# NETCOM6P/ACU RN M1 (Encrypted) Installation Guide

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

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

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 Reverse Network Overview.

## Reverse Network Overview

Keyscan RN licenses—AUR-RN for Aurora—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.

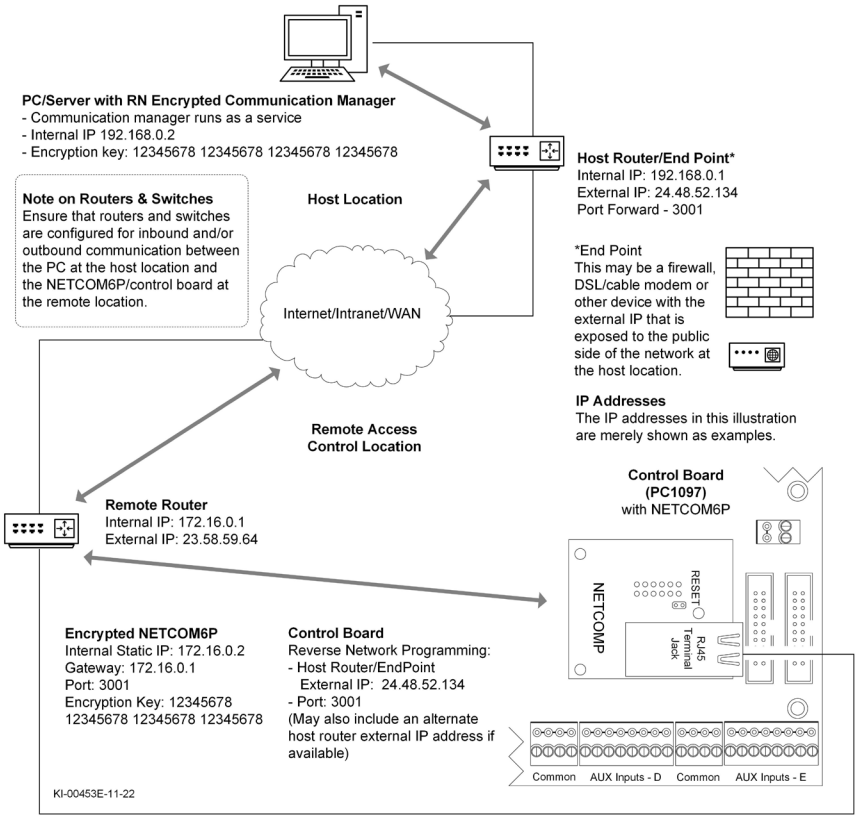
- the technician installing the hardware components must have a host-location IP address that the ACU connects to on the network
- both the host and remote locations must have the same encryption key
- the host location requires the serial # of the designated reverse network control board
- a valid path 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<br>Port #<br>Gateway<br>Encryption Key | Router with port forward or router table to PC/server with Keyscan reverse network encrypted communication manager<br>Same encryption key/bit setting as remote location | **ACU** | programmed with host router or end point external IP address<br>override port—optional |
| | | **NETCOM6P** | programmed with static IP address or if using DHCP server dynamic IP<br>Gateway (if static IP above)<br>Port # of host router/end point<br>Same encryption key/bit setting as host location |

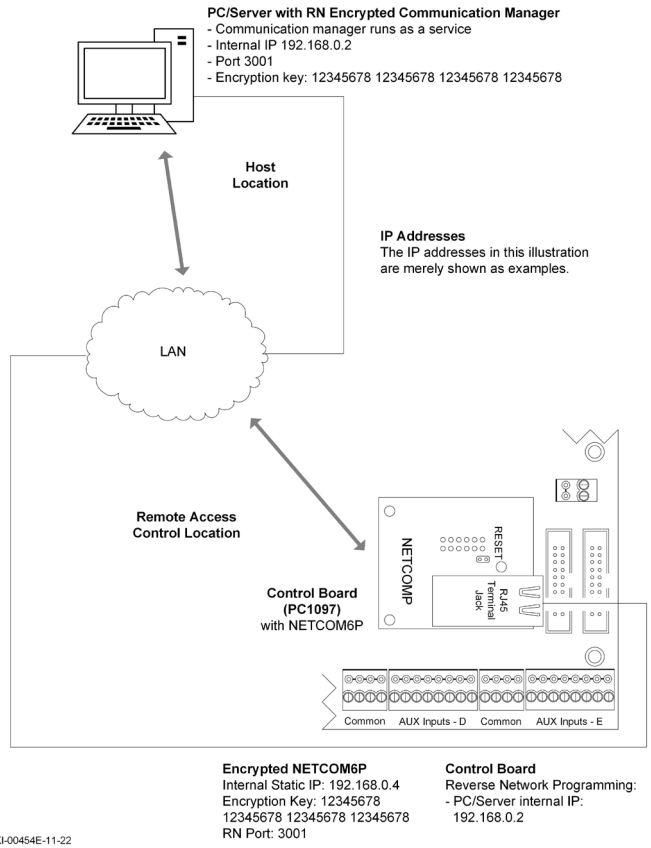
**Figure 1 - Example of Internet/Intranet/WAN with external IP Address**



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

| Settings | Host Location | Remote Location | |
|---|---|---|---|
| IP Address<br>Port #<br>Encryption Key | PC/server with Keyscan reverse network encrypted communication manager<br>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<br>Port # of host PC/server<br>Same encryption key/bit setting as host location |

**Figure 2 - Example of LAN closed with no public exposure**



# Installation Procedures RN Reverse Network

If you are installing an encrypted NETCOM6P mounted directly on the control board for a reverse network application with a Keyscan RN license, follow the instructions in this guide for installation and programming. A NETCOM6P mounted directly on the control board does not support multiple access control units on the same communication bus.

***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 in the preceding section
- Have a PC1097 or later control board
- If the host location is operating with Keyscan Aurora software, the control board requires firmware version 9.21/9.02 or higher
- 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 at the back to record address settings
- Ensure you install the latest Keyscan NETCOM Program Tool utility on a laptop or PC that can be serially connected to program the NETCOM6P. The Keyscan NETCOM Program Tool Utility can be downloaded here:

  https://www.dormakaba.com/us-en/knowledge-center/software-downloads-updates/device-drivers-download

***Important***
The NETCOM6P involves 2 connection procedures, temporary serial programming connections and permanent operating 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.



| Parts List (Included) | |
|---|---|
| NETCOM6P | 1 |
| Ferrite Core | 1 |

| Additional Parts (Not Included) |
|---|
| Serial Cable or USB-SER adapter |

**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.

## 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 settings.

**Set Reverse Network – S2 DIP Switches on Control Board**
The table below outlines reverse network configurations for PC1097 control boards.

**S2 DIP Switches – Reverse Network Settings**

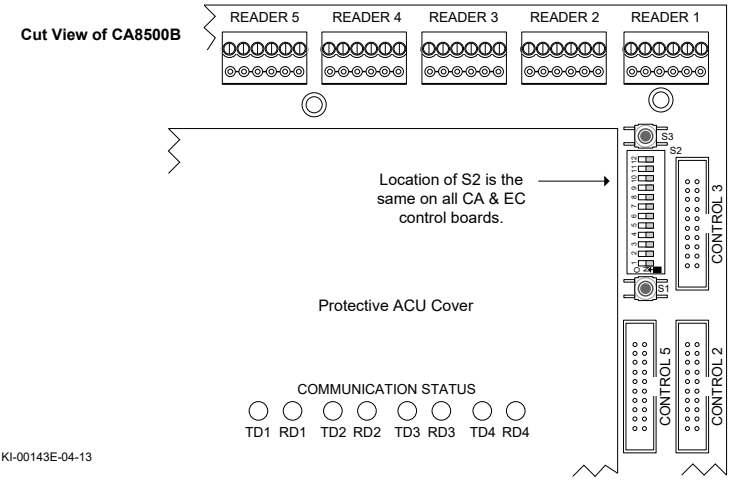
| Communication | Bits/Second | Mode | Switch # | Settings 0=Off/1=On |
|---|---|---|---|---|
| | 9600 | Reverse network | 1 & 2 & 3 | 1 0 0 |
| | 57,600 | Reverse network | 1 & 2 & 3 | 1 0 1 |

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 settings. Refer to 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 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, otherwise you may encounter communication difficulties. The Keyscan NETCOM Program Tool Utility can be downloaded here:

https://www.dormakaba.com/us-en/knowledge-center/software-downloads-updates/device-drivers-download

You will require a PC or laptop that has a direct serial connection to the NETCOM6P via the control board's RS-232 (COM4) terminal to program the device. To install the NETCOM Program Tool Utility software, download the utility from the URL link provided above, then open the .exe file. Follow the on-screen prompts to complete the installation.

## 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 Client (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:

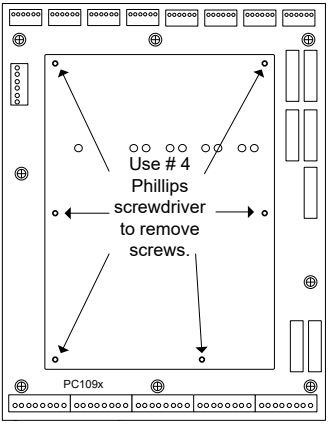
- See Figure 4 or Figure 5 for temporary serial programming connections to the laptop/PC with the NETCOM Program Tool utility.
- See Figure 6 for NETCOM2P/ACU permanent operating connections on the network.

## Steps to Program and Install a NETCOM6P

The NETCOM6P plugs directly into a PC109x or higher control board. Please note that this configuration only supports a single panel communication bus.

To program the NETCOM6P, use a direct serial connection via the RS-232 (COM4) terminal block on the ACU control board as instructed.

1. Touch the earth ground lug inside the ACU metal enclosure to discharge body static.
2. Disconnect the ACU control board from the power.
3. Using a #4 Phillips screwdriver, unfasten the 6 screws holding the ACU protective cover. Remove the cover and set it aside with the six screws.

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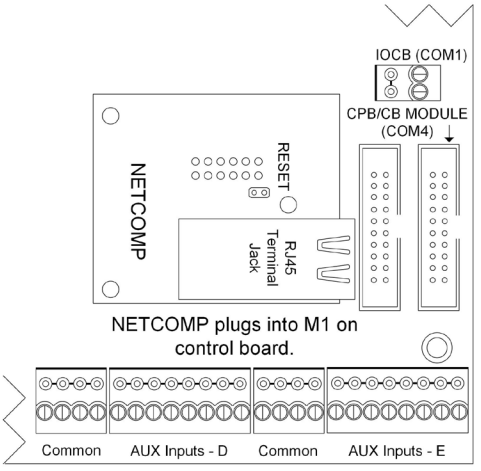
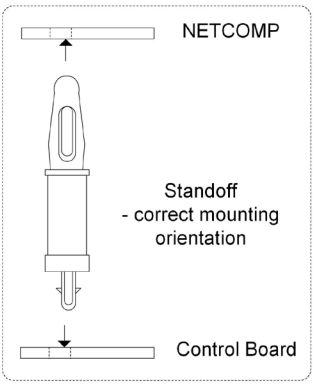
4. Mount the NETCOM6P into M1 in the correct orientation as shown below.

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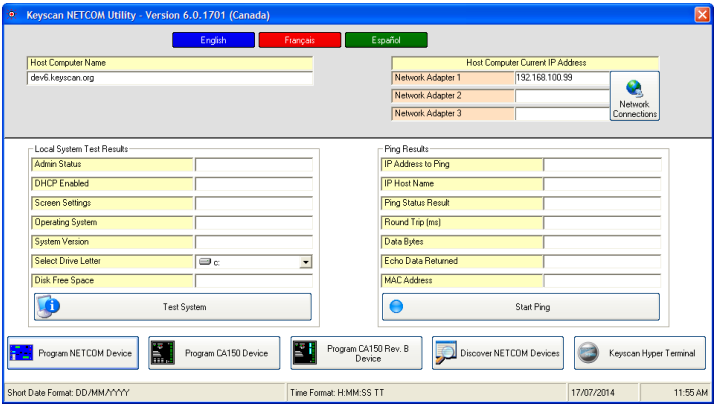
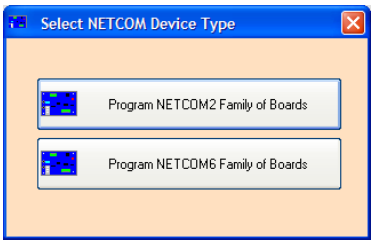
**Steps to Install and Program the NETCOM6P…cont'd**

5. On the control board, set communication for M1 to program mode for the NETCOM6P:
   - S2 DIP Switches – 7 and 8 - ON
6. Connect the serial programming cable from the RS-232 (COM4) terminal on the control board to the laptop or PC as illustrated in Figure 4. If using the USB-SER adaptor, see Figure 5. Be sure the USB-SER adaptor has been configured before programming.
7. Apply power to the ACU control board.
8. Turn on the laptop or PC connected to the ACU control board.
9. Select start > All Programs and select Keyscan NETCOM Program Tool from the Keyscan menu.
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.

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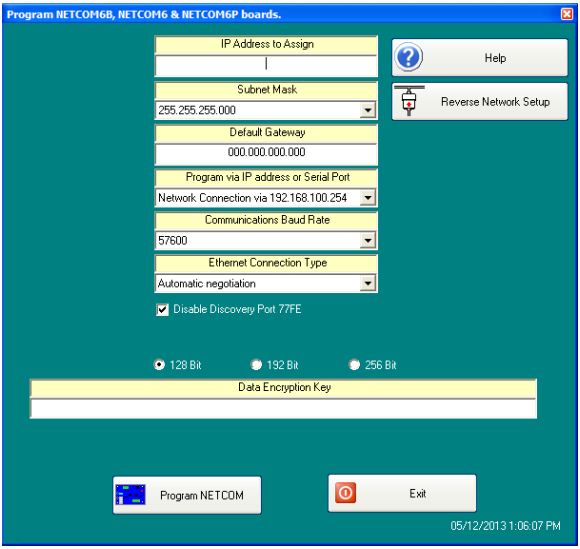
**Steps to Install and Program the NETCOM6P …cont'd**

12. From the Program NETCOM6B, NETCOM6 & NETCOM6P screen, enter the IP address assigned to the NETCOM6P. If using DHCP, enter 0.0.1.0 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 control board's RS-232 communication terminal.
16. Select the baud rate that corresponds to the control board communication S2 bit rate settings.
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 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.

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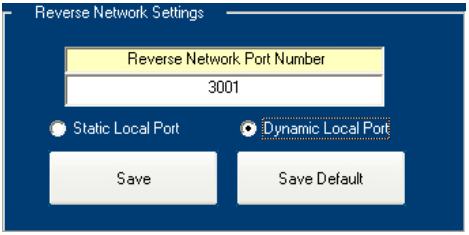
**Steps to Install and Program the NETCOM6P …cont'd**

21. Select the Reverse Network button.



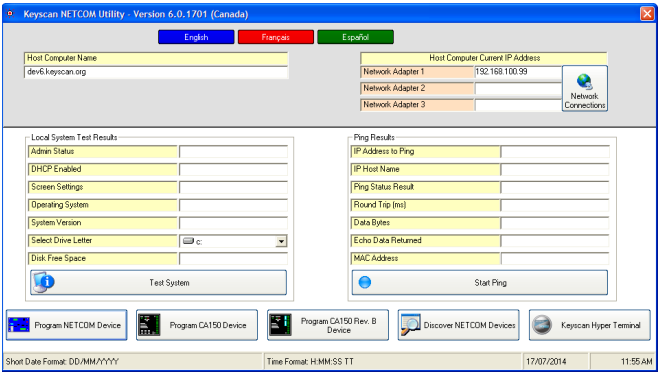

22. In the Reverse Network Port Number text box and depending on the network configuration, enter the port number of the router, end point or the PC/server with the Reverse Network Communication Manager at the host location. Generally this is port 3001.
23. Select the radio button – Static Local Port or Dynamic Local Port (50,000 –59,999) depending on whether the inbound port of the remote location's router/endpoint is assigned a static port or a range of dynamic ports.
    - 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. Press and release the S1 switch.
28. Wait while the NETCOM Program tool utility programs the NETCOM device.
    - If you experience any difficulties when programming, press the F1 key with the Keyscan NETCOM Program Settings screen open to receive additional programming tips.
29. After the NETCOM6P has been programmed, press and release the S1 switch on the control board.
30. At the PC/laptop, click on the OK button in the Disconnect the serial cable… screen.
31. Keep the PC/laptop connected to the control board's RS-232 terminal with the temporary serial cable and keep the Keyscan NETCOM Utility screen open. Go to the next section on the following page—Program the Control Board with a Host-Location IP Address.

# Program the Control Board with a Host-Location IP Address

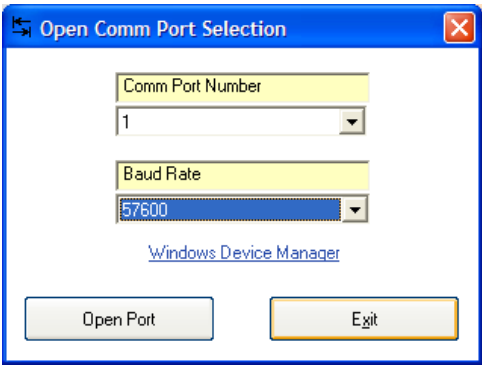
You will program the control board with the IP address of the router, endpoint or PC/server at the host location depending on the network configuration. This allows the control board to initiate communication back to the host location.

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

1. Ensure that the access control board still has power.
2. Set the S2 DIP Switches: Turn S2 – switches 7 and 8 OFF, then press and release the S1 switch.
3. Return to the PC/laptop with the NETCOM Program Tool Utility. From the Keyscan NETCOM Utility screen, select the Keyscan Hyper Terminal button.




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




5. Set the Baud Rate to match S2 on the access control board.
6. Select the Open Port button.

Continued on the next page…

**Steps to Program the Control Board with a Host-Location IP Address Cont'd**

7. With the HyperTerminal screen open, it is currently blank, 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 HyperTerminal menu opens. If the menu starts to scroll, release the "c" and wait until the menu has stabilized before going to the next step.
8. The HyperTerminal menu opens:

    1) Set Primary IP Address

    2) Set Secondary IP Address

    3) Display IP Address

    4) Clear IP Address

    5) Set Port Number

    9) Exit
9. Select 1) Set Primary IP Address.
10. 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 9 & 10.
    - Ensure the correct IP address format is used with periods separating appropriate digits as shown in the example 192.168.100.12
11. Press the Enter key.
12. Verify the correct IP address has been programmed by selecting: 3) Display IP Address.
13. Do one of the following:
    - If the IP address is correct go to the next step.
    - If the IP address is incorrect, repeat steps 9 to 12.
14. 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.
    - 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.
15. When you have completed the ACU programming, select 9) Exit.
16. Close HyperTerminal.
17. Disconnect the serial programming cable wires from the communication terminal block on the control board.
18. Set the S2 DIP Switches: Turn S2 – switch 7 to the ON position to activate the M1 terminal for NETCOMP communication.
19. Press and release the S1 switch to reset the control board.
20. Disconnect the power from the control board.

**Steps to Program the Control Board with a Host-Location IP Address Cont'd**

21. Re-mount the ACU protective cover.
22. Plug the Ethernet cable into the NETCOM6P for on-going permanent operation. See Figure 6.
23. Re-apply power after the ACU protective cover has been re-mounted.
24. After applying power, press and release the S1 switch, 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 to the control board while the System Status LED is flashing red and the piezo is beeping.
25. After the control board and the NETCOM have been programmed and connected to the network, confer with the host location to confirm the reverse network software installation procedures have been completed and the Reverse Network communication manager is running as a service. The host location must do a full panel upload from a Client module to populate the control board with the access control database.
26. The following control board LEDs will indicate a network connection has been established with data transmitted to and received from the host location:
    - System Status LED — solid green
    - TD4 LED — flashing green—frequent
    - RD4 LED — flashing red—frequent
27. Close and secure the ACU enclosure door after communication has been verified with the host location.

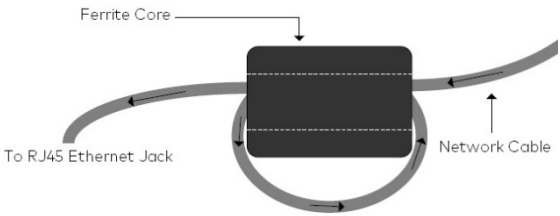
***Note***
If the control board/NETCOM6P has not established communication, the control board's TD4—LED only illuminates with a series of 4 flashes on a call out cycle. Call out cycles may occur from 1 minute to 15 minute intervals. Refer to Troubleshoot Communication Issues on page 18.

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

- Aurora – Red Health icon – Comms Failure reported on Transaction Response screen

## 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.

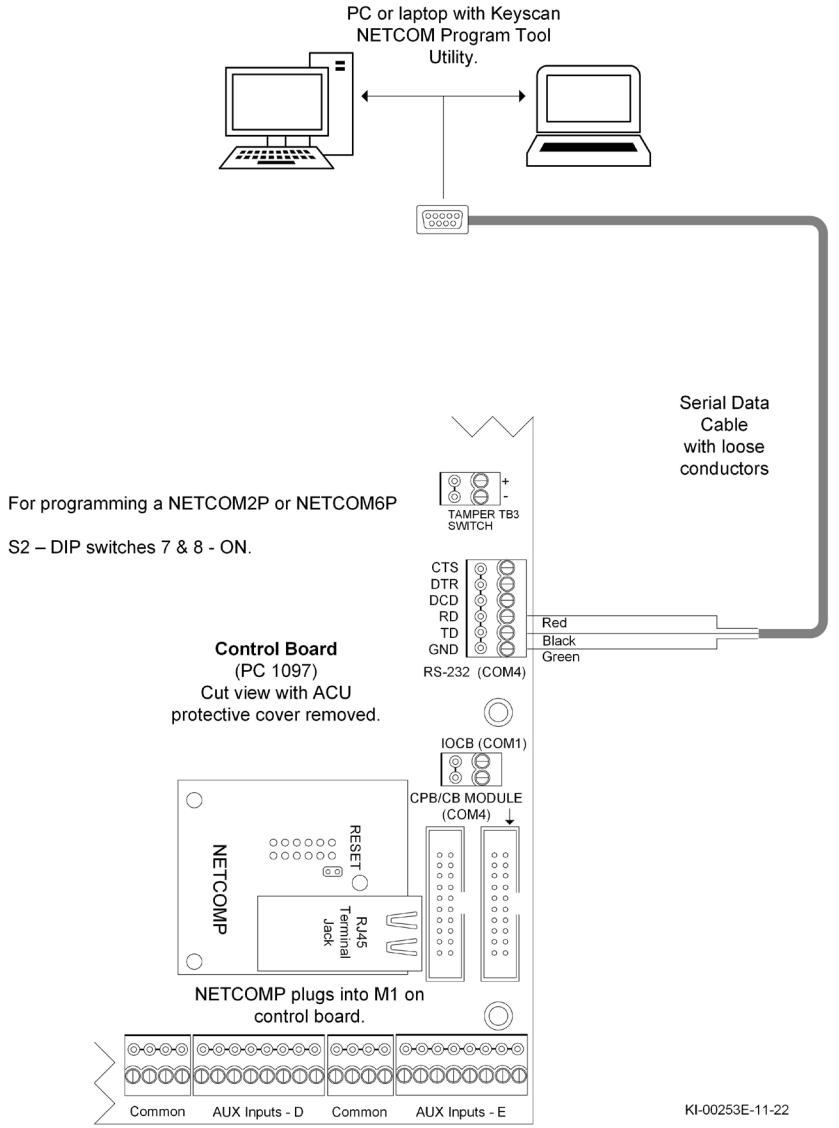


## NETCOM6P Serial Programming Connections

Figure 4 illustrates serial programming connections from the PC or laptop to the NETCOM6P via M1 on the control board using the enclosed data cables.

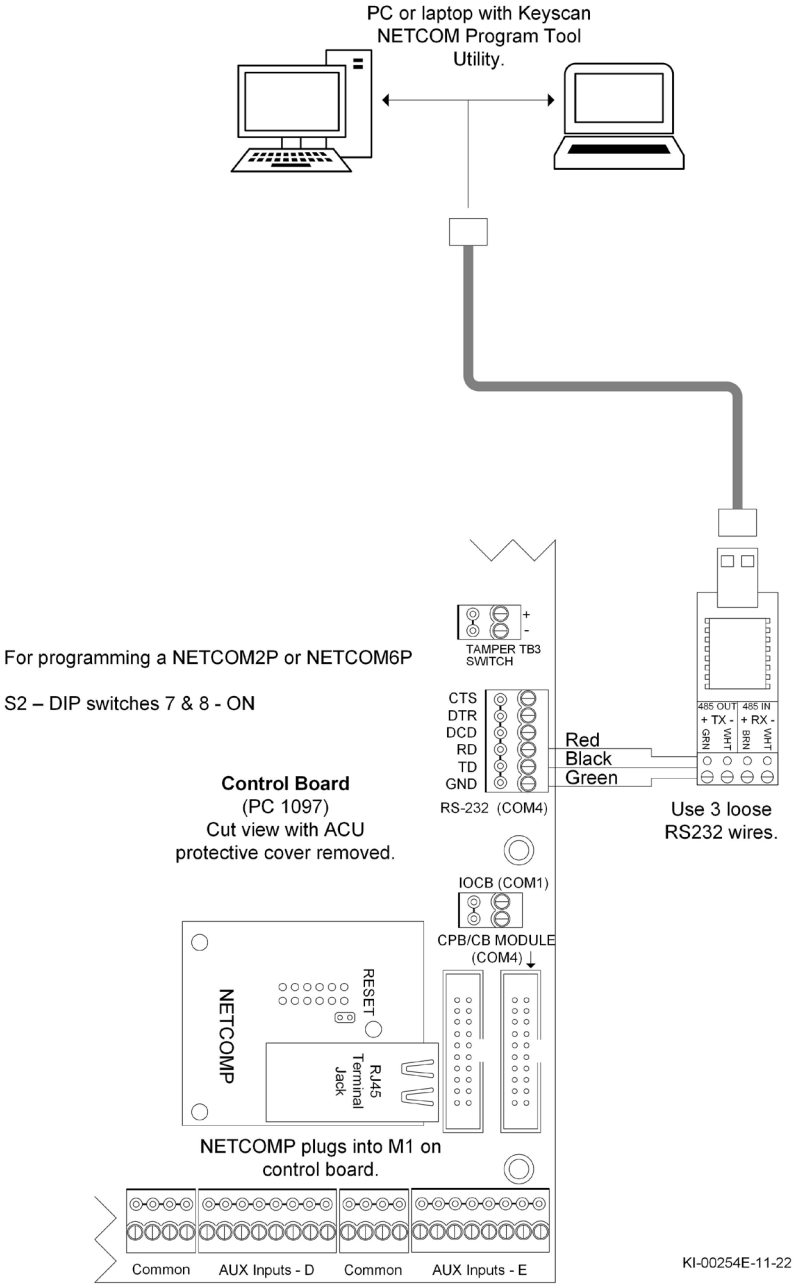
If the PC or laptop does not have a serial port, use the optional USB-SER adaptor.

**Figure 4 - Serial Programming Connections**




**Temporary connections for programming only.**

**Figure 5 - Serial Programming Connections with USB-SER Adaptor**

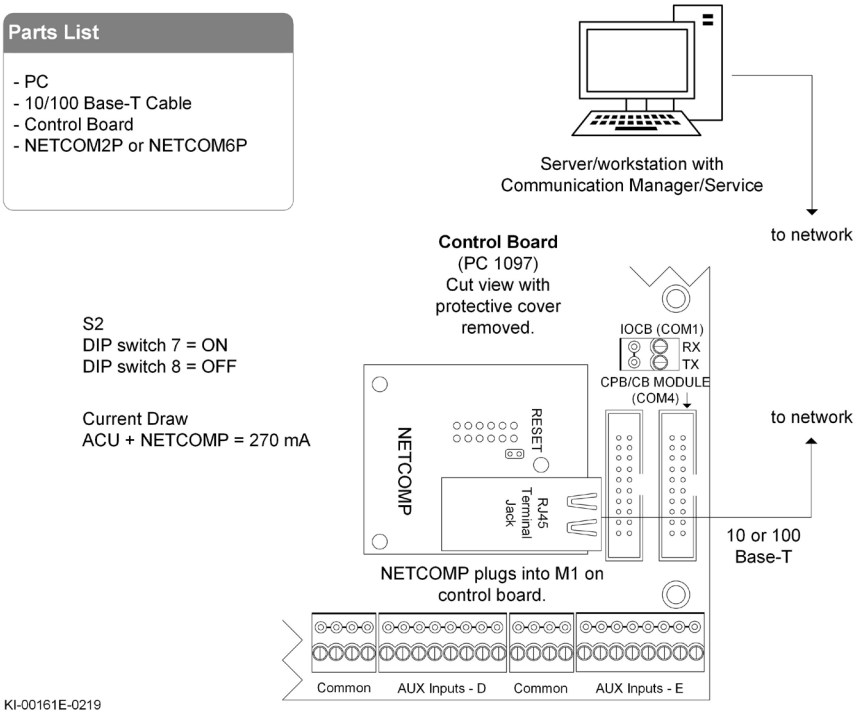



**Temporary connections for programming only.**

# NETCOM6P/Control Board Operational Connection

Figure 6 illustrates NETCOM6P operating connections and jumper settings when mounted on a PC109x or higher control board. This configuration only supports a single control board communication bus.

**Figure 6 - NETCOM6P/PC109x (or higher) ACU Control Board**



## Troubleshoot Communication Issues

If communication difficulties arise, review the check list below to eliminate some potential installation errors. You may have to contact the host location and verify the necessary software has been installed and configured.

**Remote Location**

- Verify all switches on the control board 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 port settings?
- Have you programmed the NETCOM with the same encryption key that was specified at 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 inbound/outbound communication with the correct port settings

**Host Location**

- Is there a Reverse Network license available?
- 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/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 NETCOM6P/control board at the remote location.

## Specifications

**Input Power Requirements**

Powered through control board (NETCOM6P 140 mA + control board 130 mA = 270 mA

**Network**

RJ45 (10/100 Base-T) Ethernet

LAN/ WAN, TCP/IP protocol—default port 3001 (configurable)

**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**

The RJ45 Ethernet terminal has two bi-colour LEDs:

| 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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## Address Settings

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

* Required fields for device configuration with software
** If other than Automatic Negotiation

**dormakaba Canada Inc.**
901 Burns St., E. Whitby, Ontario, Canada L1N 0E6

1.888.539.7226 (toll free Canada/USA)

905.430.7226 (elsewhere)

www.dormakaba.ca

**Technical Support**
Hours – 9:00 A.M. to 6:30 P.M. Eastern Time

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