digital™

# VRC20-Hx Ultra VGA Multi-Scanning 20-inch Color Monitor

## Installation and Operating Information

Order Number: EK–VRC20–HX. A01

**August 1994**

The information in this document is subject to change without notice and should not be construed as a commitment by Digital Equipment Corporation.

Restricted Rights: Use, duplication, or disclosure by the U.S. Government is subject to restrictions as set forth in subparagraph (c) (1) (ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.227-7013.

**FCC ID: ARFKDM2077**

**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. Any changes or modifications made to this equipment may void the user's authority to operate this equipment.

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 and television reception; 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 reception, which can be determined 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:

- Re-orient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to 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.

DO NOT attempt to modify this equipment. If modified, your authority to operate this equipment might be voided by the FCC.

**Canadian Department of Communications Statement**
This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

DEC and the DIGITAL logo are trademarks of Digital Equipment Corporation.
VGA is a registered trademark of International Business Machines Corporation.
SVGA and VESA are registered trademark of the Video Electronic Standards Association.
The Energy Star emblem does not represent EPA endorsement of any product or service.

Copyright © Digital Equipment Corporation 1994. All rights reserved.
Printed in Taiwan.

This document was prepared using VAX DOCUMENT Version 2.1.

# Contents

**About This Guide** . . . . . v

## 1 Installation

1.1 Monitor Installation . . . . . 1–1
1.2 User Controls . . . . . 1–2

## 2 Servicing

2.1 Cleaning the Monitor . . . . . 2–1
2.2 Maintenance and Troubleshooting . . . . . 2–1
2.2.1 Identifying and Correcting Problems . . . . . 2–1
2.2.2 Troubleshooting Table . . . . . 2–2
2.3 Servicing the Monitor . . . . . 2–3
2.3.1 DECmailer . . . . . 2–3
2.3.2 Carry-In Service . . . . . 2–3
2.3.3 Monitor Disposal . . . . . 2–3

## 3 Specifications

3.1 Monitor Specifications . . . . . 3–1
3.2 Scanning Modes . . . . . 3–2
3.3 Pin Assignments . . . . . 3–3
3.4 Power Management System . . . . . 3–3
3.5 Environment . . . . . 3–4

## Figures


| | | |
|---|---|---|
| 1–1 | Monitor Control Panel . . . . . | 1–2 |


## Tables


| | | |
|---|---|---|
| 1–1 | User Controls and Functions . . . . . | 1–2 |
| 1–2 | Save and Reload Functions . . . . . | 1–5 |
| 1–3 | Secondary User Controls and Functions . . | 1–6 |
| 2–1 | Identifying and Correcting Problems . . . . . | 2–2 |
| 3–1 | Factory Pre-set Resolution and Frequencies . . . . . | 3–2 |

# About This Guide

## Overview

The VRC20-Hx Monitor is a 20-inch *multi-scanning* color monitor with high resolution, compatible with VGA and SVGA built-in modes.

The VRC20-Hx offers the following features:

- Power management system that exceeds the EPA Energy Star requirements for saving energy
- Anti-glare screen with anti-static coating
- User controls for screen alignment, color adjustment, and mode control

- Manual and automatic degauss control

This product has been designed and manufactured to minimize the impact to the environment. The monitor also has a power management feature, which a personal computer can control to reduce the monitor's output power levels while not in use, thus saving energy.

## Audience

This guide is intended for users who wish to install the monitor.

## Conventions

The following conventions are used in this document:

| Convention | Meaning |
|---|---|
| **Note** | Provides general information. |
| **Caution** | Provides information to prevent damage to equipment. |
| **Warning** | Provides information to prevent injury. |

## Installation/Operating Guidelines

Observe the following basic rules for installation and use.

### Do . . .

- Use the power cord supplied with the monitor, which is UL-, CSA-, and VDE-approved, designed for a **grounded** outlet.
- Turn the monitor off when you clean the monitor or if you do not use it for an extended period of time.

### Do Not . . .

- Exceed the ac power output rating of the ac outlet of your computer or other source.
- Move the monitor on a stand over carpet or thresholds.
- Push objects into the monitor's openings.
- Add accessories that are not designed for this monitor.
- Operate the monitor near water or in a damp environment, which could cause an electrical shock hazard.
- Operate the monitor near magnets, motor devices, transformers, high power lines, or large steel pillars, which can cause distortion in the picture.
- Obstruct the ventilation openings in the monitor's cabinet, such as placing the monitor on a rug or within an enclosure.
- Place the monitor near a radiator or heat source.
- Use liquid cleaners or aerosol cleaners. Instead, use a damp cloth for cleaning.

**Warning**

The monitor weighs 30 Kg (66 lbs), so it may require two people to lift the monitor out of its box.

# 1
# Installation

## 1.1 Monitor Installation

To connect your monitor:

1. Make sure the power to the monitor and the computer is off.
2. Connect the monitor's signal cable to the 15-pin interface connector on the High Resolution Graphic Video Adapter on the back of the computer.
3. Plug in the ac power cord to the monitor, then to a properly-grounded ac electrical outlet.

### Turn On Power to Monitor

Push the power switch button to turn on the monitor. The power indicator LED to the left of this switch should light green.

**Figure 1–1 Monitor Control Panel**

## 1.2 User Controls

**Table 1–1 User Controls and Functions**

| Control | Action |
|---|---|
| Power | Push the switch. When the power is on, the LED beside the power switch is on. |
| Power Indicator | The power LED color has the following states:<br>**Green** Normal operation<br>**Yellow** Stand-by and suspend state<br>**Amber** Off state |

(continued on next page)

**Table 1–1 (Cont.) User Controls and Functions**

| Control | Action |
|---|---|
| Degauss Switch | This monitor is equipped with automatic and manual degaussing. **Automatic degaussing** is operative when the monitor is cold (after being off for approximately 20 minutes). Therefore, if the monitor is repositioned while it is warm and discoloration is observed, it is important to remember to turn off the monitor and let it cool. When powering the monitor back on, it will then degauss automatically and discoloration will disappear. **Manual degaussing** is operative by pressing the switch for a few seconds. |

**Caution**

Please allow a minimum of 20 minutes to elapse between uses of the degauss button. Do not hold the button down continuously to avoid decreasing the life of the degauss circuitry.

**Contrast**— Press the right side of the button to sharpen contrast. Press the left side of the button to reduce contrast.

**Brightness**— Press the right side of the button to increase brightness. Press the left side of the button to reduce brightness.

**Note**

If the picture is too small or not centered, the monitor does not recognize the input frequency mode. Adjust the position and size of the picture using the controls that follow.

(continued on next page)

**Table 1–1 (Cont.) User Controls and Functions**

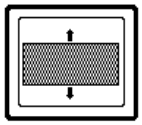
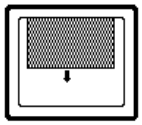
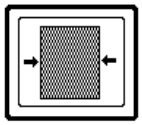
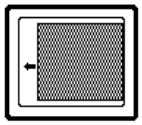
| Control | Screen | Adjustment |
|---|---|---|
| |  | **Vertical Size**— Press the right side of the button to increase the vertical size of the image. Press the left side of the button to decrease the vertical size of the image. |
| |  | **Vertical Shift**— Press the right side of the button to move the image upward. Press the left side of the button to move the image downward. |
| |  | **Horizontal Size**— Press the right side of the button to increase the horizontal size of the image. Press the left side of the button to decrease the horizontal size of the image. |
| |  | **Horizontal Shift**— Press the right side of the button to move the image to the right position. Press the left side of the button to move the image to the left position. |

**Table 1–2 Save and Reload Functions**

| Control | Action |
|---|---|
| **SAVE** | Press the **SAVE** button to save the display mode parameters that you just set manually. The mode indicator light will blink to indicate that the save has occurred.<br><br>**Caution**<br><br>If the SAVE button is not pressed, the settings will not be permanently stored. Pressing the SAVE or RELOAD button affects only those parameters that can be changed in the current display mode but does not affect those parameters that can be changed in the other display mode. See MODE control. |
| **RELOAD** | When the mode indicator light is **off**, pressing the RELOAD button reloads the factory settings for the image size, position, brightness and contrast.<br><br>When the mode indicator light is **on**, pressing the RELOAD button reloads the factory settings for image color temperature (R-, G-, and B-Gain), pincushion, trapezoid, and rotation. |

**Table 1–3 Secondary User Controls and Functions**

| Control | Action |
|---|---|
| **MODE** | The MODE button allows you to switch between the Primary controls and Secondary controls. |

| Mode Indicator | Controls | Adjustments Affected |
|---|---|---|
| Off | Primary: | H-position, H-size, V-position, V-size, brightness, and contrast. |
| On | Secondary: | R-gain, G-gain, B-gain, pincushion, trapezoid, and rotation. |

**Note**

If no changes are made to the secondary controls for sixty seconds, the mode automatically returns to primary controls.

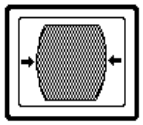
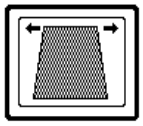
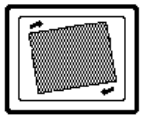
| | |
|---|---|
| **R-Gain** | Press the left side of the button to decrease red video output. Press the right side of the button increase red video output. |
| **G-Gain** | Press the left side of the button to decrease green video output. Press the right side of the button to increase green video output. |
| **B-Gain** | Press the left side of the button to decrease blue video output. Press the right side of the button to increase blue video output. |

**Note**

Initially, all three gain settings are at maximum.

(continued on next page)

**Table 1–3 (Cont.) Secondary User Controls and Functions**

| Control | Screen | Secondary Control Adjustments |
|---|---|---|
| |  | **Pincushion**—Corrects a bowed image. Press the right side of the button to increase the amount of side pincushion. Press the left side of the button to decrease the amount of side pincushion. |
| |  | **Trapezoid**—Corrects a trapezoid image. Press the right or left side of the button to correct the distorted image shape to a rectangle. |
| |  | **Rotation**—Corrects a rotated image. Press the right side of the button to rotate the display screen clockwise. Press the left side of the button to rotate the display screen counter clockwise. This control is used to compensate for any magnetic field effect on the display. |

# 2

# Servicing

## 2.1 Cleaning the Monitor

To clean the monitor:

1. Unplug the monitor.
2. Clean the monitor with a soft, slightly damp cloth. **Do not** use an aerosol cleaner directly on the screen.

**Caution**

Do not use benzene, thinner, or any volatile substance to clean the monitor, as these product may discolor the monitor's cabinet. Likewise, do not place rubber or vinyl on the monitor.

## 2.2 Maintenance and Troubleshooting

### 2.2.1 Identifying and Correcting Problems

The following can be sources of problems:

- Communications cables
- Host system
- Nearby power or electrical sources

## 2.2.2 Troubleshooting Table

Use Table 2–1 to identify and correct any problem areas.

**Table 2–1 Identifying and Correcting Problems**

| Symptom | Possible Cause | Suggested Solution |
|---|---|---|
| Display does not appear. | Brightness or Contrast control is set too low. | Increase the brightness and contrast control setting. |
| | Power Management feature is active in the off state. | Press any key and allow 20 seconds for the monitor to warm up. |
| | There is no power. | Check the power cord. Use another ac outlet. |
| Video display has moving dots and distorted lines. The display rolls or flickers. | There is electromagnetic interference. | Move any electromechanical device, such as a fan or a motor, away from the monitor or move the monitor. |

**Warning**

Serious shock hazards exist inside this display. There are no user serviceable parts inside. DO NOT remove covers under any circumstances or attempt to service the monitor yourself. Call a qualified service representative.

## 2.3 Servicing the Monitor

Digital provides a wide range of maintenance programs for monitors. It is recommended that you use either DECmailer or Carry-In Service when servicing the VRC20-Hx monitor. If needed, use the original box and packing material to send the unit to the service location. Contact your local Digital Services office.

### 2.3.1 DECmailer

DECmailer provides a mail-in service for the VRC20-Hx monitor. Ship the monitor to your nearest Digital Servicenter using a common carrier. The monitor will be repaired or exchanged and returned to you.

### 2.3.2 Carry-In Service

Digital Carry-In Servicenters are located in major cities around the world. They offer convenient, cost-effective repair service with a 48-hour turnaround time.

### 2.3.3 Monitor Disposal

**Warning**

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

# 3
# Specifications

## 3.1 Monitor Specifications

| | |
|---|---|
| **Monitor** | 50.8 cm (20 in) non-glare, non-static |
| Active area | 36.0 × 27.0 cm (±0.5 cm) |
| Height | 45.0 cm (17.7 in) |
| Width | 48.0 cm (18.9 in) |
| Depth | 48.0 cm (18.9 in) |
| Swivel | ±45° |
| Tilt | -5° to +10° |
| Weight | 30 Kg (66 lbs) |
| **Video Signal** | 0.7V p-p R, G, B color (positive) 75Ω. |
| **H-Sync** | TTL, or SYNC on Green, positive or negative, 1KΩ min. 30K to 82KHz (multi-scanning). |
| **V-Sync** | TTL, or SYNC on Green, positive or negative, 1KΩ min. 50 to 120 Hz. |
| Connector | 15-pin D-sub |
| **Power input** | 90 - 135 Vac, 2.5 A max at 60 Hz; 180 - 264 Vac, 1.25 A max at 50 Hz (auto-switching) |
| **Power consumption** | 150 W (max) |
| **Environment:** | |
| Operating Temperature | +10 to +40°C |
| Humidity | 10 - 90% relative humidity (noncondensing) |

## 3.2 Scanning Modes

To minimize adjustment needs, the monitor has 11 factory pre-set display standards, shown in Table 3–1. When the monitor detects any of these display standards, it automatically adjusts the picture size and centering. All the vertical refresh rates are *non-interlaced*.

**Table 3–1 Factory Pre-set Resolution and Frequencies**

| Mode | Pre-set Addressability (Pixels x Lines) | Vertical Refresh (Hz) | Horizontal Frequency (kHz) |
|---|---|---|---|
| 1 | 640 x 480 (VGA/60) | 59.95 | 31.47 |
| 2 | 1152 x 900 (76) | 76.15 | 71.81 |
| 3 | 640 x 480 (VGA VESA 75) | 75.00 | 37.50 |
| 4 | 720 x 400 (70) | 70.08† | 31.47 |
| 5 | 800 x 600 (SVGA VESA 75) | 75.00† | 46.88† |
| 6 | 1024 x 768 (VESA 70) | 70.07 | 56.48 |
| 7 | 1024 x 768 (VESA 75) | 75.03† | 60.02† |
| 8 | 1024 x 864 (Digital) | 60.02 | 54.05 |
| 9 | 1280 x 1024 (60) | 60.10 | 64.98 |
| 10 | 1280 x 1024 (72) | 72.56 | 77.17 |
| 11 | 1280 x 1024 (75) | 75.03 | 79.98 |

†positive polarities

## 3.3 Pin Assignments

The pin assignments for the 15-pin D-type connector are:

| Pin | Signal | Pin | Signal | Pin | Signal |
|---|---|---|---|---|---|
| 1 | Red | 6 | Red Return | 11 | NC[1] |
| 2 | Green | 7 | Green Return | 12 | NC |
| 3 | Blue | 8 | Blue Return | 13 | H-SYNC |
| 4 | ID Connect to pin 10 | 9 | NC[1] | 14 | V-SYNC |
| 5 | GND | 10 | Logic GND | 15 | NC |

[1]NC = no connection

## 3.4 Power Management System

The monitor has three power-saving states, indicated by the LED on the front panel:

| LED | State | Power Consumption† | Recovery Time |
|---|---|---|---|
| Green | On | Normal 150 w (max) | - |
| Yellow | Standby/ Suspend | < 30 watts | 3 s |
| Dark amber | Off | < 8 watts | 15 s |

† These power-saving states exceed the Environmental Protection Agency (EPA) Energy Star requirements using the Video Electronics Standard Association (VESA) methodology for Display Power Management Signals.

The Power Management function requires TTL horizontal and vertical sync. For proper operation of this Power Management System, make sure that the monitor signal cable is connected to the host system and that the host system is On.

## 3.5 Environment

This product has been designed and manufactured to minimize the impact to the environment. The packaging is recyclable and the monitor can be returned for proper disposal.

### Acoustic Levels

Preliminary declared values per ISO 9296 and ISO 7779:

| | Sound Power Level[1] $L_{wAd}$, B | | Sound Pressure Level[2] $L_{pAm}$, dBA | |
|---|---|---|---|---|
| Product | Idle | Operate | Idle | Operate |
| VRC20-Hx | <4.0 | <4.0 | <35 | <35 |

[1] 1 B = 10 dBA.
[2] Operator position.

### Asbestos

This product does not use asbestos in any form.

### Flame Retardants

The enclosures do not contain polybrominated diphenylether (PBDE) as a flame retardant additive; therefore, they do not emit toxic dibenzofuran and dibenzodixion gases.

### Ozone Depleting Substances (ODS)

The VRC20-Hx is in full compliance with the labeling requirements in the U.S. Clean Air Act Amendments of 1990. It does not contain, nor is it manufactured with, a Class 1 ODS, as defined in Title VI Section 611 of this act.

### PVC

The plastic enclosures are not made of rigid PVC. The material has a non-halogenated, flame-retardant system and is cadmium free.

### Recyclable Material

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

### VCCI Class 2

この装置は，第一種情報装置（商工業地域において使用されるべき情報装置）で商工業地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会〈VCCI〉基準に適合しております。
従って，住宅地域またはその隣接した地域で使用すると，ラジオ，テレビジョン受信機等に受信障害を与えることがあります。
取扱説明書に従って正しい取り扱いをして下さい。