# Technical Manual

# WEBasDISK

## Rev. 2.2

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# 2 USER INFORMATION

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Before contacting Kontron Embedded Modules technical support, please consult our Web site for the latest product documentation, utilities, and drivers. If the information does not help solve the problem, contact us by telephone.
The table below lists technical support contacts and service facilities for Kontron Embedded Modules.

| **Asia** | **Europe** | **North/South America** |
|---|---|---|
| Kontron Asia | Kontron Embedded Modules | Kontron Americas |
| 5F-1, 341, Sec 4<br>Taipei, Taiwan | Brunnwiesenstr. 16<br>94469 Deggendorf Germany | 3988 Trust Way<br>Hayward, CA 94545 |
| Tel: +886 2 2751 7192 | Tel: +49 (0) 991-37024-0 | Tel: 510-732-6900 |
| Fax: +886 2 2772 0314 | Fax: +49 (0) 991-37024-104 | Fax: 510-732-7655 |

# 3 INTRODUCTION

**Kontron** ®'s **WEBasDISK** acts just like any other 100% IDE compatible hard disk drive. The difference with **WEBasDISK** is that the contents of the drive are read on the fly from any location on the Internet or local file servers, including any MS Windows workstation. **WEBasDISK** allows you to boot any operating system that has IDE support from LAN or the Internet.

**WEBasDISK** can be connected to any computer system (referred to as ***target system*** or ***target***) that supports IDE hard disks. **WEBasDISK** behaves like any other hard disk that may also be found in that computer system. The data read from **WEBasDISK** is not necessarily stored in **WEBasDISK** but can be dynamically synthesized from data found on any other computer (referred to as ***server system*** or ***server***) connected to the local area network or even over the internet. The data must not necessarily be prepared to work with **WEBasDISK**. In this instance the data will be presented to that target system as a FAT compatible file system, which is supported by all major operating systems.

**WEBasDISK** can operate in two distinct modes: ***image mode*** and ***file mode***.

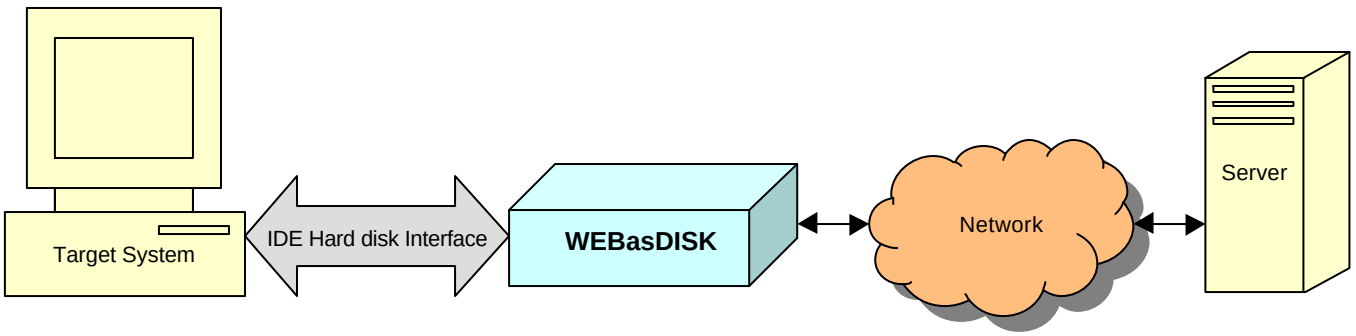
In ***image mode*** the server contains a disk image that has been prepared for use with **WEBasDISK**. This allows total operating system independence. The data can be formatted in any way and can contain any file system.

In ***file mode*** the server contains any file system in the form of a recursive directory tree. **WEBasDISK** builds a virtual FAT file system on the fly that is presented to the target machines OS. The data is not read from the server until the target's OS requires it. The server does not need to be aware of **WEBasDISK**.

**WEBasDISK** uses the TCP/IP network protocol on the network connection side. It uses either HTTP or SMB (CIFS) to access the files. HTTP allows **WEBasDISK** to read the data from any web server on the Internet. SMB allows **WEBasDISK** to read the files on any MS Windows workstation or server. This is regular Windows peer-to-peer file sharing. No special configuration is required to use **WEBasDISK** in that environment. Linux also contains SMB support in the SAMBA package.

The IDE interface allows **WEBasDISK** to be used as a regular hard disk in most computer systems.

**WEBasDISK** contains a web server that is acessible through a webpage, which allows you to change any configuration option using a web browser.



# 4 BENEFITS AND APPLICATIONS

## 4.1 Basics

- Remote hard disk
- Environment requires no moving parts
- Flash disk replacement
  - Faster than chipDISK
  - Auto update
  - Larger capacity
- Easy remote update
- Off-line boot on network failure
- No additional software required
  - on Server
  - on Target

## 4.2 Technical background

The sector data transfer rate of **WEBasDISK** is about 500 kB/sec when reading data over the network. Reading or writing from Cache (from **WEBasDISK** memory) is much faster with a data transfer rate of about 1.5 MB/sec. These transfer rates cannot be compared with those of actual hard disks. But nevertheless the operating system boot times for example of a complete WIN98 installation with **WEBasDISK** (≈ 1min 10sec) are almost identical to that of a regular hard disk. When booting an OS only a fraction of the installed size is actually loaded into memory. So the impact of the lower transfer rate is not always noticeable.

# 5 FEATURES

## 5.1 IDE interface

- Target system is provided with data from server via IDE port
- Module power can be supplied via PIN 41 and 42 of IDE interface
- Behaves on IDE side as ATA compliant hard disk
- Operates as Master or Slave drive
- Boot from local flash without network connection
- Write sector cache to allow using OS's that require writing to boot device
- Selectable boot sectors for popular operating systems

## 5.2 Supported Disk Formats

- FAT12 disk format
- FAT16 disk format
- FAT32 disk format

## 5.3 Network Interface

- Connects network via 10/100Base-T, RJ45 Ethernet
- Network status can be indicated via LINK/ACTIVITY/SPEED LED
- Transmission protocol for Ethernet communication is TCP/IP based
- Implemented HTTP server allows module configuration via browser
- DNS/NETBIOS name resolution

## 5.4 Supported Server Protocols

- SMB (CIFS) Protocol to use access files on Windows NT/9x/ME/2000/XP and Linux/Samba machines
- SMB password support
- HTTP Protocol
- HTML page URL analyzer
- DHCP

## 5.5 Soft-/Firmware Functionality

- Boot OS via Ethernet from shared server directory
- File mode with FAT disk builder
- Image mode supports all disk formats
- Read data from network or flash if there isn't any server connection or the server share is an empty string
- Writing to WEBasDISK can either
  - Report errors
  - Write changes back to server in Image Mode
  - Write changes back to server in File Mode
- File connection cache
- Automatic Share redirection on server file change
- File tree description files in file mode
- Image mode auto detects drive parameters from image file
- Permanent share redirection
- Creates a snapshot of the current server files to flash
- Save multiple configurations (in EEPROM)
- Configuration password support
- Firmware update via FTP

# 6 INSTALLATION

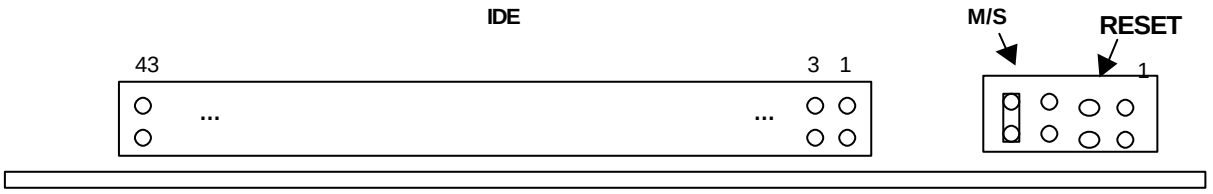
## 6.1 Hardware Installation

### *IDE Connection*

**WEBasDISK** can be connected to the target system just like any 2.5-inch IDE hard disk. Simply attach the 44-pin IDE connector with a standard IDE cable to your target system's IDE port. **WEBasDISK** receives its power through that connection.

By default **WEBasDISK** is configured as IDE master drive. **Remove** the M/S jumper closest to the IDE connector to have **WEBasDISK** operate as a slave drive.

**Attention** Don't plug the jumper via other pins, they are for other usage.




Attach a standard Ethernet cable to the RJ-45 Ethernet connector and hook it up to your 10/100Base-T Ethernet LAN.

Turn on the power of the target system. The networking LEDs should light up if the networking connection is physically working. After a short while the **WEBasDISK** status LED should turn off.

If required enter the target systems BIOS setup to enable or detect the hard disks. Newer BIOSes are usually set to auto detect hard disks so this step is not required.

Some BIOSes may display the **Kontron WEBasDISK** name or the drive's geometry.

If **WEBasDISK** is your boot drive and it has not been configured yet you may see a "Boot Failure" error message or something similar like "No Operating System". This is normal.

### *Reset target system*

If you want to be able to reset the target system remotely via the configuration page you have to make a separate connection from the pad labeled "RES_CPU" located next to the Master/Slave connector to the reset pin of your target system. Optionally connect the reset pin on the Master/Slave connector (see figure above) with the reset pin of your mainboard.
A complete pin description of the connectors can be found in chapter **10.2 Pinout Table.**

### *Compact Flash*

It's not necessary to insert a compact flash card but keep in mind that without it emergency boot is not possible.
You can install any bootable operating system on the compact flash using any compact flash adapter.
If a compact flash card is inserted it is also possible to boot from WEBasDISk without a network connection present.

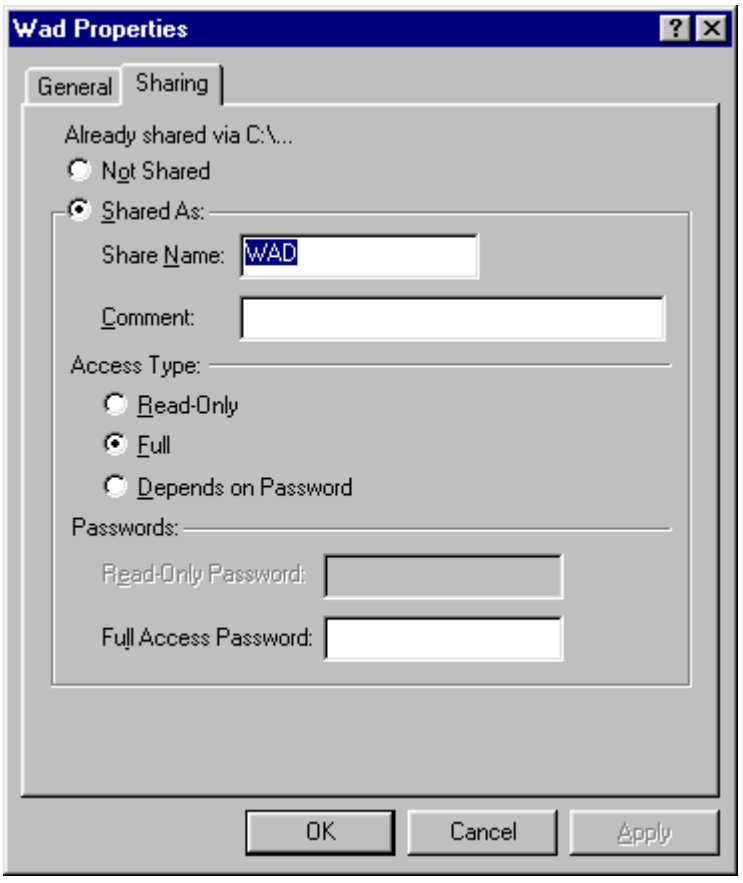
### *WEBASDISK Setup Prompt*

If the server isn't configured for use with **WEBasDISK** you'll get a short infomation prompt when you switch on your target system with **WEBasDISK.**
Here you can find informations about the current IP-address, the IP mask and the MAC address of **WEBasDISK**.
Now you have the possiblity to change these settings directly in this mode or later on in the browser config setup.

## 6.2 Server Preparation

If you want to use **WEBasDISK** with files located on a MS Windows Workstation or Server you need to:

- Create a new directory on "Server"
- Copy operating system files, or any other files that you want to access on the target, into that directory
- Right click on the directory in Explorer
- Select "Sharing..." from the menu
- Enter a "Share Name" in the dialog that appears and then press OK




To remotely boot MS-DOS you need these files; IO.SYS, MSDOS.SYS, and COMMAND.COM, stored in the shared directory mentioned above.

## 6.3 WEBasDISK Express Setup

**WEBasDISK** contains a web server that is acessible through a webpage, which allows you to change any configuration option using a web browser. Simply type in the **WEBasDISK** IP address in the address or URL field of your browser. Some browsers might require the http:// prefix.

The first time you access **WEBasDISK** you need to type in the factory default IP address of **10.0.0.21**

For this to work your PC needs to be (temporarily) configured with any IP address that starts with 10.0.0.xxx (the subnet mask for this is 255.255.255.0).

Currently this is the only way to gain access to **WEBasDISK** the first time.

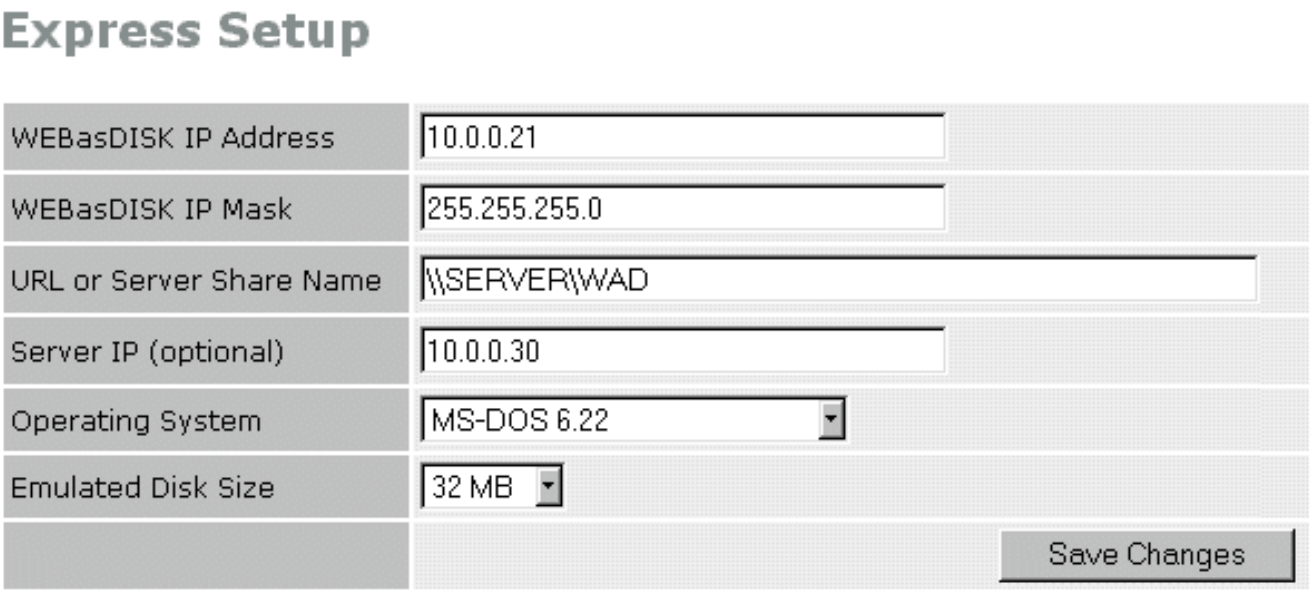
If you are using MS Windows you can right click on the "Network Neighborhood", select "Properties" from the menu, select "TCP/IP -> *your Ethernet card*", then "Properties" to specify an IP address.

Your browser should now display the **WEBasDISK** configuration home page:

.




From the Navigation bar close to the top of the page click on "Express Setup" to display Express Setup page.




It is likely that **WEBasDISK**'s factory default IP address and mask is not ideal for your LAN. The server's Computer Name must be set for your environment. Enter a server share like "\\SERVER\SHARE" to access files from a MS Windows or Samba server. Enter a web site or subdirectory like "http://www.**WEBasDISK**.com/wad". Then select the operating system that you would like to boot. This page allows you to adjust these settings.

| **Option** | **Explanation** |
|---|---|
| **WEBasDISK** IP Address | Defaults to 10.0.0.21 and should be changed to match your networks address range. |
| **WEBasDISK** IP Mask | Defaults to 255.255.255.0, which should be appropriate for most LANs. |
| URL or Server Share Name | This is a combination of the server's Computer Name and the name of the shared directory. The syntax is \\server\share |
| Server IP (optional) | This is an optional field. If you know the server's IP address and it is fixed then specifying it in this field speeds up the connect phase. In all other cases this field should be blank or 0.0.0.0. |
| Operating System | Select the operating system that you want to use on your target system. This simply uses the correct boot sector. If your system is not listed or for a complete list of options refer to section 7.3 Server Configuration. |
| Emulated Disk Size | This is the disk size that will be emulated. It must be larger then the total size of all files in the shared directory on the server. |

If you are using Windows you can right click on the "Network Neighborhood", select "Properties" from the menu, select the "Identification" tab to display or change the Computer Name.

Press the "Save Changes" button to have **WEBasDISK** save and retain the new settings. The new **WEBasDISK** IP address and mask take effect after you power off the target system.

If everything was set up correctly the target system should boot the new operating system located in the server's shared directory when the power is turned back on.

After that you need to use the new IP to access the **WEBasDISK** configuration pages.

# 7 WEBASDISK CONFIGURATION

This section shows the configuration pages that are accessible with a standard web browser and describes the options in detail.

## 7.1 Navigation Bar

The navigation menu bar close to the top of the page is always present and allows you to quickly jump to the various configuration sub pages

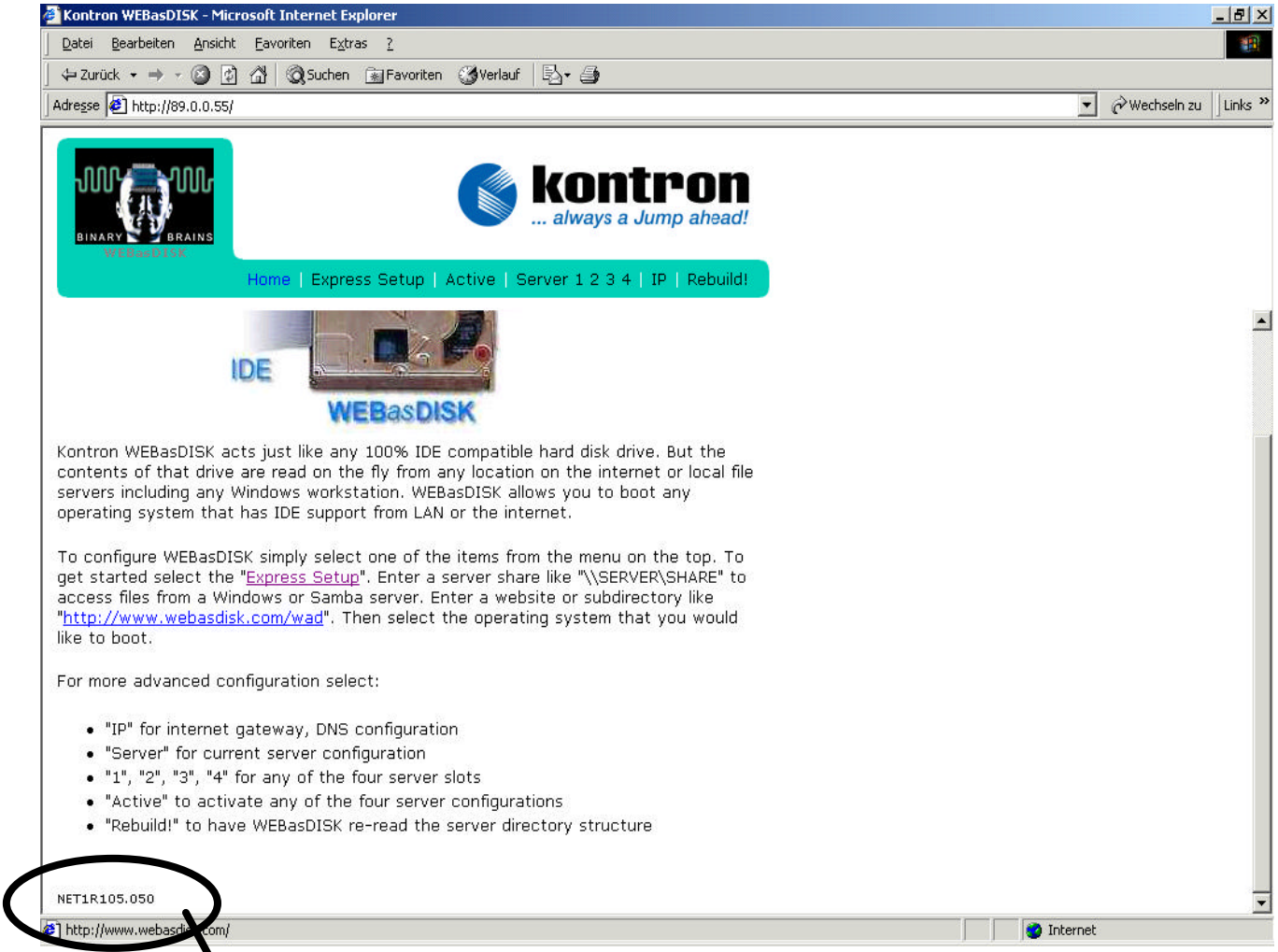
| **Option** | **Explanation** |
|---|---|
| Home | Home page with basic instructions and firmware revision number |
| Express Setup | Easy initial configuration. Refer to section 6.3 WEBasDISK Express Setup |
| Active | Activate any of the four pre configurable server configurations |
| Server | Current server configuration |
| 1, 2, 3, 4 | Any of the four server configuration slots |
| IP | Internet gateway, IP, and DNS configuration |
| Rebuild | Have **WEBasDISK** re-read the server directory structure. Note this takes effect immediately. In the current version of **WEBasDISK** you need to reboot the target system or it will be presented with inconsistent data. |

Press the "Save Changes" button in the individual pages to have **WEBasDISK** save and retain the new settings from that page. To discard any changes you have made simply select another item from the navigation bar.

Unless otherwise noted the changes take effect after the next rebuild of the directory structure and reboot of the target system, or after the next power off. You can instruct **WEBasDISK** to automatically rebuild whenever the settings are saved. Refer to section 7.5 IP Configuration for details.

## 7.2 Home Page

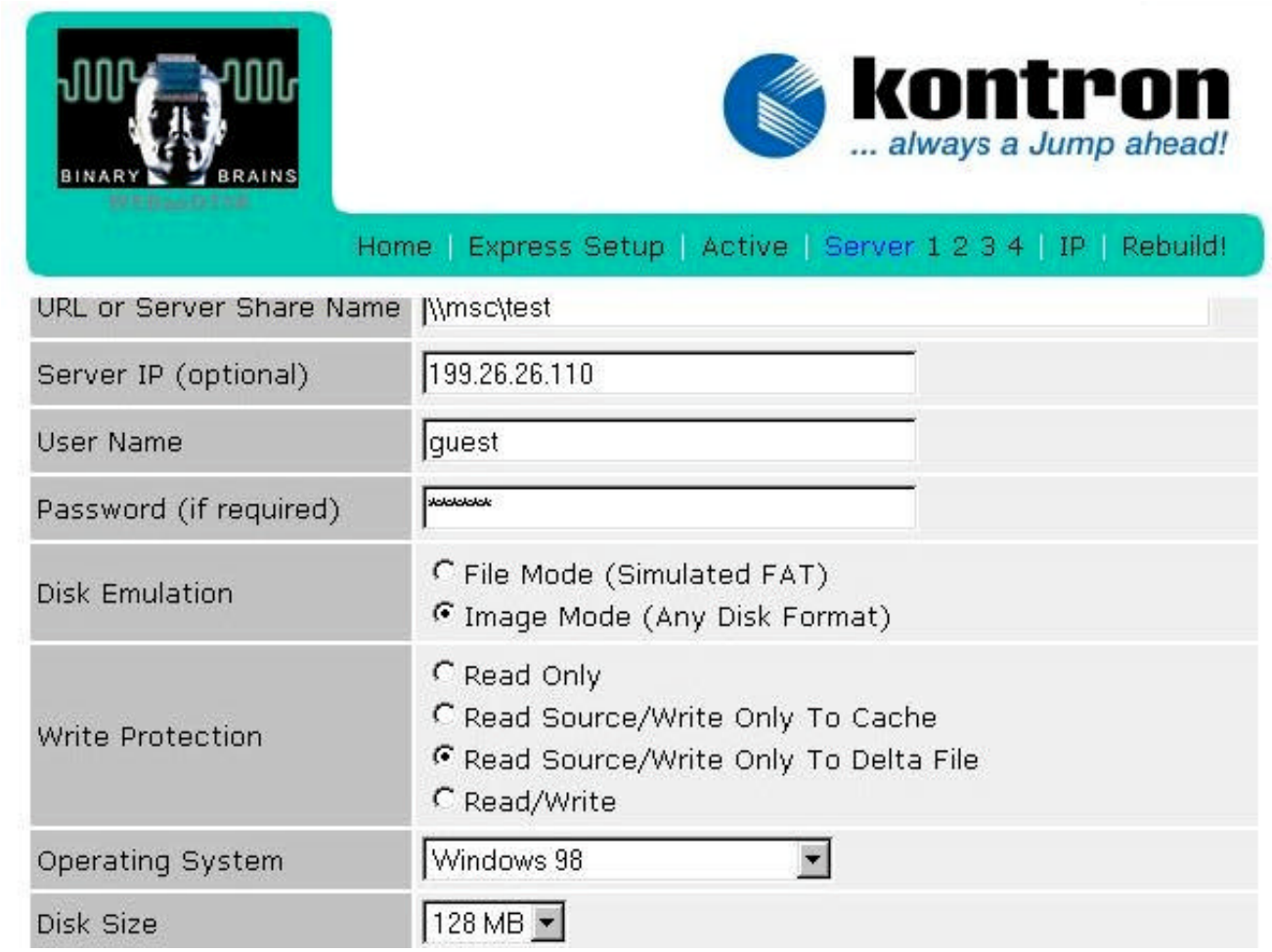
This page gives a brief and general overview about the **WEBasDISK**.
**Note:** In the bottom left hand corner, the current programmed firmware revision is shown.




In this example, the current programmed firmware revision is 0.5 build 050.

## 7.3 Server Configuration

These settings describe how to access the server and how the emulated disk should be presented to the target system.



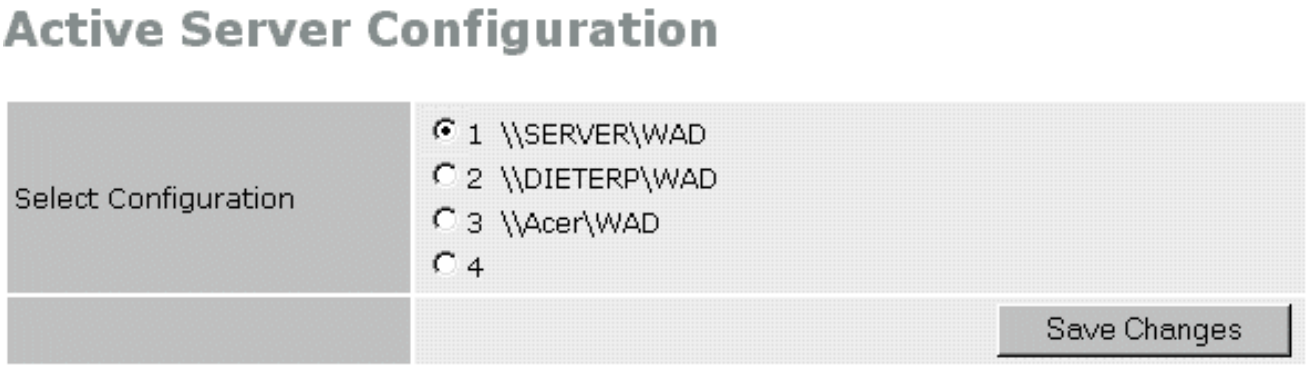

| Option | Explanation |
|---|---|
| URL or Server Share Name | This describes the server and the location of the file on the server. There are three different protocols implemented:<br>• SMB (CIFS) protocol to access MS Windows and Linux Samba Servers. This is a combination of the server's Computer Name and the name of the shared directory. The syntax is *server**share*. An optional subdirectory path can follow with each directory separated by back slashes.<br>• HTTP protocol to access any web server in the Intranet or Internet. The syntax is http://*servername* (i.e. http://www.**WEBasDISK**.com/wad). An optional subdirectory path can follow with each directory separated by slashes.<br>• If this field remains blank, and no server is specified, then the disk image that is stored in the onboard flash is used. |
| Server IP (optional) | This is an optional field. If you know the server's IP address and it is fixed then specifying it in this field speeds up the connect phase. In all other cases this |

| | |
|---|---|
| | field should be blank or 0.0.0.0. |
| User Name (optional) | Login user name for the server. (Currently only used with SMB) |
| Password (if required) | Login password for the server. (Currently only used with SMB) |
| Disk Emulation | • ***File Mode*** (Simulated FAT):<br>**WEBasDISK** builds the complete file system from the individual files located in the server directory. The synthesized file system will be any of the 3 FAT variants FAT12, FAT16 or FAT32. If a file named diskimg.bin is present **WEBasDISK** automatically switches to image mode even if file mode is selected.<br><br>• ***Image Mode*** (Any Disk Format):<br>A file named diskimg.bin must be stored in the shared directory on the server. This file is the complete sector snapshot of any hard or flash disk. This image must start with a valid partition root sector. **WEBasDISK** uses the information in this sector to initialize its drive geometry. All other sectors are transparent and simply passed through to the target system upon request. If there is no diskimg.bin file **WEBasDISK** automatically switches to File Mode. |
| Write Protection | • Read Only: All writes from the target system to the disk will fail.<br><br>• Read Source/Write Only To Cache: All writes are cached in **WEBasDISK** internal RAM (up to 13 MB). If the cache is full writes fail. All changes are lost when the power is turned off<br><br>• Read/Write to delta files: All writes go to a delta files named waddelta.wdi and waddelta.wds in the shared server directory that contains only the written sectors. If the files are later deleted from the server only these changes are rolled back.<br><br>• Read/Write: In **Image Mode** all writes go directly to the image file.In **File Mode** the files created on the target are build on the fly in the shared directory. Files created or changed in the shared directory are not seen at the target until target system is rebooted. |
| Operating System | Select the operating system that you want to use on your target system. This simply uses the correct boot sector. If your system is not listed then choose the "None/Any/WADBOOT.SEC". In this case the disk is not bootable or a separate 512-byte boot sector file named wadboot.sec must be present in the shared server directory. Optinally a root sector file named wadroot.sec can be present. If there is a file named wadboot.sec in the shared server directory this setting is without effect.<br><br>• None/Any/WADBOOT.SEC<br>• Windows NT/NT Embedded /2000 / XP<br>• Windows CE<br>• Windows 98/ME<br>• Windows 95<br>• MS-DOS 6.22<br>• DR-DOS 7.03<br>• VxWorks<br>• Linux FAT<br>. |
| Emulated Disk Size | This is the disk size that will be emulated. It must be larger then the total size of all files in the shared directory on the server. (up to 32GB possible) |

| | |
|---|---|
| Save As Configuration | **WEBasDISK** supports four independent server configurations. This selection determines in which slot the current settings should be written. Note you can use this to simply copy configurations. |

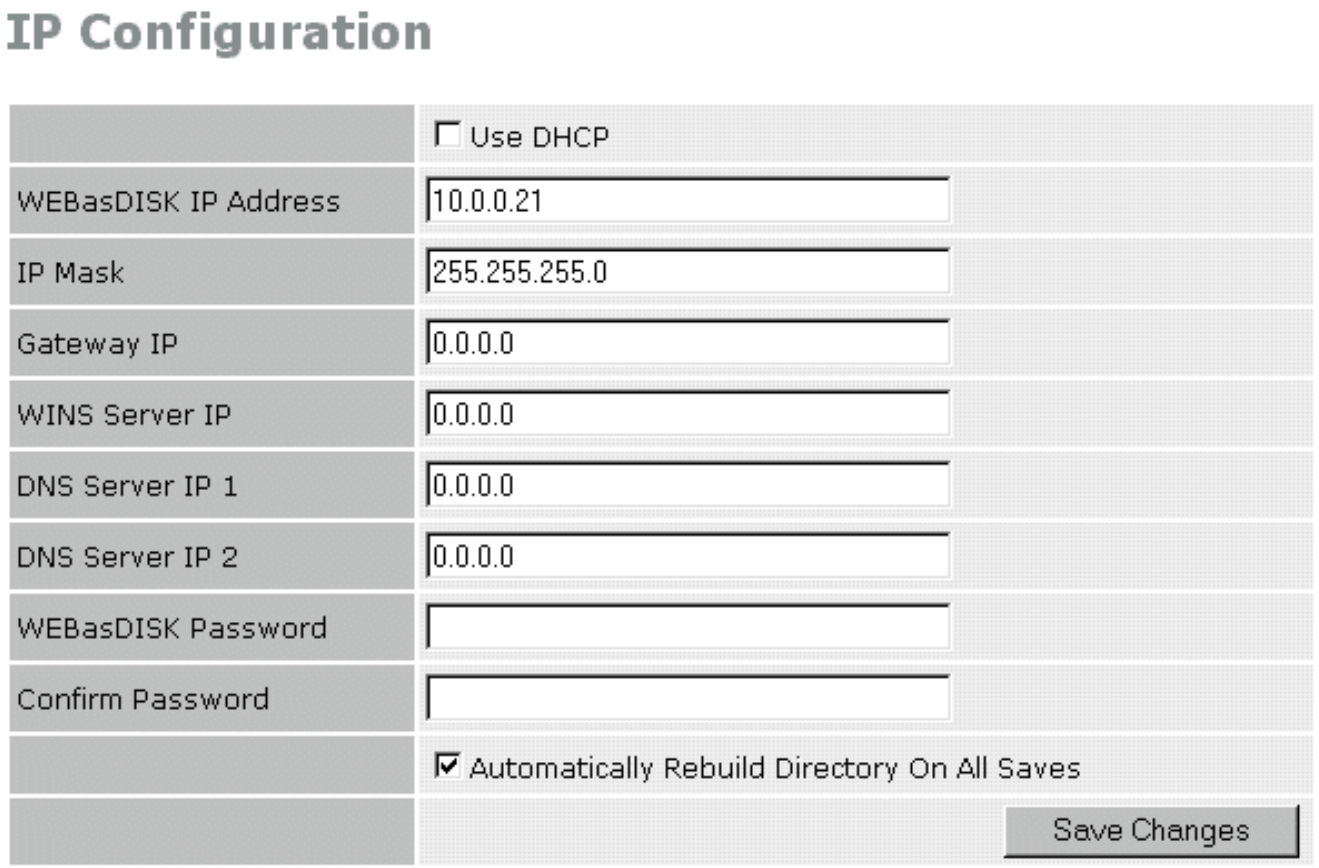
## 7.4 Active Server Configuration

**WEBasDISK** supports four independent server configurations. Only one of these can be active. This page displays the server share names of all configurations and allows you to select the currently active server.



## 7.5 IP Configuration

This page allows you to change a variety of IP addresses to values appropriate for your network including **WEBasDISK**'s own IP address and also its' configuration password.




| **Option** | **Explanation** |
|---|---|
| Use DHCP | **WEBasDISK**'s IP must be fixed. |
| **WEBasDISK** IP Address | Defaults to 10.0.0.21 and should be changed to match your networks address range. |
| **WEBasDISK** IP Mask | Defaults to 255.255.255.0, which should be appropriate for most LANs. |
| Gateway IP | IP address of the gateway or router. This is necessary in a LAN with more than one subnet or to access the internet. |
| WINS Server IP | Not implemented yet. Currently a broadcast will be used to resolve computer names. |
| DNS Server IP 1 | IP address of the primary DNS server. This is required to resolve names like www.**WEBasDISK**.com to the website's IP address. |
| DNS Server IP 2 | IP address of the secondary DNS server. This is optionally used if the first server cannot be reached. |
| **WEBasDISK** Password | This password is used to protect the configuration pages of **WEBasDISK**. If a password is assigned the web browser will prompt you for this password whenever you access any **WEBasDISK** web page except the home page. The user name is always "admin". |

| | |
|---|---|
| Confirm Password | If you change the password you must retype it here to avoid assigning a misspelled password. If you forget the password that you have assigned you need to contact **Kontron** ®. A handling surcharge may apply. |
| Automatically Rebuild Directory On All Saves | When checked, all configuration saves automatically trigger a rebuild of the cached server directory structure.<br><br>We **recommend** to always check this option. |

# 8 ADVANCED TOPICS

## 8.1 Storing Files in CompactFlash

You can store a snapshot of the currently connected server shared directory into **WEBasDISK**'s CompactFlash card. This snapshot will be used whenever there is no network connection, the server is down or a blank server share name has been set up in the Server Configuration page.

This example assumes that **WEBasDISK**'s IP address is the default 10.0.0.21.

- Wait until the **WEBasDISK** activity LED (see Connector Locations and Pinouts) is off.
- Access the **WEBasDISK** configuration web page with http://10.0.0.21
- check out if the emulated disk size is the same as the size of your CFC otherwise you'll have to reboot the system with the correct emulated disk size
- Enter http://10.0.0.21/*snapshot* in your web browsers address field.
- The status LED will be turned on and **WEBasDISK** pulls in all server data and stores it to the compact flash.
- This process may take a number of minutes depending of the size of the files in the server's shared directory.
  During this time the LED will blink several times
- When the status LED stops blinking, the process is complete.
- power down your system, disconnect network cable
- power up, WEBasDISK will boot from compact flash

In the current firmware version this is the only way to use the compact flash for data storage. This area will be heavily expanded in new firmware versions to include writing to flash from the target system and background copying of server data to flash with an automatic change detection.

(***Attention:*** At the moment data you stored on CFC working offline, won't be copied automatically back to server and will be deleted doing a new snapshot)

## 8.2 Configuration Files on the Server

The following files can be located in the server's shared directory:

| File name | Explanation |
|---|---|
| diskimg.bin | This file is the complete snapshot of all used sectors on any hard or flash disk. This image must start with a valid partition root sector. **WEBasDISK** uses the information in this sector to initialize its drive geometry. All other sectors are transparent and simply passed through to the target system upon request. |
| wadboot.sec | If "None/Any/WADBOOT.SEC" is chosen as an OS then the disk is not bootable unless this 512-byte boot sector file is present. |
| wadroot.sec | If "None/Any/WADBOOT.SEC" is chosen as an OS then this 512-byte root sector file can be present if necessary. |
| waddelta.wdi<br><br>waddelta.wds | In ***File Mode*** writes from the target go to these two delta files that contain only the written sectors. In Read/Write File Mode **WEBasDISK** automatically creates these files. The files, if present, are re-read when **WEBasDISK** is powered up. If the files are later deleted from the server all changes recorded in these files are discarded. |
| wadserv.ini | This file allows you to configure **WEBasDISK** from the server. You can also use it to redirect **WEBasDISK** to use another or new server share. This is useful when you have to |

| | | |
|---|---|---|
| | change something on the server side while **WEBasDISK**(s) is (are) accessing these files. Create a new share with the new files and a wadserv.ini in the old share, which points to the new share. This procedure ensures consistent data at all times.<br><br>The wadserv.ini is read whenever the directory is rebuilt and also during power-on. The syntax of the file is similar to a MS Windows INI file. Currently two sections with optional settings are defined: | |
| Sections of wadserv.ini | `[Redirect]`<br>`Server=\\server\share`<br>`IP=10.0.0.30`<br>`Permanent=1`<br><br><br>`[Options]`<br>`DiskSize=16` | `Redirect section`<br>`New server share name`<br>`New optional server IP address`<br>`If successful, store new server in EEPROM`<br><br>`Options section`<br>`Disk size in MBytes` |

## 8.3 WEBasDISK Button

The button S1 (see chapter 10 ) is **NOT** a reset button (see chapter 10 Connector Locations and Pinouts).

Pressing it while you power up your system, **WEBasDISK** will switch in setup mode where you get information about the current IP configuration and you have the possiblity to change IP configuration without access via server.

## 8.4 Creating Boot Sector Files

To create the wadboot.sec boot sector file under MS Windows or DOS open the Command Prompt and enter the commands shown in bold type:

```
C:\WINDOWS> debug
-l 100 2 0 1
-rcx
CX 0000
:200
-nwadboot.sec
-w
Writing 00200 bytes
-q

C:\WINDOWS> _
```

Copy the created wadboot.sec and all the other files to the server's shared directory and configure the OS for **WEBasDISK** as "None/Any/WADBOOT.SEC".

**Note**: Creating a wadboot.sec file for a 32 bit-file system will be supported in the future firmware versions.

## 7.5. Rebooting Target System

To restart the complete target system enter http://10.0.0.21/reboot in your web browsers address field and the system will restart.

Note: for using this function it is necessary to connect the reset line see chapter 6.1.

# 9 FIRMWARE UPGRADE

**WARNING:** Following these instruction incorrectly, interrupting power during the firmware update, or using an incorrect or corrupt firmware file **might destroy WEBasDISK** and prevent it from operating properly. If this happens all of the LEDs will remain dark when restoring the power after running an update. In this case **WEBasDISK** must be returned to **Kontron**® for repair at your expense.

This example assumes that **WEBasDISK**'s IP address is the default 10.0.0.21 and the firmware file name is net1r110.rom.

- Access the **WEBasDISK** configuration web page with http://10.0.0.21
- At the bottom of the page you will find the current firmware name that includes the version *xx* and build *bbb* number NET1R1*xx*.*bbb*.
- Obtain a new firmware file from **Kontron**® and decompress it if necessary. The file should be named NET1R1*xx*.ROM where *xx* is the version number.
- Please note that the file name must be all upper case or all lower case. Rename the file if necessary.
- Consult the readme file (if present in the firmware file archive) for restrictions about which old firmware version can be upgraded to which new versions.
- Enter http://10.0.0.21/init_flash in your web browsers address field.
- A message "Ready for an FTP firmware upload!" should be returned and the status LED will be turned on.
- Upload the firmware file with an FTP client. To do this under MS Windows open the Command Prompt and enter the commands shown in bold type:

```
C:\WINDOWS> ftp 10.0.0.21

Connected to 10.0.0.21.
220 NET+ARM FTP Server 1.0 ready.
User (10.0.0.21:(none)): press <RETURN> here
230 User none logged in.
ftp> type binary
200 Type set to I.
ftp> put net1r110.rom
.....
ftp> bye

C:\WINDOWS> _
```

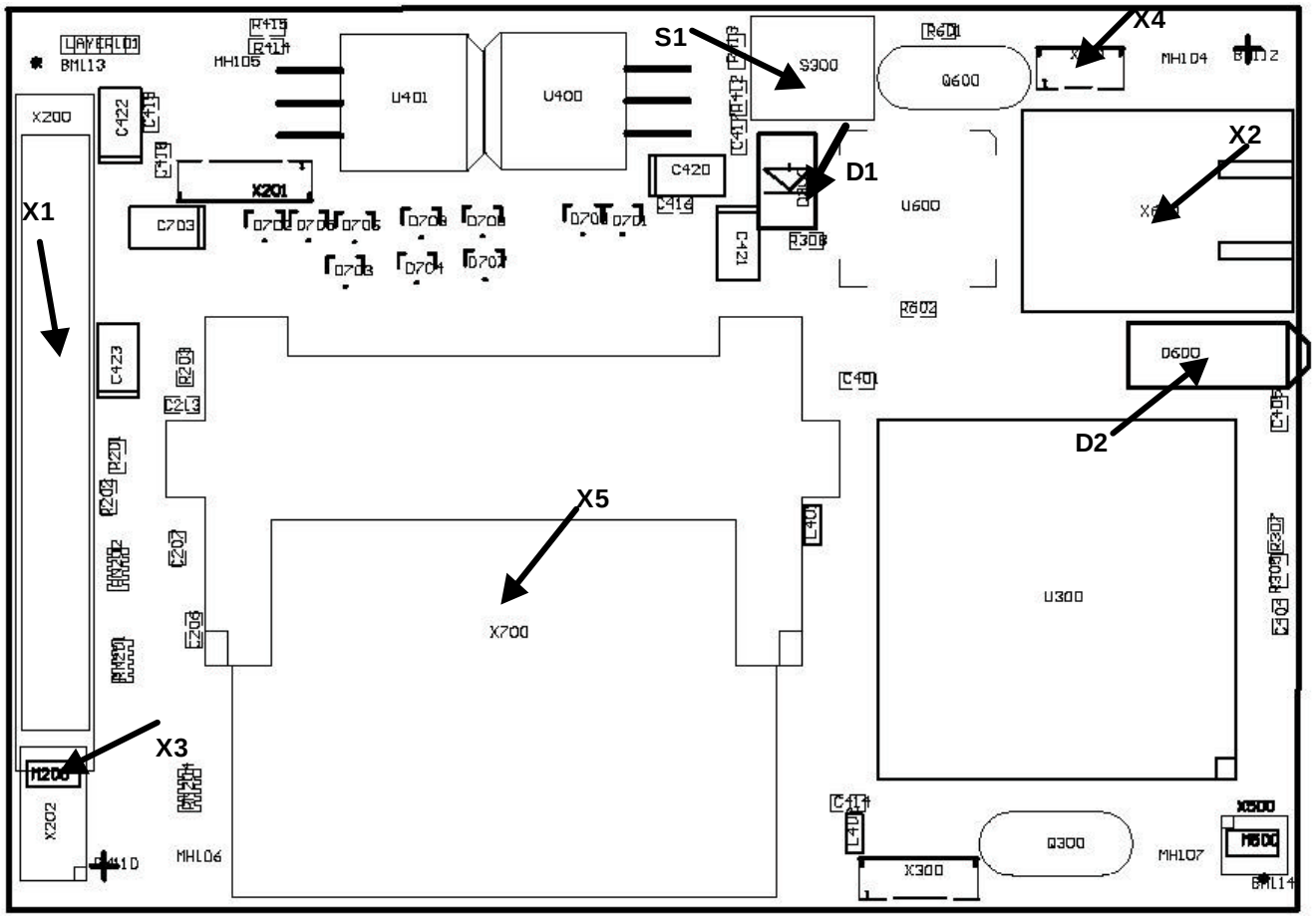
The file is stored in **WEBasDISK**'s RAM at first. The flash cycle will begin after the connection has been closed with the **bye** command. Up to that point you can upload a new file if a previous upload failed or you forgot the **type binary** command.

After issuing the **bye** command the status LED will remain on and will flicker every few seconds. The whole process can take a few minutes (currently less than two). When the firmware has been flashed completely the status LED will be turned off. After that, recycle the power and verify that **WEBasDISK** is working and the configuration page shows the new version and build number.

**DO NOT turn off the power while the STATUS LED is still on** after issuing the **bye** command. If the status LED is still on after 5 minutes have passed the upgrade has failed.

# 10 CONNECTOR LOCATIONS AND PINOUTS

## 10.1 Connector Locations and LEDs




**Note:** PIN 1 of connectors is marked with a square pad on the bottom layer!
**Note:** S1 is **NOT** a RESET button! Please refer to 8.3 for its function.

**D1** is a green status LED; it shows the right function of **WEBasDISK**. It should light up when switching power on and should go out after a few seconds.

**D2** is a triple LED and indicates the network interface status.

- The upper **red** LED indicates that a 100 MBit network connection is established (**speed** indicator).
- The middle **yellow** LED indicates that **WEBasDISK** is connected to a network (**link** indicator).
- The bottom **green** LED indicates that data is transmitted (**activity** indicator).

**S1**: IP address switch

**X1**: IDE connector

**X2**: Ethernet connector

**X3**: MASTER/SLAVE Jumper, connect to GND to operate **WEBasDISK** as master drive. Leave open for slave operation.

**X5**: CompactFlash socket

## 10.2 Pinout Table

| | IDE44 2.5" HDD | Ethernet | Jumper | I2C | CFC |
|---|---|---|---|---|---|
| **Pin** | **X1** | **X2** | **X3** | **X4** | **X5** |
| 1 | /RESET | TXD+ | VCC (+5V) | Vcc | GND |
| 2 | GND | TXD- | VCC (+5V | I2CLK | D03 |
| 3 | IDE D7 | RXD+ | RES_CPU | I2DAT | D04 |
| 4 | IDE D8 | NC | GND | GND | D05 |
| 5 | IDE D6 | NC | Reserved | | D06 |
| 6 | IDE D9 | RXD- | GND | | D07 |
| 7 | IDE D5 | NC | /Master | | /CS0 |
| 8 | IDE D10 | NC | GND | | GND |
| 9 | IDE D4 | | | | /ATA-SEL |
| 10 | IDE D11 | | | | GND |
| 11 | IDE D3 | | | | GND |
| 12 | IDE D12 | | | | GND |
| 13 | IDE D2 | | | | VCC |
| 14 | IDE D13 | | | | GND |
| 15 | IDE D1 | | | | GND |
| 16 | IDE D14 | | | | GND |
| 17 | IDE D0 | | | | GND |
| 18 | IDE D15 | | | | A02 |
| 19 | GND | | | | A01 |
| 20 | NC | | | | A00 |
| 21 | DMARQ | | | | D00 |
| 22 | GND | | | | D01 |
| 23 | /IOW | | | | D02 |
| 24 | GND | | | | /IOCS16 |
| 25 | /IOR | | | | GND |
| 26 | GND | | | | GND |
| 27 | IORDY | | | | D11 |
| 28 | BALE | | | | D12 |
| 29 | /DMACK | | | | D13 |
| 30 | GND | | | | D14 |
| 31 | IDEIRQ14 | | | | D15 |
| 32 | /IOCS16 | | | | /CS1 |
| 33 | IDEA1 | | | | GND |
| 34 | /PDIAG | | | | /IOR |
| 35 | IDEA0 | | | | /IOW |
| 36 | IDEA2 | | | | VCC |
| 37 | IDE CS0* | | | | INTRQ |
| 38 | IDE CS1* | | | | VCC |
| 39 | /DASP | | | | GND |
| 40 | GND | | | | GND |
| 41 | Vcc | | | | /RESET |
| 42 | Vcc | | | | NC |
| 43 | GND | | | | NC |
| 44 | NC | | | | VCC |
| 45 | | | | | /DASP |
| 46 | | | | | /PDIAG |
| 47 | | | | | D08 |
| 48 | | | | | D09 |
| 49 | | | | | D10 |
| 50 | | | | | GND |

# 11 COMPATIBILITY LIST

**WEBasDISK** should work with all mainboards that have IDE support.
You should be aware that using an adapter for 40 pin cables to 44 pin cable increases the total length of the IDE cable. This can cause problems with some boards so always use cables that are as short as possible.
The following table shows different **Kontron**® mainboards (including BIOS version) and common mainboard systems from different manufacturers, which have already been tested with **WEBasDISK** and are known to work correctly.

| | **BIOS** |
|---|---|
| ***coo*/MONSTER (64 MByte)** | Phoenix Bios; LEU2R116 |
| **MOPS/*cd*4 (36 MByte)** | AMI-Bios; P488R119 |
| **MOPS/*cd*6 (64 MByte)** | Phoenix Bios P588R118 |
| **ETX-mgx** | Phoenix Bios MOD1R222 |
| **ETX-P1 266 MHz** | Phoenix Bios MOD5R120 |
| **ETX-P3 700MHz** | Phoenix Bios; MOD6R121 |
| **DELL PIII/1 GHz** | OptiPlex GX150 V. A06 |
| **Asus P2B Rev. 1.02 PII/233 MHz** | Award Bios 4.51 PG |
| **GA586 ATX Rev. 3.0 PII/266 MHz** | Award Bios 4.51 PG |
| **Asus MEL-M Rev. 1.02 Intel Celeron 366** | Award Bios ACPI |

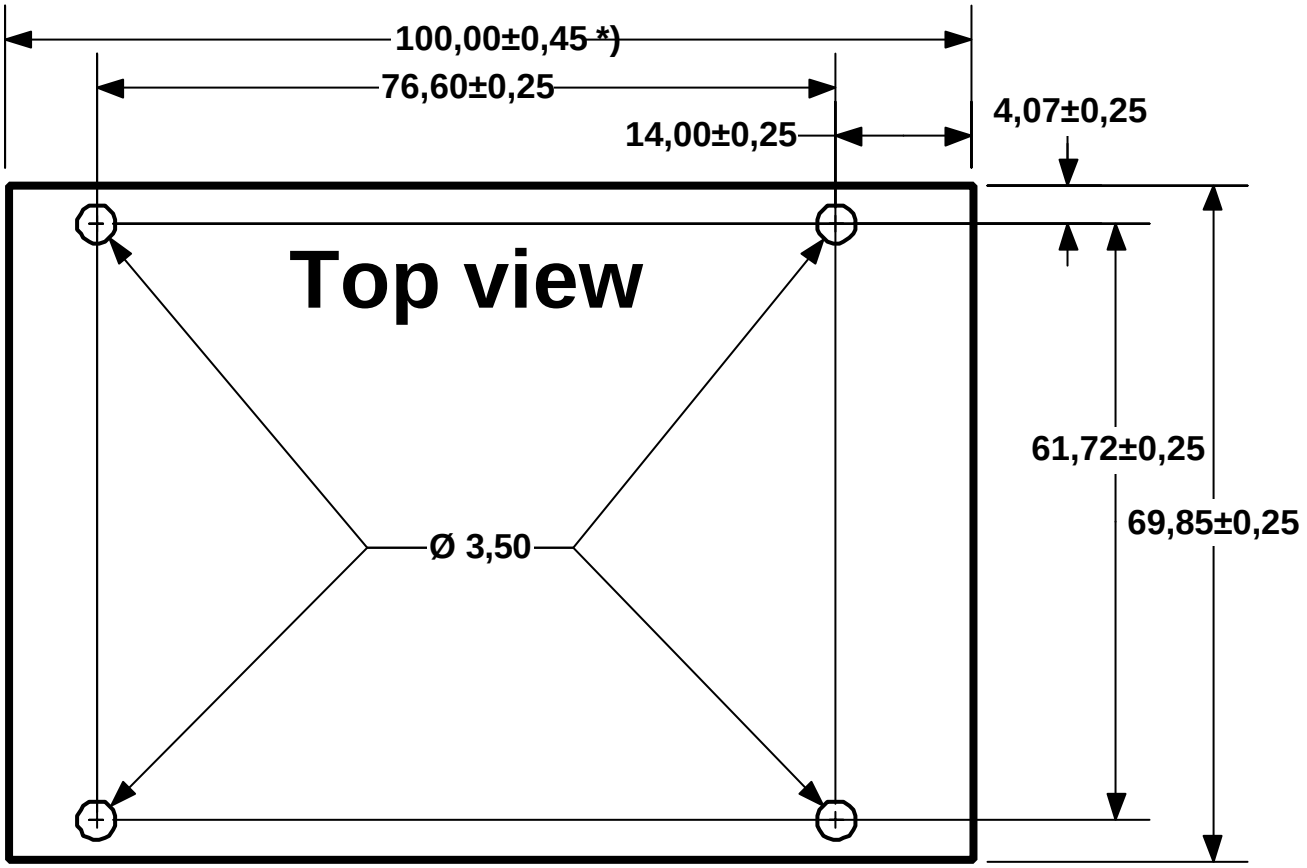
**Note:** If your mainboard doesn't support auto-detect hard disk you need to configure the BIOS setup with the correct settings for the hard disk geometry. You can use a board with automatic detection to record these values.

**Note:** At the moment you can't work with file names which are including the german umlauts, so always use filenames without umlaut.

# 12 SPECIFICATIONS

| | | | |
|---|---|---|---|
| **Electrical** | supply voltage | 5 ± 5% | [V] |
| | supply current | max. 550 | [mA] |
| **Mechanical** | board dimensions | see Picture 1: all mechanical dimensions | [mm] |
| | height | max. 18 | [mm] |
| | connectors | RJ45, 2 mm IDE | |
| | mounting | 4 drill holes, diameter 4 mm | |
| **Temperature** [1)] | operating | ± 0 to +70 | °C |
| | non operating | -10 to +85 | °C |
| **Humidity** | operating | 10 to 90 (non-condensing) | % |
| | non operating | 5 to 95 (non-condensing) | % |

**[1)] The maximum operating temperature is the maximum measurable temperature on any spot of the modules surface. It is the users responsibility to maintain this temperature within the above specification.**




**Picture 1: all mechanical dimensions in [mm]**

*) with additional IDE connector length is 104mm

To protect the external powerlines to peripherial devices the customer has to take care about:
The wires to the external device have the right diameter to withstand the max. avaiable current.
The houseing of external device fulfils the fire protecting requirements of IEC/EN 60950

# 13 LITERATURE, STANDARDS, LINKS

It is not the responsibility of **Kontron**® to supply you with information about standard PC technology. For your convenience we have compiled the list below, which contains different information sources that can be easily referenced

PC/104-Bus
PC/104 Specification Version 2.3 June 1996, **PC/104 Consortium; www.pc104.org**
Embedded PCs, **Markt&Technik GmbH, ISBN 3-8272-5314-4 (German)**
ISA-Bus, Standard PS/2 Connectors
ISA System Architecture, **Addison-Wesley Publishing Company, ISBN 0-201-40996-8**
AT BUS Design IEEE P996 Compatible, **Edward Solari, Annabooks San Diego CA. ISBN 0-929392-08-6 www.annabooks.com**
PC Handbook, Sixth Edition**, John P. Choisser and John O. Foster, Annabooks San Diego CA. ISBN 0-929392-36-1, www.annabooks.com**
AT IBM Technical Reference Vol. 1&2, **1985**
ISA Bus Specifications and Application Notes, **January 30, 1990, Intel**
Technical Reference Guide, Extended Industry Standard Architecture Expansion Bus, **Compaq 1989**
Personal Computer Bus Standard P996, **Draft D2.00, January 18, 1990, IEEE Inc**
Embedded PCs, **Markt&Technik GmbH, ISBN 3-8272-5314-4 (German)**
PCI Specifications
PCI Special Interest Group, **c/o Intel Corporation**
PCI System Architecture, **Addison-Wesley Publishing Company, ISBN 0-201-40993-3**
RS232C
EIA-232-E Interface between data terminal equipment and date circuit-terminating equipment employing serial binary data interchange (ANSI/IEA-232-D)

National Semiconductor's Interface Data Book includes several applications notes. These notes are also available online at http://www.national.com/. A search engine is provided to search the text of the available application notes. Entering “232“ as search criteria shows you a current list of related application notes.

# 14 DOCUMENT REVISION HISTORY

| Filename | Date | Edited by | Changes to previous document revision |
|---|---|---|---|
| NET1M102.DOC | 05-Oct-2001 | DJP | first draft |
| NET1M110.DOC | 09-Oct-2001 | BRU | first release |
| NET1M111.DOC | 23-Nov-01 | MUP/BRU | release for SPS/IPC/Drives 2001 |
| NET1M112.DOC | 17-Dec-01 | MUP/BRU | reworked version, added chapter 11 Compatibility List |
| NET1M113.DOC | 15-Jan-02 | MUP | expanded chapter 11 Compatibility List, completed temperature specification in chapter 12 Specifications, deleted note about disk size emulation restriction (only sizes < 1 GB available) |
| NET1M120.DOC | 26-Nov-02 | MUP | reworked manual for redesign NET1-CFC version |
| NET1M121.DOC | 18-Dec-02 | MUP | updated reboot und CFC description |
| NET1M122.DOC | 27-May-03 | MUP | added setup promt description, enlarged file mode description |