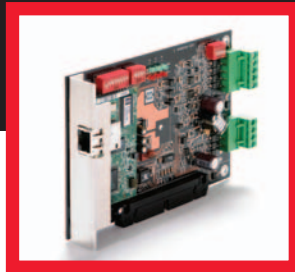
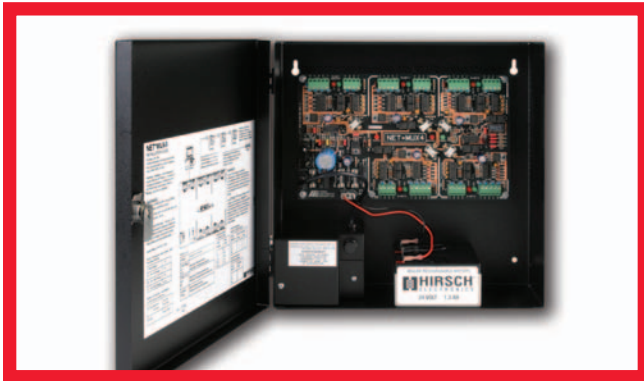


SNIB



SNIB2



NET\*MUX4

# Network Components

*A variety of controller network configurations is available to meet even the most challenging security applications. AES (Rijndael) encryption provides extremely secure communications. TCP/IP (Ethernet), direct connect or dial-up RS-232, multi-drop RS-485, and fiber optic paths are supported.*

## Features

- Encrypted Communications
  - FIPS 197 AES 128 bit Rijndael (SNIB2)
  - HES 64 bit SCRAMBLE\*NET (SNIB)
- Packet Communications
  - X\*NET2 with SNIB2
- Communications Options
  - 10/100 BASE-T Ethernet (SNIB2)
  - Up to 115K baud RS-485 (SNIB2)
  - RS-232 (SNIB, SNIB2)
  - Fiber (SNIB, SNIB2)
  - Leased Line (SNIB, SNIB2)
  - Dial-up (SNIB)
- Globalization/Gateway
  - SNIB2 Master
  - Xbox with SNIB

## Description

### Controller Protocols

DIGI\*TRAC controllers support two protocols: SCRAMBLE\*NET (S\*NET) and X\*NET2. S\*NET uses 64 bit HES (Hirsch Encryption Standard – similar to DES) encryption whereas the newer X\*NET2 uses a NIST-certified 128 bit AES (Advanced Encryption Standard) based on the extremely secure Rijndael algorithm. X\*NET2 also blends periodic polling

with event driven communications and bundles messages into packets for enhanced performance and improved bandwidth utilization.

S\*NET uses continuous polling for communications and operates on a SCRAMBLE\*NET Interface Board (SNIB) in the controller. X\*NET2 operates on a Secure Network Interface Board (SNIB2). A SNIB “emulator” resides in the SNIB2 for legacy migration.

S\*NET baud rates are 9600 and 19.2K. X\*NET2 baud rates are 10/100M over Ethernet and up to 115K over RS-485.

Another protocol, X\*NET, is used to interface a host PC to an Xbox which establishes S\*NET communications to up to 63 controllers. X\*NET is not encrypted. The Xbox also provides globalization functions for downstream controllers. A SNIB2 includes the Xbox functions in the first controller which is the polling Master for up to 63 downstream controllers.

Both SNIB and SNIB2 based controllers can be coresident on the same physical RS-485 cable, utilizing

their separate S\*NET and X\*NET2 protocols, as long as they all have the same baud rate settings, and are downstream of a Master SNIB2.

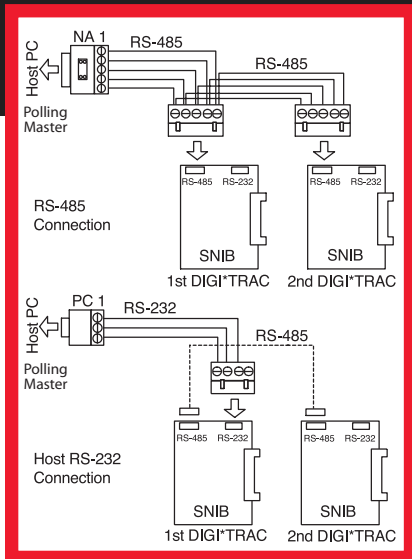
In addition to eliminating the need for an Xbox, the SNIB2 also eliminates the need for a LAN interface device when used with Ethernet. As these functions are built into the SNIB2, they are battery backed by the controller UPS.

### SCRAMBLE\*NET Interface Board (SNIB)

The SNIB has two ports, one a multi-drop RS-485 channel, the other a direct connect RS-232. Both can be active concurrently. When the RS-485 port is used for connection to other controllers, the RS-232 port can connect to a host PC locally or by modem. The SNIB communicates using S\*NET.

### Secure Network Interface Board (SNIB2)

The SNIB2 is a second generation SNIB that uses a high performance second generation protocol – X\*NET2. The SNIB2 has three ports. One is a



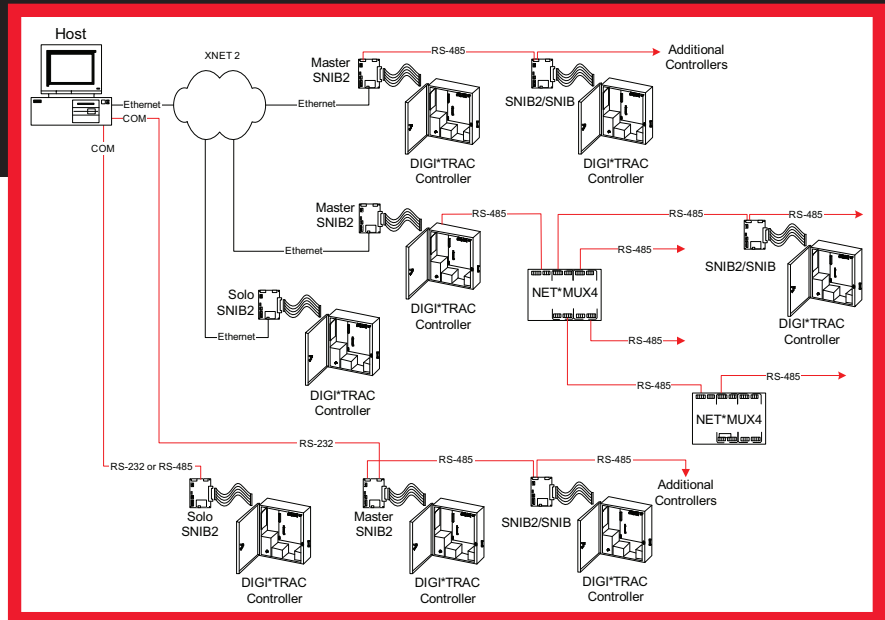
Host PC Serial Com Port To DIGI\*TRAC Connection (S\*NET)

10/100BASE-T Ethernet port with an RJ45 connector. The second provides a multi-drop RS-485 channel. A third port, RS-232, is available in the Master SNIB2 for direct connection to a host PC (no modem) if the Ethernet port is not used. The SNIB2 incorporates XBox functionality in the Master SNIB2 that will poll the other controllers connected to the RS-485 port. The SNIB2 Master communicates to other SNIB2 using X\*NET2, and to SNIB controllers using S\*NET.

### NET\*MUX4™ Network Multiplexor

The NET\*MUX4 enables segmentation of the communication path into as many as four optically isolated segments for greater distance and survivability. It has five ports (one IN, four OUT), each of which can be single-ended RS-232 or multi-drop RS-485. Each multi-drop RS-485 port will support up to 16 DIGI\*TRAC controllers. Single-ended RS-232 can be used for leased phone lines and fiber optic cables.

The NET\*MUX4 can be cascaded (two levels deep) to provide more than four isolated circuits. However, all NET\*MUX4s must be located immediately downstream of a “polling master” (Host PC, XBox, Master SNIB2) or NET\*MUX4. The NET\*MUX4 includes a locked



Typical SNIB2 Architectures

enclosure, integral power supply and battery.

### Fiber Optic Transceivers

Optical fiber can be used to enhance or extend RS-485 communication paths by using the Hirsch Fiber Optic Link– Network (FLN). The FLN transceiver provides either a simplex or duplex RS-422 data link using fiber optic transmission on one end and RS-485 terminal blocks on the other.

### S\*NET Connectors & Adaptors

The NET\*ADAPT (NA1) converts RS-232 from a Host PC com port to multi-drop RS-485 to communicate with a network of DIGI\*TRAC controllers. This active device provides LED indication of transmit and receive status of both RS-232 and RS-485 communications.

The PC\*CONNECT (PC1) connects the RS-232 from a Host PC com port directly to the RS-232 port on a SNIB, SNIB2 or NET\*MUX4. Similarly, the MODEM\* CONNECT (MC1 or MC2) connects the RS-232 from a modem directly to the RS-232 port on a SNIB. The PC1, MC1, and MC2 are passive devices without visual status indication.

### S\*NET Dial-up Modems

The DM9600A-DL RS-232 modem can be securely installed in the DIGI\*TRAC controller enclosure for tamper protection and operation from

the controller’s primary and secondary power. The EM9600-DL is an external companion which can be installed near the Host PC or DIGI\*TRAC controller.

### S\*NET Leased-Line & Short-Haul Modems

The EM9600-LL RS-232 external modem is installed in pairs between a Host PC or NET\*MUX4 and a DIGI\*TRAC controller.



XBox

### XBox™ Gateway/Globalizer

The XBox offloads encryption and polling from older PCs. It can also globalize User Management, Passback and Master Control Zones to downstream DIGI\*TRAC controllers.

The XBox uses unencrypted X\*NET protocol upstream to the Host PC and HES encrypted SCRAMBLE\*NET downstream to controllers with a SNIB. Both upstream and downstream communications can be RS-232 or RS-485.

The XBox functionality is inherent in a Master SNIB2.

Product	LEDs	Host Side		Cable	Controller Side	
		Protocol	Connector		Connector	Protocol
SNIB2	T&R	TCP/IP	RJ-45		5-Pin Plug-in	RS-485
	T&R	RS-232	4-Pin plug-in		5-Pin Plug-in	RS-485
	T&R	RS-485	5-Pin plug-in			
SNIB	T&R	RS-232	4-Pin Plug-in		5-Pin Plug-in	RS-485
	T&R	RS-485	5-Pin Plug-in		5-Pin Plug-in	RS-485
NET*MUX4	T&R	RS-232	Terminals		Terminals (4)	RS-232
	T&R	RS-485	Terminals		Terminals (4)	RS-485
NA1	T&R	RS-232	DB25 (F)	6 ft (2 m)	5-Pin Plug-in	RS-485
PC1		RS-232	DB25 (F)	10 ft (3 m)	4-Pin Plug-in	RS-232
PC2		RS-485	DB9 (F)	10 ft (3 m)	5-Pin Plug-in	RS-485
MC1		RS-232	DB25 (M)	10 ft (3 m)	4-Pin Plug-in	RS-232
MC2		RS-232	DB9 (M)	10 ft (3 m)	4-Pin Plug-in	RS-232
MC-PC		RS-232	DB25 (F)	3 ft (1 m)	DB25 (M)	RS-232
AT-AC			DB9 (F)	9 in (23cm)	DB25 (M)	
DM9600A-DL		RS-232	RJ-11		DB9 (F)	RS-232
EM9600-DL		RS-232	DB25 (F)		RJ-11	RS-232
		RS-232	RJ-11		DB25 (F)	RS-232
EM9600-LL		RS-232	DB25 (F)		RJ-11	RS-232
		RS-232	RJ-11		DB25 (F)	RS-232
FLN		RS-485	Terminals		SMA	RS-422
		RS-422	SMA		Terminals	RS-485
XBOX	T&R	RS-232/RS-485	DB9 (F)		Terminals	RS-232
	T&R				Terminals	RS-485

## Specifications

### Communications

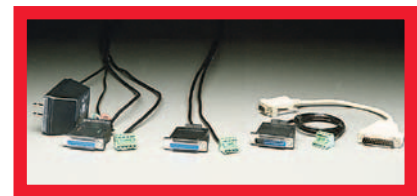
- Encryption:
  - SCRAMBLE\*NET: 64bit HES
  - X\*NET: None
  - X\*NET2: 128bit AES (Rijndael)
- Serial Interface Ports:
  - RS-485: multi-drop to 16 controllers max (without NET\*MUX4)
  - RS-485 S\*NET baud rate: 9600, 19.2K
  - RS-485 X\*NET2 baud rate: 9600, 38.4K, 57.6K, 115.2K
  - RS-485: 4000 ft. (1220 m) to last controller on a cable run with 22 gauge, 2 pair, stranded, twisted, overall shield
  - RS-232 baud rate: 9600
  - RS-232: 50 ft. (15 m)
- Ethernet Ports:
  - TCP/IP 10/100Base-T

### Components

- SNIB
  - Connectors: RS-232, RS-485 (removable)
  - Optically isolated serial ports
  - LEDs: Power, T&R (RS-232), T&R (RS-485)
- SNIB2 (CCM v7.3 or later)
  - Connectors: RJ-45, RS-232, RS-485 (removable)

- Optically isolated serial port
- LEDs: T&R (RS-232) T&R (RS-485), T&R (Ethernet)
- NET\*MUX4
  - Connectors: direct connect (RS-232 & RS-485 per port)
  - 1 input & 4 output ports
  - Optically isolated serial ports
  - 16 controllers per RS-485 output
  - 1 controller per RS-232 output
  - 9600 baud: SNIB, SNIB2; 19.2K baud: SNIB
  - Primary and standby power: 90-130VAC, 50/60 Hz, fused. 180-260VAC, 50/60 Hz, fused
  - Uninterruptible power supply
  - Standby battery: 1.3 AH included
  - Enclosure: NEMA type, with conduit knockouts & key lock
  - Dimensions: 12"H x 12"W x 5.5"D (30.5 cm x 30.5 cm x 14 cm)
  - Shipping weight: 5.3 lbs (2.4kg)
  - Operating temperature range: 32°F to 140°F (0° to 60°C)
  - Relative Humidity: 0 to 90%, non-condensing
- Modems
  - Baud rate: 9600 baud
  - Dial-up: Dedicated auto-dial, auto-answer via dedicated 3002 voice-grade lines (SNIB only)
  - Leased Line: Via 3002 voice-grade 2-wire full duplex lines
  - Power: DM series 24VDC from

- DIGI\*TRAC, EM series via 120VAC plug-in transformer
- Fiber Optic Transceivers
  - Connectors: SMA plug-in
  - Fiber supported:
    - 50μ 10,000 ft. (3048 m)
    - 62.5μ 15,000 ft. (4572 m)
    - 100μ 20,000 ft. (6096 m)
  - Power via 12VAC plug-in transformer
- Xbox Gateway/Globalizer
  - Connectors: removable
  - Baud rate: X\*NET (2400 to 38,400), S\*NET (9600, 19.2K)
  - Addressing: 0-255 via DIP switch
  - Controllers supported: 63 per Xbox; requires NET\*MUX4 if greater than 16
  - Power: 12-30V DC (2W), 9-20 VAC (3VA) from plug-in transformer
  - Dimensions: 1"H x 8"W x 4"D (2.5 cm x 20 cm x 10 cm)
  - Shipping weight: 2.5 lbs (1.1 kg)
  - Operating temperature range: 32° to 140°F (0° to 60°C)
  - Relative Humidity: 0 to 90%



SCRAMBLE\*NET Adaptors & Cables: NA1, PC1, MC1, AT-AC (left to right)



Fiber Optic Link - Network (FLN) Pair

# Systems With Integrity

## Ordering Information

Model #	Description	Comments
SNIB2	Secure Network Interface Board 2	Networks DIGI*TRAC controller to PC (with Velocity Version 2.6 SP2 or later only) via 10/100 Ethernet (TCP/IP), RS-232 (direct connect only) or RS-485 (solo controller only). Optically isolated RS-485 and RS-232 ports. RS-485 for multi-drop between SNIB2s at baud rates up to 115KBps or between Master SNIB2 and SNIBs at baud rates up to 19.2KBps. RS-232 for Host PC. Supports AES (128 bit Rijndael) encryption between Host PC and Master SNIB2 and between Master SNIB2 and downstream SNIB2. Master SNIB2 supports integral XBox functionality for globalization. UL Listed. CE.
SNIB	SCRAMBLE*NET Interface Board	Networks DIGI*TRAC controller to PC with appropriate software such as SAM, MOMENTUM, or Velocity. Optically isolated RS-485 and RS-232 ports. RS-485 for multi-drop to Host PC, XBox, or other SNIB at baud rates of 9600 or 19.2KBps. RS-232 for local host or modem. UL Listed. CE.
NET*MUX4	Network Multiplexor 4	Provides 1 input & 4 output ports, each optically isolated RS232 or RS485, with status LEDs. Up to 16 DIGI*TRAC controllers per output port. Cascading supported (2 levels deep). Includes enclosure, 115VAC power supply, battery, key lock.
NA1	NET*ADAPT Communication Adaptor	Converts RS-232 to RS-485 to connect Host PC to RS-485 SCRAMBLE*NET network. Includes transmit and receive status LEDs, external plug-in transformer, AT-AC cable to connect to DB9 Host PC COM port, & 6 ft. cable to connect to SNIB terminal plug.
PC1	PC*CONNECT Network Connector 1	Use to connect a Host PC RS232 port directly to the RS-232 port of a SNIB or SNIB2 in a DIGI*TRAC controller or to the RS-232 port of a NET*MUX4. DB25 female connector with 10 ft. of cable to 4 pin RS-232 terminal plug (remove for NET*MUX4). Includes AT-AC to convert DB25 female to DB9 female for PC port.
MC1	MODEM*CONNECT 1 Network Connector	Use to connect a Modem's DB25 RS232 port directly to the RS-232 port of a SNIB in a DIGI*TRAC controller. Includes cable and 4 pin RS232 terminal plug.
MC2	MODEM*CONNECT 2 Network Connector	Use to connect a Modem's DB9 RS232 port directly to the RS-232 port of a SNIB in a DIGI*TRAC controller. Includes cable and 4 pin RS232 terminal plug.
MC-PC	MODEM Cable	Use to connect a Host PC to a Modem's RS232 port. 3 ft cable with DB25 female connectors on both ends.
AT-AC	AT ADAPTOR Cable	Use to convert a DB9 male serial port to a DB25 male serial port. 9 inch cable with DB9 female connector on one end and DB25 male connector on the other end.
DM9600A-DL	9600B Modem Assy Dial-Up Line	A miniature 9600 baud Modem Assembly that can be powered from & installed internally in the M1N, M2, M8, M16 or MSP for remote site management via dial-up network. Includes cables, adaptor, & power supply harness. Do not use at Host PC or NET*MUX4 out port. Factory Set to Dial-Up Line.
EM9600-DL	External 9600B Modem Dial-Up Line	For dial-up installations. The EM9600's setups use DIP switches & non-volatile memory, and will return to proper function after power failures. Includes power transformer. Includes MC-PC for Host PC. Includes MC1 for DIGI*TRAC controller or NET*MUX4. Factory Set to Dial-Up Line.
EM9600-LL	External 9600B Modem Leased Line	For leased line installations. The EM9600's setups use DIP switches & non-volatile memory, and will return to proper function after power failures. Includes power transformer. Includes MC-PC for Host PC. Includes MC1 for DIGI*TRAC controller or NET*MUX4. Factory Set to Leased Line.
FLN	Fiber Link - Network	Pair of Fiber Optic transceivers for communications network (SNIB to SNIB, SNIB2 to SNIB, SNIB2 to SNIB2). Simplex or duplex RS-422 SMA plug-in fiber connector to RS-485 terminal block. Accepts 50, 62.5, or 100 micron fiber. Requires 12VDC Power Supply at each unit. Two 100/240VAC Power Supplies are included.
XBOX	XBox Gateway	SCRAMBLE*NET Gateway/Globalizer. Polling engine & encryption for Host PC communications to up to 63 DIGI*TRAC controllers (16 max without NET*MUX4. 16 max for MOMENTUM). RS-232 (or RS-485, selectable) port for Host PC and RS-232 & RS-485 ports for DIGI*TRAC controllers. Provides server independent globalization of Credential Limits and Master Control Zones between DIGI*TRAC controllers on Velocity. Includes 6' host RS-232 extension cable, transformer, Alarm relay, & status LEDs. Low profile plastic desktop housing. UL Listed.



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