

Setting Up and Managing a Multi-Site NK Series Routing System

References: Phoenix Online Help

Setting Up an NK Series System with Phoenix

IPS User Manual

Introduction

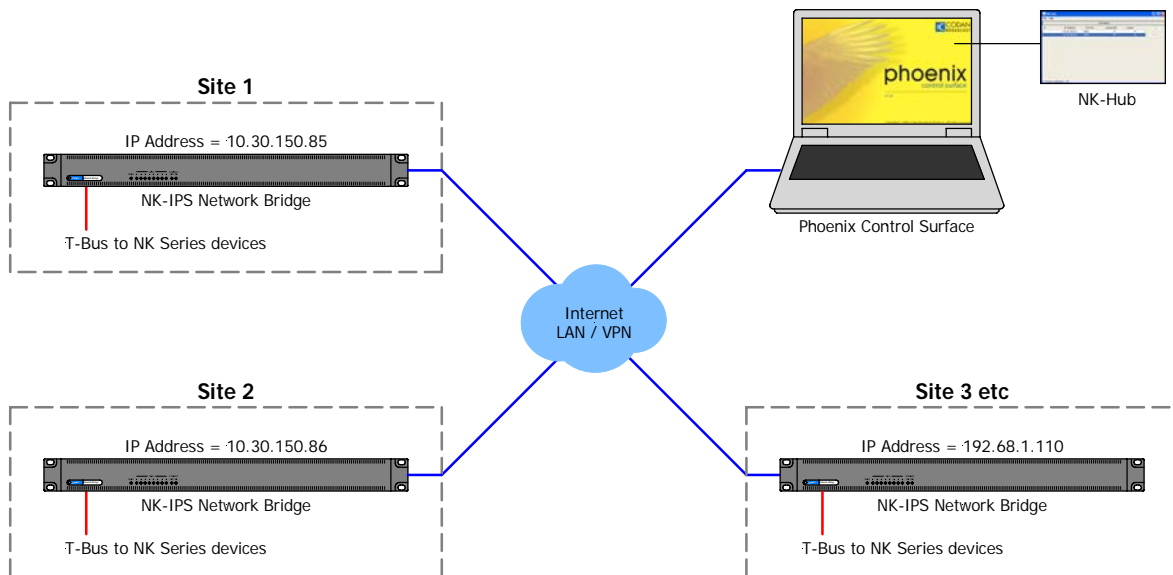
Globalisation has afforded us the luxury of greatly improved communication, while placing increasing demands on the broadcasting infrastructure. It is now common place for a broadcast organisation to have operations in different cities, states, or countries, with networking already an accepted way of maximising effectiveness and audience reach.

The distributed nature of the NK Series routing control system lends itself perfectly to the increasing need for integrated configuration, control and monitoring of geographically separated routing systems.

What Is a Multi-Site Routing System?

A multi-site routing system is characterised by a number of geographically separated routing systems functioning as one integrated system, with common control distributed across the multiple sites. The system may be controlled from one location or multiple locations, using physical control panels or virtual control with software. Provided network connectivity has been established between sites, there is no practical limitation to the distances over which a multi-site routing system can exist.

An NK Series multi-site routing system uses an NK-IPS Network Bridge at each site enabling the use of TCP/IP to transport switch and protocol communication between NK Series devices at each site. Communication between each site is facilitated using NK-Hub, a stand alone software application which functions as a virtual hub, connecting two or more IPSs. NK-Hub is shipped with the NK-IPS T-Bus Utilities CD and is also available as a download from the Codan Broadcast website.



NK Series Multi-Site Routing System Topology

A multi-site NK Series routing system requires the following components:

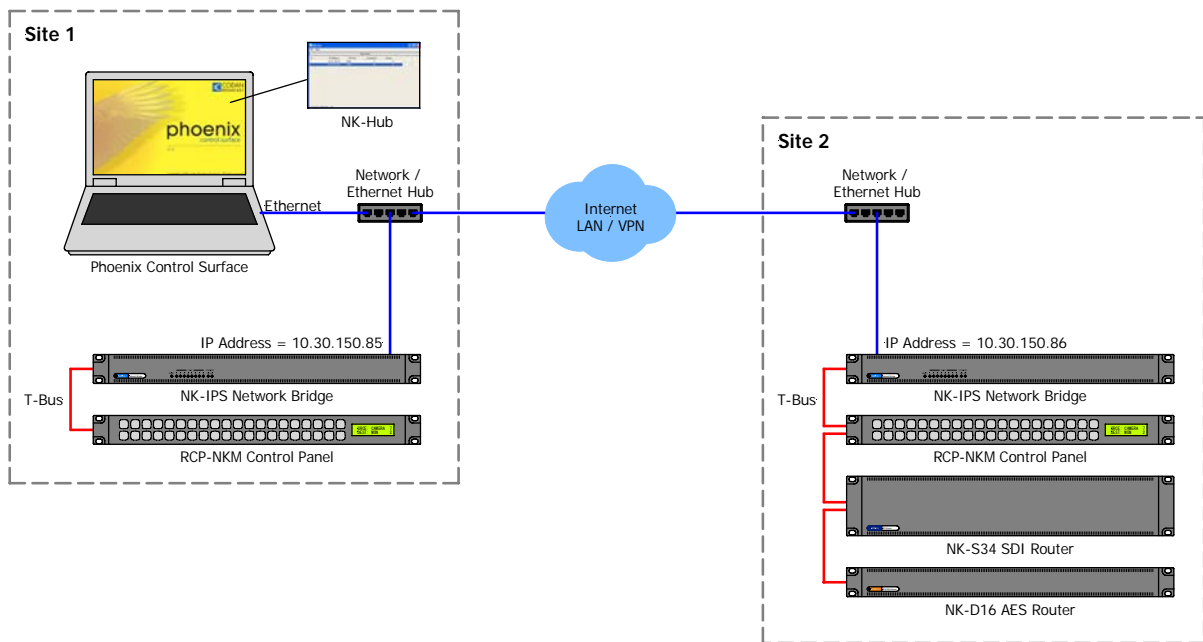
- At least two geographically separated routing systems
- Internet/WAN/LAN/VPN connectivity between sites
- An NK-IPS Network Bridge at each site
- A PC running NK-Hub in one location

Although some multi-site systems will only require minimal configuration, which can be achieved using a web browser, most systems will benefit by using Phoenix Control Surface software for enhanced system configuration, control and monitoring capabilities. Phoenix has been specifically designed to manage multi-site routing systems, either from a single location on the network, or from multiple locations.

Setting Up a Multi-Site Routing System

Multi-Site Routing System with Routers at One Site Only

Consider the following example with routers at one-site only. This system would be typical of a remote transmitter site or an unmanned broadcast facility, with routers switching baseband signals at the remote site and control, configuration and monitoring managed from a Master Control. The remote site has a local override panel for performing maintenance. The control panels at either location could be replicated for ease of configuration and operation, but they need not be.



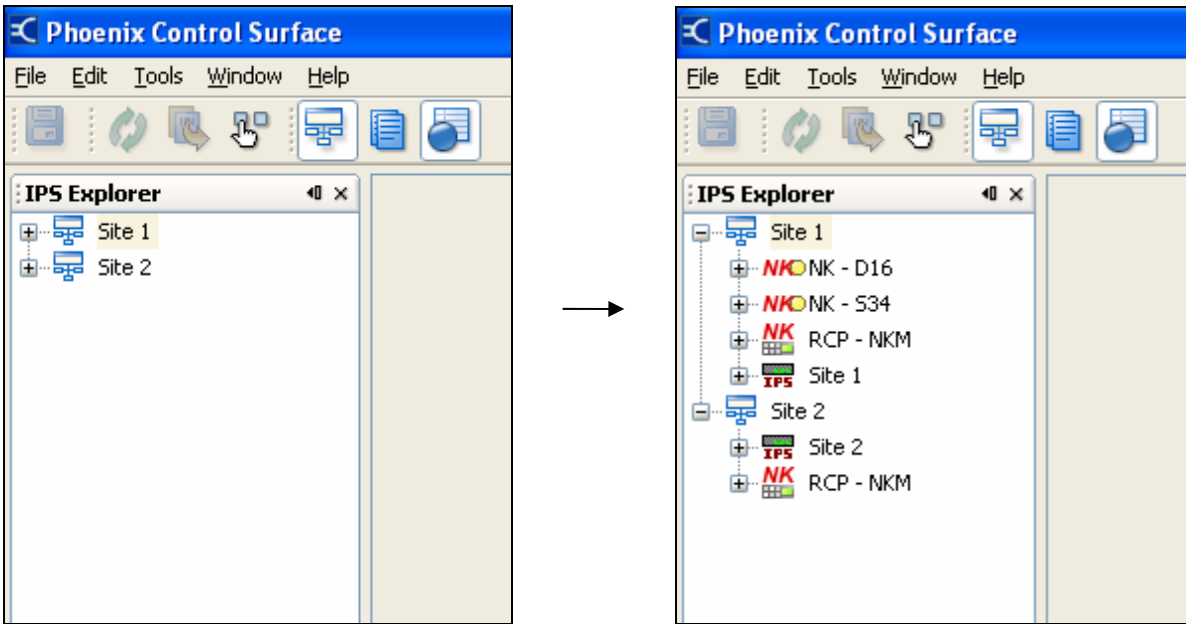
Example Multi-Site Routing System with Routers at One Site Only

Establishing Network Connectivity

To allow communication across a TCP/IP network, each IPS in a multi-site routing system must first be assigned an IP address. The range of IP addresses available will depend on the IT infrastructure employed by your organisation, and you should consult your network administrator for details. The Codan Broadcast Device Finder utility can be used to find IPs on a network and configure their IP addresses. It is also possible to use DHCP to allow an IP address to be automatically acquired by an IPS. Please refer to the **IPS User Manual** for more information.

Configuring a Multi-Site System Using Phoenix

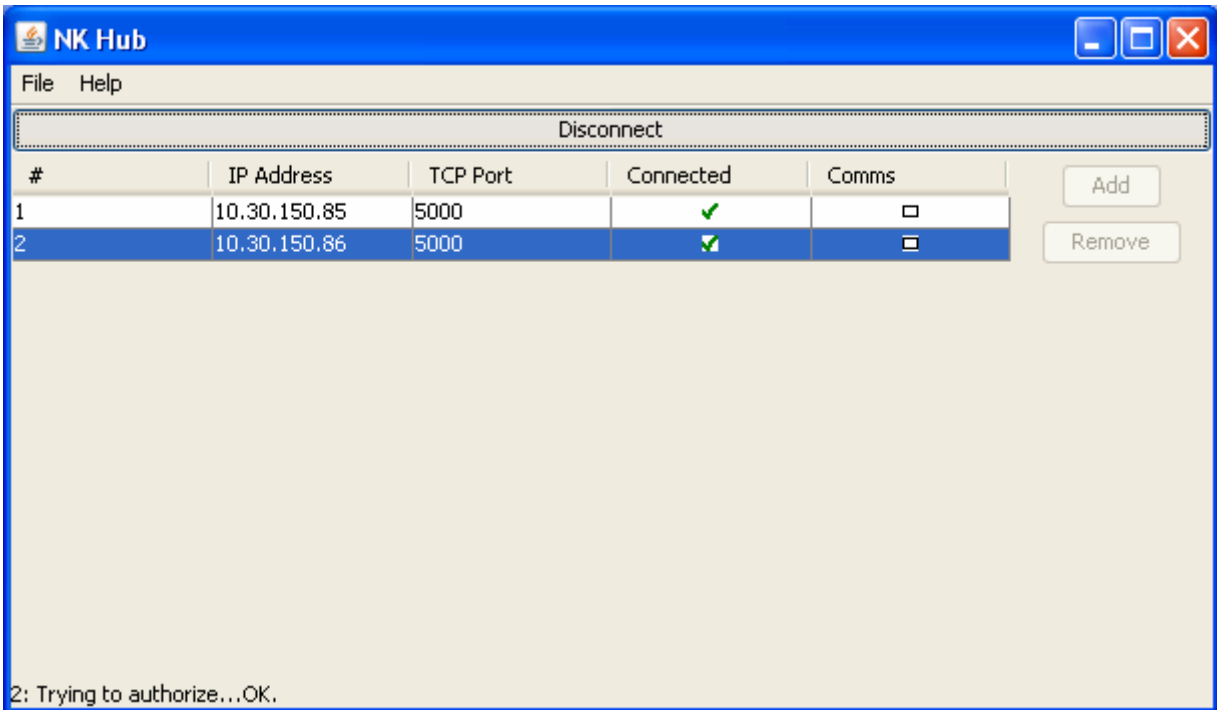
Once IP addresses have been established, a computer running Phoenix software can locate each IPS on the network, giving access to NK Series devices at each site such as routers and control panels. Each site can be configured by simply selecting the appropriate IPS in the IPS Explorer window and expanding the device list. Device configurations can be uploaded or saved to disk, and firmware can be uploaded to devices if required, all from a remote location.



Phoenix IPS Explorer Window Display for Multi-Site System

Configuring and Running NK-Hub

To connect the two sites in the above example simply enter the IP address of each site's IPS in the NK-Hub's **IP Address** column and select **Connect**. Minimizing the program window allows NK-Hub to run in the background.

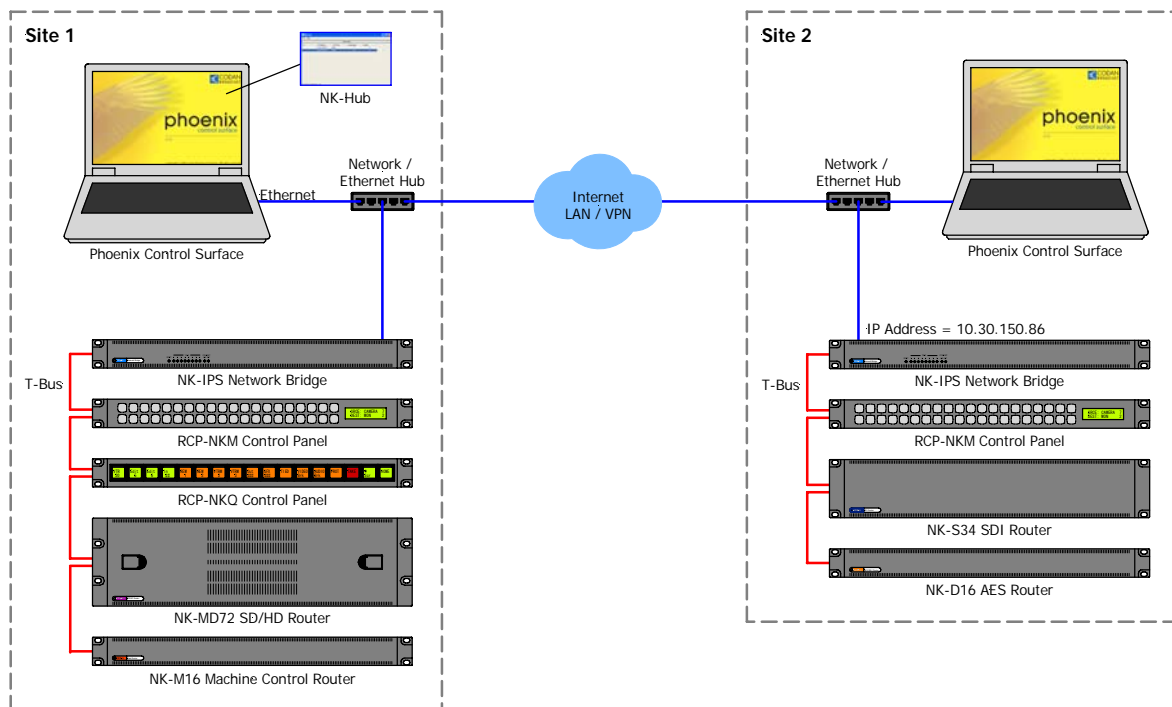


NK Hub Application Window

With NK-Hub running, all sites function as one large system as if devices are connected by one large T-Bus. In the above example, the RCP-NKM panel at Site 1 is used to remotely switch the routers at Site 2. Switches are made from the control panel as if the routers were connected on the same T-Bus, first selecting the router levels to be switched, then destination and source. If the switch is successful, the router returns an acknowledge and the control panel updates its status display.

Multi-Site Routing System with Routers and Control Panels at Multiple Sites

Consider the following multi-site routing system with routers and control panels at multiple sites as shown below. In this scenario, router levels are configured as if they were connected locally to the same T-Bus. Two routers assigned to the same level at different sites will make the same switch when a control panel anywhere on the network sends a switch command on that level. By programming control panels with appropriate levels and breakaways, local or remote routers can be selected to switch, and status will be updated on the panel accordingly. When switching a router from a remote control panel at another site, the remote control panel's status provides confirmation a switch has been successful. If two control panels are identically configured in the multi-site system, they will both be updated with the same crosspoint status, regardless of their location within the multi-site system, since routers broadcast their status to all control panels whenever a switch is made.



Multi-Site Routing System with Routers and Control Panels at Multiple Sites

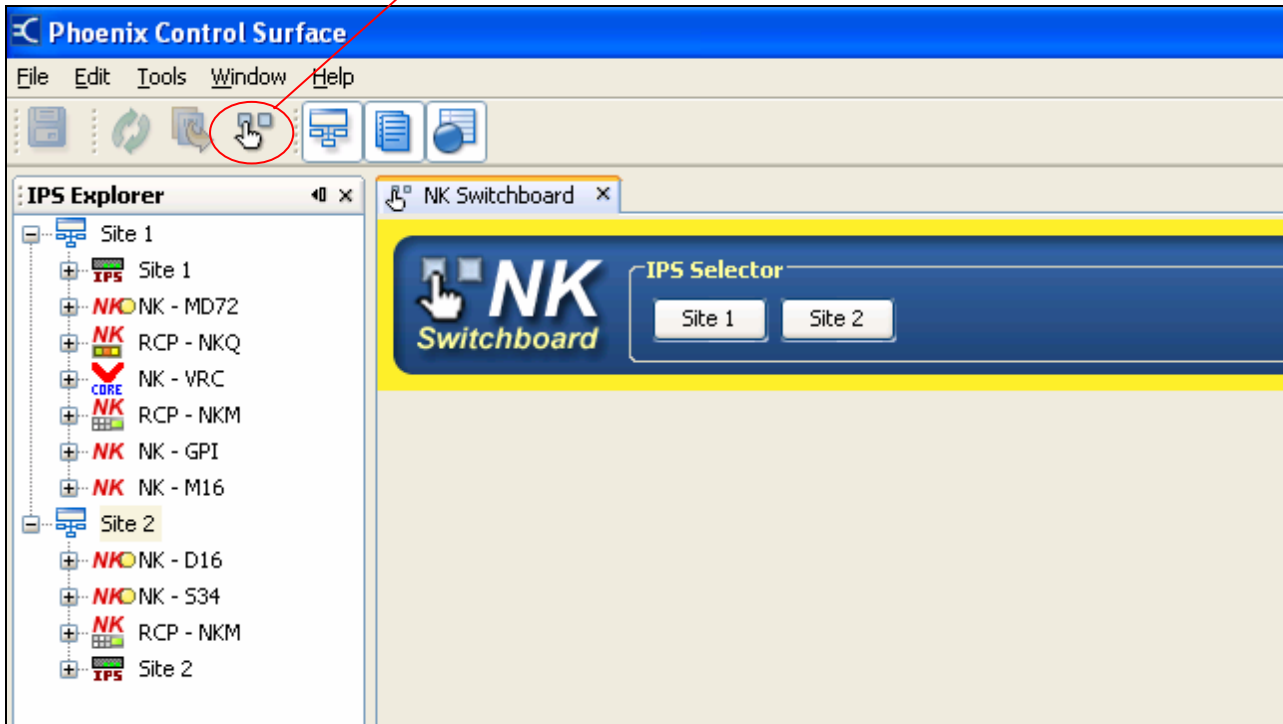
Adding Virtual Routing Capability to a Multi-Site Routing System

A single NK-VRC Virtual Routing Core connected to the T-Bus at one site in a multi-site system provides virtual routing functionality across all sites. Devices across the system are then individually enabled for virtual routing in their configurations. Provided they are configured identically, two or more Virtual Routing Cores can be connected at different sites to provide virtual routing redundancy.

Controlling and Monitoring a Multi-Site System Using Phoenix NK Switchboard

The Phoenix NK Switchboard is a convenient tool for providing multi-site system control and status monitoring from anywhere on the network.

Click here to open NK Switchboard



Phoenix NK Switchboard

The crosspoint status of routers at each site is displayed by selecting an IPS in the IPS Selector (see above). The NK Switchboard is also a virtual control panel, allowing router crosspoints to be switched by selecting levels, then outputs and inputs. Router outputs can also be protected, with current protects displayed and designated as being protected from the current Phoenix computer or from another Phoenix computer or control panel in the system. The NK Switchboard can be fully customised with editable text labels for Inputs, Outputs and Levels.

More than one instance of Phoenix software can be run in a multi-site system allowing the NK Switchboard to be used for monitoring or control of specific sites. Each install of Phoenix requires a USB hardware key, providing secure access for device configuration and system control to authorised personnel.

Click here to open view the Switchboard Status Table for Site 1

IPS Selector

Site 1 Site 2

Status

Output	SD/HD	MC
Out 1	In 6	In 6
Out 2	In 2	In 2
Out 3	In 10	In 10
Out 4	In 3	In 3
Out 5	In 7	In 7
Out 6	In 6	In 6
Out 7	In 4	In 4
Out 8	In 7	In 7
Out 9	In 13	In 13
Out 10	In 9	In 9
Out 11	In 12	In 12
Out 12	In 12	In 12
Out 13	In 10	In 10
Out 14	In 14	In 14
Out 15	In 15	In 15
Out 16	In 9	In 9
Out 17	In 14	
Out 18	In 22	
Out 19	In 20	
Out 20	In 28	
Out 21	In 18	
Out 22	In 10	
Out 23	In 4	
Out 24	In 24	
Out 25	In 22	
Out 26	In 30	
Out 27	In 27	

Functions

MC Protect

Levels

SD/HD MC

Sources

In 1
In 2
In 3
In 4
In 5
In 6
In 7
In 8
In 9
In 10
In 11
In 12
In 13

Key: Protected By Me Protected By Other Invalid Status No Router

Phoenix NK Switchboard Status Table