Silicon Graphics

F180 Flat Panel Display

USER GUIDE
BENUTZERHANDBUCH
MANUEL D'UTILISATION
GUIDA UTENTE
GUIA DEL USUARIO

Regulatory Information

Class B

FCC Declaration of Conformance

Trade Name	Silicon Graphics, Inc.
Product	Monitor
Model Number	CMN014
Date of Conformance	May, 2001
Responsible Party	Silicon Graphics, Inc.
Address	2011 North Shoreline Boulevard Mountain View, California 94043-1389
Telephone	(650) 933-1071

This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television ch the receiver is connected.mined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Caution: The user is cautioned that changes or modifications to the equipment not expressly approved by the party responsible for compliance could void the userís authority to operate the equipment.

Electromagnetic Emissions

This device complies with the Class B limits of Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

Also, this device complies with Class B electromagnetic emissions limits of C.I.S.P.R. Publication 22, Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment.

Industry Canada Notice (Canada Only)

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique német pas de perturbations radioélectriques dépassant les normes applicables aux appareils numériques de Classe B préscrites dans le Règlement sur les interferences radioélectriques établi par le Ministère des Communications du Canada.

VCCI Notice (Japan Only)

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取扱説明書に従って正しい取り扱いをして下さい。

Korean Regulatory Notice

이 기기는 가정용으로 전자파적합등록을 한 기기로서 주거지역에서는 물론 모든 지역에서 사용할 수 있습니다.

CE Notice

Marking by the “CE” symbol indicates compliance of the device to directives of the European Community. A “Declaration of Conformity” in accordance with the above standards has been made and is available from Silicon Graphics upon request.

Shielded Cables

The monitor is FCC-compliant under test conditions that include the use of shielded cables between host and its monitor. The monitor that you purchase from Silicon Graphics has shielded cables. Shielded cables reduce the possibility of interference with radio, television, and other devices. If you use any cables that are not from Silicon Graphics, make sure they are shielded. Telephone cables do not need to be shielded.

The monitor cable supplied with your system uses additional filtering molded into the cable jacket to reduce radio frequency interference. Always use the cable supplied with your system. If your monitor cable becomes damaged, a replacement cable should be obtained from Silicon Graphics.

Table of Contents

ENGLISH

Introduction

The Silicon Graphics® F180™ Flat Panel Display has an active matrix TFT (Thin-Film Transistor) LCD (Liquid Crystal Display).

Features

- The F180 is a 18.1-inch (18.1 inches viewable) intelligent microprocessor based display.
- Two signal ports (Dsub port and DVI-I port) on the rear panel allow 2 connections to 2 computers at a time.
- Soft touch buttons on the front panel are simple and allow you to conveniently adjust a variety of image controls. The absolute flat screen and screen surface treatment eliminate distracting glare.
- Microprocessor based auto-scanning of horizontal scan frequencies between 30-80kHz, and vertical scan frequencies between 56-85Hz enables the display to operate with the precision of a fixed frequency display.
- Resolutions up to 1280x1024, are supported with a wide viewing angle of ±80 degrees horizontal and ±80 degrees vertical.
- To reduce energy consumption, this display is certified to meet the EPA Energy Star requirements, and utilizes the VESA Display Power Management Signaling (DPMS) protocol for power saving during periods of inactivity.

Monitor Registration

Space is provided below to record the model and serial numbers found on the rear of the display, along with additional purchase information . You can also staple your receipt here.

Date of Purchase : _____
Dealer Purchased From : _____
Dealer Address : _____
Dealer Phone No. : _____
Model No. : _____
Serial No. : _____

Important Precautions

This unit has been engineered and manufactured to assure your personal safety, but improper use can result in potential electrical shock or fire hazard. In order not to defeat the safeguards incorporated in this display, observe the following basic rules for its installation, use, and servicing. Also follow all warnings and instructions marked directly on your display.

On Safety

Use only the power cord supplied with the unit. In case you use another power cord, make sure that it is certified by the applicable national standards. If the power cable is faulty in any way, please contact the manufacturer or the nearest authorized repair service provider for a replacement.

Operate the display only from a power source indicated in the specifications of this manual or listed on the display. If you are not sure what type of power supply you have in your home, consult with your dealer.

Overloaded AC outlets and extension cords are dangerous. So are frayed power cords and broken plugs. They may result in a shock or fire hazard. Call your service technician for replacement.

Do not Open the Display.

- There are no user serviceable components inside.
- There are Dangerous High Voltages inside, even when the power is OFF.
- Contact your dealer if the display is not operating properly.

To Avoid Personal Injury :

- Do not place the display on a sloping shelf unless properly secured.
- Use only a stand recommended by the manufacturer.
- Do not try to roll a stand with small casters across thresholds or deep pile carpets.

To Prevent Fire or Hazards:

- Always turn the display OFF if you leave the room for more than a short period of time. Never leave the display ON when leaving the premiss.
- Keep children from dropping or pushing objects into the display's cabinet openings. Some internal parts carry hazardous voltages.
- Do not add accessories that have not been designed for this display.
- During a lightning storm or when the display is to be left unattended for an extended period of time, unplug it from the wall outlet.

On Installation

Do not allow anything to rest upon or roll over the power cord, and do not place the display where the power cord is subject to damage.

Do not use this display near bodies of water such as baths, washbowls, kitchen sinks, laundry tubs, wet basements, or swimming pools.

Important Precautions

On Installation

Displays are provided with ventilation openings in the cabinet to allow the release of heat generated during operation. If these openings are blocked, built-up heat can cause failures which may result in a fire hazard. Therefore, NEVER:

- Block the bottom ventilation slots by placing the display on a bed, sofa, rug, etc.
- Place the display in a built-in enclosure unless proper ventilation is provided.
- Cover the openings with cloth or other material.
- Place the display near or over a radiator or heat source.

Do not rub or strike the Active Matrix LCD with anything hard as this may scratch, mar, or damage the Active Matrix LCD permanently.

Applying pressure to the LCD screen with your finger or other object may cause a persistent discoloration in the affected area of the LCD.

A certain number of pixel defects are expected on LCD panels and do not constitute a defective display. Each graphic pixel on an LCD screen is made up of red, green and blue subpixels. Due to variables inherent to the manufacturing process, some of these subpixels become stuck in either the on or the off state. This pixel defect, also called a stuck pixel, appears as a small red, green or blue dot for stuck-on pixels, or a small black dot for stuck-off pixels. During the manufacturing testing process, LCD panels that exceed a specified number of stuck pixels are rejected. In order to provide the latest flat panel technology at a reasonable price, LCD manufacturers allow a small number of pixel defects in their quality control specifications. Although these specifications are constantly being improved resulting in fewer pixel defects allowed with every new generation of displays, a zero-defect policy today would make the active matrix LCD prohibitively expensive. SGI flat panel displays have some of the most stringent specifications for pixel defects in the industry, but many panels can still have several stuck pixels.

For the best image quality use the VESA 1280 x1024 @60Hz video mode with your Silicon Graphics F180 flat panel display. Other resolutions or timing modes may result in the image being scaled or processed in ways that can cause a degradation in sharpness.

On Cleaning

- Unplug the display before cleaning the face of the LCD screen.
- Dust the display by wiping the screen and the cabinet with a soft, clean cloth. If the screen requires additional cleaning, use a clean, damp cloth.
- Do not use liquid cleaners or aerosol cleaners.

On Repacking

- Do not throw away the carton and packing materials. They make an ideal container in which to transport the unit. When shipping the unit to another location, repack it in its original material.

Connecting the Display

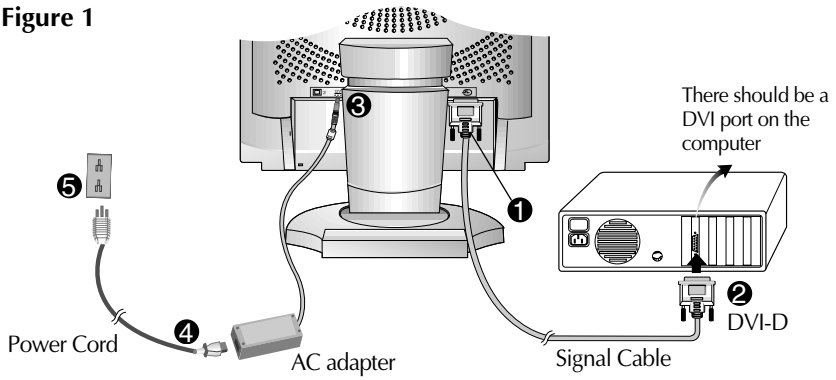
To set up the display, ensure that the power is turned off to the display, computer system, and other attached devices, then follow these steps:

1. Place the display in a convenient, well-ventilated location near your computer.
2. Connect the signal cable.
   - Connecting the DVI-D digital signal cable **.....Figure 1**

   Connect the end of DVI signal cable to the DVI port ❶ on the rear panel of the display. Connect the other end to the DVI port on the rear panel of the computer and tighten the screws. ❷
   - Connecting the Dsub analog signal cable **.....Figure 2**

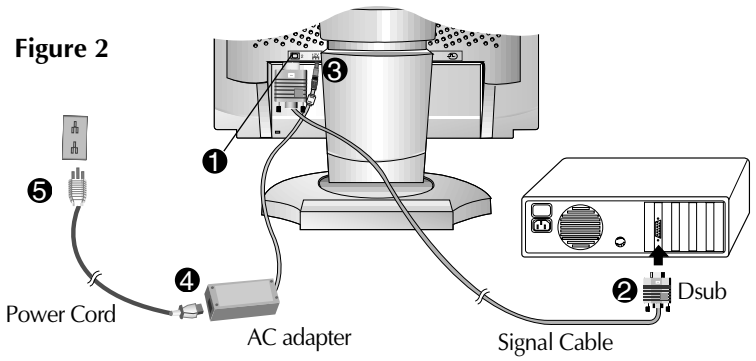
   Connect the end of Dsub signal cable to the Dsub port ❶ on the rear panel of the display. Connect the other end to the Dsub port on the rear panel of the computer and tighten the screws. ❷
3. Connect the plug from the AC adapter into the back of the display. ❸

Figure 1



Connecting the Display

Figure 2

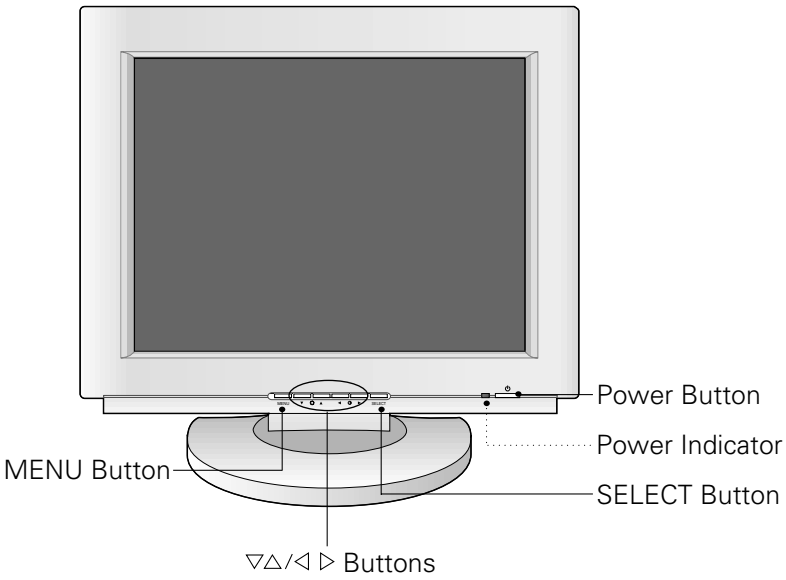


4. Connect one end of the AC power cord to the AC adapter ❹ and the other end to a properly grounded AC outlet that is easily accessible and close to the display. ❺
5. Power on the display, then the system.
6. If you see the NO SIGNAL message, check the signal cable and connectors.

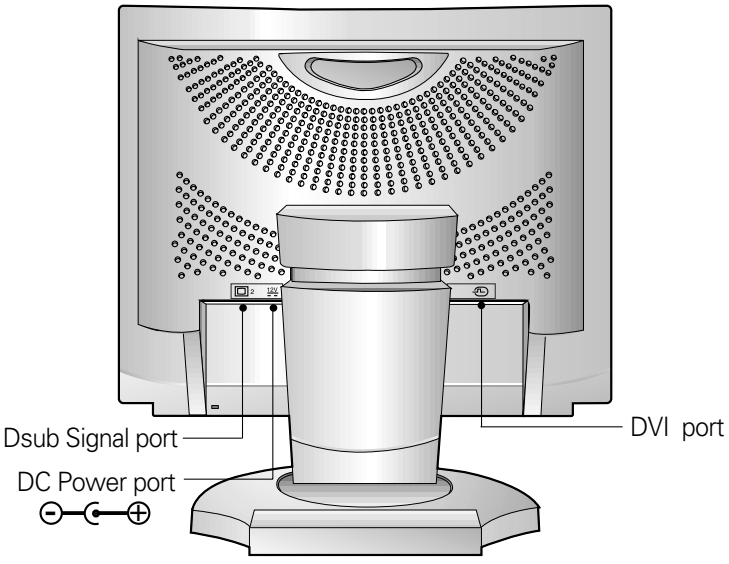
   Note : If you see the INPUT SIGNAL OUT OF RANGE message, check to make sure your system is set to one of the factory preset modes (see page A13), or is set to a resolution and refresh rate within the specification limits of this display.

Location and Function of Controls

Front View



Rear View

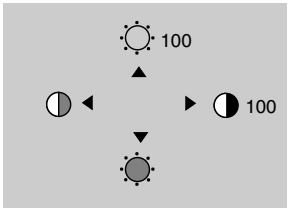


Control Panel Function

Front Panel Controls

<Shortcut Keys>

- Brightness and Contrast can be adjusted directly without entering the On Screen Display (OSD) system.



Touch the ▼/▲/◀/▶ buttons to adjust the settings and then the **MENU button** to save all changes. The Brightness and Contrast functions are also available in the On Screen Display (OSD) menu.

MENU Button

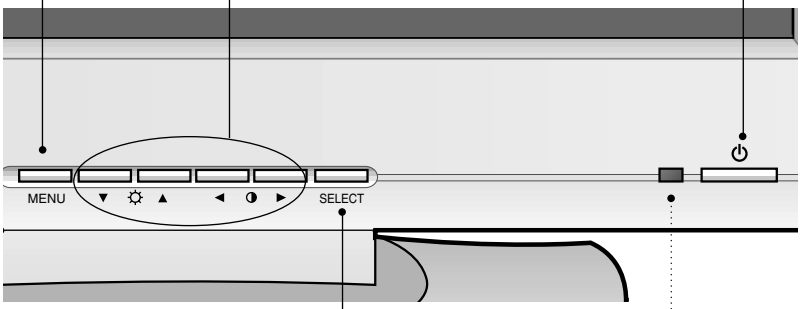
Use this button to enter or exit the on screen display.

▼▲/◀ ▶ Buttons

Use these buttons to choose or adjust items in the on screen display.

Power Button

Use this button to turn the display on or off.



SELECT Button

- Use the **SELECT** Button to switch between **DSub** analog and **DVI** digital input signals. This feature is used to switch between two video sources that are simultaneously connected to the display. The default setting is **Dsub**.
- Use this button to enter a selection in the on screen display.

Power Indicator

The power indicator light is green when the display is powered on and is operating normally. When the display is in Energy Saver mode the power indicator changes to amber.

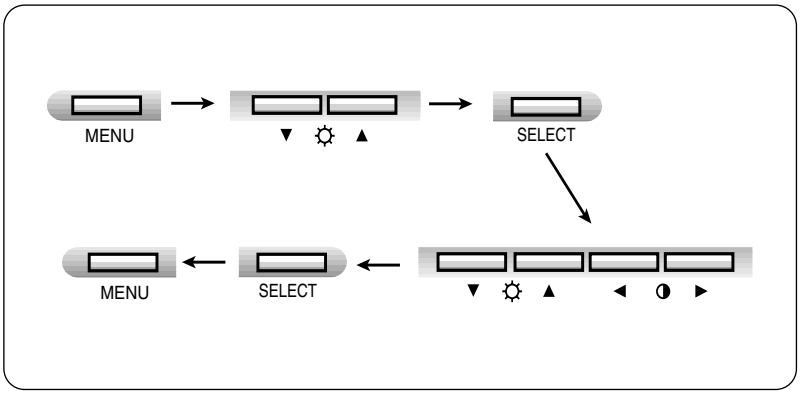
On Screen Display (OSD) Control Adjustment

Making adjustments to the image size, position and operating parameters of the display are quick and easy with the On Screen Display Control system. A quick example is given below to familiarize you with the use of the controls. Following the section is an outline of the available adjustments and selections you can make using the OSD.

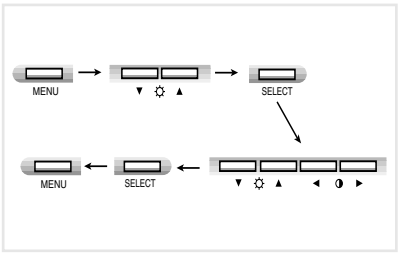
NOTE

- Let the display warm up for at least 30 minutes before making image adjustments.

To make adjustments in the On Screen Display, follow these steps:



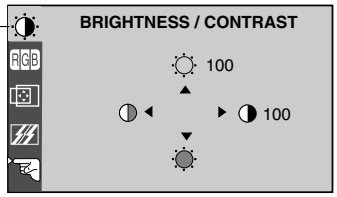
1. Press the **MENU Button** to display the main menu of the OSD.
2. To acces a control, use the ▽ or △ **Buttons**. When the icon you want becomes highlighted, press the **SELECT Button**.
3. Use the ▽△/◁ ▷ **Buttons** to adjust the item to the desired level.
4. Accept the changes by pressing the **SELECT Button**.
5. Exit the OSD by pressing the **MENU Button**.



On Screen Display(OSD) Selection and Adjustment

Listed below are the OSD menu icon descriptions.

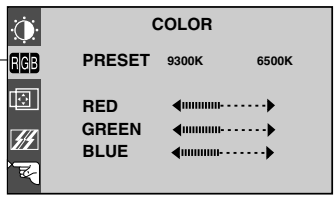
OSD Adjust	Description
BRIGHTNESS/CONTRAST	



Brightness
Adjust display brightness.

Contrast
Adjust display contrast.

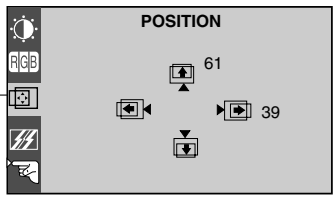
COLOR



PRESET **9300K/6500K**
Select preset display color temperature settings.
- 9300K: Cooler white.
- 6500K: Warmer white.

RED
GREEN
BLUE
Adjust custom color temperature setting.

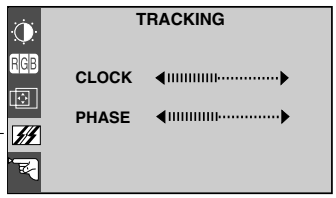
POSITION



Vertical Position
Adjust image position vertically.

Horizontal Position
Adjust image position horizontally.

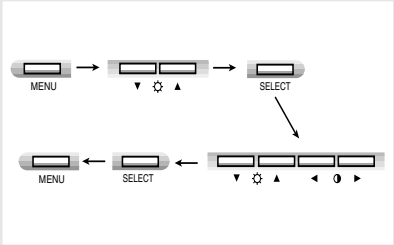
TRACKING



CLOCK
To minimize any vertical bars or stripes visible on the screen background.The horizontal screen size will also change.

PHASE
Adjust focus to remove horizontal noise and sharpen the display of text.
Phase adjustment should be done after adjusting the **Clock**.

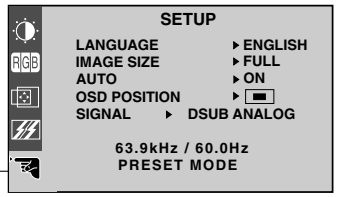
NOTE
- When the DVI-D digital input signal is active only BRIGHTNESS, CONTRAST and SETUP controls are available.



On Screen Display(OSD) Selection and Adjustment

OSD Adjust	Description

SETUP



LANGUAGE To choose the language in which the control names are displayed.

IMAGE SIZE Choose 1:1 to display the image at a 1-to-1 ratio of video signal resolution to LCD native pixels, which will result in a reduced image area for resolutions lower than 1280x1024, or choose FULL to expand the image to fit the full screen.

AUTO This function is suitable for analog signal input only. Use AUTO for the automatic adjustment of the screen position, clock and phase.
Note: The signal from some video sources may not function properly with the AUTO feature. If the results of using the AUTO feature are unsatisfactory, adjust the Position, Clock and Phase functions manually.

OSD POSITION To adjust position of the OSD window on the screen.

SIGNAL To select DSUB ANALOG or DVI ANALOG / DIGITAL as the active input. This feature is used when two computers are connected to the display. The display automatically detects the proper input when only one video source is connected.

Energy Saving Design

This display complies with the EPA's Energy Star program, which is a program designed to have manufacturers of computer equipment build circuitry into their products to reduce power consumption during periods of inactivity.

This display also goes into its energy saving mode if you exceed the display's operating limits, such as the maximum resolution of 1280x1024 or the frequency refresh rates of 30-80kHz horizontal or 56-85Hz vertical. When this display is used with a Green or EPA Energy Star PC, or a PC with screen blanking software following the VESA Display Power Management Signaling (DPMS) protocol, this display can conserve significant energy by reducing power consumption during periods of inactivity. When the PC goes into the energy saving mode, the display will go into a suspended operation state, indicated by the Power LED light changing from a green color to an amber color. After an extended period in the suspended mode, the display will then enter a semi-OFF mode to conserve more energy. In the semi-OFF mode or DPMS OFF mode, the Power LED will still show an amber color. When you awaken your PC by hitting a key or moving the mouse, the display will also awaken to its normal operating mode, indicated by the green Power LED light. By following these conventions, the power consumption can be reduced to the following levels:

Power Consumption

Mode	Hori. Sync	Verti. Sync	Video	Power Consumption	LED Color
Normal	On	On	Normal	≤ 55W	Green
Stand-by	Off	On	Off	≤ 5W	Amber
Suspend	On	Off	Off	≤ 5W	Amber
Power Off	Off	Off	Off	≤ 5W	Amber

Low Radiation Compliance (MPR II), Self Diagnostics Messages and DDC (Display Data Channel)

Low Radiation Compliance (MPR II)

This display meets one of the strictest guidelines available today for low radiation emissions, offering the user extra shielding and an antistatic screen coating. These guidelines, set forth by a government agency in Sweden, limit the amount of emission allowed in the Extremely Low Frequency (ELF) and Very Low Frequency (VLF) electromagnetic range.

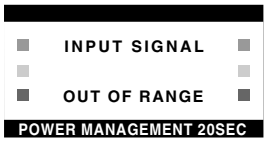
Self Diagnostics Messages

Special Self Diagnostics messages will appear on the screen when identifying the following display conditions:

- NO SIGNAL

This OSD may pop up when it is ON but no signal is detected. In this case the message NO SIGNAL will be highlighted, alerting you to check the signal cable connections.

- INPUT SIGNAL OUT OF RANGE



This OSD may appear to inform you that the signal being sent to the display is not within its frequency range. In this case, you would need to check the resolution and refresh rate you have your video card set to, and adjust to be within the range of the display.

DDC (Display Data Channel)

DDC is a communication channel over which the display automatically informs the host computer providing the video signal about its capabilities. This display has two DDC functions; DDC1 and DDC2B. DDC1 and DDC2B carry out uni-directional communication between the PC and the display. Under these situations, the PC sends display data to the display but not commands to control the display settings.

NOTE

- PC must support DDC functions to do this.

Video Memory Modes

The display has 26 memory locations for display modes, 15 of which are factory preset to popular video modes.

Display Modes (Resolution)

Display Modes (Resolution)			Horizontal Freq. (kHz)	Vertical Freq. (Hz)
1	VGA	640 x 350	31.469	70
2	VGA	720 x 400	31.468	70
3	VGA	640 x 480	31.469	60
4	VESA	640 x 480	37.500	75
5	VESA	640 x 480	43.269	85
6	VESA	800 x 600	37.879	60
7	VESA	800 x 600	46.875	75
8	VESA	800 x 600	53.674	85
9	VESA	1024 x 768	48.363	60
10	VESA	1024 x 768	60.123	75
11	VESA	1024 x 768	68.677	85
12	MAC	1152 x 870	68.681	75
13	SUN	1152 x 900	61.805	66
14	SGI	1280 x 1024	63.839	59.943
15	VESA	1280 x 1024	79.976	75

User Modes

- Modes 17-26 are empty and can accept new video data. If the display detects a new video mode that has not been present before or is not one of the preset modes, it stores the new mode automatically in one of the empty modes starting with mode 17.

  If you use up the 10 blank modes and still have more new video modes, the display replaces the information in the user modes starting with mode 17.

Troubleshooting

Check the following before calling for service.

Display Position is incorrect.
- Select **AUTO** from the OSD menu, and press ◄/►to activate the function.
- If the results are unsatisfactory, adjust the image position using the H position and V position icon in the on screen display.

On the screen background, vertical bars or stripes are visible.
- Select **AUTO** from the OSD menu, and press ◄/►to activate the function.
- If the results are unsatisfactory, decrease the vertical bars or stripes using the CLOCK icon in the on screen display.

Any horizontal noise appearing in any image, or 'fuzzy' text.
- Select **AUTO** from the OSD menu, and press ◄/►to activate the function.
- If the results are unsatisfactory, decrease the horizontal bars using the PHASE icon in the on screen display.

NO SIGNAL message.
- The signal cable is not connected, or is loose. Check and secure the connection.

INPUT SIGNAL OUT OF RANGE message appears.
Picture is blank.
- The frequency of the signal from the video card is outside the operating range of the display.
  *Horizontal Frequency: 30kHz-80kHz
  *Vertical Frequency: 56Hz-85Hz

  Use the graphics board's utility software to change the frequency setting (Refer to your graphics board manual).

  You can change the setup to a supported resolution on Windows systems by starting up in Safe Mode (press the F8 key while booting the system).

The power LED is amber.
- The display is in its display power management mode.
- There is no active signal coming from the PC.
- The signal cable is not fastened securely.
- Check the computer power and graphics adapter configuration.

The display doesn't enter the power saving off mode (Amber).
- Computer video signal is not VESA DPMS standard. Either the PC or the video controller card is not using the VESA DPMS power management function.

NOTE
- If the power indicator(LED) light is blinking amber, it may indicate an abnormal condition of the display.
- Press the power ON/OFF button on the front panel control and call your service technician for more information.

Service

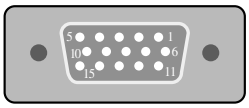
Unplug the display from the wall outlet and refer servicing to qualified service personnel when :

- The power cord or plug is damaged or frayed.
- Liquid has been spilled into the display.
- The display has been exposed to rain or water.
- The display does not operate normally following the operating instructions. Adjust only those controls that are covered in the operating instructions. An improper adjustment of other controls may result in damage and often requires extensive work by a qualified technician to restore the display to normal operation.
- The display has been dropped or the cabinet has been damaged.
- The display exhibits a distinct change in performance.
- Snapping or popping from the display is continuous or frequent while the display is operating. It is normal for some displays to make occasional sounds when being turned on or off, or when changing video modes.

Do not attempt to service the display yourself, as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

Specifications

Signal Connector Pin Assignment

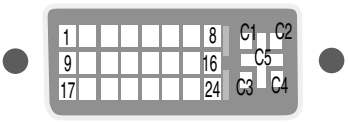


■ 15pin VGA Connector

Pin	Signal(D-Sub)	Pin	Signal(D-Sub)
1	Red Video	9	N.C.
2	Green Video	10	Sync.Ground
3	Blue Video	11	Ground
4	Ground	12	SDA (DDC Data)
5	Ground	13	H. Sync.
6	Red Ground	14	V. Sync.
7	Green Ground	15	SCL (DDC Clock)
8	Blue Ground		

NOTE

■ No.5 Pin must be grounded on the PC side.



■ DVI-I Connector (Digital/Analog)

Pin	Signal(DVI-I)	Pin	Signal(DVI-I)
1	TMDS Data2-	16	Hot Plug Detect
2	TMDS Data2+	17	TMDS Data0-
3	TMDS Data2/4 Shield	18	TMDS Data0+
4	TMDS Data4-	19	TMDS Data0/5 Shield
5	TMDS Data4+	20	TMDS Data5-
6	DDC Clock	21	TMDS Data5+
7	DDC Data	22	TMDS Clock Shield
8	Analog Vertical Sync.	23	TMDS Clock+
9	TMDS Data1-	24	TMDS Clock-
10	TMDS Data1+	C1	Analog Red
11	TMDS Data1/3 Shield	C2	Analog Green
12	TMDS Data3-	C3	Analog Blue
13	TMDS Data3+	C4	Analog H. Sync.
14	+5V Power	C5	Analog Ground
15	Ground (return for +5V, H. Sync. and V. Sync.)		

TMDS (Transition Minimized Differential Signaling)

AC-DC Adapter

Input	AC 100-240V ~2.0 - 1.0A 50/60Hz
Output	DC 12V 5.8A

Use only the AC-DC adapter supplied with the display.

Specifications

Display	Type	18.1inch (45.97cm) Flat Panel Active matrix-TFT LCD Anti-Glare coating
	Viewable Size	18.1inch (45.97cm)
	Viewing Angle (max.)	80˚ (Left / Right / Up / Down)
	Pixel pitch	0.28 x 0.28mm
	True color	16.7 million color
Sync Input	Horizontal Freq.	30kHz - 80kHz (Automatic)
	Vertical Freq.	56Hz - 85Hz (Automatic)
	Input form	Separate, TTL, Positive/Negative Composite, TTL, Positive/Negative SOG (Sync On Green) Digital
Video Input	Signal input	15 pin D-Sub connector / DVI-I connector
	Input Form	Separate, RGB Analog, 0.7Vp-p/75ohm, Positive, Digital
	Resolution	Max VESA 1280 x 1024 @75Hz (Digital/Analog) Recommend VESA 1280 x 1024 @60Hz (Digital/Analog)
Power Input		DC 12V 5.8A
Dimensions	WxHxD(without stand)	43.4cm x 44.3cm x 23.5cm (43.4cm x 37.7cm x 8.6cm) 17.09" x 17.4" x 9.25" (17.09" x 14.8" x 3.39")
Weight	Net (without stand)	8.7kg / 19.18lbs (6.0kg / 13.23lbs)
Tilt/Swivel Range	Tilt	5˚ (Down) / 25˚ (Up)
	Swivel	30˚ (Left) / 30˚ (Right)
	VESA FPMPMI	75cm x 75cm
Regulatory	UL, CSA, FCC, CE, DOC, TÜV-GS, TCO'95, C-Tick, Class B, Gost, VCCI, SEMKO, NEMKO, FIMKO, Energy Star®, BSMI, MIC	
Environment Conditions	Operating condition	
	Temperature	10˚C to 35˚C
	Humidity	10% to 80% non-condensing
	Storage condition	
	Temperature	-20˚C to 60˚C
	Humidity	5% to 95% non-condensing

NOTE

- Information in this document is subject to change without notice.

Regulatory Information

Congratulations! You have just purchased a TCO'95 approved and labelled product! Your choice has provided you with a product developed for professional use. Your purchase has also contributed to reducing the burden on the environment and to the further development of environmentally-adapted electronic products.

Why do we have environmentally labelled computers?

In many countries, environmental labelling has become an established method for encouraging the adaptation of goods and services to the environment. The main problem as far as computers and other electronic equipment are concerned is that environmentally harmful substances are used both in the products and during their manufacture. Since it has not been possible so far for the majority of electronic equipment to be recycled in a satisfactory way, most of these potentially damaging substances sooner or later enter Nature.

There are also other characteristics of a computer, such as energy consumption levels, that are important from both the working and natural environment viewpoints. Since all types of conventional electricity generation have a negative effect on the environment (acidic- and climatic-influencing emissions, radioactive waste, etc.), it is vital to conserve energy. Electronic equipment in offices consumes as enormous amount of energy, since it is often routinely left running continuously.

What does labelling involve?

This product meets the requirements for the TCO'95 scheme, which provides for international environmental labelling of personal computers. The labelling scheme was developed as a joint effort by the TCO (The Swedish Confederation of Professional Employees), Naturckyddsfˆreningen (The Swedish Society for Nature Conservation), and NUTEK (The National Board for Industrial and Technical Development in Sweden), and SEMKO AB (an international certification agency).

Regulatory Information

The requirements cover a wide range of issues: environment, ergonomics, usability, emission of electrical and magnetic fields, energy consumption and electrical and fire safety.

The environmental demands concern, among other things, restriction on the presence and use of heavy metals, brominated and chlorinated flame retardants, CFCs (freons), and chlorinated solvents. The product must be prepared for recycling, and the manufacturer is obliged to have an environmental plan, which must be adhered to in each country where the company implements its operational policy.

The energy requirements include a demand that the computer and/or display, after a certain period of inactivity, shall reduce its power consumption to a lower level, in one or more stages. The length of time to reactivate the computer shall be reasonable for the user.

Labelled products must meet strict environmental demands, for example, in respect of the reduction of electric and magnetic fields, along with physical and visual ergonomics and good usability.

The following is a brief summary of the environmental requirements met by this product. The complete environmental criteria document may be ordered from:

TCO Development Unit
Linnegatan 14, S-11494 Stockholm, Sweden
FAX +46-8 782 92 07
E-mail (Internet): development@tco.se

Current information regarding TCO'95 approved and labelled products may also be obtained on the Internet using the address:
http://www.tco-info.com/
TCO'95 is a co-operative project between:

TCO *Naturskydds föreningen* NUTEK Närings- och teknikutvecklingsverket **SEMKO**

Regulatory Information

TCO'95 Environmental Requirements

Brominated flame retardants are present in printed circuit boards, cabling, casings, and housings, and are added to delay the spread of fire. Up to 30% of the plastic in a computer casing can consist of flame-retardant substances. These are related to another group of environmental toxins, PCBs, and are suspected of giving rise to similar harm, including reproductive damage in fish-eating birds and mammals. Flame retardants have been found in human blood, and researchers fear that they can disturb fetus development.

Bio-accumulative TCO'95 demands require that plastic components weighing more than 25 grams must not contain flame retardants with organically bound chlorine or bromine.

Lead can be found in picture tubes, display screens, solder, and capacitors. Lead damages the nervous system and in higher doses causes lead poisoning. The relevant bio-accumulative TCO'95 requirement permits the inclusion of lead, as no replacement has yet been developed.

Cadmium is present in rechargeable batteries and in the color-generating layers of certain computer displays. Cadmium damages the nervous system and is toxic in high doses. The relevant bio-accumulative TCO'95 requirement states that batteries may not contain more than 25 ppm (parts per million) of cadmium. The color-generating layers of display screens must not contain any cadmium.

Mercury is sometimes found in batteries, relays and switches. Mercury damages the nervous system and is toxic in high doses. The relevant bio-accumulative TCO'95 requirement states that batteries may not contain more than 25 ppm of mercury and that no mercury is present in any of the electrical or electronic components concerned with the display unit.

CFCs (freons) are sometimes used for washing printed circuit boards and in the manufacture of expanded foam for packaging. CFCs break down ozone and thereby damage the ozone layer in the atmosphere, causing increased reception on Earth of ultra-violet light with consequent increased risks of skin cancer (malignant melanoma). The relevant TCO'95 requirement: Neither CFCs nor HCFCs may be used during the manufacture of the product or its packaging.

1 **Bio-accumulative means that the substance accumulates within living organisms.**

Regulatory Information

Shipping Package

The packaging material can be recycled, or you can save it to return the display to a service center for repair or disposal.

CFC Compounds in Distribution Packaging

Cushioning material used for shipping finished monitors are not manufactured with nor do they contain any CFC compounds.

Design for Disassembly/Recycling

These displays have been designed for easy end-of-life disassembly and recycling. Fasteners are generally of the same type for efficient disassembly. Components made of different materials can be easily separated and plastics have been identified using international symbols to aid in recycling.

Display Disposal

WARNING

If you need to dispose of a display, ask a qualified service representative for the proper procedure. Improper disposal could result in personal injury from implosion.

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