Application Note

Remote Control of Master Control

Introduction

Many of our customers require remote control of their various operations. These range from controlling a small router at a remote site to controlling an entire system remotely. This document describes a few methods for the remote control of Miranda's master control switchers.

Remote control allows these advantages:

- Control for disaster recovery.

  A building might need to be evacuated. People are unable to work, but the equipment is still operational. Remote control allows the operation to continue and provides alternate signal paths that allow programming to pass through from some remote location.

- Personnel reduction.

  A group of regional stations that rely entirely on automation after the late news might designate one station to remain staffed during the night. This station would monitor the other stations and intervene at the remote station in case of some malfunction and correct the problem.

This document addresses only remote control of the Miranda's master control switcher. There are many other devices that make up a master control operation that could also be controlled remotely: servers, graphics, satellite receivers, transmitters, and so on. These are beyond the scope of this document. Following the overview are examples of remotely controlled master control switchers.

Master Control Overview

Miranda master control offers system flexibility: controlling single or multiple master control channels by one or more control panels. A control panel can be either a hardware panel or a software panel (GUI).

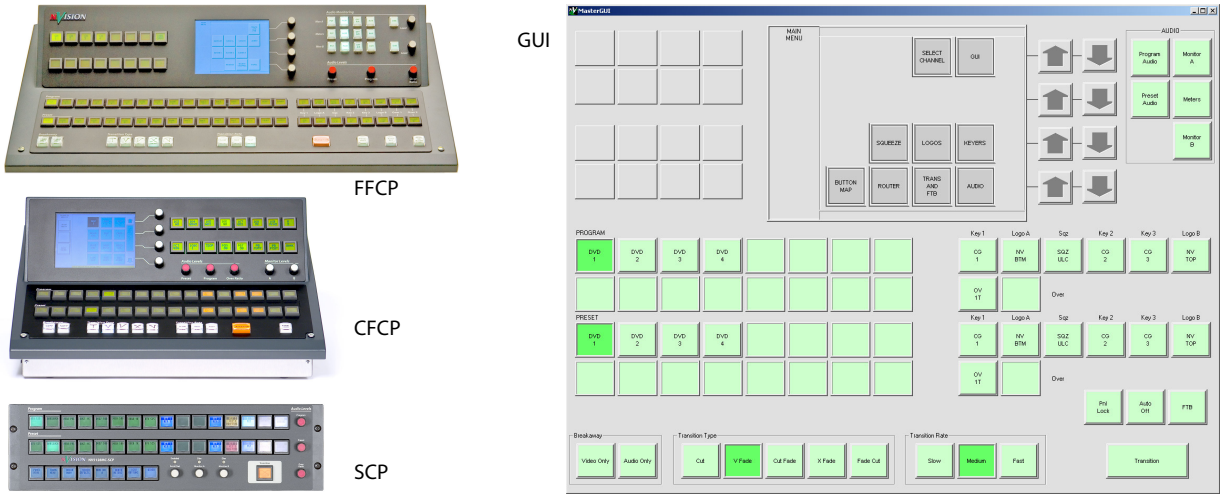

Figure 1. Hardware and Software Control Panels

An installation can have 4 to 5 channels (or more), using a mixture of SD and HD master control processor modules (MCPMs). All control panels and MCPMs connect together on an Ethernet LAN. A control panel may control a single MCPM or multiple MCPMs. Buttons on the control panel select which MCPM to control. When the panel connects to a new channel, the new channel's state information is displayed at the control panel.

The network of panels and MCPMs allows several control panels to connect to single MCPM, with all of the panels operating concurrently. Some customers use a software panel for each channel displayed on the monitor wall to monitor automation control, and then have one hardware panel that can be delegated to any MCPM for manual override.

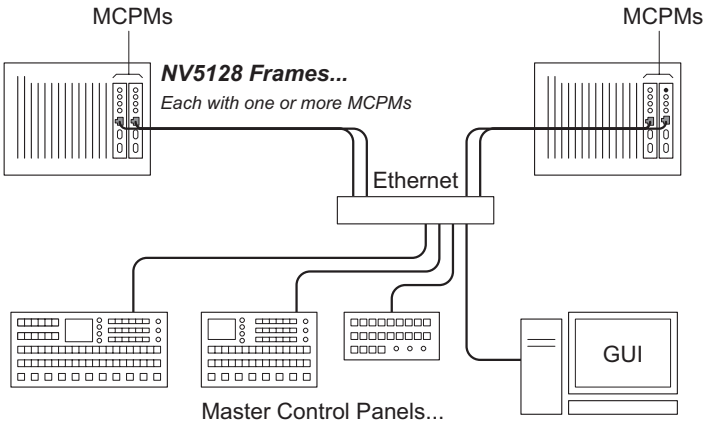

Figure 2. A Master Control System

Remote control using a software control panel

Windows® XP® and Vista® allow one computer to control another computer using remote desktop control. Similar software is available from pcAnywhere,™ LogMeIn, and others, which can make managing remote connections easier. The costs are low: from free to the price of the software.

When a remote PC is running, the local PC's desktop appears on the remote computer's screen. The local computer accepts keyboard and mouse control from the remote. The remote PC now drives the local PC.

A software control panel (GUI) on a remote PC is a simple remote control system. When control is needed, the operator at the remote PC connects to the local computer, opens the GUI, and operates the master control switcher. The GUI can control more than one channel.

To monitor video remotely, you can use simple Slingbox network streaming devices or professional broadcast backhaul methods.

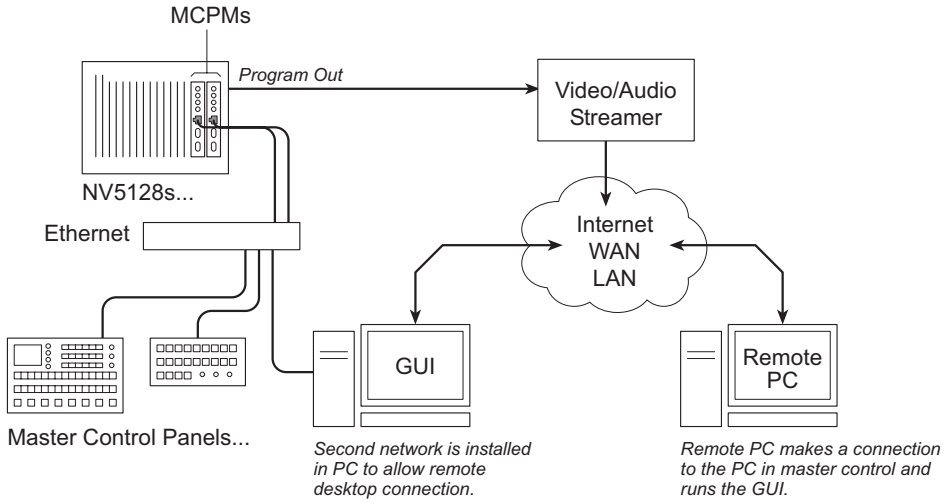

Figure 3. Master Control System with Remote PC

Remote control using a hardware control panel

A hardware panel can also be located remotely. A remote hardware panel requires a bit more networking savvy than a remote GUI.

A virtual private network (VPN) can be used to connect the network at the two sites over a public network. The IP routers on each end provide VPN services. The VPN effectively places all the devices on each end of the network on a common subnet. The remote panel becomes part of the local master control network.

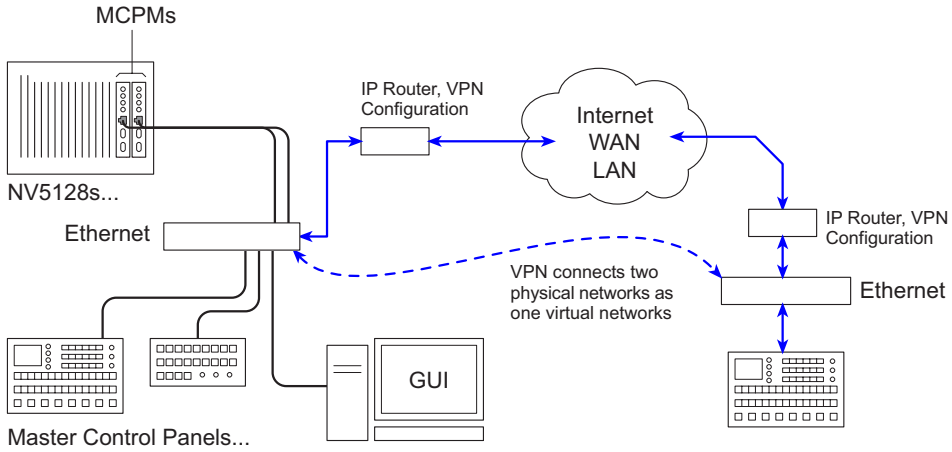

Figure 4. Master Control System with Remote Control Panel and VPN

You can use a WAN if you have more control over the network. The IP routers know the network path based on the IP router's routing table. Each IP router has a gateway address. The control panels and MCPMs are configured with the local IP router's gateway address, so that the router will accept the traffic, route it to the destination router, and then to the destination device.

The IP routers effectively connect two different subnets, using routing table knowledge to pass data between devices at each end of the network.

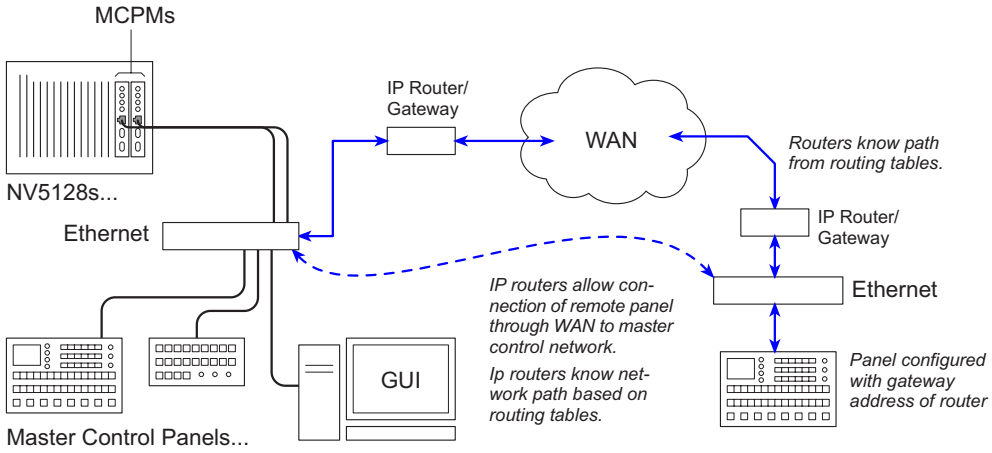

Figure 5. Master Control System with Remote Control Panel and WAN

The local panels and MCPMs connect on a 100 Mb/s switched network. The switch provides multiple high-speed connections appropriate for multiple panels and multiple MCPMs.

When the local network is connected to a remote network, there is possibility of reduced bandwidth and increased latency from the remote connection. The remote panels will be slower than the local panels. Indicator lamps may take a bit longer to light. Rotary knobs generate a significant amount of network traffic. Network latency can cause the operator to over-correct changes being made with the knobs. An alternative to knob-turning is to adjust the data values directly using the LCD menus on the hardware panels or the software menus of the GUI. All parameters that are adjustable using a knob can also be changed using numeric entry from the menu. Figure 6 shows a sample audio menu:

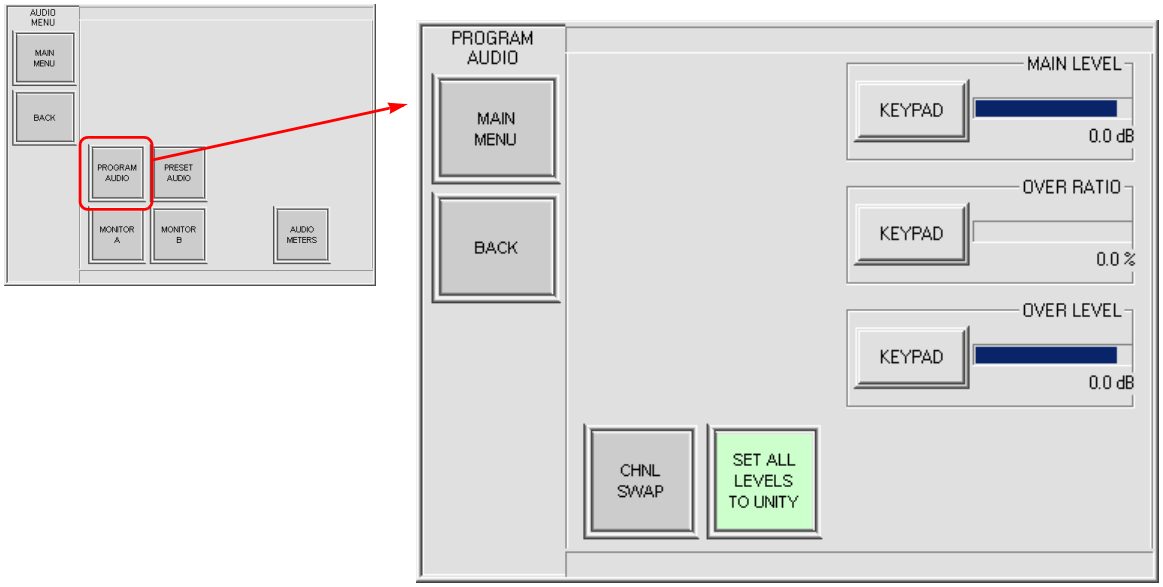

Figure 6. Audio Menu (GUI)

Miranda also supports SNMP for monitoring master control status. An NV9000 system controller added to the master control network collects the alarm information from the master control panels and MCPMs and

provides a single SNMP agent. A SNMP manager can then receive traps from the NV9000 agent for integration into an overall SNMP monitoring system.

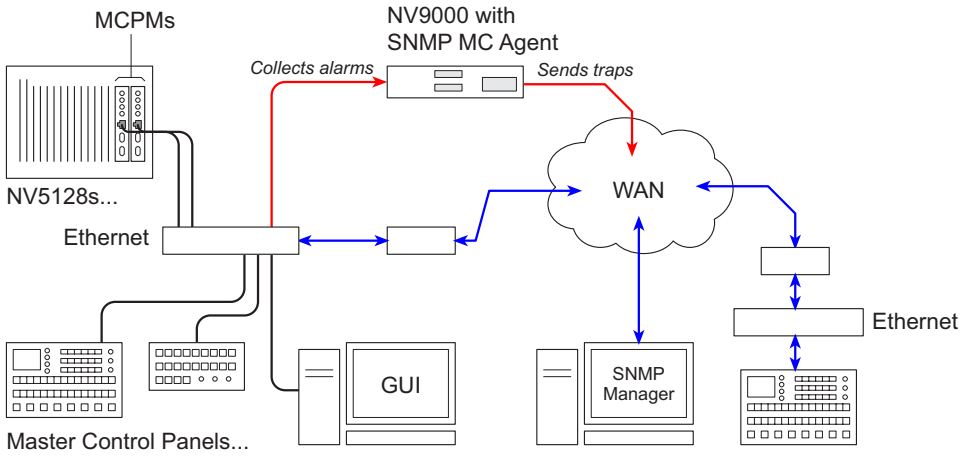

Figure 7. Master Control System with Remote Control Panel and SNMP

Summary

The NV5128-MC master control system provides some flexibility for remote control: from simple remote desktop software to hardware panels at a remote location. We also support remote control of our NV9000 Router Control System.

Remote control offers (1) disaster protection and (2) personnel reduction during non-critical broadcast times.

We offer several different master control panels. The remote panel can be smaller and cost less than than what may be in use at the main location.