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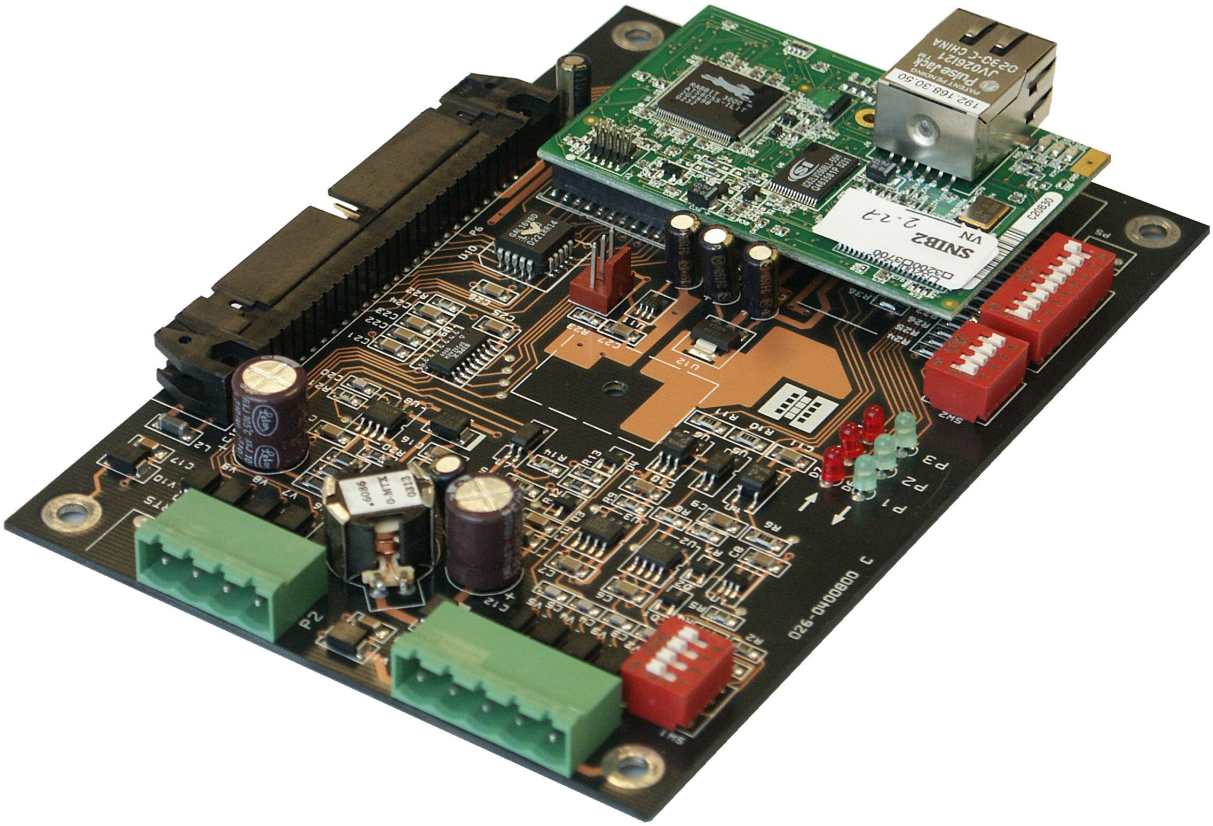
SNIB2 Configuration Guide



SUPP009

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SUPP009-0414

The National Institute of Standards and Technology (NIST) has awarded the SNIB2 AES Certificate #280.

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Getting Help

If you encounter a problem that is not discussed in this guide and you need technical support, do the following:

1. Contact your local dealer or the provider of this product.
2. If your dealer is not available, contact Technical Support directly. This can be done in a number of ways:

Mail:	Identiv 1900-B Carnegie Avenue Santa Ana, CA 92705-5520 Attn: Technical Support
Phone:	877-HIRSCHX (877-447-7249) toll-free
Fax:	(949) 250-7362
Email:	support@hirschelectronics.com
WWW:	www.hirsch-identive.com

Whenever you call your local dealer or Identiv, be sure to have your registration material, serial number, and software version numbers available.

For future reference, record that information here.

SNIB2 MAC Address: _____

SNIB2 Firmware #: _____

Dealer: _____

Dealer Phone #: _____

CCM Firmware #: _____

CCM BIOS #: _____

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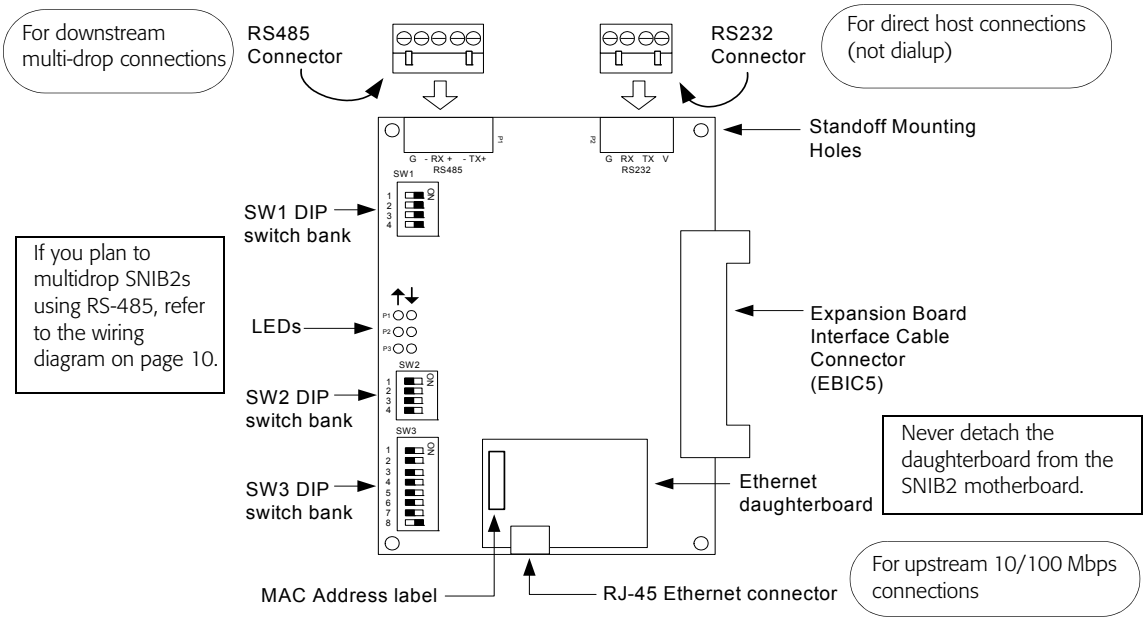
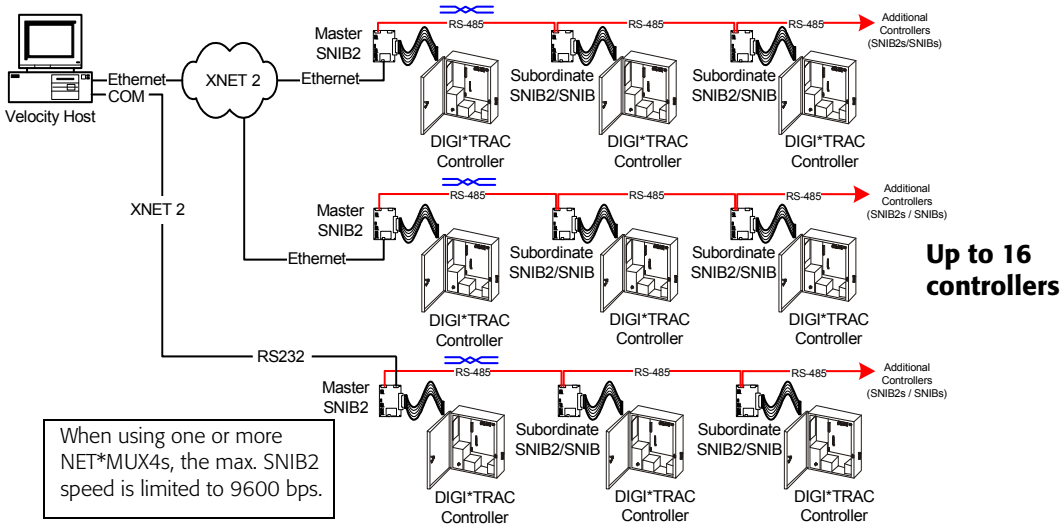
SNIB2 Configuration Guide

The SNIB2 is a high-security encryption Secure Network Interface Board. The main components of the SNIB2 are shown below:



The SNIB2 is a controller-resident communication board that enables a host PC running Velocity (version 2.6 SP2 or higher) to program, monitor, and control up to 63 SNIB2-resident controllers per SNIB2 Ethernet port. A NET*MUX4 is required whenever there are more than 16 controllers. Additional NET*MUX4s may be needed to ensure that there are never more than 16 controllers per port.



= this cable segment swaps the RX± and TX± wires. See page 10 for details.

Each connected DIGI*TRAC controller must have its own SNIB2 or SNIB board installed. The SNIB2 provides RS-485, RS-232, and 10/100BaseT Ethernet ports. The SNIB2 supports the XNET2 protocol.

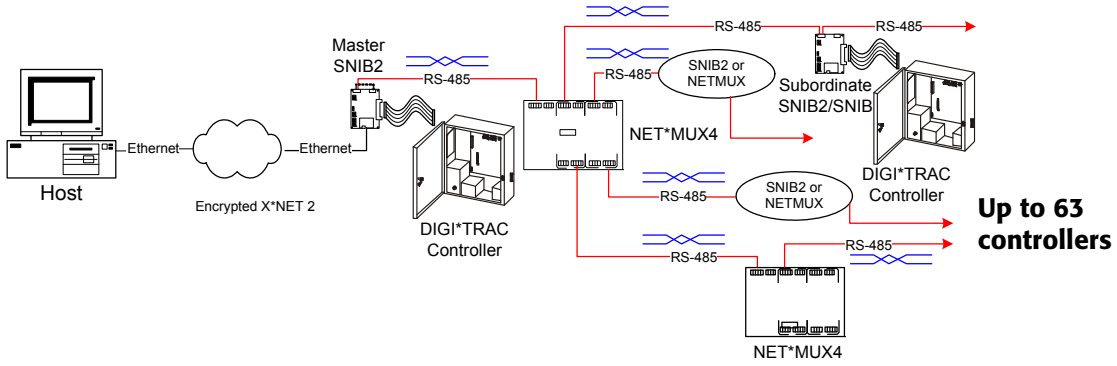
An Mx controller's main board provides built-in SNIB2 capability, and it includes an Ethernet connector and an RS-485 connector (but not an RS-232 connector).

☞ *XNET2 was first supported by Velocity version 2.6 with Service Pack 2.*

Physically, the SNIB2 board differs from the original SNIB in three obvious respects. The SNIB2 has:

- three switch banks (SW1, SW2, and SW3)
- an Ethernet RJ-45 connector with its accompanying daughterboard
- three pairs of status LEDs (see page 25)

With the SNIB2 board, a host PC running Velocity can program, monitor, and control up to 63 controllers with NET*MUX4 (as shown in the example below), or up to 16 without NET*MUX4. Each connected controller must have its own SNIB2 or SNIB board installed. The SNIB2 provides a downstream/multi-drop RS-485 port, as well as an upstream 10/100 Mbps Ethernet port and an RS-232 port for direct host connections (not dial-up).



The SNIB2 provides these functional advantages over the original SNIB:

- AES encryption
- Ethernet connectivity (if required)
- XBox functionality
- Higher serial communication speeds

Each of these features is explained below.

AES Encryption

The SNIB2 employs AES-Rijndael asymmetric 128-bit block data encryption.

☞ *The National Institute of Standards and Technology (NIST) has awarded the SNIB2 AES Certificate #280.*

Ethernet Connectivity

A standard RJ-45 Ethernet port is included on the SNIB2. This enables the connected controller installed with a SNIB2 to communicate with the server using TCP/IP over 10BaseT or 100BaseT Ethernet networks. This eliminates the need for external device servers for LAN connectivity.

XBox Functionality

The SNIB2 also incorporates full XBox gateway functionality, thereby eliminating the need for an XBox. This enables the SNIB2 to function as a gateway for up to 63 controllers (with inclusion of the NET*MUX4), and provides the ability to globalize certain features.

Globalizing is the task of connecting two or more controllers so they can share credential user management and control zone information amongst all connected controllers. Globalization can only be performed within a local XBox node. One SNIB2 acting as an XBox cannot talk to and share information with another XBox or another master SNIB2.

Higher Serial Communication Speeds

Communications between multidropped SNIB2s are supported at speeds up to 115,200 bps with Cat5/Cat6 cable.

When using one or more NET*MUX4s, the maximum SNIB2 speed is limited to 9600 bps. When combining SNIBs and SNIB2s, the maximum speed is limited to the lower SNIB speed – that is, the lowest speed that all connected devices have in common.

Communications become less robust as baud rates increase, wire gauge decreases, and distances increase. Most tables for wire gauge and distance in the DIGI*TRAC Systems Design and Installation Guide are based on 9600 bps.

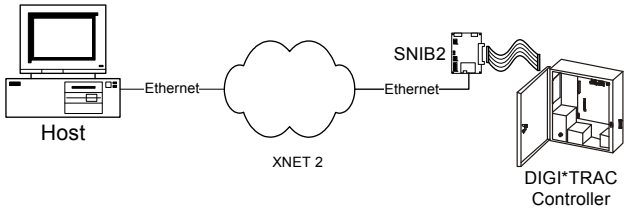
At higher baud rates, maximum distances are decreased and minimum wire gauge is increased. It may not be possible to implement the higher baud rates supported by the SNIB2 if you have long wire runs or small wire gauges.

To use the SNIB2, your controller must be running CCM 7.3.08 or higher; use Vn. 7.4.00 or higher if your computer has Velocity 3.0. To check your current version number, refer to “” on page 27.

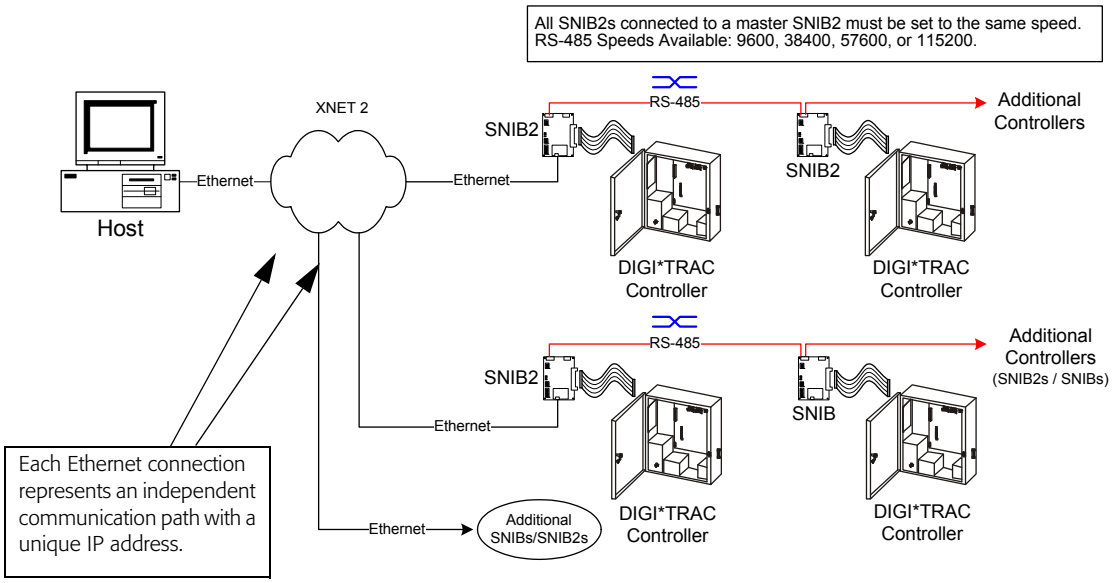
You can install the SNIB2 board in any Hirsch DIGI*TRAC controller except the M1N. (The Mx controller includes SNIB2 capability.)

Configuration Options

The SNIB2's Ethernet port provides high-speed TCP/IP communication over an Ethernet network between the host computer and the controller.



In a multiple controller sequence, the configuration can look like this:



= this cable segment swaps the RX± and TX± wires. For details, see "Cabling the SNIB2" on page

This enables communication between the controller with the master SNIB2 and host PC at 10/100BaseT. Speeds between the master SNIB2 and other connected downstream SNIB2s range up to 115200 bps when using Cat5/Cat6 cable. Speeds between a master SNIB2 and downstream SNIBs are limited by the top speed of the older SNIBs (38400 bps).

Higher baud rates are also more dependent on the number of twists per foot, so capacitance specifications must be strictly followed: total wire run per port is not to exceed 100,000 pf per foot.

Before the Velocity server can communicate over Ethernet with a SNIB2, you must first configure the SNIB2 through Velocity. For more about this, refer to "Configuring a Master SNIB2 on the Same Subnet" starting on page 16.

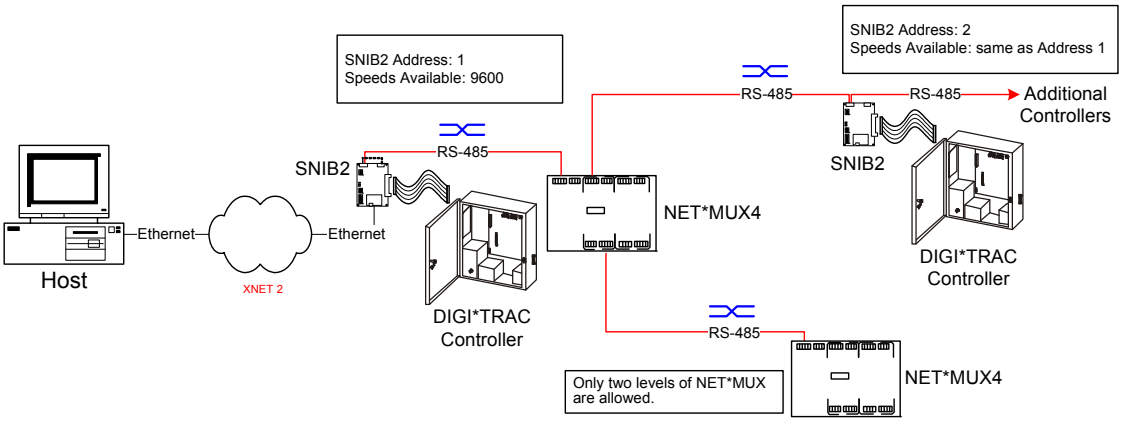
Whenever an Ethernet connection is employed between the host and the SNIB2, Velocity views the SNIB2 as an XNET port because the SNIB2 includes XBox functionality. The host communicates with the Ethernet-connected SNIB2 using AES-encrypted XNET 2.

Controller-to-controller speeds range from 9600 to 115200 bps. For each string of controllers, the first (master) SNIB2 with the Ethernet connection must be assigned the same address as the XBox port.

For more about this, refer to "Configuring a Master SNIB2 on the Same Subnet" starting on page 16.

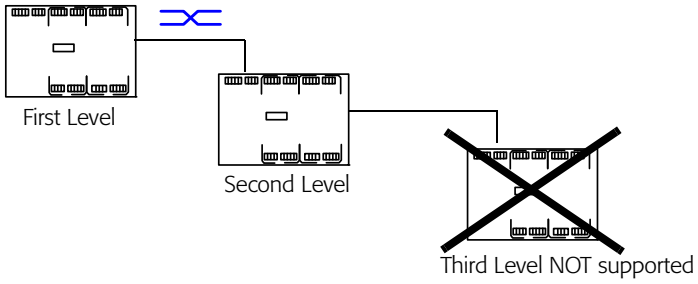
☞ ***When the host is connected to a SNIB2 using Ethernet, Velocity views the first (master) SNIB2 as both a DIGI*TRAC controller and an XBox residing on an XNET port. Subsequent multidropped controllers in the sequence do not appear as XBox controllers.***

You can also use the SNIB2 with the NET*MUX4. The NET*MUX4 consists of a single input for either RS-232 or RS-485 and four outputs to which a series of controllers or additional NET*MUX4s can be wired, as shown in the following illustration:



= this cable segment swaps the RX± and TX± wires. See page 10 for details.

If required, you can add a second level of NET*MUX4s to create additional controller runs; however, Hirsch does not support more than two levels of NET*MUX4s.



☞ ***NET*MUX4 speeds are dictated by wire gauge and distance. We recommend using Cat5/Cat6 cable.***

Installing the SNIB2

The following procedure includes steps for replacing original SNIB boards with newer SNIB2 boards. (You should perform this activity after hours, because each controller will have to be powered down while these expansion boards are swapped.)

To install the SNIB2:

1. Download CCM 7.3.08 or later firmware to the required controllers.

   For instructions about doing this, refer to the "Firmware Updates > Updating SNIB2 Firmware" topic in the main Velocity 3.1 or 3.5 help system.
2. Make sure each controller in the sequence shows the CCM version as 7.3.08 or later, and the BIOS as Version 7.2.19 or later.

   This information can be found on the controller's Properties dialog.

   If these version numbers do not appear, replace the controller's CCM.
3. Disconnect both the AC and battery backup power from each controller, so you can safely remove its SNIB expansion board.

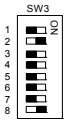
Hint We recommend removing the SNIB expansion boards controller-by-controller to ensure that each SNIB2 comes online successfully.

4. Pull the original SNIB expansion board from each required controller.
5. Run the required network cable to the controller(s) with the master SNIB2s.

   The Ethernet cable you are connecting to each master SNIB2 should be connected to the Velocity host through a hub or switch.
6. Run RS-485 cable downstream from the master SNIB2.

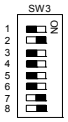
   The run between the master SNIB2 and the second SNIB2 should be wired according to the instructions in "Cabling the SNIB2" starting on page 10.
7. Set the DIP switches on each SNIB2, which varies depending on whether it is the master, one in the middle, or the last one.

   In general, use the settings shown in the following tables.



Switch Bank	Switch	Setting	Comments
Master SNIB2:			
SW1	S1-S4	all **ON**	This SNIB2 is either first (master) or last (termination) in the multidrop sequence
SW2	S1	OFF	The SNIB2 communicates with the Velocity host PC in XNET 2, using the encryption keys stored in memory
		ON	Return the encryption keys to their default settings. If this switch is set when the SNIB2 powers up or reboots after a firmware upgrade, the keys reset. This switch should be turned off after the LED patterns begin to light. Because this is the master SNIB2, you must also 'Reset Encryption' on the Velocity Port settings. All downstream units must have their encryption keys reset as well.
	S2 - S3	OFF	Normal operation. (These switches should only be ON when resetting this SNIB2 to the factory default settings; see "Resetting the SNIB2 to its Factory Default Values" on page 24.)
	S4	**ON**	Indicates this SNIB2 is first in the sequence (master) and is connected to the host via Ethernet or direct RS-232 connection (not dial-up). This SNIB2 controls polling.
SW3	S1 S2	OFF **ON**	Set downstream RS-485 speed (38400 in this example)
	S3-S8	—	Address as required (address 1 shown)

Switch Bank	Switch	Setting	Comments
SNIB2s in the middle:			
SW1	S1-S4	all OFF	Indicates this is a middle SNIB2 in run
SW2	S1	OFF	The SNIB2 communicates with the Velocity host PC in XNET 2, using the encryption keys stored in memory
		ON	Return the encryption keys to their default settings. If this switch is set when the SNIB2 powers up or reboots after a firmware upgrade, the keys reset. This switch should be turned off after the LED patterns begin to light. All downstream units must have their encryption keys reset as well. Because this is a downstream unit, the master SNIB2 automatically detects that the keys have been reset.
	S2-S3	OFF	Normal operation. (These switches should only be ON when resetting this SNIB2 to the factory default settings; see "Resetting the SNIB2 to its Factory Default Values" on page 24.)
	S4	OFF	SNIB2 not first/master
SW3	S1 S2	OFF **ON**	Set downstream RS-485 speed (38400 in this example)
	S3-S8	—	Address as required (address 2 shown)



Switch Bank	Switch	Setting	Comments
Last SNIB2 in run:			
SW1	S1-S4	all **ON**	Indicates this is the last SNIB2 in run
SW2	S1	OFF	The SNIB2 communicates with the Velocity host PC in XNET 2, using the encryption keys stored in memory
		ON	Return the encryption keys to their default settings. If this switch is set when the SNIB2 powers up or reboots after a firmware upgrade, the keys reset. This switch should be turned off after the LED patterns begin to light. All downstream units must have their encryption keys reset as well. Because this is a downstream unit, the master SNIB2 automatically detects that the keys have been reset.
	S2-S3	OFF	Normal operation. (These switches should only be ON when resetting this SNIB2 to the factory default settings; see "Resetting the SNIB2 to its Factory Default Values" on page 24.)
	S4	OFF	SNIB2 not first/master
SW3	S1 S2	OFF **ON**	Set downstream RS-485 speed (38400 in this example)
	S3-S8	—	Address as required (address 3 shown)

For specific cases, refer to "Setting Up the SNIB2" starting on page 11.

8. Install the new SNIB2s into their controllers.

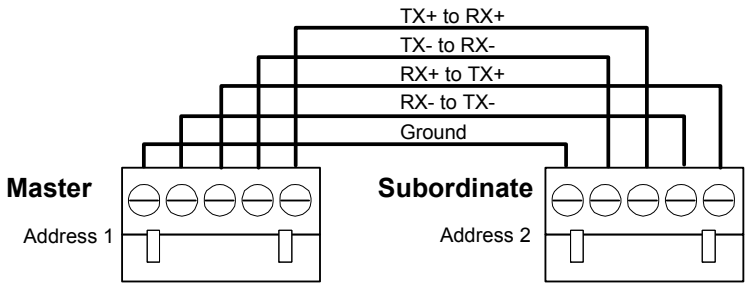
   Follow the instructions in Chapter 7 of the *DIGI*TRAC Systems Design & Installation Guide*.

Handle the SNIB2 board with care, because it is very sensitive to static discharges. Observe the normal anti-static precautions by using grounded wrist straps and anti-static devices when installing the board.

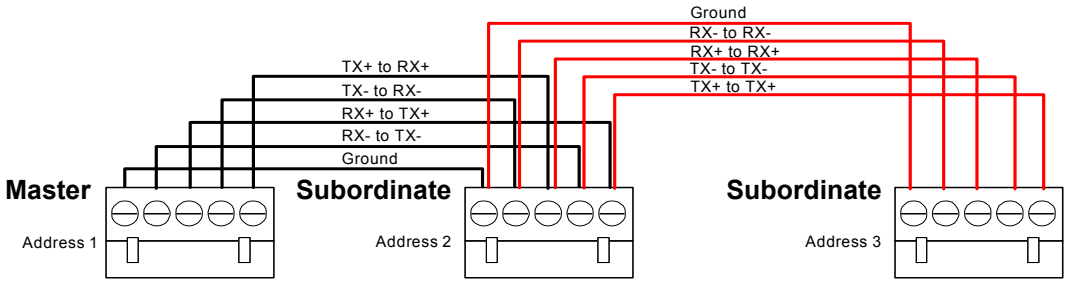
9. Plug the RJ-45 connector from the cable into the Ethernet connector on the SNIB2.
10. Connect the RS-485 cables to their respective SNIB2.
11. Reconnect and power up the controllers.
12. At the host, open Velocity and configure the new SNIB2s using the instructions in "Configuring a Master SNIB2 on the Same Subnet" starting on page 16.

Cabling the SNIB2

The cable linking the first controller (master) to the second (subordinate) in a multidropped RS-485 series must cross over the RX± and TX± wires in this manner:



If more than two controllers are connected in the series, the wiring would look like this:



At 9600 baud, the maximum allowed cable run between controllers is shown in the following table:

Connection	Maximum Distance
Total Max. Run from Master SNIB2 to Last Downstream SNIB2	4000 feet (1,220 m.)

In general, communications become less robust as baud rates increase, wire gauge decreases, and distances increase. For this reason, it may not be possible to implement the higher baud rates supported by the SNIB2 if you have long wire runs or small wire gauges.

Higher baud rates are also more dependent on the number of twists per foot, so capacitance specifications must be strictly adhered to: total wire run per port is not to exceed 100,000 pf per foot.

Hint We recommend using Cat5/Cat6 cable for your cable runs. Use 1 pair for the RX pair, 1 pair for the TX pair, and 1 conductor or pair for the ground connection.

Setting Up the SNIB2

The SNIB2 includes three DIP switch banks. The first bank (SW1) and second bank (SW2) have four DIP switches each. The third bank (SW3) possesses eight DIP switches.

Switch Bank 1 (SW1)

SNIB2s can be used throughout a multidrop run; however, you must specify whether a specific SNIB2 is connected to a controller that is at the beginning, middle, or end of a run.

To do this, set S1-S4 on switch bank SW1 to all ON or all OFF in this way:

S1-S4	OFF	This SNIB2 is in the middle of a multidrop sequence.
	ON	This SNIB2 is either first (master) or last (termination) in the multidrop sequence.

Switch Bank 2 (SW2)

The second switch bank at SW2 has 4 switches which configure such properties as the type of XNET protocol you are using, and the SNIB2's location in the multidrop run.

S1	OFF	The SNIB2 communicates with the host PC in XNET 2 using the encryption keys stored in memory.
	ON	Return the encryption keys to their default settings. If this switch is set when the SNIB2 powers up or reboots after a firmware upgrade, the keys reset. *Note: This switch should be turned off after the LED patterns begin to light. See the* SNIB2 Troubleshooting Guide *for details.* If this is the master SNIB2, you must also 'Reset Encryption' on the Velocity Port settings. All downstream units must have their encryption keys reset as well. If this is a downstream unit, the master SNIB2 automatically detects that the keys have been reset.
S2-S3	OFF	Reserved.
	ON	These switches should only be ON when resetting this SNIB2 to the factory default settings; see "Resetting the SNIB2 to its Factory Default Values" on page 24.
S4	OFF	Indicates this SNIB2 is NOT first in the multidrop sequence, or you only have one controller.
	ON	Indicates this SNIB2 is first in the sequence (master), and is connected to the host via Ethernet or direct RS-232 connection (not dial-up). This SNIB2 controls polling.

Switch Bank 3 (SW3)

Switch bank SW3 is used to specify the SNIB2 speed (S1-S2) and the SNIB2 address (S3-S8). DIP switch settings for this are:

S1	OFF	OFF	**ON**	**ON**
S2	OFF	**ON**	OFF	**ON**
Baud Rate	9,600	38,400	57,600	115,200

This controls the baud rate for the RS-485 multi-drop line and the RS-232 connection. 57,600 and 115,200 bps are only available if your RS-485 cables are made from Cat5/Cat6 data grade wire. These speeds are not recommended when using:

- RS-232 connections to host
- 18-gauge to 22-gauge shielded twisted-pair cable
- NET*MUX4s
- Mixed SNIBs/SNIB2s

Baud rates only apply to the SNIB2's RS-485 and RS-232 ports. The SNIB2's Ethernet port is used for host-to-controller connections and runs at 10/100 BaseT speeds. All SNIBs/SNIB2s in an RS-485 multi-drop sequence must be set to the same speed, and if connected to a host PC using RS-232 direct connection, the same speed must also be used. For example, if one SNIB2 in the sequence is set to 9600, all other SNIBs and SNIB2s (and the RS-232 host connection, if used) must be set to the same baud rate.

The remaining DIP switches (S3 - S8) on SW3 set the SNIB2 address:

Address	S3	S4	S5	S6	S7	S8
1	OFF	OFF	OFF	OFF	OFF	**ON**
2	OFF	OFF	OFF	OFF	**ON**	OFF
3	OFF	OFF	OFF	OFF	**ON**	**ON**
4	OFF	OFF	OFF	**ON**	OFF	OFF
5	OFF	OFF	OFF	**ON**	OFF	**ON**
6	OFF	OFF	OFF	**ON**	**ON**	OFF
7	OFF	OFF	OFF	**ON**	**ON**	**ON**
8	OFF	OFF	**ON**	OFF	OFF	OFF
9	OFF	OFF	**ON**	OFF	OFF	**ON**
10	OFF	OFF	**ON**	OFF	**ON**	OFF
11	OFF	OFF	**ON**	OFF	**ON**	**ON**
12	OFF	OFF	**ON**	**ON**	OFF	OFF
13	OFF	OFF	**ON**	**ON**	OFF	**ON**
14	OFF	OFF	**ON**	**ON**	**ON**	OFF
15	OFF	OFF	**ON**	**ON**	**ON**	**ON**
16	OFF	**ON**	OFF	OFF	OFF	OFF
17	OFF	**ON**	OFF	OFF	OFF	**ON**
18	OFF	**ON**	OFF	OFF	**ON**	OFF
19	OFF	**ON**	OFF	OFF	**ON**	**ON**
20	OFF	**ON**	OFF	**ON**	OFF	OFF
21	OFF	**ON**	OFF	**ON**	OFF	**ON**
22	OFF	**ON**	OFF	**ON**	**ON**	OFF
23	OFF	**ON**	OFF	**ON**	**ON**	**ON**
24	OFF	**ON**	**ON**	OFF	OFF	OFF

Address	S3	S4	S5	S6	S7	S8
25	OFF	**ON**	**ON**	OFF	OFF	**ON**
26	OFF	**ON**	**ON**	OFF	**ON**	OFF
27	OFF	**ON**	**ON**	OFF	**ON**	**ON**
28	OFF	**ON**	**ON**	**ON**	OFF	OFF
29	OFF	**ON**	**ON**	**ON**	OFF	**ON**
30	OFF	**ON**	**ON**	**ON**	**ON**	OFF
31	OFF	**ON**	**ON**	**ON**	**ON**	**ON**
32	**ON**	OFF	OFF	OFF	OFF	OFF
33	**ON**	OFF	OFF	OFF	OFF	**ON**
34	**ON**	OFF	OFF	OFF	**ON**	OFF
35	**ON**	OFF	OFF	OFF	**ON**	**ON**
36	**ON**	OFF	OFF	**ON**	OFF	OFF
37	**ON**	OFF	OFF	**ON**	OFF	**ON**
38	**ON**	OFF	OFF	**ON**	**ON**	OFF
39	**ON**	OFF	OFF	**ON**	**ON**	**ON**
40	**ON**	OFF	**ON**	OFF	OFF	OFF
41	**ON**	OFF	**ON**	OFF	OFF	**ON**
42	**ON**	OFF	**ON**	OFF	**ON**	OFF
43	**ON**	OFF	**ON**	OFF	**ON**	**ON**
44	**ON**	OFF	**ON**	**ON**	OFF	OFF
45	**ON**	OFF	**ON**	**ON**	OFF	**ON**
46	**ON**	OFF	**ON**	**ON**	**ON**	OFF
47	**ON**	OFF	**ON**	**ON**	**ON**	**ON**
48	**ON**	**ON**	OFF	OFF	OFF	OFF
49	**ON**	**ON**	OFF	OFF	OFF	**ON**
50	**ON**	**ON**	OFF	OFF	**ON**	OFF
51	**ON**	**ON**	OFF	OFF	**ON**	**ON**
52	**ON**	**ON**	OFF	**ON**	OFF	OFF
53	**ON**	**ON**	OFF	**ON**	OFF	**ON**
54	**ON**	**ON**	OFF	**ON**	**ON**	OFF
55	**ON**	**ON**	OFF	**ON**	**ON**	**ON**
56	**ON**	**ON**	**ON**	OFF	OFF	OFF
57	**ON**	**ON**	**ON**	OFF	OFF	**ON**
58	**ON**	**ON**	**ON**	OFF	**ON**	OFF
59	**ON**	**ON**	**ON**	OFF	**ON**	**ON**
60	**ON**	**ON**	**ON**	**ON**	OFF	OFF

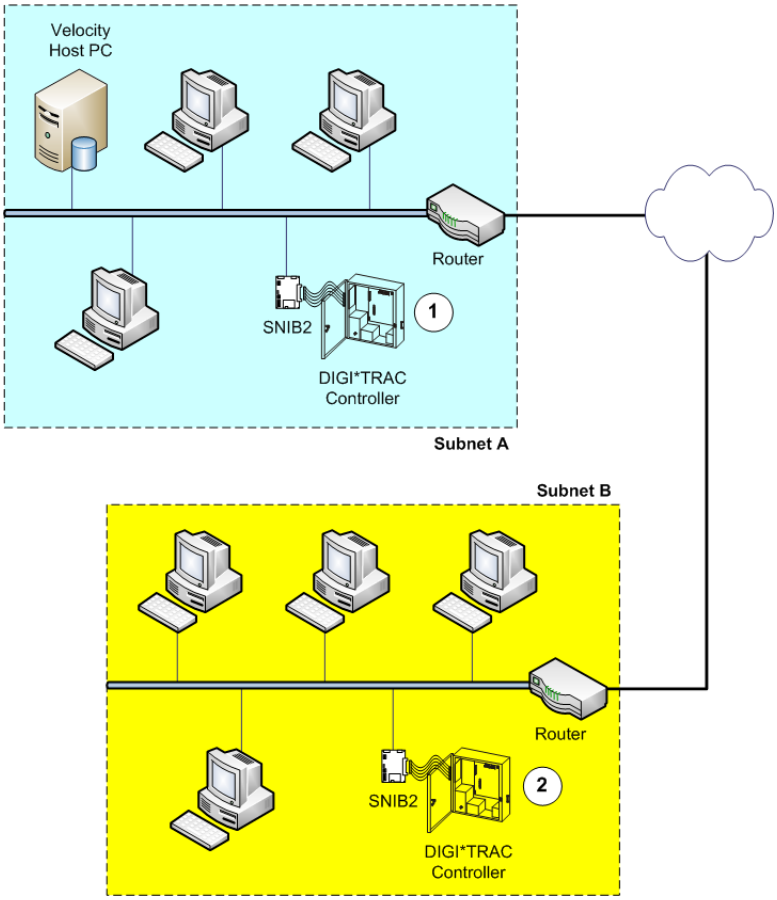
Address	S3	S4	S5	S6	S7	S8
61	**ON**	**ON**	**ON**	**ON**	OFF	**ON**
62	**ON**	**ON**	**ON**	**ON**	**ON**	OFF
63	**ON**	**ON**	**ON**	**ON**	**ON**	**ON**

Deploying the SNIB2

Each master SNIB2 (Velocity port) must be assigned a unique IP address so it can communicate with Velocity on the host PC. Depending on the network location of the master SNIB2, this is accomplished in one of two ways:

- If the SNIB2 is located within the same subnet as the host PC, then you can use Velocity to assign the IP address. For more about this, refer to "Configuring a Master SNIB2 on the Same Subnet" starting on page 16.
- If the master SNIB2 is located outside the host PC's subnet, you must use the SNIB2 Configuration Utility. For more about this, refer to "Configuring a Master SNIB2 in a Different Subnet" starting on page 19.

What is a subnet? Put simply, a subnet is any group of PCs and other devices, such as printers and scanners, connected by network cable to a network router. Anything behind the router is considered part of the subnet. Anything beyond this router is not part of the subnet.



In the preceding illustration, the master SNIB2 and controller labeled 1 are located in the same subnet as the host PC (Subnet A). This SNIB2 can therefore be configured using Velocity; however, the master SNIB2 and controller labeled 2 are located behind a different router, in a different subnet (Subnet B), and must be configured using the SNIB2 Configuration Utility.

Any number of computers and devices can be behind a single router, but for reasons of security and speed, a company network often incorporates many routers. It isn't uncommon to find that each department within a company has its own router. Routers not only find the quickest way to ferry packets of information between two points, but also could serve as a rudimentary firewall against potential intrusion.

Configuring a Master SNIB2 on the Same Subnet

When a master SNIB2 is connected via Ethernet to the host PC sharing the same subnet, configure and assign a new IP address through the Velocity port properties dialog.

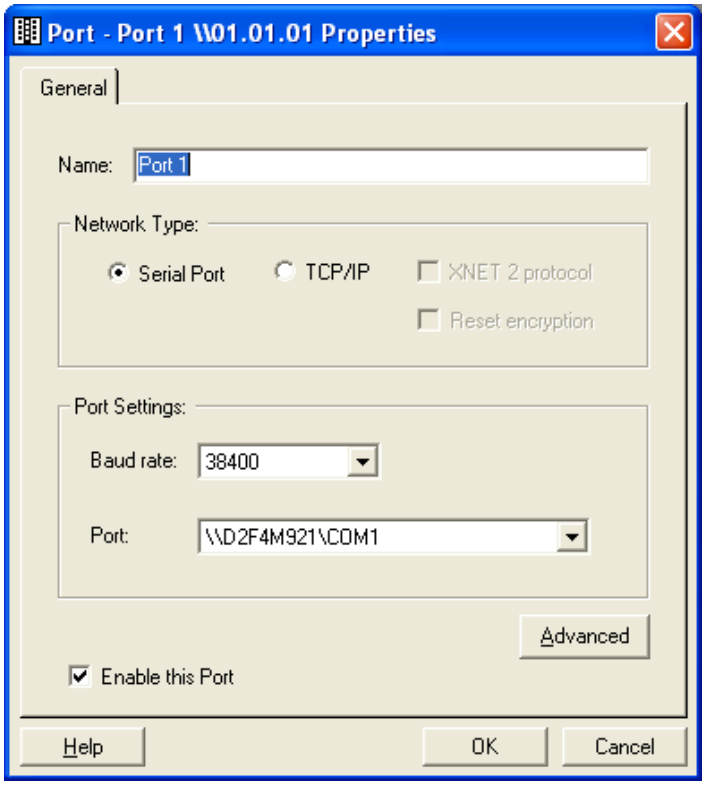
To do this:

1. If necessary, open Velocity.
2. In the System Tree pane, click and expand the DIGI*TRAC Configuration system folder, .

   Three port folders are currently available: SNET, XNET, or Dial-Up.
3. Expand the XNET Port folder.

   When the Velocity host is connected to a SNIB2 via Ethernet, it treats it as an XNET port.
4. Double-click **Add New XNET Port** in the Components pane.

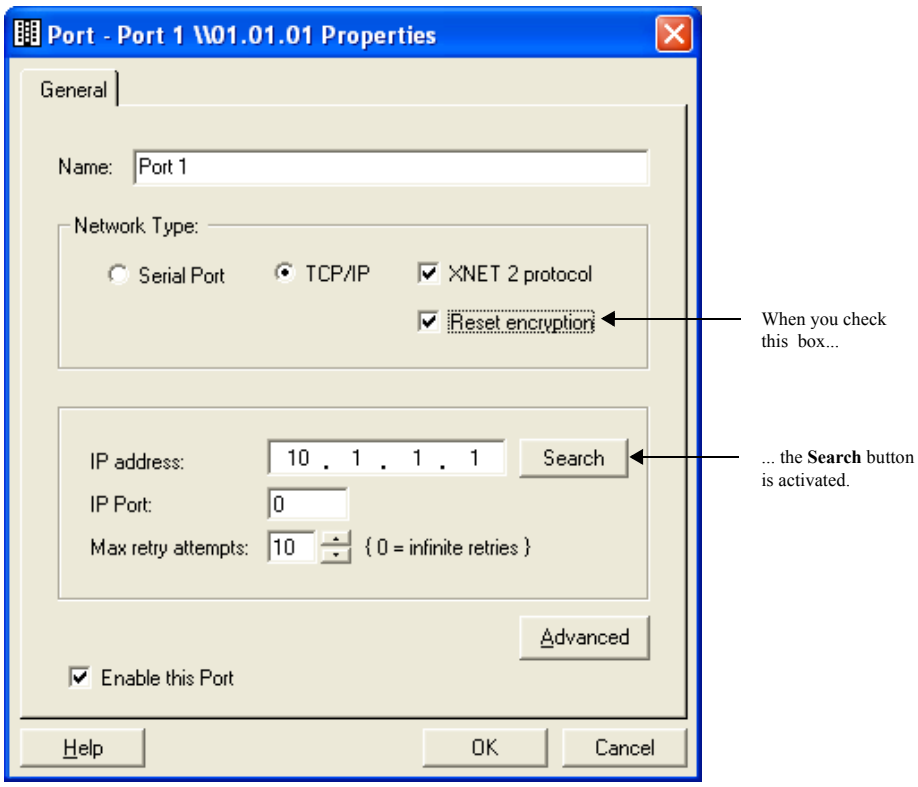
   The Port Properties dialog appears:



5. Click to select the **TCP/IP** radio button.

   The dialog changes to show the 'IP Address', 'Port', and 'Max Attempts' fields.

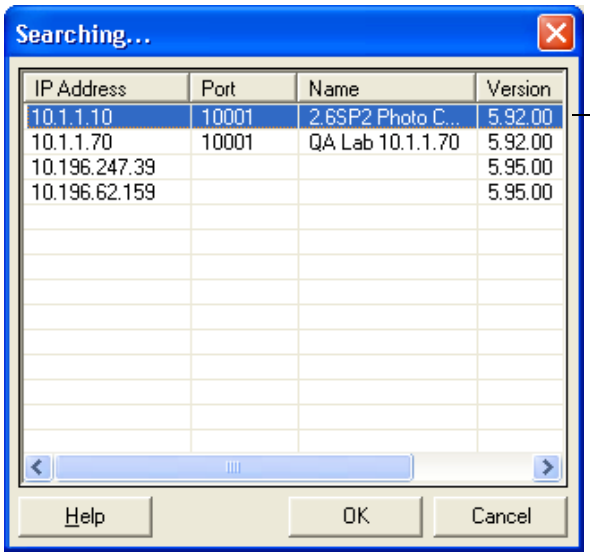
6. Check the **XNET 2 Protocol** checkbox, to indicate this port is using encrypted XNET 2 protocol.



7. Click the **Search** button.
   Velocity searches on the subnet for all SNIB2s that Velocity is not using.

☞ *If a SNIB2 is currently logged on, the search feature will not detect it.*

A dialog listing all new SNIB2s appears.



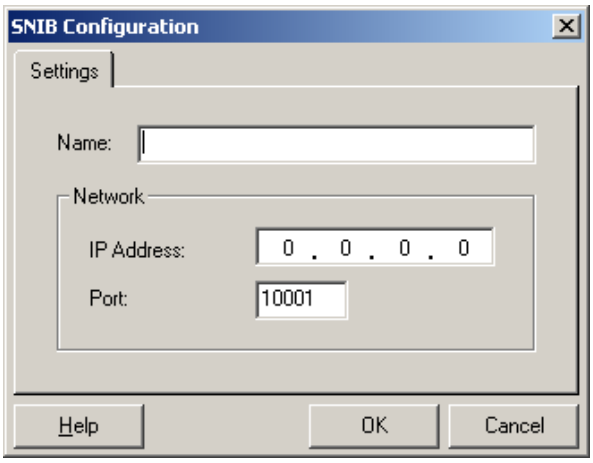
Drag the slide bar over to the right to see the MAC Address column. Although a newly detected SNIB2 does not have an assigned IP address, it always has a unique MAC address.

Because all SNIB2 MAC addresses start with the same six digits (00:90:C2), the label on the SNIB2 only lists the last six digits.

Although a newly-detected SNIB2 does not possess an IP address, port number, or name, it should have a unique MAC address. To see this MAC address, drag the slide bar at the bottom of the dialog to the right. The MAC address for each SNIB2 is printed on a white label located on the left side of the SNIB2's daughterboard. This label contains both a barcode and a six-digit number. This number is the last six digits of the MAC address.

8. From this list, double-click the SNIB2 entry you want to configure.

   The SNIB Configuration dialog appears:



9. In the 'Name' field, enter the name you want to assign to the SNIB2.
10. In the 'IP Address' field, enter the IP address for the SNIB2 connected to this Velocity PC.

    In version 5.95 and later, all SNIB2s have a factory default IP address in the format 10.*x.y.z* where the variables are supplied from a hash of the MAC address. For versions earlier than that, you must enter the required IP address.
11. In the 'Port' field, enter the correct port number.

    All network ports possess an address used to identify the SNIB2's physical port address. The default Velocity port is **10001**.

☞ *Consult your system administrator for the correct values for both the IP and port address.*

12. Click **OK**. The Searching screen reappears.
13. Click **OK**.

    The Port Properties screen reappears with the Name, IP Address, and IP Port fields populated.
14. In the 'Max retry attempts' field, specify the maximum number of retries this PC will attempt. Increment or decrement the value using the counter buttons.

    If you get port errors, increase this number.
15. Check the 'Enable this Port' box if this port is currently active. Clear this box if the port is not currently active.
16. If required, click the **Advanced** button to access the Advanced Settings dialog to specify additional options for this port.
17. When you're finished, click **OK**.

The new SNIB2 port appears in the Components pane.

☞ *If you ever need to reassign an IP address, repeat this procedure.*

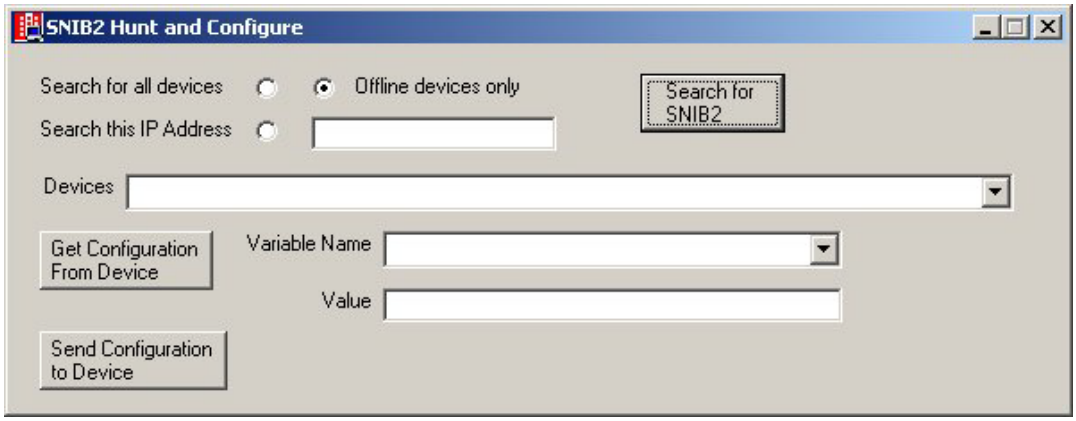
Configuring a Master SNIB2 in a Different Subnet

To connect a master SNIB2 via Ethernet to a host PC residing outside the host PC's subnet, configure and assign a new IP address for the master SNIB2 on its own subnet using the SNIB2 Configuration Utility.

To configure a master SNIB2 using the SNIB2 Configuration Utility:

1. If you haven't already done so, install the SNIB2 Configuration Utility on a PC in the same subnet as the master SNIB2 you want to configure. To do this:
   a. Insert the Velocity CD or DVD in your PC's optical drive, or go to the *\Velocity* folder.
   b. Using Windows Explorer, navigate to the *\SNIB2* folder. The file SNIB2CONFIG.EXE should be located there.
2. Double-click **SNIB2CONFIG.EXE**.

   The SNIB2 Configuration Utility appears:



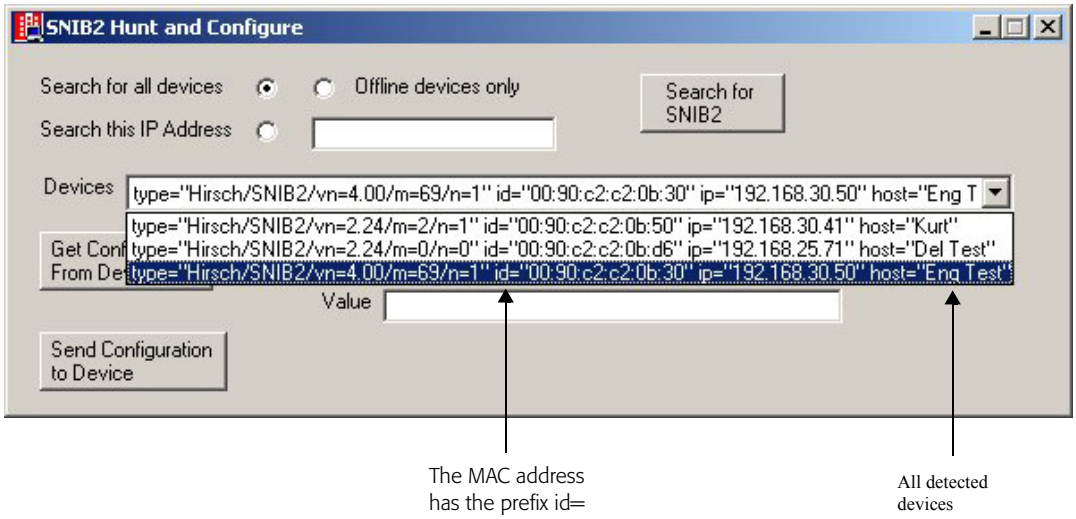
3. Select one of these radio buttons:

Search for all devices	Select this option to search for all SNIB2s on this subnet. *Note: If a SNIB2 is currently logged on, the utility will not detect it.*
Offline devices only	Select this option to search only for SNIB2s that are currently offline. It automatically eliminates all SNIB2s that are already configured for this subnet. This is the default selection.
Search this IP Address	Select this option if you know the address of the SNIB2 you are programming, then enter the SNIB2's current IP address in the field to the right of this radio button. Use this option to change the IP or port address of a previously-configured SNIB2.

4. Click the **Search for SNIB2** button.

   The utility scans the network within the current subnet, and returns a list of all devices meeting the criterion specified by the radio button.

5. Click the 'Devices' pick list to display all devices currently detected by the utility, like the following example:



6. Select the correct SNIB2.

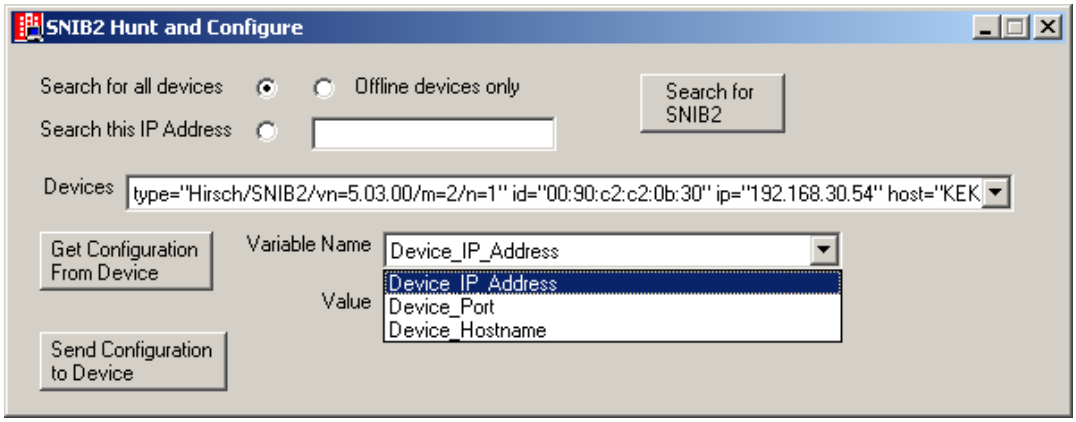
   You can identify which SNIB2 you need by its MAC address (id=). The MAC address for each SNIB2 is printed on a white label located on the left side of the SNIB2's daughterboard. This label contains both a barcode and a six-digit number. This number is the second half of the MAC address.

Because all SNIB2 MAC addresses start with the same six digits (00:90:C2), the label on the SNIB2 only lists the last six digits.

7. Click the **Get Configuration From Device** button.

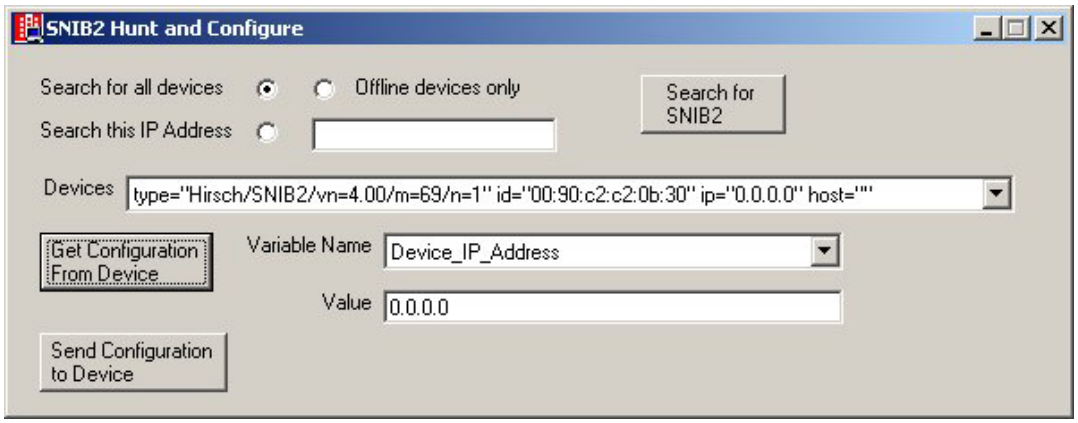
   A list of variables specific to this SNIB2 appear in the 'Variable Name' window.

   The three options used for SNIB2 configuration are: **Device_IP_Address**, **Device_Port**, and **Device_Hostname**, as shown in the following example:



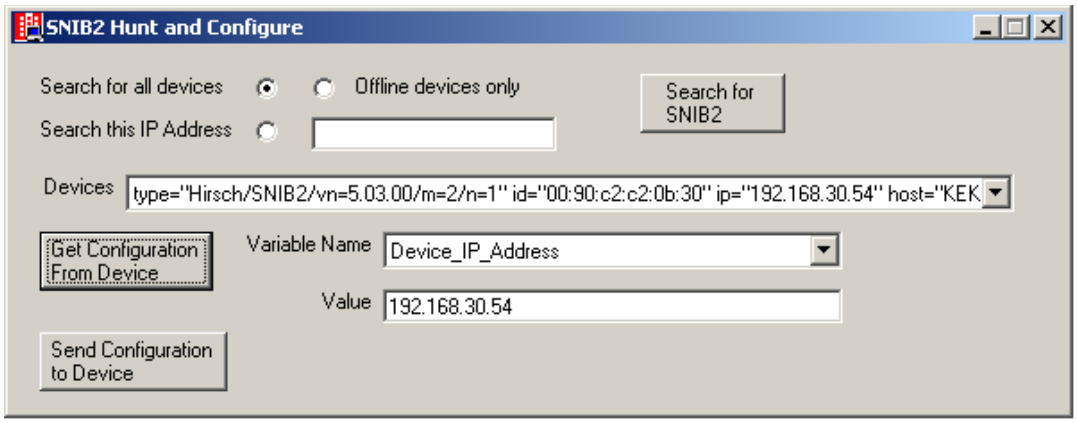
8. From the 'Variable Name' pick list, select **Device_IP_Address**.

A screen like this appears:



9. In the 'Value' field, enter the IP address you require for this SNIB2.

   A screen like this appears:



   Consult your IT or Security Administrator for the proper address.

10. From the 'Variable Name' pick list, select **Device_Port**.
11. In the 'Value' field, enter a port address for this SNIB2.

    All network ports possess an address used to identify the SNIB2's physical port address. The default Velocity port is **10001**.

12. From the 'Variable Name' pick list, select **Device_Hostname**.
13. In the 'Value' field, enter a name for this SNIB2.
14. Click the **Send Configuration to Device** button to send the information to the SNIB2.
15. Click the **Search for SNIB2** button again to verify that the SNIB2 has correctly received the information.

Make sure to write down the address, port, and host name you assigned for each SNIB2. These values are required when you configure the SNIB2 in Velocity.

Hint If there are a lot of master SNIB2s to configure remotely, we recommend using a dedicated portable computer with SNIB2CONF already installed. This should enable the installer to do the job more rapidly. But be careful: make sure you are on-site when you do this. A SNIB2 does not retain its IP address for more than 5 minutes after being unplugged from a controller. If you are planning to program several SNIB2s from a controller then move them to a remote site, you probably won't have time before the IP address in each SNIB2 is irrevocably lost.

After the installer has assigned the remote master SNIB2 an IP address and port, use Velocity on the host PC to identify it to the system. To do this:

1. Create a new XNET port, as specified in Steps 1–5 of "Configuring a Master SNIB2 on the Same Subnet" starting on page 16.

☞ *Do not use the Search button. This only works for finding SNIB2s that are currently residing on the host PC's subnet.*

2. In the 'Name' field, enter the name you assigned to the SNIB2 using the SNIB2 Configuration Utility (Device_Hostname).
3. In the 'IP Address' field, enter the IP address you assigned to this device using the SNIB2 Configuration Utility (Device_IP_Address).
4. In the 'Port' field, enter the port number you assigned to this device using the utility (Device_Port). The default value is **10001**.
5. Make sure the 'Enable this Port' box is checked.
6. Click **OK**.

This enables Velocity to find and monitor the remote SNIB2.

Resetting SNIB2 Encryption Keys

After Velocity creates the encryption keys required for secure Host-to-SNIB2 communication, it continues to use those keys. If for some reason you need to change these keys, there are several ways to do it.

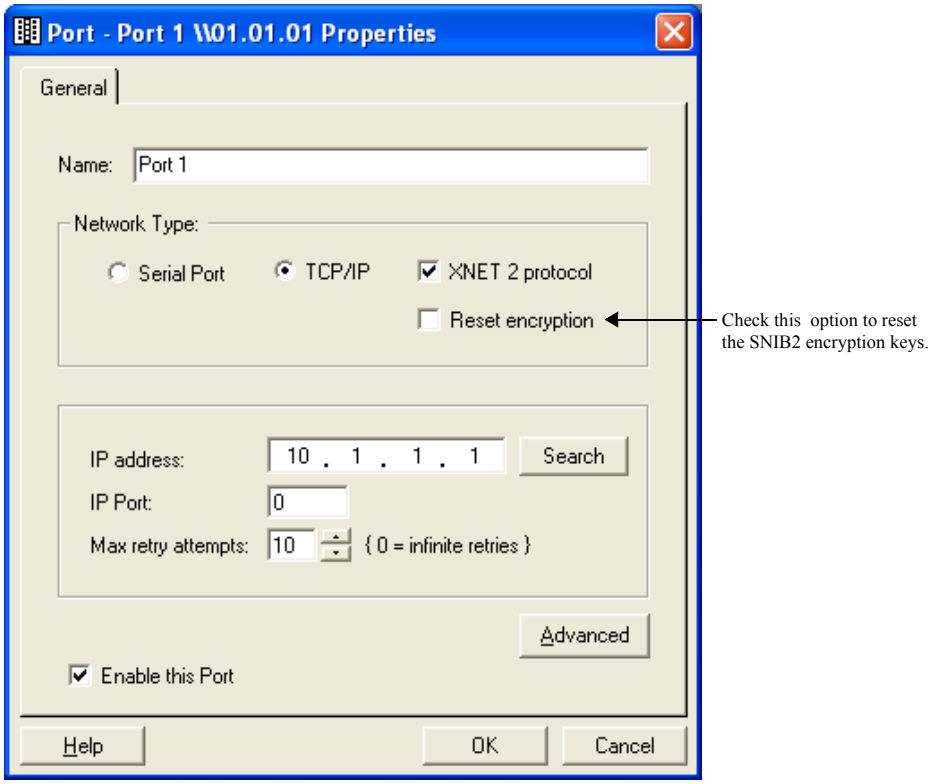
☞ *Several of these techniques reset not only the SNIB2 encryption keys but also the controller.*

Set SW2-1 to:	Procedures/Results
 **OFF**	• Cycle power on controller. SNIB2 retains encryption keys. Controller retains setups. • Press the blue Reset button on the controller until it resets. SNIB2 retains encryption keys. Controller **loses** setups. • Download SNIB2 firmware through Velocity. SNIB2 retains encryption keys. Controller retains setups.
 **ON**	• Cycle power on controller. SNIB2 resets encryption keys. Controller retains setups. • Press the blue Reset button on the controller until it resets. SNIB2 resets encryption keys. Controller **loses** setups. • Download SNIB2 firmware through Velocity. SNIB2 resets encryption keys. Controller retains setups.
OFF or **ON**	Download CCM firmware through Velocity. SNIB2 retains encryption keys. Controller retains setups.

After you have reset the encryption key to its default value (set SW2-1 to ON, recycle controller power, then reset SW2-1 to OFF), you must assign a new key so that Velocity and the master SNIB2 can talk to each other. To do this:

1. From the Velocity Administrator system tree, click and expand the DIGI*TRAC Configuration system folder until the master SNIB2 port you require appears.
2. Right-click on the SNIB2 port and select **Properties**.

The Port Properties dialog appears. The master SNIB2 Properties should look something like this:



3. Check the 'Reset encryption' box and click **OK**.

This resets and syncs the encryption key at host SNIB2.

Resetting the SNIB2 to its Factory Default Values

Starting with version 6.42 of the SNIB2 firmware, a SNIB2 board can be reset to the factory default values for its encryption keys and network settings. To reset a SNIB2 board to have an IP address based on its unique MAC address, perform the following steps:

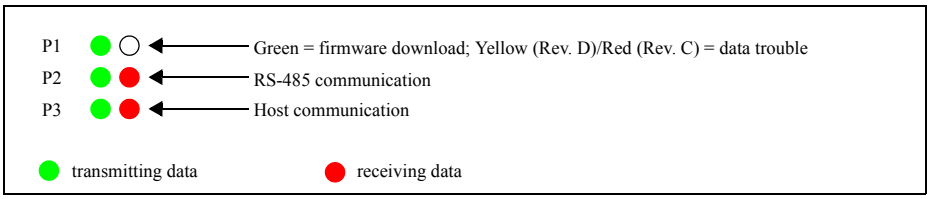
1. Set all four DIP switches in Switch Bank 2 to ON, and set all eight DIP switches in Switch Bank 3 to OFF.
2. Cycle power to the controller containing this SNIB2 board.
3. Watch the status LEDs on the SNIB2 board, to ensure that they display the Lamp Test start up pattern, and then display the following SNIB2/CCM Synchronization pattern:

4. Turn off power to the controller.

You can then reconfigure the SNIB2 board as needed, using its DIP switches and Velocity.

Controller and SNIB2 LED Diagnostics

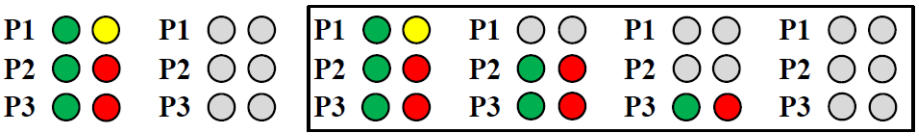
The SNIB2 has three pairs of LEDs that show you how the SNIB2 is communicating with the Velocity Server.



Special Light Patterns: Start Up

This consists of the following light patterns during start up.

First comes the **Lamp Test**.



Power-up might include the first two patterns. If you've just reflashed the SNIB2, the sequence starts with the ones in the box.

This pattern is followed by:

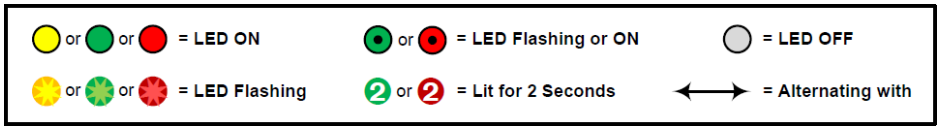
This is the **SNIB2/CCM Synchronization**. This pattern repeats until the CCM and SNIB2 are synchronized. This light pattern should not persist longer than four minutes if there are no memory expansion boards on the controller.

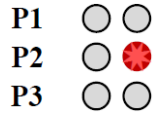
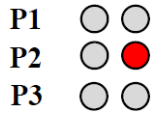
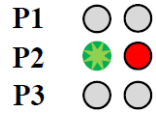
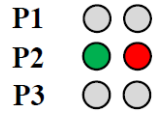
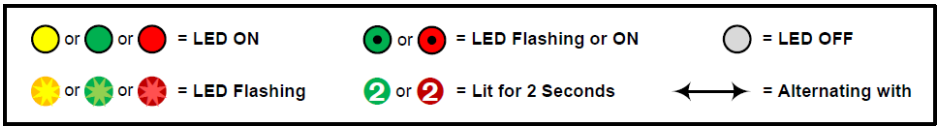
Normal Operation

This table illustrates the various light patterns displayed during normal operation for both the master and subordinate SNIB2s:

Master or Subordinate	
P1 P2	Ordinary communication between master and subordinates. Lights may blink or stay lit during heavy data transfers. They will go out every 4 seconds during idle or low-traffic periods; this is normal, indicating the master is hunting for new addresses, such as newly-added controllers, or controllers that went offline and are expected back online.

Legend:



Master	
	This could be programming activity (downloads) or events, or both.
	P2's red LED flashes while P2 green and P3 red and green stay lit. This normally means that the Velocity server is in the process of downloading CCM or SNIB2 firmware to one or more controllers.
	Heartbeat. If the P3 LED flashes appear to be about 5 seconds apart, it means the host is keeping the communication link open.
Subordinate	
	The master is polling a different SNIB2. This SNIB2 ignores those polls.
	If this stays lit and doesn't go out every 4 seconds, that means there's a lot of data going to or coming from some other controller(s). If you don't see any green flashes at all, this unit won't come online until the data traffic decreases. This pattern may also alternate with occasional red or green P3 flashes.
	If these stay flashing and lit, it means there is a lot of data going to or coming from several controllers. This occurs particularly when you have many controllers.
	If these stay lit, it means there is a lot of data going to or coming from this particular controller.
Legend: 	

For more about the status LEDs, especially for the patterns displayed during a firmware reflash or during data trouble, refer to the ***SNIB2 Troubleshooting Guide*** included with the SNIB2.

The SNIB2 also causes certain changes to the way the controller LEDs display, as shown below:

LED Configuration	Meaning
● ○ AC ○ ○ BAT ● ○ SYS ○ ○ KPD ● ○ NET	The NET green LED is on; the NET red LED blinks intermittently depending on the amount of data being received from the host. This indicates the SNIB2 is working properly. *Note: The exact NET LED behavior depends on the controller version.*
● ○ AC ○ ○ BAT ● ○ SYS ○ ○ KPD ○ ○ NET	Neither NET LED is blinking or only the NET green LED is on. In either case, the master SNIB2 is not communicating with the host. Check both your Ethernet connection and your Velocity port configuration.

For more about this, refer to "Troubleshooting the Controller Using Status LEDs" starting on page 355 (in the January 2014 version) of the *DIGI*TRAC Systems Design and Installation Guide*.