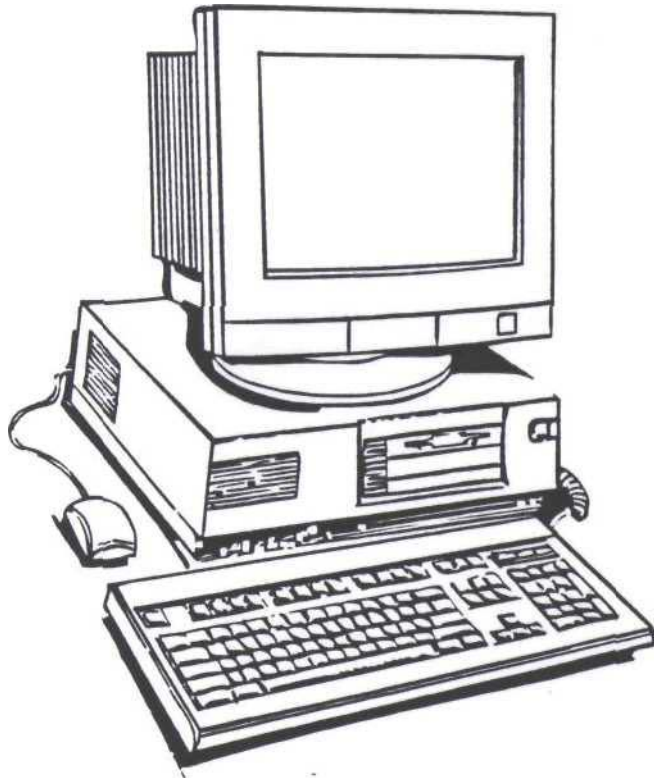


Cyber Systems

Versaplex 2000



NT

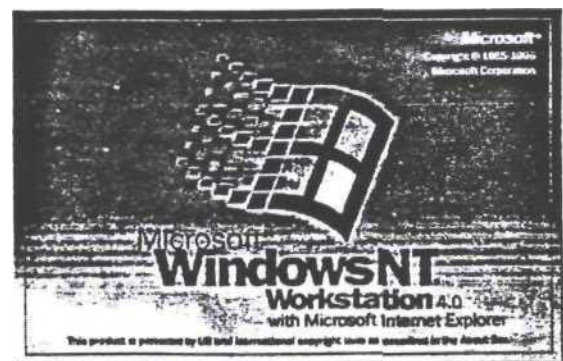


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Preston's Versaplex 2000NT Data Acquisition System

General System Description

The Versaplex system is designed to be unpacked and ready-to-use within a few minutes. This is possible because the Versaplex 2000NT system consists of very few pieces. In fact, aside from the measurement cabinet, a complete system includes only three principle items; a Personal Computer (PC), an Acquisition Control Unit, and an Interface Adapter. **Figure 4** illustrates how these items are configured in a complete system.

The PC used with the Versaplex system is configured with a powerful Pentium based processor and a complement of hardware interfaces and peripherals. All phases of the test, including setup, calibration, acquisition, limit checking, data display, recording, and replaying of test data, are handled by the PC and Cyber's Versaplex 2000NT application software

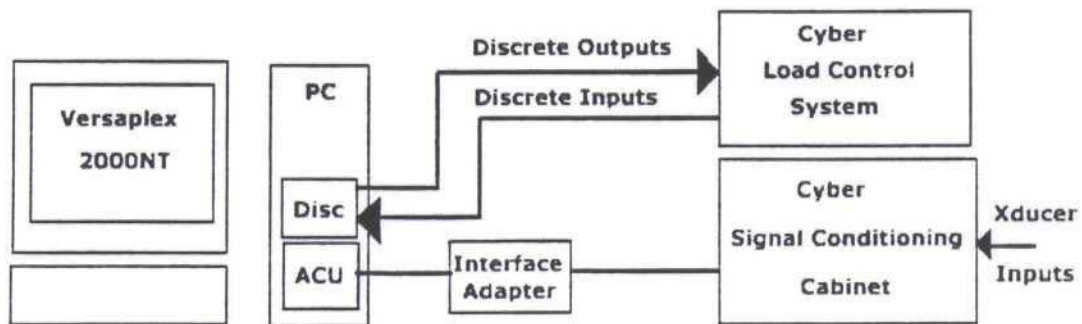


Figure 4 – Basic Versaplex 2000NT System Configuration

The PC works in conjunction with Cyber's Acquisition Control Unit (ACU) module, which is installed in the PC. The ACU is similar to the MCU used in earlier Cyber DAS systems and performs the actual scanning of the input channels. The ACU is capable of scanning up to 1,024 input channels at an aggregate rate of 10,000 samples/second or more.

Communication between the ACU and the input channels in the signal conditioning cabinet is accomplished through an Interface Adapter box. This box is designed to operate with a single signal conditioning cabinet (i.e. master chassis). Other hardware options are available to connect more than one "Data Front End" to the Versaplex.

The connection between the PC and Interface Adapter is through a 5-wire serial cable, while the connection between the Interface Adapter and the measurement cabinet can be either copper cable or fiber optic, depending on the configuration of the measurement hardware.

In most cases, the measurement hardware can be readily located out on the lab floor, while the computers and other peripherals are located in the control room.

Preston's Cyber Measurement Hardware

The measurement cabinet houses all of the Cyber multiplexing & signal conditioning hardware, included Cyber's Model 9477 Eight (8)-Channel Signal Conditioner/Multiplexer Boards (a.k.a. mux cards).

Input Signal Path within Cyber's Signal Conditioning Cabinet

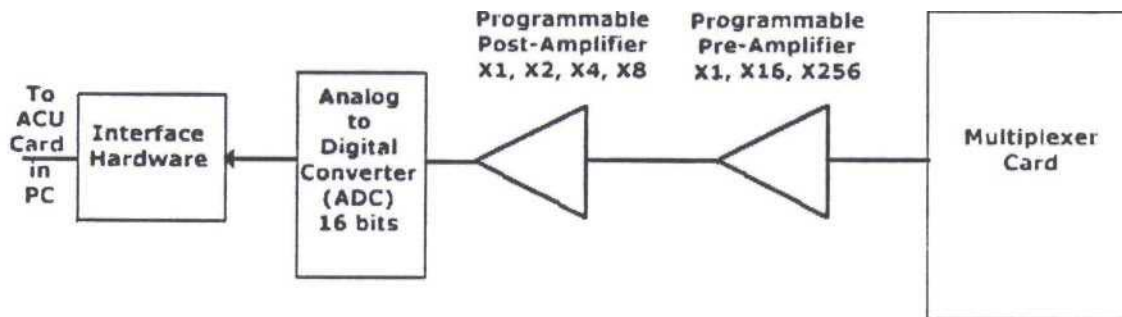


Figure 5 - Analog Input Path

As **Figure 5** illustrates, the combination of a common preamplifier and post-amplifier provides twelve (12) programmable gain ranges between X1 and X2048, allowing each input to accommodate differential signals in the range of $\pm 5\text{mV}$ to ± 10.24 volts full scale.

Existing Cyber DAS customers should note that, although their Cyber DAS equipment is very similar to Cyber's current signal conditioning hardware, there might be slight differences with the amplifier gains and/or calibration hardware, which must be addressed separately.

Within the measurement cabinet, one of the mux chassis is referred to as the "Master" chassis, while all other chassis are "Slaves". Each multiplexer chassis holds up to 16 mux cards (i.e. 128 channels). The master chassis also contains all of the amplification and digitizing hardware, which all inputs are multiplexed through. The digitizing resolution of the ADC is currently 16-bit. However, the Versaplex software can also accommodate 12-bit configurations.

A programmable precision voltage source is also included in the "master" chassis for calibration purposes. This voltage supply includes individual settings, which represent 80% of full scale for each gain range. Routines within the Versaplex application software use this voltage source in conjunction with the calibration procedure.

Acquisition Control Unit

The Versaplex system includes a Cyber Acquisition Control Unit (ACU) which installs into one of the ISA slots in the motherboard of the PC. The ACU is designed to perform the scanning of the input channels at rate up to and exceeding 10,000 samples/second.

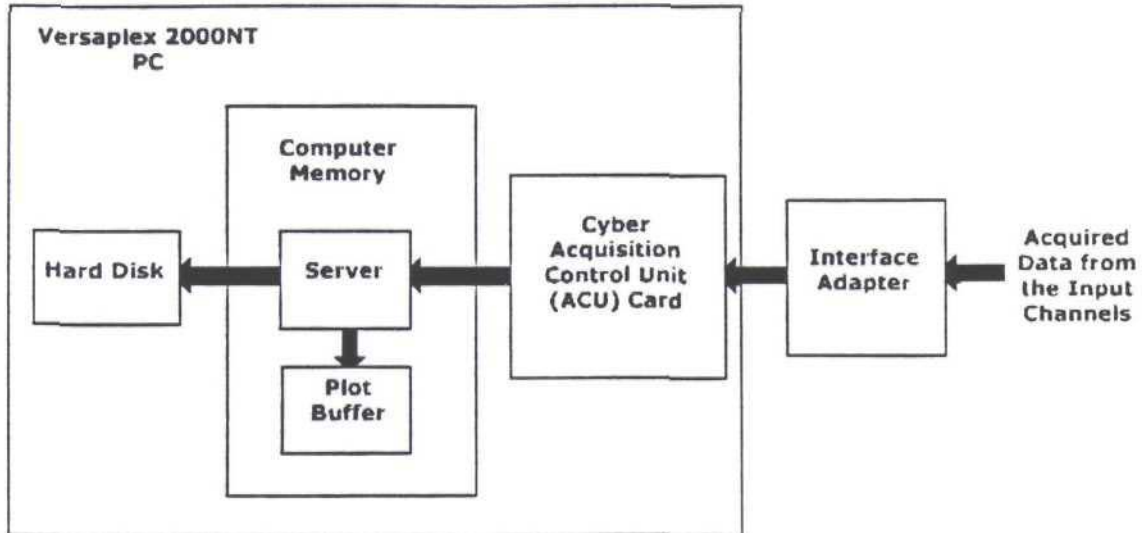


Figure 6 - ACU Diagram

As **Figure 6** illustrates, the data collected by the ACU is not only used for recording to disk, it is also passed on to the server running in the PC which uses this data for various things, including updating the plot buffer and limit checking each measurement.

System Software & Operation

The most important aspect of any Data Acquisition System is its operation. This is why the Versaplex system uses contemporary techniques throughout every aspect of the system operation. These techniques include:

- Using individual software buttons to select specific functions
- Separating categories of functions into software folders
- Using spread sheets to define the channel parameters
- Using "drag & drop" techniques whenever possible
- Using scrolling techniques for long lists of information
- Using familiar PC keyboard commands to select or de-select items

The actual process used to setup and use the Versaplex system is very logical and allows even inexperienced users to become familiar with the system within a short period of time. The Versaplex application software also provides "help boxes" which pop up whenever the user moves the mouse on top of an icon or button. All of these techniques help to minimize the time necessary for personnel to become proficient with the overall Versaplex operation and its individual features.

Remote Data Monitoring

The Versaplex system includes an Ethernet server, which allows acquired data to be monitored in real-time from one or more remote PC's. As the Versaplex system is acquiring data, regular updates are provided over the Ethernet to the remote PC(s). This capability allows other test personnel, such as stress engineers, to monitor the test data from another location in the lab independently of the master station. From the remote PCs, any of the available displays (e.g. tabular, XY plot, bar chart, strip chart, or CAD) can be used to look at the data. But most importantly, remote users have no control of the system, and can not affect it in anyway.

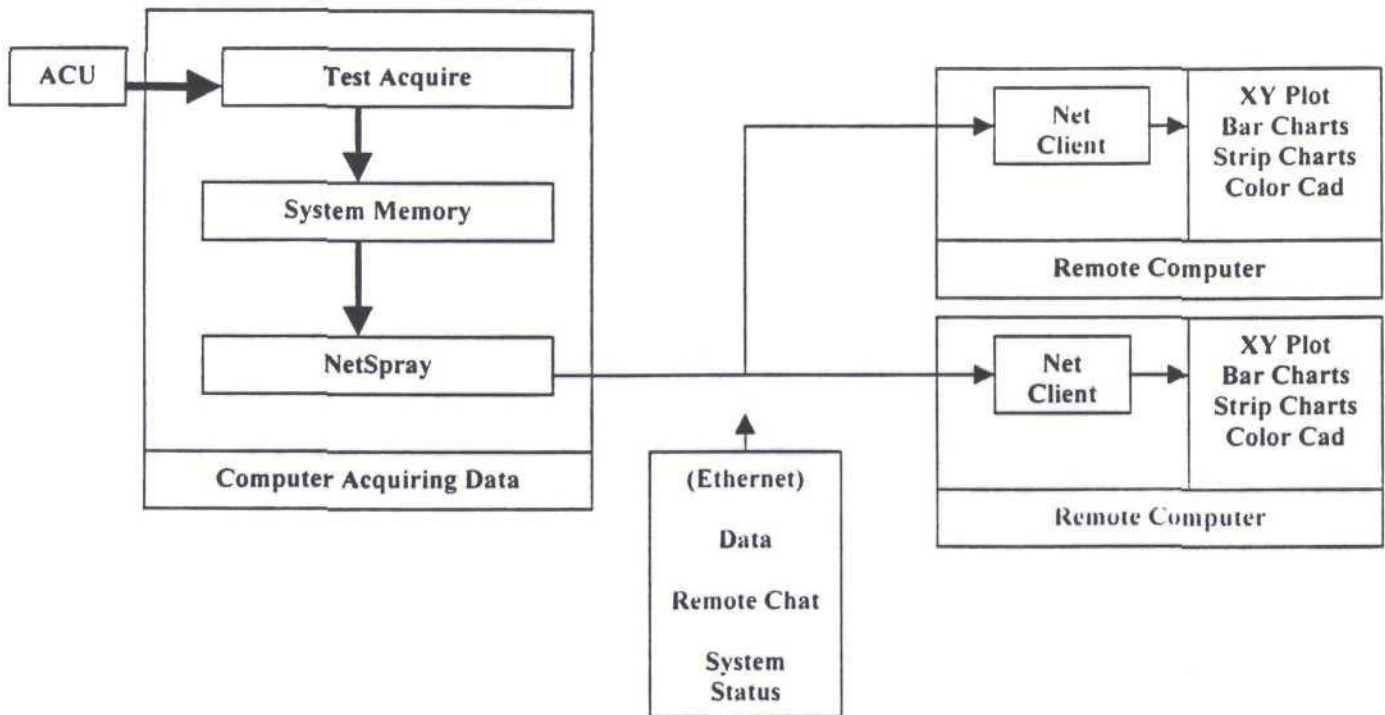
Description:

To allow remote monitoring on separate PCs the Versaplex 2000nt Data Acquisition System provides two programs designed to work in conjunction. Found in the Versaplex program folder, *Netspruy* is the network server and *Net Client* is the network client application. These applications work over the common TCP/IP network connection that is provided with the system.

Netspruy, when activated, runs in the background and monitors any data acquisition activity currently on the system. It is passive until a request from one or more computers on the network running the *Net Client* application is received. If data acquisition is in progress the client is allowed to connect and data is transferred, if not the client is informed and disconnected.

Netspruy is designed to remain running on the system at all times. In addition to transferring test data, *Netspruy* also monitors all other data system *Netspruy* servers on the network and reports their status. *Netspruy* maintains a connection log, allows users to communicate with each other using a chat feature, browses the systems intranet and provides a useful program menu bar to execute other Versaplex programs and utilities.

Net Client is the remote data display application that is similar in appearance and function to *Test Acquire*, except it only displays test data and does not acquire it. By connecting to a *Netspray* application running on a computer that is currently acquiring data with *Test Acquire*, the same data is transmitted over the network and the test operator can perform data analysis upon the test independently of the data's source.



Main Features:

- Remote data displays across network.
- System status to all computers on network
- Remote chat to all computers on network
- System logbook of connections
- Versaplex system menu bar

Preston Cyber Analog Measurement Subsystem

Specifications - Model 7077 Low-Level Multiplexed Signal Conditioning

Number of Channels	8 Channels per card, 16 cards per chassis
Sampling Rate	20kHz with unlimited gain switching
Filter	Wideband or 1-pole passive
Multiplexing	
Input Voltage	±10.24V clamped at +11 V
Input Impedance	1000 Mohm in parallel with 300 pF
Offset	2µV
Pumpout	1nA at 25 Degree C
Crosstalk	20µV.V of adjacent channel at 20kHz
Chassis Preamplifier	
CMRR	110dB
Noise	10uV RTI peak 3-sigma at 20kHz
Nonlinearity	±0.01% of Full Scale
Gain and Offset	Calibratable by system reference supply

Specifications - Model 7044 Post-Amp/ADC

Channel Addressing Capability	1024 analog, 1024 discrete (16 bits each)
Programmable Gain Amplifier	
Gains	X1.X2.X4.X8
Offset	Adjustable to zero
Sample Rate (Programmed)	100Khz samples/sec (20Khz Versaplex)
Linearity	0.005% of Full Scale
Gain Accuracy	Calibrated by System Reference
Output Range	±10.24 V
Offset DAC	
Maximum Cancellation	10.24(1-1/Posi-Amp Gain) RTO
Resolution	12 Bits
ADC Resolution	10 Bus

Specifications - Model 7044 (13468) Calibration Voltage Reference

Cal. Voltage Reference Accuracy	$\pm 0.015\% \pm 3\mu\text{V}$ for 6 months
Cal Voltages Provided:	0 $\pm 4\text{mV}$ $\pm 8\text{mV}$ $\pm 16\text{mV}$ $\pm 32\text{mV}$ $\pm 64\text{mV}$ $\pm 1.28\text{V}$ $\pm 2.56\text{V}$ $\pm 5.12\text{V}$ $\pm 10.24\text{V}$
Buffered Outputs	Up to $20\mu\text{A}$ output
Current sensing protection	$>20\mu\text{A}$

Preston Scientific



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