

VTECS™ Signal Monitoring System
Product Line Description

1.0 Introduction

The Videoframe VTECS™ Signal Monitoring System has been developed in response to customer requests. The company is already well established in the control system market, particularly in the area of modular equipment control. With a proven capability to remotely control audio and video parameters and adjust for signal impairments, it was a logical next step to design and produce a system that would continuously monitor signals and automatically detect those impairments. The process of detecting signal impairments and correcting them is now available as a seamless whole. The Videoframe range of signal monitoring solutions produce and maintain a quality on-air look and allow for significant savings in manpower resources.

1.1 Overview

Videoframe offers signal monitoring solutions in three tiers. These are:

- 1) The Enterprise Tier. This includes one specific product: VTECS™ Enterprise monitoring software, which is a Windows™ based computer program that is connected to devices on tiers two and three. The program draws together signal monitoring input from these devices and displays monitoring input and logs events as they occur.
- 2) The Modular Tier. This tier includes the VF200 modular card frame and the VF200 family of modules. There are modules that monitor audio and video signals for defects. When defects are detected the VF200 can report these to the VTECS™ Enterprise monitoring software, or it can respond directly. Direct responses include setting GPI outputs or issuing SNMP traps. The VF200 can be configured to operate in stand-alone mode by using either the Windows based Videoframe Configuration Application or by using the VTECS™ 1 Control Panel.
- 3) The Spot Monitoring or VNODE™ Tier. This tier includes the VNODE product line. A VNODE is a self-contained small-scale signal monitoring system. There are six different models. Each one measures 5" x 3" x 1" and includes 1) circuitry to monitor one or more signals, 2) relays for GPI alarm outputs, 3) GPI inputs, and 4) a microprocessor with 100Base-T Ethernet communication capability. A VNODE can be configured and operated the same way as the VF200 only on a smaller scale.

2.0 The Enterprise Tier

The VTECS™ Enterprise monitoring software provides a central focus point for a large signal monitoring system. A large facility or a multi-facility monitoring application would begin with one or more installations of the VTECS Enterprise monitoring software. The application contains features to perform on-line monitoring, event logging, and alarm generation. A typical operator's display is shown at the top of the next page.

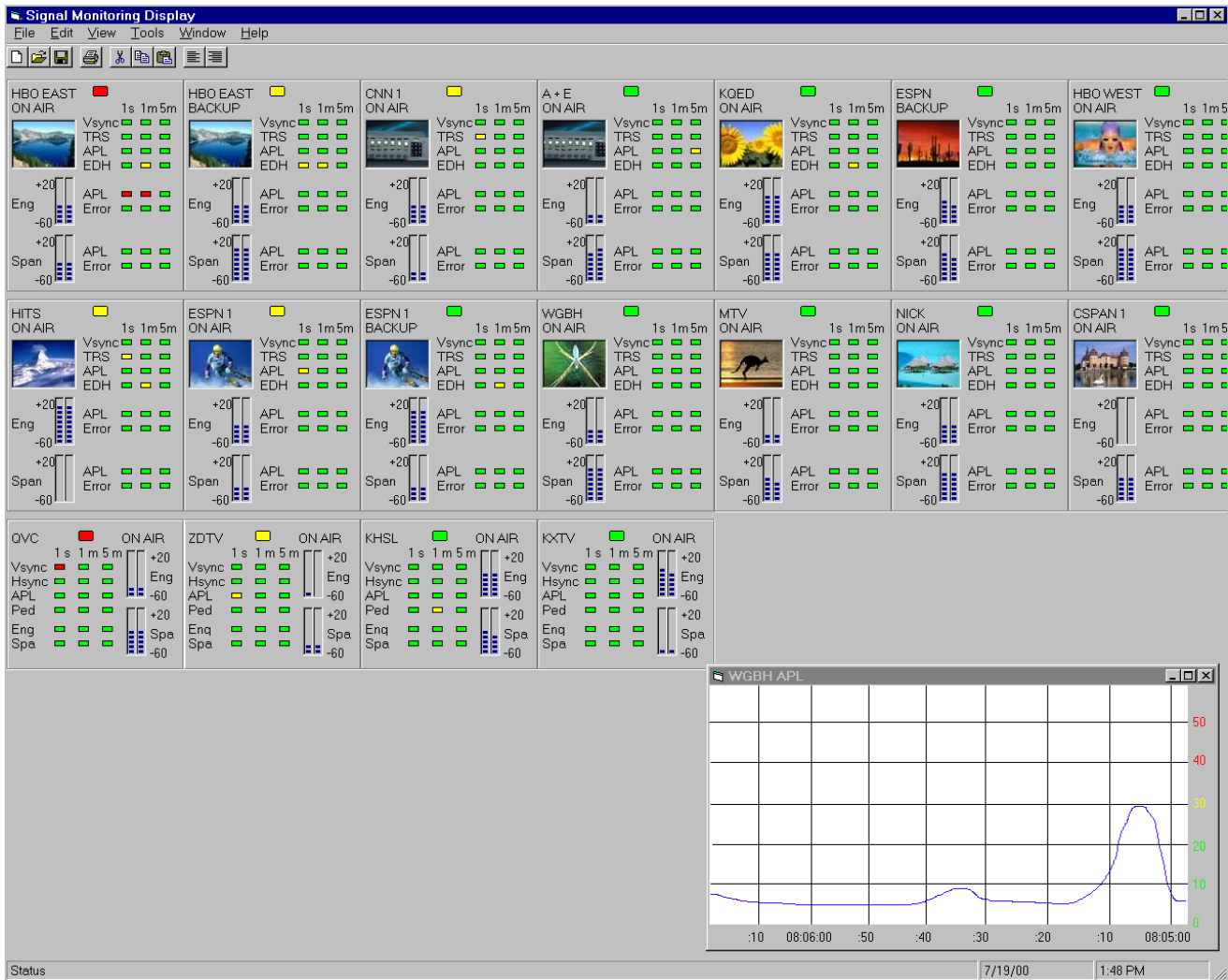


Fig. 1 – Monitoring Session Display

2.1 VTECS Enterprise Features

The overall feature set includes the following:

- 1) Signal formats include analog video (NTSC/PAL), analog audio, SDI video, and AES/EBU audio, DTMF tones and GPIs.
- 2) Continuous 7/24 monitoring of signals.
- 3) Distributed LAN based architecture with virtually no limit to the number of signals monitored or the number of operator consoles. 10Base-T/100Base-T operation of LAN connections.

VTECS Enterprise Features continued:

- 4) Monitored signals can be across the room or across the country limited only by the WAN/LAN bandwidth available.
- 5) Operator consoles are Windows 2000 based.
- 6) Wide range of video and audio defects can be monitored and detected.
- 7) Video thumbnails can be viewed over the network. They can be sized from 66x49 pixels up to full field.
- 8) Signals can be organized into “channels”.
- 9) Channels can be organized into “signal path” groupings.
- 10) Main monitoring displays can show multiple channels simultaneously.
- 11) Defect events and signal snapshots can be logged to a database files.
- 12) Database historical data can be analyzed graphically.
- 13) Channels can be “scheduled” for active monitoring by time and date (option).
- 14) Logged events can be time stamped.
- 15) DTMF tones can be detected and directed to GPO’s. DTMF tones are logged with time stamps.
- 16) GPI indicators can be monitored and integrated into the channel displays.
- 17) CP32 alarm and monitoring control panels can be configured and integrated into the system.
- 18) VBI data can be monitored and displayed. Data can also be logged. E.g. closed captioning.
- 19) The system can automatically assign a VTECS hard surface panel to a processing channel.
- 20) SNMP fault monitoring is available in both the monitoring electronic frames and the operators Console Windows application software.

2.2 The VTECS Enterprise Monitoring Software

The VTECS™ Enterprise monitoring software provides a centralized focus for monitoring and logging. The actual interfaces to the real world signals, however, are provided by the VF200 and its’ family of interface modules and by the VNODE Spot Signal Monitors. All of these products together form a complete top to bottom system.

3.0 The Modular Tier

The principal component of this tier is the VF200 modular card frame and its’ interface module family. Interfaces are available for analog audio and video, digital audio and video, DTMF tones and GPIs. The VF200 can report defects to the VTECS Enterprise, it can report defects to an SNMP Manager, or it can set its’ own GPI relays depending on the user configuration. The VF200 can be set up to operate in stand-alone mode by using either the Windows based Videoframe Configuration Application or by using a VTECS™ 1 Control Panel.

3.1 The VF200 Modular Frame

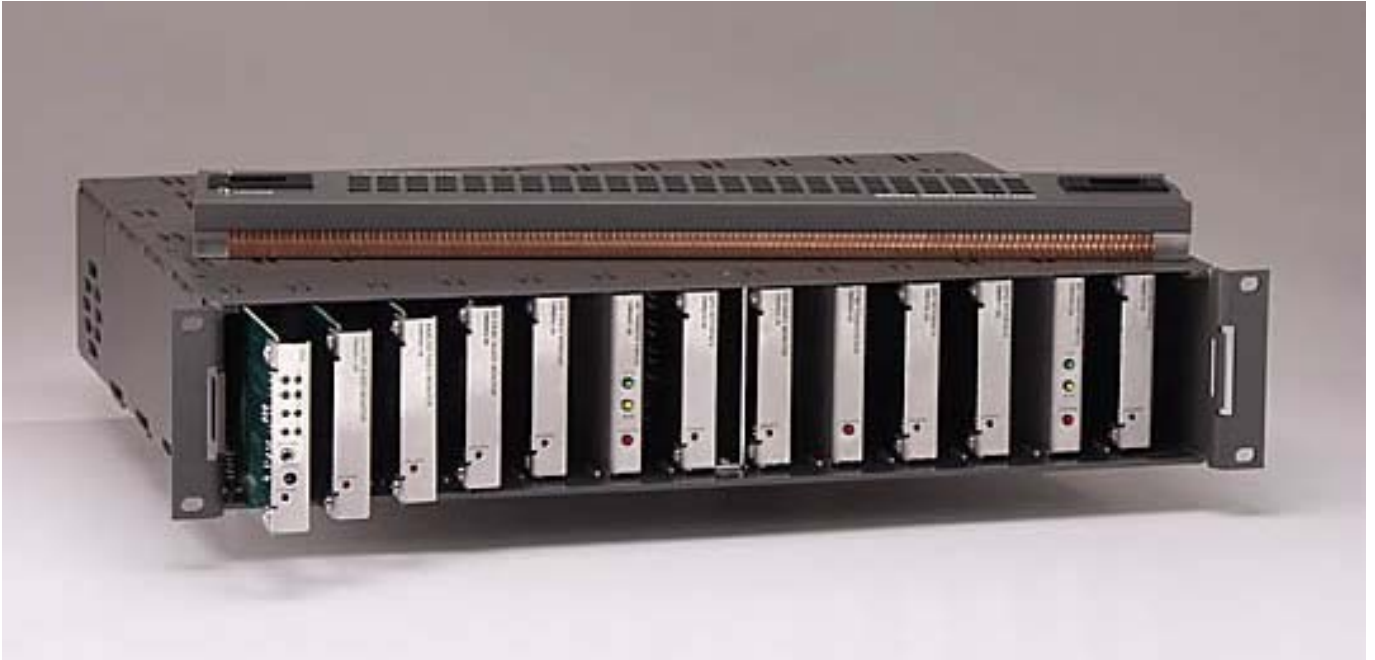


Figure 2 - VF200 Modular Card Frame

The features of the VF200 Modular Frame include:

- a. 2 RU high, 14.5" deep.
- b. Holds 12 signal interface modules plus the control module.
- c. Removable front panel.
- d. Two external power supplies with motherboard mounted schottky diodes for hot switchable redundant power.
- e. No main or mid back plane for I/O connections. Each module has a matching back plate with feed-through connectors that mate with the module in one direction and the facility cabling in the other direction. Alternatively the back plate can include an interface PCB. Note that the interface PCB will not contain active circuitry.
- f. Connector board at the rear of the frame for power entry and control signals from the control module.
- g. The power entry and fan module is user replaceable.
- h. The standard rear panel connectors include a 100Base-T Ethernet RJ-45 port, an RS-232 DB9F console port, a BNC connector for optional video reference, a BNC connector for longitudinal timecode, and an RJ-45 connector for the optional failover function.

3.2 The VF200 Modules

There are 10 different VF200 modules available. These are:

- 3.2.1 The VM0008 Control Module – This module controls the VF200 and is usually required.
- 3.2.2 The VM0002 Analog Video Module – This module monitors 2 channels of NTSC/PAL video. Parameters monitored include:
 - a. Video is sampled and pictures are output to the VTECS Enterprise monitoring software. Pictures are available as 66x49 small thumbnails, 102x81 large thumbnails, or full field.
 - b. Missing vertical sync.
 - c. Pedestal level.
 - d. Video average program level. This can be set to various thresholds such as black.
 - e. Frozen signals.
 - f. VBI data such as closed captioning.
- 3.2.3 The VM0004 SDI Video Module – This module monitors one channel of SDI video. Parameters monitored include:
 - a. Video is sampled and pictures are output to the VTECS Enterprise monitoring software. Pictures are available as 66x49 small thumbnails, 102x81 large thumbnails, or full field.
 - b. Picture unlocked – bad or missing clock.
 - c. Pedestal level.
 - d. Video average program level. This can be set to various thresholds such as black.
 - e. Frozen signals.
 - f. 16x9 aspect ratio.
 - g. VBI data such as closed captioning.
 - h. Monitors four audio signals out of one group. Group is configurable.
- 3.2.4 The VM0001 Analog Audio Module – This module monitors four channels of analog audio. Parameters monitored include:
 - a. Audio is sampled and levels are output to the VTECS Enterprise monitoring software.
 - b. Average audio level is available.
 - c. Peak audio level is available.
 - d. Major feature is being able to detect a certain level such as silence or excessive loudness for certain lengths of time.

The VF200 Modules continued:

- 3.2.5 The VM0003 AES/EBU Audio Module – This module monitors four channels of digital audio. Parameters monitored include:
- a. Audio is sampled and levels are output to the VTECS Enterprise monitoring software.
 - b. Input clock detect and quality.
 - c. Average audio level is available.
 - d. Peak audio level is available.
 - e. Major feature is being able to detect a certain level such as silence or excessive loudness for certain lengths of time.
 - f. The module can be jumper configured for balanced or unbalanced audio.
- 3.2.6 The VM0009 DTMF Tone Transceiver Module – This module monitors four channels of analog audio for DTMF tones. Parameters monitored include:
- a. DTMF tones can be received.
 - b. DTMF tones can be generated.
- 3.2.7 The VM0010 16 Relay Output Module.
- a. 16 GPI outputs.
- 3.2.8 The VM0006 16 GPI Input Module.
- a. 16 GPI inputs.
 - b. Each input can be jumper configured to be TTL or opto-isolated.
- 3.2.9 The VM0011 32 GPIO Input/Output Module.
- a. Each I/O pin can be dynamically configured by the software to be a TTL input or TTL output.
- 3.2.10 The VM0007 2x2 Passive Transfer Switch Module – This module is a two-by-two relay based signal router.
- a. One 2x2 video passive switch.
 - b. Four 2x2 balanced audio passive switches.
 - c. Control can be from the VM0008 or from back panel GPI inputs.
 - d. Power presence back panel GPI output.
 - e. Switch state back panel GPI output.

4.0 The VNODE Spot Monitoring Tier

A VNODE is a self-contained small-scale signal monitoring system. There are six different models. Each one measures 5" x 3" x 1" and includes 1) circuitry to monitor one or more signals, 2) relays for GPI alarm outputs, 3) GPI inputs, and 4) a microprocessor with 100Base-T Ethernet communication capability. A VNODE can report defects to the VTECS Enterprise monitoring software. It can report defects to an SNMP manager, or it can respond to defects by setting its' own GPI relays. The unit can be configured by using either the Windows based Videoframe Configuration Application, or by using a VTECS™ 1 control panel.

The VNODE solution is recommended for systems where monitoring points are few in number or for situations where the monitoring points are spread out thinly over a wide area. There may also be situations where centralized monitoring is not a requirement. The small "zero rack unit" package can be mounted anywhere. This can be an advantage when there are no rack units left or rack space is tight, for example, in older installations or in trucks.



Figure 3 – VNODE Spot Signal Monitoring Units

4.1 The VNODE Product Line

There are presently six VNODE models. They all share the same software and Ethernet interface features. They all contain relay output GPI capability for generating local alarm responses. The individual VNODE models are:

4.1.1 The VF0038 SDI Video VNODE – This VNODE monitors one channel of SDI video.

Parameters monitored include:

- a. Video is sampled and pictures are output to the VTECS Enterprise monitoring software. Pictures are available as 66x49 small thumbnails, 102x81 large thumbnails, or full field.
- b. Picture unlocked – bad or missing clocking.
- c. Pedestal level.
- d. Video average program level. This can be set to various thresholds such as black.
- e. Frozen signals.
- f. 16x9 aspect ratio.
- g. VBI data such as closed captioning.
- h. Monitors four audio signals out of one group. Group is configurable.

Other features include:

- a. Has 8 GPI output relays.
- b. Has 8 GPI TTL inputs.
- c. 10/100 Ethernet port.
- d. SNMP agent with HP Openview compatibility.

4.1.2 The VF0039 Analog Audio/Video VNODE – This VNODE monitors a channel of NTSC/PAL video and two channels of analog audio. Parameters monitored include:

- a. Video is sampled and pictures are output to the VTECS™ Enterprise monitoring software. Pictures are available as 66x49 small thumbnails, 102x81 large thumbnails, of full field.
- b. Missing vertical sync.
- c. Pedestal level.
- d. Video average program level. This can be set to various thresholds such as black.
- e. Frozen signals.
- f. VBI data such as closed captioning.
- g. Audio is sampled and levels are output the VTECS Enterprise monitoring software.
- h. Average audio level is available.
- i. Peak audio level is available.
- j. Major feature is being able to detect a certain level such as silence or excessive loudness for certain lengths of time.

Other features include:

- a. Has 8 GPI output relays.
- b. Has 8 GPI TTL inputs.
- c. 10/100 Ethernet port.
- d. SNMP agent with HP Openview compatibility.

- 4.1.3 The VF0040 Analog Audio VNODE - This VNODE monitors four channels of analog audio. Parameters monitored include:
- a. Audio is sampled and levels are output to the VTECS Enterprise monitoring software.
 - b. Average audio level is available.
 - c. Peak Audio level is available.
 - d. Major feature is being able to detect a certain level such as silence or excessive loudness for certain lengths of time.

Other features include:

- a. Has 8 GPI output relays.
- b. Has 8 GPI TTL inputs.
- c. 10/100 Ethernet port.
- d. SNMP agent with HP Openview compatibility.

- 4.1.4 The VF0041 AES/EBU Audio VNODE – This VNODE monitors four channels of digital audio. Parameters monitored include:
- a. Audio is sampled and levels are output to the VTECS Enterprise monitoring software.
 - b. Input clock detect and quality.
 - c. Average audio level is available.
 - d. Peak audio level is available.
 - e. Major feature is being able to detect a certain level such as silence or excessive loudness for certain lengths of time.
 - f. The module can be jumper configured for balanced or unbalanced audio.

Other features include:

- a. Has 8 GPI output relays.
- b. Has 8 GPI TTL inputs.
- c. 10/100 Ethernet port.
- d. SNMP agent with HP Openview compatibility.

- 4.1.5 The VF0042 DTMF Tone Receiver VNODE – This VNODE monitors four channels of analog audio for DTMF tones. Features include:
- a. DTMF tones can be received.
 - b. Has 8 GPI output relays.
 - c. Has 8 GPI TTL inputs.
 - d. 10/100 Ethernet port.
 - e. SNMP agent with HP Openview compatibility.

- 4.1.6 The VF0037 GPI VNODE.
- Features Include:
- a. 16 relay outputs.
 - b. 16GPI TTL inputs.
 - c. 10/100 Ethernet port.
 - d. SNMP agent with HP Openview compatibility.