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APPLICATION NOTE

An0072

DuraCOR VP2000 and VT100 serial terminal

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For any technical questions, or if you cannot isolate a problem with your device, or for any enquiry about repair and returns policies, feel free to contact your local Eurotech Technical Support Team.

See the back cover for full contact details.

Revision history

REVISION	DESCRIPTION	DATE
1.0	First release	February 2007
2.0	Layout update	March 2009
3.0	Complete contents review	25 September 2014

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Important user information

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Alerts that can be found throughout this manual

The following alerts indicate potentially dangerous situations:

SYMBOL	MEANING
	**DANGER!** Information highlighting potential electrical shock hazards: • Personal injury or death could occur. • Damage to the system, connected peripheral devices, or software could occur. Appropriate safety precautions should always be used; these should meet the requirements set out for the environment that the equipment will be deployed in.
	**WARNING!** Information highlighting potential hazards: • Personal injury or death could occur. • Damage to the system, connected peripheral devices, or software could occur. Appropriate safety precautions should always be used; these should meet the requirements set out for the environment that the equipment will be deployed in.
	**NOTE** These will highlight important features or instructions.

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Foreword

This Application Note describes the Virtual Peripheral and VT100 serial terminal operating modes and how to use them with an Eurotech DuraCOR system to manage the BIOS via a serial port.

These become useful for example when the service panel of a DuraCOR system is inaccessible. In this case the communication can be only performed through a serial port.

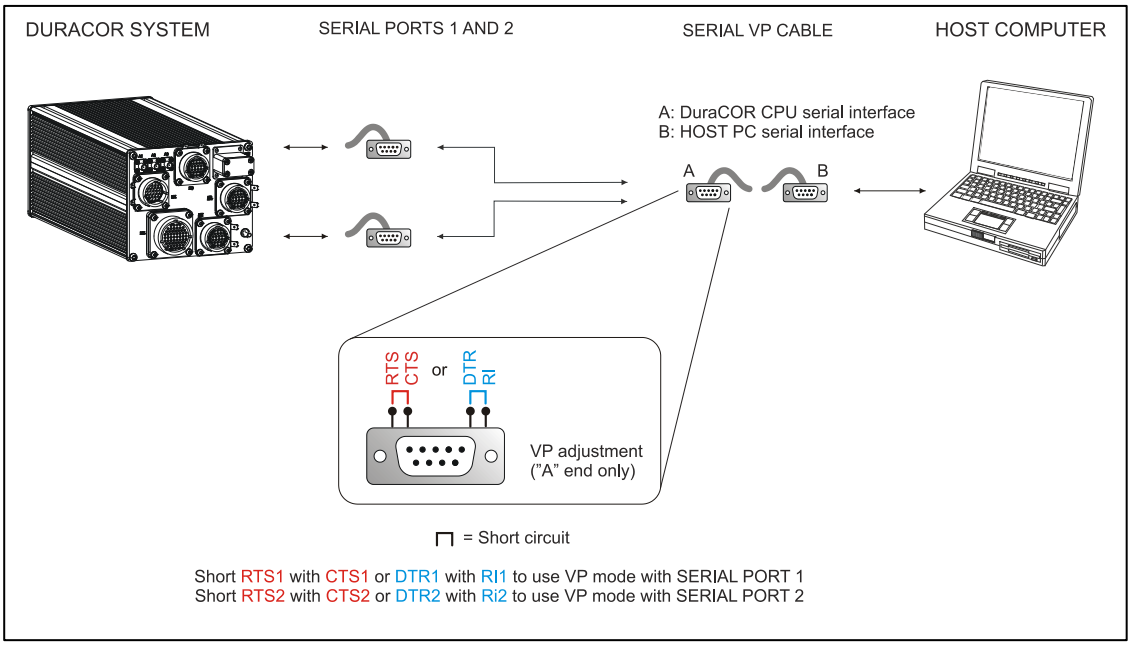
Local and redirected peripherals

- **Local peripherals:** the peripheral directly connected to the DuraCOR system (keyboard, video interface, Internal DOM, USB devices and USB floppy[1])
- **Redirected (remote) peripherals:** the peripherals of a PC compatible computer, called Host computer (Host PC), used for the remote control of the DuraCOR (i.e.: keyboard, video interface and floppy disk drive).

The Serial VP Cable

The Serial VP Cable is an essential component in both the Virtual Peripheral and VT100 serial terminal connections.
The Serial VP Cable is not supplied by Eurotech. You have to make it according to the following information:

1. Starting from a standard serial cable, make the following VP adjustment (see also the following figure): provide a short circuit between the RTS and CTS (or DTR and RI) signals on the end facing the DuraCOR CPU serial interface (“A” end)



[1] If the DuraCOR CPU BIOS supports this option

2. Make sure you are observing the connections explained in the following table:

DuraCOR CPU serial interface				Host PC serial interface		
DuraCOR SERIAL 1 & 2 Pin #	DB9 Pin #	Signal	Function	Signal	DB25 Pin #	DB9 Pin #
For detailed information refer to the specific DuraCOR Manual	2	RX	Receive Data	TX	2	3
	3	TX	Transmit data	RX	3	2
	4	DTR	Data Terminal Ready			
	5	GND	Signal Ground	GND	7	5
	7	RTS	Request To Send			
	8	CTS	Clear To Send			
	9	RI	Ring Indicator			

Pins not included in the table above are not connected

NOTE:
It is recommended to verify:

- **the availability of the serial signals needed to operate the Virtual Peripheral or VT100 modes in the DuraCOR manual before connecting and realizing the Serial VP Cable**
- **which the serial mode (RS232/RS485/RS422) is selected in the BIOS to prevent problems during communications**

The Virtual Peripheral mode and the VP2000 utility

Virtual Peripheral is a serial terminal mode developed by Eurotech. With this mode a DuraCOR system can use keyboard, video and floppy disk drive of the Host PC to:

- modify the DuraCOR BIOS parameters
- upgrade the DuraCOR BIOS

VP2000 (VP2000.exe) is a utility developed by Eurotech that has to run in the Host PC to make the Virtual Peripheral mode possible.

Each Eurotech CPU module requires its appropriate VP2000 utility.

VP2000 can be downloaded from the download area of the Eurotech website:
http://www.eurotech.com/en/download/

The VT100 mode

VT100 is a standard video terminal emulator that allows the DuraCOR system to use keyboard and video of the Host PC to:

- Modify the DuraCOR BIOS parameters
- Boot from USB to upgrade or modify the DuraCOR BIOS
- Boot from USB to access the internal DuraCOR storage and manage it:
  - Partitioning
  - Formatting
  - Data copying

Comparison between Virtual Peripheral and VT100

	Virtual Peripheral	VT100
Required DuraCOR CPU BIOS	Eurotech BIOS only	Eurotech BIOS and Phoenix BIOS
DuraCOR CPU serial port characteristics	Set up as RS232 and enabled for console redirection	Set up as RS232 and enabled for console redirection
Host PC serial port characteristics	Standard serial port (not via USB) set up as RS232	Serial port (also via USB) set up as RS232
Redirected Host PC peripherals	• Floppy disk drive (connected via a standard FDD cable, not via USB) • Keyboard (connected via a standard PS/2 cable, not via USB) • Video	Keyboard Video
Required Host PC OS	DOS	Any
Other required Host PC software	VP2000.exe	Any terminal emulator supporting VT100

Available operations	• Modify the DuraCOR BIOS parameters
	• Upgrade the DuraCOR BIOS from a floppy disk
	• Boot from USB to upgrade or modify the DuraCOR BIOS
	• Boot an external O.S.
	• Boot with USB to access the internal DuraCOR storage device and manage it:
	  ○ Partitioning
	  ○ Formatting
	  ○ Data copying
		• Modify the DuraCOR BIOS parameters
		• Boot from USB to upgrade or modify the DuraCOR BIOS
		• Boot from USB to access the internal DuraCOR storage device and manage it:
		  ○ Partitioning
		  ○ Formatting
		  ○ Data copying

Enable the Virtual Peripheral mode

What you need

To perform the Virtual Peripheral mode, you need the following items:

- The DuraCOR. It must:
  - integrate an Eurotech CPU module provided with an Eurotech BIOS
  - feature an RS232 serial port coming from the Eurotech CPU module enabled as “VP2000 and VT100” (refer to the specific DuraCOR manual to check which are the CPU ports available)
- The Host PC. It must:
  - have a DOS operating system running
  - feature a free standard (not connected via USB) RS232 serial port
  - feature a floppy disk drive connected via a standard FDD cable, not via an USB connection
  - feature a keyboard connected via a standard PS/2 cable, not via an USB connection
  - have a video connected
- The Serial VP Cable
- The VP2000.exe utility

NOTE:
Because the Host PC is running DOS, to simplify operations it is recommended to store the appropriate VP2000.exe utility in a floppy disk.

How to proceed

The Virtual Peripheral mode can be performed as follows:

1. Make sure that both your DuraCOR system and the Host PC are turned off
2. Using the Serial VP Cable, connect the serial port coming from the Eurotech CPU module inside the DuraCOR to the free standard RS232 serial port of the Host PC
3. Turn on the Host PC
4. Make sure that a DOS operating system is running in the Host PC
5. On the Host PC insert the floppy disk
6. Type the following command (where *A* is the letter assigned to the floppy drive):

```
A:>VP2000 /h
```

7. The available options will appear. Select the appropriate parameters according to your configuration

```
VP2000 - Virtual Peripheral Link
         Eurotech S.p.A. - ver. 2.01 - 2003

Use : VP2000 [/COM=n][/V][/K][/F][/A][/C]

          /COM=1 - Use Serial Port at 3F8h (IRQ=4)
               2 - Use Serial Port at 2F8h (IRQ=3)
               3 - Use Serial Port at 3E8h (IRQ=4)
               4 - Use Serial Port at 2E8h (IRQ=3)

          /LPT=1 - Use Parallel Port at 378h
               2 - Use Parallel Port at 278h
               3 - Use Parallel Port at 3BCh

          /V   - Redirect Video
          /K   - Redirect Keyboard
          /D   - Redirect Diskette A:
          /C   - Redirect Console (Video+Keyboard)
          /A   - Redirect All     (Video+Keyboard+Diskette)
```

NOTES:
The Parallel option is not supported because the DuraCOR system has no parallel port available on his connectors.

If you select the [/A] parameter, the Virtual Peripheral connection will be performed according to the following rules:

- All the remote peripherals (keyboard, video interface and floppy disk drive of the Host PC) are redirected in Virtual Peripheral connection
- The local (the DuraCOR ones) keyboard and video interfaces are disabled
- The Boot is performed from the remote floppy disk drive

If you select the [/V] [/K] [/D] [/C] parameters, the Virtual Peripheral connection will be performed according to the following rules:

- Only the selected remote peripherals are redirected in Virtual Peripheral connection
- The local peripherals connected are used according to the set-up
- If the floppy disk drive is redirected, it becomes the drive of the DuraCOR and it is no more available for the Host PC
- The Boot is performed from the selected peripheral

8. Turn on the DuraCOR system.
9. From now on, the selected Host PC's peripherals are redirected on the serial line and are at the disposal of the DuraCOR system
10. Use the *PrintScreen* key to terminate the VP2000 utility. The remote peripherals will return to the Host PC. It is recommended to turn off the DuraCOR system

To re-connect the DuraCOR to the Host PC, turn on the DuraCOR system and start again form step 1.

Example:

Make sure you have followed correctly the steps from 1 to 5 above.
Type the following command (where *A* is the letter assigned to the floppy drive):

```
A:>VP2000 /com=1 /a
```

You will obtain the following message

```
VP2000 - Virtual Peripheral Link
         Eurotech S.p.A. - ver. 2.01 - 2003

Connection on Serial Port at 3F8h.
Use PrintScreen Key to exit VP2000 ...
```

The DuraCOR CPU serial port used will be the COM1 mapped at 3F8h (IRQ=4).
The keyboard, video interface and floppy disk drive of the Host PC will be redirected to the DuraCOR system and the DuraCOR keyboard and video interfaces will be disabled.
The boot will be performed from the remote floppy disk drive

Important notes

- While the VP2000 utility is running, the CTRL+ALT+DEL key combination on the Host PC causes the restart in the Host PC and NOT in the DuraCOR system
- The Virtual Peripheral mode doesn't support the "Format" command.
- Virtual peripheral redirects the peripherals at BIOS service level. It is therefore not possible to use programs performing direct accesses to video memory, keyboard or floppy disk.

Enable the VT100 mode

What you need

To perform the VT100 mode, you need the following items:

- The DuraCOR. It must:
  - integrate an Eurotech CPU module provided with an Eurotech/Phoenix BIOS
  - feature an RS232 serial port coming from the Eurotech CPU module and:
    - with an Eurotech BIOS: enable the serial port as “VP2000 and VT100” (refer to the specific DuraCOR manual to check which are the CPU ports available)
    - with a Phoenix BIOS: enable the serial port for console redirection
- The Host PC. It must:
  - feature a free standard RS232 serial port
  - feature a keyboard
  - have a video connected
- The Serial VP Cable

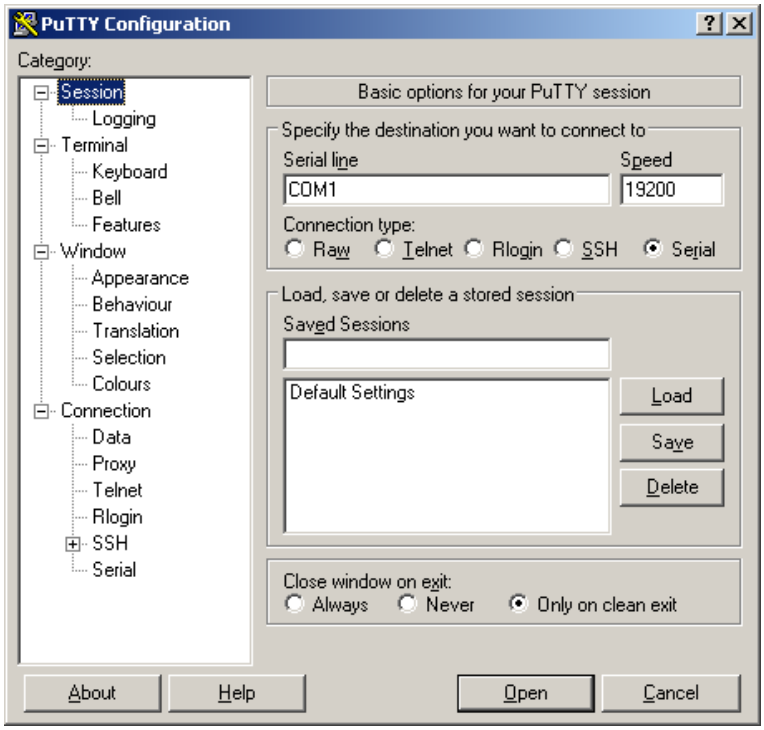
How to proceed

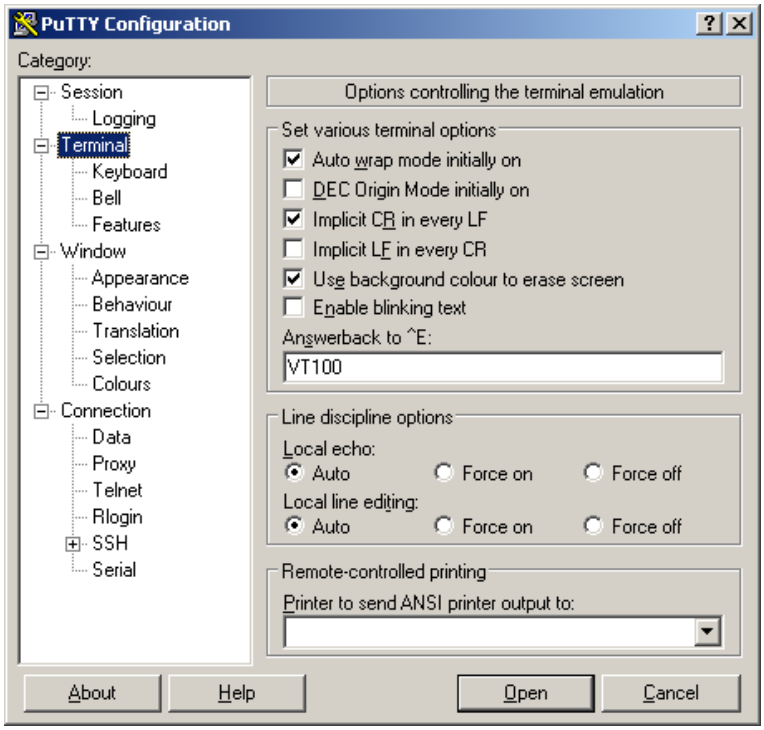
1. Make sure that both your DuraCOR system and the Host PC are turned off
2. Using the Serial VP Cable, connect the serial port coming from the Eurotech CPU module inside the DuraCOR to the free standard RS232 serial port of the Host PC
3. Turn on the Host PC
4. Run a terminal emulation program
5. Choose a serial port to use. Configure it with these parameters:
   - Baud rate =19200
   - 8 bit
   - No parity
   - 1 stop bit
6. Choose “VT100 emulation mode”
7. Turn on the DuraCOR system. The Host PC will display on the VT100 terminal the BIOS boot sequence.

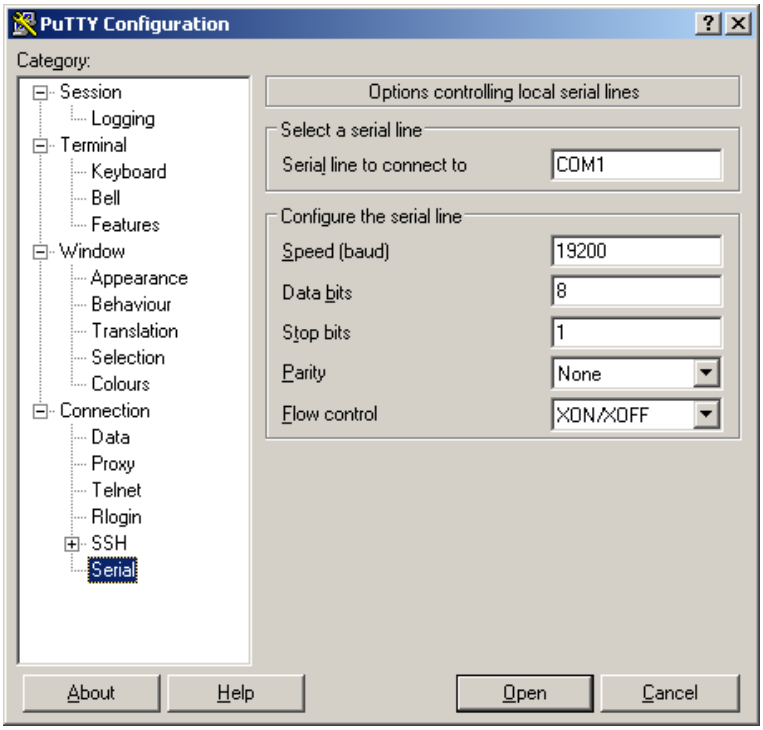
Example using a PuTTY terminal emulation program

The following example shows you some screenshots of a configuration made with a PuTTY terminal emulation program (version 0.63, but any version is ok) in order to use the Bios terminal on your DuraCOR system.

The relevant setting are about a serial port configuration and VT100 terminal option to be set on Answerback to ^E: VT100 field.






PuTTY Configuration
Category:
Session
Logging
Terminal
Keyboard
Bell
Features
Window
Appearance
Behaviour
Translation
Selection
Colours
Connection
Data
Proxy
Telnet
Rlogin
SSH
Serial
Options controlling local serial lines
Select a serial line
Serial line to connect to
COM1
Configure the serial line
Speed (baud)
19200
Data bits
8
Stop bits
1
Parity
None
Flow control
XON/XOFF
About
Help
Open
Cancel

Use Virtual Peripheral and VT100 for DuraCOR BIOS management

Modify the BIOS parameters

Using Virtual Peripheral

This is the procedure to follow to enter the BIOS setup and edit its parameters using Virtual Peripheral:

1. Make sure your DuraCOR system is turned off
2. Connect the DuraCOR system with the Host PC using the Serial VP cable as described in Enable the Virtual Peripheral mode on page 10
3. Run the VP2000 utility on the Host PC selecting the [/C] parameter. This will redirect video and keyboard
4. Turn on the DuraCOR system.
5. The Host PC will display the BIOS boot sequence. Press F2 to enter the Setup and modify the parameters

NOTE:
In the Communication BIOS menu, remember to leave enabled the VP2000 and VT100 mode otherwise you will not be able to enter this mode again in the future.

6. When finished exit from the setup and save.

Using VT100

This is the procedure to follow to enter the BIOS setup and edit its parameters using Virtual Peripheral:

1. Make sure that both your DuraCOR system and the Host PC are turned off
2. Using the Serial VP Cable, connect the serial port coming from the Eurotech CPU module inside the DuraCOR to the free standard RS232 serial port of the Host PC
3. Turn on the Host PC
4. Run a terminal emulation program
5. Choose a serial port to use. Configure it with these parameters:
    - Baud rate =19200
    - 8 bit
    - No parity
    - 1 stop bit
6. Choose “VT100 emulation mode”
7. Turn on the DuraCOR system. The Host PC will display on the VT100 terminal the BIOS boot sequence.
8. Press F2 to enter the Setup and modify the parameters

NOTE:
Remember to leave enabled the console redirection parameters otherwise you will not be able to enter this mode again in the future.

9. When finished exit from the setup and save.

NOTE:
The VT100 mode only allows you to modify the BIOS setup parameters not to upgrade the BIOS firmware

Upgrade the BIOS

Using Virtual Peripheral and a redirected floppy disk drive

This DuraCOR BIOS upgrade procedure is similar to the BIOS upgrade procedure for the Eurotech CPU modules. This is described in the Eurotech CPU user manuals.

NOTE:
The new BIOS will erase the previous setup parameters and will start with the default setup. For this reason it is recommended to make a note of your current settings if you want to reuse them after the update.

1. Make a DOS bootable floppy disk including the VP2000.EXE utility and all the BIOS utilities, including BTOOL.EXE and the binary firmware you need to update
2. Make sure your DuraCOR system is turned off
3. Connect the DuraCOR system with the Host PC using the Serial VP cable as described in Enable the Virtual Peripheral mode on page 10
4. Run the VP2000 utility on the Host PC selecting the [/A] parameter. This will redirect keyboard and the floppy disk drive
5. Insert the DOS bootable floppy disk in the Host PC drive
6. Turn on the DuraCOR system. It will boot from the Host PC floppy
7. At the DOS prompt, write the following command (where *bios.bin* is the name of the new BIOS):

```
BTOOL /B bios.bin
```

8. The program will store the new BIOS version to the CPU EPROM
9. Follow the instructions BTOOL will give you. The program will proceed by erasing the Flash device blocks and then writing and verifying them with the data present in the Binary file.
10. BTOOL will inform you about the result of the operation
11. Cycle the DuraCOR power to finalise the upgrade
12. The new BIOS will start with the default setup. If you want to reuse the settings you had before the upgrade you need to enter the BIOS setup and restore them manually. When finished, save and exit.

Using Virtual Peripheral (or VT100) and an USB port

Some new BIOS revisions support the boot from USB. In this case you can connect a USB device and boot from it (i.e.: USB floppy disk drive, USB key, etc…).

To be able to boot from an USB device, the USB support must be enabled in the BIOS. You can enable this feature by entering the DuraCOR setup and using either Virtual Peripheral or VT100 as described previously.

In the following procedure we assume that the BIOS has been already configured to boot from a USB device.

NOTE:
The boot from USB needs a console directly connected to the DuraCOR system. In this case the Service Panel has to be open to access the keyboard and VGA connector.

NOTE:
The new BIOS will erase the previous setup parameters and will start with the default setup. For this reason it is recommended to make a note of your current settings if you want to reuse them after the update.

1. Make a DOS bootable USB device including the VP2000.EXE utility and all the BIOS utilities, including BTOOL.EXE and the binary firmware you need to update
2. Connect the USB device to the DuraCOR CPU USB port
3. Run the VP2000 utility on the Host PC selecting the [/C] parameter. This will redirect video and keyboard
4. Turn on the DuraCOR system. It will boot from the Host PC USB device.
5. At the DOS prompt, write the following command (where *bios.bin* is the name of the new BIOS):

```
BTOOL /B bios.bin
```

6. The program will store the new BIOS version to the CPU EPROM
7. Follow the instructions BTOOL will give you. The program will proceed by erasing the Flash device blocks and then writing and verifying them with the data present in the Binary file.
8. BTOOL will inform you about the result of the operation
9. Cycle the DuraCOR power to finalise the upgrade
10. The new BIOS will start with the default setup. If you want to reuse the settings you had before the upgrade you need to enter the BIOS setup and restore them manually. When finished, save and exit.

USB boot features

The USB BIOS support provides some useful features to operate the DuraCOR system. Here the summary of some of the features available operating the DuraCOR with a USB:

- Booting from USB for upgrading BIOS or BIOS Setup modifications
- Booting an external O.S.
- Booting with USB to access the internal DuraCOR storage for disk management:
- Partitioning
  - Formatting
  - Data copying

Related Documents

DuraCOR User Manuals
VP2000 – User manual of the CPU installed into the DuraCOR

For a complete list of our products visit our website: www.eurotech.com

Notes

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