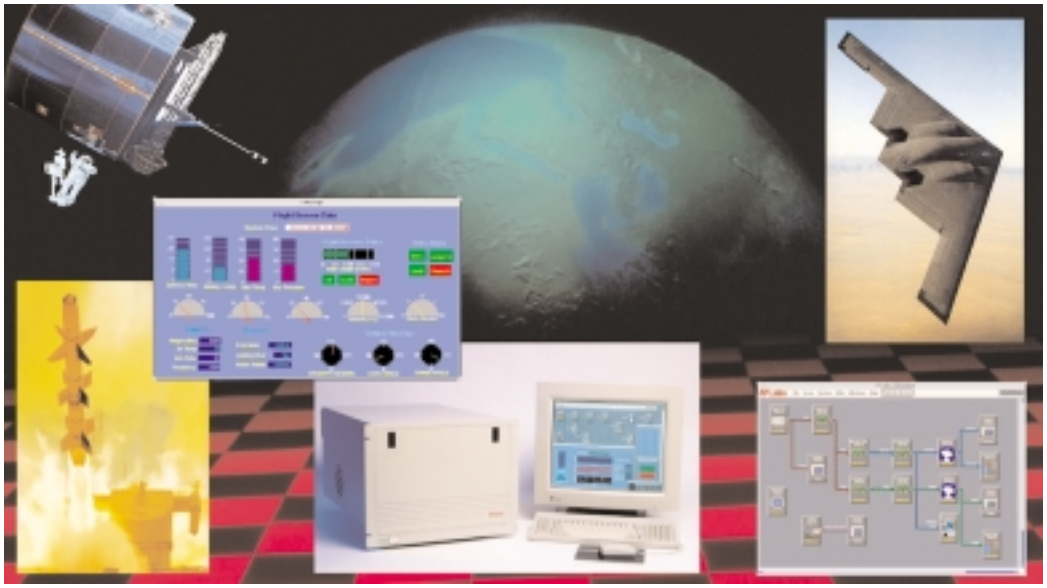
AP Labs

Rugged Enclosures
Integrated Systems
Manufacturing Services

PCM Telemetry with VMEwindow®



The open architecture approach to PCM Telemetry

The *VMEwindow® Telemetry System* (VTS) is an open architecture, dedicated real-time system providing deterministic performance in PCM Telemetry acquisition and processing applications. Simplified system operation is provided using the VMEwindow® Graphical User Interface (GUI) software for setup and control.

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, simultaneous high-speed streams.

The VTS consists of one or more VME chassis and standard host workstations, networked together using Ethernet, FDDI, ATM or shared memory high-speed networks. All hardware used in the system is Commercial-Off-The-Shelf (COTS) and is based upon the industry standard VME bus.

The software architecture of the system is based upon standard workstation technology for the host graphical user interface capability, and the widely supported VxWorks® Real-Time Operating System for the acquisition & processing subsystem. Standard TCP/IP networking is used extensively by both host and target components in the VTS. Access to source code enables users to easily add their own software and hardware to meet customer specific requirements.

Scalable Architecture

- *Industry standard 6U VME format*
- *Supports multiple VME chassis and multiple CPUs per chassis*
- *Any data acquisition & processing tasks can be allocated to any CPU*

Turnkey Control Software

- *Provides real-time data acquisition and processing under VxWorks*
- *Easy to use graphical setup and control with real-time displays*

Data Acquisition & Processing

- *Single/Multi-stream IRIG-106 PCM*
- *MIL-STD-1553 Avionics Bus*
- *IRIG-B/GPS, Analog I/O, digital I/O, GPIB, and serial I/O support*
- *Real-time SCSI archival & playback*
- *Real-time conditional, compression, engineering units conversion (EUC) and derived processing routines*
- *Easy integration of user-defined and third party EUC, derived, and post-processing routines*

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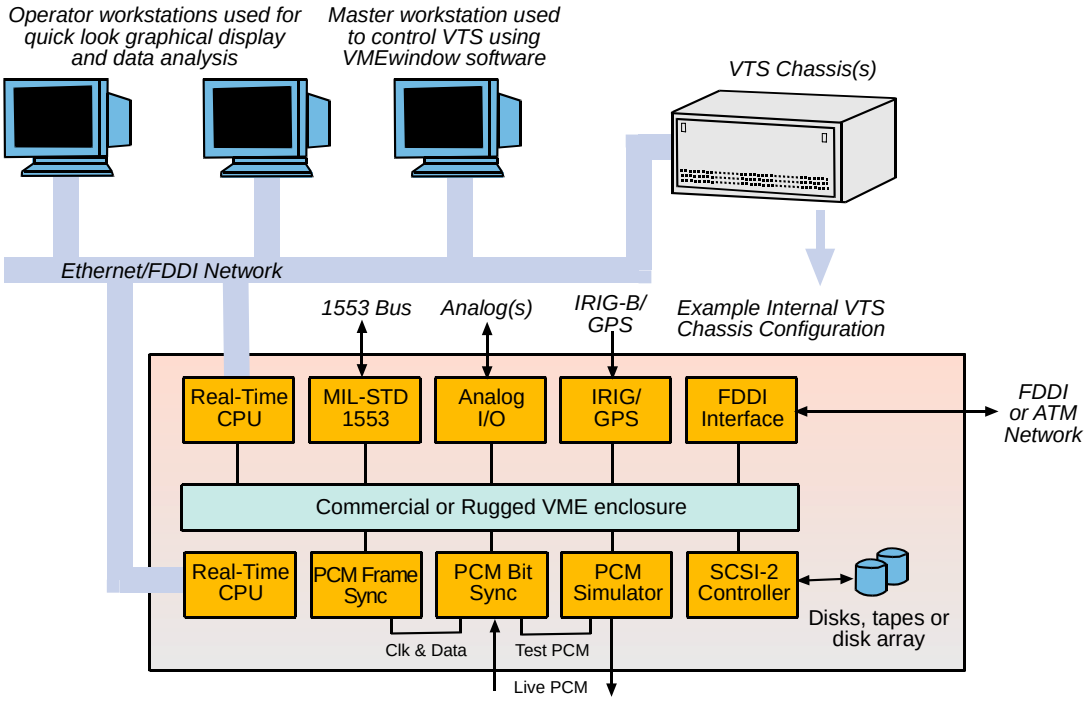

In the sample block diagram above, the VTS contains two real-time CPUs which may be allocated to any data acquisition or processing task based on current mission requirements. Operator workstations are used to integrate the VTS with third party graphical display and data analysis products, while the 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 fixed and removable hard disks
- 8mm and 4mm tape, RAID disk arrays

Network:
- Ethernet, FDDI, ATM
- FTP, NFS, RPC, TCP/IP, UDP/IP protocols

Other VME-based I/O Interfaces:
- MIL-STD-1553
- Analog In/Out, Serial (RS-232/422), Digital I/O
- IEEE-488 (GPIB), Replicated Memory
- IRIG-B time code processor (GPS optional)

Packaging (Table Top or Rack Mount):
- Standard 12/20 slot VME enclosure for laboratory environments
- Full line of rugged and MIL-SPEC enclosures and rugged workstations 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 bandwidth by only processing parameters of interest
  - Provides data averaging, sub-sampling, matching, slope, etc.
- 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 parameters
  - Can define via an in-line equation or user-provided C subroutine
- Easy integration of third party post-test data analysis packages

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