Address Settings

*IP Address:
*Subnet Mask:
Gateway:
**Ethernet Connection Type:
*Encryption key

* Required fields for device configuration with software

** If other than Automatic Negotiation

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NETCOM6P/CIM - RN Installation Guide - PC109x – Document # KD10034-E-0920

NETCOM6P/CIM RN (Encrypted) Installation Guide

The NETCOM6P includes two sets of instructions for reverse network (RN) communication:

- For mounting a NETCOM6P on a CIM circuit board with reverse network communication, follow the instructions contained in this installation guide
- For mounting a NETCOM6P directly on a control board with reverse network communication follow the NETCOM6P/ACU RN (Encrypted) Installation Guide

If you require NETCOM6P instructions for a non-reverse network application, refer to the Product Documentation Library CD—NETCOM6P Installation Guide.

The NETCOM6P is only compatible with CIM modules or plugged directly into a PC109x or higher control board's M1 socket for reverse network communication. Before installing the NETCOM6P, be sure to review the K-RN/V-RN Reverse Network Overview section.

K-RN/V-RN Reverse Network Overview

Keyscan RN licenses—AUR-RN for Aurora, K-RN for System VII and V-RN for Vantage—are designed so that a programmed access control unit at a remote location initiates communication via an encrypted NETCOM6P over a private or public network to the PC/server at a host location.

Installation Coordination – Host & Remote Locations

The RN license involves installing and configuring reverse network encrypted communication software at a host location and installing hardware components at a remote location. You must coordinate certain settings between the two locations in order that the ACU/NETCOM6P at the remote location can establish network communication back to the PC/server with the encrypted communication software at the host location.

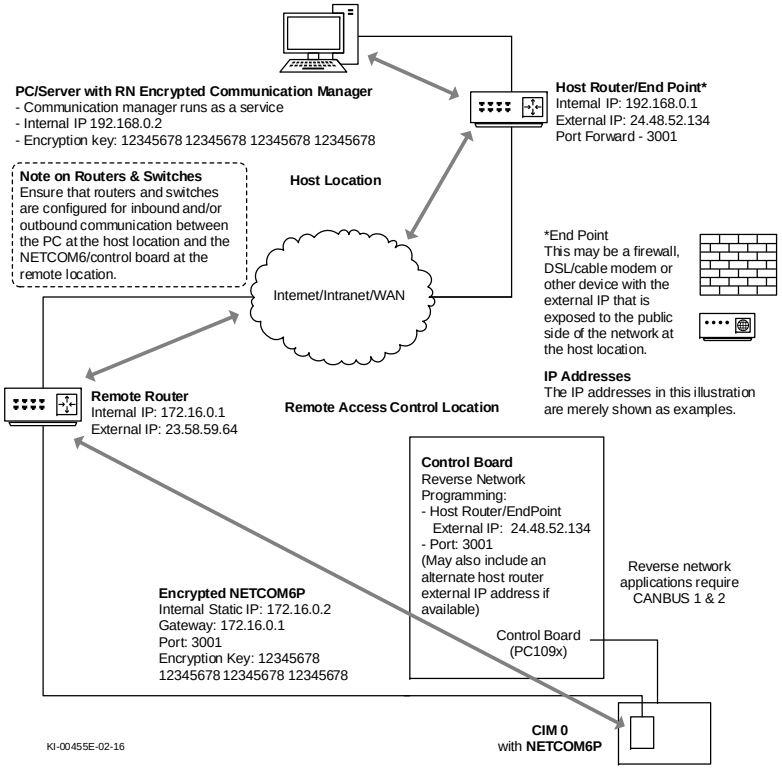
- the technician installing the hardware components must have a host-location IP address that the ACU connects to on the network
- both the host and remote locations must have the same encryption key
- the host location requires the serial # of the designated reverse network control board
- a valid path and connectivity must exist from the PC/server with the encrypted reverse network communication manager at the host location to the NETCOM6P/reverse network control board at the remote location—may require a network administrator

The hardware technician must program the access control board with a host-location IP address along with other settings. The IP address the technician programs into the control board depends on the network configuration. We have provided two general network configuration outlines: an Internet/Intranet/WAN configured network that is exposed publicly and a LAN that is closed. Refer to the network configuration that best approximates your network application.

Network Configuration - Internet/Intranet/WAN
- Host Router or End Point with External IP Address example.

Settings	Host Location	Remote Location	
IP Address Port # Gateway Encryption Key	Router with port forward or router table to PC/server with Keyscan reverse network encrypted communication manager Same encryption key/bit setting as remote location	**ACU**	programmed with host router or end point external IP address override port—optional
		NETCOM6P	programmed with static IP address or if using DHCP server dynamic IP Gateway (if static IP above) Port # of host router/end point Same encryption key/bit setting as host location

Figure 1 - Example of Internet/Intranet/WAN with External IP Address



Specifications

Input Power Requirements
Powered through CIM (NETCOM6P 140 mA + CIM 150 mA = 290 mA)

Network
RJ45 (10/100 Base-T) Ethernet
LAN/ WAN (TCP/IP protocol—port 3001)

Agency Approvals—Ethernet Socket
Complies with Class B limits of EN 55022: 1998 Direct & Indirect ESD.
Complies with EN55024:1998

Dimensions
1 9/16" x 1 15/16" (41 mm x 49 mm)

Environmental
Suitable for industrial and commercial applications.
Operating temperatures: 5^0 C to 70^0 C (41^0 F to 158^0 F)

Encryption
256 – bit AES Rijndael encryption
For more information on encryption, visit
http://www.bis.doc.gov/encryption/default.htm
http://www.bis.doc.gov/policiesandregulations/regionalconsiderations.htm

RJ45 Ethernet (Xport) LED States

Link LED (left side)		Activity LED (right side)	
Amber – solid	10 Mbps	Amber – flashing	Half-duplex
Green – solid	100 Mbps	Green – flashing	Full-duplex

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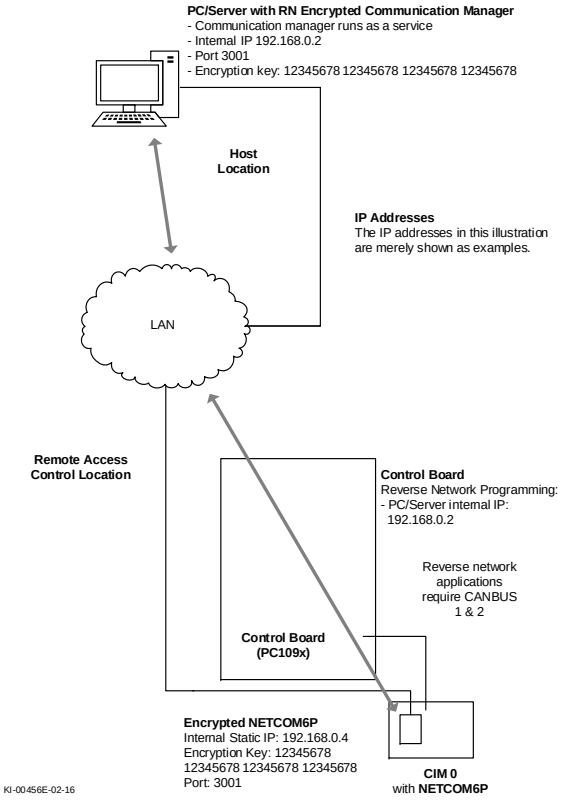
Network Configuration – LAN
- Closed network with no public exposure example

Settings	Host Location	Remote Location	
IP Address Port # Encryption Key	PC/server with Keyscan reverse network encrypted communication manager Same encryption key/bit setting as remote location	**ACU**	programmed with IP address of host PC/server with Keyscan reverse network encrypted communication manager
		NETCOM6P	programmed with static IP address or if using DHCP server dynamic IP Port # of host PC/server Same encryption key/bit setting as host location

Figure 2 - Example of Closed LAN with No Public Exposure



Installation Procedures for Reverse Network

For installing a NETCOM6P on a CIM circuit board for reverse network communication follow all the instructions outlined in this guide.

Before You Start

- Verify that you have all the parts as outlined below
- Ensure that you have coordinated settings, including the encryption key, with the host location as outlined on pages 1 to 3
- Have a control board with firmware 7.95/8.75 on the control board programmed with the host-location IP address for System VII or Vantage)
- Have firmware 9.21/9.02 on all control boards for Aurora
- Obtain a static IP address, Subnet Mask, and, if applicable, a Gateway (for a configuration similar to Figure 1) from the network administrator for each NETCOM6P unless using a DHCP server. Space is provided to record the address settings at the back
- Ensure you install the latest Keyscan NETCOM Program Tool utility on the enclosed CD on a laptop or PC that can be serially connected to program the NETCOM6P
- Have a copy of the CIM Installation Guide

Important

The NETCOM6P involves 2 procedures, temporary serial programming connections and permanent operation connections. Refer to the appropriate connection diagrams.

Ensure that you follow all the instructions beginning on page 5. Ensure that you program the NETCOM6P and program the control board as instructed.

As networks can be highly complex structures with a labyrinth of routers, firewalls, and switches, as well as layers of security protocols, you may be required to engage the services of a network administrator to establish communication between the two locations.

Please be aware that in addition to this document which pertains to the required setup at the remote location, a sister document – K-RN Setup or V-RN Setup – is included with the RN license and encrypted communication software at the host location.

Contents

Parts List

NETCOM6P	1
Serial Data Cable	1
Encrypted Communication CD	1

Troubleshoot Communication Issues

If communication difficulties arise, review the check list below to eliminate some potential installation errors:

Remote Location

- Verify all jumpers on the control boards and the CIMs are properly configured
- Verify all wiring and terminal block connections are correct
- Have you programmed the NETCOM device with the correct IP address, gateway if required, and ports
- Have you programmed the NETCOM with the same encryption key as the host location
- Have you programmed the control board with the correct host-location IP address
- If the remote location has a router or end-point device, verify the port settings are correct for inbound/outbound communication
- Run a diagnostic on CIM 0 - jumper ON J2. LEDs B3— B0 will indicate potential faults—refer to the CIM Installation Guide.
    - If B3 and B0 illuminate during the diagnostic cycle, the data carrier detection connection is lost. This generally indicates a network connectivity issue

Host Location

- Has the Reverse Network license been registered
- Is the host location running the encrypted reverse network communication manager
- Has the host location entered the same encryption key in the Keyscan Settings utility software
- Does the host location have a valid network path from the PC/server with the encrypted reverse network communication manager via any router/end points to the NETCOM6P/CIM 0/control panel including the correct port settings for inbound and outbound communication

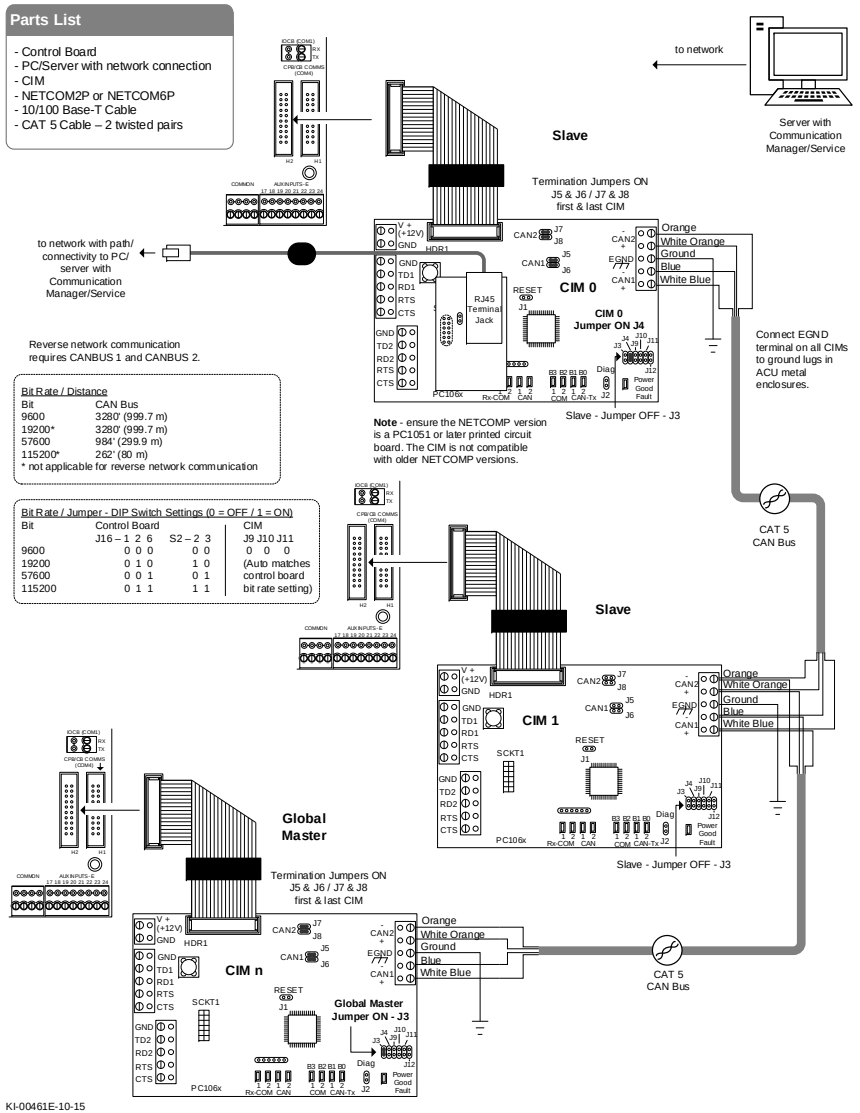
Note

You may require the services of a network administrator to resolve network issues and ensure the PC/server with the encrypted reverse network communication manager at the host location has a valid path and connectivity to the CIM 0/NETCOM6P/control board at the remote location.

Figure 10 – CIM 0 / CIM / ACU Connections

Important

For reverse network, use either 9600 or 57,600 baud jumper settings whichever jumper setting was selected for the control board.



Set Control Board for Reverse Network

In this set of procedures you will configure the control board for reverse network communication at one of the following bit rates: 9600 or 57,600.

See the table below for reverse network jumper settings.

Set Reverse Network – Jumper J16 or S2 DIP Switches on Control Board

The table below outlines reverse network configurations for PC109x control boards. Depending on the PC109x control board version, which either have jumpers at J16 or DIP switches at S2, refer to the relevant settings.

System Jumper J16 – Reverse Network Settings

Communication	Bits/Second	Mode	Jumper #	Settings 0=Off/1=On
	9,600	Reverse network	1 & 2 & 6	1 1 1
	57,600	Reverse network	1 & 2 & 6	1 0 1

S2 DIP Switches

Communication	Bits/Second	Mode	Switch #	Settings 0=Off/1=On
	9600	Reverse network	1 & 2 & 3	1 0 0
	57,600	Reverse network	1 & 2 & 3	1 0 1

The recommended setting is 57,600.

Steps to Set the Control Board for Reverse Network and Set the Bit Rate

1. Configure the control board for reverse network setting either the jumpers at J16 or the DIP switches at S2 as outlined above.
2. Note the bit rate you have selected for the control board. You require this setting when programming the NETCOM6P.
3. Go to Install NETCOM Program Tool Utility on the next page and follow each set of setup instructions.

Figure 3 - Location of J16 Jumpers

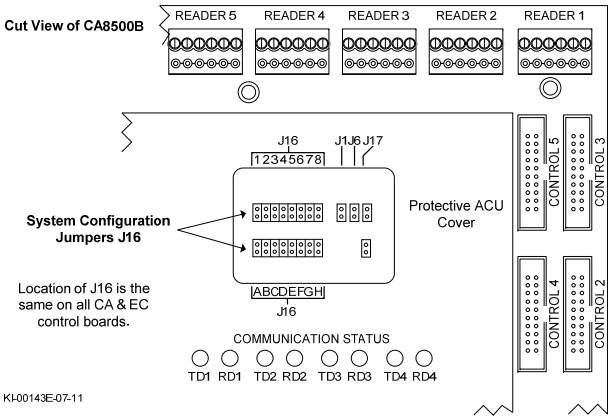
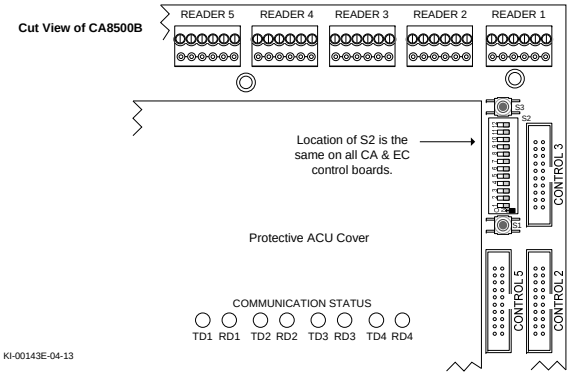


Figure 4 - Location of S2 DIP Switches



Install Keyscan NETCOM Program Tool Utility

Each NETCOM6P that you are installing must be programmed with the NETCOM Program Tool Utility software. Ensure you have the latest NETCOM Program Tool Utility software installed, which is on the enclosed CD; otherwise you may encounter communication difficulties. You will require a PC or laptop that has a direct serial connection to the NETCOM6P via the CIM board's COM2 terminal to program the device. To install the NETCOM Program Tool Utility software, load the Encrypted Communication CD into the CD-ROM or DVD drive. Observe the firewall and anti-spyware message and close the screen. Select Install NETCOM Program Tool from the Encryption Installation screen.

About the Encryption Key

The encryption key for the NETCOM6P must consist of one of the following bit settings: 32 characters (128 bit), 48 characters (192 bit) or 64 characters (256 bit). Characters can be as follows in any combination:

- alpha A—F
- numeric 0—9
- example of 128 bit key — A91376F1 C3621FBC DD68917E 1006B167

The encryption key can be created at either the host location or the remote access control location. But it must be entered exactly the same in the following two Keyscan software utilities:

- Application Utilities screen – Aurora (host location)
- System Settings—Reverse Network utility (host location)
- NETCOM Program Tool utility (remote access control location)

When requested in the Steps to Program the NETCOM6P with Encryption procedures, ensure that you enter the same encryption key that is used at the host location.

Program the NETCOM6P

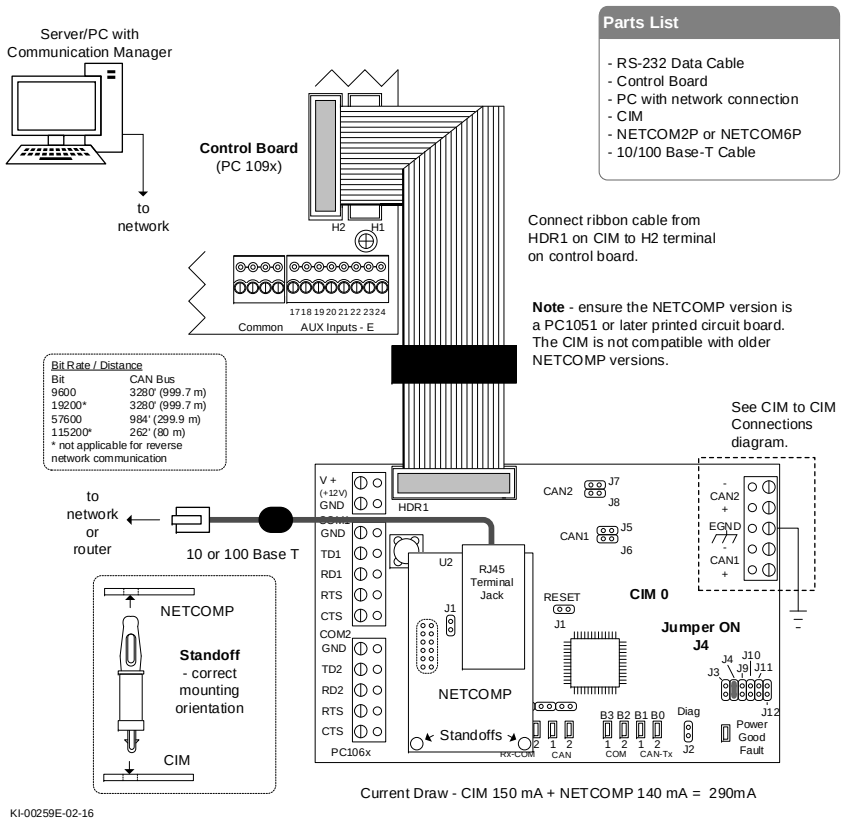
The NETCOM6P involves making a temporary connection to program the device and then making a permanent connection to operate the device as outlined:

- See Figure 5 to Figure 8 for temporary serial programming connections to the laptop/PC with the NETCOM Program Tool utility.
- See Figure 9 and Figure 10 for permanent operating connections on the network.

NETCOM6P Operational Connections

Figure 9 and Figure 10 illustrate NETCOM6P operating connections via CIM 0. Refer to the CIM Guide for complete instructions on setting up and installing CIMs.

Figure 9 – NETCOM6P Mounted on CIM 0



Configure the Control Board & CIMs

After programming the NETCOM6P and programming the control board with the host-location IP address, review the general steps below to configure the control board and CIMs for operation. Also refer to the CIM Setup Guide for instructions.

1. Refer to the NETCOM6P Operational Connections— Figure 9 and Figure 10 for permanent on-going operation.
2. Ensure that the CIM with the network connection has a jumper ON J4. This designates it as CIM 0.
3. Ensure that you have set the baud rate for all other CIMs to the same jumper setting as set on CIM 0—9600 or 57,600.
4. If using global anti—pass back, ensure that one CIM is set as a Global Master by placing a jumper ON J3. All other CIMs are set as slaves. A global master is not required if global functions are not used.
5. Ensure that the first and last CIMs have CANBUS 1 & 2 termination jumpers set.
   - Reverse network communication requires CANBUS 1 & 2
6. After the control board and the NETCOMP have been programmed and connected to the network, confer with the host location and verify the Keyscan Reverse Network Settings Encryption and the Client software for Reverse Network communication have been programmed.
7. After you have made all the necessary wiring and ribbon cable connections, and the host location has installed and configured the reverse network communication software, ensure the control boards/CIMs have power.
8. When initially powered, the CIMs will boot-up and run a self-diagnostic test. Check the CIMs for the following:
   - Power Good / Fault LED—solid green
9. On the control board, the initial state of the LEDs are as follows:
   - System Status—solid amber
   - TD3—flashing momentarily approx. every minute
   - RD3—flashing momentarily approx. every minute following TD3
10. When communication is established with the host location, the LEDs on the control board change to the following states:
11. System Status—solid green
12. TD3—flashing green frequent
13. RD3—flashing red frequent
14. When communication has been verified, have the host location perform a panel upload from a Client module.
15. If the CIMs Power Good /Fault LED is flashing green or the control board's Communication Status COM3—TD LED only flashes x4 approximately every 60 seconds on a call out cycle to make a connection with the host location, you may have to resolve communication issues. Refer to Troubleshoot Communication Issues to resolve potential causes for communication faults.

Also if there is no communication, the host location Client software will report one of the following warnings:

- System VII or Vantage - Communication Status Failed message
- Aurora – Red Health icon – Comms Failure reported on Transaction Response screen

About the Reset Function

During the NETCOM6P programming procedures, you are prompted to reset the device, which is a soft re-boot. This is equivalent to a power cycle.

Steps to Install and Program the NETCOM6P

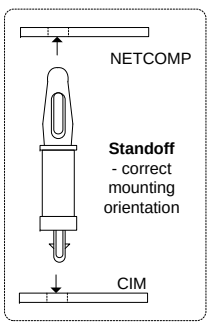
The NETCOM6P plugs directly into the CIM that is to be designated as CIM 0.

For programming the NETCOM6P (required), use a direct serial connection via the COM2 terminal block on CIM 0 as instructed. Also ensure you place jumpers ON J12 during the programming procedure when instructed.

As an option, the NETCOMP can be programmed off-site before installation providing you have a 12 VDC power supply that can be connected to the CIM's TB4 power terminal. See Figure 6 or Figure 8.

Steps to Install and Program the NETCOM6P... cont'd

1. Mount the NETCOM6P into SCKT1 on CIM 0 in the correct orientation as shown below. Do not change the orientation of the standoffs.



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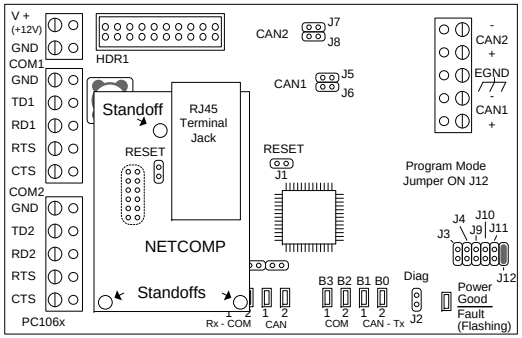
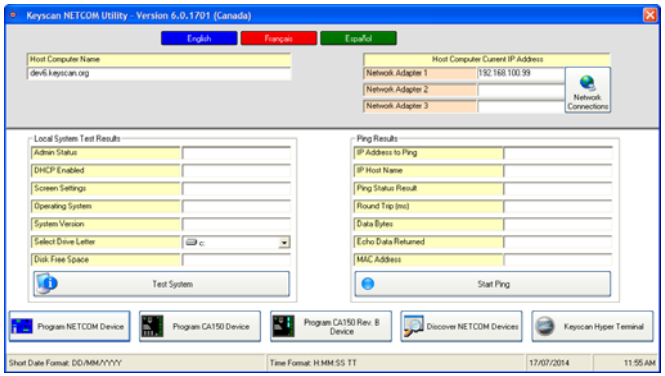


2. Mount the CIM/NETCOM6P in its designated location in the metal enclosure.
3. On the CIM circuit board, place a jumper on J12.
4. Connect the ribbon cable from the HDR1 terminal on the CIM circuit board to the H2 terminal on the control board. The H2 terminal provides power for programming the NETCOM6P.
5. Ensure the control board has power.
6. If the control board is newly installed and this is the first time it is powered up, restore the factory defaults as outlined depending on the version of PC109x control board:
   - J16 Jumpers - place a jumper ON J16—pin H, then momentarily place a jumper ON J1—Clear Memory to load the factory defaults. Allow approximately 2 minutes and do not make any changes while the control board re-configures. Remove the jumper from J16—pin H
   - S1 and S3 Switches – After applying power, press S1, wait 5 seconds, and then press S3 within 10 seconds to load the factory defaults. Allow approximately 2 minutes and do not make any changes while the control board re-configures.
7. Connect the RS-232 serial cable from the laptop or PC to the COM2 terminal block on the CIM circuit board. See Figure 5 or Figure 7.
8. Turn on the laptop or PC connected to the CIM circuit board.
9. Select start > All Programs and select Keyscan NETCOM Program Tool from the Keyscan menu.

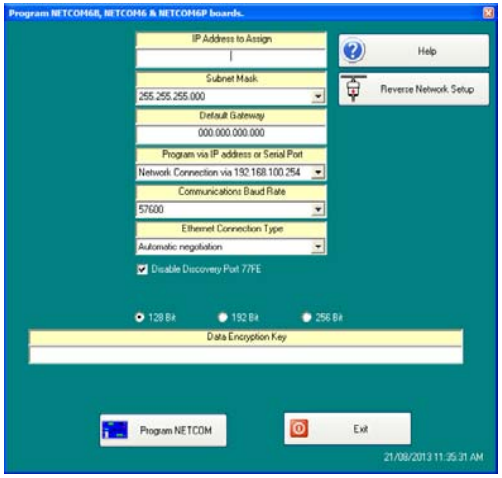
Steps to Install and Program the NETCOM6P…cont'd

10. From the Keyscan NETCOM Utility screen, click Program NETCOM Device.



11. From the Select NETCOM Device Type screen, click on the Program NETCOM6 Family of Boards button.

12. From the Program NETCOM6B, NETCOM6 & NETCOM6P Boards screen, enter the IP address assigned to the NETCOM6P. If using DHCP, enter 0.0.0.0 in the IP Address to Assign.



13. If a subnet mask is required, select it from the drop down list.

14. If the NETCOM6P requires a gateway to communicate on the network, enter the gateway address in the default Gateway text box.

15. From the Program via IP Address or Serial Port, select the port on the PC/laptop with the serial connection to the NETCOM6P via the CIMs COM2 terminal.

16. Select the baud rate that corresponds to the control board's J16 or S2 communication bit rate settings—9,600 or 57,600 for reverse network.

17. Leave Ethernet Connection Type set on Automatic Negotiation unless the IT administrator gives a specific setting.

    - If the NETCOM device experiences network communication difficulties, you may have to alter the Ethernet Connection Type from automatic negotiation. (The Ethernet Connection Type is the network speed & duplex setting). Set the NETCOM so it matches the network equipment setting. If the network equipment

Steps to Set IP Address on Control Board …cont'd

15. As an option, you can set a secondary IP address and/or set an override port number as outlined below provided they have been specified by the host location; otherwise go to step 17.

    - To set a secondary IP address, select 2) Set Secondary IP Address and enter a secondary IP address. You must have entered a primary IP address, otherwise the secondary address will not be used if a primary IP address is non-existent. If not entering a different secondary address, we recommend entering the primary IP address in the secondary location.
    - To set a port number which is an override to the Reverse Network Port Number programmed into the NETCOM6P, select 5) Set Port Number and enter a valid port. This override port can also be entered in the Keyscan Client software.

16. When you have completed the ACU programming, select 9) Exit.

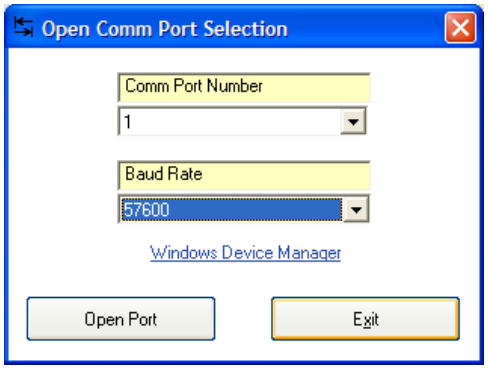
17. Exit HyperTerminal and close the NETCOM Program Tool Utility.

18. Disconnect the serial programming cable wires from the Communication terminal block—TB4 on the control board and from the PC/laptop.

19. Go to the next set of instructions—Configure the Control board and CIMs.

Steps to Set IP Address on Control Board ...cont'd

5. In the Open Comm Port Selection screen, select the COM port on the PC laptop connected with the access control board.



6. Set the Baud Rate to match J16 or S2 on the access control board.
7. Select the Open Port button.
8. With the Hyper Terminal screen open, it is currently blank, momentarily remove the jumper from pin 1 on J16 and then put it back on or turn S2.1 off then back on. Within 15 seconds, press and hold the c (lower case or upper case) on the keyboard until the Hyper Terminal menu opens. If the menu starts to scroll, release the "c" and wait until the menu has stabilized before going to the next step.
9. The Hyper Terminal offers the following menu selections:

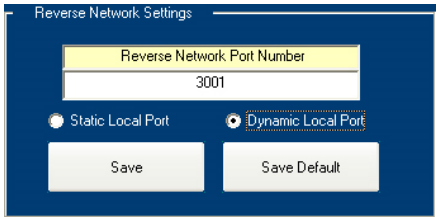
    1) Set Primary IP Address
    2) Set Secondary IP Address
    3) Display IP Address
    4) Clear IP Address
    5) Set Port Number
    9) Exit

10. Select 1) Set Primary IP Address.
11. Enter the IP address of the host router, end point or the PC/server running the Keyscan Reverse Network communication manager that was provided by the host location.
    - If you make a typing error, do not use the backspace key. Press the Enter key and repeat steps 10 & 11.
    - Ensure the correct IP address format is used with periods separating appropriate digits as shown in the example 192.168.100.12
12. Press the Enter key.
13. Verify the correct IP address has been programmed by selecting: 3) Display IP Address.
14. Do one of the following:
    - If the IP address is correct go to the next step.
    - If the IP address is incorrect, repeat steps 10 to 13.

Continued on the next page...

was on an automatic setting, then reconfigure both the network equipment, which may include routers or switches, and the NETCOM to a matching fixed speed and duplex setting. As an example, NETCOM = 100 Mbit/Half Duplex – Network equipment = 100Mbit/Half Duplex.

18. The Discovery Port 77FE is disabled by default. We recommend that you leave it on the default setting. This function is principally for troubleshooting communication difficulties.
19. Click on a radio button that corresponds to the encryption bit setting of the host location.
20. Enter the same encryption key that was entered at the host location.
21. Select the Reverse Network button.
22. In the Reverse Network Port Number text box and depending on the network configuration, enter the port number of the router, end point or the PC/server with the Reverse Network Communication Manager at the host location. Generally this is port 3001.



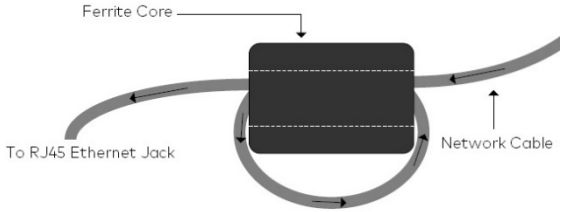
23. Select the radio button – Static Local Port or Dynamic Local Port (50,000 –59,999) depending on whether the inbound port of the router/endpoint is assigned a static port or a range of dynamic ports at the remote location.
    - If Static Local Port applies ensure that the router/end point is configured for inbound communication using the same port number as entered in the Reverse Network Port Number field.
24. Click on Save.
25. Click on the Program NETCOM button.
26. From the Reverse Network Settings confirmation box—Do you wish to continue..., click on the Yes button.
27. The NETCOM Program Settings screen indicates it is waiting for a NETCOM reset or power cycle. Momentarily place a jumper on the CIM board's J1 RESET pins, then remove the jumper, and wait while the NETCOM is programmed.
    - If the NETCOM does not program on the 1st attempt, keep the NETCOM Program Settings screen open and press the F4 key. Click inside the box to the left of Program Server Address Settings Only so it has a check mark. Ensure the settings have been retained, including the IP Address, otherwise re-enter them. Click on the Program NETCOM button. If successful, program the NETCOM one more time. For additional programming tips, press the F1 key with the Keyscan NETCOM Program Settings screen open.
28. When prompted by the NETCOM Program Tool utility, ensure that you remove the temporary RS-232 serial cable from the CIM circuit board's COM2 terminal after the device has been programmed. Leave the data cable connected to the PC/laptop.
29. Momentarily short the RESET jumper on the NETCOM6P.
30. Leave the NETCOM Program Tool Utility open.
31. Remove the jumper from J12 on the CIM circuit board.

Steps to Install and Program the NETCOM6P…cont'd

32. Place a jumper ON J4 on the CIM unit to enable the board for network communication. This designates it as CIM 0.
33. Momentarily place a jumper on the CIM board's J1 RESET pins to initiate the jumper change in the preceding step.
34. At the PC/laptop, click on the OK button in the Disconnect the serial cable… screen.
35. Go to the next set of instructions—Program the RN Control Board on page 15.

Ferrite Core Installation

Network cables must be fed through a ferrite core (as detailed in the diagram below). Feed the network cable through the open ferrite core, loop the cable back around and feed it through again. Clamp the ferrite core shut and connect the network cable into the RJ45 ethernet port on the ACU. The ferrite core should be within 5 inches of the RJ45 ethernet jack on the NETCOM.

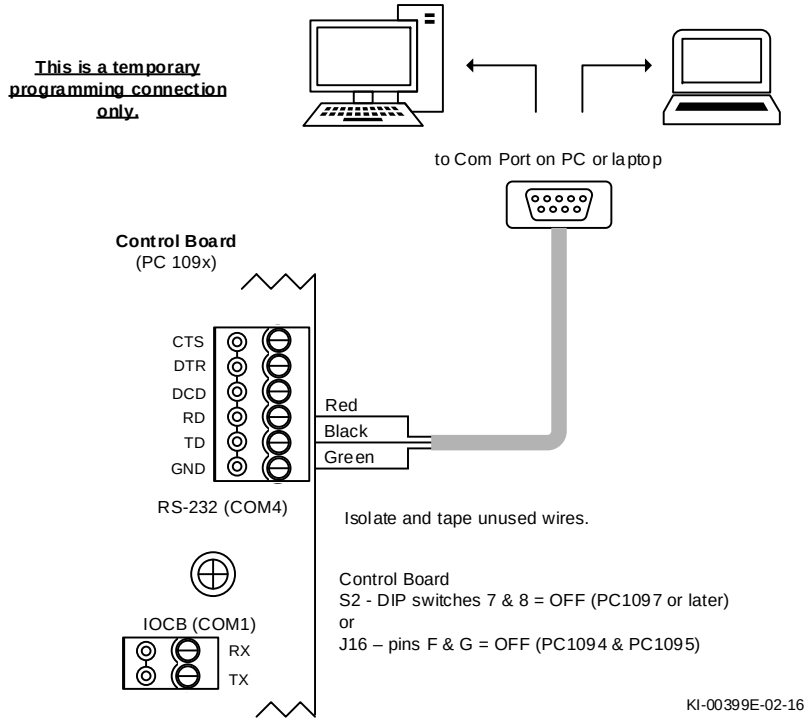


Program the RN Control Board

In this set of procedures you will input the IP address of the router, endpoint or PC/server with the Keyscan Reverse Network Communication Manager at the host location depending on the network configuration. This allows the control board to initiate communication back to the host location. This must be the same control board that was jumpered for reverse network communication on page 5. Ensure the board has firmware version 7.95/8.75.

Steps to Program the Control Board with a Host-Location IP Address

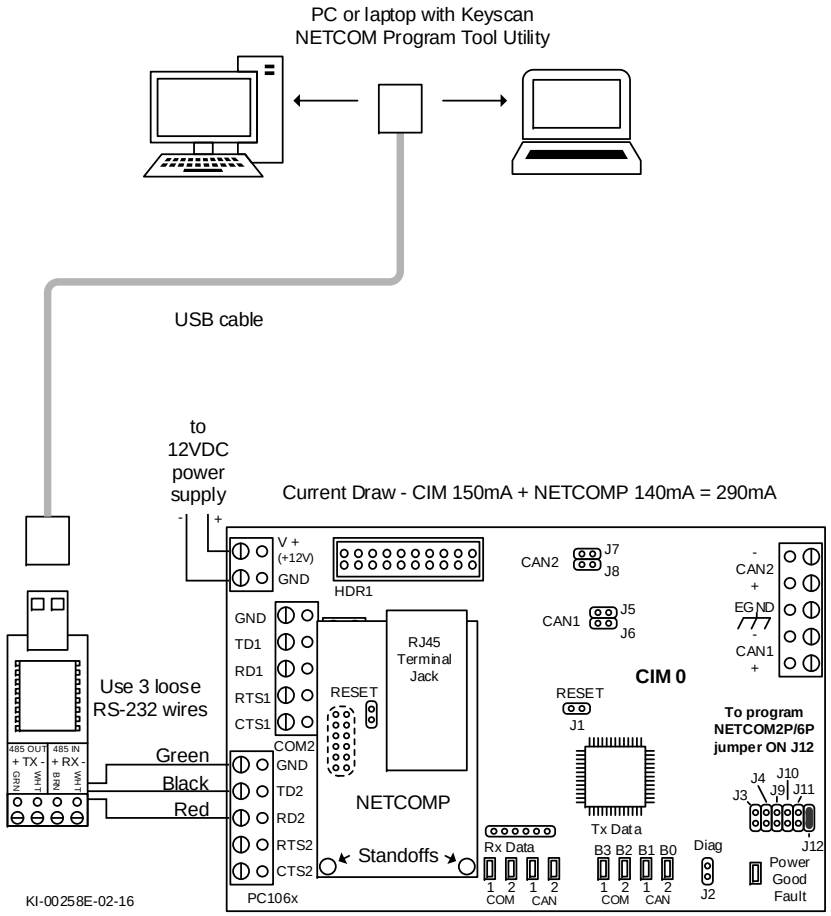
1. Ensure that the access control board has power.
2. Do one of the following steps depending on the PC109x version of control board:
   - J16 Jumpers - Remove the jumpers from J16—pins F & G. And then place a jumper on J6 momentarily to reset the control board and then remove the jumper.
   - S2 DIP Switches – Turn S2 – switches 7 and 8 OFF. And then press and release the S1 switch.
3. Connect the 3 loose wires from the serial programming cable to the communication terminal block—TB4—as shown below.
   - You can also remove the terminal block from TB4 in the lower right corner of the access control board, make the connections and then re-mount the terminal block.



4. From the PC or laptop with the NETCOM Program Tool Utility main screen open, select the Keyscan Hyper Terminal button.

Continued on the next page….

Figure 8 - Optional USB-SER Serial Programming Connections via Independent 12 VDC Supply



Serial Programming Connections

Establish a serial programming connection from the PC or laptop using the enclosed data cables.

If the PC or laptop does not have a serial port, use the optional USB-SER Adaptor.

Figure 5 - Serial Programming Connections Powered via H2 on the Control Board

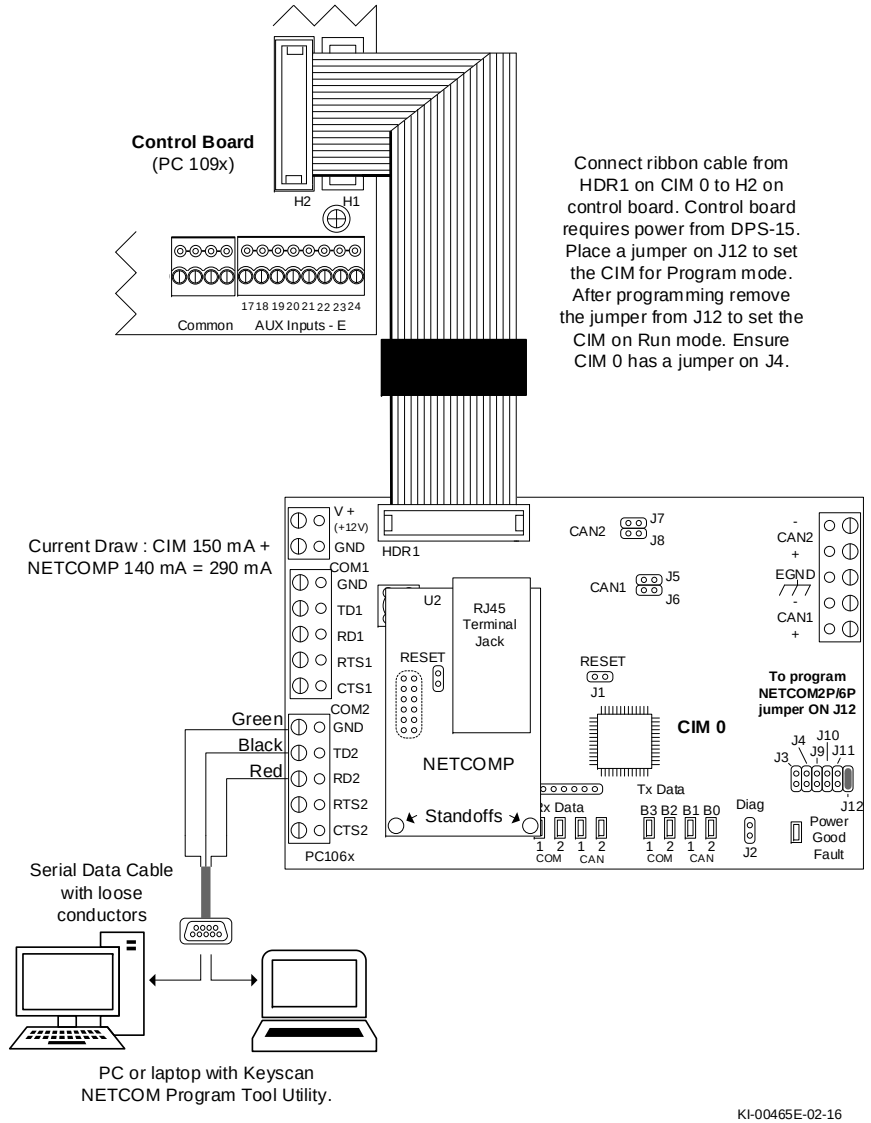


Figure 6 - Serial Programming Connections via Independent 12 VDC Supply

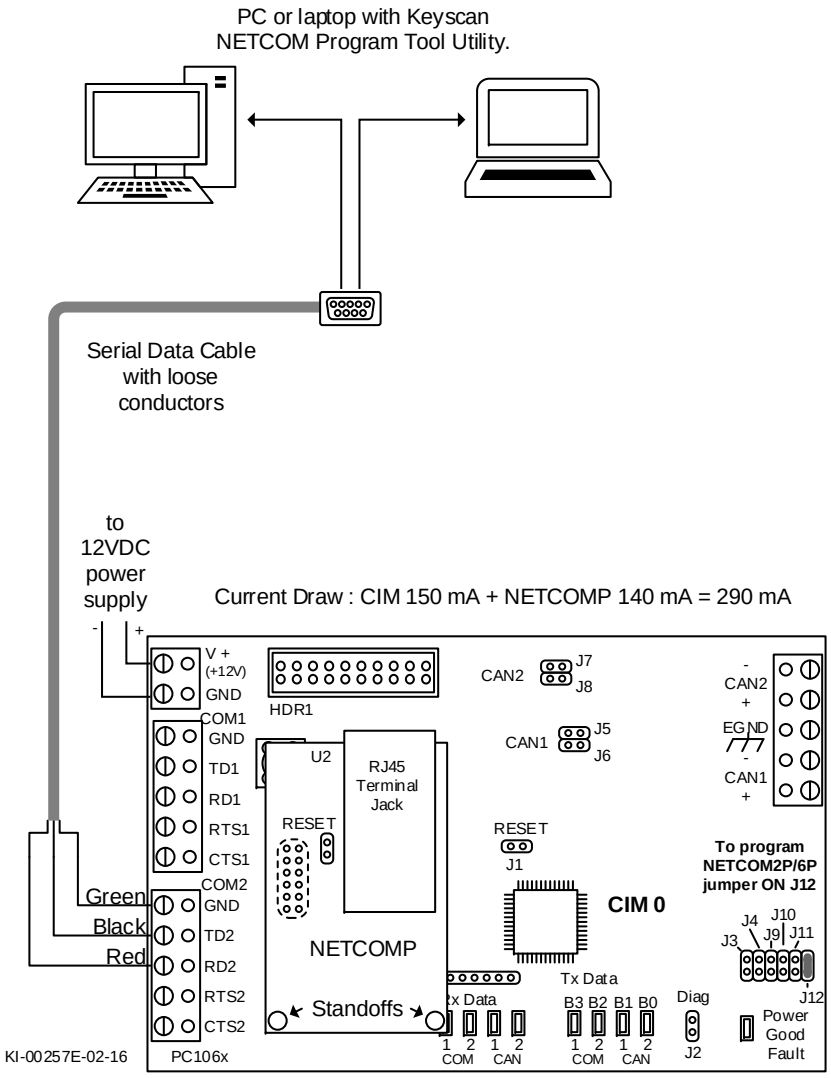


Figure 7 - Optional USB-SER Serial Programming Connections Powered via H2 on Control Board