Help menu commands

The Help menu offers the following commands, which provide you assistance with this application:

Index	Offers you an index to topics on which you can get help.
Using Help	Provides general instructions on using help.
About	Displays the version number of this application.

New command (File menu)

Use this command to create a new document. Select the type of new file you want to create in the File New dialog box.

You can open an existing document with the Open command.

Shortcuts

Toolbar: 

Keys: CTRL+N

File New dialog box

Specify the type of document you wish to create:

File Open dialog box

The following options allow you to specify which file to open:

File Name

Type or select the filename you want to open. This box lists files with the extension you select in the List Files of Type box.

List Files of Type

Select the type of file you want to open:

Drives

Select the drive where the file is that you want to open.

Directories

Select the directory where the file is that you want to open.

Network...

Choose this button to connect to a network location, assigning it a new drive letter.

Save command (File menu)

Use this command to save the active document to its current name and directory. If you want to change the name and directory of an existing document before you save it, choose the Save As command.

Shortcuts

Toolbar: 
Keys: CTRL+S

Save As command (File menu)

Use this command to save and name the active document.

To save a document with its existing name and directory, use the Save command.

File Save As dialog box

The following options allow you to specify the name and location of the file you're about to save:

File Name

Type a new filename to save a document with a different name. A filename can contain up to eight characters and an extension of up to three characters.

Drives

Select the drive in which you want to store the document.

Directories

Select the directory in which you want to store the document.

Network...

Choose this button to connect to a network location, assigning it a new drive letter.

Exit command (File menu)

Use this command to end this session. You can also use the Close command on the application Control menu.

Shortcuts

Mouse: Double-click the application's Control menu button.

Keys: ALT+F4

Index command (Help menu)

Use this command to display the opening screen of Help.

Once you open Help, you can click the Contents button whenever you want to return to the opening screen.

Using Help command (Help menu)

Use this command for instructions about using Help.

About command (Help menu)

Use this command to display the copyright notice and version number.

Context Help command

Use the Context Help command to obtain help on some special portion. The mouse pointer will change to an arrow and question mark. Then click somewhere in the active window. The Help topic will be shown for the item you clicked.

Shortcut

Keys: SHIFT+F1

Title Bar

The title bar is located along the top of a window. It contains the name of the application and document.

To move the window, drag the title bar. Note: You can also move dialog boxes by dragging their title bars.

A title bar may contain the following elements:

- Application Control-menu button
- Document Control-menu button
- Maximize button
- Minimize button
- Name of the application
- Name of the document
- Restore button

Scroll bars

Displayed at the right and bottom edges of the document window. The scroll boxes inside the scroll bars indicate your vertical and horizontal location in the document. You can use the mouse to scroll to other parts of the document.

Size command (System menu)

Use this command to display a four-headed arrow so you can size the active window with the arrow keys.

After the pointer changes to the four-headed arrow:

1. Press one of the DIRECTION keys (left, right, up, or down arrow key) to move the pointer to the border you want to move.
2. Press a DIRECTION key to move the border.
3. Press ENTER when the window is the size you want.

Note: This command is unavailable if you maximize the window.

Shortcut

Mouse: Drag the size bars at the corners or edges of the window.

Move command (Control menu)

Use this command to display a four-headed arrow so you can move the active window or dialog box with the arrow keys.

Note: This command is unavailable if you maximize the window.

Shortcut

Keys: CTRL+F7

Minimize command (application Control menu)

Use this command to reduce the window to an icon.

Shortcut

Mouse: Click the minimize icon  on the title bar.
Keys: ALT+F9

Maximize command (System menu)

Use this command to enlarge the active window to fill the available space.

Shortcut

Mouse: Click the maximize icon  on the title bar; or double-click the title bar.
Keys: CTRL+F10 enlarges a document window.

Close command (Control menus)

Use this command to close the active window or dialog box.

Double-clicking a Control-menu box is the same as choosing the Close command.

Note: If you have multiple windows open for a single document, the Close command on the document Control menu closes only one window at a time. You can close all windows at once with the Close command on the File menu.

Shortcuts

Keys:	CTRL+F4 closes a document window
	ALT+F4 closes the window or dialog box

Restore command (Control menu)

Use this command to return the active window to its size and position before you chose the Maximize or Minimize command.

Switch to command (application Control menu)

Use this command to display a list of all open applications. Use this "Task List" to switch to or close an application on the list.

Shortcut

Keys: CTRL+ESC

Dialog Box Options

When you choose the Switch To command, you will be presented with a dialog box with the following options:

Task List

Select the application you want to switch to or close.

Switch To

Makes the selected application active.

End Task

Closes the selected application.

Cancel

Closes the Task List box.

Cascade

Arranges open applications so they overlap and you can see each title bar. This option does not affect applications reduced to icons.

Tile

Arranges open applications into windows that do not overlap. This option does not affect applications reduced to icons.

Arrange Icons

Arranges the icons of all minimized applications across the bottom of the screen.

No Help Available

No help is available for this area of the window.

No Help Available

No help is available for this message box.

WINman Help Index

WINMAN.EXE is a program for the adaptation of the ELSA WINNER graphics board and the ELSA WINNER Windows driver to your monitor.

Click on one of the following headwords for further help:

WINman Startup Menu

WINMAN.EXE is a program for the adaptation of the ELSA WINNER graphics board and the ELSA WINNER Windows driver to your monitor.

Click on one of the following headwords for further help:

First Installation / Simple Monitor Adaptation
Modifying a Graphics Mode, Adjusting Color Depth/Resolution/Timing
Graphics Mode Quick Switching

Graphics Mode Fast Switching

WINMAN.EXE is a program for the adaptation of the ELSA WINNER graphics board and the ELSA WINNER Windows driver to your monitor.

The graphics mode fast switching menu is presented only if you have previously saved any graphics modes with WINman. Then WINman starts with this menu.
The graphics mode fast switching menu offers the tested and saved graphics modes for fast switching.

In the graphics mode fast switching menu:

If you want to switch Windows to one of these graphics modes, click on the desired graphics mode and confirm with OK.

If you only want change the MULTIman configuration, the virtual pan area or the font size, do the changes and confirm with OK.

If you want to include a new graphics mode into the quick switching list or modify a graphics mode, select New Graphics Mode ....

If you want change the language, change the monitor or modify monitor data, select WINman main program ... and then Language or First ....

Monitor Data File

WINman uses the ELSA monitor short description file WINMAN.MON.
If your monitor is included in this file, the monitor limits can be retreived from the file.

In the monitor data menu, you can then select the manufacturer of your monitor from the upper list box and click on it. Afterwards you can select your monitor model from the lower list box. When you click on OK, the data of the selected monitor are loaded and used.

If your monitor was supplied with a disk containing a VESA VDIF monitor description file (*.VDA), you should click on VESA VDIF. All necessary information will then be read from that file to find the best graphics mode for your monitor.

If you don't find your monitor in the list, click on 'Other...'

Monitor Registration

Monitor manufacturer, monitor model name:
Normally you will find the manufacturer and the model name on a label on the back of your monitor; otherwise you have to consult your monitor manual.

Nominal monitor size:
The value for the monitor size is the nominal diagonal size of the picture tube (CRT). This value is a bit higher than the diagonal size of the visible display area. Typical values are
14" (35.5 cm), 17" (43 cm) or 20" (51 cm). The " character means inch (2.54 cm). The program uses only the inch value. To determine this value, you may also state the diagonal size in cm or measure the visible screen area in cm.

kHz horizontal scan frequency range,
Hz vertical refresh rate range:
You can find the minimum and maximum horizontal scan frequency and refresh rate in your monitor manual.
Here the maximum allowed horizontal scan frequency of your monitor (in kHz) is of special importance. If this limit is exceeded, in extreme cases your monitor can be damaged. The other values may be left zero if they can't be determined.

VESA VDIF:
If your monitor was supplied with a disk containing a VESA VDIF monitor description file (*.VDA), you should click on VESA VDIF. All necessary information will then be read from that file to find the best graphics mode for your monitor.

First installation / Simple Monitor Adaptation

Using this option is normally all you have to do to adapt the WINNER graphics board to your monitor.
The data of your monitor are determined by some simple questions. Afterwards, a graphics mode suitable for your monitor is proposed and used for Windows operation.
You may subsequently use other menu options to improve the graphics mode selection or change the color depth at any time.

Monitor Consultant (1): Selecting a Standard Graphics Mode

You have not filled in all the fields in the Monitor Registration. Important information is missing to find a graphics mode suitable for your monitor.

You can now either look for the maximum allowed horizontal scan frequency in your monitor manual and enter it in the previous menu (Monitor Registration), or take a certain operating mode/graphics mode (display resolution and frame refresh rate) from your monitor manual and select it in this menu, or, if you don't find a suitable mode, enter it in the following menu.

Monitor Consultant (2): Entering Resolution and Refresh Rate

Please take from your monitor manual either the maximum allowed horizontal scan frequency (in kHz) and enter it in the first menu of this sequence (Monitor Registration), or take an allowed operating mode/graphics mode (display resolution and frame refresh rate) and enter the values here.

Monitor Consultant (3): Test Screen/Saving

WINman has proposed a graphics mode. This graphics mode will be installed with the standard color depth for the moment (normally 8bpp = 256 colors). Later you can change it to a different resolution, color depth or refresh rate at any time.

The found graphics mode must be checked. Use the Test Screen button to activate a test screen. If Windows is already installed on the ELSA graphics board and the new graphics mode only slightly differs from the installed one, the new monitor timing is displayed under Windows. The display will only change a little, but will be displayed with the selected new timing.
Normally, however, the Windows screen dissapears, and a test pattern is displayed instead.
Please check the test setting. Especially the borders must be entirely and properly visible.
When you have a stable test pattern, you should first save the settings and restart Windows, and then begin adjusting display size and position.
If possible, you should use the monitor controls to adjust display size and position. If the control range of your monitor is insufficient, you can also use the buttons for display size and position (except for WINNER 100VL).

Finally, you must save the graphics mode as new Windows driver graphics mode.

Reading a VESA VDIF Monitor Description File

To adapt the WINNER graphics board to your monitor, the operating data and limits of your monitor must be determined. If a VESA VDIF monitor description file (*.VDA) exists for your monitor, it should be used for this purpose. Other methods are described under the headword determining monitor data.

In the WINman menu "Read VESA VDIF Monitor Description File", first select the desired color depth (normally 8 bpp = 256 colors). With higher color depths, the selection of allowed monitor timings is automatically reduced. Afterwards, select the desired monitor timing. The first two values stand for the X and Y resolution (horizontal and vertical). Common resolutions are 800 x 600 for a monitor size up to 15", 1024 x 768 for 16"..18", and 1280 x 1024 for 19" and larger. The next value indicates the frame refresh rate in Hz (frames per second). For applications with a mainly black background, 60 Hz may be sufficient. Applications with a brighter background (e.g. Windows) should run at least at 70 or better 75 Hz or more, to prevent the display from flickering. Refresh rates over 100 Hz usually don't provide any more visible improvement. The abbreviations i or ni stand for interlaced and non-interlaced, respectively.
The kHz values indicate the horizontal scan frequency. They must not exceed the maximum horizontal scan frequency of the monitor (it is not exceeded in a VDIF file). The MHz values indicate the pixel clock. The graphics board must be able to generate it (WINman checks that).

Check your selected monitor timing with the test screen. Afterwards, you can save the monitor timing as new graphics mode,

Selecting a Graphics Mode from Preset or Previously Saved Graphics Modes

After entering the desired color depth and resolution, a list of suitable existing graphics modes or monitor timings is generated. You can select a graphics mode from this list, check it with the test screen, modify it if desired, and save it as a new graphics mode for use.

This requires that the maximum allowed horizontal scan frequency (in kHz) of your monitor is known (see Determining monitor data).

If you don't find a suitable graphics mode, you can also program new graphics modes/monitor timings in another menu (see Creating a new monitor timing).

In the WINman menu "Select a Graphics Mode from Preset or Previously Saved Graphics Modes", first select the desired color depth (normally 8 bpp = 256 colors). Click on the + button under Resolution, until the desired X resolution is displayed. Common resolutions are 800 x 600 for a monitor size up to 15", 1024 x 768 for 16"..18", and 1280 x 1024 for 19" and larger. Then select the desired monitor timing. The first values stand for the X and Y resolution (horizontal and vertical). The next values indicate the color depth in bpp and number of colors. The next value indicates the frame refresh rate in Hz (frames per second). For applications with a mainly black background, 60 Hz may be sufficient. Applications with a brighter background (e.g. Windows) should run at least at 70 or better 75 Hz or more, to prevent the display from flickering. Refresh rates over 100 Hz usually don't provide any more visible improvement. The abbreviations i or ni stand for interlaced and non-interlaced, respectively.
The kHz values indicate the horizontal scan frequency. They must not exceed the maximum horizontal scan frequency of the monitor (WINman checks this). The MHz values indicate the pixel clock. The graphics board must be able to generate it (this is also checked by WINman).

Check your selected monitor timing with the test screen. Afterwards you must save the monitor timing as new graphics mode,

Modifying a Graphics Mode, Adjusting Color Depth/Resolution/Timing

Upon entering the desired color depth, resolution and refresh rate, a monitor timing is generated. This timing can be checked with a test screen, modified if desired and saved as new graphics mode.

This requires that the maximum allowed horizontal scan frequency (in kHz) of your monitor is known (see Determining monitor data).

In the WINman menu "Modify a Graphics Mode", first select the desired color depth (normally 8 bpp = 256 colors). With higher color depths, the maximum possible pixel clock is automatically reduced. Click on the + or - button under Resolution, until the desired resolution is displayed. Common resolutions are 800 x 600 for a monitor size up to 15", 1024 x 768 for 16"..18", and 1280 x 1024 for 19" and larger.
Afterwards, generate the desired Monitor-Timing by entering one of the three frequency values (Hz, kHz or MHz) or by adjusting it with the +/- buttons. Normally the desired refresh rate in Hz is entered.
For applications with a mainly black background, 60 Hz may be sufficient. Applications with a brighter background (e.g. Windows) should run at least at 70 or better 75 Hz or more, to prevent the display from flickering. Refresh rates over 100 Hz usually don't provide any more visible improvement.
The kHz values indicate the horizontal scan frequency. They must not exceed the maximum horizontal scan frequency of the monitor (WINman checks this). The MHz values indicate the pixel clock. The graphics board must be able to generate it (this is also checked by WINman).

The found graphics mode must be checked. Use the Test Screen button to activate a test screen.
If Windows is already installed on the ELSA graphics board and the new graphics mode only slightly differs from the installed one, the new monitor timing is displayed under Windows. The display will only change a little, but will be displayed with the selected new timing.
Normally, however, the Windows screen dissapears, and a test pattern is displayed instead.
Please check the test setting. Especially the borders must be entirely and properly visible.
When you have a stable test pattern, you should first save the settings and restart Windows, and then begin adjusting display size and position.
If possible, you should use the monitor controls to adjust display size and position. If the control range of your monitor is insufficient, you can also use the buttons for display size and image position.

You must save your new graphics mode in order to use it afterwards.

Editing Monitor Timing Details

If a very precise adaptation of the monitor timing to your monitor is required, the WINman menu "Edit Monitor Timing Details" can be used to adjust each timing value individually.

Check your modified monitor timing with the test screen. Afterwards, you must save the new graphics mode.

Check the test setting. Especially the borders must be entirely and properly visible.
If possible, you should use the monitor controls to adjust display size and position. If the control range of your monitor is insufficient, you can also use the buttons for display size and position.

You can find more information on monitor timing details under the headword monitor timing.

Monitor Timing Test Screen

Before a new monitor timing can be saved, WINman checks if the new timing is suitable for your monitor.
For this purpose, a test screen is displayed for a short time.
While the test screen is displayed, you can abort it at any time by pressing the Escape key (Esc).
Afterwards, you are asked if the test pattern was OK.

When you have a stable test pattern, you should first save the settings and restart Windows, and then begin adjusting display size and position.
Try to adjust the display size and position at the monitor. When this has no success you also can adjust the monitor timing with WINman.

Monitor Timing Test Screen

Was the test pattern OK ?

When you have a stable test pattern, you should first save the settings and restart Windows, and then begin adjusting display size and position.

Saving a Graphics Mode

Before a new graphics mode or a new monitor timing can be saved, a test screen must have been checked.

If you then select Save, you are presented the following selection:

Save as new graphics mode for Windows,
graphics mode also available to other applications:
The new graphics mode is saved on the graphics board and installed for the Windows driver. It can also be used by other applications (such as DOS applications).

Save as additional graphics mode,
do not (yet) change Windows graphics mode:
The new graphics mode is saved on the graphics board. The Windows driver is not switched to the this graphics mode for the moment. The graphics mode can later be installed as Windows graphics mode. The new graphics mode is also available to other applications (such as DOS applications).

Create a VESA VDIF file,
do not (yet) change Windows graphics mode:
The new monitor timing is saved in a VESA VDIF monitor description file (*.VDA). The graphics mode is not yet saved on the graphics board. After saving the VESA VDIF file, this menu reappears, so that the graphics mode can also be saved on the graphics board or as Windows graphics mode.

Saving a Monitor Timing: Freeing EEPROM Memory

All available memory for saving user-programmable graphics modes is occupied. To saveU the new graphics mode, one of the previously saved graphics modes must be deleted to free space for the new one. Select a graphics mode to delete, which you don't need any longer.

Saving a Monitor Timing as VESA VDIF file

In the WINman menu "Save as VESA VDIF Monitor Description File", the new monitor timing is saved in a VESA VDIF monitor description file (*.VDA).

The new graphics mode is not saved on the graphics board in this case. However, this can be done afterwards.

VDIF is a VESA standard, which defines a data format to describe monitor characteristics. A VDIF file contains several monitor data (e.g. the diagonal screen size), keeps the operating limits of the monitor (e.g. the maximum allowed horizontal scan frequency (kHz)) and describes some monitor timing data sets specially suited to the monitor (in the [PREADJUSTED_TIMING] sections).
Using VDIF files, monitor data can be saved, passed on and reused later.

WINman creates a template for a new VDIF file. Not all items are filled in, however. WINTM only fills in those items it would need to reload the file for its own use. If the file is to be used by other programs, the other items must be filled in as well. The keywords are already present, but where the place right of the '=' character is left blank, the missing information must be inserted. This can be done with any standard text editor, as the *.VDA VDIF file is a pure ASCII file.
WINman creates a new file for every monitor timing. If several monitor timings belong to the same monitor and are to be combined, the [PREADJUSTED_TIMING] sections of the other files must be appended to the end of the first file using a text editor.

VDIF filename:
The first three characters of the filename of the VDIF file should indicate the monitor manufacturer, while the following five letters or digits should represent the monitor model name. The filename extension must be .VDA. If possible, the entered path name should be a harddisk directory and not a floppy disk drive, as the latter would need a considerably longer saving time.

Nominal monitor size:
The value for the monitor size is the nominal diagonal size of the picture tube (CRT). This value is a bit higher than the diagonal size of the visible display area. Typical values are
14" (35.5 cm), 17" (43 cm) or 20" (51 cm). The " character means inch (2.54 cm). The program uses only the inch value. To determine this value, you may also state the diagonal size in cm or measure the visible screen area in cm.

kHz horizontal scan frequency range,
Hz vertical refresh rate range:
You can find the minimum and maximum horizontal scan frequency and frame refresh rate in your monitor manual.
Here the maximum allowed horizontal scan frequency of your monitor (in kHz) is of special importance. If this limit is exceeded, in extreme cases your monitor can be damaged.

Determining Monitor Data

To adapt the ELSA WINNER graphics board to your monitor, the operating data and limits of your monitor must be determined. Here the maximum allowed horizontal scan frequency of your monitor (in kHz) is of special importance. If this limit is exceeded, in extreme cases your monitor can be damaged.

There are several ways to determine the characteristics of a monitor:

Monitor manual:
You can take the technical specification of your monitor from the manual supplied with the monitor.

VESA DDC:
If your monitor is equipped with a VESA DDC connector and your graphics board is VESA DDC compatible, the monitor data can be send automatically to the graphics board over the monitor cable. If these conditions are true, WINman will show automatically the received data when you are doing the WINman First Installation / Simple Monitor Adaptation.

VESA VDIF monitor description file (*.VDA):
If your monitor was supplied with a VESA VDIF monitor description file (*.VDA), the required data can be read from this file. In WINman you will find a button for reading VDIF files under First Installation / Simple Monitor Adaptation.

ELSA monitor short description file WINMAN.MON:
If your monitor is contained in the ELSA monitor short description file WINMAN.MON, the monitor data can be taken from this file. This is done automatically, if you select the manufacturer and model name of your monitor during First Installation / Simple Monitor Adaptation (or if you select 'Change Monitor' later).

VESA DDC (Display Data Channel)

If your monitor is equipped with a VESA DDC connector and your graphics board is VESA DDC compatible, the monitor data can be send automatically to the graphics board over the monitor cable. If these conditions are true, WINman will show automatically the received data when you are doing the WINman First Installation / Simple Monitor Adaptation.

There are two different standards: DDC1 and DDC2.

DDC1:
A line in the monitor cable is used to send a continuous unidirectional data stream from the monitor to the graphics board.
In the case of a standard IBM VGA compatible 15-pin monitor connector, pin 12 (normally used as monitor ID bit 1) is used for data transmission, and the Vertical Sync signal of pin 14 is used as transmission clock (VCLK).
An EDID data set (Extended Display Identification) of 128 bytes is sent repeatedly, from which the major monitor data can be read in the computer. It contains e.g. the three-letter manufacturer-EISA-CFG-key, the monitor size, the extent of DPMS support, color characteristics and a list of supported VESA monitor timings and some free definable monitor timings.

DDC2:
A bidirectional data channel based on the I2C protocol is used for the communication between monitor and graphics board.
In the case of a standard IBM VGA compatible 15-pin monitor connector, pin 12 (normally used as monitor ID bit 1) is used for data transmission (SDA), and the pin 15 (normally used as monitor ID bit 3) is used as transmission clock (SCL).
The graphics board can request the short EDID information (see DDC1) as well as the more comprehensive VDIF information. The DDC2 channel can also be used for ACCESS bus communication.

VESA VDIF Monitor Decription File

VDIF is a VESA standard, which defines a file format to describe monitor specifications. A VDIF file contains several monitor characteristics (e.g. the diagonal screen size), keeps the operating limits of the monitor (e.g. the maximum allowed horizontal scan frequency (kHz)) and describes some monitor timing data sets specially suited to the monitor (in the [PREADJUSTED_TIMING] sections).

Using VDIF files, monitor data can be saved, passed on and reused later.

*.VDA VDIF files are ASCII files and can be created or modified with any standard text editor.
*.VDB VDIF files are binary coded files and can only be used by special software.
WINman can read and write *.VDA VDIF files. When writing a file, WINman only fills in those items that are relevant for WINman. If the file created by WINman is to be used by other software, the missing information must be inserted in the blank spaces right of the '=' character using a text editor.

*.VDA VDIF files consist of several sections:

[VERSION]:
Version number of the VESA standard.

[MONITOR_DESCRIPTION]:
General monitor description, e.g. Manufacturer = monitor manufacturer, ModelNumber = monitor model name, CRTSize = diagonal screen size.

[OPERATIONAL_LIMITS]:
Monitor operating limits, e.g. MinHorFrequency = min. horizontal scan frequency, MaxHorFrequency = max. horizontal scan frequency, MinVerFrequency = min. vertical refresh rate, MaxVerFrequency = max. vertical refresh rate.

[PREADJUSTED_TIMING]:
Monitor timing data set, e.g. PreadjustedTimingName = Timing name, HorPixel/VerPixel = X/Y resolution, HorFrequency = horizontal scan frequency, VerFrequency = vertical refresh rate, PixelClock = pixel clock rate, TotalTime = total time, AddrTime = display time, BlankStart = time between display start and blanking start, BlankTime = blanking time, SyncStart = time between display start and sync pulse start, SyncTime = duration of a sync pulse.

WINMAN.MON

If your monitor is contained in the ELSA monitor short description file WINMAN.MON, its operational limits can be read from this file. The file contains the major characteristics and limits of some known monitors.

In this ASCII text file, each describes a monitor. The entries are:
Monitor manufacturer, monitor model name, nominal diagonal monitor size in inches, min. and max. horizontal scan frequency in kHz, min. and max. vertical frame refresh rate in Hz, pixel size/dot pitch in millimeters.

Such a monitor description line might e.g. read as follows:
ELSA, GDM-17E40, 17", 29-82kHz, 50-150Hz, 0.26mm

Monitor Manual

For the best possible adaptation of your WINNER graphics board to your monitor, you should try to find the following data in the manual of your monitor:

Monitor manufacturer, Monitor model name, nominal diagonal monitor size in inches or cm (= diagonal CRT size in inch or cm), min. and max. horizontal scan frequency in kHz (= horizontal deflection frequency = scan rate), min. and max. vertical frame refresh rate in Hz (= vertical deflection frequency), pixel size in millimeters (= dot pitch).

Here the maximum allowed horizontal scan frequency of your monitor (in kHz) is of special importance. If this limit is exceeded, in extreme cases your monitor can be damaged.

Monitor Size

The value for the monitor size is the nominal diagonal size of the picture tube (CRT). This value is a bit higher than the diagonal size of the visible display area. Typical values are listed in the following table:

nominal diagonal size (inch)	nominal diagonal size (cm)	approx. visible area (cm)	common resolutions
14"	35,5	27 x 20	800 x 600
17"	43	32 x 24	1024 x 768
20"	51	38 x 29	1280 x 1024

" means inch, 1 inch = 2.54 cm.

Normally the resolution is set to 640 x 480 for monitors up to 13", 800 x 600 for 14"..15", 1024 x 768 for 16"..18", and 1280 x 1024 for 19" and larger. However, the best resolution depends on other factors as well, such as the dot pitch size and the maximum allowed horizontal scan frequency.

Graphics Mode (Videomode)

A graphics mode (or videomode) is a data set, which describes a certain monitor timing, a certain resolution, a certain color depth and possibly other technical data associated to a certain operating mode.

The various ELSA WINNER 1000/2000... graphics boards offer approx. 13 to 17 predefined fixed graphics modes and approx. 4 freely programmable graphics modes.
ELSA WINNER 100VL offers only predefined fixed graphics modes.

The predefined fixed graphics modes offer a range of common standard monitor timings. Normally e.g. the VESA timings 800 x 600 at 75 Hz, 1024 x 768 at 75 Hz, and 1280 x 1024 at 75 Hz are predefined (X resolution x Y resolution at refresh rate in Hertz).

The data of the user-programmable graphics modes can be freely adjusted. On some WINNER graphics boards they are saved in an EEPROM on the graphics board (e.g. WINNER 2000PRO), on other they are saved only in a tim=... text string in the Windows start up file SYSTEM.INI (e.g. WINNER 1000TRIO).

Monitor Timing

A monitor timing is a data set, which defines the temporal behavior of the monitor signals.
Basically these are pixel clock, horizontal scan frequency and frame refresh rate.
It is more precisely described by horizontal and vertical display time, frontporch, synchronization pulse (Sync) and backporch.
The display time is the time when the electron beam is drawing pixels to the screen. Subsequently, a certain time is needed to return the electron beam to the start position. This blanking time consists of frontporch (time between end of display time and start of sync pulse), sync pulse (duration of the synchronization pulse) and backporch (time between end of sync pulse and start of next display time). This applies to both horizontal and vertical timing.

Pixel Clock / MHz

The pixel clock or pixel rate is stated in MHz (Megahertz). The value normally lies in the range from 10 to 220 MHz. For example, a resolution of 1024 x 768 at 75 Hz would require a pixel clock of 79 MHz. The pixel clock value indicates how many million pixels are written per second.

Horizontal Scan Frequency / kHz

The horizontal scan frequency or deflection frequency is measured in kHz. The value normally lies in the range from 30 to 110 kHz. For example, a resolution of 1024 x 768 at 75 Hz would require a horizontal scan frequency of 60 kHz. The value indicates how fast the pixel lines are written, i.e. how many thousand times per second the electron beam in the picture tube moves from the left to the right.

Refresh Rate / Hz

The frame refresh rate or vertical deflection frequency is measured in Hz. The value normally lies in the range between 60 and 100 Hz. Hz is the abbreviation of Hertz. 75 Hz means that 75 frames are displayed per second.

For applications with a mainly black background, 60 Hz may be sufficient. Applications with a brighter background (e.g. Windows) should run at least at 70 or better 75 Hz or more, to prevent the display from flickering. Refresh rates over 100 Hz usually don't provide any more visible improvement.

In normal non-interlaced operation, the frame refresh rate is equal to the vertical deflection frequency. In interlaced operation, however, the frame refresh rate is only half the vertical deflection frequency, since two interlaced half frames are displayed one after the other. Normally, a non-interlaced timing is preferable.

The frame refresh rate is an important factor for monitor ergonomics. Refresh rates below 75 Hz or interlaced operation are classified as non-ergonomic.
Of course, ergonomics are affected by other characteristics as well, such as low radiation or a resolution suited to monitor size and dot pitch.

Interlaced / Non-Interlaced

In the past, the interlaced display method was often used to give the impression of a high refresh rate even with low horizontal scan frequencies. In this display mode, each frame is split into two half frames. In the first half frame, all the even lines are drawn, then, after a shift by one line, all the odd lines are drawn in the second half frame. The vertical deflection frequency is thus twice the frame refresh rate. This display method is e.g. used for television and by the IBM 8514/A video adapter.
A better display quality, however, is achieved in non-interlaced mode.

Resolution

The resolution indicates the number of pixels that can be displayed. For example, 1024 x 768 means that 1024 pixels are displayed in each horizontal row and 768 pixels in each vertical column. The total number of pixels on the screen is thus 1024 x 768 = 786432.

Normally the resolution is set to 640 x 480 for a monitor size up to 13", 800 x 600 for 14"..15", 1024 x 768 for 16"..18", and 1280 x 1024 for 19" and larger. However, the best resolution depends on other factors as well, such as the dot pitch size and the maximum allowed horizontal scan frequency.

The resolution can also be stated in dots per inch (dpi).

Color Depth / bpp

The color depth can be measured in bpp or numebr of colors.
bpp means bits per pixel and indicates the amount of video memory available for each pixel. For example, 8 bpp means that each pixel uses 8 bits, allowing 256 (= 2 to the power of 8) colors to be stored and displayed.
The number of colors indicates how many colors can be displayed simultaneously (if there are enough pixels on the screen).

Common color depths are:
1 bpp = 2 colors (black and white, monochrome),
4 bpp = 16 colors from a palette (e.g. VGA text mode or VGA 640 x 480 graphics mode),
8 bpp = 256 colors from a palette (standard mode of common HiRes graphics boards),
15 bpp = 32768 colors (5 + 5 + 5 bpg, HiColor/RealColor),
16 bpp = 65536 colors (5 + 6 + 5 or 6 + 6 + 4 bpg, HiColor/RealColor),
24 or 32 bpp = 16.7 million colors (8 + 8 + 8 bpg, TrueColor).

Under Windows, normally 8 bpp (= 256 colors) are used, as this is normally the best compromise between display fidelity and memory consumption/display speed. With lower color depths, the image quality decreases and often requires dithering. With higher color depths, memory consumption increases rapidly, normally the Windows driver gets slower, and often a display with these color depths is only possible with a reduced refresh rate or resolution. In fact, there is only few software that really uses the higher color fidelity with higher color depths.

With 4 or 8 bpp, the color number is translated to the actual color to be displayed using a palette (RAM DAC color table). These palettes offer e.g. 262144 different color entries (with 6 bpg) or 16.7 million color entries (with 8 bpg).

bpg should not be confused with bpp: bpg indicates the color depth per RGB color share (bpg = bits per gun). For example, with 16 bpp RealColor, 5 + 6 + 5 bpg indicates the number of bits available for the three color shares Red, Green and Blue.

MULTIman

MULTIman is a program for using Windows on multiple screens. You must have installed more than one ELSA WINNER graphics boards in your computer. Please pay attention that not every board may be combined with any other board, only special combinations are allowed. Best results you will get with two equal WINNER boards with equal memory size.

Install MULTIman with the ELSA installation program WSETUP. Here you determine in which color depths and with how many screens you can use MULTIman as maximum. Afterwards MULTIman is still not active. You have to configure MULTIman with WINman for switching MULTIman on.

To configure MULTIman with WINman Windows must run on the first ELSA WINNER board. You must have stored a graphics mode with WINman, so that WINman will start with the Graphics Mode Fast Switching dialog.
Select in the the Graphics Mode Fast Switching dialog the whiched graphics mode for the first screen and click at Change MULTIman ....

In the MULTIman configuration menu first select the whiched number of screens. The visible resolution of the first screen you cannot modify in this menu, but the virtual pan area of the first and the visible and virtual resolutions of all further screens you can adjust here. When the virtual resolution value is too large it may be possible that the Windows driver ignores this value.
Also here you adjust the refresh rate of the additional screens. Please pay attention that here you cannot check with a test screen. You have to ensure that you do not use a too high refresh rate! Pay attention to the limits of your monitor (see also determining monitor data).

Virtual Screen (Pan)

When the virtual screen is activated, the Windows working area is larger than the visible screen display. The hidden areas become visible as soon as the mouse cursor is moved to a screen border. The visible screen contents are then scrolled. This is also called 'Panning'.

After storing a graphics mode with WINman, at the next call of WINman you will enter the graphics mode fast switching menu. There you may adjust the pan area.

Font size

The font size usual used by Windows is adjustable. Normally you will use at resolutions up to 800x600 a font size of 96dpi (small) and with 1024x768 and higher of 120dpi (large).

After storing a graphics mode with WINman, at the next call of WINman you will enter the graphics mode fast switching menu. There you may adjust the font size.

VESA DPMS

Display Power Management Signaling.

The VESA DPMS standard describes a method to switch the monitor to an energy-saving mode in periods where it is not used. This can e.g. be triggered automatically by screen saver programs, which cause the monitor to enter an energy-saving mode, when the keyboard and the mouse have not been used for a certain time. As soon as a key is pressed or the mouse is moved, the monitor is switched back to normal operation.

Four different DPMS states are defined:

ON:
No enery saving, normal operation, display active.

STANDBY:
Little energy saving, short reactivation time.
This is signaled to the monitor by blanking the screen and switching the horizontal Sync signal off.
This mode is not always supported.

SUSPEND:
Considerable energy saving, longer reactivation time.
This is signaled to the monitor by blanking the screen and switching the vertical Sync signal off.

OFF:
Maximum energy saving, longest reactivation time.
This is signaled to the monitor by blanking the screen and switching both the horizontal and the vertical Sync signal off.