NK-Hub User Guide

Version 01

ROSS

Production Technology Experts

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You've made a great choice. We expect you will be very happy with your purchase of Ross Technology. Our mission is to:

1. Provide a Superior Customer Experience

   - offer the best product quality and support

2. Make Cool Practical Technology

   - develop great products that customers love

Ross has become well known for the Ross Video Code of Ethics. It guides our interactions and empowers our employees. I hope you enjoy reading it below.

If anything at all with your Ross experience does not live up to your expectations be sure to reach out to us at *solutions@rossvideo.com.*

David Ross
CEO, Ross Video
dross@rossvideo.com

Ross Video Code of Ethics

Any company is the sum total of the people that make things happen. At Ross, our employees are a special group. Our employees truly care about doing a great job and delivering a high quality customer experience every day. This code of ethics hangs on the wall of all Ross Video locations to guide our behavior:

1. We will always act in our customers' best interest.

2. We will do our best to understand our customers' requirements.

3. We will not ship crap.

4. We will be great to work with.

5. We will do something extra for our customers, as an apology, when something big goes wrong and it's our fault.

6. We will keep our promises.

7. We will treat the competition with respect.

8. We will cooperate with and help other friendly companies.

9. We will go above and beyond in times of crisis. *If there's no one to authorize the required action in times of company or customer crisis - do what you know in your heart is right. (You may rent helicopters if necessary.)*

NK-Hub · User Guide

- Ross Part Number: **9807DR-0012-01**
- Release Date: March 30, 2015.

The information contained in this Guide is subject to change without notice or obligation.

Copyright

Patents

Patent numbers US 7,034,886; US 7,508,455; US 7,602,446; US 7,802,802 B2; US 7,834,886; US 7,914,332; US 8,307,284; US 8,407,374 B2; US 8,499,019 B2; US 8,519,949 B2; US 8,743,292 B2; GB 2,419,119 B; GB 2,447,380 B; and other patents pending.

Notice

The material in this manual is furnished for informational use only. It is subject to change without notice and should not be construed as commitment by Ross Video Limited. Ross Video Limited assumes no responsibility or liability for errors or inaccuracies that may appear in this manual.

Important Regulatory and Safety Notices to Service Personnel

Before using this product and any associated equipment, read all the Important Safety Instructions listed below so as to avoid personal injury and to prevent product damage.

Products may require specific equipment, and /or installation procedures be carried out to satisfy certain regulatory compliance requirements. Notices have been included in this publication to call attention to these Specific requirements.

Symbol Meanings

	The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product. Failure to heed this information may present a risk of damage or injury to persons or equipment.
Warning	The symbol with the word "**Warning**" within the equipment manual indicates a potentially hazardous situation, which if not avoided, could result in death or serious injury.
Caution	The symbol with the word "**Caution**" within the equipment manual indicates a potentially hazardous situation, which if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

	Notice	The symbol with the word "**Notice**" within the equipment manual indicates a situation, which if not avoided, may result in major or minor equipment damage or a situation, which could place the equipment in a non-compliant operating state.
	Warning Hazardous Voltages	The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of shock to persons.
	ESD Susceptibility	This symbol is used to alert the user that an electrical or electronic device or assembly is susceptible to damage from an ESD event.

Important Safety Instructions

1. Read these instructions.

2. Follow all instructions and heed all warnings.

3. Refer all servicing to qualified service personnel.

4. The equipment's external power supply AC appliance inlets are the means to disconnect the product from the AC Mains and must remain readily operable for this purpose.

5. To avoid the risk of electrical shock and to completely disconnect the apparatus from the supply AC appliance inlets prior to servicing.

Warning

6. The safe operation of this product requires that a protective earth connection be provided. A grounding conductor in the equipment's external power supply line cord provides this protective earth. To reduce the risk of electrical shock to the operator and service personnel, this ground conductor must be connected to an earthed ground.

7. Indoor Use: WARNING: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

8. Warning: This product includes an "Ethernet Port" for connection to a local area network (LAN). This Ethernet port interface is designed for intra-building networks only.

   Do not connect this port to networks that go outside of the building.

EMC Notices

US FCC Part 15

This equipment has been tested and found to comply with the limits for a class A Digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a Commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

	Notice	Changes or modifications to this equipment not expressly approved by Ross Video Ltd. could void the user's authority to operate this equipment.

CANADA

This Class "A" digital apparatus complies with Canadian **ICES-003**.

Cet appareil numerique de la classe "A" est conforme a la norme **NMB-003** du Canada.

EUROPE

This equipment is in compliance with the essential requirements and other relevant provisions of **CE Directive 93/68/EEC**.

INTERNATIONAL

This equipment has been tested to **CISPR 22:1997** along with amendments **A1:2000** and **A2:2002** and found to comply with the limits for a Class A Digital device.

Notice   This is a Class A product. In domestic environments, this product may cause radio interference, in which case the user may have to take adequate measures.

Warranty and Repair Policy

The product is backed by a comprehensive one-year warranty on all components.

Notice   Changes or modifications to this equipment not expressly approved by Ross Video Limited could void the user's authority to operate this equipment.

If an item becomes defective within the warranty period Ross will repair or replace the defective item, as determined solely by Ross.

Warranty repairs will be conducted at Ross, with all shipping FOB Ross dock. If repairs are conducted at the customer site, reasonable out-of-pocket charges will apply. At the discretion of Ross, and on a temporary loan basis, plug in circuit boards or other replacement parts may be supplied free of charge while defective items undergo repair. Return packing, shipping, and special handling costs are the responsibility of the customer.

This warranty is void if products are subjected to misuse, neglect, accident, improper installation or application, or unauthorized modification.

In no event shall Ross Video Limited be liable for direct, indirect, special, incidental, or consequential damages (including loss of profit). Implied warranties, including that of merchantability and fitness for a particular purpose, are expressly limited to the duration of this warranty.

This warranty is TRANSFERABLE to subsequent owners, subject to Ross' notification of change of ownership.

Extended Warranty

For customers that require a longer warranty period, Ross offers an extended warranty plan to extend the standard warranty period by one year increments. For more information, contact your regional sales manager.

Environmental Information

The equipment that you purchased required the extraction and use of natural resources for its production. It may contain hazardous substances that could impact health and the environment.

To avoid the potential release of those substances into the environment and to diminish the need for the extraction of natural resources, Ross Video encourages you to use the appropriate take-back systems. These systems will reuse or recycle most of the materials from your end-of-life equipment in an environmentally friendly and health conscious manner.

The crossed-out wheeled bin symbol invites you to use these systems.
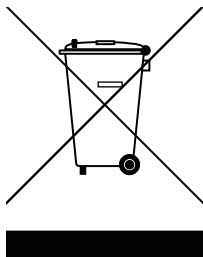
If you need more information on the collection, reuse, and recycling systems, please contact your local or regional waste administration.

You can also contact Ross Video for more information on the environmental performances of our products.

Company Address

Ross Video Limited	Ross Video Incorporated
8 John Street	P.O. Box 880
Iroquois, Ontario	Ogdensburg, New York
Canada, K0E 1K0	USA 13669-0880

General Business Office:	(+1) 613 • 652 • 4886
Fax:	(+1) 613 • 652 • 4425
Technical Support:	(+1) 613 • 652 • 4886
After Hours Emergency:	(+1) 613 • 349 • 0006
E-mail (Technical Support):	techsupport@rossvideo.com
E-mail (General Information):	solutions@rossvideo.com
Website:	http://www.rossvideo.com

Contents

Introduction

NK-Series router devices connect together via T-Bus, a proprietary RS485-based serial communications link. In some installations, it is not practical to connect devices directly to the bus and it would be preferable to access the control system via TCP/IP.

The NK Hub is an application that connects NK-IPS devices together across a TCP/IP network. This allows NK Series routers and panels to be connected like they were on the same T-Bus network.

Overview of this Guide

This guide is for system administrators, installers, and operators of the Ross Video NK Series NK-Hub. It provides instructions on how to install the NK-Hub, how to set up an NK Series system for the NK-Hub, and how to operate it. It assumes that you are experienced with general broadcast concepts, and that you are familiar with the planning requirements for a routing switcher system.
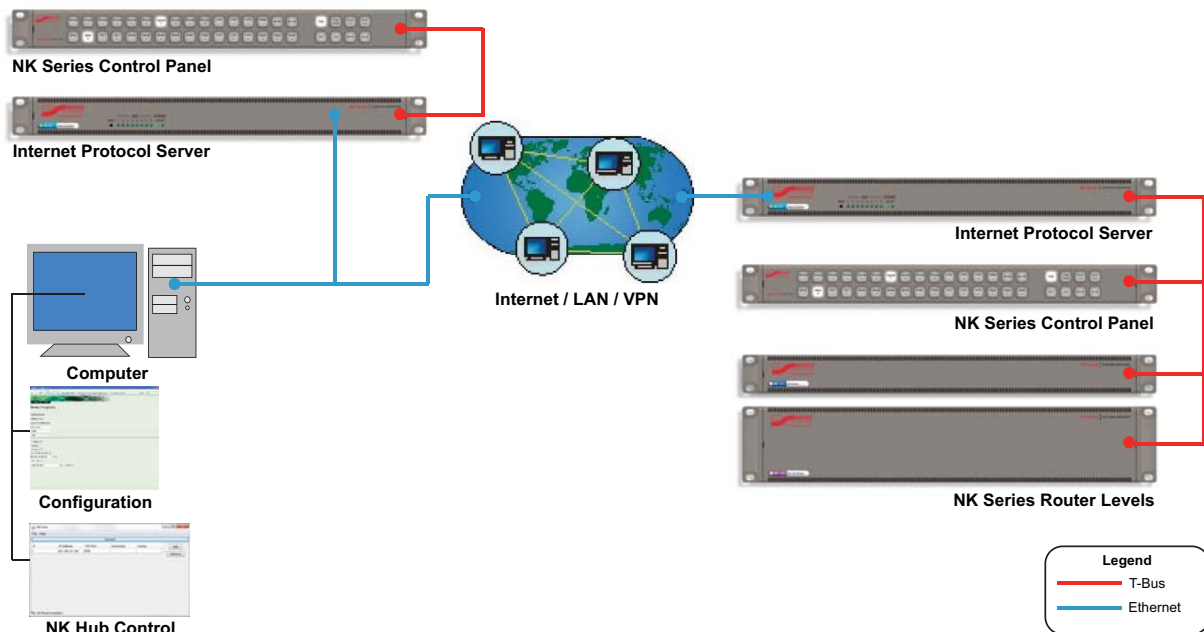
Overview

System Requirements

The NK-Hub requires the following:

- Windows XP, Windows 7, Mac OSX, or Linux

- Java SE 6 or later

- 128MB RAM

- 128MB disk space

System Diagram

The following diagram provides an example of the NK-Hub in an NK system.

NK Series Control Panel

Internet Protocol Server

Computer

Configuration

NK Hub Control

Internet / LAN / VPN

Internet Protocol Server

NK Series Control Panel

NK Series Router Levels

Legend	
———	T-Bus
———	Ethernet

A local connection enables two NK-IPS devices within the same network to communicate with NK Series components connected to each. A remote connection, via an Internet connection or Virtual Private Network (VPN), allows two or more NK-IPSs to communicate over longer distances.

System Setup

Setting Up an NK Series System for the NK-Hub

Your system will incorporate at least two NK-IPS devices, and multiple NK-Series routers, panels, and interface devices. These will be split into T-Bus networks, with each T-Bus network consisting of one NK-IPS and any number of NK-Series devices connected via T-Bus.

The TCP/IP network must be configured so that the NK Hub can establish TCP/IP connections with each NK-IPS. The NK-IPS devices do not need to be able to communicate directly with each other.

Tips for Setting Up the NK Series System

Messages are sent fastest between two devices on the same T-Bus network. You can optimize your system by:

* connecting panels and the routers that they control on the same T-Bus network if possible.
* connecting the NK-VRC to the same T-Bus network as routers, if using an NK-VRC virtual routing core.
* connecting the NK-3RD to the same T-Bus network as routers, if using an NK-3RD protocol interface.

Installation

Overview

The NK-Hub must be installed on either Windows XP, Windows 7, Mac OSX, or Linux.

Installing the NK-Hub

Use the following instructions to install the NK-Hub on either the Windows, Mac, or Linux operating systems.
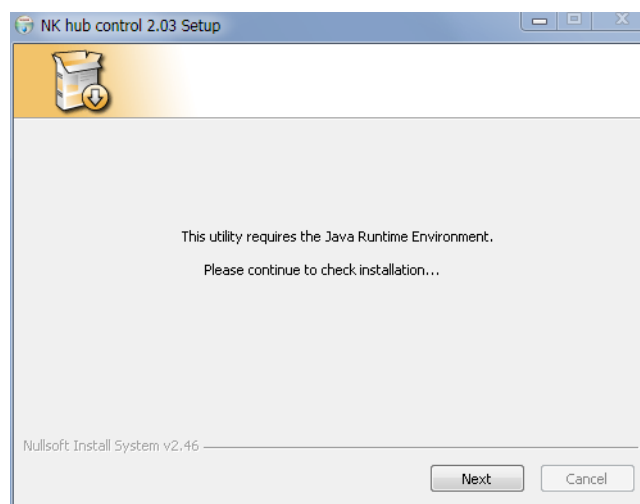
Windows

The following procedure explains how to install the NK-Hub on Windows XP and Windows 7.

To install the NK-Hub on Windows:

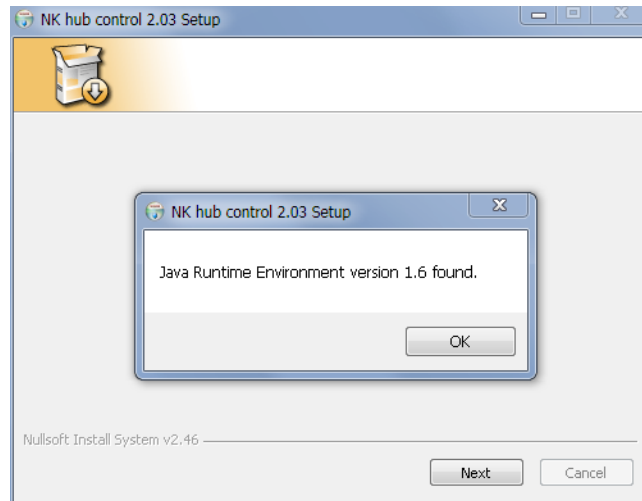1. From the installation CD menu, select **Install NK-Hub**.
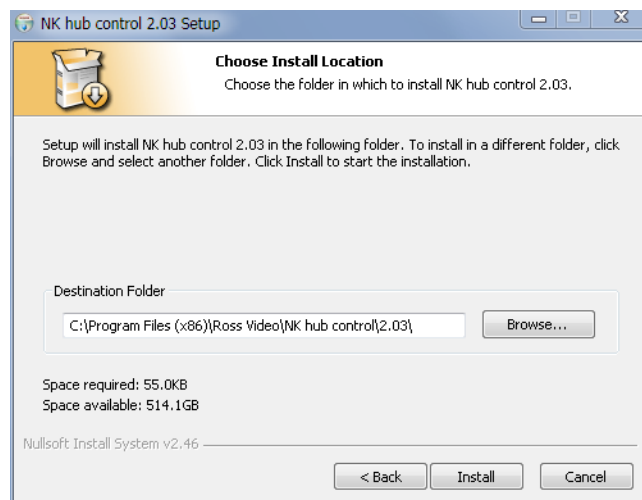

The **NK hub control** window opens.

2. Click **Next**.

   If the required Java Runtime Environment is installed, a window opens indicating that it has been found.

3. Click **OK**.

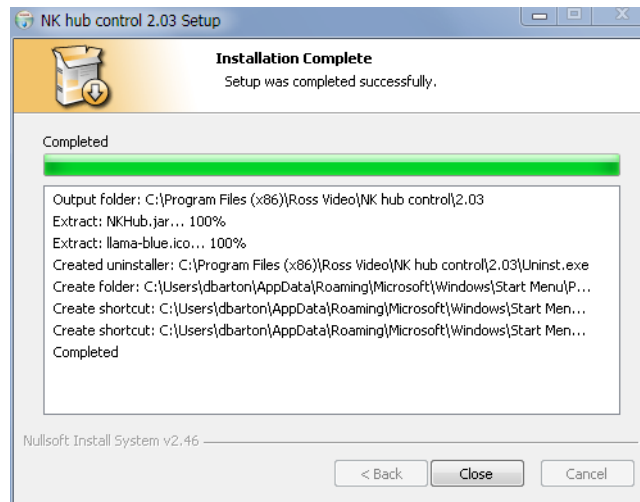   The **NK-Hub control** window prompts the user to choose an installation location.

4. Enter the file path for the installation or click **Browse** and select a location for the installation.

5. Click **Install**.

A progress bar indicates the progress of the installation. The **NK-Hub control** window indicates when the installation is complete.

6. Click **Close**.

The **NK-Hub control** window closes and the NK-Hub is ready for use.

Mac OSX and Linux

The following procedure explains how to install the NK-Hub on Mac OSX and Linux.

To install the NK-Hub on Mac OSX or Linux:

**1.** From the installation CD menu, select **Browse the CD**.

2. Double-click the **software** folder.

3. Double-click the **NK-Hub** folder.

4. Unzip the **NKHub.zip** file to a location on the hard drive.

5. Open the location on the hard drive where the file was unzipped.

6. Double-click the **NKHub.jar** file to run.

Operating the NK-Hub

NK-Hub User Interface

This section describes the user interface of the NK-Hub. The following image provides a general overview of the NK-Hub user interface:
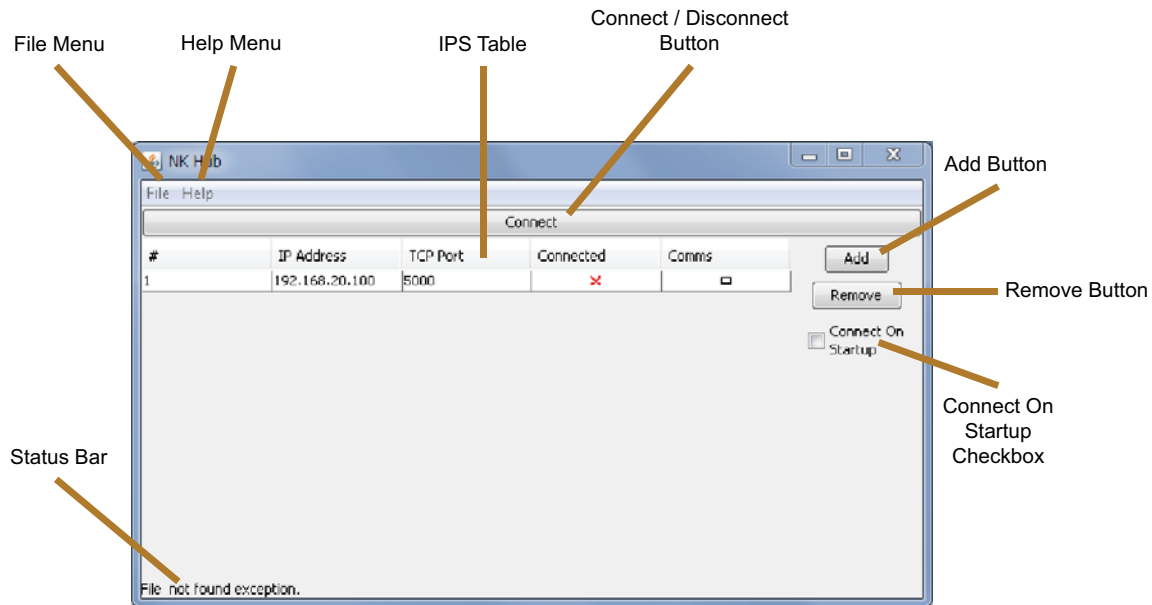
File Menu

Use the **File** menu to open and save configuration files.

Open Config — select this to open a saved configuration file. Once a file has been opened, the NK-Hub will automatically open that file on future start-ups.

Save Config — select this to save the current configuration.

Exit — select this to exit and close the NK-Hub.

Help Menu

Use the **Help Menu** menu to access information about the NK-Hub.

About — select this to view the version information about the NK-Hub.

IPS Table

Shows list of IPS Devices that to which the NK-Hub can connect. The table contains the following information:

— the NK-IPS number in the table.

IP Address — the IP address of the NK-IPS.

TCP Port — the TCP port that is used to connect to the NK-IPS.

★ The TCP port must match the **Client TCP Port** setting in the NK-IPS configuration.

Connected — displays the connection status:

- ✖ — not connected
- ✔ — connected

Comms — displays the T-Bus comms traffic on the NK-IPS:

- ☐ — T-Bus idle
- ■ — T-Bus active

Connect Button

Click this button to connect to the NK-IPS devices listed in the IPS table.

Add Button

Click this button to add another row to the IPS table.

Remove Button

Click this button to remove the selected row in the IPS table.

Connect On Startup

Select this check box to automatically connect the NK-Hub to all devices listed in the IPS table on startup.

Adding NK-IPS Devices

Use the following procedure to add NK-IPS devices to the NK-Hub.

To add NK-IPS devices:

1. Using the DashBoard NK Plugin, find out the IP address and port for each NK-IPS device to be connected:

   a. In DashBoard, place the cursor over the **NK-IPS** in the **Basic Tree View**.

      A popup displays the IP address.

   b. Double-click the **NK-IPS** to open the editor.

      A tab for the NK-IPS opens in the main window. The **Client TCP Port** field displays the port number.
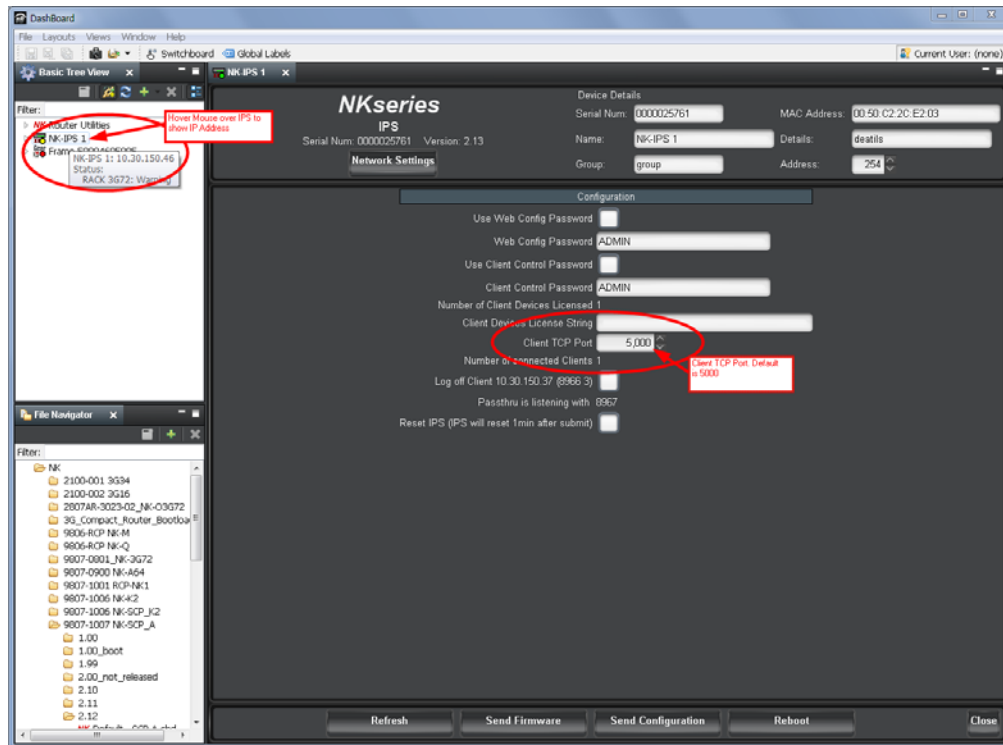
2. In the first row of the IPS table, enter the **IP Address** and **TCP Port** of the first NK-IPS.

3. Click **Add** to add another row to the IPS table.

   A new row is added to the IPS table.

4. In the new row of the IPS table, enter the **IP Address** and **TCP Port** of the second NK-IPS.

5. If necessary, repeat steps 2 to 4 to add more NK-IPS devices.

6. Click **Connect**.

   The **Connected** column status changes from not connected (✗) to connected (✓).

Configuring NK Series Routers and Panels

Sending crosspoint commands via the NK-Hub adds delays to the switch messages. Control panels, in particular, must be configured to minimize unnecessary retries and tolerate longer delays in receiving responses.

Configuring Retry Delay

The retry delay sets the maximum time a panel will wait for a response before retransmitting switch requests. If this delay is shorter than the round trip through the NK-Hub and the receiving NK-IPS, then retrying will worsen the situation by adding more switch requests to handle.

To set the retry delay:

1. In DashBoard, double-click the control panel in the **Basic Tree View**.

   A tab for the control panel opens in the main window.

2. In the **Configuration** section, set the **Comms Retry Delay Factor** to 250ms.
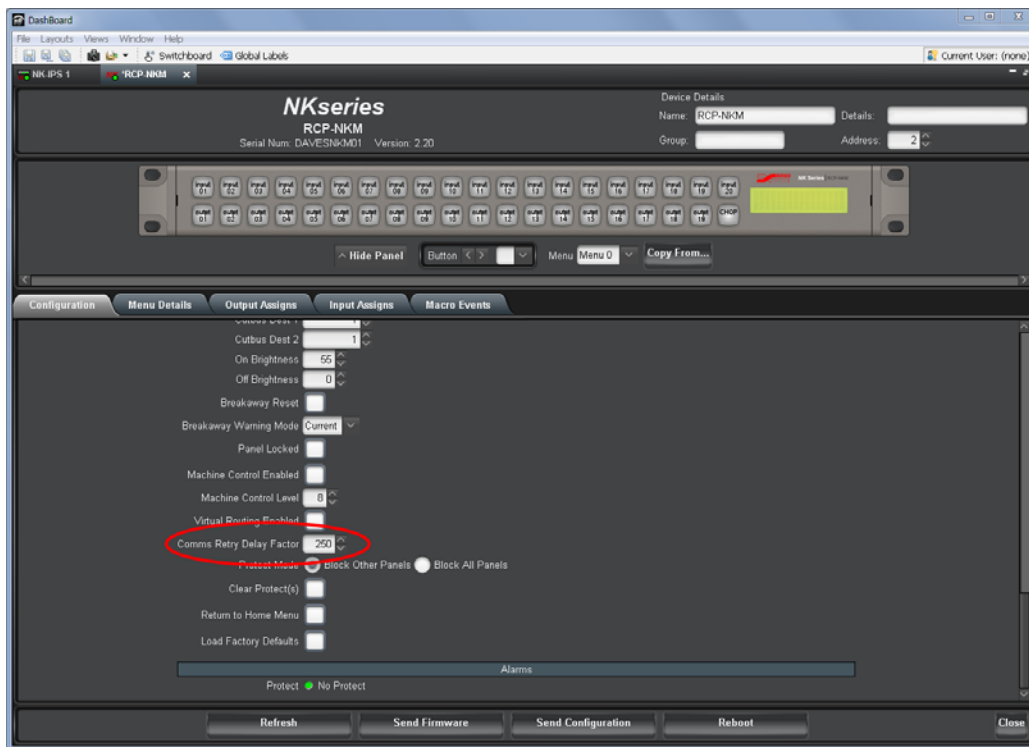
★ Set the **Comms Retry Delay Factor** to 250ms for any panels on different T-Bus networks than the router that they are switching.

Configure Breakaways to Match Router Levels

Configuring breakaways to match router levels is recommended procedure with the NK Series, but it is especially important when using the NK-Hub.

If the panel breakaway contains levels that do not correspond to a connected router, it will retry those levels until it times out. When retry delays are around 10ms, this is not noticeable. With the retry delay set to 250ms, the panel will take seconds to respond to button presses.

To set the breakaway:

1. In DashBoard, double-click the control panel in the **Basic Tree View**.

   A tab for the control panel opens in the main window.

2. In the **Breakaways** section, change the default breakaway to match only the levels present in the NK Series router system.

3. Press **Send Configuration** to send the changes to the control panel.

   For example, a system with a single NK-3G34 router on level 1 would be configured as shown in the following image:
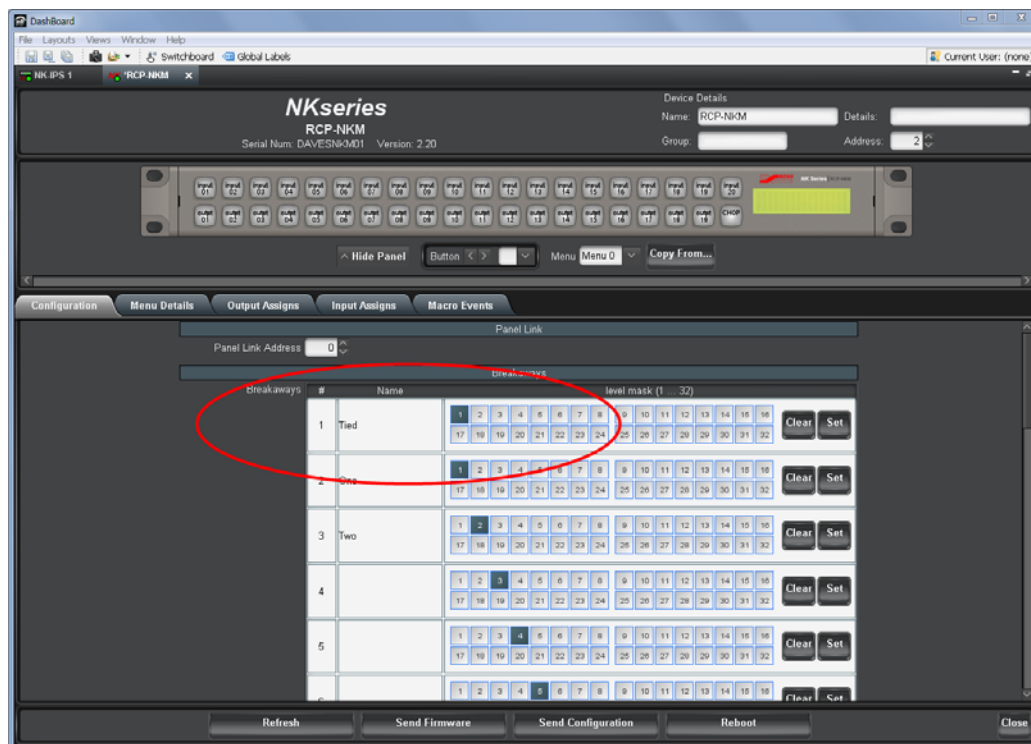
★ If this value is set and button presses still take longer than expected, configure a key as the default breakaway key. Press this key on the panel to ensure that the new default breakaway is selected.