Components\APOLLO

- 5 Click on **Import**. Target Designer imports all files required for the APOLLO and adds them to its internal database:



- 6 Click on **Close**.
- 7 Repeat steps 3 through 6 to for the **Arcom Common Components.sld** file in the following folder:
C:\Arcom\APOLLO\TDExtensions\Components\Common
- 7 Repeat steps 3 through 6 to for the **KB912883.sld** file in the following folder:
C:\Arcom\APOLLO\TDExtensions\Components\HotFixes
- 8 The **Arcom APOLLO.sld** file contains a design template for the APOLLO board. The design template has all the components for all the devices on Eurotech Ltd's APOLLO board. If you want to create a new configuration, you can add this component to your configuration. This design template appears as Eurotech Ltd APOLLO under **Design Templates** in the list of components.



The StandardXPe image includes the QFE update KB929403 for File Based Write Filter. If you wish to rebuild the StandardXPe image, this update must be downloaded from Microsoft's website.

Configuration information

Once all the components have been imported to the component database, you can open the configuration in Target Designer. The Standard XPe is installed as part of the Target Designer Extensions package included on the Development Kit DVD. By default, it is installed to the following folder:

C:\Arcom\APOLLO\TDExtensions\Configuration



To make it simple to save the configuration file once you've edited it, we recommend that you copy the configuration file to your local hard disk and open it from there, instead of from the DVD.

To view target device settings, follow these steps:

- 1 Open Target Designer.
- 2 Click on **Settings**, under **StandardXPe.slx** in Target Designer.
- 3 Click on **Show**, under **Target Device Settings**.

The target device settings shown suggest that images created using these settings must be run from drive C:, with a boot partition size of 2048MB. These are the settings used to create all the images shipped with this APOLLO Windows XP Embedded Development Kit.

If you want to use a storage device with a boot partition size other than 2048MB, change the **Boot Partition Size** settings under **Target Device Settings**.

If you want to use a boot drive other than the C: drive, you must change the target device settings as appropriate. The settings you need to change may include the boot drive, Windows folder, program files folder, documents and settings folder and the boot ARC path.

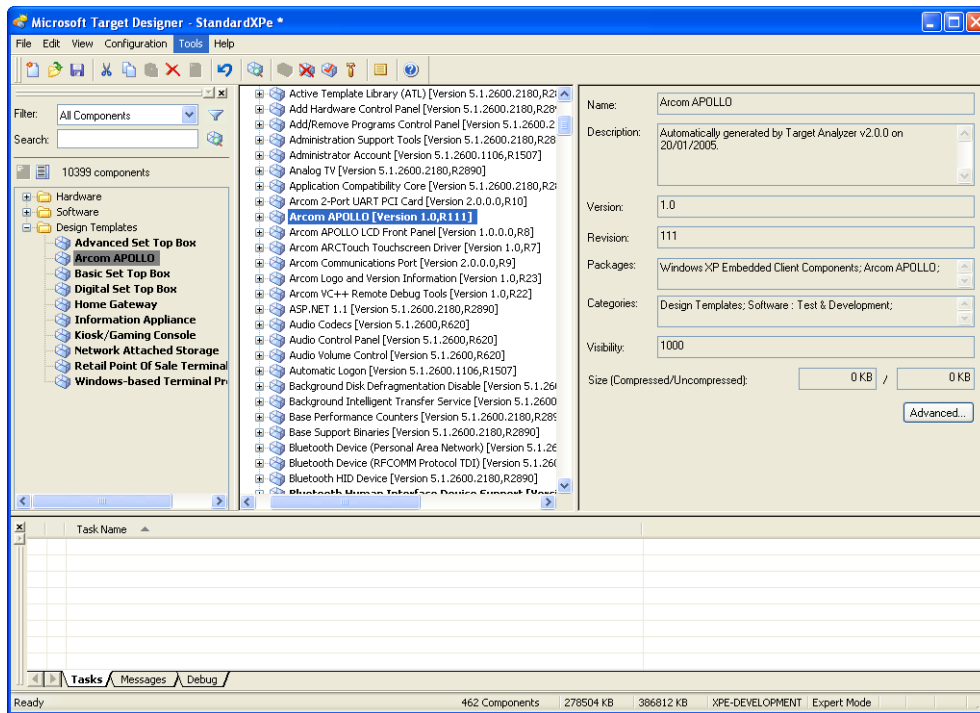


To view information about any of these settings, click on **(more info)** next to the name of the setting.

To create a new XP Embedded image with these target device settings, copy the new image to the drive (as explained in [Transferring a new image to the APOLLO](#), page 37) and then boot the system.

Viewing components

The following image shows what you see when viewing components:



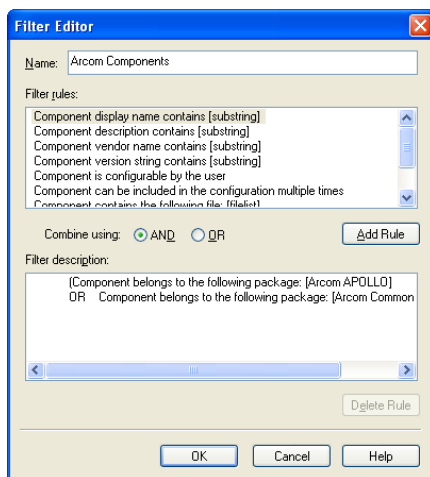
To view all the components, set the visibility to 100.

To set the visibility, open Target Designer and select **Tools** → **Options** → **Advanced** → **Minimum visibility**.

If you just want to view Eurotech Ltd components, you can create a filter by following these steps:

- 1 Open Target Designer and select **Tools** → **Filter Manager** → **New**.
- 2 Enter the name **Arcom** to represent this new filter.
- 3 Double-click on **Component belongs to the following package** under **Filter Rules**.
- 4 Double-click on **Component belongs to the following package** (which now appears in the **Filter Description** window with the heading **Filter Rule and Edit box**), and choose the following package:
Arcom APOLLO
- 5 Click on **OK** to return to the **Filter Editor** window.
- 6 Change the **Combine using** selector to **OR**.

- 7 Double-click on **Component belongs to the following package** under **Filter Rules**.
- 8 Double-click on **Component belongs to the following package** (which now appears in the **Filter Description** window with the heading **Filter Rule and Edit box**), and choose the following package:
Arcom Common Components
- 9 Click on **OK** to return to the **Filter Editor** window.
- 10 Click on **OK** in the **Filter Editor** window.
- 11 Click on **Apply Filter**. This displays all the components supplied by Eurotech Ltd for the Windows XP Embedded APOLLO Development Kit:



If you want to view all the components in the Target Designer, select **All Components** from the **Filter** drop-down list in the left-hand pane of the main Target Designer window.

Transferring a new image to the APOLLO

The flash disk module supplied with the Development Kit is installed with a copy of the Standard XPe image. This contains many of the features available in Windows XP Embedded and is well suited to a development environment. Customers who wish to use an image created by Target Designer must generate the image on a host development system before transferring it to the flash disk on the APOLLO.



All the images for the APOLLO Windows XP Embedded Development Kit shipped by Eurotech Ltd are designed for 2GB Intel USB Flash disks only. If you want to use a storage media size other than 2GB, you must use Windows XP Embedded Studio to modify the boot partition size from the corresponding configuration, and rebuild the image.

Also please note that the Intel USB Flash Disk has to be seen as drive C: on the APOLLO board for the images shipped with this Development Kit to work. For details, see [Configuration information](#), page 34.

Preparing a new Intel USB Flash Disk module

Intel USB Flash Disk modules are available in various sizes, from 1GB. Contact Eurotech Ltd for further information about these parts (see [Appendix A – Contacting Eurotech Ltd](#), page 49).

These devices are supplied completely blank, with a single partition already defined. To ensure that they will work correctly with XP Embedded, they must be repartitioned and reformatted before they can be used.



The following procedure erases everything from the USB Flash Disk module, so make sure there is no useful data on the module before you begin.

To repartition the Intel USB Flash Disk module, follow these steps:

- 1 Connect a DVD reader to the IDE connector on the APOLLO.
- 2 Power on the APOLLO, and press F2 to enter the BIOS.
- 3 Navigate to the **Boot** section using the → and ← arrow keys, and make sure that **CD-ROM Drive** is selected as the first boot device. If you need to change the order, you can do so using the + and – keys.
- 4 At this point, insert the APOLLO Windows XP Embedded Development Kit DVD into the DVD reader.
- 5 Navigate to the Exit section using the → and ← arrow keys, select **Exit Saving Changes** and press **Enter**.

- 6 It will take approximately 3 minutes to boot the image of XP Embedded contained on the DVD.



If a window appears with the message “This disk or device contains more than one type of content. What do you want Windows to do?” click the **Cancel** button.

- 7 Click on the **START** button, and select **COMMAND PROMPT**.
- 8 Please refer to the screenshot on the following page and type the commands show in red to remove the existing partition, create a new one, and assign it a drive letter.



The Intel USB Flash Disk is the device, which is 1956MB in total size. In the example shown on the following page, it has the drive letter E: assigned to it, and is highlighted in blue

```

C:\>diskpart

Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\>diskpart

Microsoft DiskPart version 5.1.3565

Copyright (C) 1999-2003 Microsoft Corporation.
On computer: APOLLO

DISKPART> list disk

   Disk ###  Status         Size           Free           Dyn  Gpt
   -----  -
   Disk 0    Online         8158 MB        7899 MB
   Disk 1    Online         1956 MB        1956 MB

DISKPART> select disk 1

Disk 1 is now the selected disk.

DISKPART> clean

DiskPart succeeded in cleaning the disk.

DISKPART> create partition primary

DiskPart succeeded in creating the specified partition.

DISKPART> list disk

   Disk ###  Status         Size           Free           Dyn  Gpt
   -----  -
   Disk 0    Online         8158 MB        7899 MB
   * Disk 1    Online         1956 MB         0 MB

DISKPART> select partition 1

Partition 1 is now the selected partition.

DISKPART> assign

DiskPart successfully assigned the drive letter or mount point.

DISKPART> active

DiskPart marked the current partition as active.

DISKPART> detail partition

Partition 1
Type : 06
Hidden: No
Active: Yes

   Volume ###  Ltr  Label           Fs      Type          Size      Status       Info
   -----  -
   * Volume 2   E           Partition       1956 MB  Healthy

DISKPART> exit

Leaving DiskPart...

C:\>
    
```

Once the USB Flash disk module has been partitioned, it must be formatted. See [Formatting a USB Flash Disk module](#), on page 40, for an explanation of this procedure.



Incorrect use of the CFCLONE tool could result in you overwriting any other disks connected to your APOLLO. Make sure that you follow the instructions carefully, and are specifying the correct drive for the Intel USB Flash Disk.

Formatting a USB Flash Disk module

To transfer a complete Windows XP Embedded image, the USB Flash Disk module must be formatted to use NTFS.



The following procedure erases everything from the USB Flash Disk module, so make sure there is no useful data on the module before you begin.

To erase the flash disk module, follow these steps:

- 1 Boot your APOLLO from the DVD supplied, as described at the beginning of the [Preparing a new Intel USB Flash Disk module](#) section, page [37](#).
- 2 Click on the **START** button, and select **COMMAND PROMPT**.
- 3 Once at the Command Prompt, type **FORMAT E: /FS:NTFS** and press **Enter**.
- 4 When asked if you wish to proceed with the format answer [Y]es and press **Enter**.
- 5 Once the format has completed, you can supply a name for the flash disk, or simply press **Enter**.

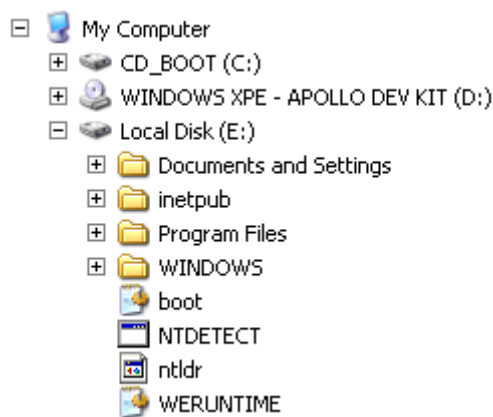
Once the USB Flash Disk module has been formatted, you will need to transfer your image onto it. See [Transferring an image](#) below, for an explanation of this procedure.

Transferring an image

Before transferring an image to the APOLLO, the Intel USB Flash Disk must be partitioned and formatted. This can be done by formatting it as described in [Preparing a new Intel USB Flash Disk module](#), page [37](#), and [Formatting a USB Flash Disk module](#), page [40](#).

Once the device has been prepared To transfer the image onto the APOLLO, simply copy the files using Windows Explorer. All the files and folders should be copied to the root folder. For example, if your USB Flash Drive module appears as drive E, copy all the folders and files in the StandardXPe folder to the E: drive.

When copying is complete, the folder structure for drive E: should look something like this:



Click on the **START** button, and select **TURN OFF COMPUTER**. Follow the instructions below to change the boot order of the BIOS:

- 1 Power on the APOLLO, and press F2 to enter the BIOS.
- 2 Navigate to the **Boot** section using the → and ← arrow keys, and make sure that **Hard Disk** is selected as the first boot device. If you need to change the order, you can do so using the + and – keys.
- 3 Navigate to the Exit section using the → and ← arrow keys, select **Exit Saving Changes** and press **Enter**.

Windows will now run through the First Boot Agent (FBA). Depending on the size and complexity of your XP Embedded image, this can take up to an hour to complete.

Security and image duplication

Windows XP Embedded images can be duplicated via one of two possible methods, standalone and cloning. The standalone method is not recommended for production, but is useful during development, whereas the cloning method may be used during production.

Whichever method is used, it is essential that each duplicate module is allocated a unique computer Security ID (SID). You must also ensure that you have the appropriate Windows XP Embedded licenses for each computer.

Start from the new image prepared using Microsoft Windows XP Embedded Studio.

Flash Disk requirements

If you want to run the supplied sample image using any other flash disk or CompactFlash, the boot partition size must be 1024MB. If you wish to use a different size flash disk, you must prepare the Windows XP Embedded image accordingly using Windows XP Embedded Studio, as explained in [Configuration information](#), page 34.



All the Windows XP Embedded images shipped with this Development Kit are configured for a boot partition size of 2048MB.

The boot drive must be the C: drive, as these images are configured to run from this drive.

Duplication of Windows XP Embedded images

Proper duplication can be achieved using either the standalone or the cloning method. These are described below:

Standalone method

This method simply involves preparing the flash disk copying the required folders and files to your flash disk module, and rebooting the system. Follow these steps:

- 1 Copy all the folders and files for the required image to a properly partitioned and formatted flash disk. For more information about flash disk preparation, formatting and image copying, see [Transferring a new image to the APOLLO](#), page 37.
- 2 Boot the individual system.

The sample image supplied with this Development Kit will only work with 2048MB flash disk devices. The complete boot process takes approximately 20 minutes for each system. When complete, the Windows XP Embedded desktop is displayed.

Repeat this procedure for each individual flash disk to get duplicate OS images, each with its own unique SID.

Cloning method

You can use the cloning method described in Microsoft Windows XP Embedded Studio. This is a two-stage process. The first stage involves creating a master copy, which is duplicated in the second stage to create clones.

To use the cloning method, the **System Cloning Tool** component must be included in the image. The sample image supplied with this Development Kit already includes this component. You will also require a hard disk with enough free space to copy the entire flash disk device, or a suitable network connection to transfer the file to/from a remote computer.

Creating the master copy (resealing the image)

Creating the master copy is identical to creating a standalone system. Follow the instructions described in the [Standalone method](#) on page 42, making sure that the System Cloning Tool component has been included.

Once the Windows desktop has been displayed, you can make any changes to the image, which you want to be reproduced once it has been cloned.

When satisfied that you have an image you want to use as your master, follow the instructions below:

- 1 Boot the APOLLO so that you are presented with the Windows Desktop.
- 2 Open a **Command Prompt** from the **Start** menu and type the following command:
fbreseal

After a few seconds, the following message is displayed:

```
Machine resealed! Click to shutdown or reboot.
```

- 3 Click on **Shutdown** and wait for Windows to shutdown. This flash disk is now the master copy.



Make sure this master copy is not used to boot the system again, before you clone it. A Windows XP Embedded image can only be resealed once.

- 4 Connect a DVD reader to the IDE connector on the APOLLO. If you want to store your master image on a hard disk, also connect one now. This example will assume that the image is being stored on a network location called **\\MYSERVER\MYSHARE**.
- 5 Power on the APOLLO, and press F2 to enter the BIOS.
- 6 Navigate to the **Boot** section using the → and ← arrow keys, and make sure that **CD-ROM Drive** is selected as the first boot device. If you need to change the order, you can do so using the + and – keys.
- 7 At this point, insert the APOLLO Windows XP Embedded Development Kit DVD into the DVD reader.

- 8 Navigate to the Exit section using the → and ← arrow keys, select **Exit Saving Changes** and press **Enter**.
- 9 It will take approximately 3 minutes to boot the image of XP Embedded contained on the DVD.



If a window appears with the message “This disk or device contains more than one type of content. What do you want Windows to do?” click the **Cancel** button.

- 10 Click on the **START** button, and select **COMMAND PROMPT**.

Refer to the screenshot below and type the commands show in red to determine the drive letters allocated to each drive.

```

C:\> Command Prompt
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.
C:\> diskpart

Microsoft DiskPart version 5.1.3565
Copyright (C) 1999-2003 Microsoft Corporation.
On computer: APOLLO

DISKPART> list volume

  Volume ###  Ltr  Label          Fs      Type          Size      Status       Info
  -----  -  -  -  -  -  -  -  -
  Volume 0    D  WINDOWS XPE  CDFS    DUD-ROM       669 MB    Healthy
  Volume 1    C  CD_BOOT      FAT     Partition     259 MB    Healthy
  Volume 2    E  APOLLO WinX  NTFS    Partition    1956 MB    Healthy

DISKPART> exit
Leaving DiskPart...
C:\>
    
```



The Intel USB Flash Disk is the device which is 1956MB in total size. In the example shown above, it has the drive letter E: assigned to it, and is highlighted in blue

For this example we will assume that the drive letters are the same as shown in the screenshot. If they differ on your system, you will have to change the commands accordingly.

- 11 Change to your DVD drive by typing **D:**
- 12 Change directory to the folder containing the **CFCLONE** tool by typing **CD\TOOLS\CFCLONE**
- 13 Type the following command to copy the image on the flash disk to a network location: **CFCLONE E: \\MYSERVER\MYSHARE\MasterImage.bin /S**



You will need to replace the **\\MYSERVER\MYSHARE** with the name of your own network location.

- 14 When prompted, enter a meaningful description of the image contents. This is for your own reference only.
- 15 When the CFCLONE tool has finished, type **EXIT**.
- 16 Click on the **START** button, and select **TURN OFF COMPUTER**.
- 17 Power on the APOLLO, and press F2 to enter the BIOS.
- 18 Navigate to the **Boot** section using the → and ← arrow keys, and make sure that **Hard Disk** is selected as the first boot device. If you need to change the order, you can do so using the + and – keys.
- 19 Navigate to the Exit section using the → and ← arrow keys, select **Exit Saving Changes** and press **Enter**.

The file that was created by the CFCLONE tool is your master image. This file must be kept safe.

Creating the clone Flash Disk from the master

To copy the master image onto another flash disk (the clone), follow these steps:

- 1 Connect a DVD reader to the IDE connector on the APOLLO. If you want to store your master image on a hard disk, also connect one now. This example will assume that the image is being stored on a network location called **\\MYSERVER\MYSHARE**.
- 2 Power on the APOLLO, and press F2 to enter the BIOS.
- 3 Navigate to the **Boot** section using the → and ← arrow keys, and make sure that **CD-ROM Drive** is selected as the first boot device. If you need to change the order, you can do so using the + and – keys.
- 4 At this point, insert the APOLLO Windows XP Embedded Development Kit DVD into the DVD reader.
- 5 Navigate to the Exit section using the → and ← arrow keys, select **Exit Saving Changes** and press **Enter**.
- 6 It will take approximately 3 minutes to boot the image of XP Embedded contained on the DVD.



If a window appears with the message “This disk or device contains more than one type of content. What do you want Windows to do?” click the **Cancel** button.

- 7 Click on the **START** button, and select **COMMAND PROMPT**.

Refer to the screenshot overleaf and type the commands shown in red to determine the drive letters allocated to each drive.

```

C:\ Command Prompt
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\>diskpart

Microsoft DiskPart version 5.1.3565

Copyright (C) 1999-2003 Microsoft Corporation.
On computer: APOLLO

DISKPART> list volume

   Volume ###  Ltr Label          Fs      Type          Size      Status       Info
   -----
   Volume 0      D  WINDOWS XPE   CDFS    DVD-ROM       669 MB    Healthy
   Volume 1      C  CD_BOOT       FAT     Partition     259 MB    Healthy      System
   Volume 2      E  APOLLO WinX   NTFS    Partition     1956 MB   Healthy
DISKPART> exit

Leaving DiskPart...

C:\>

```



The Intel USB Flash Disk is the device which is 1956MB in total size. In the example shown above, it has the drive letter E: assigned to it, and is highlighted in blue. If your Intel USB Flash Disk does not have a drive letter allocated, you will need to follow the instructions in the [Preparing your Intel USB Flash Disk](#) section, on page [37](#).

For this example we will assume that the drive letters are the same as shown in the screenshot. If they differ on your system, you will have to change the commands accordingly.

- 8 Change to your DVD drive by typing **D:**
- 9 Change directory to the folder containing the **CFCLONE** tool by typing **CD\TOOLS\CFCLONE**
- 10 Type the following command to copy the image from a network location to the flash disk: **CFCLONE \\MYSERVER\MYSHARE\MasterImage.bin E:**



You will need to replace the **\\MYSERVER\MYSHARE** with the name of your own network location.

- 11 When the CFCLONE tool has finished, type **EXIT**.



If you wish to create more than one cloned flash disk, you can click on the **Safely Remove Hardware** icon on the taskbar near the clock, and then **Safely remove USB Mass Storage Device – Drive(E:)**. You will NOT see a confirmation box that it is safe to remove it, but after waiting a few seconds you can physically remove the flash disk from the APOLLO and plug in the next one to be programmed.

- 12 Click on the **START** button, and select **TURN OFF COMPUTER**.
- 13 Power on the APOLLO, and press F2 to enter the BIOS.

- 14 Navigate to the **Boot** section using the → and ← arrow keys, and make sure that **Hard Disk** is selected as the first boot device. If you need to change the order, you can do so using the + and – keys.
- 15 Navigate to the Exit section using the → and ← arrow keys, select **Exit Saving Changes** and press **Enter**.

When Windows next starts it will run through the final part of its 'First Boot'

Each clone created this way has a unique SID and network name when it completes the boot process, and shows the Windows XP Embedded desktop.



Do not duplicate the image from a cloned flash disk after it has completed the entire boot process. This would result in duplication of the computer security ID (SID).

Do not remove or insert the flash disk while it is being accessed, or if the operating systems has booted from it.

Customising the Standard XPe image supplied to create a master image

The Standard XPe image supplied on the flash disk cannot be used as a base image for duplication, as the image has already been sealed for production purposes.

If you wish to customise the Standard XPe image, you must install the nonsealed version of the image, included on the DVD. This can be done in the same way as described in [Reinstalling the supplied Windows XP Embedded image](#), page 29, using the image file from the **NONSEALED** folder, instead of the **SEALED** folder.

This image has been created using the steps described for the duplication of Windows XP Embedded images (see [Creating the master copy \(resealing the image\)](#), page 43) but **fbreseat** has not been run. This allows you to make any customisations to the image before running **fbreseat**, and thus creating your own master image.



Do not use the **NONSEALED** image for anything other than creating a master image. If more than one **NONSEALED** image is connected on the same network, problems will occur because they have the same SID and network name.

For general use, use the **SEALED** version of the image.

Appendix A – Contacting Eurotech Ltd

Eurotech Ltd sales

Eurotech Ltd's sales team is always available to assist you in choosing the board that best meets your requirements.

Eurotech Ltd
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Cambridge
CB1 7BN
UK

Tel: +44 (0)1223 403410

Fax: +44 (0)1223 410457

Email: sales@eurotech-ltd.co.uk

Comprehensive information about our products is also available at our web site:

www.eurotech-ltd.co.uk.



While Eurotech Ltd's sales team can assist you in making your decision, the final choice of boards or systems is solely and wholly the responsibility of the buyer. Eurotech Ltd's entire liability in respect of the boards or systems is as set out in Eurotech Ltd's standard terms and conditions of sale. If you intend to write your own low level software, you can start with the source code on the disk supplied. This is example code only to illustrate use on Eurotech Ltd's products. It has not been commercially tested. No warranty is made in respect of this code and Eurotech Ltd shall incur no liability whatsoever or howsoever arising from any use made of the code.

Eurotech Ltd technical support

Eurotech Ltd has a team of dedicated technical support engineers available to provide a quick response to your technical queries.

Tel: +44 (0)1223 412428

Fax: +44 (0)1223 410457

Email: support@eurotech-ltd.co.uk

Eurotech Ltd Group

Eurotech Ltd is a subsidiary of Eurotech Group. For further details see

www.eurotech.com

Appendix B - End User License Agreement (EULA)

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An "Embedded Application" means industry or task-specific software programs and/or functionality that provide the primary functionality of the device and which offer significant functionality in addition to Windows XP Embedded. You must check these before using the product.

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Microsoft OEM Customer License Agreement For Embedded Systems.

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