Johnson Controls

CK722

Network Controller

Network Utility Tool

(NUT)

December, 2008
24-10239-30 Revision B

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CE

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This product complies with the requirements of the European Council Electromagnetic Compatibility Directive 2004/108/EEC and the Low Voltage Directive 2006/95/EEC.

This equipment must not be modified for any reason and it must be installed as stated in the Manufacturer's instruction.

If this shipment (or any part thereof) is supplied as second-hand equipment, equipment for sale outside the European Economic Area or as spare parts for either a single unit or system, it is not covered by the Directives.

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Chapter 1

INTRODUCTION

The CK722 Network Utility Tool (NUT) is a troubleshooting tool that allows you to restore functionality to the CK722 network controller in the event of device failure, and upgrade the controller's operating system, by deleting the data from the unit and re-installing the controller's operating system (OS) and firmware. Once you re-install the firmware and OS, the controller's configuration settings will be re-initialized with the factory default settings. Downloading the CK722 object database from the P2000AE SCT returns the controller's settings to their desired configuration.

This document describes how to use the Network Utility Tool (NUT) to install the CK722 controller's OS and firmware.


CAUTION

The Network Utility Tool should only be used on new CK722 controllers, when the CK722 is unresponsive and requires drastic measures to get the unit up and running, or when you need to update the controller's operating system. Do **not** use the Network Utility Tool to update the CK722 firmware if the unit is functioning properly and does not require an operating system update.

To update the firmware for a properly functioning controller, use the P2000 Host software's firmware update feature. Refer to the *P2000AE Software User Manual* for details.

Using the Network Utility Tool to install the CK722 OS and firmware can take 5 minutes, plus any setup and breakdown time.

NOTES

- *If you remove power from the CK722 before the device has completed the initial reboot, the CK722 may either begin a new reboot sequence or require a new image update altogether.*
- *The screen captures shown in this manual may differ slightly, depending on the software version you are using.*
- *"P2000" is also referred to as "P2000AE" throughout this manual.*

CHAPTER SUMMARIES

- ***Chapter 1: Introduction*** provides an overview of the Network Utility Tool, including a list of the hardware and software required to use the tool.
- ***Chapter 2: Installation*** describes how to use the Network Utility Tool to install the CK722 OS and firmware.

MANUAL CONVENTIONS

The following items are used throughout this manual to indicate special circumstances, exceptions, important points regarding the equipment or personal safety, or to emphasize a particular point.

NOTE

Notes indicate important points or exceptions to the information provided in the main text.

CAUTION

Cautions remind you that certain actions, if not performed exactly as stated, can cause damage to equipment, security problems, or cause the system to operate incorrectly due to errors in system setup or programming.

KEY TERMS

CK722 Disk Image – A CK722 disk image is a collection of all the software files needed for the installation of the controller's OS and firmware.

Network Utility Tool (NUT) – The Network Utility Tool is a software utility used to reload the disk image into a CK722 controller.

SYSTEM REQUIREMENTS

The CK722 disk image must be installed on a standalone PC networked with the CK722 controller (see Figure 2-1 on page 2-2). The following hardware and software are required to install the CK722 disk image:

- PC running Microsoft® Windows® Server 2003, Windows XP® Professional, or Windows 2000 Professional

- An external power adapter to an AC power source for the computer running the Network Utility Tool. We do not recommend running the Network Utility Tool on a computer running on battery power. If the low battery message appears, you cannot see it, because it appears behind the Network Utility Tool screen.

Do not run the CK722 Network Utility Tool on a P2000 server or workstation, as this may cause a network conflict with the Dynamic Host Configuration Protocol (DHCP) server.

- Two (2) 10/100Base-T CAT5 Ethernet straight-through cables – Black Box EVNSL80-0020 (grey cable), EVNSL82-0020 (green cable), or equivalent. Do not use cross-over cables.
- One (1) FS10x 10/100 Netgear® switch – for example, FS105 Netgear 5 Port 10/100 or one (1) W-Linx 5-port 10/100 Mini Hub (USB) (part number SW-005CM-X) connected to the PC that will run the Network Utility Tool.
- P2000 Supervisory Device Tools CD
- The following CK722 disk image files (located on the P2000 Supervisory Device Tools CD):
  - NAE45_2.1.20_CK722_x.x.xx.release.SH4.rgz
  - NAE45Revisionx.x.x.x.NK.bin
  - NAE45Revisionx.x.x.x.script
- Java® Runtime Environment (JRE) Version 1.5.0_04 (see “Java Technology Requirements”)

Java Technology Requirements

To use the Network Utility Tool, you must have the Java Runtime Environment (JRE) Version 1.5.0_04 installed on your computer. The Network Utility Tool installation program installs the correct version of the JRE for you if it is not present on your computer.

Alternatively, before Network Utility Tool installation, you can download the Java 2 Runtime Environment (JRE) Version 1.5.0_04 at this site:

http://cgproducts.johnsoncontrols.com/jre/jre-1_5_0_04-windows-i586-p.exe

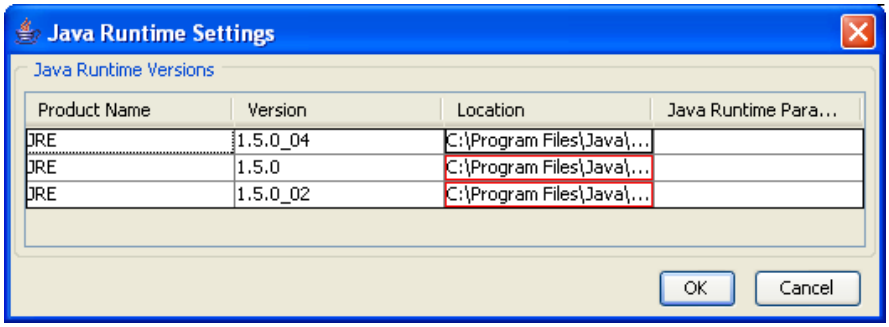
NOTE

If you are using Windows Server 2003 OS with the Enhanced Security Configuration, and this site has not been added as a trusted site in Internet Explorer, the browser blocks the JRE download. If you trust this site, add ***http://cgproducts.johnsoncontrols.com/*** *to the list of Internet Explorer trusted sites* ***before*** *attempting to download the JRE.*

➤ **To verify that the 1.5.0_04 JRE is installed on your computer:**

1. On the Control Panel, double-click the Java Control Panel Icon.

2. Select the **Java** tab.
3. In the Java Applet Runtime Settings section, click **View**. The Java Runtime Settings dialog box appears.



4. Verify the version 1.5.0_04 appears as one of the versions in the Java Runtime Settings box.
5. Close all open windows.

NOTE

*You may have multiple versions of the JRE on your computer, but you **must** have the same version of the JRE on your computer as that of the site you need to access. If you have other JRE versions you are not using, uninstall them.*

Media Access Control (MAC) Address

Know the Media Access Control (MAC) address of the CK722 that will receive the latest OS and firmware. Find this information in one of the following ways:

- The sticker on the side of the CK722's enclosure contains the MAC address.
- Use Tera Term Pro or other terminal emulation program on the computer that will run the Network Utility Tool. Shortly after receiving power (approximately 3 minutes), the CK722 MAC address appears on the computer screen. See the "Terminal Emulation Software (Optional)" section for more information.

Terminal Emulation Software (Optional)

As an option, CK722 communication data can be viewed using the following hardware and software:

- RS232 Null Modem Cable (DB9F/F) – Black Box EYN257T-0015-FF or equivalent (see "Null Modem Cable" on page 1-7 for more information)
- Terminal Emulation Software (Tera Term Pro Preferred) – To use the free Tera Term Pro software, download and install the latest version from the following site:

  http://hp.vector.co.jp/authors/VA002416/teraterm.html

NOTE

The Tera Term Pro terminal emulation software was used in the development of this document. Use of other terminal emulation programs may differ.

For more information on configuring Tera Term Pro, see:

- "Null Modem Cable" on page 1-7
- "Connecting the PC to the CK722" on page 2-1
- "Configuring Tera Term Pro (Optional)" on page 2-5

Host Name Restrictions

The Host Name field on the Update Target dialog box (see page 2-8) is used to reset the CK722 Item Reference name at the end of the update process. The Network Utility Tool places restrictions on the Host Name of any CK722 controller. This change is in response to Microsoft® Corporation's enforcement of an Information Technology (IT) naming standard for the operating system used in affected engines.

Names must start with a letter, end with either a number or letter, and may contain dashes only in the interior of the name.

If a CK722 controller has an existing name that violates the standards, and you choose not to use the Update Target dialog box to rename the CK722 to a name that follows the standards, the CK722 is given the name **NAE<MAC address>** during the update. You then can rename the CK722 via the database download process after the update. Refer to the instructions for downloading the P2000SCT archive database to a new CK722 controller in the *CK722 Commissioning Guide*.

In the Update Target dialog box, if you enter a Host Name that violates the standards, a message box appears warning you of the violation, and you must enter a different name.

Cable Wiring

Ethernet Straight-through Cable

The Ethernet straight-through cable provides a network connection from the CK722 Ethernet port to the computer's network port via a hub or switch.

Connector 1 Pinout	Connector 2 Pinout
1 TX+	1 RX+
2 TX-	2 RX-
3 RX+	3 TX+
6 RX-	6 TX-

TX = Transmit
RX = Receive

Make sure you use straight-through Ethernet cables. To verify that you have a straight-through cable, use a cable tester. If you do not have a cable tester, visually inspect the cables by holding both ends of the cable either tab up or tab down. The order of the colors/terminations at both ends of a patch cable should be identical (see Figure 1-1).

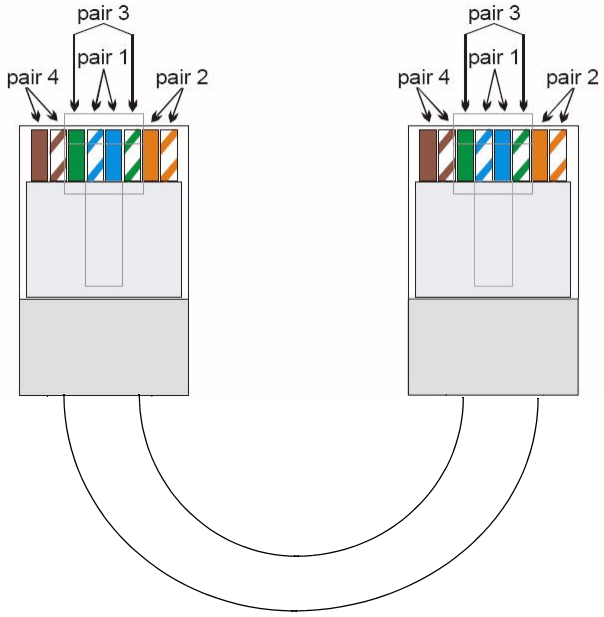


Figure 1-1: Straight-through Ethernet Cable

Null Modem Cable

The null modem cable provides an RS-232 serial connection from the CK722 RS232C A port to the COM port of the computer running the terminal emulation software, such as Tera Term Pro.

Connector 1 Pinout	Connector 2 Pinout
3 TX	2 RX
2 RX	3 TX
7 RTS	8 CTS
8 CTS	7 RTS
5 SG	5 SG
6 DSR	4 DTR
4 DTR	6 DSR

TX = Transmit
RX = Receive
RTS = Request to Send
CTS = Clear to Send
SG = Signal Ground
DSR = Data Set Ready
DTR = Data Terminal Ready

Chapter 2

INSTALLATION

This chapter describes how to use the Network Utility Tool to install the CK722 controller's operating system and firmware.

INSTALLATION OVERVIEW

The installation process consists of the following steps:

- Preparing the PC (see page 2-1)
- Configuring Tera Term Pro (Optional) (see page 2-5)
- Installing the CK722 OS and Firmware (see page 2-6)
- Downloading the P2000SCT archive database to each CK722 controller that has been updated with the Network Utility Tool (see page 2-12)

Before continuing, verify you have met the requirements in the "System Requirements" section, starting on page 1-2.

PREPARING THE PC

This section provides instructions on preparing your PC to install the CK722 disk image files.

Connecting the PC to the CK722

This section provides instructions on connecting a PC to the CK722 to run the Network Utility Tool.

➤ **To connect the PC to the CK722 controller:**

1. Disconnect the CK722 from the Ethernet network, and connect a switch/hub with two straight-through Ethernet cables between the Ethernet port of the CK722 and your computer. See Figure 2-1.
2. (Optional) Connect the RS232 Null Modem Cable to the PC's **COM 1** or **COM 2** port. Connect the other end of the cable to the CK722's **RS232C A**

port. This connection enables you to use your PC as a CK722 terminal to monitor the software installation process.

3. Verify that the **10 Link** or **100 Link** LED on the CK722 and switch/hub are lit to confirm connectivity between the computer and the CK722 via the switch/hub.

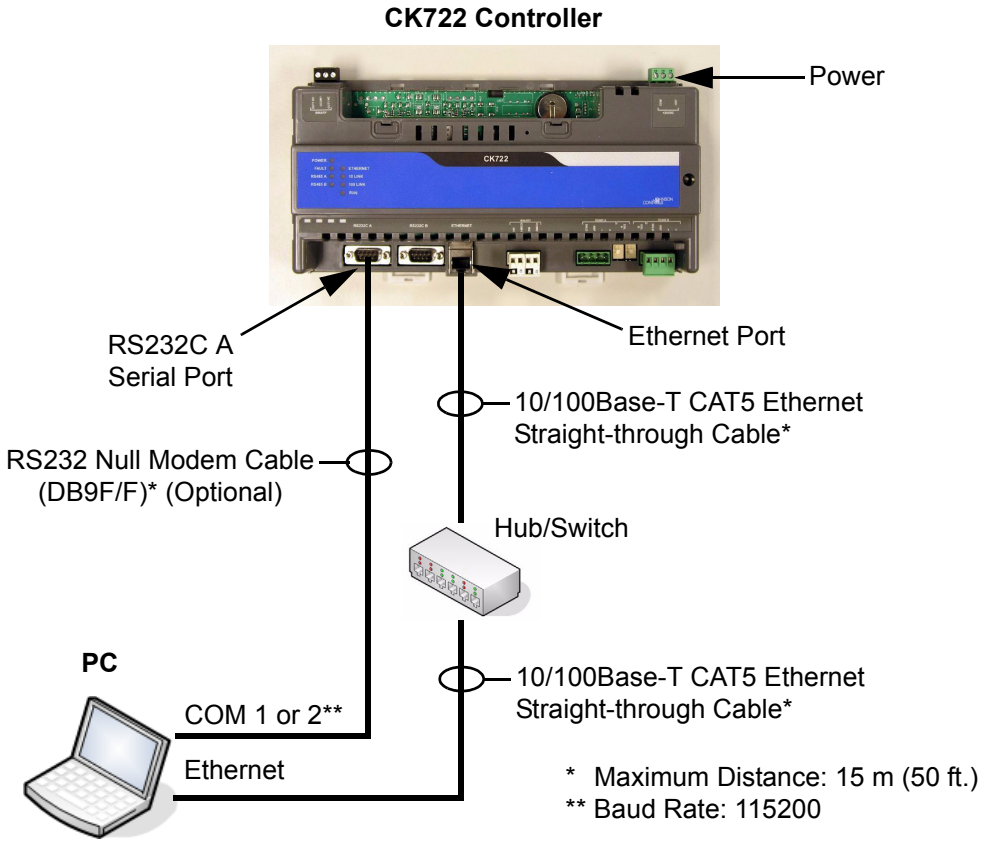


Figure 2-1: PC to CK722 Controller Connections

Verifying Network Settings

Verify the computer has a valid Internet Protocol (IP) address.

➤ To verify a valid IP address:

1. On the Start menu, select **Run**.
2. Type `cmd` in the **Open** field.
3. Click **OK**.
4. At the command prompt, type **ipconfig** and press **<Enter>**.

   If the computer IP address is all 0s, wait several minutes. Repeat ipconfig until the address is established.

In addition, verify that the Local Area Connection (LAN) for the Ethernet connection to the CK722 is enabled and all other network connections (including wireless connections) are disabled.

➤ To verify the LAN Ethernet connection to the CK722 is enabled:

1. On the Control Panel, select **Network Connections** or **Network and Dialup Connections**.
2. Verify that the Local Area Connection for the Ethernet connection to the CK722 is enabled. All other connections should be Disabled or Disconnected.

   To disable or enable a connection, right-click the connection and choose from the menu.

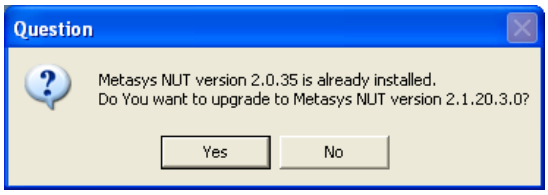
Installing the Network Utility Tool

➤ To install the Network Utility Tool:

1. Insert the P2000 Supervisory Device Tools CD.
2. Open Windows® Explorer and access the following directory:

   <CD/DVD Drive>:\NUT
3. Double-click **Setup.exe**.

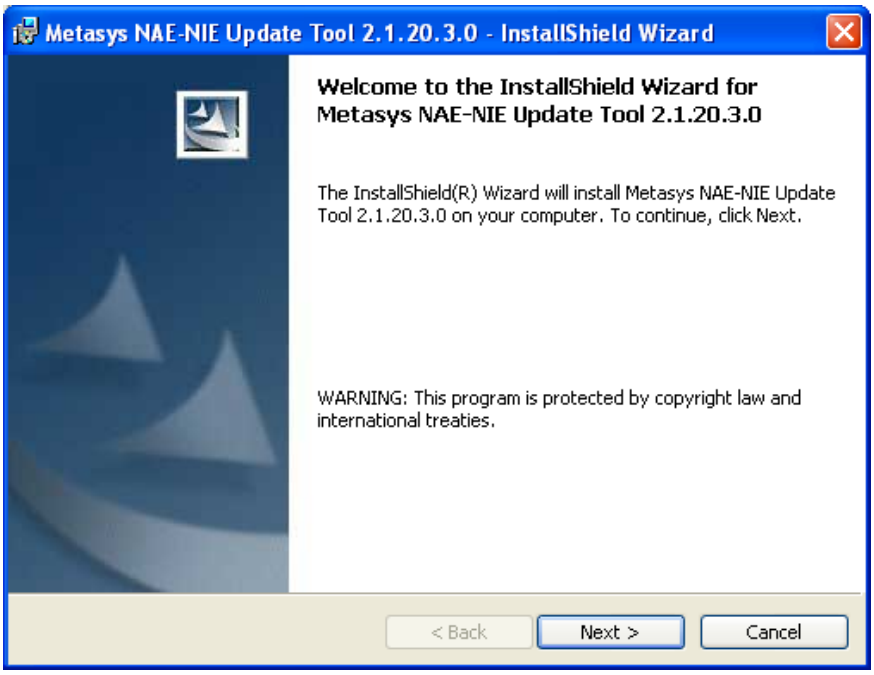
   If you have a previous version of the Network Utility Tool installed, a Question dialog box appears. Click **Yes**.



NOTE

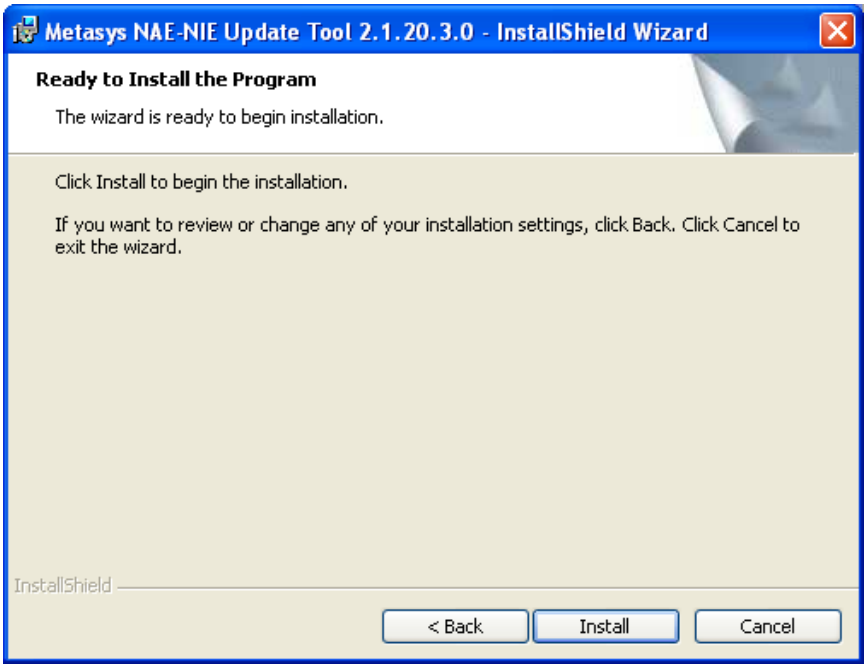
Previous versions of the Network Utility Tool remain visible in the Add/Remove Programs list but can be removed at any time. Only the files from the newest version exist on the hard disk of your computer, and the presence of the previous versions in the Add/Remove program list does not affect the performance of the newest version.

The Network Utility Tool Installation wizard appears.



4. Click **Next**.

   The Ready to Install the Program screen appears.



5. Click **Install**.

   The Installation Complete screen appears when the Network Utility Tool is installed successfully in the *C:\NAEUpdateTool* folder on the computer.

6. Click **Finish**.

CONFIGURING TERA TERM PRO (OPTIONAL)

This section provides instructions on configuring Tera Term Pro. If your configuration settings currently match the settings outlined in this section, or if you will not be using terminal emulation software, skip to the next section. The required settings to turn your PC into a CK722 terminal are:

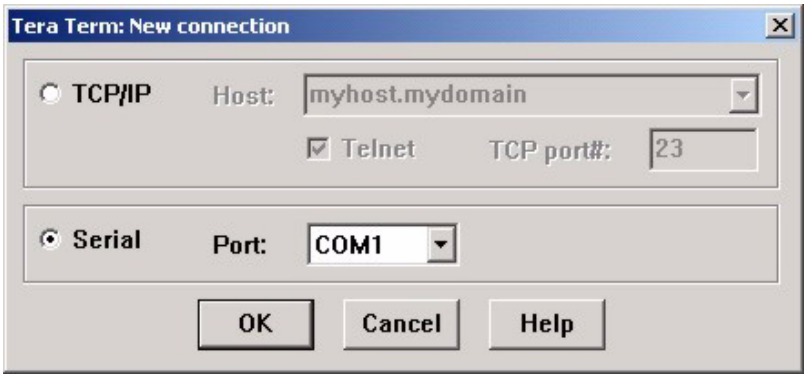
- Connect to serial port: COM1 or COM2 (depending on the COM port you are using)
- Serial port baud rate: 115200

NOTE

Once Tera Term Pro is configured according to the following instructions, the settings will take effect each time you launch the application.

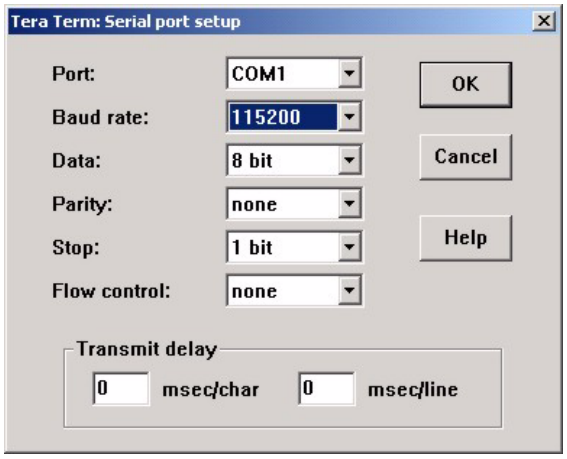
➤ To configure Tera Term Pro:

1. Open Windows Explorer®.
2. Access the following directory: **C:\Program Files\TTERMPRO**
3. Delete the **TERATERM.INI** file.
4. Launch Tera Term Pro.
5. On the Tera Term: New connection dialog box, select the **Serial** radio button and the **COM1** or **COM2** port, depending on the COM port you are using. Click **OK**.

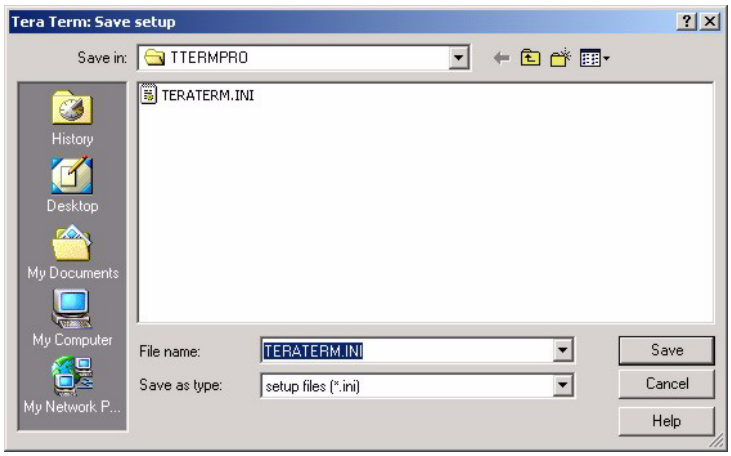


6. From the menu bar, select **Setup>Serial Port**.

7. On the Tera Term: Serial port setup dialog box, select **115200** from the **Baud rate** drop-down list. Click **OK**.



8. From the menu bar, select **Setup>Save setup**.
9. On the Tera Term: Save setup dialog box, navigate to **C:\Program Files\TTERMPRO** and click **Save**.



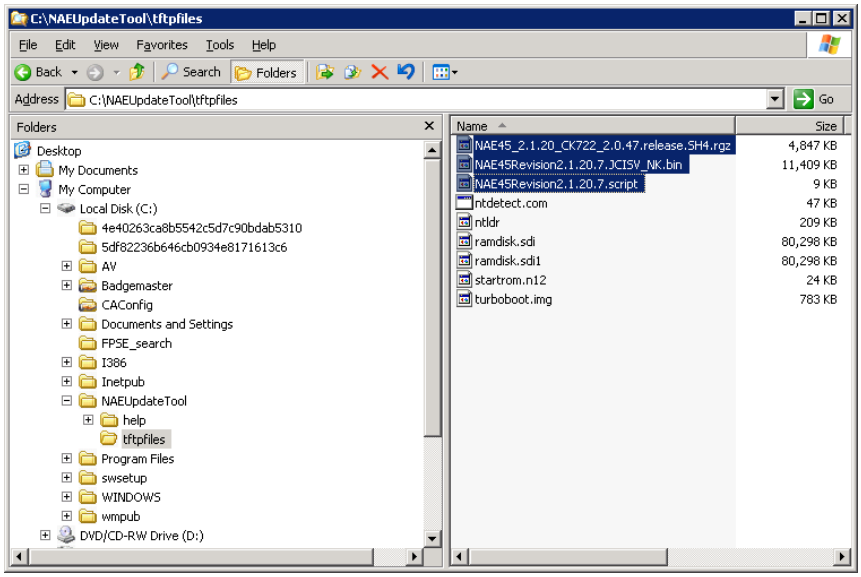
INSTALLING THE CK722 OS AND FIRMWARE

Copying the Disk Image Files

Copy the following disk image files from the P2000 Supervisory Device Tools CD to *C:\NAEUpdateTool\tftpfiles*:

- NAE45_2.1.20_CK722_x.x.x.release.SH4.rgz (located in the *CK722 Firmware* directory)
- NAE45Revisionx.x.x.JCISV_NK.bin (located in the *WinCE OS* directory)
- NAE45Revisionx.x.x.script (located in the *WinCE OS* directory)

Each “x” in the listed .rgz, .bin, and .script files represents a variable number.



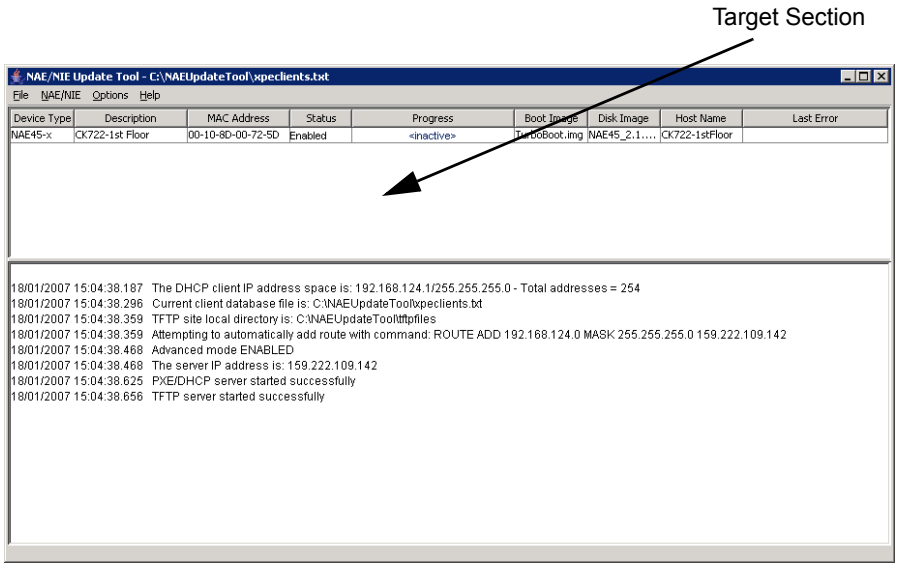
Adding CK722 Targets

The next steps require you to select the controllers (i.e. targets) that will receive the latest OS and firmware.

➤ To add a CK722 target:

1. On the **Start** menu, select **Programs>Johnson Controls>Metasys> NAE-NIE Update Tool**.

   The Network Utility Tool main screen appears showing the CK722 controllers you have already configured.



NOTE

CK722 controllers are displayed as NAE controllers in the Device Type column.

If you have not configured any CK722 controllers, the top section of the screen (Target section) appears blank.

2. From the menu bar, select **NAE/NIE>Add NAE45-x**.

   The Add new NAE45-x update target dialog box appears.

   To edit existing entries, double-click the target you wish to edit in the Target section, or select the target in the Target section and select **NAE/NIE>Edit** from the menu bar. The Edit update target dialog box appears.

3. Edit the fields according to Table 2-1.

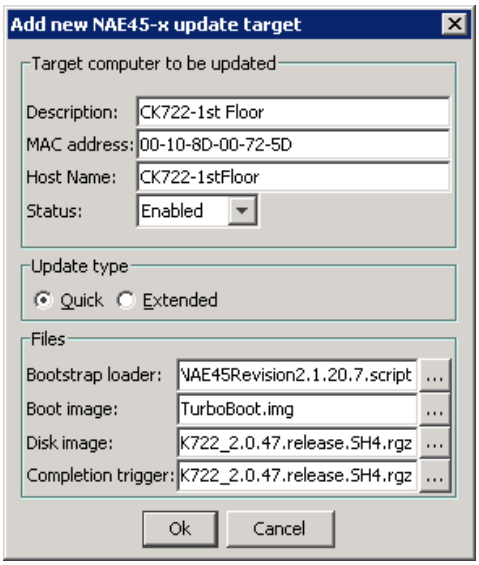


Table 2-1: Add New (or Edit) NAE45-x update target Dialog Box Fields

Field	Description/Action
Description	(Optional) This is used only in the Network Utility Tool to help you identify the CK722.
MAC address	Enter the MAC address for the CK722. See “Media Access Control (MAC) Address” on page 1-4 for details.

Table 2-1: Add New (or Edit) NAE45-x update target Dialog Box Fields

Field	Description/Action
Host Name	If a CK722 Device object has been configured in P2000 SCT for this controller, enter the Item Reference name assigned to the CK722 controller. To determine the Item Reference name, hover your mouse cursor over the CK722 Device object in the P2000 SCT navigation tree until the name appears in a pop-up. If a CK722 Device object has not been configured in P2000 SCT for this controller, leave this field blank.
Status	Verify that the Status is **Enabled**.
Update type	Select the **Quick** radio button.
Bootstrap loader	Click the **Browse** button and select the latest **NAE45Revisionx.x.x.x.script** file from *C:\NAEUpdateTool\tftpfiles*.
Boot image	Verify that the **TurboBoot.img** file is selected.
Disk image	Click the **Browse** button and select the latest **NAE45_2.1.20_CK722_x.x.x.release.SH4.rgz** file from *C:\NAEUpdateTool\tftpfiles*.
Completion trigger	Verify that the name of the file selected for the Disk image field also appears in this field.

4. Click **Ok** to save your changes.

   To save the target information for future updates, select **File>Save Target File As** from the menu bar and save the file as the job name. For subsequent saves, select **File>Save Target File**.

5. To update the disk image for the new targets immediately, go to Step 2 in the "Uploading the Disk Image Files" section.

Uploading the Disk Image Files

➤ **To upload the disk image files:**

1. On the **Start** menu, select **Programs>Johnson Controls>Metasys> NAE-NIE Update Tool**.

   The Network Utility Tool main screen appears showing the CK722 controllers you have already configured.

   If you have not configured any CK722 controllers, the top section of the screen (Target section) appears blank. To configure CK722 controllers, see "Adding CK722 Targets" on page 2-7.

2. From the menu bar, select **Options>Automatically Scroll Log Window**.

   This feature allows you to see the most up-to-date log messages as they are created.

NOTE

*To save the contents of the Network Utility Tool log to a .txt file at any time in the process, select **File>Save Diagnostic Log** from the menu bar.*

3. Make sure the **Status** column entry for the CK722 is set to **Enabled**.

   If the Status entry is not Enabled, double-click on the **Status** column entry for the CK722 you want to update. The Edit update target screen appears. In the Status drop-down box, select **Enabled** and click **Ok**.

4. Use a paper clip to press the SYSTEM RE-BOOT switch or cycle power to the CK722 controller.

   The CK722 SYSTEM RE-BOOT switch is inside a round, unmarked hole on the face of the controller, just below the battery compartment.

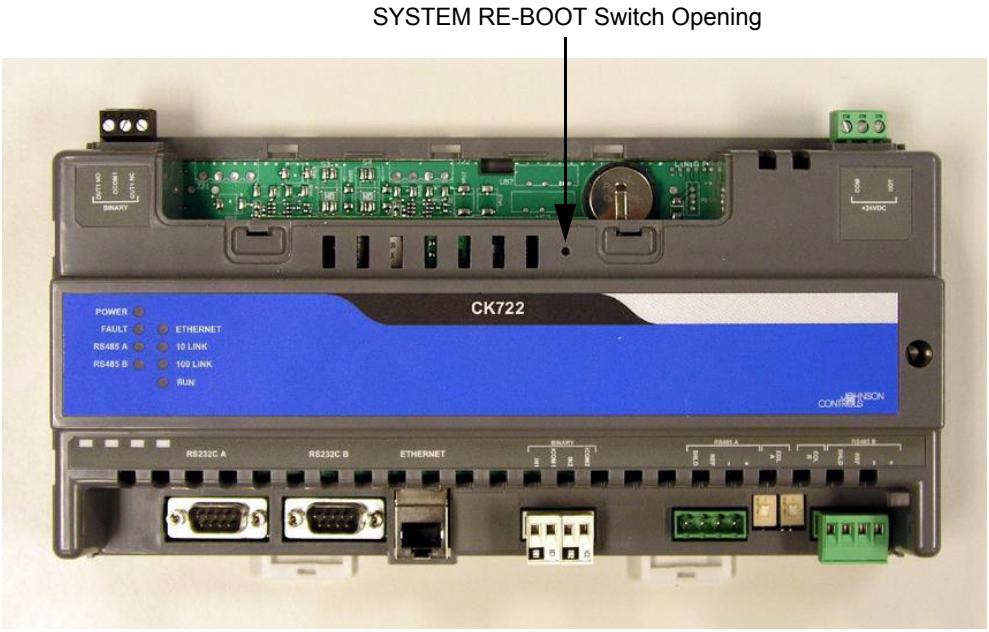


Figure 2-2: Location of CK722 SYSTEM RE-BOOT Switch

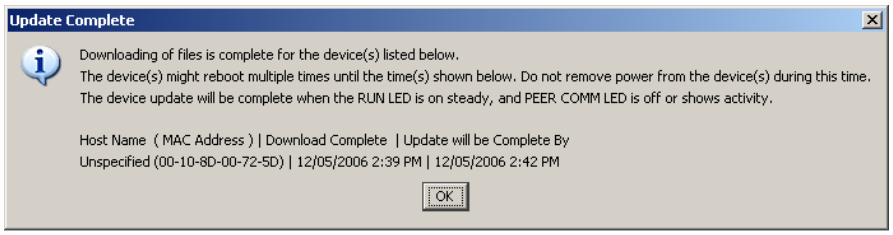
The Network Utility Tool detects the CK722 reboot and begins the installation. The log portion of the screen shows the progress of the installation.

The CK722 update takes place in four stages, with a total update time of approximately 5 minutes:

- The NAE45Revisionx.x.x.x.JCISV_NK.bin file downloads in approximately 1 minute. Do not touch the CK722 or the Network Utility Tool during this time.

- The CK722_x.x.x.release.SH4.rgz file downloads in approximately 3 minutes. Do not touch the CK722 or the Network Utility Tool during this time.

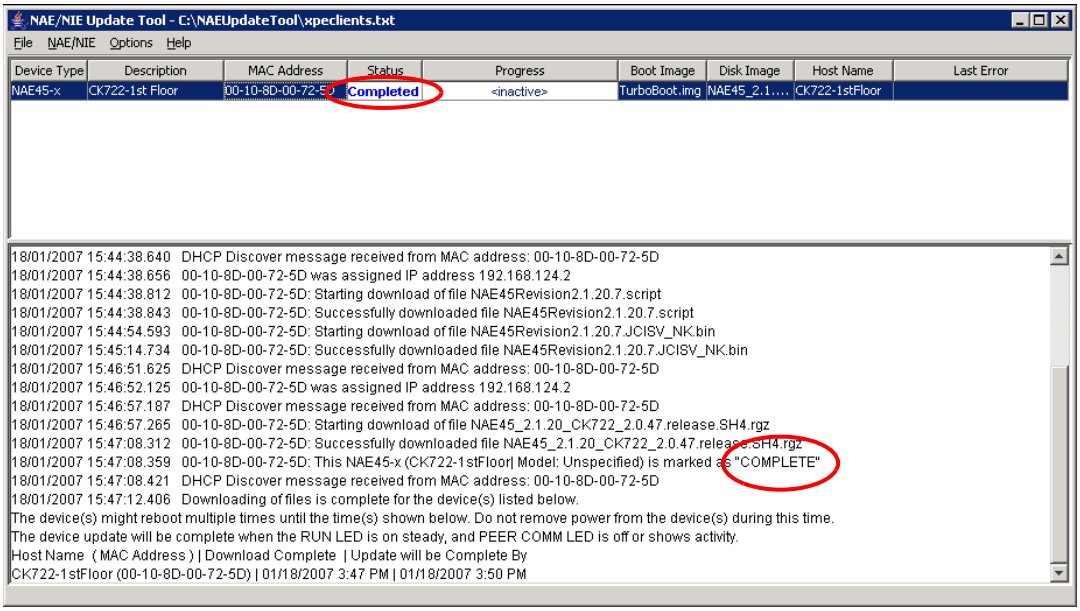
When the CK722 installation is complete, the Update Complete dialog box appears.



5. Click **OK**.

   Other indicators that the CK722 installation is complete are:

   - When the CK722's RUN LED is on steady.
   - When the CK722 is **Marked as Complete** in the Network Utility Tool log.



6. Disconnect the Ethernet straight-through cable from the CK722 and reconnect the CK722 to the Ethernet network shared with the P2000 server.

   If you have other CK722 controllers to update, connect the computer and hub/switch to a new CK722 and repeat Step 1 through Step 6 of this section.

7. Close the Network Utility Tool session.

   The disk image installation is complete.

DOWNLOADING THE CK722 DATABASE (P2000 SCT)

After the disk image installation is complete, download the controller's database from the P2000 SCT to the CK722. Refer to the *P2000AE System Configuration Tool (SCT) Manual* for details on downloading the database from the P2000 SCT. Refer also to the *CK722 Commissioning Guide* for information on downloading the P2000 SCT archive database to a new CK722 controller.

TROUBLESHOOTING

NOTE

All non-bold text in the Problem column represents an actual error message.

Table 2-2: Troubleshooting the CK722 Network Utility Tool

Problem	Condition
One or both of the following messages appears in the log screen: `Error creating PXE/DHCP server: Address in use: Cannot Bind Error creating TFTP server: Address in use: Cannot Bind`	Multiple instances of the Network Utility Tool may be running on the system. Only one instance of the Network Utility Tool can run at a time. Close the extra instances. or The system for which the Network Utility Tool is installed may be running a Dynamic Host Configuration Protocol (DHCP) or Trivial File Transfer Protocol (TFTP) server. The Network Utility Tool uses these ports. Make the ports available for exclusive use by the Network Utility Tool. Follow the vendor instructions to disable these services or install the Network Utility Tool on a system that does not use a DHCP or TFTP server.
`Error creating TFTP server: Address in use: Cannot Bind`	Check that the Server IP address in the Network Utility Tool log matches the IP address of your computer. Restart your computer. If the addresses still do not match, on the **Options** menu of the Network Utility Tool, select **Settings**. Delete the Server IP address and make sure Automatically create IP route for clients is checked. Click **OK**. Save the target file then close and restart the Network Utility Tool.

Table 2-2: Troubleshooting the CK722 Network Utility Tool

Problem	Condition
WinPoET™ for Windows OS application is also known to interfere with the Network Utility Tool.	The WinPoET application is a Point-to-Point Protocol over Ethernet (PPPoE) application that is often distributed by Digital Subscriber Line (DSL) providers for authentication and other purposes. If this tool is installed, the Network Utility Tool does not work properly. Removing the WinPoET application using Add/Remove Programs does not fully remove the WinPoET application from a system. There is an application called KILLPOET that completely removes the application from the system. This application usually comes on the installation disk from the Internet Service Provider (ISP). Please contact your ISP if you need help with this application.
`Error: Maximum Retries Exceeded Error: Communication lost unexpectedly with client (???)`	If one of these errors appears on the Log screen, your computer and the CK722 have lost communication. Reboot the computer and restart the update process.
`Error: Error for file startrom.n12 - Client stopped transfer before getting data (not really an error) Error: Error for file BOOTFONT.BIN - File doesn't exist`	Ignore these messages. They do not report any problem with the Network Utility Tool.
`Error for file image.dsk - File doesn't exist`	The file name of the disk image you specified for this CK722 in the Add New Update Target screen does not exist on the computer. Check the name of the file.
`Error for file image.dsk - Client prematurely terminated the transfer`	The disk image file stopped downloading, because the connection between the CK722 and your computer was severed. Check the connection.
Update process does not initiate.	Make sure the Ethernet straight-through cable is connected to the CK722 and that the CK722 is receiving power when you start using the Network Utility Tool. Check that the LAN connection on the computer running the Network Utility Tool is enabled but that all other connections are disabled. Check that the battery is not connected to the CK722.
The size of database required for the application exceeds the available memory.	Reduce the size of the CK722 database as much as possible. Reduce the point count and/or feature complement so that there is enough memory. Alternatively, back up and remove the archive file (archive.moi). Reload the archive after the update is complete.

Table 2-2: Troubleshooting the CK722 Network Utility Tool

Problem	Condition
Transfer of files is incomplete during an update using the Network Utility Tool on a notebook.	The notebook loses power or has insufficient battery charge to complete the update. Plug in the external power adapter to an AC power source. We do not recommend that you run the Network Utility Tool computer on battery power. If the low battery message appears, you cannot see it, because it appears behind the Network Utility Tool screen. Restart the update process.
Update does not work with crossover cables (if using a separate PC to run the Network Utility Tool).	The CK722 installation process is not supported with crossover cables. Use recommended hardware according to “System Requirements” on page 1-2.
RUN LED is not on steady.	The CK722 has not completed the reboot sequence.