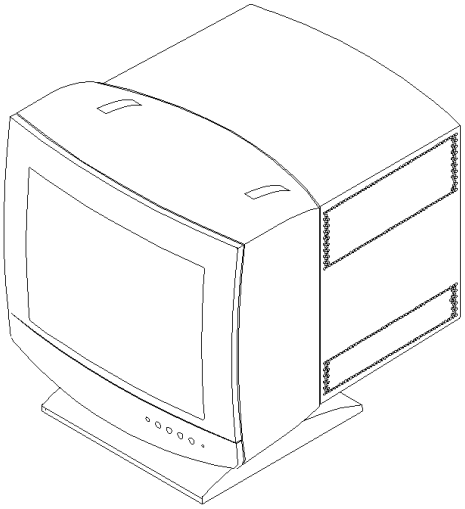
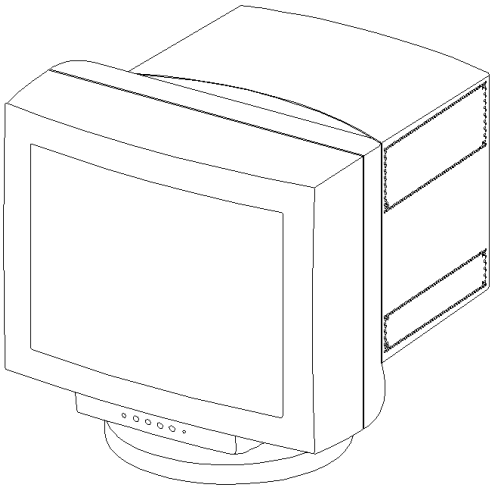
USER MANUAL

MGD203
MGD403





Published by GE 9845 Monitor Service Dept. Printed in Italy GB 3119 206 13832

PHILIPS

FCC NOTICE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC (U.S. Federal Communications Commission) rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.
This equipment generates, uses and can radiate radio frequency energy and , if not installed and used in accordance with the instruction, may cause harmful interference to radio communications.
Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
The monitor described in this user manual has been certified/registered by the safety agencies/regulatory authorities as model n° MD0709BRM.

Modification
The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by the manufacturer may void the user's authority to operate the equipment.

Cables
Connections to this device must be made with shielded signals cables with metallic RFI/EMI connector hoods to maintain compliance with FCC Rules and Regulations.

⚠ The lighting flash with arrowhead symbol is intended to alert the user of the presence of uninsulated "dangerous voltage" within the product's enclosure that may be sufficient magnitude to constitute a risk of electric shock to people.

⚠ The exclamation mark is intended to alert the user of the presence of important operating and maintenance (servicing) instructions in literature accompanying the appliance.

CAUTION
RISK OF ELECTRICAL SHOCK
DO NOT OPEN
ATTENTION
RISQUE DE CHOC ELECTRIQUE
NE PAS OUVRIR

CAUTION: TO REDUCE THE RISK OF ELECTRICAL SHOCK,
DO NOT REMOVE COVER (OR BACK)
NO USER SERVICEABLE PARTS INSIDE
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL

WARNING:

TO PREVENT DAMAGE WHICH MAY RESULT IN FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR EXCESSIVE MOISTURE.

The manufacturer declares that this product satisfies the basic requirements of Electromagnetic Compatibility and Safety of the Directive:

- 93/42/EEC Medical Device regarding risk Class I device.
- As having been designed and tested in conformity with the requirements of the following Reference Standards:
- EN55011 - Limits and methods of measurements of radio interference characteristics of Industrial Scientific and Medical (ISM) radio-frequency equipment; Class B
- EN60601-1-2 (1993) Medical electrical equipment - Part 1: General requirements for Safety - 2 - Collateral Standard: Electromagnetic compatibility - Requirements and tests.
- EN60601-1 Medical electrical equipment - Part 1: General requirements for Safety.
- EN60950 (Safety of Information Technology equipment, including electrical business equipment).

Conformity with the above basic requirements is certified by means of the CE Marking shown on the product.

Printed in Italy

TABLE OF CONTENTS

PREFACE 2

INTRODUCTION 2 - 3

MAIN FEATURES 4 - 5

SETTING UP YOUR NEW MONITOR 6 - 9

Inspection and unpacking 6

Connecting your monitor 7 - 9

INFORMATION AND USE OF THE CONTROL PANEL

Control location and functions 10

HARDWARE OSD

Adjustment: size position, geometry and special functions 11 - 22

Technical Specification APPENDIX 1

Mechanical Specification APPENDIX 2

Note for UK APPENDIX 3

Factory Pre-Set Video Timings APPENDIX 4

Thank you for purchasing the new MGD 203/MGD 403 high brightness monochrome monitor. We hope you will enjoy using it and we are confident that this quality product will meet your highest expectations.

PREFACE

This user manual contains the following informations:

- An introduction to the product features
- Instructions for unpacking and connecting to a computer: this allows you to quickly set-up and receive the best performance from your new monitor
- Guide to the On Screen Display
- Instructions for the care and maintenance of the monitor to extend its service life
- Trouble shooting information in case you encounter any difficulties while you are installing or using the monitor
- Technical performance

INTRODUCTION

The new MGD 203/MGD 403 is a very high brightness, high resolution digitally controlled autoscan monochrome monitor, based on the CyberScreen technology. ®

This new monitor, specifically designed for medical applications, gives unique performances in term of brightness, resolution and spot size.
Typical applications are X-ray display systems, Tele Radiology (TR), Picture Archiving and Communications Systems (PACS), Radiology Information Systems (R.I.S.)
Cardiac Workstation, etc.
A rich set of functions allows quick installation, flexible user preference customization and easy maintenance.

Specifically designed for very high-end medical imaging applications, the new MGD 203/ MGD 403 monitor is capable of working with all the formats available from the most different monochrome as well as color video cards of both Apple and PC environments and from all the high-end workstations.

This monitor incorporates a DDC1/DDC2B function that allows bidirectional communications between the monitor and PC system for optimal video configuration.

It is also possible to use up to 15 of these monitors in Daisy Chain Mode, as explained later in this manual.

Almost all the internal functions of the monitor are digitally controlled, and they can be stored in a resident memory which may contain up to 28 different formats, 12 of which are factory pre-set. The monitor can store also five different ref. settings (all user adjustable) wich can be recalled at any moment.

The power saving is operating ONLY when used with VESA DPMS compliant PC's and/or video controllers. By reducing power consumption to less than 15 W in suspend or stand-by mode and about 3 W in off mode, the monitor also complies with the Energy Star Computers Program initiated by the EPA.

The monitor will automatically sychronise within a wide range of scanning frequencies and determine the specific operating mode.

Monitor behaviour (degauss & reset), image quality and screen geometry adjustments can be changed or selected via the hardware OSD by means of the front panel push-buttons.

Your new monitor provides special features as:

- Very high contrast, high definition image.
- Digital brightness uniformity control (higher than 90%).
- Automatic correction of the effect of the horizontal magnetic field.
- Digital correction of geometric distortions.
- Automatic calibration (with optional light probe and software tool).
- Incredible high contrast (750 cd/sqm for 21" - 900 cd/sqm for the 17").
- Universal power supply.
- Interactive On Screen Display with a rich set of functions for easy installation and customization.
- Fully autoscan from 30 to 95 KHz (Horizontal Frequency)
  50 to 170 Hz (Vertical Frequency).
- Most common video modes already factory stored in the monitor memory.
- Large number of free memory locations to store up to 16 user-defined video modes.
- Full compatibily with all mono and color video cards, progressive and interlaced timing
- Black Level Stabilization for quick warm-up (4 min.) and perfect contrast stability over time.
- Integrated Ambient Light Compensation control function.
- RS 485 - like 'Daisy chain' bus connection (up to 15 monitors), allows simultaneous adjustment of each enabled monitor from each monitor's keyboard.
- RS 232 serial connection to host computer or service laptop.
- Large number of functions available through the interactive On Screen Display, (including also Hours of Operating, Horizontal Scan Rate, Vertical Refresh Rate) to allow easy installation and optimal operation.
- Orbiting function to increase CRT lifetime.
- Loop-through input facility makes the connection of more monitors to the same video source easy and economical.
- Flexible inputs selection: 3 BNCs (for mono drivers), 5 BNCs or 15 pin D-sub (for color drivers).
- Six user selectable combinations of max Brightness and max Contrast (5 preset + 1 available to the user).
- Direct key access for most commonly used user commands:
  BRIGHTNESS up/down, CONTRAST up/down, REF. SETTING, USER SETTING, USER STORE, KEYBOARD UNLOCK.
- Automatic Brightess Control programmable.
- Multi-level Keyboard lock facility.
- Number of hours of operation recorded and readable at any time.
- Power Saving (VESA DPMS) function according to latest Environmental Regulations & Reccomendations, including also the Power Factor (IEC 555-2) control circuit.

MAIN FEATURES

ADVANCED TECHNOLOGY

The MGD 203/MGD 403 monitor includes the following advanced technologies:
- CYBERSCREEN®: digital technology that allows the optimization of the picture quality all over the screen, corners included.
- MAGNETOMETER: the magnetic field inside your monitor may dramatically change whenever you tilt or swivel the monitor, or when you bring a magnetic object, e.g. an audio speaker, close to the monitor. Changes to the magnetic field around a monitor can cause distortion of the image displayed on the screen. The automatic magnetic field compensation circuitry (horizontal component of earth magnetic field) of your MGD 203/ MGD 403 monitor, immediately correct these effects thus keeping the image always sharp.

- ABC: Automatic Brightness Control (ABC) function, when enabled, adjusts automatically Brightness and Contrast according to the ambient light.

- Black Level Stabilization: The circuit reduces the time necessary to have a stabilized brightness level from 20 minutes to less than 4 minutes. The BLS circuit also automatically compensates the normal brightness decay due to the aging of the CRT.

- Digital Brightness Uniformity: thanks to the CyberScreen Technology, the screen brightness can be digitally controlled all over the screen, making possible to have a >90% brightness uniformity.

- Digital Control: all the monitor parameters, and display functions are accessible either via the Service Software package or by means of a set of direct commands, making it easy to remotly control the unit either from the System Console or from the Application Program.

- Digital Geometry Control:
Full digital control of all geometry parameters to improve the overall performances (geometry up to 1% - linearity up to 5%)

- Brightness Calibrator:
The optional MAP 201 HW/SW tool allows you to recalibrate the unit and to even improve the brightness uniformity of the image all other the screen.

- Input Connection:
Your new monitor can be operated either through the 3 (5) BNC input or via the 15 pin mini D-sub inputs to give you the maximum flexibility.

AGAS

The CRT of your new MGD203/MGD403 is finished with “AGAS” treatment, one of the most effective Anti-Glare/Anti-Static screen coating. With this treatment the intensity of reflected light is reduced to less than 0,5%, the picture contrast and sharpness remains unimpaired, and cleaning the screen is made easier.

AUTOSCAN

This feature allows you to use your monitor with a wide range of video cards: the MGD 203/MGD 403 monitor will automatically synchronize at all horizontal frequencies in the range 30 - 95 KHz and vertical frequencies in the range 50-170 Hz, and will automatically discriminate the specific operating mode.

CATHODE RAY TUBE

This new monitor incorporates a special monochrome 17”/21” CRT for brilliant and high contrast image (approximately three times the brightness of a standard monochrome CRT). The Flat Square screen has P45 phosphor for best performance, high resolution in-line electron polygon DAF (Dynamic Astigmatism and Focusing) triple gun and AGAS coating.

DDC (DISPLAY DATA CHANNEL)

Plug and Play

This feature allows your operating system and application software to retrieve the display identity information directly from the display device.
Note: the DDC feature works only if the monitor is connected to the PC by a mini D-Sub 15 pins / mini D-Sub 15 pins video signal cable as explained in the chapter Connecting your monitor’ .

ENVIRONMENT

All the package materials are recyclable. This monitor does not contain any: Polychlorinated Biphenyl (PCB), Polyc. Diphenylether (PCDE), Polybromated Diphenylether (PBDE), Asbestos and Cadmium.
The complete manufacturing process of the monitor does not emit the following substances: Chlorinated Fluorohydrocarbons (CFC), Acrylonitrile, Styrol, Phenol, Benzol and Heavy Metals.

HARDWARE OSD (ON SCREEN DISPLAY)

An easy to use OSD menu allows the user to control and adjust some monitor parameters: Tilt, Hor. & Vert. Phase, Hor. and Vert. Size.

1GUN / 3 GUNS BRIGHTNESS

This function allows to select (via OSD menu) between Low Brigtness Mode (even better picture sharpness and reduced eye strain) and High Brightness Mode (full brightness).

WARNING: This function is available only if “1-BNC” input is selected since it has no much sence with color video cards.

MAP 201 - Calibration Package (optional)

Specifically designed for the Triple Gun monochrome monitor series, this package consists of a calibration software and an high sensitivity light probe sensor.
The calibration package allows precise calibration of: brightness uniformity across the entire area, black level and white level, moreover it allows the user to correct the beam convergence from edge to edge for optimum display sharpness and accuracy.

ORBITING

The MGD 203/MGD 403 monitor includes a circuit specifically developed to increase the Cathode Ray Tube phosphors life-time by slightly moving, on a circular orbit, the entire displayed image.

DAISY CHAIN INTERFACE

The two 9-pin DSUB (male and female) connectors are parallel-wired RS485-like Multi-Point Serial Interface to allow the connection of up to 15 units in daisy chained configuration, each one having unique address in the range from 1 to 15.
The maximum total cable lenght between monitors is 15 m.
If Daisy Chain Mode is ENABLED the RS232, KEYBOARD and ABC controls are trasmitted to all the other monitors and at the same time executed inside the monitors.
(see specific chapter for details)

AUTOMATIC BRIGHTNESS CONTROL

The ABC feauture automatically adapts the contrast/brightness level to the ambient light (measured with a special sensor).
The ABC function is selectable in one of the following three modes:

Active control range : 10 - 1000 lux ambient on the photo-sensor

ABC - FULL	Adjustable Reduction Effect via OSD (20% - 100%)
ABC - REDUCTION	Derived from ABC - FULL
ABC - OFF	No reduction (100%)

In case of daisy chain connection only one unit can be allowed to be “ABC master” (flying master concept). See also pages 18 and 25 of this user manual.

SHOW CONFIGURATION

Via OSD it is possible to display the monitor unit information:
firmware release, total working hours (to keep track of the real usage of the monitor), active video mode, horizontal and vertical frequencies.

REFERENCE SETTING

Five different 'pairs' of brightness and contrast combinations can be defined, and stored in the monitor and selected via OSD menu. This feature is particularly attractive for OEMs using the monitor with multiple systems wich will save a lot of time in the factory and in the field as well ('tailoring' of the monitor adjustments on the specific system is no more needed).

POWER MANAGEMENT

The MGD 203/MGD 403 is ENERGY STAR compatible (requires "VESA DPMS" compliant signalling).
The Power Management feature operates automatically by gradually powering down the monitor in three different status:

ON:	Display in full operation (GREEN/YELLOW/RED) depending on reference setting status - see also' LED LIGHT MEANING TABLE'.
SUSPEND OR STAND-BY:	Either Hsync or Vsync is missing, the power con sumption is less than 15 W, (Yellow blinking LED).
OFF:	Both H & V signals are inactive, the power consumption is about 3 W, LED off).

This function can be easily disabled in a safe and permanent way through the Hardware OSD (Mode/Power Saver).

Note: The manufacturer is a partner in the EPA's Energy Star computer program.
The Energy Star emblem does not represent EPA endorsement of any product or service.

PRE-SET MODES

The monitor memory can store the geometry display parameters of each operating mode up to 28 modes (12 of them are factory pre-set; see appendix 4), thus allowing to auto-size the picture for the detected mode.
For any "not found" mode, the microprocessor will automatically store the geometry settings as adjusted by the user in the first free location.
The user has the possibility to change the adjustments at any time.

RESOLUTION

The maximum resolutions displayable on the screen are:
MGD203 : 1280 x 1024 @ 90 Hz
MGD403 : 1600 x 1280 @ 72 Hz

UNIVERSAL POWER SUPPLY

This unit will automatically detect and power up at any line voltage and frequency all over the world with no intervention of the operator.

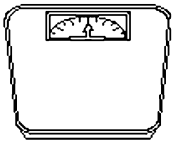
INSPECTION

Before installation, please check your monitor for physical damages which may have occurred during transport, and also check that the package includes all the items below:

- ´ Your new monitor (including pedestal)
- ´ Power cord
- ´ User manual
- ´ Signal cable (optional)

In case any items are missing or damaged, please contact your dealer or supplier.

UNPACKING



This chapter explains in detail how to safely unpack and position your new display:

Caution: please remember that your monitor weights approximately:
MGD 203 24 Kg (52.9 lbs);
MGD 403 32 Kg (70.5 lbs);
therefore to avoid injury, you should not lift it by yourself: two people are required.

1. To safely lift the monitor, position one hand below the top front mask and the other one below the bottom of the backcover.

2. Place the monitor only on a strong table or a desk. Avoid placing your monitor on top of a computer.

Suggestions !

To minimise glare and reduce eye fatigue, it is recommended to place your monitor in the following positions:

- ´ *avoid direct sunlight or other bright light source;*
- ´ *keep the screen lower than your eyes (with an angle of 20° respect to the ideal horizontal line;*
- ´ *set the monitor to "1 gun mode", when full brightness is not required;*

Important !

Retain your original packing, which is ideal and safe, in case you need to transport your monitor in the future.

The MGD 203/MGD 403 monitor is equipped with a tilt swivel base which will allow you to position the display at a comfortable viewing angle.

The base rotates 140° to the right and to the left (a stop prevents further rotation) and 5° top / forward plus 15° top / backwards.

A duly designed metal bracket is also available as option for both MGD203 and MGD403 when a ceiling or trolley mount application is requested.

CONNECTING YOUR MONITOR

Follow these steps to connect the MGD 203/MGD 403 monitor to your computer:

Connection to the mains

This monitor is equipped with a standard European or North American or United Kingdom power cord provided with ground wire (depending on where your monitor has been purchased). According to the AC power standards utilised in your Country, you may be required to purchase a different power cord.

Warning !

THE SOCKET OUTLET TO WHICH THE UNIT IS CONNECTED SHALL BE INSTALLED NEAR THE EQUIPMENT AND SHALL BE EASILY RECOGNIZABLE AND ACCESSIBLE AND/OR THE POWER LINE SHALL BE PROVIDED WITH AN EASILY RECOGNIZABLE CIRCUIT BREAKER.

Important !

- *Connect the monitor to a grounded outlet.*
- *This equipment can be connected to an IT power system with phase voltage of 230 VAC.*

Warning !

POWER LED COLOUR

In X-ray systems context, the red light indicates that the system is not working with optimal Image Quality; user could work in a hazardous condition. Press both **+** and **-** ref. keys contemporary; LED light turns green, and the optimal Image Quality shall be restored.

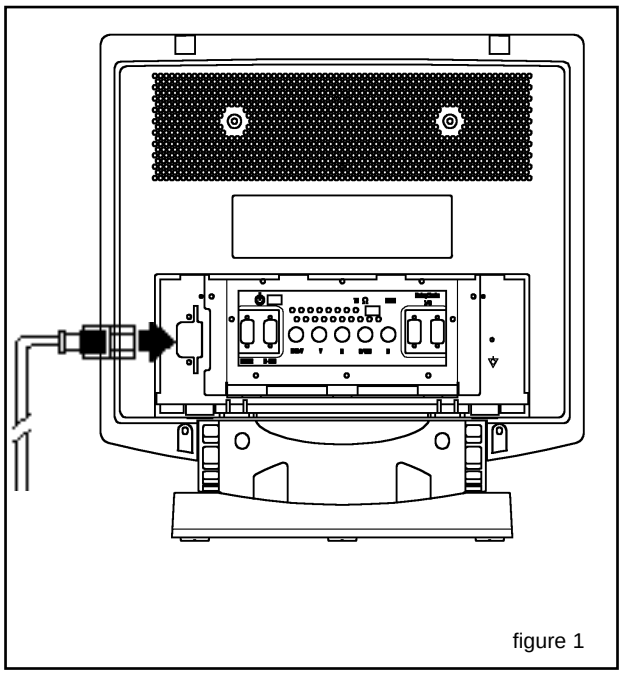


figure 1

1. Remove the connector protection from the rear cover.
2. Connect the female plug of the power cord to the mainssocket on the back of the monitor (see figure 1).
3. Connect securely the male plug of the power cord to the AC power supply outlet.

All the world AC power voltages (100 - 240 Vac) and frequencies will be automatically selected. You do not need to check the voltage or change any fuses.

Important !

Please, be sure the AC power of your computer or any one else in the chain (if Daisy Chain mode is used) is 'OFF' before connecting any display peripheral. You may cause serious personal injury as well as permanent damage to your computer equipments.

End of life disposal

Your new set contains materials which can be recycled and reused. Specialized companies can recycle your product to increase the amount of reusable materials and to minimize the amount of material to be disposed of.
Please, inform yourself on local regulations on disposal of your old set.

Connection to the computer

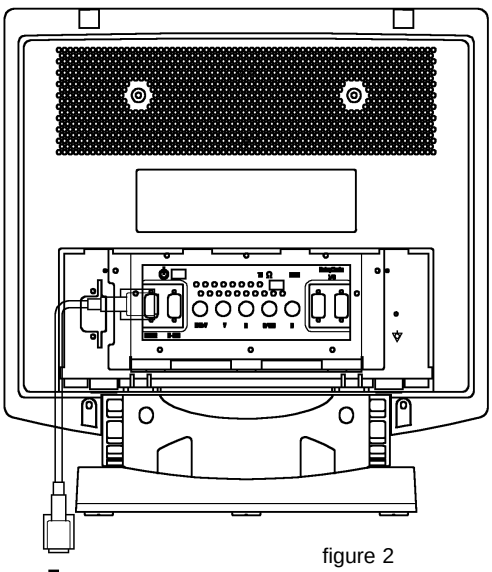


figure 2

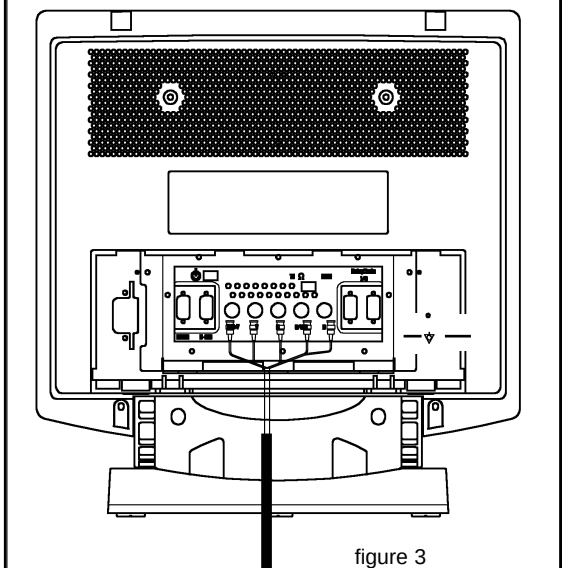


figure 3

D-SUB

1. Connect the male plug of the mini D-Sub 15 pins cable (optional) to the **D-SUB** input connector at the rear of the monitor (see figure 2).

VIDEO H/H+V V

2. (Alternative) Connect the BNC connectors (VIDEO/H/V) of the video cable to thesocket on the back of the monitor as shown in figure 3. In this configuration, the three guns will be automatically 'locked' (the monitor is driven as 'monochrome').

RGB H/H+V V

3. (Alternative) Connect the BNC connectors (R/G/B/H/V) of the video cable to the socket as in § 2. (see figure 4). In this configuration, the guns are driven indepentently (the monitor is seen as 'colour').

DAISY CHAIN

4. If you use some monitors in Daisy Chain configuration, the units shall be connected each other as shown in figure 5.

Important !
to prevent bad connection and to ensure a proper fit, tighten the thumbscrews.

5. Connect the other end of the video cable to the **VIDEO OUTPUT** of your PC (with high resolution graphic card or usual VGA graphic card).

Note: The monitor automatically recognizes the connected input.
The 15 pins D-Sub interface cable complies with VESA DDC1/2B standard.

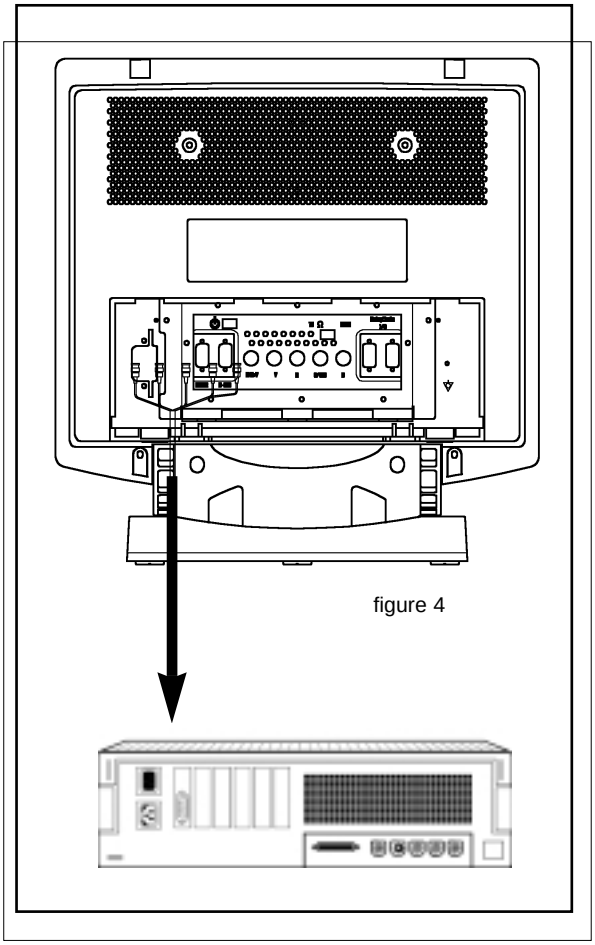


figure 4

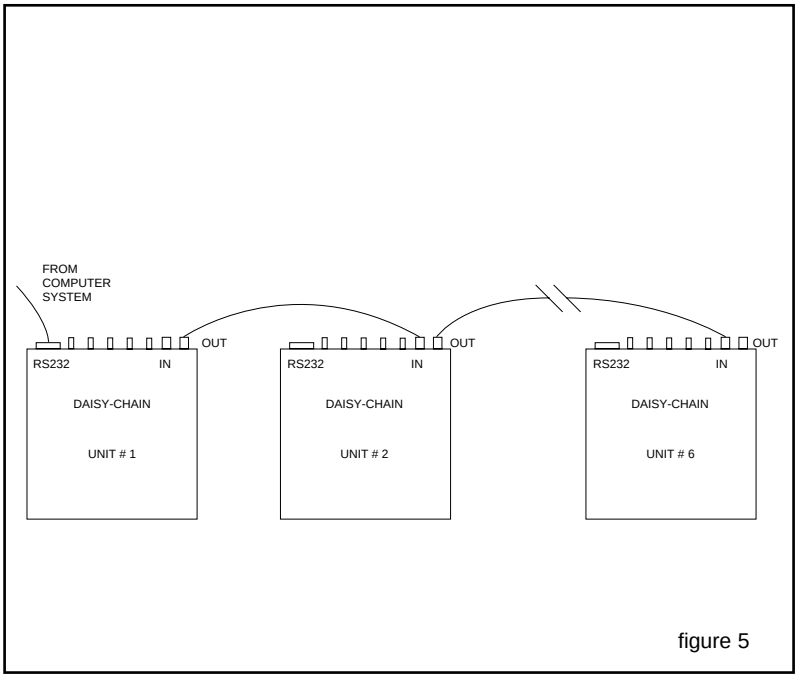
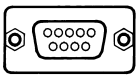


figure 5

RS232 CONNECTOR

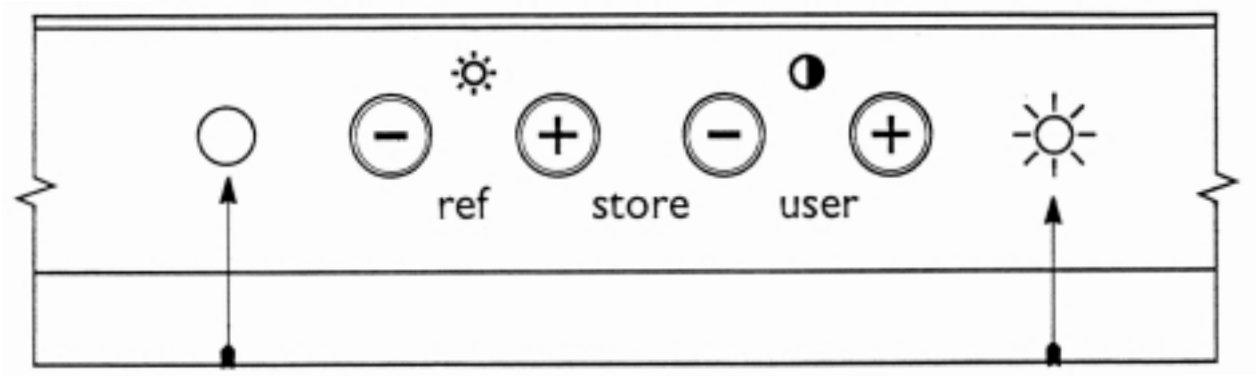
RS-232



This connector, located on the back of the monitor, is provided for Service maintenance of the monitor through an extra RS232 line.

Caution ! *It is to be used only by qualified personnel.*

INFORMATION AND USE OF THE CONTROL PANEL



Control location and functions

☼ Brightness -/+ ´ Adjusts brightness (brilliance of the screen)

◑ Contrast -/+ ´ Adjusts contrast (the ratio between the brightness of the brightest and darkest parts of a picture).

LED COLOR / MEANING TABLE

OFF	Monitor in STAND-BY condition or powered off.
YELLOW BLINKING	Monitor in suspend condition (see POWER MANAGEMENT)
RED	Monitor out of reference (see REFERENCE SETTING / STORE REFERENCE SETTING)
YELLOW	“USER SETTING” Calibration mode is active
GREEN	One of the five

HARDWARE ON SCREEN DISPLAY

An easy OSD menu to control and adjust by keyboard or mouse all the monitor parameters.
The H. OSD has five languages selectable by the user.

Hardware On Screen Display flow chart - MAIN MENU

OSD FUNCTIONS

GLOBAL MENU		LOCAL MENU	
____	1-GUN / 3-GUNS		
____	DEGAUSS		
____	KEYLOCK (ALL / STORE / CNTRL / OFF)		
____	ABC (FULL / REDUCED / OFF)		
____	REF. SETTING (1 / 2 / 3 / 4 / 5)		
____	LOCAL MENU	____ ABC MASTER (ON / OFF)	<1>
		____ POWER SAV. (ON / OFF)	
		____ AUTO DEG*AUSS* (ON / OFF)	
		____ DAISY ADD*RESS* (ON / OFF)	
		____ DAISY CHAIN (ON / OFF)	
		____ INPUT (1-BNC / 3-BNC / DSUB)	
		____ ORBITING (ON / OFF)	
		____ LIGHT BAR (ON / OFF)	
		____ OSD REVERSE	
		____ OSD POSITION	
		____ SHOW CONFIG.	
		____ STORE REF. SET.	
		____ H. SIZE	
		____ V. SIZE	
		____ H. SHIFT	
		____ V. SHIFT	
		____ TILT	
		____ ABC CONTRAST	
		____ ABC BRIGHTNESS	
		____ SERVICE MENU	

NOTES:

- ´ The DIRECT KEY ENTRY functions are transmitted over the daisy chain (if enabled) to set all monitors with the same light paramiters (brightness and contrast)
- ´ The OSD MENUs are meant for SERVICE purposes only
- ´ The GLOBAL MENU functions are transmitted over the daisy chain (if enabled) to set all monitors with the same paramiters.
- ´ The LOCAL MENU functions are intended for customising, NOT transmitted and only LOCAL executed.

<1> This function is executed ONLY on the LOCAL unit (that is going to be defined as ABC-Master). However, before the local execution of the setting, the GLOBAL command “Reset All Master ABC Units” is transmitted over the Daisy-Chain, in order to disable another (possible) already active Master unit.

USER INTERFACE FUNCTIONS

DIRECT KEYBOARD FUNCTIONAL INTERFACE

The monitor is equipped with DIRECT KEYING FUNCTIONS control capability for brightness and contrast functions.
When not locked, the operations are executed by using single front keys as following:

☼ **Brightness -** Decreases monitor brightness level.

☼ **Brightness +** Increases monitor brightness level.

◑ **Contrast -** Decreases monitor contrast level.

◑ **Contrast +** Increases monitor contrast level.

Notes: These above direct keying functions have an auto-repeat function implemented.
These operations are terminated as soon as the key is released.

☼ **Brightness - AND** ☼ **Brightness +** Set the monitor into the REFERENCE setting.

◑ **Contrast - AND** ◑ **Contrast +** Set the monitor into the USER setting.

☼ **Brightness + AND** ◑ **Contrast -** Store the current brightness and contrast value as new USER setting.

Notes: All these above direct keying functions are transmitted to other monitors via the daisy chain (when enabled) to obtain the same light value.
10 seconds after the last key release: brightness and contrast settings are stored in non-volatile memory.

☼ **Brightness - AND** ◑ **Contrast +** Activates the monitor OSD main menu and allows to select the desired function or sub menu

Note: This function is not transmitted over the daisy chain and is only executed locally.

All 4 buttons KEYBOARD UNLOCK

Notes: This function will never be locked.
This function is transmitted over the daisy chain when Daisy-Chain-Mode is enabled.

DIRECT KEYING FUNCTIONS

´REFERENCE SETTING

Pressing ☼ **Brightness - AND** ☼ **Brightness + together**, the brightness and contrast optimal factory stored values are recalled and update the currently active values. The front panel LED turns GREEN.
All the other daisy chain mode enabled units will execute it in parallel.
The window shown below will be displayed on all enabled units and will disappear after 2 seconds time-out.

MODE
REF. SETTING

´USER SETTING

Pressing ◑ **Contrast - AND** ◑ **Contrast + together**, the brightness and contrast stored by the user are recalled and update the currently active values.
All the other daisy chain mode enabled units will execute it in parallel.
The window shown below will be displayed on all enabled units and will disappear after 2 seconds time-out.

MODE
USER SETTING

´USER STORE

Pressing ☼ **Brightness + AND** ◑ **Contrast - together**, the currently active brightness and contrast setting values are permanently stored. These values will be recalled whenever the ***User Setting*** function will be activated.
All the other daisy chain mode enabled units will execute it in parallel.
The window shown below will be displayed on all enabled units and will disappear after 2 seconds time-out.

USER STORE
MODE

´KEYBOARD UNLOCK

While ***"Key Lock"*** warning message is displayed on screen, pressing **ALL front keys together**, the LOCAL KEYBOARD LOCK FUNCTION DISABLED shell be locally executed in the monitor.
The window shown below will be displayed on all enabled units (if daisy chain on) and will disappear after 3 seconds time-out.

MODE
KEYBOARD UNLOCK

´OSD GLOBAL MENU

Pressing ☼ **Brightness - AND** ◑ **Contrast + together**, the item of the 'GLOBAL MENU' menu is invoked locally.
The second line shows the new key functionality.
Due to the fact that the number of items can be quite high, in order to avoid a too large menu_window, only four of them are displayed. When the last displayed item is highlighted, scrolling is used to show the next item.

GLOBAL MENU
SEL EXIT - +
3 - GUNS
DEGAUSS
KEYLOCK ALL
ABC REDUCED
REF. SETTING 1
LOCAL MENU

ON-SCREEN-DISPLAY SPECIAL KEYS FUNCTIONS

OVERVIEW FOR OSD KEY FUNCTIONALITY

After the activation of OSD window, the following functions are associated to the different keys:

FUNCTION	KEY	DESCRIPTION
´Select	☼ **Brightness -**	Selects and executes the OSD FUNCTION highlighted When the highlighted item is blinking, store the new parameter value
´Exit	☼ **Brightness +**	Escapes from the On-Screen-Display Menu Function
´Adjust	◑ **Contrast -**	When main menu or sub-menu is active, it allows to move or scroll to the previous (upper) item When the highlighted item is blinking, decrements the relevant parameter value.
´Adjust	◑ **Contrast +**	When main menu or sub-menu is active, it allows to move or scroll to the following (lower) item When the highlighted item is blinking, increments the relevant parameter value.

Note: When in GLOBAL MENU mode, if no keys are pressed, the window shall disappear in 30 sec.
When in LOCAL MENU mode, if no keys are pressed, the window shall disappear in 5 min.

OSD DAISY-CHAIN OPERATION WARNING WINDOW

If a DAISY CHAINED function is executed and the DAISY CHAIN MODE is ENABLED the Daisy-Chain 'Sense-Line' is tested.
If the 'Sense-Line' is low, this means that some other unit is already 'Master' and have previously engaged the Line.
In this case a waiting time e.g. 1 second is engaged until the sense-line is freed.
If the waiting time is longer than this maximum waiting a pop-up window appears locally for 3 seconds with warning message.

MODE
DAISY CH. BUSY

GLOBAL MENU CONTROLS

The commands associed to the global menu are trasmitted over daisy chain (if enabled), and the other monitors connected receive and execute the commands. A pop-up window appears with a message to indicate a change: e.g.

MODE
REF. SETTING 3

The message window will be displayed on all applicable units.

´3-GUNS / 1-GUN (*BRIGHT. HI / LOW*)

This function makes sense only if 1-BNC input signal is selected. In this case it is possible to switch between 3-GUNS (Hi-brightness) mode and 1-GUN (Low-brightness) mode.
If the active selection is 1-GUN (Low-brightness) the front LED indicator is set to Red. In the other input selection cases (3-BNC or D-SUB) this function is locked to 3-GUNS mode. The message shown on the OSD window will be:
‘3-GUNS Locked’.

GLOBAL MENU
SEL EXIT - +
3-GUNS
DEGAUSS
KEYLOCK ALL

Pressing the “**SELECT**” key, the current active mode is **TOGGLED**.

´DEGAUSS

When the Global Menu window is displayed locally on the screen, if ‘DEGAUSS’ item is highlighted:

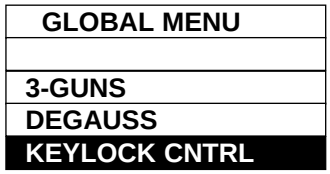
GLOBAL MENU
SEL EXIT - +
1-GUN
DEGAUSS
KEYLOCK ALL

Pressing the “**SELECT**” key, the Degaussing function is executed locally (degaussing circuit is operated once).

KEYBOARD LOCK

The Key lock function can be extended selectively to different key function controls. By default the KEYLOCK OFF shall always appear, then by ripetitively pressing the **"SELECT"** key you will have access to the following functions in turn:

MENU MESSAGE	FUNCTION
a) : KEYLOCK ALL	Lock ALL: All keyboard functions disabled (1)
b) : KEYLOCK CNTRL	Lock BRIGHT. +/-, CONTR. +/-, USER-STORE_Function
c) : KEYLOCK STORE	Lock USER-STORE_Function
d) : KEYLOCK OFF	No lock

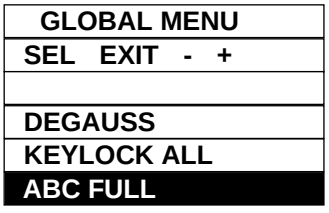


Pressing the "**EXIT**" key: the displayed lock-mode item is activated. The Special Function Menu window disappears, and a window similar to the one shown below appears on all monitors, showing which kind of lock function took place. From now on, all key boards operate according to the selected Lock-mode (except from the keyboard **UNLOCK** function). If the 'Daisy Chain Mode' option is enabled, the proper daisy chain command sequence is transmitted over the Daisy Chain Line and all the other monitors connected execute the command.

Pressing "***Adj. +***" or "***Adj. -***": the highlight selection of menu item moves downward/upward, and exit from the Lock-item line without activating any LOCK mode.
If ***"Lock All"*** (or ***"Store"*** or ***"Cntrl"***) is enabled, it is not allowed to activate OSD Menu anymore.
The warning message shall be displayed. To access OSD Menu, it is necessary to unlock the keyboard: e.g.

´ABC MENU

When the Global Menu window is displayed on the screen, if 'ABC <*status*>' item is highlighted:



Pressing the "**SELECT**" key, the ABC-mode selection <*status*> toggles between the 3 possible choices: FULL / REDUCED / OFF.
Every time the **"SELECT"** key is pressed once, the newly displayed selection becames effective. If the 'Daisy Chain Mode' option is enabled, the proper daisy chain command sequence is transmitted over the Daisy Chain Line and all other monitors execute the same function.

ABC FULL	Set ABC-Full Range
ABC REDUCED	Set ABC-Reduced Range (the real brightness and contrast depend on the ambient light)
ABC OFF	Set ABC-Off (Disabled)

´REFERENCE SETTING

Five different Brightness/Contrast parameters 'pairs' are available (Factory preset).They are identified with a number in the range 1-5. These values can be modified using OSD Service Local Menu item 'STORE REF. SET'. The Reference Setting #n choice defines which pair of '*Brightness'* and '*Contrast'* parameter is to be used when '*Reference Setting Recall*' or '*Store Ref. Set.*' function is activated.
When the Special Function Menu window is displayed on the screen, if 'REF. SETTING (1/2/3/4/5)' item is highlighted:

GLOBAL MENU
SEL EXIT - +
KEYBOARD LOCK
ABC FULL
REF. SETTING 5

Pressing the "**SELECT**" key, the Reference id. number displayed on the line 'rotates' starting from the current setting through all of the 5 possible choices, at the same time the newly selected reference becomes the active one. If the 'Daisy Chain Mode' option is enabled, the proper daisy chain command sequence is transmitted over the Daisy Chain Line and all other monitors execute the same function.

´LOCAL MENU

When the Global Menu window is displayed on the screen, if 'LOCAL MENU' item is highlighted:

GLOBAL MENU
SEL EXIT - +
ABC FULL
REF. SETTING 1
LOCAL MENU

Pressing the "**SELECT**" key, the GLOBAL Menu window is replaced by the Local Menu window:

LOCAL MENU
SEL EXIT - +
ABC MASTER ON
POWER SAV. ON
AUTO DEG. OFF
DAISY ADDR. 6
DAISY-CH. ON
ORBITING OFF
LIGHT BAR ON
OSD REVERSE
OSD POSITION
SHOW CONFIG.
STORE REF. SET.
H. SIZE
V. SIZE
H. SHIFT
V. SHIFT
TILT
ABC CONTRAST
ABC BRIGHTNESS
SERVICE MENU

LOCAL MENU CONTROLS

´SET MASTER ABC

This function allows the monitor's light sensor to operate as Master ABC Sensor for the Daisy-chained units. When enabled, the monitor sends (every 2 seconds) through the Daisy-Chain a command sequence to set "*Contrast and Brightness"* of all units to a suitable value, according to the measured ambient light.

LOCAL MENU	
SEL EXIT - +	
ABC MASTER	ON
POWER SAV.	ON
AUTO DEG.	OFF

Pressing the "**SELECT**" key, the 'ABC Master' function setting is toggled to ABC Master ON (if Daisy Chain is ON) or the warning blinking message "Daisy Chain Off" (if Daisy Chain is OFF).

Note: If any other monitor was set with ABC Master "ON", it shall be automatically turned to ABC Master "OFF".
When replacing one unit in an existing dasy chain installation, please take care of setting the new unit the same as the replaced one, to avoid dasy chain conflict between 2 master units.

´POWER SAVING

This function when enabled will check the presence or absence of horizontal and vertical TTL sync signals and activate the proper Power-State accordingly: 1) Power-On (< 190 W) if both H &V sync.s ; 2) Standby/Suspend (< 15 W) if only one sync; 3) Power-Off (< 1.5 W) if no sync signal is present.

LOCAL MENU	
SEL EXIT - +	
ABC MASTER	ON
POWER SAV.	OFF
AUTO DEG.	OFF

Pressing the "**SELECT**" key, the active mode of this function is toggled (ON/OFF).

´AUTO DEGAUSS

When enabled, Degaussing will be automatically triggered by the detection of a magnetic field variation (e.g. by changing or rotating the monitor unit orientation). When disabled, degauss is executed only once at power-on.
In Daisy Chain configuration, the unit on which the function is set becomes the '*Degauss-Master-Unit*'.
This means that the specific unit will send on, the daisy chain line the Degauss Command, and all units will execute the function simultaneously.
In Daisy Chain configuration, at power on the unit whose Daisy Address is **"1"** and AUTO DEG. ON will execute the Degauss command on itself and send the same command through the Daisy Chain to all other units connected. It is very important to assign an "address-1" unit in each Daisy Chain installation in order to have the Degauss function executed on each unit at power on.

LOCAL MENU	
SEL EXIT - +	
ABC MASTER	ON
POWER SAV.	OFF
AUTO DEG.	OFF

Pressing the "**SELECT**" key, the 'previously active mode of this function item is toggled.

Note: When replacing one unit in an existing dasy-chain installation, please take care of setting this function, on the new unit, the same as on the replaced one, to avoid dasy-chain conflict between two units set as AUTO DEG. ON.

´SET ADDRESS

This function allows to assign an unique address to each monitor in a Daisy Chain connection. This local operation is executed once during installation. The address can be in the range 1-15.
Note: Care must be taken to assign different addresses to each of the monitors connected in one Chain.

LOCAL MENU	
SEL EXIT - +	
POWER SAV.	ON
AUTO DEG.	OFF
DAISY ADDR.	1

Each time the "**SELECT**" key is pressed, the address displayed on the window is incremented by one unit (set to 1 if '--') and saved in the memory of the monitor. When the address "15" is reached a further key press shall set it to '--' (this simbol indicate no address assigned).
Note: When replacing one unit in an existing dasy chain installation, please take care of setting the address of the new unit the same of the replaced one, to avoid dasy-chain conflict between two units having the same address.

´DAISY CHAIN MODE

Each monitor has 2 modes of control operation:
DAISY-CHAIN MODE option OFF for local operation: RS232, KEYBOARD and ABC controls are just executed LOCALLY (inside the monitor unit). In this condition no command sequence is sent (trasmitted) to Daisy-Chain interface and no command will be received from the Chain.
DAISY-CHAIN MODE option ON the controls are trasmetted to the other monitors and all applicable received controls are executed.

The Daisy-Chain Control commands are:

Brightness, Contrast, Reference Setting, User Setting, Store User Setting, via Keyboard;
1-GUN / 3-GUNS, DEGAUSS, KEYLOCK, (ALL / STORE / CNTRL), ABC (FULL / REDUCED / OFF), REF. SETTING (1/2/3/4/5)
ABC MASTER OFF, via On Screen Display selection.
ABC measurement control and RS232 Commands

When a unit is set to Daisy Chain OFF, it shall automatically reset to ABC Master OFF, to prevent the possibility to set to ABC Master ON in more than one unit in a Daisy Chain configuration.

LOCAL MENU	
SEL EXIT - +	
AUTO DEG.	OFF
DAISY ADDR.	4
DAISY CH.	ON

Pressing the "**SELECT**" key, the active mode of this function item is toggled (ON/OFF).

´INPUT SELECTION

This function allows to choose the setting of the proper input mode between three possibilities:

LOCAL MENU	
SEL EXIT - +	
DAISY ADDR.	6
DAISY CH.	ON
INPUT =	3-BNC

Pressing the "**SELECT**" key, the 'INPUT = <*SEL*>' item displays the next selection among three possibilities: 1-BNC, 3-BNC, D-SUB.
The current choice is not activated immediately, to avoid the loss of the image on the screen.

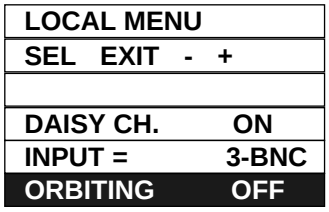
Pressing the "**EXIT**" key, the selected input is activated.

1-BNC: when selected, the video amplifier input is switched to BNC V2 (green).
3-BNC: when selected, the video amplifier input is switched to three BNC: V1, V2, V3.
Each gun is connected to the single BNC input.
D-SUB: when selected, the video amplifier input is switched to 15 PINS D-sub connector.

Note: If the previous selection of the brightness mode item was 1-GUN, after activation of D-SUB or 3-BNC mode, it will be automatically forced to 3-GUN LOCKED (see also GLOBAL MENU CONTROLS - 3-GUN/1-GUN).

´ORBITING

When enabled, the function causes a very slow movement of the image displayed on screen, shifting few millimeters upward, leftward, downward and rightward in order to reduce the " PRINTING" effect on the screen due to browning of glass and burn-in of phosphors of CRT tube displaying a still image. The total cycle lasts about one hour.



Pressing the "**SELECT**" key, the previously active mode of this function item is toggled.

Note: When ORBITING function is enabled all the geometry adjustments from the OSD Local Menu are inhibited, and at the corresponding menu line the warning message 'ORBITING ON' is displayed with blinking attribute. In this case, pressing the "**SELECT**" key once more will remove the warning message.

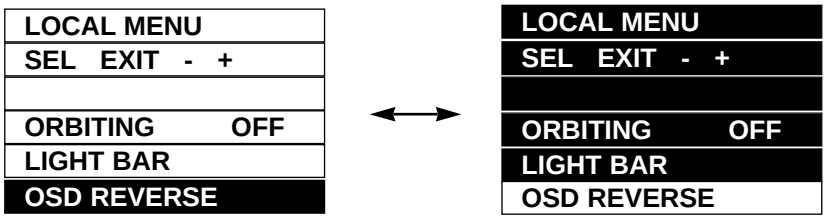
´LIGHT BAR (ON / OFF)

When disabled, this function prevents the appearing on screen of Brightness & Contrast Bars, Ref. Setting, User Setting, and User Store messages, after touching one of control keypads.
When enabled, the above mentioned messages appear (for 3 seconds) on the screen, during adjust operation from keypads.

Pressing the "**SELECT**" key, the previously active mode of this function item is toggled.

´OSD REVERSE

On Screen Display menu window is displayed with reversed video attributes: e.g. '*dark background*" will be toggled to '*white background*".



Pressing the "**SELECT**" key, the previously active mode of this function item is toggled

´OSD POSITION

This function allows to move the OSD Menu window at the desired position on the screen.

LOCAL MENU
SEL EXIT - +
LIGHT BAR ON
OSD REVERSE
OSD POSITION

First "**SELECT**" key press will change the message 'OSD POSITION' to 'OSD UP/DOWN' (blinking) message, indicating that the function is active, press + / - keys to move up/down the window.

Next "**SELECT**" key press saves previous changes and turns the message 'OSD UP/DOWN' (blinking) to 'OSD LEFT/RIGHT' (blinking) message, indicating that the function is active, press - / + keys to move left/right the window.

Further "**SELECT**" key press saves previous changes and turns the message 'OSD LEFT/RIGHT' (blinking) to 'OSD POSITION' message, (non blinking).

At this point all the changes in OSD window position are permanently stored

If pressing the "**EXIT**" key at any time, when the message is blinking, last change in the new OSD position is only temporary saved in memory. In this case if the monitor is switched OFF, the "temporary saved" change is lost.

´SHOW CONFIGURATION

This function is intended to display monitor firmware release, accumulated operating hours, selected video channel Hor. & Vert. frequencies on the screen window:

LOCAL MENU
SEL EXIT - +
LIGHT BAR
OSD REVERSE
SHOW CONFIG.

Pressing the "**SELECT**" key, the Local Menu disappears and a new window (see below) appears. This window contains information about unit. Pressing "**SELECT**" key again this windows disappears and the Local Menu is displayed.

SEL EXIT	
FW-REL:	1.00
WORK. HRS.	12345
CHANNEL NUM.	11
HOR.	31.5 KHz
VERT.	70.0 Hz

Note: The useful range for Working Hours is: 0 to 99.999
Channel number is the stored timing presenty recognized by the monitor.

´STORE REFERENCE SETTINGS

This function allows to modify the values of *Brightness* and *Contrast* associated to each of the 5 Reference Settings of the unit. The change is operated on the currently active Ref. Setting in OSD Global Menu.
The sequence of operations is:

- ➢ Select the reference to be changed in OSD Global Menu (1 to 5).
- ➢ Set the desired values using keys ☼ **Brightness -/+** and ◑ **Contrast -/+**. LED will turn to RED because setting is out of ref. values.
- ➢ When *Brightness* and *Contrast* values are set as required, enter OSD and select the Local Menu 'STORE REF. SETTING' item. The LED will turn GREEN, to show that the setting is now stored.

LOCAL MENU	
SEL EXIT - +	
OSD REVERSE	
SHOW CONFIG.	
STORE REF. SET.	

Pressing the "**SELECT**" key, the current *Brightness* and *Contrast* values are stored in the active Reference Setting Memory.
The Local Menu disappears and a new window will be displayed indicating information about which one of the Reference Settings has been updated.

STORED	
REF. SETTING	3

´HORIZONTAL SIZE / VERTICAL SIZE / HORIZONTAL SHIFT / VERTICAL SHIFT / TILT

When the Local Menu window is displayed, if one of the following item is highlighted: "H.SIZE", "V.SIZE", "H.SHIFT", "V.SHIFT", "TILT"

LOCAL MENU	
SEL EXIT - +	
OSD REVERSE	
SHOW CONFIG.	
H. SIZE	75

LOCAL MENU	
SEL EXIT - +	
SHOW CONFIG.	
H. SIZE	75
V. SIZE	66

LOCAL MENU	
SEL EXIT - +	
H. SIZE	75
V. SIZE	66
H. SHIFT	88

LOCAL MENU	
SEL EXIT - +	
V. SIZE	66
H. SHIFT	88
V. SHIFT	43

LOCAL MENU	
SEL EXIT - +	
H. SHIFT	88
V. SHIFT	43
TILT	57

A first "**SELECT**" key press makes the line blinking; the corresponding parameter can now be modified using **+** and **-** keys.
A further "**SELECT**" key press makes the line stop blinking. This way the value is also saved in memory.

If you press the "**EXIT**" key when the message is blinking the new parameter value remains active but is not saved in memory.
Pressing the "**EXIT**" key, the Local Menu disappears.

When displaying a new timing not yet known by the monitor, you can adjust all the geometry parameters and then automatically store them in memory. The associated CHANNEL NUM will be shown in the SHOW-CONFIG window of the Local Menu.

Note:
When the ORBITING function is enabled, all the geometry adjustments from the OSD Local Menu are inhibited. If an attempt is made to modify one of following items: H. SIZE, V.SIZE, H. SHIFT, V. SHIFT and TILT, on the corrisponding menu line the blinking warning message 'ORBITING ON' is displayed.

To modify one of the geometry parameters the Orbiting Function must be disabled first.

´ABC CONTRAST REDUCTION-FACTOR EFFECT

This function allows the user to customize the 'CONTRAST' behavior of the ABC circuit at different ambient light in the range: 10 to 100 lux.

LOCAL MENU	
SEL EXIT - +	
V. SHIFT	43
TILT	57
ABC CONTRAST	

To modify ABC_Contrast Reduction-Factor, the sequence of operations is the following:
First set ABC FULL in the Global Menu and than blank the sensor (e.g. with a finger) for all the time of the operation.

Highlight ABC CONTRAST in the Local Menu and press "**SELECT**" key: a new window is displayed on the screen.
The blinking line shows the '**ABC Contrast Reduction factor value**'. Press now the **+ / -** key to change the value: the effect is visible at the same time.

SEL EXIT - +	
ABC CT	137

When the desired effect is achived, press the "**SELECT**" key to exit the function, this way the Local Menu window is displayed and the new '**ABC Contrast Reduction factor value** ' is saved in memory.

If you press the "**EXIT**" key when the message is blinking the new parameter value will remain effective but will not be permanently stored in memory.
Pressing the "**EXIT**" key, the Local Menu disappears.

´ABC BRIGHTNESS REDUCTION-FACTOR EFFECT

This function allows to customize the BRIGHTNESS behavior of the ABC circuit at different ambient light in the range: 10 to 100 lux.

LOCAL MENU	
SEL EXIT - +	
TILT	57
ABC CONTRAST	
ABC BRIGHTNESS	

To modify ABC_ Brightness Reduction-Factor, the sequence of operations is the following:
First set ABC FULL in the Global Menu and than blank the sensor (e.g. with a finger) for all the time of the operation.

Highlight ABC BRIGHTNESS in the Local Menu and press '**SELECT**' key: a new window is displayed on the screen.
The blinking line shows the '**ABC Brightness Reduction factor value**'. Press now the **+ / -** key to change the value, the effect is visible at the same time.

SEL EXIT - +	
ABC BR	204

When the desired effect is achived, press the "**SELECT**" key to exit the function this way the Local Menu window is displayed and the new '**ABC Brightness Reduction factor value**' is saved in memory.
If you press the "**EXIT**" key when the message is blinking the new parameter value will remain effective but will not be permanently stored in memory.
Pressing the "**EXIT**" key, the Local Menu disappears.

´ABC REDUCTION-FACTORS COMBINED TO REF. SETTINGS

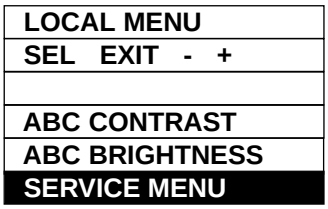
Each of the five Reference Settings has its own couple of ABC_Reduction_Factor settings.
At monitor power-on, the ABC_Setting corresponding to the active Reference Setting are used to drive the ABC_Reduction_Effect.
Every time a new Reference Setting is selected, the associated ABC_Setting variables are used to drive the ABC effect.

To preset any of the five ABC brightness and contrast reduction factors, please use the following sequence of operations:

a) - select one of 5 reference settings (e.g. #1) in the OSD global menu.
b) - Set ABC contrast and ABC brightness reduction factors according your needs following the Local Menu procedures indicated above.
c) - repeat steps a) and b) selecting the other reference settings.

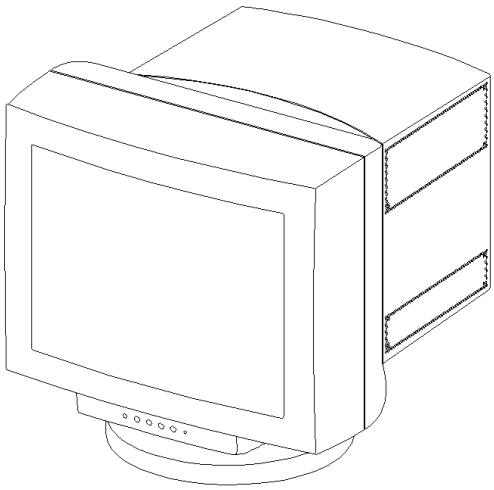
´SERVICE MENU

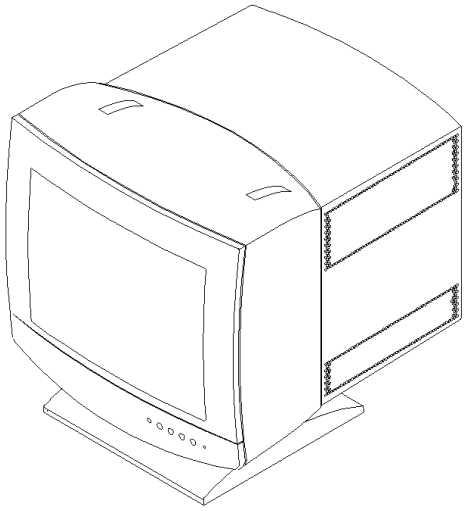
This function is reserved to TECHNICAL SERVICE personnel which only has the tools and the knowhow to perform the factory - level involved light adjustments.



Pressing the ***"EXIT"*** keys to go back to the Local Menu.

APPENDIX





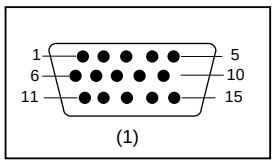
APPENDIX 1

The following specification are subject to change without notice. Specification limits are guaranteed for the pre-set timings at the "nominal picture size"

	TECHNICAL SPECIFICATIONS
CRT	17/21 inches - Flat square CRT - Medium persistence white phosphor type P45 - Surface treatment Anti Glare Anti Static (AGAS) - 43% light transmission (approx.) - Dynamic astigmatic Focus
POWER SUPPLY	Universal Power Supply 90 to 264 Vac, nominal range 100 ÷ 240 Vac
INPUT SIGNALS	VIDEO = BNCs (VIDEO G/VIDEO RGB, V, H/H+V) and D-SUB inputs analog 0.700 Vpp typ., Impedance = 75Ω SYNC = composite on video or separate composite TTL level or separate H and V sync TTL level (+ or -), Impedance = 270Ω
SCANNING FREQUENCIES	**HORIZONTAL RANGE:** MGD 203: 30 to 85 KHz (continuous/autoscan) MGD 403: 30 to 95 KHz (continuous/autoscan) **VERTICAL RANGE:** 50 to 170 Hz (continuous/autoscan)
VIDEO BANDWIDTH	MGD 203: up to 1280x1024 @ 90Hz MGD 403: up to 1600x1200 @ 75H
RESOLUTION	up to 1280 x 1024 @ 90 Hz (MGD203) - 1600x1200 @ 75 Hz (MGD403)
VISUAL PERFORMANCE	SPOT SIZE ≤ 0.30 mm at 120 cd/m^2 (center) (typical) ≤ 0.35 mm at 300 cd/m^2 (center) ≤ 0.45 mm at 750 cd/m^2 (center)
EMI / RFI	CISPR11/EN5011 Class B, FCC Class A, IEC 601-1-2/EN60601-1-2
SAFETY & REGULATIONS	EN60950/UL1950/CSA No 950, EN601-1/UL2601/CSA No 601-1, FDA/DHHS, RœV
MARKS AND STATEMENTS	CSA NTRL/C, CE, RœV §5 (4), 21CFR Subch. J (FDA) 47CFR Part 15 Class A (FCC)
ERGONOMICS	Ergonomics performance complies with ZH 1/618 and ISO9241-3
	ENVIRONMENTAL CONDITIONS
OPERATING	AMBIENT TEMPERATURE: 0°C ÷ +40°C
STORAGE	AMBIENT TEMPERATURE: -20°C ÷ +60°C
HUMIDITY	10% ÷ 90% R.H. (non condensing)
	RELIABILITY
MTBF	50.000 hours (excluding CRT)
	CONNECTORS
INPUT SIGNALS CONN.	15 pins mini D-SUB and 5 BNCs
RS232 INPUT	standard D-SUB
EQUIPOTENTIAL PIN	External ground safety connector
DAISY CHAIN CONN.	IN and OUT standard RS 485 Interface
AC POWER	EN60320 C14 (EUROPE)
	EXTERNAL CONTROLS
FRONT SIDE	Brightness High/Low, Contrast High/Low (Multifunction keys)
REAR SIDE	Power on-off
	CABLES
POWER CORD	

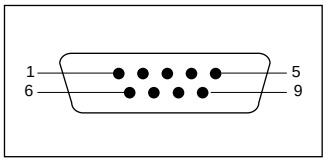
PIN ASSIGNMENT

(1) The 15-pins D-sub connector (female) of the video signal cable:



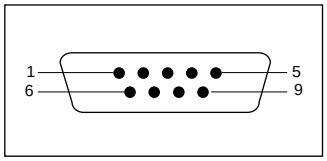
Pin N°	Assignment	Pin N°	Assignment
1	V_1 video input	9	+5V EXT
2	V_2 video input/Sync on green	10	Logic ground
3	V_3 video input	11	Optional - connected to pin10
4	Ground	12	NC
5	Ground	13	H sync
6	V_1 video ground	14	V sync
7	V_2 video ground	15	NC
8	V_3 video ground		

(2) Communications port (RS 232):

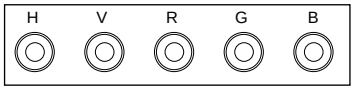


Pin N°	Assignment	Pin N°	Assignment
1	NC	6	NC
2	Rx viewed from PC	7	NC
3	Tx viewed from PC	8	NC
4	NC	9	+ 5 V
5	Ground		

(3) Two 9-pins D-sub connectors (1 male - 1 female) for Daisy chain:

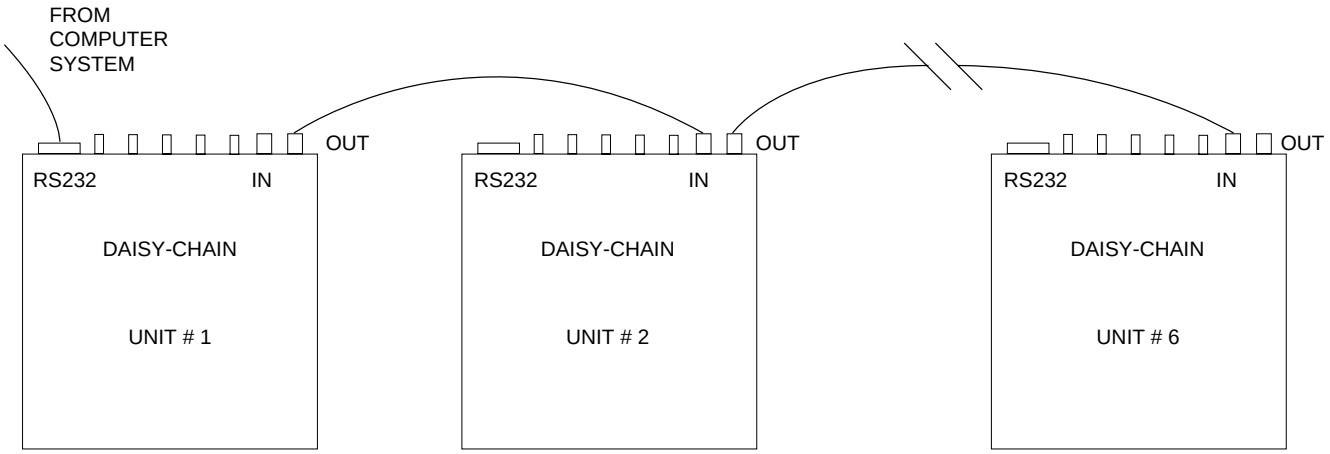


Pin N°	Assignment	Pin N°	Assignment
1	Ground	6	NC
2	Sense line	7	Ground
3	NC	8	NC
4	NC	9	Data line 2
5	Data line 1		



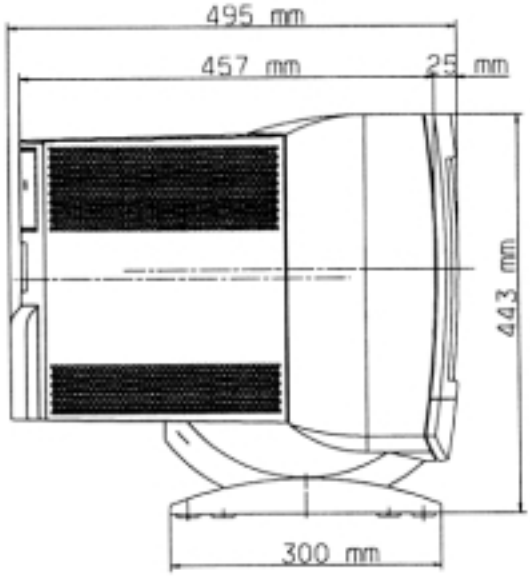
BNC	Assignment
R	Red Analog Video
G	Green Analog Video + Combined sync. on green
B	Blue Analog Video
V	Vertical sync.
H/H+V	Horizontal / Comp. sync.

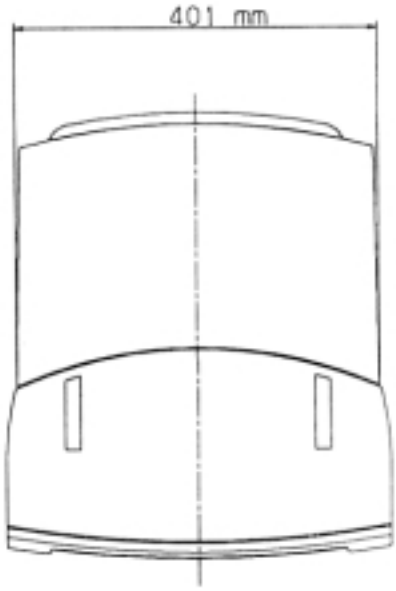
(5) Daisy chain connection:

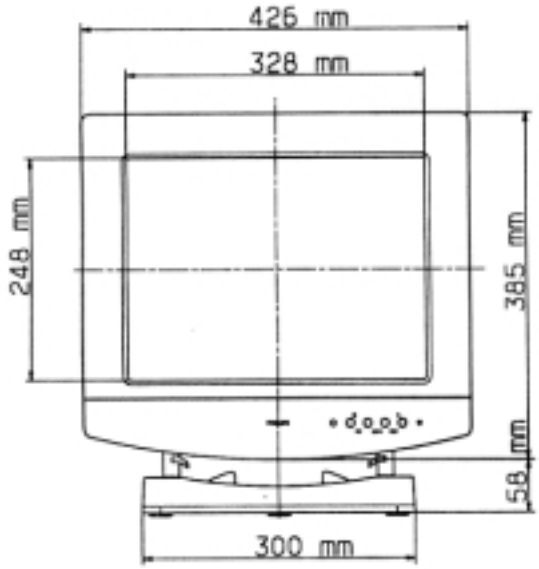


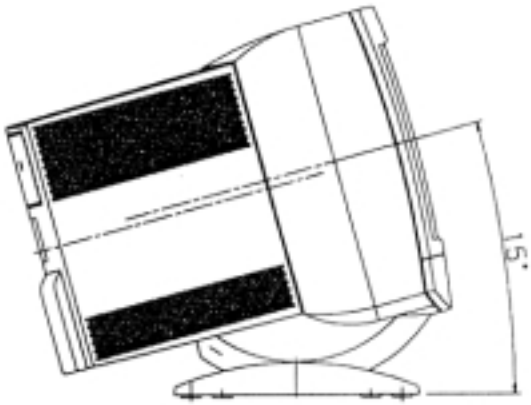
APPENDIX 3

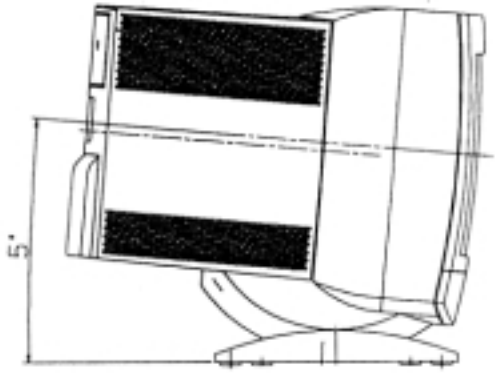
MGD 203 MECHANICAL SPECIFICATIONS - CARATERISTIQUES MECANIQUES		
WEIGHT - POIDS	24kg (52.9 lbs)	
DIMENSIONS	: w x h x d (l x h x p)	: 426 x 446 x 495 mm





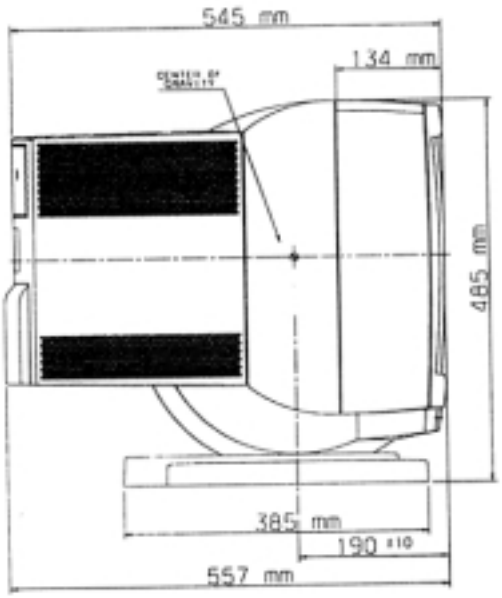


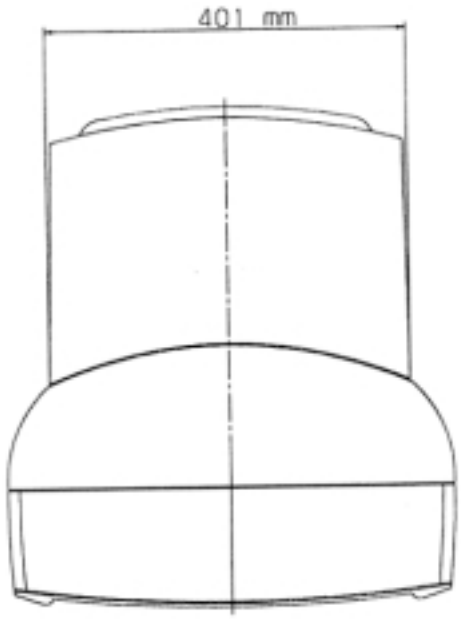


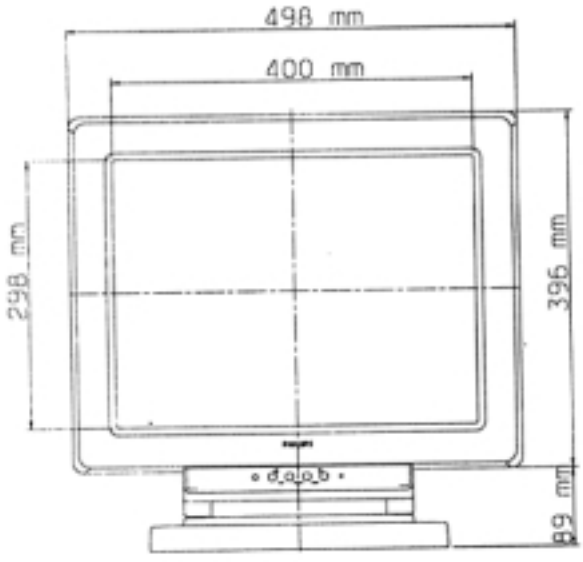


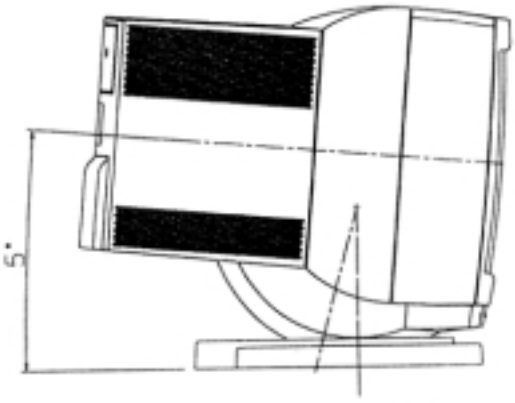
APPENDIX 4

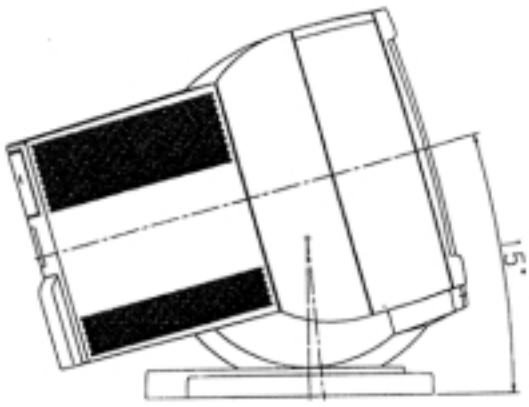
MGD 403 MECHANICAL SPECIFICATIONS - CARATERISTIQUES MECANIQUES		
WEIGHT - POIDS	32kg (70.5 lbs)	
DIMENSIONS	: w x h x d (l x h x p)	: 498 x 485 x 557 mm











APPENDIX 5

⚠ **WARNING - THIS APPLIANCE MUST BE EARTH GROUNDED**

IMPORTANT (information for UK only)

This apparatus is supplied with an approved moulded 13A plug. To change a fuse in this type of plug proceed as follow:

1. Remove Fuse cover and fuse.
2. Fit new fuse which should be a BS 1362 5A, A.S.T.A. or BSI approve type.
3. Refit the fuse cover.

If the fitted plug is not suitable for your socket outlets, it should be cut off and an appropriate 3-pin plug fitted in its place.

If the main plug contains a fuse, this should have a value of 5A. If a plug without a fuse is used, the fuse at the distribution board should be not greater then 5A.

Note: the severed plug must be destroyed to avoid a possible shock hazard should it be inserted into a 13A socket elsewhere.

How to connect a plug

The wires in the mains lead are colored in accordance with the following code:

BLUE - “NEUTRAL” (“N”)

BROWN - “LIVE” (“L”)

GREEN & YELLOW- “EARTH GROUND” (“E”)

1. The GREEN & YELLOW wire must be connected to the terminal in the plug which is marked with the letter “E” or by the Earth symbol ⏚ or

   colored GREEN or GREEN & YELLOW.

2. The BLUE wire must be connected to the terminal which is marked with the letter “N” or colored BLACK.

3. The BROWN wire must be connected to the terminal which is marked with the letter “L” or colored RED.

Before replacing the plug cover, make certain that the cord grip is clamped over the sheath of the lead - not simply over the three wires.

MGD203 / MGD403 FACTORY PRESET VIDEO TIMINGS

ITEM	UNIT	NUM-9 1280x1024 60 Hz	ST-VGA-1 640x480 VGA	INT-31/100 625/100/2:1 100 Hz	INIT-31/120 525/120/2:1 120 Hz	VESA 1024x768 85 Hz	SUN-81/76 1280x1024 76Hz
Pixel Rate	MHz	106.85	25.18	29.688	24.696	94.5	134.81
Hor. Freq.	KHz	63	31.47	31.25	31.5	68.677	81.01
Vert. Freq	Hz	59.10	59.94	100.00	120.00	84.997	76.00
Horiz. Res.	pixels	1280	640	754	642	1024	1280
Vert. Res.	lines	1024	480	561	481	768	1024
H. Period	pixels	1696	800	950	784	1376	1664
H. Blank	pixels	416	160	196	142	352	384
H. Fr. Prc.	pixels	43	16	31	22	48	28
H. Sy. Wdt	pixels	132	96	70	60	96	64
Interlace	Y/N	N	N	Y	Y	N	N
V. Period	lines	1066	525	625	525	808	1066
V. Blank	lines	42	45	32	22	40	42
V. Fr. Prc.	lines	6	10	6	4	1	2
V. Sy. Wdt	lines	4	2	2.5	3	3	8
Comp.Sync.	G/H	H		G	G		H
H/Comp.Sy.Pol.	+/-	-	-			+	-
V. Sy. Pol.	+/-		-			+	
H. Width	mm	356	380	380	380	380	356
V. Height	mm	285	285	285	285	285	285
Factory Preset	N°	1	2	3	4	5	6

ITEM	Unit	DEC-77/72 1280x1024 72 Hz	SUN-72/76 1152x900 76 Hz	ST-MAC 2 1152x870 75 Hz	SUN-62/66 1152x900 66 Hz	SUN 71/66 1280x1024 66 HZ	ATI-80/75 1280x1024 75 H
Pixel Rate	MHz	130.81	107.89	100.00	94.80	116.79	135.00
Hor. Freq.	KHz	77.12	71.8	68.68	61.91	71.43	79.976
Vert. Freq.	Hz	77.55	76.6	75.00	66.07	66.44	75.03
Horiz. Res.	pixels	1280	1152	1152	1152	1280	1280
Vert. Res.	lines	1024	900	870	900	1024	1024
H. Period	pixels	1696	1503	1456	1532	1635	1688
H. Blank	pixels	416	351	304	380	355	408
H. Fr. Prc.	pixels	32	29	32	37	28	16
H. Sy. Wdt	pixels	160	128	128	129	117	144
Interlace	Y/N	N	N	N	N	N	N
V. Period	lines	1063	937	915	937	1075	1066
V. Blank	lines	39	37	45	37	51	42
V. Fr. Prc.	lines	3	2	3	2	6	1
V. Sy. Wdt	lines	3	4	3	4	8	3
Comp. Sync.	G/H	G	H		H	G	G
H/Comp.Sy.Pol.	+/-		-	-	-		
V. Sy. Pol.	+/-			-			
H. Width	mm	356	365	380	365	356	356
V. Height	mm	285	285	285	285	285	285
Factory Preset	N°	7	8	9	10	11	12