IMUX Variable Video System

VIDEO TRANSPORT FOR THE SUBSTATION ENVIRONMENT

The preconceived notion that quality video requires much more bandwidth than T1 is based on outdated methods of video compression. The advanced work being done on video compression permits systems which can provide usable high resolution video at speeds as low as 64 kb/s, a single T1 channel. This speed produces about 1-2 frames per second of high-resolution video, which can easily be used for substation & switchyard monitoring. Allocation of 3 channels out of the 24 provided by T1 allows for real motion video that is relatively smooth and clear. Going up to 6 channels or 384 kb/s allows for very smooth real time video for closely examining detailed situations as required. As much as an entire T1 can be used when desired. The IMUX 2000 Video System can be used with all standard cameras and video monitors.

Several different applications can be put together which allows multiple cameras per T1 link. Since T1 equipment is a fraction of the cost of higher bandwidth equipment, many more cameras can be purchased for a given budget. The following two examples show how multi-channel simultaneous systems and sequential systems can be designed using the RFL IMUX 2000 Variable Video System.

Specifications

Video Input	NTSC Composite, 1 Vp-p, 75 ohm, 60 Hz PAL Composite, 1 Vp-p, 75 ohm, 50 Hz
Number of Video Inputs	3 (one active at a time, user selected remotely)
Video Output	NTSC Composite, 1 Vp-p, 75 ohm, 60 Hz PAL Composite, 1 Vp-p, 75 ohm, 50 Hz
Frame Rate	1-20 fps (dependant on bandwidth allotted and amount of movement per frame)
Number of Video Outputs	1
Communications Bandwidth	16 kb/s – 1536 kb/s
Resolution	352 x 288 pixels
Operating Temperature Range	-20°C to +70°C
Power Requirement	1.5A @ 5V

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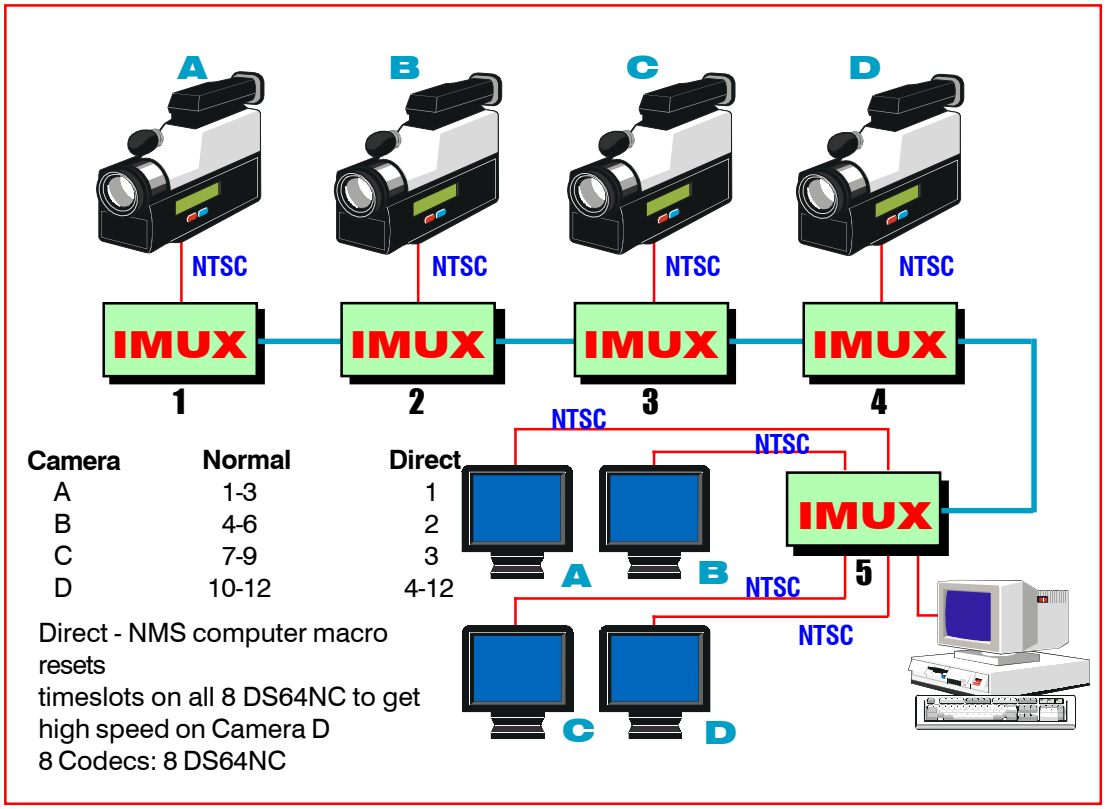
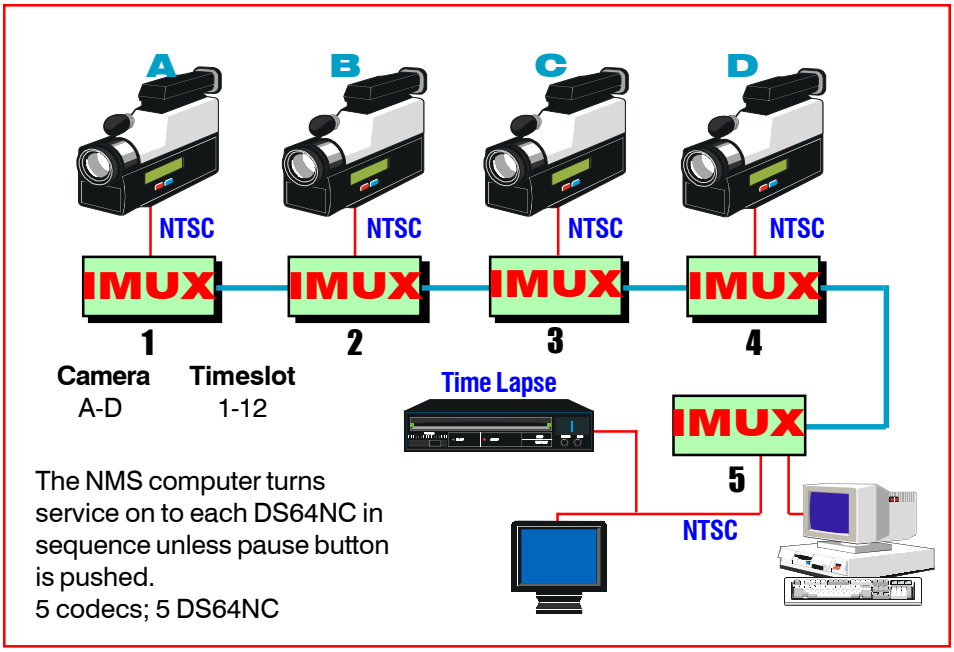
Application 1 - Simultaneous Channels



In this application the video from four video cameras is transported using only ½ (768 kb/s) the bandwidth available in a single T1 link. Each of the video transmitters is set up to transmit continuously on 3 timeslots (192 kb/s). The control center displays this video on four separate monitors. This 192 kb/s video gives status and security information at a glance. A computer running the RFL network management software is also used to control the video channels. A more detailed look is only a click away. The network management software can easily reduce the bandwidth on all but the desired camera to a single timeslot. These video feeds continue at a reduced frame rate. The camera of interest is increased in speed to 9 time slots giving a high quality video look at the desired location. Another click and the cameras are back to the original configuration. This application is useful when the video feed from the other cameras is still desired. Please reference IMUX 2000 Product Information Brochure for additional information the VS-100.

Application 2 - Sequential Channels



In this application the video from each camera is shown in a continuous sequence, one camera at a time. The use of one half of a T1 bandwidth gives an extremely high quality video. The network management computer directs each camera to send its feed for a user-determined period of time. The sequence can be stopped and one camera viewed continuously with a click of the mouse. Another click and the sequence resumes. This application is useful in that it requires much less hardware in the control center and provides high quality video all the time.