

The Open Architecture Approach to Telemetry Processing

Based upon the AP Labs VMEstation®, the **VTS** is an open architecture, dedicated real-time system providing deterministic performance in telemetry processing applications.

The VTS consists of one or more VME chassis and standard Unix workstations, networked together using Ethernet, FDDI or other high-speed networks. The VTS can function as a stand-alone system, or in a networked environment. Because of its modular architecture, the VTS can easily accommodate a single PCM telemetry stream, or may be scaled up to support multiple, high-speed streams, simultaneously.

Simplified system operation is provided using AP Labs VMEwindow™ Graphical User Interface (GUI) software for setup and control. Based upon X Windows/Motif, VMEwindow supports the industry standard Unix operating systems.

The VTS is an open architecture solution for telemetry processing. All hardware used in the system is Commercial-Off-The-Shelf (COTS) and is based upon the industry standard VME and VSB busses. The open software architecture of the system is based upon UNIX, X Windows/Motif, and the widely supported VxWorks® Real-Time Operating System. The TCP/IP Ethernet and/or FDDI network is used extensively by both host and target components in the VTS. The open architecture of the system also enables VTS users to easily add their own software & hardware to meet customer specific requirements.

All VTS products are shipped fully integrated, tested, and are backed up by responsive and efficient customer service. Installation, hands-on training and integration services are also available.

Scalable System Architecture

- Industry standard 6U VME/VSB format
- Supports multiple VME chassis & multiple CPUs per chassis
- Any data acquisition & processing task can be allocated to any CPU

Turnkey VMEwindow™ Control Software

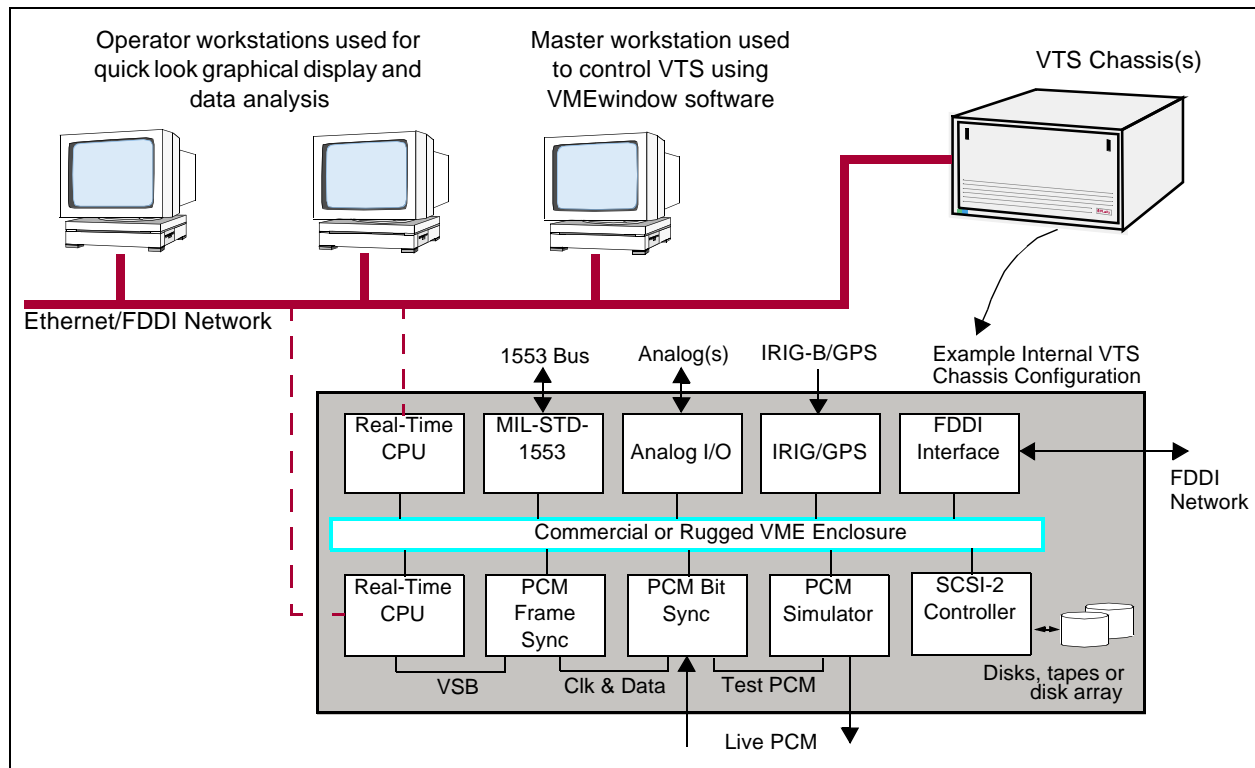
- Provides real-time data acquisition & processing under VxWorks
- Provides easy to use graphical setup and control under Unix
- Real-time quick look graphical displays

Data Acquisition

- Single & multiple stream PCM telemetry supporting IRIG 106 formats
- MIL-STD-1553
- IRIG/GPS time code
- Analog I/O, discrete digital I/O, GPIB, asynchronous serial I/O
- Real-time archival & playback using industry standard SCSI-2 devices

Data Processing

- All data is converted internally to a common format providing uniform data processing capabilities
- Real-time conditional, compression, engineering units conversion (EUC) and derived parameter processing
- Easy integration of user-defined EUC and derived processing routines
- Easy integration with third party post test data analysis software products



In the sample block diagram above, the VTS contains two real-time CPUs which may be allocated to any data acquisition or processing task based on current mission requirements. Operator workstations are used to integrate the VTS with third party graphical display and data analysis products, while the master workstation is used to control the VTS using VMEwindow.

Specifications

VME-based PCM Telemetry Interfaces:

- Bit synchronizer
- Decommutator
- Simulator
- Viterbi & convolutional encoder/decoder
- CCSDS Reed-Solomon encoder/decoder
- BPSK/QPSK modulator/demodulator
- L/S band receiver & matrix switch

Archival/Playback:

- Standard SCSI-2 fixed and removable hard disks
- 8mm and 4mm tape
- RAID-3 disk arrays
- Network File System (NFS) supported for archival/playback and file transfer

Network:

- System control and real-time data distribution supported over both Ethernet and FDDI
- FTP, NFS, RPC, TCP/IP, UDP/IP protocols

Other VME-based I/O Interfaces:

- MIL-STD-1553
- Analog
- Serial (RS-232/422)
- IEEE-488 (GPIB)
- IRIG-B time code processor (GPS optional)
- Discrete digital I/O (TTL)
- Reflective memory

Packaging (Table Top or Rack Mount):

- Standard 12/20 slot VME enclosure for most laboratory environments
- Full line of rugged and MIL-SPEC enclosures and rugged workstations available for mobile, shipboard and airborne environments

Data Processing:

- Real-time conditional parameter processing
 - Supports frame format changes
 - Supports alternate parameter definitions
- Real-time compression parameter processing
 - Conserves CPU bandwidth by only processing parameters of interest
 - Provides data averaging, sub-sampling, matching, slope, etc. routines
- Real-time Engineering Units conversions (EUCs)
 - Converts raw counts to engineering units
 - Provides linear, polynomial, table lookup, data conversion and user defined routines
- Real-time derived parameter processing
 - Creates new parameters by combining one or more other parameters
 - Can define via an in-line equation or user-provided C subroutine
- CCSDS telemetry data processing
- Easy integration of third party post-test data analysis packages

Graphical Setup and Display:

- VMEwindow provides point & click, Unix based graphical user interface
- Easy configuration using icons which represent data acquisition or processing tasks
- Quick look graphical displays support strip charts, bar charts, XY plots, numerics, tabular data, alarms, gauges, etc.
- Easy integration of third party real-time graphical display packages

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