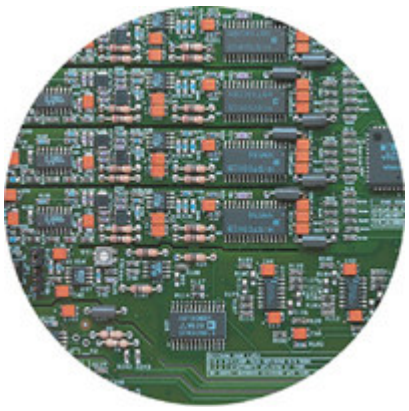
Why not select remotely control terminal equipment?



When the notion of remotely controlled terminal equipment is brought up, people are likely to think, 'What would you control on a Distribution Amplifier?' Despite this initial response, the availability of networked, remotely controlled products for the conversion and processing of audio and video signals has steadily increased over the last five years. More and more, customer service calls are predominated by questions about setting up their 'essential' terminal equipment control networks and control points. Why is this a useful concept? How does it affect product cost? How does it integrate with other control mechanisms in the production facility?

The remote control of terminal equipment is an extension of an existing concept; that of modern production switcher control panels. Modern production switchers and DVE's don't send video and audio signals to the control panel from the chassis in which those signals are processed. Instead, the control panels are actually specialized computer terminals that exchange digital control signals with the signal processing chassis. Gains, offsets, time delays, and all other adjustments are performed with solid state devices which are often less expensive than the mechanical components they replace. Menus in these control panels dynamically reassign a few knobs to dozens of different adjustments, depending on the needs of the moment.

As plants have grown to send their signals from place to place in a single format, the need for conversion, gain, and time delay adjustments has been redefined. Signals are converted and adjusted before they reach the production switcher and DVE. Adjustments are made to each signal before it enters the main router or at intermediate points between routers of one format or another. Changes may also be required at facility exit points; a consumer VCR or an STL. The same adjustment convenience previously embedded in the production switcher or DVE is now sought wherever the change takes place. Centralized adjustment/monitoring capability becomes even more important in this new scheme

as two interrelated adjustments may be at opposite ends of a building; not merely on adjacent printed circuit boards.

Thus, an analog composite video network feed which varies in amplitude from program to program can now be corrected by the master control operator without leaving her station as it is converted to the digital format used for distribution within the plant. A camera which was previously timed correctly for a production switcher can now be re-timed for a post production suite by monitoring signal alignment and correcting timing while sitting at the editing station. A maintenance engineer can remotely change the test signal being produced by his generator while troubleshooting a device on a different floor. Separating engineering and production control networks also allows production and engineering tasks to be performed simultaneously. Integrated interfaces required technical directors to stand around while engineering staff used a shared interface to correct signal errors. Many plants keep a variety of VTR's on hand to deal with many incoming source formats. These may be routed in analog form, then converted through a common device. Remote control of the conversion allows format and gain changes to be remotely executed as different source VTR's are selected. Remote control also means remote monitoring. This means the presence and nature of signals can be monitored throughout a processing chain; eliminating the need for someone to wander through the racks with test equipment to find out which link in the chain has broken.

What is the cost of remote control functionality? Modern conversion/adjustment products commonly contain microprocessors and digitally controlled adjustments. Thus, the real question of remote control expense becomes, 'How much does a terminal port cost for each module?' The customer expense for this added feature is generally under ten dollars, or one percent of a one thousand dollar conversion product price. What about network 'glue' hardware? True-networked terminal equipment products simply share wires. The Sierra Video Systems DigiLinx family, for example, connects up to 174 different modules to the same three wires to compose a network. Control points are added in the form of hardware control panels or host adapter cards; any one of which can control or monitor any device in the network. Larger networks, such as Ethernet based LAN's, can access the terminal equipment network via PC's attached to the network or web server micro controllers which attach directly to host adapter cards. A fifty module network can be interfaced to a PC for less than fifteen dollars per module.

What about inexpensive modules, such as distribution amplifiers? Since distribution amplifiers are often without adjustment, adding networked monitoring capabilities to a DA can cost fifty dollars or more to the list price of the product. Such products can be offered with or without network access; plugging into the same frame either way. The fact that a different style of frame need not be purchased just to add a DA can justify non-networked product purchases in an otherwise networked environment. If

networked DA's are purchased, the user gains the ability to monitor the presence or even nature of the signal passing through the DA.

This must be balanced against the expense of maintaining sufficient staff to adjust locally controlled products or the cost of additional products to circumvent the need to change module settings as applications change. Some venues, such as multi-standard post production facilities, find remotely re-configurable products more valuable than single format facilities.

Because only one controller is needed for an entire network, no 'slots' need be lost to a controller within each frame. The user simply connects frames within a network together with a three wire (audio or RS232 quality) cable. Because little additional hardware is required per module, remote control modules are available in the same rack density as non-remote control modules. Because local control can be performed with a shared control panel on the front of a frame, front panel space doesn't have to be allocated to each modules adjustments; saving more space.

Remote control of terminal equipment goes hand in hand with remote control of routers, VTR's and other centralized resources. Setting up for a post production editing session requires selecting sources with routers, converting sources to appropriate formats for combining, adjusting source timing for combining, performing the combining operation itself, routing the combined signal to a production output recorder, and converting the combined output to a format compatible with the production output recorder. The missing link in the automation of this process has been terminal equipment control. Now that terminal equipment can be controlled from the same location as the router, VTR's, and production switcher, all elements of the post production process can be manipulated by those directly responsible for the production, reducing cost and time to market. Control of router and terminal equipment within the same computer also allow for automated format conversion by letting the computer know where conversion resources reside on the router as well as the input and output formats of sources and destinations within the plant.

Given the minimal cost, added value, reduced system troubleshooting time, and enhanced automation potential of networking, one might be tempted to ask 'Why NOT select remotely controlled terminal equipment?'

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About the Author: Mike Henderson has been at SVS for 8 years. In his role as Principal Engineer, Henderson defines and designs our digital and mixed signal video processing and routing products. He has also developed hardware for the majority of our DigiLinx modular terminal equipment.

With 14 years of experience in video design engineering, Mike has contributed to the Grass Valley Group, designing subsystems for a handful of their products and was also a design engineer at VTEL for their teleconferencing products, as well as Motorola for their remote control circuitry in automobiles. He obtained a BSECE from

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