
SMARTEYE
NETWORK READER
PRODUCTS
Ethernet IP

S-netx - Single Reader
T-netx - Dual Reader
Multi-netx - 8 Readers

Standard Ethernet or
Power over Ethernet Interface
802.3af (48v)

USER MANUAL

Revision 1



related documents:

SMARTEYE Sender/Receiver Reader User Manual

The material in this manual is for informational purposes and is subject to change without notice. Smarteye Corporation assumes no responsibility for any errors which may appear in this manual.

© Smarteye Corporation

SMARTEYE is a registered trademark of Smarteye Corporation.

BELDEN is a registered trademark of Belden CDT Inc.

Printed in U.S.A.

SMARTEYE contact information:

SMARTEYE Corporation
2637 Bond Street
Rochester Hills, MI 48309
Phone: (248) 853-4495 Fax: (248) 853-8539
www.smarteyecorporation.com
Email: support@smarteyecorporation.com

TABLE OF CONTENTS

1.0 Introduction..... 1

2.0 Smarteye Netx Control Unit Features 2

3.0 Smarteye Netx Product Installation..... 2

4.0 Power/Wiring 2

4.1 Power/Wiring for Power over Ethernet 802.3af (48v) – S-netx and T-netx only..... 3

4.2 Power/Wiring for T-netx Model SP4051/04-IP..... 3

4.3 Power/Wiring for Multi-netx Model SP4061/04-IP and SP4062/02-IP 3

5.0 Communication Line Wiring..... 3

6.0 Reader Wiring and Mounting 4

6.1 Reader Wiring..... 4

6.2 Local Reader Mounting (S-netx only)..... 4

6.3 Remote Reader Mounting (S-netx, T-netx and Multi-netx) 4

7.0 Smarteye Netx Control Units CPU Configuration 5

7.1 Configuration Legend 5

7.2 S-netx Switch and Jumper Diagram..... 6

7.2.1 S-netx Jumper Block J1 – Shield Termination Select..... 7

7.2.2 S-netx Switches SW1 – Auxiliary Port Configuration 7

7.2.3 S-netx Switches SW2, SW3, SW4, SW5 and SW6 – Not Used 8

7.3 T-netx Switch and Jumper Diagram 8

7.3.1 T-netx Jumper Block J1 – Drain Termination 8

7.3.2 T-netx Jumper Block 2 9

7.3.3 T-netx Switches SW2, SW3, SW4 and SW5 – Not Used 9

7.3.4 T-netx Power Select..... 9

7.4 Multi-netx Switch and Jumper Diagram..... 10

7.4.1 Multi-netx Jumper Block J1 – Port Ground Select..... 10

7.4.2 Multi-netx Jumper Block J2 11

7.4.3 Multi-netx Switches SW2 and SW6 – Not Used..... 11

7.5 Shield (Drain) Terminations (J1) 12

8.0 Software Configuration 12

8.1 Software Configuration Using the Network Port..... 13

8.1.1 Pre-Assignment of IP address..... 14

8.1.2 DHCP Automatic Assignment of IP address..... 14

8.1.3 Manual Assignment of IP address Using Smarteye Netx Setup Utility Program..... 15

8.1.4 Manual Assignment of IP address using a Web Browser..... 21

8.2 Software Configuration Using the Auxiliary Port 25

8.2.1 Serial configuration Commands 27

8.2.1.1 General Configuration Example..... 27

8.2.1.2 Auxiliary Port Configuration Example 28

8.3 Smarteye Netx Control Unit Configuration Parameters 28

 8.3.1 Smarteye Netx Control Unit Configuration Parameters - General Configuration 29

 8.3.2 Smarteye Netx Control Unit Configuration Parameters - Auxiliary Port 30

9.0 Monitoring – Console show command..... 30

 9.1 Show Commands: 31

 9.1.1 HELP – ‘h<cr>’ 31

 9.1.2 PHOTOEYES – ‘p<cr>’ 32

 9.1.3 LABEL – ‘l<cr>’ 32

 9.1.4 ERROR – ‘e<cr>’ 32

 9.1.5 DIAGNOSTIC – ‘d<cr>’ 33

 9.1.6 SHOW – ‘s<cr>’ 33

 9.1.7 VERSION – ‘v<cr>’ 33

 9.1.8 RUNTIME – ‘r<cr>’ 33

 9.1.9 EXIT – ‘exit<cr>’ 34

10.0 Smarteye Netx Control Unit Web Pages..... 35

 10.1 Home webpage..... 35

 10.2 Configuration webpage..... 36

 10.2.1 Setting the Date, Time and Time Zone..... 37

 10.3 History webpage 38

 10.4 Ethernet IP Information webpage 40

11.0 Power-Up 41

12.0 Communication..... 41

 12.1 Ethernet IP Control Port Operation..... 42

 12.2 Auxiliary Port Operation 42

13.0 Diagnostic Enable 42

14.0 Error Messages 43

Appendix A S-netx SP4002 Drawings..... A-1

 A.1 Sender/Receiver Cable Details for Local Mounting Applications – SP1054/01-417 A-2

 A.2 Sender/Receiver Cable Details for Remote Mount Applications –SP1054/01-418..... A-3

 A.3 S-netx Installation Details No-Power over Ethernet– SP4002/01-420 A-4

 A.4 S-netx Connection Wiring Details No-Power over Ethernet– SP4002/01-410 A-5

 A.5 S-netx Installation Details Power over Ethernet – SP4002/02-420 A-6

 A.6 S-netx Connection Wiring Details Power over Ethernet – SP4002/02-410 A-7

 A.7 S-netx Auxiliary and Communication Port Wiring Details – SP4002/01-411 A-8

Appendix B T-netx SP4050 Series Drawings..... B-1

 B.1 Sender/Receiver Cable Details – SP1054/01-419..... B-2

 B.2 T-netx Installation Details – SP4050/01-420..... B-3

 B.3 T-netx Connection Wiring Details No-Power over Ethernet– SP4050/01-410 B-4

B.4 T-netx Connection Wiring Details Power over Ethernet – SP4050/02-410 B-5

B.5 T-netx NEMA-12 Installation Details – SP4051/01-420..... B-6

B.6 T-netx NEMA-12 Connection Wiring Details 110/220 VAC Power – SP4051/04-410 B-7

B.7 T-netx Auxiliary and Communication Port Wiring Details – SP4050/01-411 B-8

Appendix C Multi-netx SP4060 Series Drawings C-1

C.1 Sender/Receiver Cable Details – SP1054/01-424..... C-2

C.2 Multi-netx Installation Details – SP4060/01-420 C-3

C.3 Multi-netx Connection Wiring Details 24VDC– SP4060/01-410 C-4

C.4 Multi-netx NEMA-12 Installation Details 24VDC– SP4061/01-420..... C-5

C.5 Multi-netx NEMA-12 Connection Wiring Details 24VDC– SP4061/01-410 C-6

C.6 Multi-netx NEMA-12 Installation Details 110/220VAC – SP4061/04-420..... C-7

C.7 Multi-netx NEMA-12 Connection Wiring Details 110/220VAC – SP4061/04-410 C-8

C.8 Multi-netx Auxiliary and Communication Port Wiring Details – SP4060/01-411..... C-9

C.9 Multi-netx Upgrade Kit Installation Details – SP4062/02-201 C-10

1.0 Introduction

Netx controller products are Smarteye's latest, RoHS-compliant, reader interface units used to interpret the patented Smarteye label pattern and direct the decoded data to a local PLC controllers. There are three offerings in Smarteye Netx product line-up; the S-netx which is a single-reader control unit, the T-netx which provides dual-reader capability, and the Multi-netx which supports up to 8 readers. To the system control engineer, all three units function identically, the only difference being the number of Smarteye readers supported and the corresponding physical footprint of the hardware. Besides the physical mounting difference, due to power limitations, only the S-netx and T-netx can support the 802.3af Power-over-Ethernet option at this time.

Wiring costs for Smarteye's Netx Control Units are expected to be substantially less since most plants now have their network infrastructure already in place. Utilizing power over Ethernet further reduces the installation cost by eliminating the need for separate power wiring.

Reader(s) interface to Smarteye Netx Control Units through the reader port(s). The reader senses a pattern of coded bars in the Smarteye label. As a label passes in front of a reader, the coded information is passed along to the Smarteye Netx Control Unit. The Smarteye Netx Control Unit then deciphers the coded information and makes the information available to the control system PLC.

Smarteye labels are typically constructed of 12-gauge steel and come in a variety of lengths to suit specific application requirements.

The following is a list of Controller models covered by this manual:

- SP4002/01IP – S-netx Ethernet IP interface, 24VDC power
- SP4002/02IP – S-netx 802.3af compliant, power over Ethernet interface
- SP4050/01IP – T-netx Ethernet IP interface, 24VDC power
- SP4150/01IP – T-netx standard Ethernet interface, 24VDC power, SGS 710172, UL 60950-1, CSA C22.2 No. 60950-1
- SP4050/02IP – T-netx 802.3af compliant, power over Ethernet interface
- SP4051/01IP – T-netx Ethernet IP interface, 24VDC power, NEMA-12
- SP4051/02IP – T-netx 802.3af compliant, power over Ethernet interface, NEMA-12
- SP4051/04IP – T-netx Ethernet IP interface, 110/220VAC power, NEMA-12
- SP4060/01IP – Muti-netx Ethernet IP interface, 24VDC power
- SP4160/01IP – Muti-netx standard Ethernet interface, 24VDC power SGS 710172, UL 60950-1, CSA C22.2 No. 60950-1
- SP4061/01IP – Muti -netx Ethernet IP interface, 24VDC power, NEMA-12
- SP4061/04IP – Muti -netx Ethernet IP interface, 110/220VAC power, NEMA-12
- SP4062/02IP – Muti -netx SEA-8 Upgrade Kit, 110/220VAC power

2.0 Smarteye Netx Control Unit Features

For ease of installation the S-netx is designed to be mounted along with the Smarteye reader assembly and can easily be mounted on the same bracket.

In general, Smarteye network products include the following major features:

- CPU circuit card with power indicators, serial console port, and reader interface circuitry. Cage or spring clamp connectors are provided for connection to reader field wiring and the serial control port. A 9-pin DB-type connector is provided for the auxiliary port.
- Panel Mount or NEMA-12 enclosures (S-netx available in NEMA-12 version only)
- RJ45 connector for Ethernet communication with link and activity LEDs
- Available in power over Ethernet 802.3af (48VDC) (S-netx and T-netx only)

3.0 Smarteye Netx Product Installation

The Smarteye Netx Control Units are designed to function in the environment found in most industrial facilities. Smarteye Netx Control Units will operate properly in the same environment as a programmable controller. They are rated for operation at temperatures from **0 to 60° C**, non-condensing.

Use of the specified cables for equipment interconnections with proper shield termination and equipment grounding are recommended to minimize electromagnetic interference on signal lines.

Smarteye Netx Control Units should be mounted in such a way to allow complete access to the unit. Adequate space must be left to insure that the covers can be opened for maintenance.

Mounting dimensions for each of the network products enclosures can be found in the appendix.

4.0 Power/Wiring

All Smarteye Netx Control Units operate on an input voltage of 24VDC. The S-netx uses 6 watts, the T-netx uses 9 watts, and the Multi-netx requires 28 watts of power. A polyswitch (self-resetting) fuse link is used to protect the electronics on all models. See the appendix for detailed drawings.

Smarteye Netx Control Units have been designed to be as tolerant to power fluctuations as is practical. However, like most electronic equipment, they can be susceptible to 'brownouts' and severe voltage 'spikes'. The AC line which drives the power supply for the Smarteye Netx Control Units can supply other similar electronic equipment such as programmable controllers, but should be isolated from any heavy industrial equipment that causes excessive line fluctuations such as motors, motor starters, welders, variable frequency drives, etc.

All applicable codes and ordinances should be observed for wiring power and ground, particularly the National Electrical Code published by the National Fire Protection Association of Boston, Massachusetts.

4.1 Power/Wiring for Power over Ethernet 802.3af (48v) – S-netx and T-netx only.

The S-netx and T-netx both offer an optional power input module, which meets the 48VDC Ethernet 802.3af specification. With this option, these units may be powered via an 802.3af compliant power source through the Ethernet communication cable. This provides power for both the CPU circuit card and the reader(s) connected to the unit. An RJ45 connector is provided on the S-netx and T-netx for delivering both power and data. See the appendix for detailed drawings.

4.2 Power/Wiring for T-netx Model SP4051/04-IP

The T-netx SP4051/04-IP unit is designed to be powered from 110 to 240 VAC 50-60 Hz. This unit includes an AC circuit breaker and internal 24VDC power supply. See the appendix for detailed drawings.

4.3 Power/Wiring for Multi-netx Model SP4061/04-IP and SP4062/02-IP

The Multi-netx SP4061/04-IP and SP4062/02-IP are designed to be powered from 110 to 240 VAC 50-60 Hz. These units include an AC circuit breaker and internal 24VDC power supply. See the appendix for detailed drawings.

5.0 Communication Line Wiring

All Smarteye Ethernet IP network products have two communication ports: the Ethernet control port, and the auxiliary port. The S-netx is supplied with an RJ45 connector on the inside of the box and a single-hole Ethernet cable grommet on the outside of the box. The T-netx and Multi-netx have an RJ45 connector on the outside of the unit. The RJ45 connector provides communication for all products and optional power connections for the S-netx and T-netx. Diagrams of the Ethernet connection can be found in the appendix.

The auxiliary port connection is a 9-pin DB connector on all Netx products. The auxiliary port is factory configured for RS232 communications (57600 baud, 8 data bits, parity none, 1 stop bit, flow control none).

Belden 8723 or equivalent (2 shielded pairs, 22 gauge) is recommended for RS232 connections. A detailed wiring drawing can be found in the appendix.

Note: The serial control port is not supported on the Ethernet IP network products models. It is only supported on the Standard network products models.

6.0 Reader Wiring and Mounting

6.1 Reader Wiring

A Smarteye reader features a six-foot cable pre-wired to each of its three receiver photoeyes and a twenty-five foot cable pre-wired to the sender. The photoeye cables typically terminate at a remote field junction box near the reader assembly. The three receiver cables are labeled A, B, or C respectively. The sender photoeye has a single unlabeled cable.

The S-netx provides a cage clamp connector for the reader connection. The T-netx and Multi-netx provide spring clamp connectors for the reader connection.

Note:

1. Readers are delivered with the white signal wires of the receivers terminated to the reader connector. The black signal wires are not used.
2. All references to + and - refer to 24VDC supplied via the reader port.

6.2 Local Reader Mounting (S-netx only)

Due to its intended use focusing on highly distributed control systems, the Smarteye reader is typically wired for local mounting to the S-netx (no junction box required) and is shipped pre-wired unless requested otherwise. The three receiver photoeyes and the sender photoeye are routed through the four-hole reader cable grommet and terminated on the cage clamp connector. Please note that the grommet nut can be slipped over the connector for ease of assembly. Connection details can be found in the appendix.

6.3 Remote Reader Mounting (S-netx, T-netx and Multi-netx)

The Smarteye reader can also be remotely mounted from the network control unit (S-netx, T-netx or Multi-netx). A remote field junction box must be located within six cable feet from the receiver assembly. This remote junction box should have eight terminals labeled: +, +, -, -, A, B, C, and SH (shield).

Belden 9773 (3 shielded pairs, 18 gauge) is recommended for connecting the network control unit to the remote junction box. For the S-netx, a remotely mounted reader will also need the four-hole reader cable grommet replaced with a single-hole grommet, which is shipped with each unit. Maximum remote mounting distance is 1500 feet.

The shield (drain) wires of the Belden 9773 cable are normally connected to 24V ground at the network control unit via jumper block J1 on the network control unit circuit card. This is the standard factory configuration. If the environment is electrically noisy, then it may be necessary to connect the shield to 24V ground at the remote reader's junction box. This can be accomplished by installing a jumper wire from the 'SH' terminal to the '-' terminal in the remote junction box. Do not connect the shield at both ends of the cable. Remove the jumper block from J1 at the network control unit, if the jumper wire is used at the remote junction box. Smarteye Corporation does not recommend that this shield ever be connected to chassis ground.

An optional junction box for the sender can be used if extra cable length is required. This junction box should provide two terminals labeled: +, -. Cabling details can be found in the appendix.

7.0 Smarteye Netx Control Units CPU Configuration

The intelligence of the Smarteye Netx Control Units is contained in the Smarteye CPU circuit card. The following features are included in the CPU circuit card hardware:

- Interface to inputs from Smarteye reader(s)
- Interface to an Ethernet communication network (Ethernet control port)
- Interface to a serial auxiliary port (monitor line)
- Jumper blocks to modify shield terminations

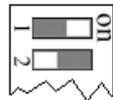
The diagrams on the following pages describe the function of the various jumper blocks and switches. Prior to shipment, the switches and jumpers are set to match the factory defaults and anticipated customer environment.

7.1 Configuration Legend



Jumper Installed

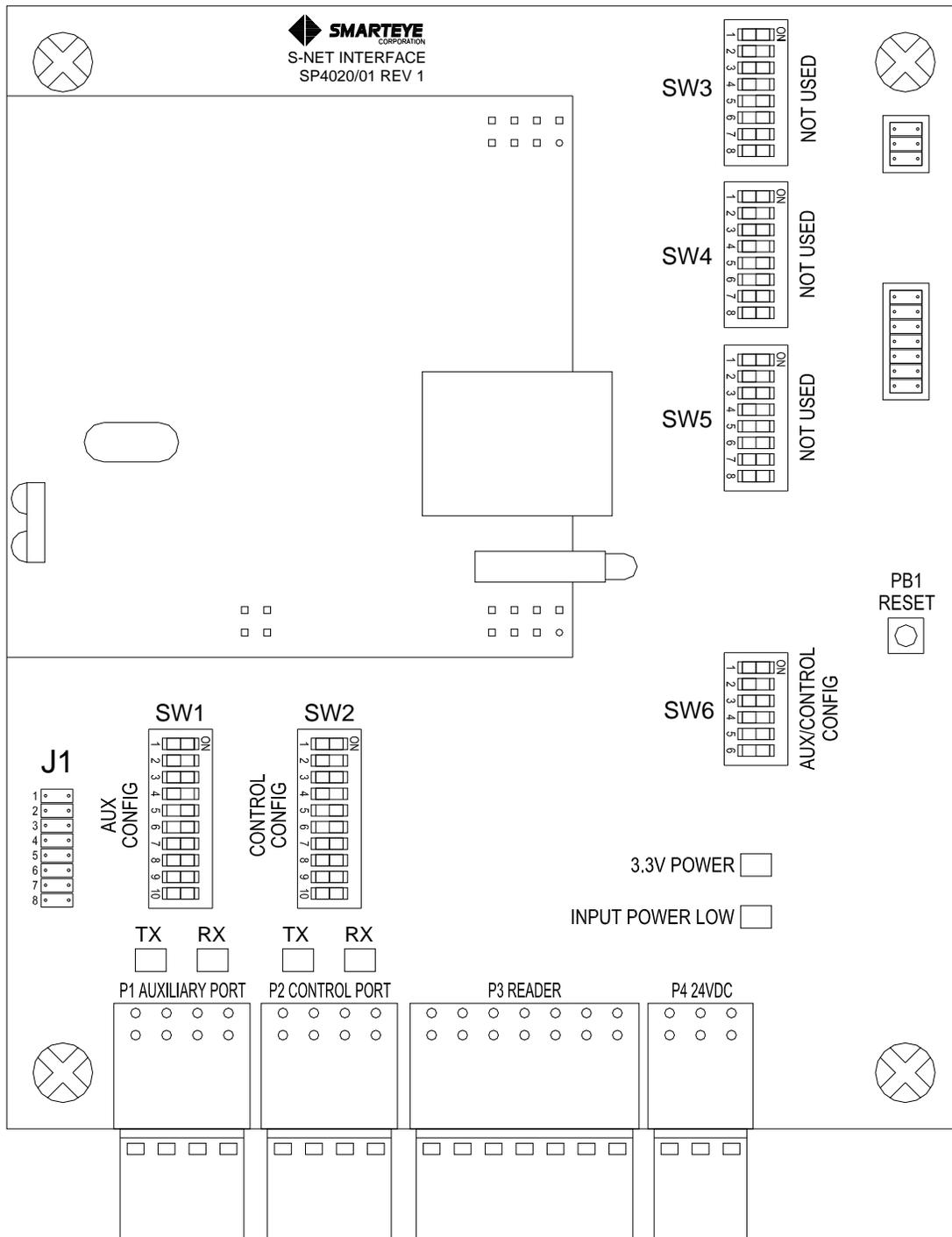
Jumper not Installed



Switch ON - Closed - Pushed to the Right

Switch OFF - Opened - Pushed to the Left

7.2 S-netx Switch and Jumper Diagram



7.2.1 S-netx Jumper Block J1 – Shield Termination Select

Jumper block J1 is used to select the shield termination for the reader port and auxiliary port. Jumper block J1 is located near the bottom left-hand side of the S-netx CPU/Reader interface board. The default settings are as shown.

J1		
1		Factory set - Jumper installed
2		Factory set - Jumper removed
3		Auxiliary port shield terminal to chassis ground
4		Auxiliary port shield terminal to 3.3v ground
5		Not Used
6		Not Used
7		Reader port shield terminals to chassis ground
8		Reader port shield terminals to 24v ground

7.2.2 S-netx Switches SW1 – Auxiliary Port Configuration

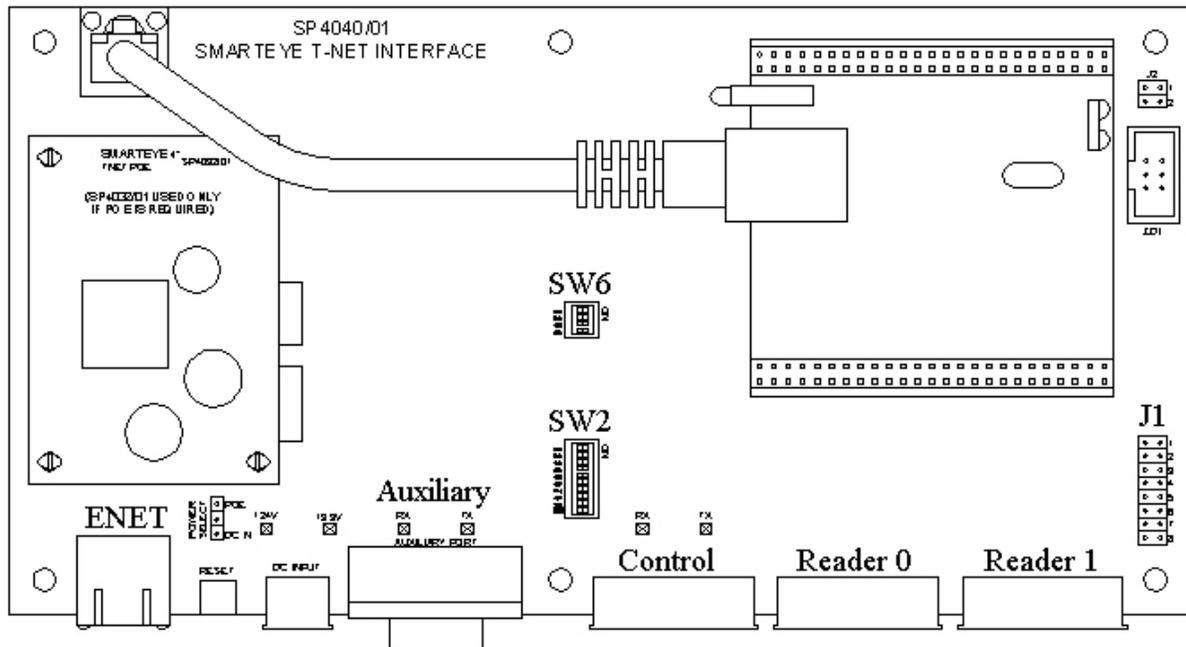
Switch block SW1 is located near the bottom left-hand side of the S-netx CPU/Reader interface board. Switch block SW1 controls the setup for the Auxiliary Port. The setup selection for SW1 is factory set and must not be changed.

SW1		
1		off Factory Set - off (pushed to the left)
2		off Factory Set - off (pushed to the left)
3		off Factory Set - off (pushed to the left)
4		off Factory Set - off (pushed to the left)
5		off Factory Set - off (pushed to the left)
6		off Factory Set - off (pushed to the left)
7		off Factory Set - off (pushed to the left)
8		off Factory Set - off (pushed to the left)
9		on Factory Set - on (pushed to the right)
10		on Factory Set - on (pushed to the right)

7.2.3 S-netx Switches SW2, SW3, SW4, SW5 and SW6 – Not Used

These switches are either not used or set through software configuration only. Their settings on the board are not recognized.

7.3 T-netx Switch and Jumper Diagram



7.3.1 T-netx Jumper Block J1 – Drain Termination

Jumper block J1 is located in the lower right-hand corner of the T-netx CPU/Reader Interface board. This jumper block is used to select how the shield is terminated for each of the three ports (two reader ports and auxiliary port). The factory defaults are shown.

J1	
1	<input checked="" type="checkbox"/> Reader 1 - Shield Terminals to 24v Ground
2	<input type="checkbox"/> Reader 1 - Shield Terminals to Chassis Ground
3	<input checked="" type="checkbox"/> Reader 0 - Shield Terminals to 24v Ground
4	<input type="checkbox"/> Reader 0 - Shield Terminals to Chassis Ground
5	<input type="checkbox"/> Not Used
6	<input type="checkbox"/> Not Used
7	<input type="checkbox"/> Auxiliary Port - Shield Terminal to 3.3v Ground
8	<input checked="" type="checkbox"/> Auxiliary Port - Shield Terminal to Chassis Ground

7.3.2 T-netx Jumper Block 2

Jumper Block J2 is located in the upper right-hand corner of the T-netx CPU/Reader interface board. This block is factory set with the top jumper installed and the bottom jumper removed. These settings should not be altered

7.3.3 T-netx Switches SW2, SW3, SW4 and SW5 – Not Used

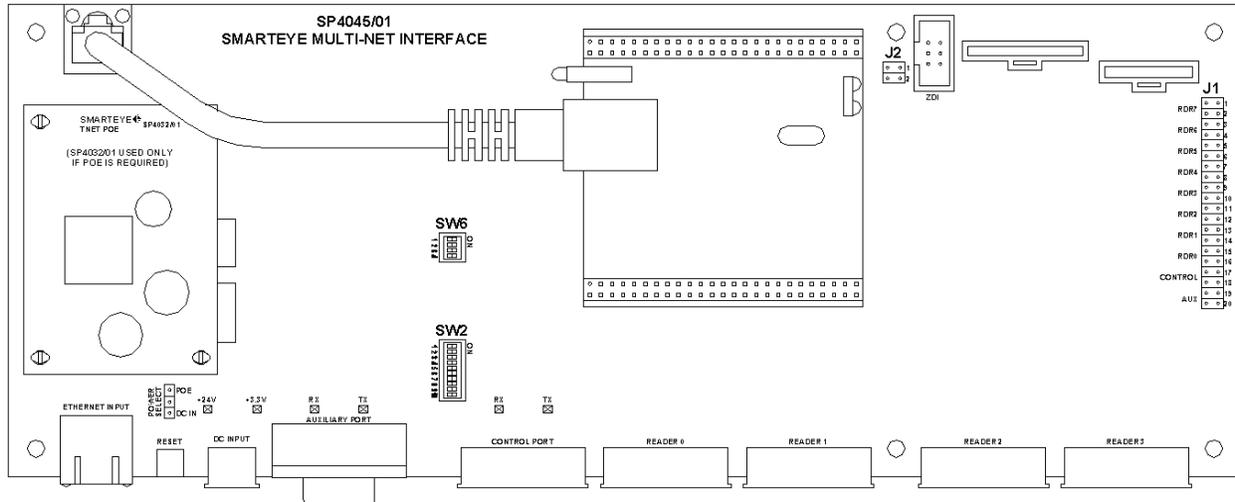
These switches are either not used or set through software configuration only. Their settings on the board are not recognized.

7.3.4 T-netx Power Select

The power select jumper is located on the lower left-hand side of the T-netx CPU/Reader interface board. The power select jumper is factory set for the specific T-netx model. Do not change the factory setting.

.

7.4 Multi-netx Switch and Jumper Diagram



7.4.1 Multi-netx Jumper Block J1 – Port Ground Select

Jumper block J1 is located on the right-hand side of the Multi-netx CPU/Reader Interface board. This jumper block is used to select how the shield is terminated for each of the reader ports and the auxiliary port. The factory defaults are shown.

J1

1		Reader 7 - Shield Terminals to 24v Ground
2		Reader 7 - Shield Terminals to Chassis Ground
3		Reader 6 - Shield Terminals to 24v Ground
4		Reader 6 - Shield Terminals to Chassis Ground
5		Reader 5 - Shield Terminals to 24v Ground
6		Reader 5 - Shield Terminals to Chassis Ground
7		Reader 4 - Shield Terminals to 24v Ground
8		Reader 4 - Shield Terminals to Chassis Ground
9		Reader 3 - Shield Terminals to 24v Ground
10		Reader 3 - Shield Terminals to Chassis Ground
11		Reader 2 - Shield Terminals to 24v Ground
12		Reader 2 - Shield Terminals to Chassis Ground
13		Reader 1 - Shield Terminals to 24v Ground
14		Reader 1 - Shield Terminals to Chassis Ground
15		Reader 0 - Shield Terminals to 24v Ground
16		Reader 0 - Shield Terminals to Chassis Ground
17		Not Used
18		Not Used
19		Auxiliary Port - Shield Terminal to 3.3v Ground
20		Auxiliary Port - Shield Terminal to Chassis Ground

7.4.2 Multi-netx Jumper Block J2

Jumper Block J2 is located near the top midway between center and the right side of the Multi-netx CPU/Reader interface board. This block is factory set with the top jumper installed and the bottom jumper removed. These settings should not be altered.

7.4.3 Multi-netx Switches SW2 and SW6 – Not Used

These switches are either not used or set through software configuration only. Their settings on the board are not recognized.

7.5 Shield (Drain) Terminations (J1)

The jumper block J1 is provided to allow shield wire terminations of the Auxiliary serial communication cable and the reader cables. Never connect a shield wire at both ends of a communication line.

Jumpers are provided to allow termination of the reader cable's shield wires. The shield wires of the reader cable (Belden 9773) are normally connected to 24V ground at the Smarteye Netx Control Unit. This is the standard factory configuration.

Refer to the section labeled 'Jumper Block J1 – Port Ground Select' earlier in this section for the individual jumpers that need to be installed for proper shield termination for each of the Netx products.

8.0 Software Configuration

Before the Smarteye Netx Control Unit can become operational, it must first be configured. Smarteye Netx Control Units are shipped with a factory default configuration. The factory default configuration has the network port enabled.

All Smarteye Netx Control Units have a auxiliary serial port, a network port, and one to eight reader ports. The serial port is labeled "Auxiliary". The auxiliary port is used for monitoring, configuration and optionally a Bluetooth data access port. The network port is used for

- Connecting to a host computer or PLC for real time control
- Smarteye Netx Control Unit configuration
- Viewing Smarteye Netx Control Unit status and historical data
- Smarteye Netx Control Unit discovery
- Smarteye Netx Control Unit real time monitoring
- Smarteye Netx Control Unit software updates and optional features activation.

There are four ways to configure a Smarteye Netx Control Unit. Three of the ways utilize the network port while the fourth way uses the auxiliary port.

- Network Port Configuration Method
 1. Using Smarteye's Setup Utility program running on a windows PC
 2. Using a web browser running on a windows PC
 3. Using a telnet session running on a windows PC
- Auxiliary Port Configuration Method
 1. Configuration through the auxiliary port requires a cable as shown in the drawing titled "Auxiliary Port Wiring Details" in the appendix. The auxiliary port of the Smarteye Netx Control Unit must be connected to a terminal or a COM port on a PC that has a terminal emulator software package installed such as 'Hyper Terminal'.

8.1 Software Configuration Using the Network Port

Before connecting the Smarteye Netx Control Unit to the network, make sure to write down the MAC address for the unit. The MAC address is printed on a sticker located on the Smarteye Netx Control Unit. The MAC address is also printed on the paperwork that accompanies the unit. The MAC address is six two digit hexadecimal numbers separated by dashes. An example of a Smarteye Netx Control Unit's MAC address is as follows: 00-50-C2-2C-20-00.

Configuration through the network port requires the Smarteye Netx Control Unit to be connected to a network through a switch or hub using a standard Ethernet cable (RJ45 connectors) as shown in the drawing titled "Ethernet Port Wiring Details" in the appendix.

The Smarteye Netx Control Unit can also be configured by directly connecting it to a computer's network adapter using a standard Ethernet crossover cable.

The first item that has to be configured on the Smarteye Netx Control Unit is the *IP address*. The IP address must be set first in order to access the unit over the network. Unless provided with specific network IP addresses from the customer, Smarteye network readers are shipped with a default IP address of 192.168.22.243 and DHCP turned off.

In order for the control system to make decisions based upon the information it receives from a Smarteye reader, it must know the physical location of that reader. The location can be identified by the IP address for readers that have a fixed IP address (static IP) or for readers that have a dynamic IP address (DHCP assigned) the reader number can be used. If the reader number is to be used to identify the location, then each Smarteye reader in the system must be assigned a unique reader address.

The Netx IP address can be set using one of the available methods listed below.

- Pre-assigned by Smarteye before shipment (list of addresses provided by customer)
- DHCP server available on the network – IP address gets assigned automatically (provided DHCP is enabled)
- Use Smarteye's Netx Setup Utility program to set the IP address. Netx unit must first be connected to the network
- Connect a computer running terminal emulation software to the auxiliary port of the Netx control unit using a standard 9 pin RS232 cable. Use the 'conf' command to access the configuration parameters for the unit.
- Use a web-browser to set the IP address after the unit has been connected to a computer using a crossover Ethernet cable or standard cable and hub. This method requires the user to change the computer's network adaptor settings to match the factory default settings of the Netx control unit.

8.1.1 Pre-Assignment of IP address

If the IP addresses of the control units have been pre-assigned by Smarteye, then nothing more needs to be done. The units can be installed and the remainder of this section can be skipped.

8.1.2 DHCP Automatic Assignment of IP address

If the Smarteye Netx Control Unit is configured to use DHCP and a DHCP server is available on the network, the unit will automatically be assigned an IP address. If a DHCP server cannot be found then the unit will use the default IP of 192.168.22.243.

Normally when requested, a DHCP server will assign an arbitrary IP address from a pool of available addresses. A DHCP server can however be configured to assign fixed IP addresses for specific MAC addresses. The network administrator, given the list of Smarteye Netx Control Unit MAC addresses, can make the IP assignments on the DHCP server. This should be done prior to installing the units on the network. This technique is known as IP reservation.

Without IP reservation, we cannot determine the IP address that was assigned to the unit by DHCP because the DHCP server assigns an arbitrary IP address. In order to use a web-browser or telnet to configure the unit, we must know its IP address. If IP reservation is not used then the Smarteye Netx Setup Utility program must be used to discover and configure the control unit. The Smarteye Netx Setup Utility program sends out a broadcast message on the network that only Smarteye Netx Control Units respond to. The response has specific information about the control unit such as unit description, MAC and IP address.

8.1.3 Manual Assignment of IP address Using Smarteye Netx Setup Utility Program

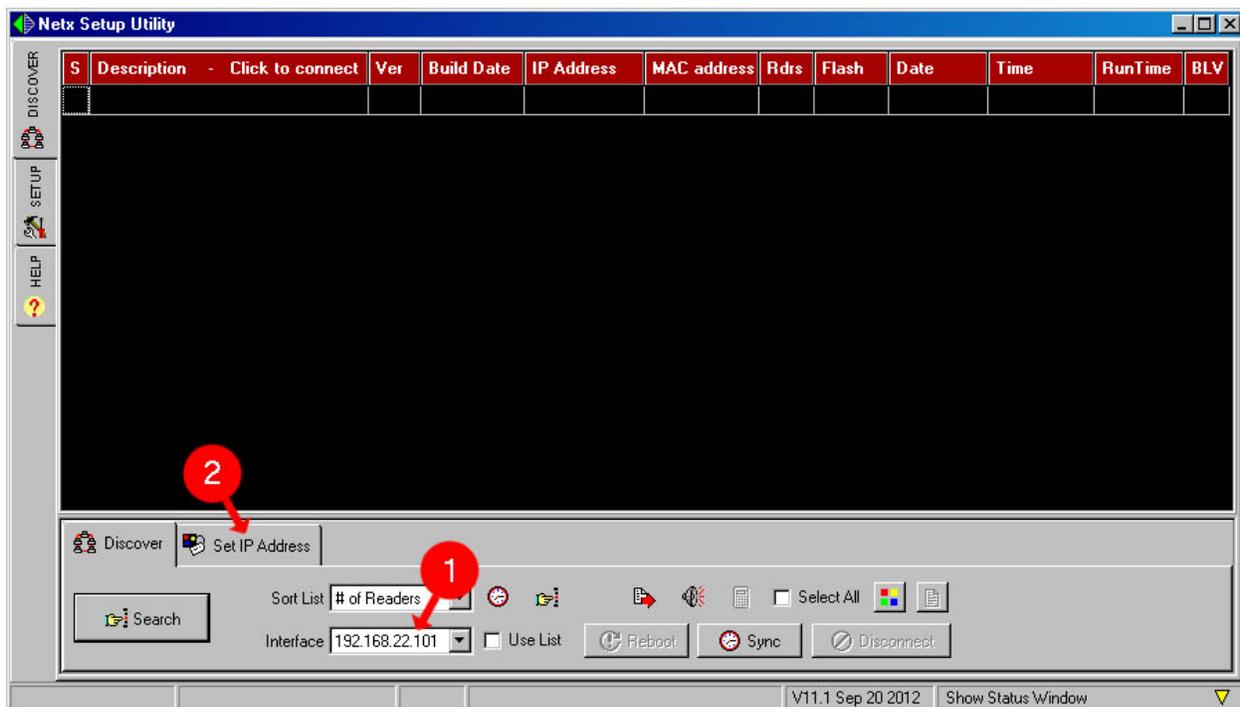
The Smarteye Netx Setup Utility program provided with every Smarteye Netx Control Unit purchased can be used to quickly and easily configure the control unit to reside on the customer's network.

Unless provided with specific network IP address from the customer, Smarteye Netx control units are shipped with a default IP address of 192.168.22.243 and DHCP turned off.

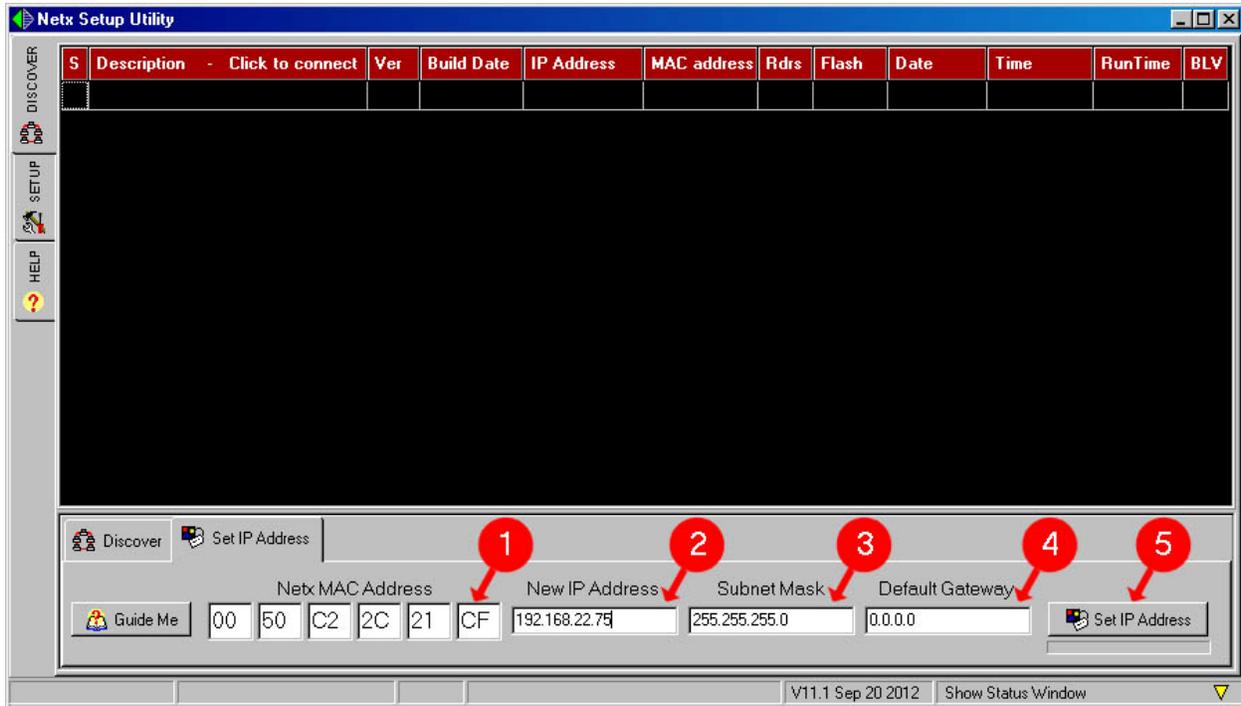
In order to configure the Netx control units, a list of available unused IP address must be obtained from the network administrator. Each Netx unit must be assigned one of these IP addresses. The Netx's MAC address along with its assigned IP should be recorded for future reference.

The unique 12 digit hexadecimal MAC address for the Smarteye Netx Control Unit is displayed on a sticker located on the unit. Once the units have been connected to the network, the configuration can begin.

The Smarteye Netx Setup Utility program can be run directly off the provided CD or copied onto and run from a computer that is connected to the same network as the Netx control unit(s). Execute the program by double clicking the "Netx_Utility.exe" file. The window shown below should appear.

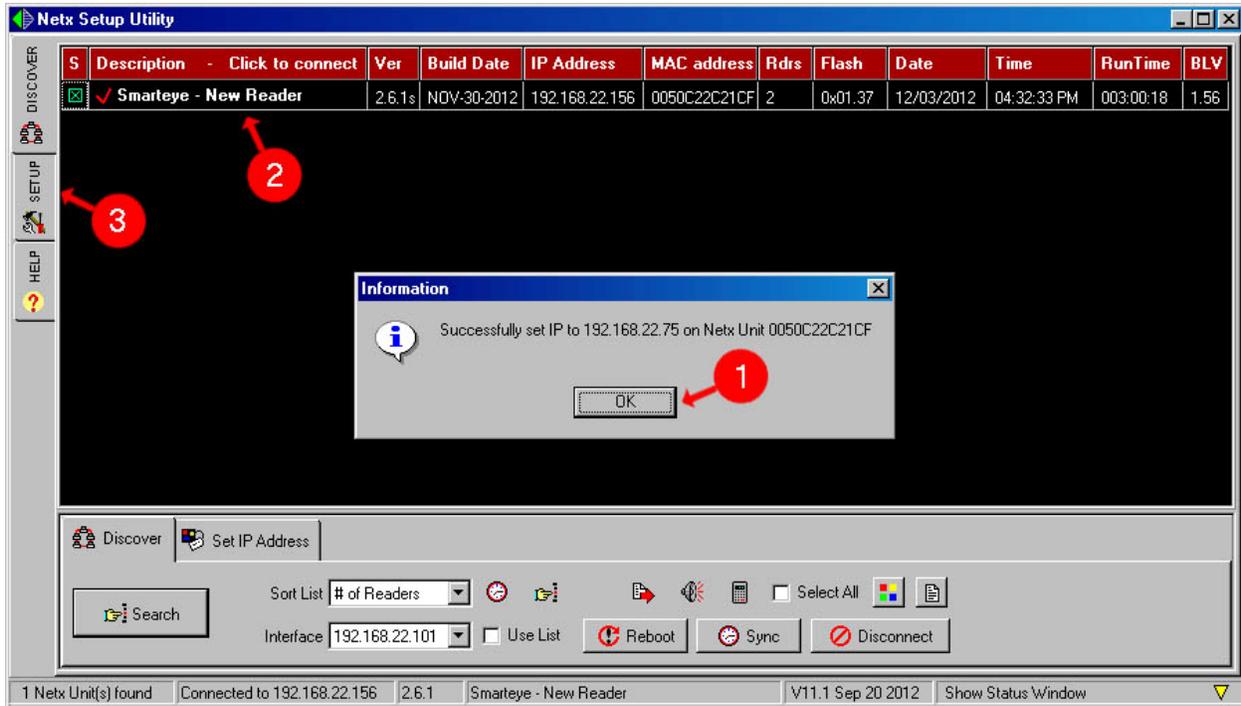


1. Select the network interface to use from the drop-down list. If the computer only has one network installed then there will only be one choice. Select the network interface that connects to the Netx control units whose IP is to be set.
2. Click on the "Set IP Address" tab to display the parameters needed for setting the IP address. The form on the next page will be displayed



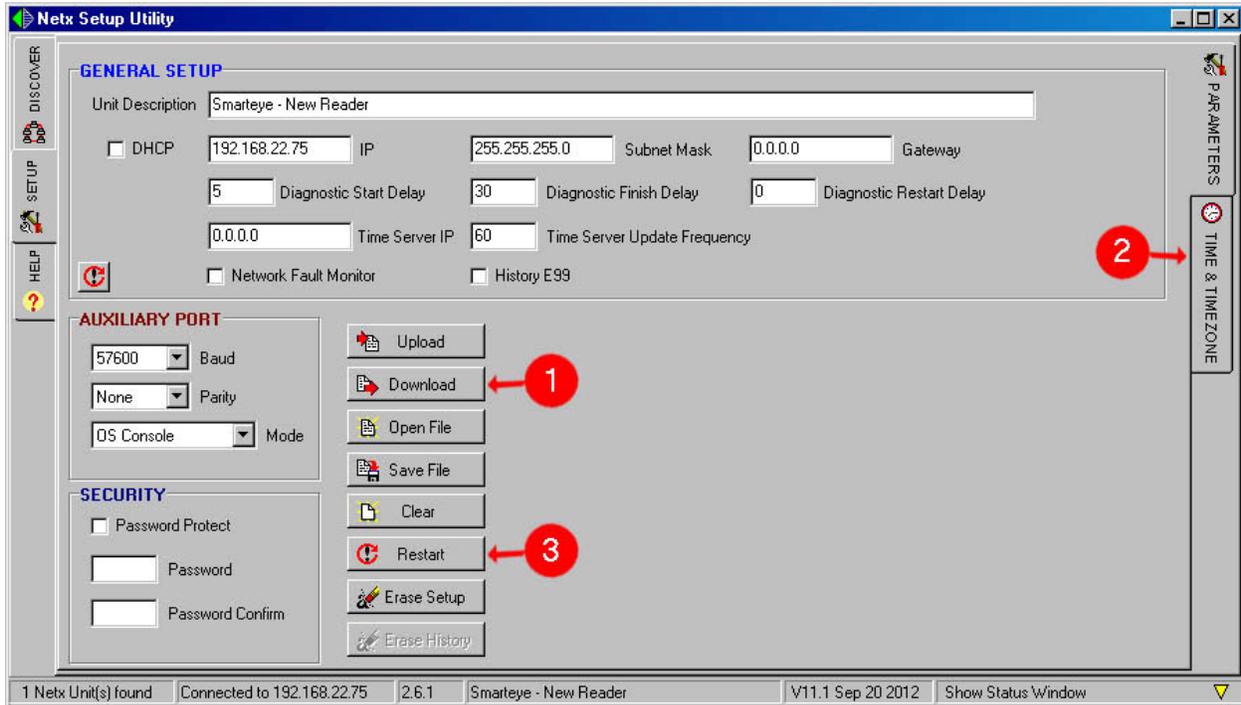
1. In the MAC Address field, type in the 12 digit MAC address for the unit to be configured.
2. Enter the assigned IP address for this unit into the “New IP Address” field.
3. Enter a valid subnet mask for your network if it is different from the default.
4. Enter the default gateway address if required.
5. Then click the “Set IP Address” button to complete the assignment.

In the example illustrated above, a Smarteye Netx Control unit with MAC address 0050C22C21CF is assigned an IP address of 192.168.22.75 with a mask of 255.255.255.0 and no default gateway.

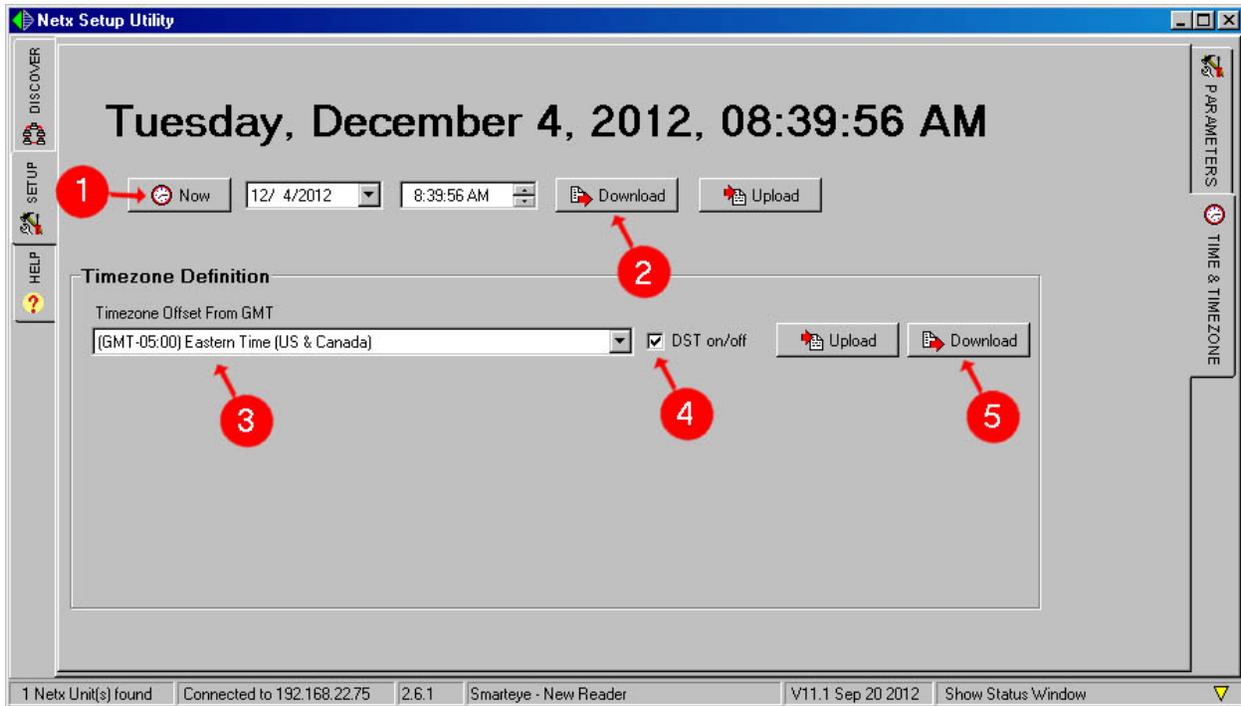


1. Click the “OK” button to get rid of the successfully set IP message box.
2. Then click on the description field to connect to the Smarteye Netx unit. A red check mark is displayed when a connection is established with the unit. Now that a connection has been made, we can proceed to the setup page to complete the configuration.
3. Click on the “Setup” tab located near the top left under the ‘Discover’ tab.

This brings up the setup page as shown below. Refer to the ‘Configuration Parameters’ section for a list and description of each field starting on page 24.

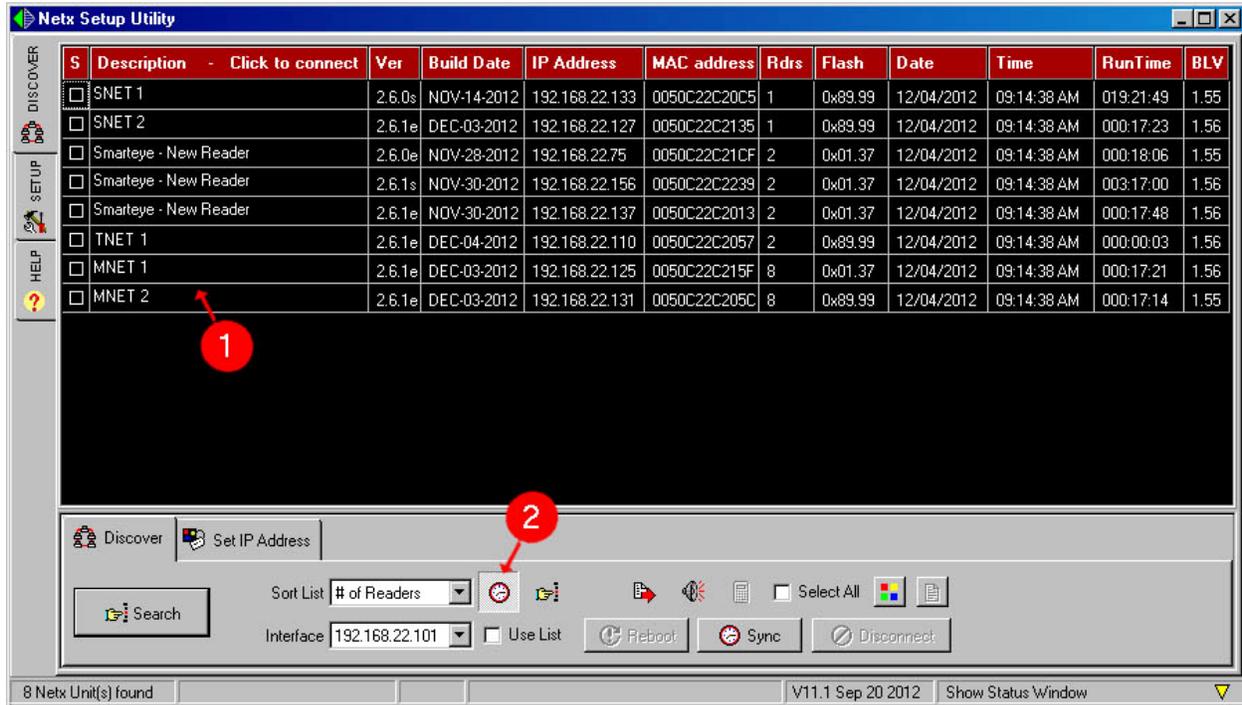


1. After the unit has been configured, click the “Download” button to save the configuration in flash memory. The configuration file will be retained even after power is removed from the unit.
2. If a timeserver is not present on the network, then the date and time can be manually configured by clicking on the “Time & Time Zone” tab located under the parameters tab on the right side. See below for an illustration on setting the time and time zone.
3. Click the “Restart” button to apply the changes. This will reboot the Netx control unit.



1. Set the date and time as desired.
2. Then click the ‘Download’ button to update the date and time for the unit.
3. The time zone can also be configured from this screen. Use the drop down box to select the correct time zone for your area.
4. Check the DST box if you want to observe day light savings time.
5. Then click the “Download” button to update the time zone for the unit.

The Smarteye Netx Control Unit has now been successfully configured. Repeat this step for each Netx control unit present on the network.



1. From the discover tab, after a unit has been configured, it will show up in the grid each time the search button is clicked.
2. The clock button enables the time sync function of the search and discover process. When the clock button is in the detent state and the search button is clicked, the current date and time of the PC is sent to each Netx Control Unit found on the network. When a Netx unit detects this date/time data packet in the discovery message, it synchronizes its internal clock to match. This feature is useful in systems that do not have an automatic timeserver on the network.

8.1.4 Manual Assignment of IP address using a Web Browser

A list of available static IP addresses will need to be acquired from the network administrator (one per Smarteye Netx Control Unit). Once these are obtained, the control unit’s IP addresses can be assigned using a standard web-browser.

The Smarteye Netx Control Unit is shipped with an IP address of 192.168.22.243. This address can be used to make a direct connection from a PC to the control unit using a crossover cable or a standard cable with a hub.

The computers network properties must be altered to match the control unit’s default IP address. The PC’s network card would need to be given a static IP of say 192.168.22.242 for example in order to communicate with the control unit. An example of how to do this on a PC running windows 2000 as the operation system is shown below.

Begin by right clicking on the “Start” button in the lower left hand corner and selecting “Settings”. Then click on “Network and Dial-up Connections”

(Figure 1).

This will bring up the “Network and Dial-up Connections” window as shown in figure 2. Double click on the active LAN connection.

This will then display the LAN status window as shown in figure 3.

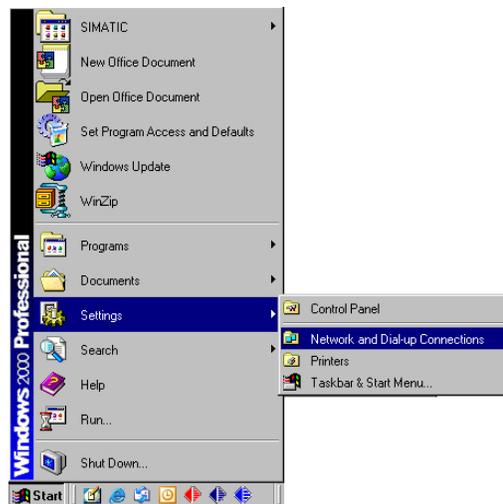


Figure 1

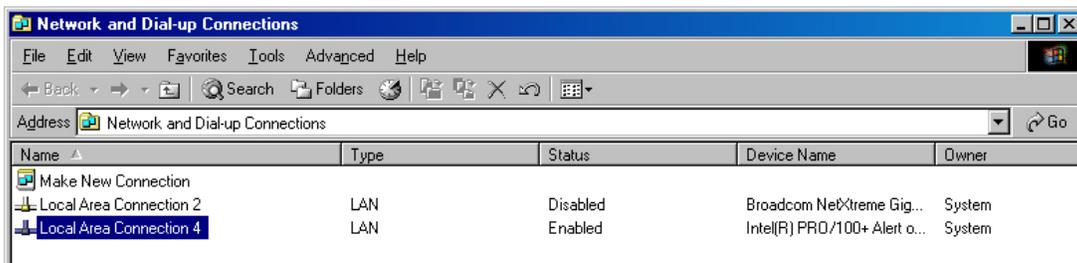


Figure 2

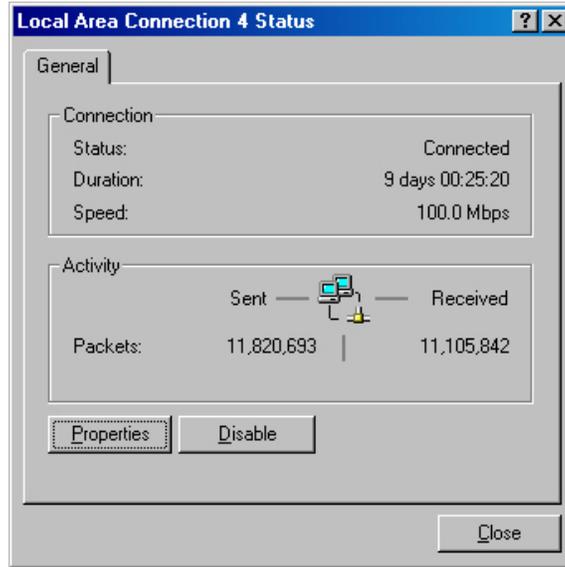


Figure 3

Now, click the “Properties” button to bring up the LAN properties window as shown in figure 4. Next, select the “Internet Protocol (TCP/IP)” item and click the “Properties” button. This will bring up the Internet Protocol dialog box shown in figure 5.

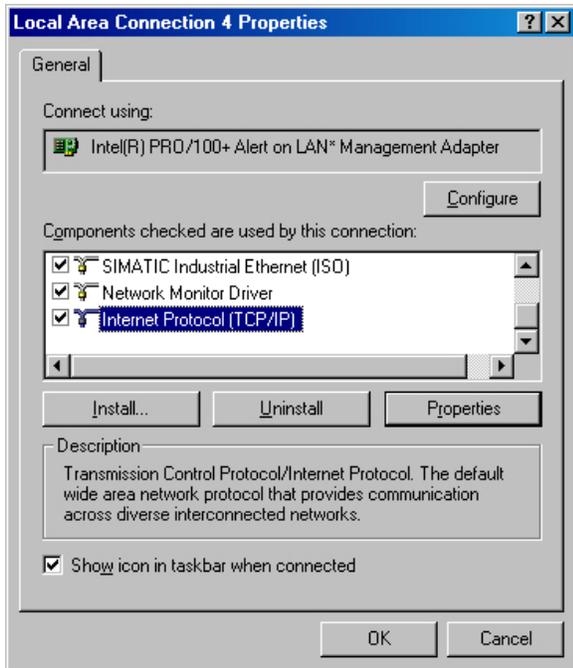


Figure 4

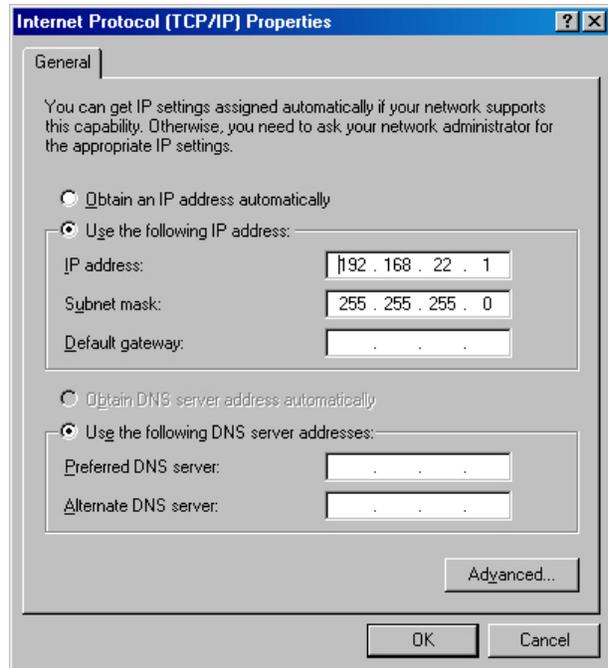


Figure 5

Select “Use the following IP address” item and enter an IP address and Subnet mask as illustrated in figure 5.

Now we are ready to set the IP address and configure the Smarteye Netx Control Unit. Open up a web browser and enter the network address “192.168.22.243” as shown in figure 6.

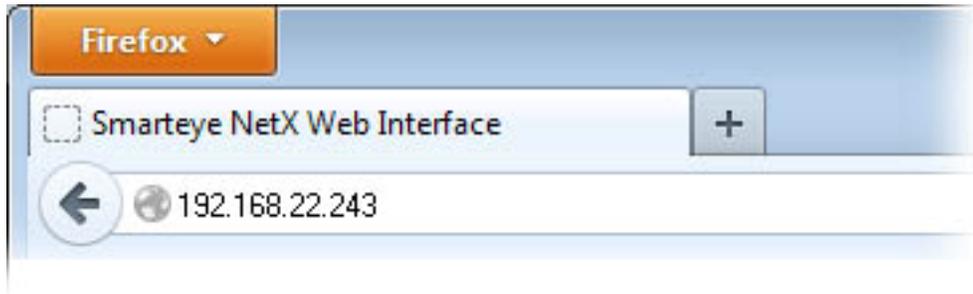
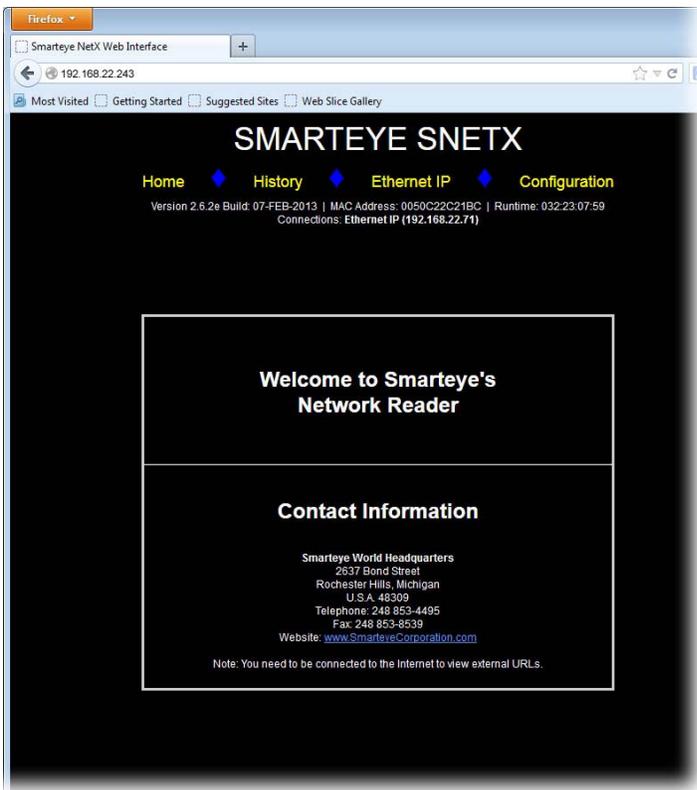


Figure 6



This will cause the Smarteye Netx Control Unit’s home page to be displayed as shown in figure 7.

Click on the “CONFIGURATION” link to bring up the control unit’s setup page as shown in figure 8..

Figure 7

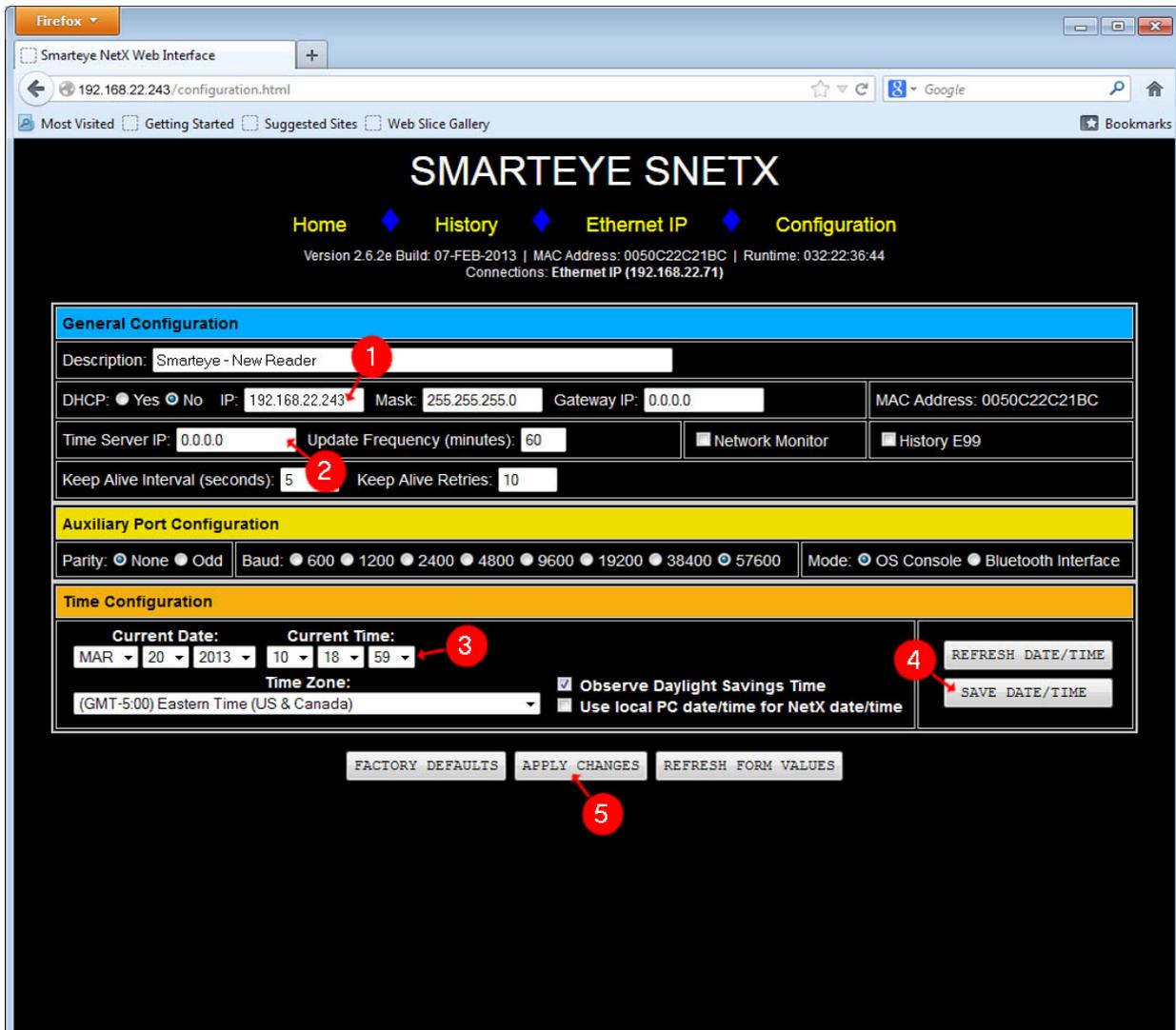


Figure 8

The Smarteye Netx Control Unit can now be configured.

1. Enter the IP address assigned to this unit by the network administrator along with the mask and gateway if required.
2. If a time server is present on the network then enter its IP address here.
3. If no time server is available then the date and time can be manually configured here.
4. Select the desired date, time and time zone then click the ‘Apply Changes’ button to set the internal clock of the Smarteye Netx Control Unit.

5. Finish any other configuration changes that are required and click the 'APPLY CHANGES' link to save the configuration in flash memory. The configuration parameters will be retained even after power is removed from the unit. After the settings are applied, the control unit will reboot with the new IP address. After rebooting we will not be able to web page to the control unit because the assigned IP no longer matches our PCs network. The Smarteye Netx Control Unit can now be installed on the plant's network.

Repeat this process for each Smarteye Netx Control Unit that needs to be configured.

8.2 Software Configuration Using the Auxiliary Port

The Smarteye Netx Control Unit must be connected serially to either a terminal or a COM port on a computer using a standard 9 pin RS232 serial cable. For the auxiliary port interconnection diagram, refer to the Auxiliary Port Wiring Details in the appendix. The Netx Control Unit does not need to be connected to the network for Auxiliary Port configuration.

If connected to a computer, then a terminal emulator program such as Hyper Terminal will be required. The terminal settings should be 57600-baud, eight data bits, no parity, and one stop bit. Once the control unit is physically connected to a terminal or PC, it can be powered up.

Provided the Smarteye Netx Control Unit is not in Bluetooth mode, similar information to the following will be displayed on your PC or terminal through the COM port when the unit is powered up.

SMARTEYE Version 2.6.1e Build: 04-DEC-2012

Boot Loader Version 1.56

Using setup parameters saved in flash

Configuration

Description:	Smarteye – New Reader
MAC Address:	0050C22C21CF
DHCP:	Yes
IP:	192.168.22.243
Mask:	255.255.255.0
Gateway IP:	192.168.22.1
Time Zone:	-5:00
Time Server IP:	0.0.0.0
Time Server Freq:	60

Watchdog Enabled: Yes
Password Protect: No
Diag Start Delay: 5
Diag End Time: 30
Diag Reset Time: 0
Network Monitor: No
E99 Logging: No
KeepAlive Interval: 0
KeepAlive Retries: 10

Auxiliary Port Configuration

Baud Rate: 57600
Parity: None
Mode: OS Console

ZiLOG TCP/IP Software Suite v2.3.2

Copyright (C) 2004, 2005 ZiLOG Inc.

All Rights Reserved

MAC address: 00:50:c2:2c:21:CF

IP address: 192.168.22.243

No Time Server Specified - Set date manually

Local time is 04-DEC-2012 14:46:59

Watch Dog Timer Enabled

Starting remote discovery process

Starting network access port

RELEASE version

Network Cable Connected

Starting Ethernet IP communication process

Aux Port BlueTooth Option Off

[SMARTEYE]>

8.2.1 Serial configuration Commands

Typing the ‘conf’ command puts the control unit into configuration mode. Here operating parameters for the unit can be configured.

```
[SMARTEYE]>conf
```

COMMANDS:

```
1 = General Configuration
2 = Configure Auxiliary Port
d = Default Configuration
e = Erase Flash Configuration
s = Save & prompt for Restart
r = Restart (reboot this unit)
exit = Exit Configuration and return to OS shell
conf%
```

Pressing the enter key without input, displays the available commands as shown above.

The control unit’s configuration parameters are divided into two groups.

1. General Configuration
2. Configure Auxiliary Port

For a list and definition of every configuration parameter, see the next section.

The General Configuration group is where the Netx control unit’s IP, Subnet Mask and Default Gateway parameters are set. Once changes have been made, use the ‘s’ command to save the configuration parameters and restart the unit.

To make configuration changes, enter the number of the group to be edited at the “conf%” prompt. For example typing a ‘1’ at the “conf %” prompt will enter the General Configuration menu. Once in the menu, simply type your choice at the ‘?’ prompt.

8.2.1.1 General Configuration Example

COMMANDS:

```
1 = General Configuration
2 = Configure Auxiliary Port
d = Default Configuration
e = Erase Flash Configuration
s = Save and Restart
exit = Configuration and return to OS shell
conf% 1
```

Configuration

Description: [TNET – New Reader]

?
 DHCP: 1=No 2=Yes [2] ?
 IP Address: [192.168.22.243] ?
 Mask: [255.255.255.0] ?
 Gateway IP: [192.168.22.1] ?
 Time Server IP: [0.0.0.0] ?
 Time Server Update Frequency: [60] ?
 Time Zone (hours:minutes from GMT): [-5:00] ?
 Date & Time: [10-MAY-2034 08:30:40] ?
 Watchdog Enable: 1=No 2=Yes [2] ?
 Password Protect: 1=No 2=Yes [1] ?
 Diagnostic Start Delay (tenths of seconds): [5] ?
 Diagnostic Finish Delay (tenths of seconds): [30] ?
 Diagnostic Restart Delay (tenths of seconds) Zero to Disable: [0] ?
 Network Fault Monitoring: 1=No 2=Yes [1] ?
 Log E99 to History: 1=No 2=Yes [1] ?
 Keep Alive Interval (0 secs = disabled): [0] ?

8.2.1.2 Auxiliary Port Configuration Example

COMMANDS:

1 = General Configuration
 2 = Configure Auxiliary Port
 d = Default Configuration
 e = Erase Flash Configuration
 s = Save and Restart
 exit = Configuration and return to OS shell
 conf % 4

Auxiliary Port Configuration

Baud Rate: 1=600 2=1200 3=2400 4=4800
 5=9600 6=19200 7=38400 8=57600 [8] ?
 Parity: 1=None 2=Odd [1] ?
 Mode: 1=OS Console 2=Bluetooth Interface [1] ?

8.3 Smarteye Netx Control Unit Configuration Parameters

Configuration parameters can be set using the Utility program, a web browser, a telnet session or through a serial connection to the auxiliary port. Refer to the “Software Configuration” section starting on page [9](#).

8.3.1 Smarteye Netx Control Unit Configuration Parameters - General Configuration

Parameter	Description
Description	The Reader description field can be up to 63 ASCII characters. These characters can be 1-9, A-Z, a-z, ., -, _, @, *, or <sp>.
DHCP:	DHCP can be enabled or disabled. See: Software Configuration page 12
IP	The unit's IP address. If DHCP is disabled, these values must be appropriate for your network
Mask	The unit's IP net mask - typically 255.255.255.0
Gateway IP	If your installation consists of two or more networks, which will be joined by a gateway node, then enter the IP address of the gateway here.
Time-Sever IP	The IP address of a master time sever residing on the network. The Netx control unit supports both SNTP on port 123 and TIMEP on port 37. On power up, the Netx control unit determines the server type by first looking for an SNTP server and if not found, then looks for a TIMEP server.
Time-Server Frequency	This parameter sets the time interval in minutes between time-server update requests. The default value is 60 minutes.
Time Zone	For Eastern standard time a "-5:00" would need to be entered (-5 hours from GMT)
Date & Time	Set the current date and time in the format shown
:Watchdog Timer	The watchdog timer can be disabled. The default value is enabled. The WDT monitors the program execution and resets the CPU if a critical fault occurs.
Password Protect	When 'password protect' is enabled, users must enter a password to make configuration changes to the units. This applies to both the configuration webpage and the auxiliary port configuration dialog 'aux conf'. Telnet sessions to the unit are always password protected regardless of this setting.
Password	8 characters max. Default password is 'eyesmart'. If a new password is entered, it must be re-typed for confirmation before it will be accepted.
Diagnostic Start Delay	The reader photo eyes must remain unblocked (no transitions) for this length of time in order to start a diagnostic reading. (in tenths of seconds)
Diagnostic Finish Delay	Once the diagnostic process starts, it must obtain a minimum number of transitions before this time expires or the attempt is aborted. (in tenths of seconds)
Diagnostic Restart Time	The diagnostic restart delay is the time, in tenths of seconds that must pass after a good diagnostic message has been produced before another diagnostic

	attempt can be made. A value of zero disables this feature.
Network Monitor	When network monitoring is enabled, any connection left in an improper state is automatically terminated. The network monitor frees the connection so that it may be utilized again. Normally the network monitor is disabled however on a badly behaved network it may be utilized until the network issues can be resolved.
E99 Logging	Turn E99 logging on if you want diagnostic abort errors saved in history.
Keep Alive Interval	This is the time interval in seconds that the Netx will check the integrity of an established connection on the network control port. If the connection has been compromised then it will be terminated after the 'Keep Alive Retry' count has been reached. A value of zero disables this feature.
Keep Alive Retry Count	The Keep Alive Retry count is the number of times the Netx attempts to solicit a response from the connected device before closing the connection.

8.3.2 Smarteye Netx Control Unit Configuration Parameters - Auxiliary Port

Parameter	Description
Baud Rate	Set the baud for the serial Auxiliary port
Parity:	None or Odd parity for the serial Auxiliary port
Mode:	Operating system console or Bluetooth data interface (optional).

9.0 Monitoring – Console show command

All Smarteye Netx Control Units has a built in monitoring tool that can be used to:

1. Show the current state of the three photo eyes (A, B, and C) for the connected reader
2. Show the last Label read, last Error generated, or last Diagnostic message
3. Show in real time each Label, Error, or Diagnostic message that is generated
4. Show the version number and build date of the firmware
5. Show how long the Netx has been running since its last reboot. (ddd:hh:mm:ss)

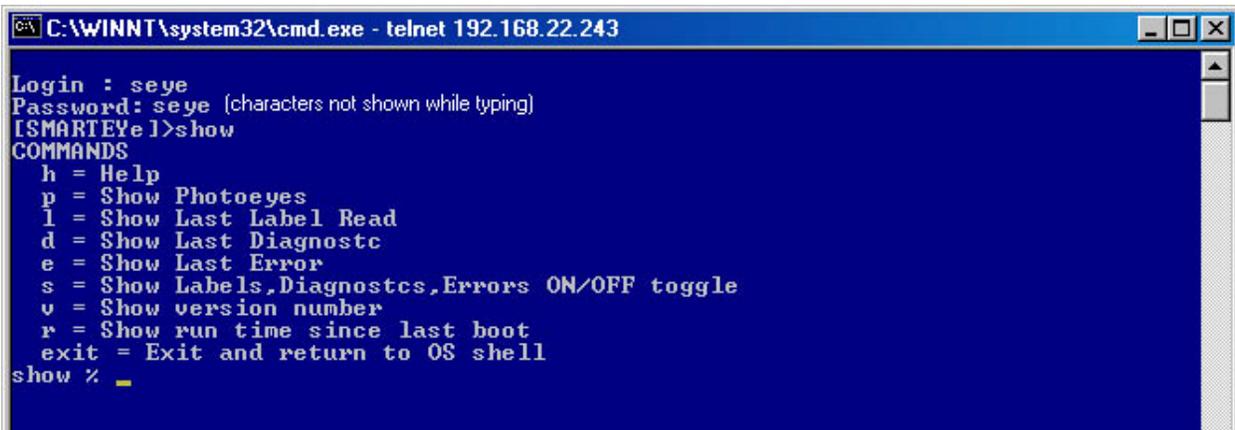
The monitoring tools are accessed either through the serial Auxiliary port or over the network using telnet. The Auxiliary port requires a cable to connect the Netx control unit to a terminal or PC. The wiring details for this cable are illustrated in the appendix. Telnet requires the Smarteye Netx Control Unit to be connected to the same network as the PC.

Telnet can be started on the PC through a command window. Startup a command window and enter the command “telnet” followed by the IP address of the control unit as shown below.



```
C:\WINNT\system32\cmd.exe
C:\>telnet 192.168.22.243
```

You will then be prompted for a password. The username is always 'seye'. The default password is also 'seye'. To terminate the telnet connection, type 'exit'.



```
C:\WINNT\system32\cmd.exe - telnet 192.168.22.243
Login : seye
Password: seye (characters not shown while typing)
[SMARTEYE]>show
COMMANDS
  h = Help
  p = Show Photoeyes
  l = Show Last Label Read
  d = Show Last Diagnostc
  e = Show Last Error
  s = Show Labels,Diagnostcs,Errors ON/OFF toggle
  v = Show version number
  r = Show run time since last boot
  exit = Exit and return to OS shell
show %
```

The 'show' command puts your session in show mode. The auxiliary port or telnet session is used to monitor Netx activity and for system inquiries. The factory default settings for the auxiliary port are RS232 protocol, 57600 baud, 8 bits, 1 stop bit and no parity.

9.1 Show Commands:

The 'show' mode is programmed to respond to single character commands followed by a carriage return (enter key) with the exception of the 'exit' command. The single character commands are:

- h Help - displays a list of valid commands
- p Photoeyes – show the state of the three photoeyes
- l Label - show the last label read
- d Diagnostic – show the last diagnostic values
- e Error – show the last error
- s Show - Labels, Diagnostics and errors in real time (toggle)
- v Version - show the software version number and build date
- r Run time since last boot (ddd:hh:mm:ss)

9.1.1 HELP – 'h<cr>'

The help command displays the list of valid commands along with a brief description for each.

```
[SMARTEYE]>show
show % h
```

COMMANDS

h = Help
p = Show Photoeyes
l = Show Last Label Read
d = Show Last Diagnostic
e = Show Last Error
s = Show Labels, Diagnostics, Errors ON/OFF toggle
v = Show version number
r = Show run time since last boot
exit = Exit Monitor and return to OS shell
show %

9.1.2 PHOTOEYES – ‘p<cr>’

The photoeyes command displays the current state of the reader input port.

- A ‘1’ means the photo-eye is blocked or turned on. A ‘0’ means the photo-eye is unblocked or off.
- If photoeye ‘A’ is blocked, a ‘1’ will be displayed in the ‘A’ slot, else a ‘0’ is displayed.
- If photoeye ‘B’ is blocked, a ‘1’ will be displayed in the ‘B’ slot, else a ‘0’ is displayed.
- If photoeye ‘C’ is blocked, a ‘1’ will be displayed in the ‘C’ slot, else a ‘0’ is displayed.

The following Snetx example shows photo-eyes ‘A’ and ‘B’ blocked and ‘C’ unblocked for reader zero.

```
show % p
Rdr 0 ABC 110
```

A Tnetx unit will show the photo-eye state for both readers 0 and 1, a Multi-netx will show the photo-eye state for all eight readers.

9.1.3 LABEL – ‘l<cr>’

The label command displays the last label read by the Smarteye Netx Control Unit. The output from the ‘l’ command looks like this:

```
show % l
Rdr 0 21-JAN-2009 13:09:40 1376
```

9.1.4 ERROR – ‘e<cr>’

The error command displays the last error read by the Smarteye Netx Control Unit. The output from the ‘e’ command looks like this:

```
show % e
Rdr 0 21-JAN-2009 13:06:14 0 Startup
```

9.1.5 DIAGNOSTIC – ‘d<cr>’

The diagnostic command displays the last diagnostic message. The output from the ‘d’ command looks like this:

```
show % d
```

```
Rdr 0 21-JAN-2009 13:10:16 A:0 B:0 C:0 X:0 Y:0
```

9.1.6 SHOW – ‘s<cr>’

The show command will show the label, diagnostics, and errors as they occur in real time. This is a toggle command, so typing it again will turn it off. The output from the ‘s’ command looks like this:

```
show % s
```

```
Rdr 0 04-FEB-2008 19:31:47 Label: 3043
```

```
Rdr 0 04-FEB-2008 19:31:54 Diagn: A:0 B:0 C:0 X:0 Y:0
```

```
Rdr 0 04-FEB-2008 19:31:58 Label: 2607
```

```
Rdr 0 04-FEB-2008 19:32:04 Diagn: A:0 B:0 C:0 X:0 Y:0
```

```
Rdr 0 04-FEB-2008 19:32:09 Label: 6616
```

```
Rdr 0 04-FEB-2008 19:32:09 Error: 99 Diagnostic attempt aborted
```

9.1.7 VERSION – ‘v<cr>’

The version command displays the current software revision along with the build date. The output from the ‘v’ command looks like this:

```
show % v
```

```
SMARTEYE Version 2.5.4 Build Date 24-NOV-2010
```

```
BootLoader 1.53
```

9.1.8 RUNTIME – ‘r<cr>’

The runtime command displays the length of time the Netx unit has been running since the last boot.

```
show % r
```

```
RunTime DDD:HH:MM:SS - 035:22:33:35
```

9.1.9 EXIT – ‘exit<cr>’

The exit command shuts down the show process (if active) and places the aux port back into OS console mode.

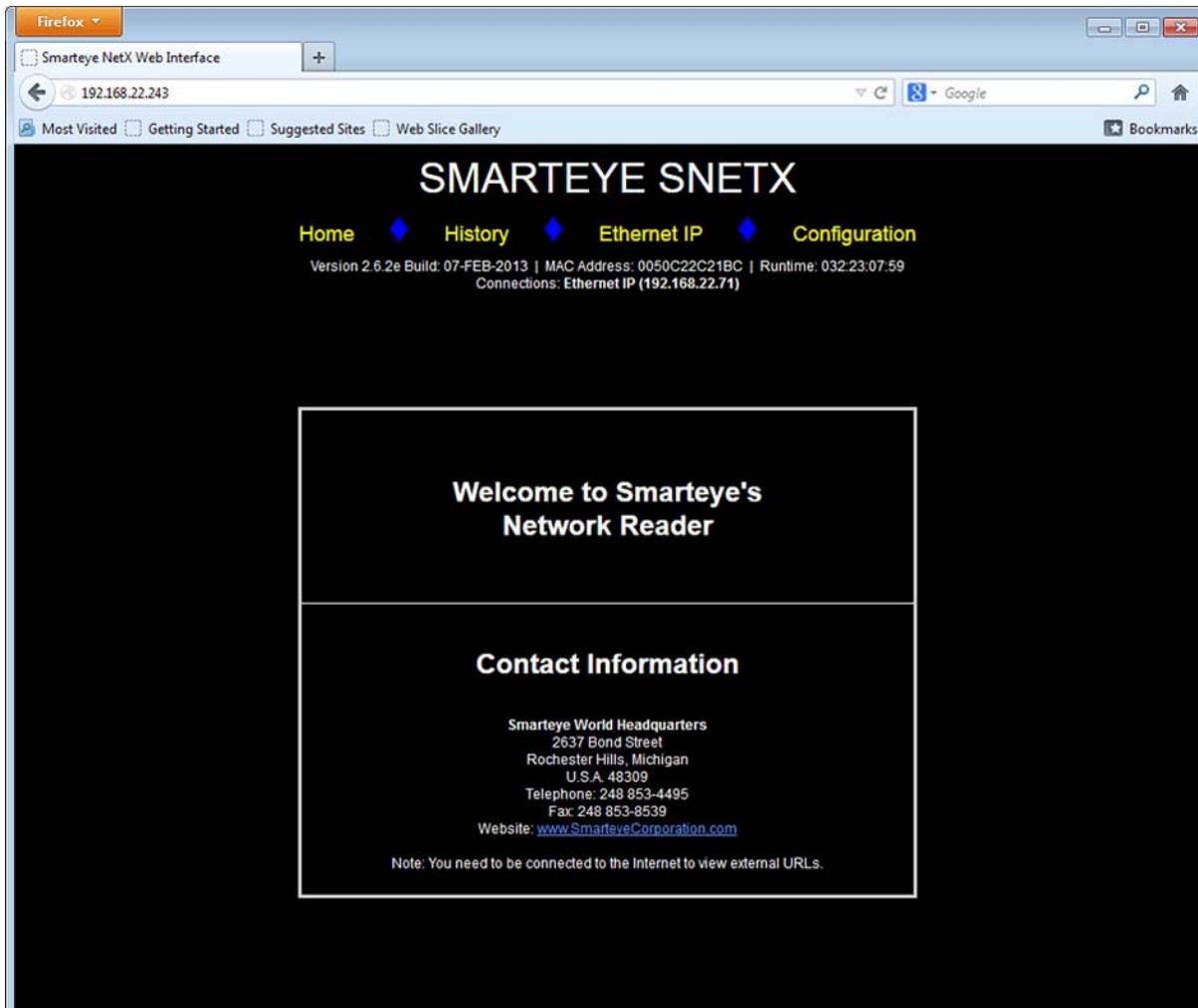
```
show % exit
```

[*SMARTEYE*]>

10.0 Smarteye Netx Control Unit Web Pages

Once the Smarteye Netx Control Unit has been connected to the plant's network, reader information can be viewed from a computer connected to the same network using a standard web browser. Enter the IP address of the unit to be viewed in the address bar of the browser as shown below.

10.1 Home webpage



The Smarteye Netx Control Unit Home page has general Smarteye Corporation contact information along with links to the other 3 WebPages.

1. History page – Displays label, error, diagnostic and alarm messages
2. Ethernet IP page – Displays Ethernet IP link information
3. Configuration page – Displays setup parameters

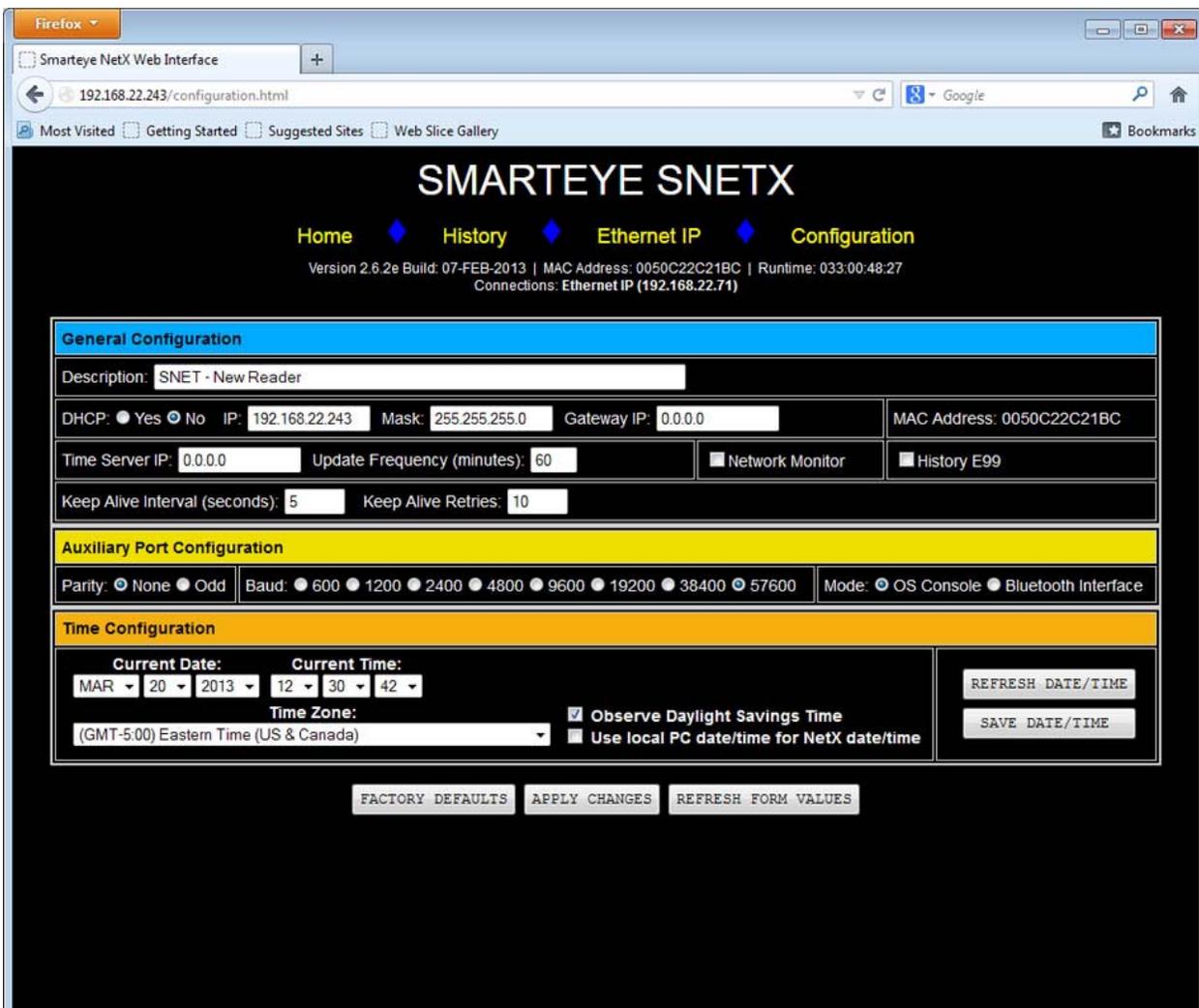
Clicking on the links will bring up the selected webpage as shown below.

10.2 Configuration webpage

The Smarteye Netx Control Unit configuration page consists of three primary configuration panes:

1. General Configuration
2. Auxiliary Port Configuration
3. Time, Date and Time Zone configuration.

The Smarteye Netx Control Unit configuration page has links to the home page, history page, and Ethernet IP information page. There are also three buttons, one for restoring the factory default configuration, one to apply changes and one for refreshing the page.



For a description of each setup parameter show above, refer to page [24](#) of this manual.

10.2.1 Setting the Date, Time and Time Zone.

The Time section of the configuration webpage is used to manually set the local date, time and time zone of the Smarteye Netx Control Unit. The control unit’s date and time only needs to be manually set if a network timeserver is not available. If a network timeserver is available, setting the date and time manually will persist only until the next timeserver update.

The Netx control unit’s internal clock will only retain the correct data and time for a maximum of 4 hours after power has been removed from the unit. If having the correct date and time displayed on the history page is important to the plant, then a network timeserver should be utilized.

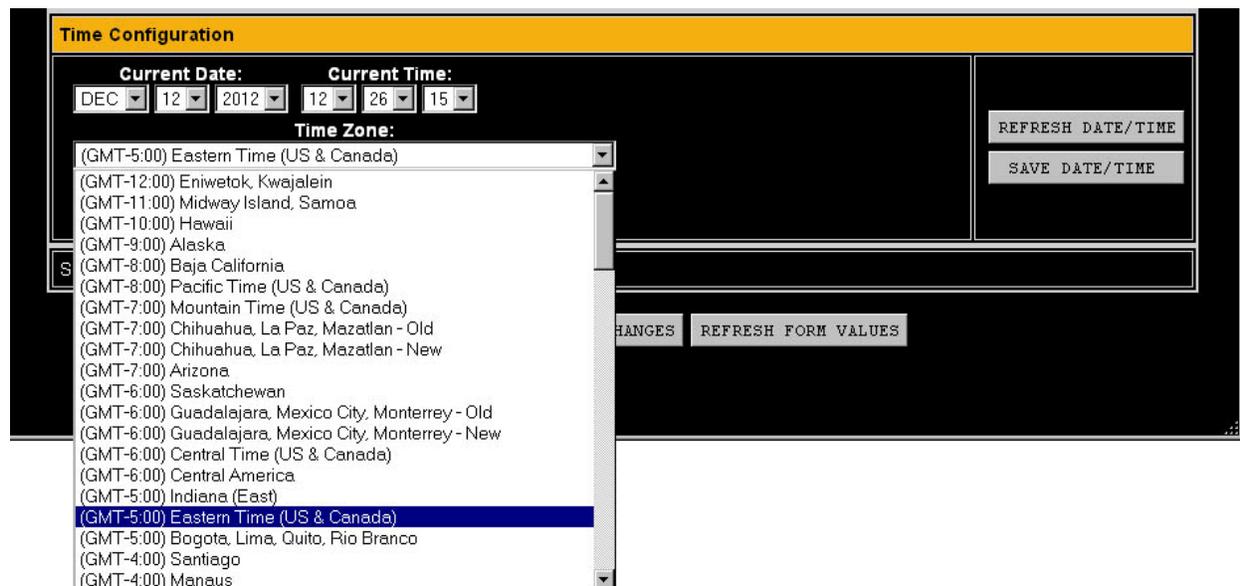
The valid date range for the Netx Control Unit is any date between the build date up to the maximum allowable date of 31-JAN-2036 (for currently shipping software). The software build date can be read from the configuration webpage located directly below the Time Configuration section.

On power up or when the date/time is being manually set, if the date value is outside of the valid range, the date will be forced to the build date and the time will be set to 12:00:00 am.

Prior to connecting to a network timeserver or manually setting the control unit’s date and time, the default date and time will be used. After setting the date and time, clicking the ‘Apply Changes’ button will set the control unit’s internal clock to the specified date and time.

If the ‘Use Local PC Date/Time for Netx Date/time’ is checked then clicking the ‘Apply Changes’ button will synchronize the Netx real time clock with the PC’s clock.

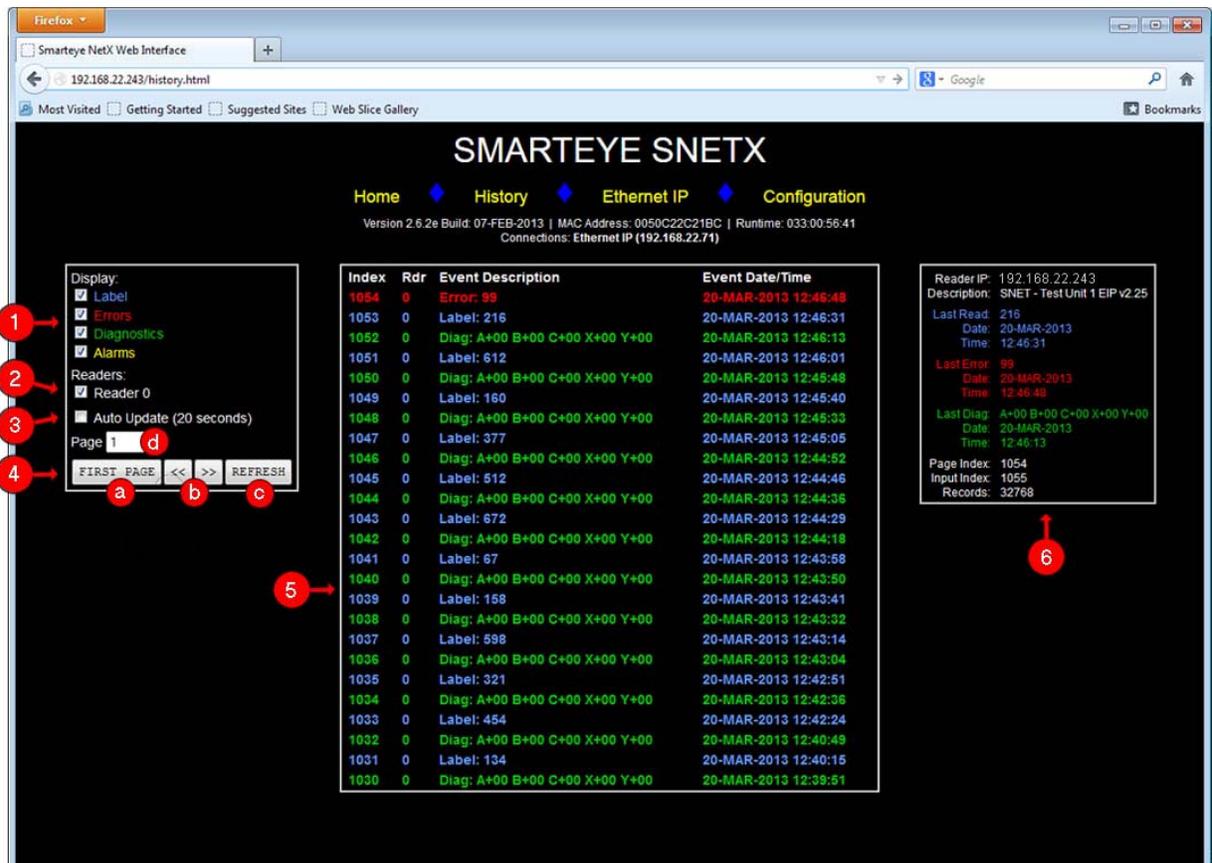
The default time zone is (GMT-5) Eastern Time (US & Canada). To change the time zone, simply select the correct time zone for your area from the drop down list as shown below:



Depending upon the time zone selected, daylight savings time (DST) may or may not be observed. If DST is not observed for the selected time zone then the ‘Automatically Adjust Clock for Daylight Saving’ check box will be disabled. If DST is observed for the selected time zone then you can choose not to observe DST by un-checking the box.

10.3 History webpage

View the read history via the example screen below.



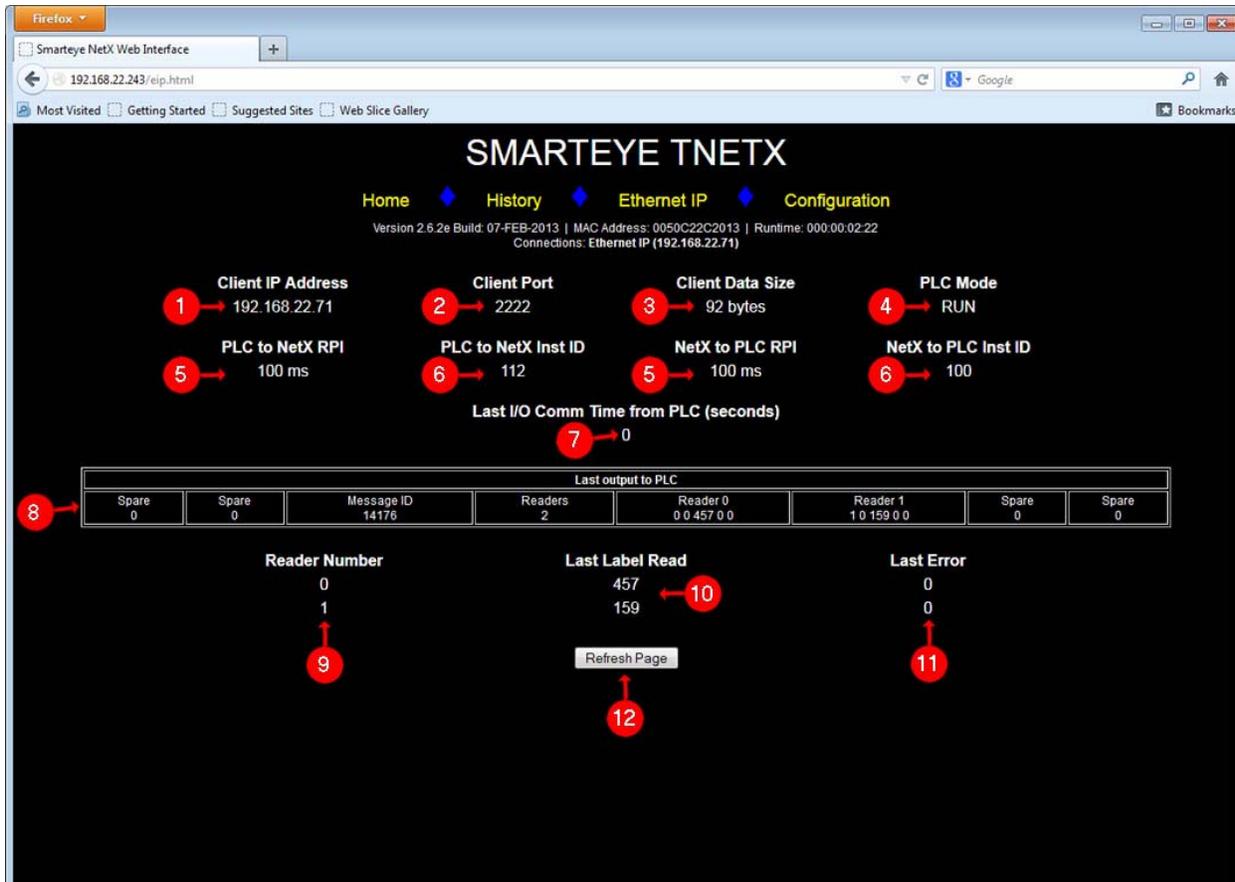
The History webpage consists of 4 main parts. The header at the top has links to the other webpages. The display controls, located on the left side (bubbles 1-4). The display pane bubble 5, located in the middle and the information pane bubble 6, located on the right hand side.

1. The Netx history data is composed of 4 message types; Labels, Errors, Diagnostic and Alarms. By default, when the webpage opens, all messages types are selected. You can choose which messages to view by checking the desired boxes. After the message type selection has been made, click the refresh button (4c) to update the display pain (5) with the new data selection(s).

2. You can also choose which readers to display. By default, when the webpage opens, all readers are selected. The number of reader check box choices depends upon the unit you're currently viewing. In the example above there is only one reader to choose from because this unit is an S-netx. There will be two readers to choice from for a T-netx and a multi-netx will have eight. After selecting the reader(s) to view, click the refresh button (4c) to update the display pain (5) with the new data.
3. Selecting the Auto-Update control will refresh the screen automatically every 20 seconds. This feature is useful when you want to keep an eye on the data but do not want to keep manually clicking the refresh button.
4. The history queue is circular and holds 32,768 entries permanently in flash memory. The history pane (5) displays 25 messages per page. The reader history displays in chronological order with the most recent entry at the top of the page. For a completely full history there are 1,310 full pages. Page 1 always shows the last 25 messages posted to the history file. Selecting the next >> or previous << buttons (4c) will move to the next or previous page. Entering a page number (1-1,310*) in the page box (4d) and clicking the refresh button (4c) will display the data for that page. To return to the first page, click the 'First Page' button (4a). ***Note:** the maximum page of 1,310 is for a completely full history, the upper or last page will actually vary and will be somewhere between 1,146 to 1,310 pages.
5. The display pane shows history messages matching the current filter criteria (1,2). The display pane consists of 4 columns: index, reader, event description and event date/time.
 - The Index column indicates the position of the message within the history file. The indices go from 0-32767. There are 8 4k pages of history for a total of 32,768 records.
 - The Reader column displays the number of the reader that generated the message. Reader numbers range from 0-7 and depends upon the Netx model. There is only one reader in an S-netx, two readers in a T-netx and eight readers in a multi-netx. Since system alarm message are not associated with a particular reader, the word 'System' will be displayed in this column instead of the reader index.
 - The Event Description column displays a description of the event along with any associated data such as label and error values.
 - The Event Date/Time column displays the local date and time for the occurrence of the event. The time is displayed in 24 hour format. This is the number of hours passed since midnight, from 0 to 23.
6. The information pane displays the description and IP address for the Netx unit along with the last label, error and diagnostic events. The page and input indices are shown at the bottom of the pane along with the history record storage capacity for the unit. The page index refers to the current page being displayed and indicates where with in the 32,768 records this page falls (index of top message on the page). The input index displays the current location of the input pointer. This is the next location in memory that a history event message will be written to

10.4 Ethernet IP Information webpage

The Ethernet IP webpage displays information pertaining to the connection between the Netx Controller and the PLC



1. This field shows the IP address of the client PLC currently connected to the Netx Control Unit on port 44818. If there isn't a PLC connection this field will say, 'No current connection'. Although the PLC connects on port 44818, the actual data I/O is sent and received on port 2222.
2. This field shows the client UDP port used for transferring I/O data between the PLC and the Netx Control Unit. This is a fixed port number and is always 2222.
3. This field shows the client data size in words. The size is a fixed length of 46 words.
4. This field shows the current mode of the PLC. The two possible values for this field are 'RUN' and 'PROGRAM'.
5. These two fields show the requested packet interval (RPI) in milliseconds from the PLC to the Netx (on the left) and Netx to PLC (on the right). 100ms is the minimum value allowed for both parameters.

6. These two fields show the instance ID number for the PLC to Netx (on the left) and Netx to PLC (on the right). Both these values are fixed and should not be changed. The PLC interface logic must match these values.
7. This field represents the elapsed time in seconds since the last I/O message was received from the PLC. This value should always be less than or equal to 1. If this value is greater than 1 then communications between the Netx and PLC has faulted.
8. This field shows the last data packet sent from the Netx unit to the PLC.
9. This field shows the reader number for the label and error information that follows. In this example, there are two readers shown because the Netx unit we are connected to is a T-netx. There will be a single reader shown for the S-netx and eight readers shown for a multi-netx.
10. This field shows the last label read by each of the readers in the Netx controller. If the reader has not read a label since the last reboot then the last label read field will display a zero.
11. This field shows the last error generated by each of the readers in the Netx controller. On power-up, the Netx controller generates a power-up error for each reader. Therefore a zero in this field means there have been no other errors since the last reboot other than the initial power-up error.
12. The 'Refresh Page' button updates the page with the most current data.

11.0 Power-Up

After the Smarteye Netx Control Unit has been mounted and the DC power is terminated, an initial checkout can be completed.

When power is applied, the Smarteye Netx Control Unit reads the setup configuration and initializes its internal data. It then waits for a connection from the PLC on port 44818. After a connection has been established the Netx Control Unit will begin sending data to the PLC.

The Smarteye Netx Control Unit always creates an 'error 0' message for each reader at power-up.

12.0 Communication

The Smarteye Netx Control Unit has two communication channels: the Ethernet IP control port and the auxiliary port. The Ethernet control port accepts connections from a programmable controller and provides the host system with label information from the Smarteye readers. The auxiliary port connects to a user display terminal or laptop computer and is used for troubleshooting. With the Smarteye Bluetooth option, the auxiliary port can be set up to function as a Bluetooth interface. In this mode, a Bluetooth enabled device in conjunction with Smarteye's Bluetooth interface software, can be used to acquire real-time reader activity and historical data wirelessly.

12.1 Ethernet IP Control Port Operation

The Smarteye Netx Control Unit communicates over the Ethernet IP network to the control system PLC. The Netx Control Unit is setup as a server and listens for in-coming connection request on port 44818. After a connection has been established, the Netx Control Unit will begin sending I/O data to the PLC using UDP messages on port 2222.

Most of the configuration settings required to get the Netx Control Unit communicating over Ethernet IP with the PLC is done on the PLC side. The Netx Control Unit only needs its' network parameters set to match the parameters of the network it will reside on. The Netx's IP address, network mask, and gateway (if required) will need to be configured before it can communicate with the PLC.

For the Ethernet IP port interconnection diagram (cable pin out configuration), refer to the Ethernet connection Wiring Details in 'Appendix'.

12.2 Auxiliary Port Operation

The auxiliary port is used to display reader activity and for system inquiries. The auxiliary port is factory configured to communicate in the RS232 standard. The baud rate and parity used for the auxiliary port is user selectable. The factory default settings for the auxiliary port are RS232, 57600 baud, 8 bits, 1 stop bit and no parity. For the auxiliary port interconnection diagram, refer to the Auxiliary Port Wiring Details in the 'Appendix'. If the Bluetooth interface option is purchased, the auxiliary port is configured for Bluetooth data mode.

13.0 Diagnostic Enable

A diagnostic message contains five numbers which indicate whether the reader needs maintenance. An ideal diagnostic reading is:

A	B	C	X	Y
+5	+5	+5	0	0

Diagnostic numbers are acceptable if they are within ± 5 of the perfect reading shown above. If an acceptable reading is unobtainable, check the Smarteye Reader User Manual for alignment information.

The Smarteye Netx Control Unit calculates a diagnostic message each time a label passes by one of its readers. The diagnostic message is transmitted to the host only after the control unit receives an L (lock command) or diagnostic is configured to ON. Once the reader is locked in diagnostic mode, then each time a label passes a reader, a diagnostic message is transmitted to the host. The diagnostic message comes in addition to any messages (label message, error message, etc.), which would appear if the reader were not in diagnostic mode.

The U (unlock) command disables diagnostic mode for the reader selected. Upon power-up, diagnostic mode is disabled for the reader. This is only true if diagnostic is configured to OFF.

14.0 Error Messages

<u>Error Code</u>	<u>Meaning</u>
00	Control Unit just powered up
01	Unrecognizable label, too much data obtained.
04	Unrecognizable label, front and back bits = 0.
05	Unrecognizable label, front and back bits = 1.
Note: Errors 01, 04, and 05 can be the result of parts of a carrier breaking the photoeye beams.	
06	Unrecognizable label, incorrect parity. Check label for obstructions.
10	Unrecognizable host message received.
15	Unrecognizable label, incorrect Hamming code. Check label for obstructions.
16	Unrecognizable label, more than 5 leading zeros.
17	Host message received w/o <cr> terminator.
19	Overload of input data from readers.
20	Checksum error in host message received.
30-39	Unrecognizable label, incorrect number of data bits. LSD (least significant digit) of error is the LSD of the number of data bits in the label read.

Errors 91 through 99 are detected during diagnostic:

- 91 Photoeye A, insufficient number of transitions in time allowed.
- 92 Photoeye B, insufficient number of transitions in time allowed.
- 93 Photoeyes A and B, insufficient number of transitions in time allowed.
- 94 Photoeye C, insufficient number of transitions in time allowed.
- 95 Photoeyes A and C, insufficient number of transitions in time allowed.
- 96 Photoeyes B and C, insufficient number of transitions in time allowed.

Note: Errors 91, 92, and 94 indicate that a photoeye is not transitioning while the other two photoeyes are. Check reader height, photoeye operation, and reader wiring.

- 99 Diagnostic attempt aborted, acceptable hole pattern not found, probably due to label speed variation. E99 is sent to the control system if diagnostic mode is enabled in the setup or an 'L' or 'C' command has been sent to the control unit.

Appendix A S-netx SP4002 Drawings

Sender/Receiver Cable Details for Local Mounting Applications – SP1054/01-417

This drawing shows the wiring details for a locally mounted reader.

Sender/Receiver Cable Details for Remote Mount Applications –SP1054/01-418

This drawing shows the wiring details for a remotely mounted reader using a customer supplied junction box.

S-netx Installation Details No-Power over Ethernet– SP4002/01-420

This drawing shows the mounting dimensions of the S-netx.

S-netx Connection Wiring Details No-Power over Ethernet– SP4002/01-410

This drawing shows the location and wiring details for the Ethernet and power connections.

S-netx Installation Details Power over Ethernet – SP4002/02-420

This drawing shows the mounting dimensions of the S-netx.

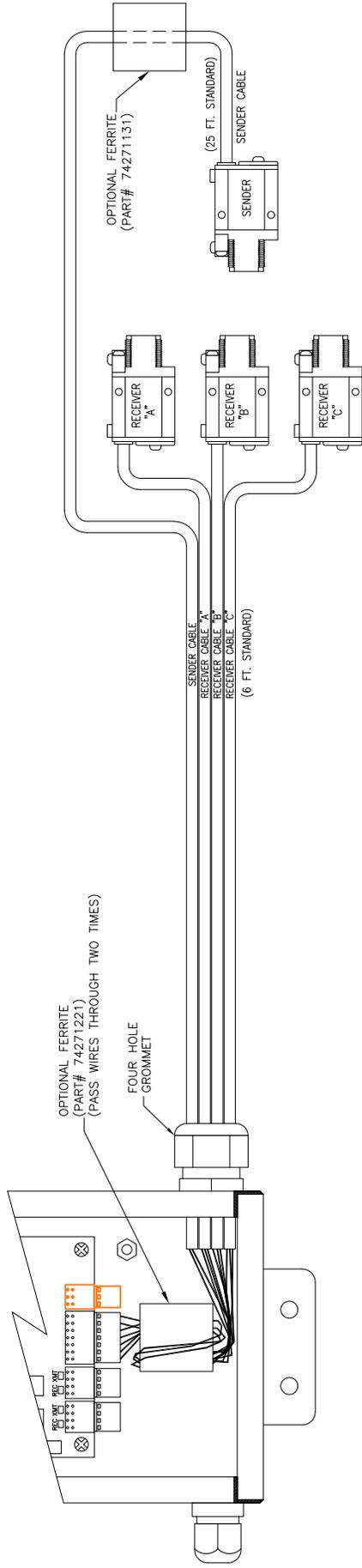
S-netx Connection Wiring Details Power over Ethernet – SP4002/02-410

This drawing shows the location and wiring details for the Ethernet connection.

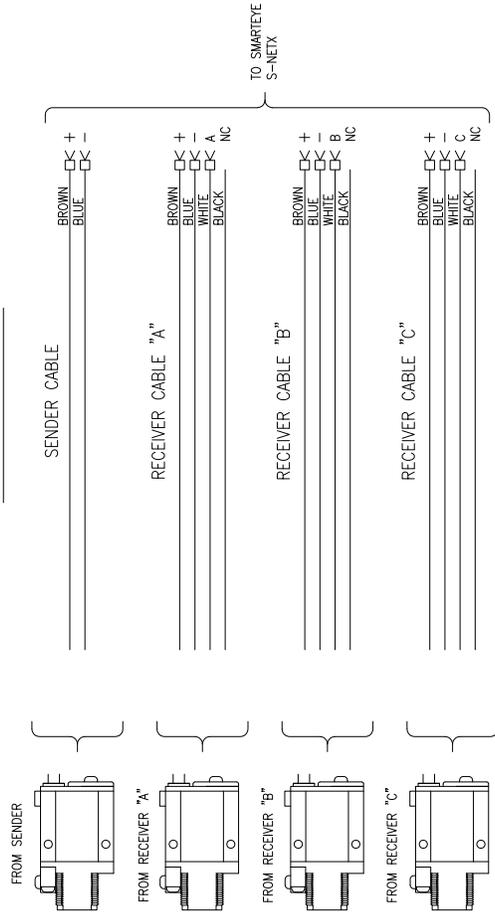
S-netx Auxiliary and Communication Port Wiring Details – SP4002/01-411

This drawing shows the wiring details for the auxiliary and communication port for all S-netx models.

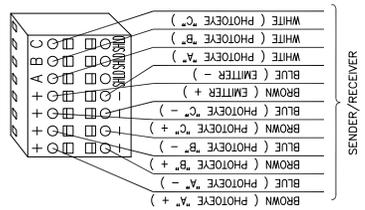
REV	DESCRIPTION	DATE	APPR. BY
0	INITIAL RELEASE	01/16/09	MDB



CABLE DETAILS



S-NETX CONNECTION DETAILS



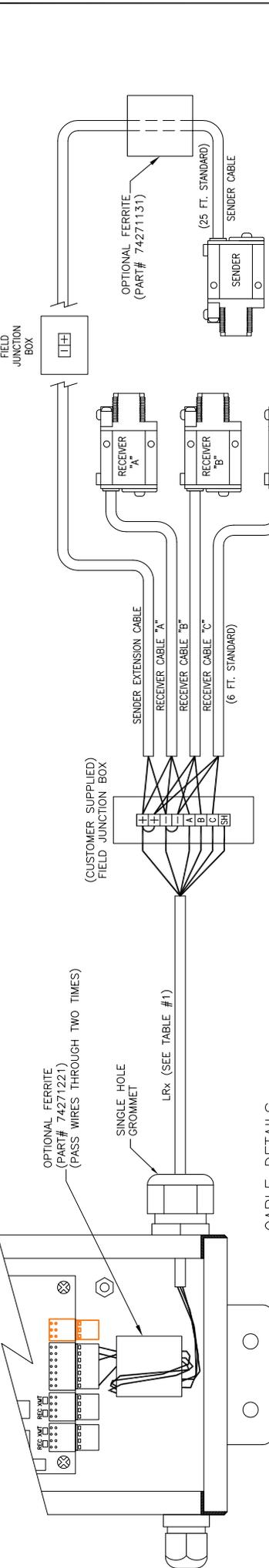
LEGEND

◻ - PLUG-IN CAGE CLAMP TERMINATION
 NC - NO CONNECTION

2637 BOND STREET ROCHESTER HILLS, MICHIGAN 48309
 PHONE (248) 853-4468 FAX (248) 853-8539

DRAWN BY: RSA TITLE: MDB SMARTEYE SENDER / RECEIVER
 CHECKED BY: MDB SMARTEYE SENDER / RECEIVER
 ENGINEER: MDB CABLE DETAILS FOR S-NETX
 DATE: 09/22/08 LOCAL INSTALLATION
 SHEET 1 OF 1
 SCALE: NTS DRAWING NO. SP1054/01-417
 SIZE: D

REV	DESCRIPTION	DATE	APPR. BY
0	INITIAL RELEASE	01/16/09	MDB



OPTIONAL FERRITE (CUSTOMER SUPPLIED) FIELD JUNCTION BOX

OPTIONAL FERRITE (PART# 74271131)

SENDER CABLE (25 FT. STANDARD)

SENDER

RECEIVER "A"

RECEIVER "B"

RECEIVER "C"

SENDER EXTENSION CABLE

RECEIVER CABLE "A"

RECEIVER CABLE "B"

RECEIVER CABLE "C"

(6 FT. STANDARD)

(CUSTOMER SUPPLIED) FIELD JUNCTION BOX

TO SMARTEYE S-NETX

NOTES:

- 1) BELDEN 9773 CABLE PAIRED AS FOLLOWS:
BLACK 1 IS PAIRED WITH RED
BLACK 2 IS PAIRED WITH WHITE
BLACK 3 IS PAIRED WITH GREEN
- 2) GREEN IS NOT USED (SEE CABLE DETAIL LRx)
- 3) THE SHIELD OF CABLE LRx MUST BE CONNECTED AT ONE END ONLY. THE SH TERMINAL IN THE REMOTE JUNCTION BOX IS FOR LANDING THE SHIELD WIRE ONLY. IT IS NOT CONNECTED TO GROUND.

THE SHIELD OF CABLE LRx NORMALLY CONNECTED TO 24V GROUND AT THE S-NETx CIRCUIT BOARD VIA JUMPER JT-8. IN A NOISY ELECTRICAL ENVIRONMENT, IT MAY BE NECESSARY TO CONNECT THE SHIELD AT THE REMOTE JUNCTION BOX. REFER TO THE 'REMOTE READER MOUNTING' SECTION OF THE USER MANUAL FOR DETAILS.

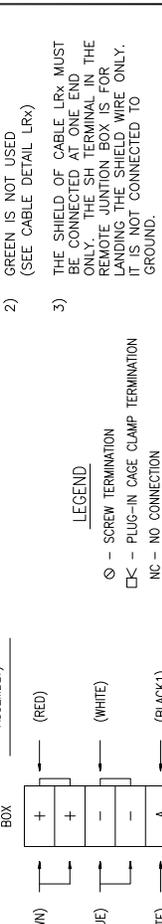
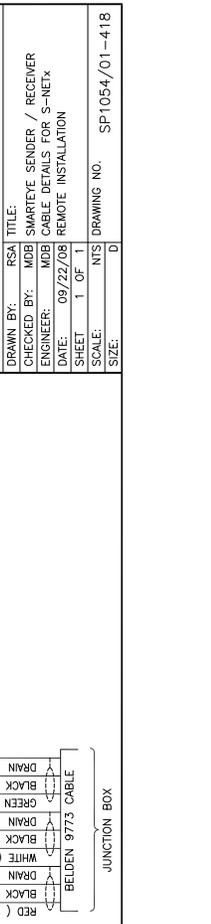
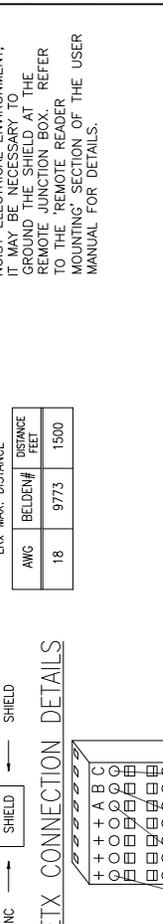


TABLE #1

CABLE TYPE AND LRx MAX. DISTANCE

AWG	BELDEN#	DISTANCE FEET
18	9773	1500

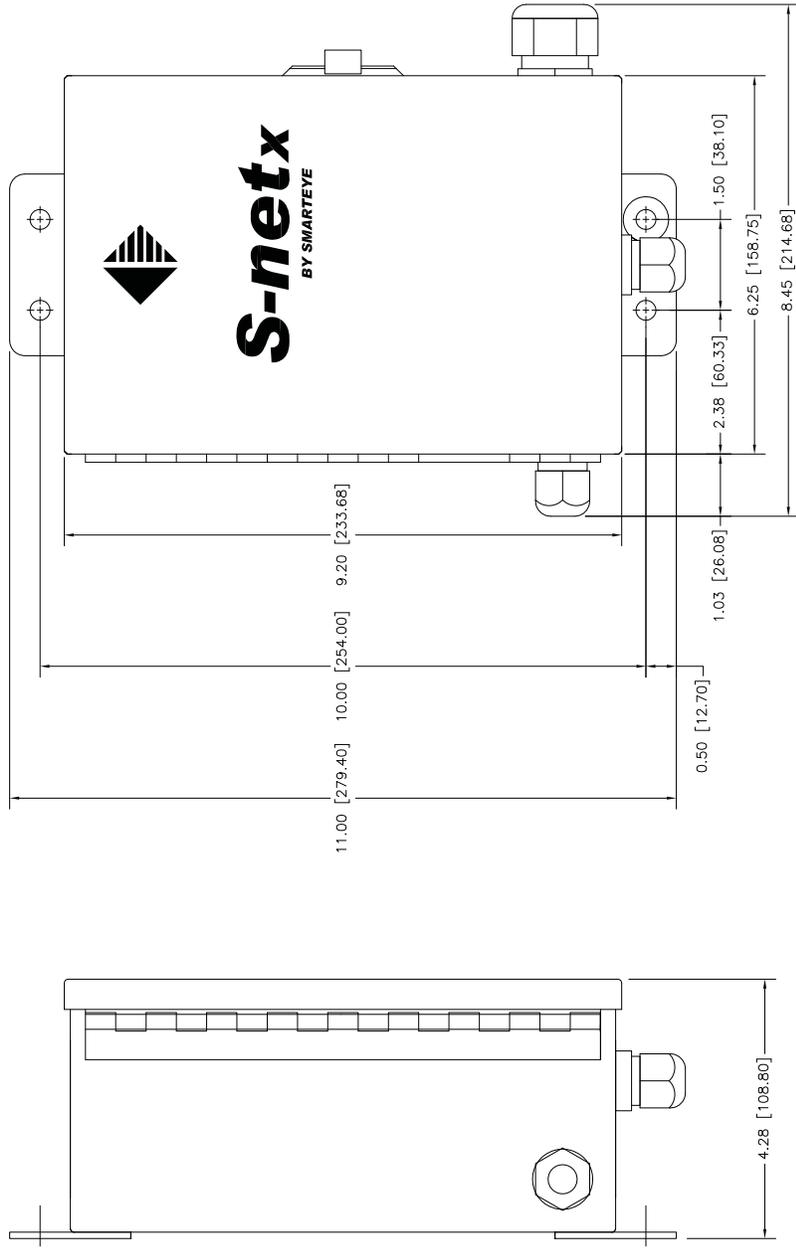


SMARTEYE CORPORATION

2637 BOND STREET ROCHESTER HILLS, MICHIGAN 48309
PHONE (248) 853-4468 FAX (248) 853-8539

DRAWN BY: RSA TITLE:
CHECKED BY: MDB SMARTEYE SENDER / RECEIVER
ENGINEER: MDB CABLE DETAILS FOR S-NETx
DATE: 09/22/08 REMOTE INSTALLATION
SHEET 1 OF 1
SCALE: NTS DRAWING NO. SP1054/01-418
SIZE: D

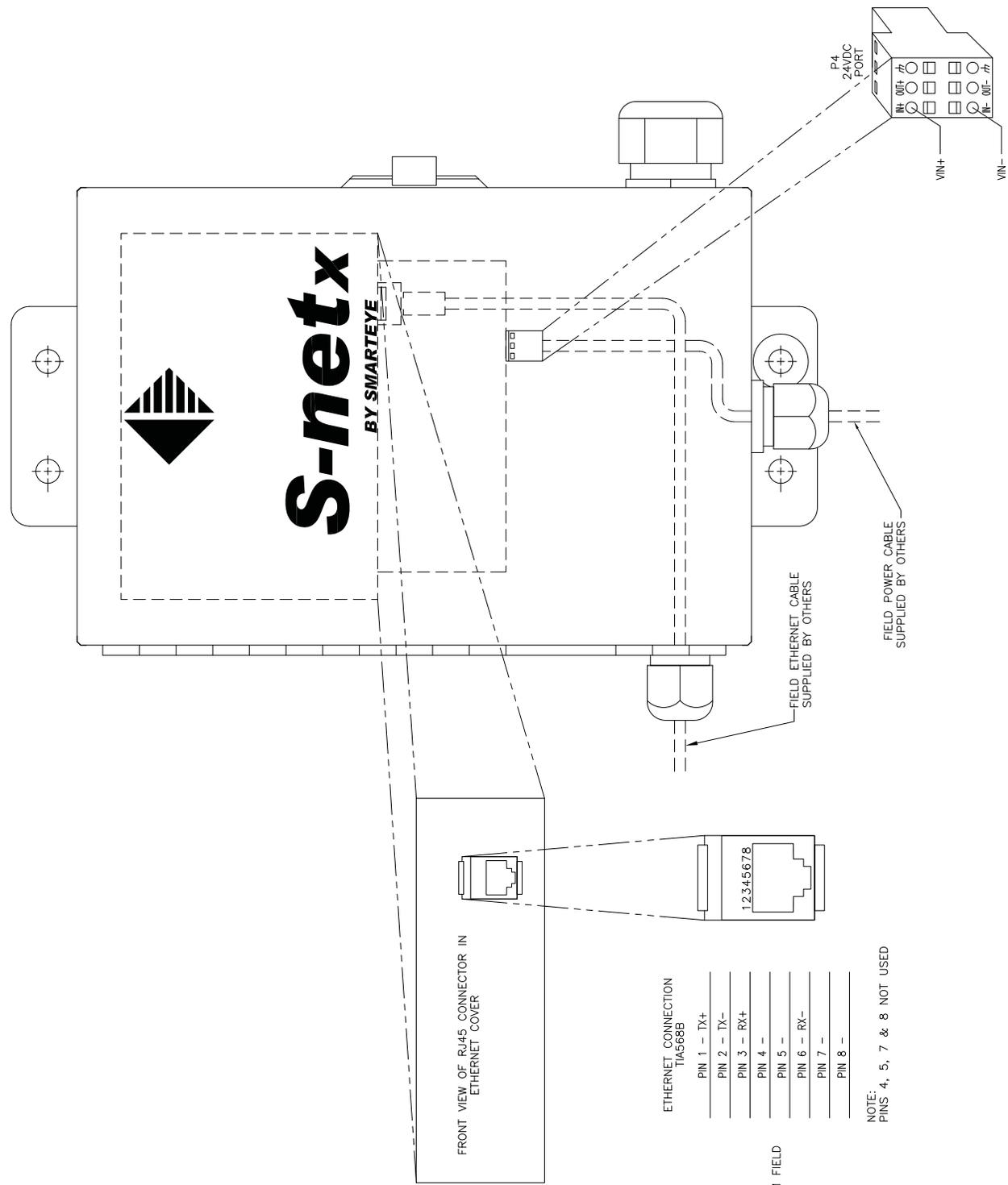
REV	DESCRIPTION	DATE	APPR. BY
0	INITIAL RELEASE	09/22/08	MDB



SMARTEYE
CORPORATION
2637 BOND STREET ROCHESTER HILLS, MICHIGAN 48309
PHONE (248) 853-4495 FAX (248) 853-8539

DRAWN BY: RSA TITLE:
CHECKED BY: MDB SMARTEYE S-NETX
ENGINEER: MDB W/ ETHERNET (NO P.O.E.)
DATE: 09/18/08
SHEET 1 OF 1 - INSTALLATION DETAILS
SCALE: 1" = 1" DRAWING NO. SP4002/01-420
SIZE: 0

REV	DESCRIPTION	DATE	APPR. BY
0	INITIAL RELEASE	10/27/08	MDB



FRONT VIEW OF RJ45 CONNECTOR IN
ETHERNET COVER

ETHERNET CONNECTION
TIA568B

PIN 1	- TX+
PIN 2	- TX-
PIN 3	- RX+
PIN 4	-
PIN 5	-
PIN 6	- RX-
PIN 7	-
PIN 8	-

FROM FIELD

NOTE:
PINS 4, 5, 7 & 8 NOT USED



SMARTEYE
CORPORATION
2637 BOND STREET ROCHESTER HILLS, MICHIGAN 48309
PHONE (248) 853-4468 FAX (248) 853-8539

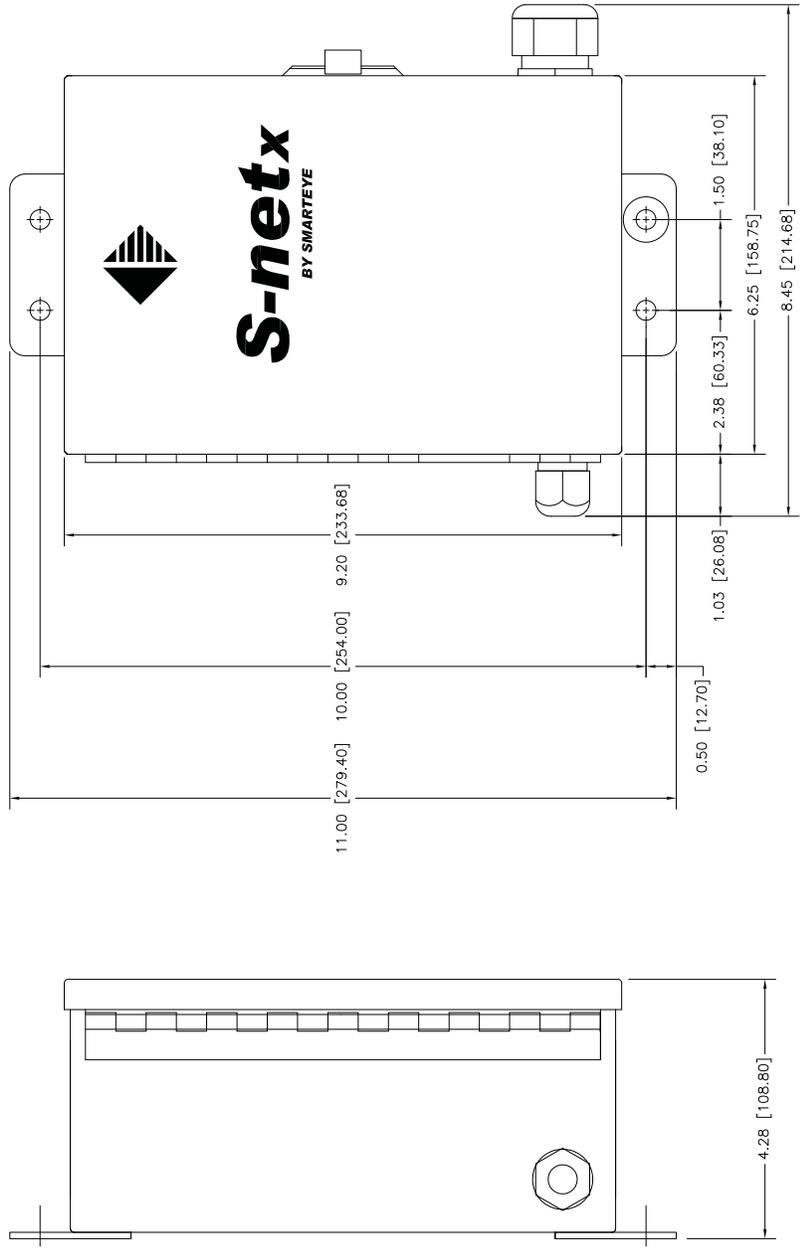
DRAWN BY:	RSA	TITLE:
CHECKED BY:	MDB	SMARTEYE S-NETX
ENGINEER:	MDB	WITH ETHERNET
DATE:	10/27/08	NOT POWERED OVER ETHERNET
SHEET:	1 OF 1	- FIELD CONNECTION DETAILS
SCALE:	1" = 1"	DRAWING NO.
SIZE:	0	SP4002/01-410



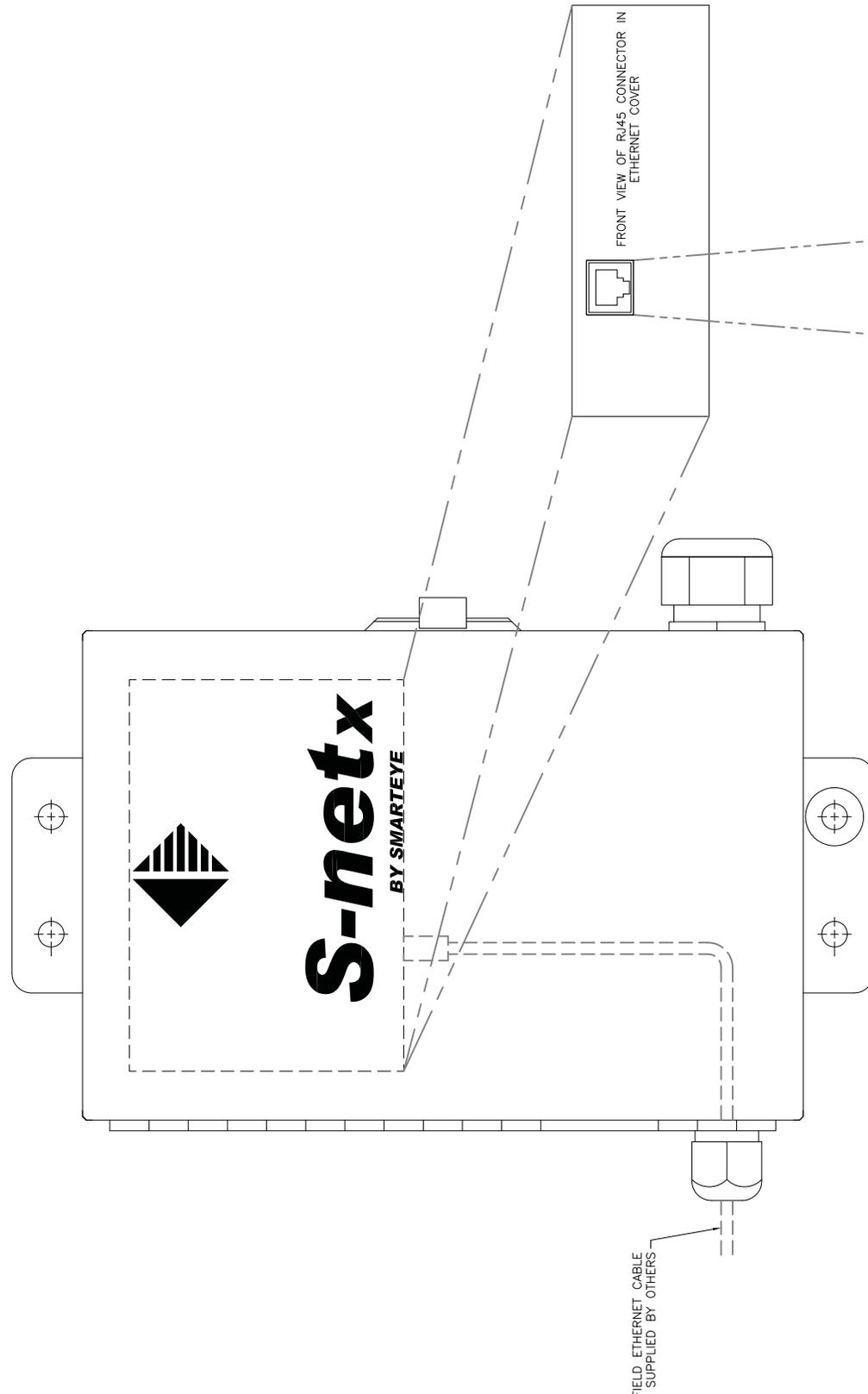
2637 BOND STREET ROCHESTER HILLS, MICHIGAN 48309
PHONE (248) 853-4495 FAX (248) 853-8539

DRAWN BY:	RSA	TITLE:	
CHECKED BY:	MDB	SMARTEYE S-NETx	
ENGINEER:	MDB	W/ ETHERNET (802.3af P.O.E.)	
DATE:	09/18/08		
SHEET:	1 OF 1		
SCALE:	1" = 1"		
SIZE:	D	DRAWING NO.	SP4002/02-420

REV	DESCRIPTION	DATE	APPR. BY
0	INITIAL RELEASE	09/19/08	MDB



REV	DESCRIPTION	DATE	APPR. BY
0	INITIAL RELEASE	09/19/08	MDB



ETHERNET CONNECTION
TIA568B

PIN 1	- TX+
PIN 2	- TX-
PIN 3	- RX+
PIN 4	-
PIN 5	-
PIN 6	- RX-
PIN 7	-
PIN 8	-

FROM FIELD

NOTE:
POWER SUPPLIED PER IEEE 802.3af SPECIFICATION (48VDC NOMINAL)

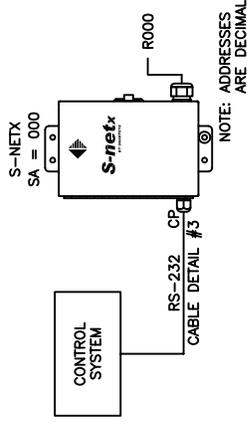


SMARTEYE
CORPORATION
2637 BOND STREET ROCHESTER HILLS, MICHIGAN 48309
PHONE (248) 853-4488 FAX (248) 853-8539

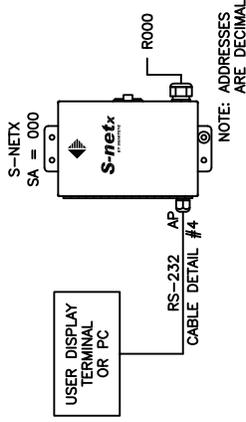
DRAWN BY: RSA TITLE:
CHECKED BY: MDB SMARTEYE S-NETx
ENGINEER: MDB W/ ETHERNET (802.3af P.O.E.)
DATE: 09/18/08
SHEET 1 OF 1 - FIELD CONNECTION DETAILS
SCALE: 1" = 1" DRAWING NO. SP4002/02-410
SIZE: 0

REV	DESCRIPTION	DATE	APPR. BY
0	INITIAL RELEASE	09/22/08	MDB
1	REVISED CONNECTOR DETAIL AT S-NETX	01/06/09	MDB
2	REVISED TO SHOW MULTIPLE COMMUNICATION CONFIGURATIONS	01/27/11	MDB
3	REVISED DETAIL (3) PINOUT	07/21/11	MDB

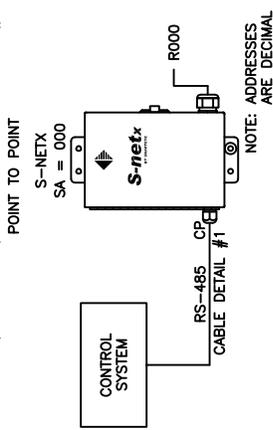
(RS-232) CONFIGURATION



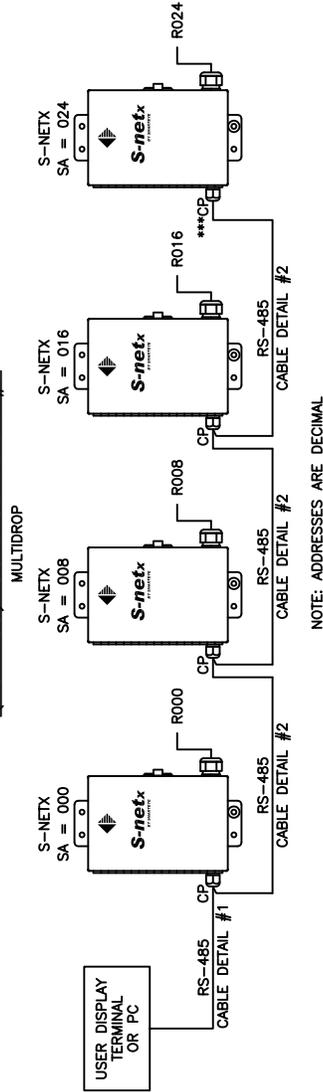
AUXILIARY PORT CONFIGURATION



(RS-485) CONFIGURATION #1



(RS-485) CONFIGURATION #2



LEGEND

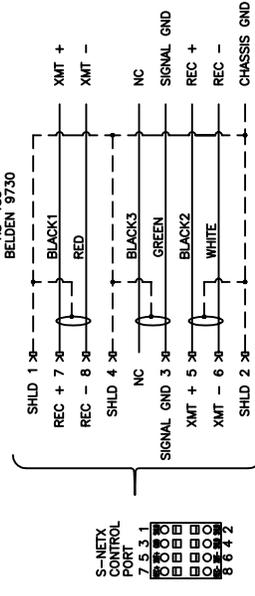
- IK = SPRING LOCK TERMINATION
- *** = INDICATES LINE TERMINATION INSTALLED
- NC = NO CONNECTION
- SA = STARTING ADDRESS OF S-NETX
- CP = CONTROL PORT
- AP = AUXILIARY PORT

NOTES:

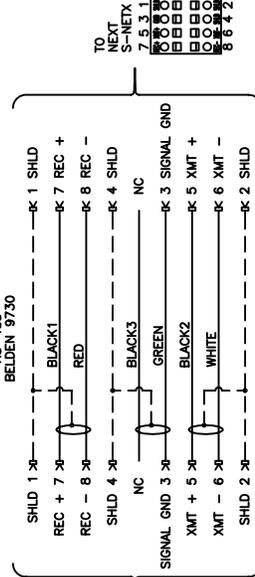
1. MAXIMUM LENGTH OF RS-485 IS 4000'
2. MAXIMUM LENGTH OF RS-232 IS 50'
3. THE LAST S-NETX ON THE MULTIDROP LINE MUST HAVE LINE TERMINATION
4. IN THE MULTIDROP CONFIGURATION EACH S-NETX MUST HAVE A UNIQUE STARTING ADDRESS
5. SEE THE NETX USER MANUAL FOR ADDRESSING DETAILS

CABLE DETAILS

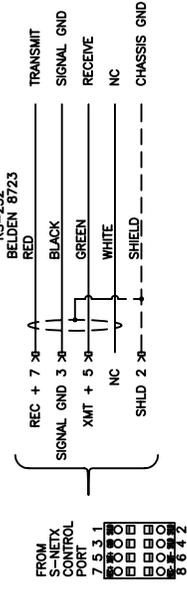
DETAIL (1)



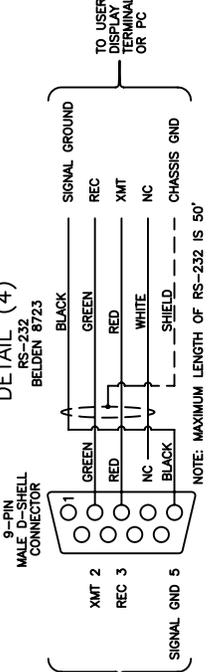
DETAIL (2)



DETAIL (3)



DETAIL (4)



SMARTEYE CORPORATION
 2837 BOND STREET ROCHESTER HILLS, MICHIGAN 48309
 PHONE (248) 853-4468 FAX (248) 853-8539

DRAWN BY: RSA TITLE:
 CHECKED BY: MDB SMARTEYE S-NETX
 ENGINEER: MDB AUXILIARY COMMUNICATION PORT AND CONTROL COMMUNICATION PORT
 DATE: 01/27/11
 SHEET 1 OF 1 WIRING DETAILS
 SCALE: NTS DRAWING NO. SP-4002/01-411
 SIZE: D

Appendix B T-netx SP4050 Series Drawings

Sender/Receiver Cable Details – SP1054/01-419

This drawing shows the wiring details for a reader using a customer supplied junction box.

T-netx Installation Details – SP4050/01-420

This drawing shows the mounting dimensions of the T-netx.

T-netx Connection Wiring Details No-Power over Ethernet– SP4050/01-410

This drawing shows the location and wiring details for the Ethernet and power connections for T-netx models SP4050/01 and SP4051/01.

T-netx Connection Wiring Details Power over Ethernet – SP4050/02-410

This drawing shows the location and wiring details for the Ethernet connection for T-netx models SP4050/02/01 and SP4051/02.

T-netx NEMA-12 Installation Details – SP4051/01-420

This drawing shows the mounting dimensions of the T-netx.

T-netx NEMA-12 Connection Wiring Details 110/220 VAC Power – SP4051/04-410

This drawing shows the location and wiring details for the Ethernet and power connections.

T-netx Auxiliary and Communication Port Wiring Details – SP4050/01-411

This drawing shows the wiring details for the auxiliary and communication port for all T-netx models.

.

REV	DESCRIPTION	DATE	APPR. BY
0	INITIAL RELEASE	11/21/08	JLD
1	ADDED OPTIONAL FERRITE ON SENDER CABLE	01/16/09	MDB
2	ADDED CONNECTOR DETAIL		

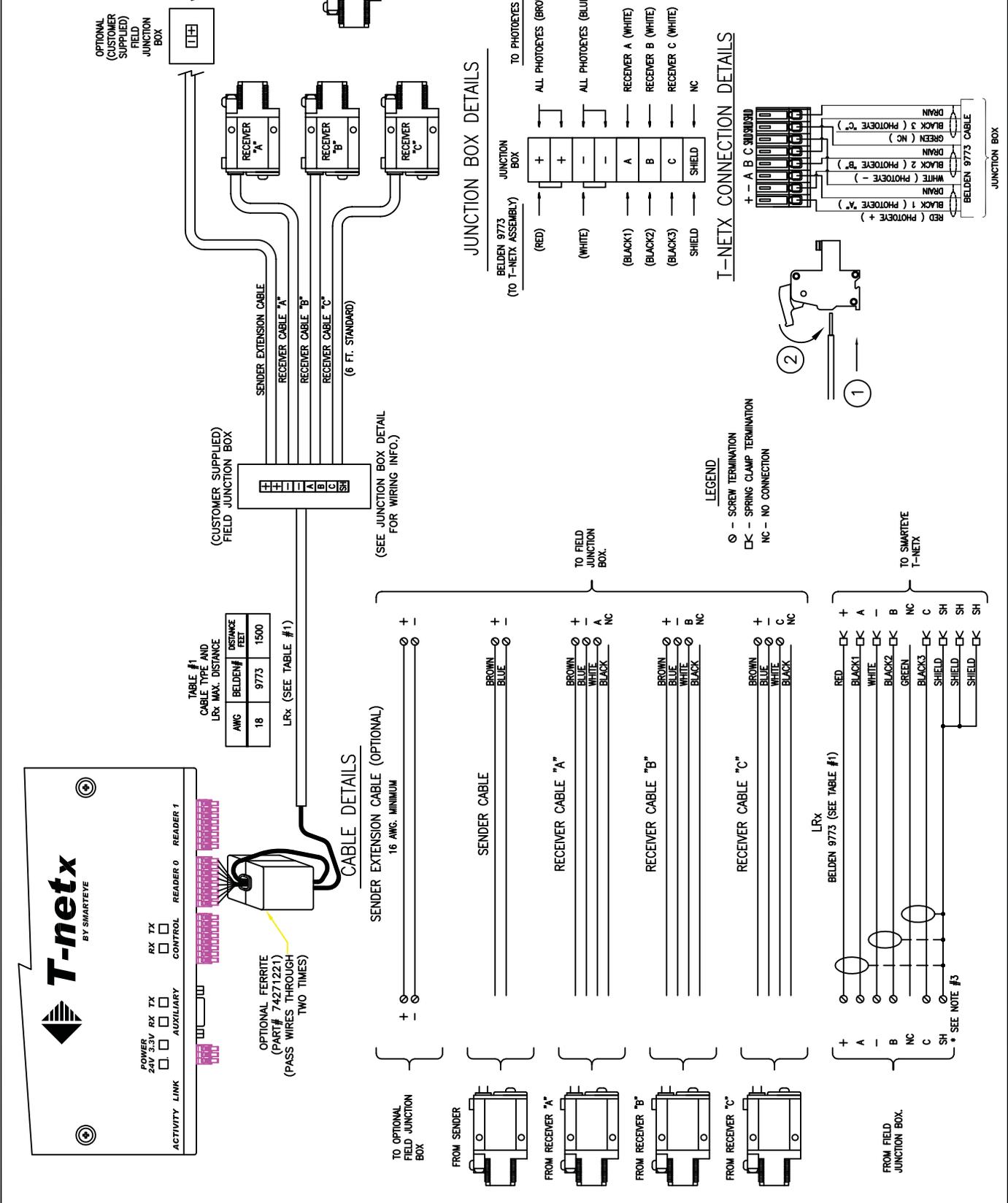
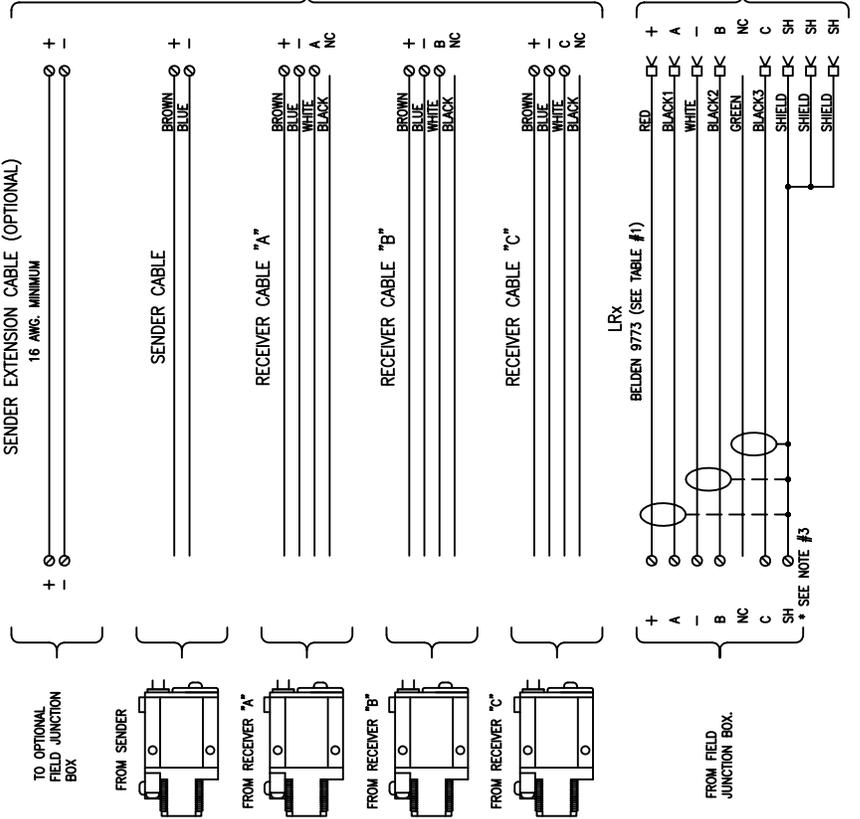


TABLE #1 AND CABLE TYPE AND LRx MAX. DISTANCE

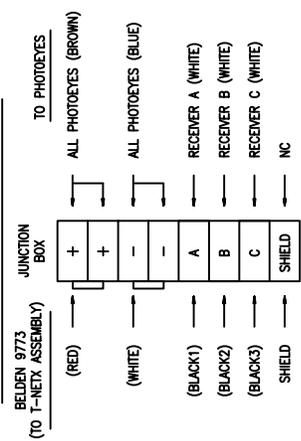
AWG	BELDEN#	DISTANCE FEET
18	9773	1500

Lrx (SEE TABLE #1)

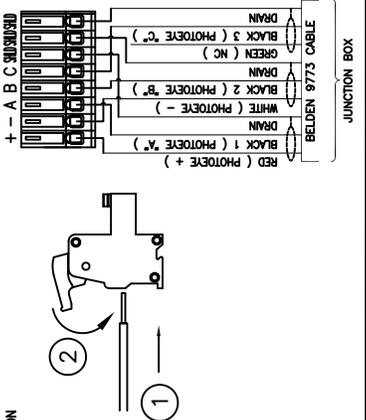
CABLE DETAILS



JUNCTION BOX DETAILS



T-NETX CONNECTION DETAILS



- NOTES:
- 1) BELDEN 9773 CABLE PAIRED AS FOLLOWS:
BLACK 1 IS PAIRED WITH RED
BLACK 2 IS PAIRED WITH WHITE
BLACK 3 IS PAIRED WITH GREEN
 - 2) GREEN IS NOT USED (SEE CABLE DETAIL LRx)
 - 3) THE SHIELD OF CABLE LRx MUST BE CONNECTED AT ONE END ONLY. THE SH TERMINAL IN THE REMOTE JUNCTION BOX IS FOR LANDING THE SHIELD WIRE ONLY. IT IS NOT CONNECTED TO GROUND.

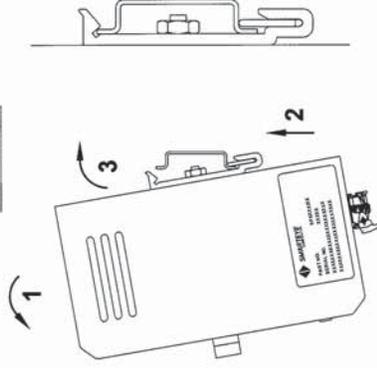
THE SHIELD OF CABLE LRx NORMALLY CONNECTED TO 24V GROUND AT THE T-NETX CIRCUIT BOARD VIA JUMPER JT-8. IN A NOISY ELECTRICAL ENVIRONMENT, IT MAY BE NECESSARY TO GROUND THE SHIELD AT THE REMOTE JUNCTION BOX. REFER TO THE 'READER MOUNTING' SECTION OF THE USER MANUAL FOR DETAILS.

2637 BOND STREET ROQUETTE HILLS, MICHIGAN 48309
PHONE (248) 853-4488 FAX (248) 853-8539

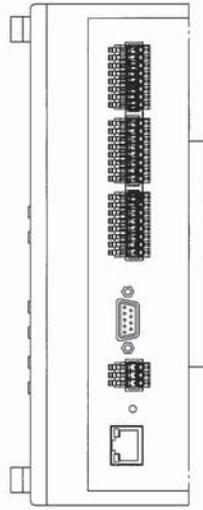
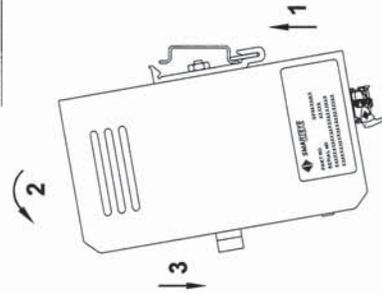
DRAWN BY: RSA TITLE:
CHECKED BY: MDB SMARTEYE SENDER / RECEIVER
ENGINEER: MDB CABLE DETAILS FOR T-NETX
DATE: 11/13/08
SHEET 1 OF 1
SCALE: NTS DRAWING NO. SP-1054/01-419
SIZE: D

REV	DESCRIPTION	DATE	APPR. BY
0	INITIAL RELEASE	07/17/08	MOB
1	ADDED "X" TO SH-SCREEN	01/16/09	MOB
2	ADDED T-NETX MOUNTING AND REMOVAL INSTRUCTIONS	05/19/10	MOB
3	REVISED DIN RAIL MTC CLIP	01/11/17	<i>[Signature]</i>

MOUNTING T-NETX ONTO DIN RAIL



REMOVING T-NETX FROM DIN RAIL



SMARTEYE CORPORATION
 2637 BOND STREET ROCHESTER HILLS, MICHIGAN 48309
 PHONE (248) 653-4495 FAX (248) 653-6539

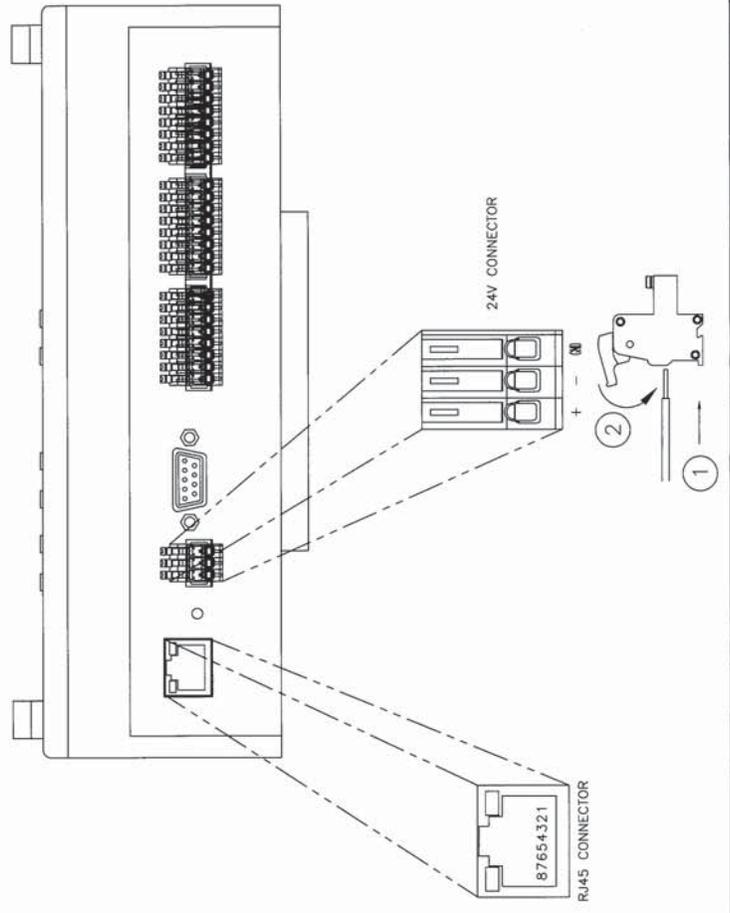
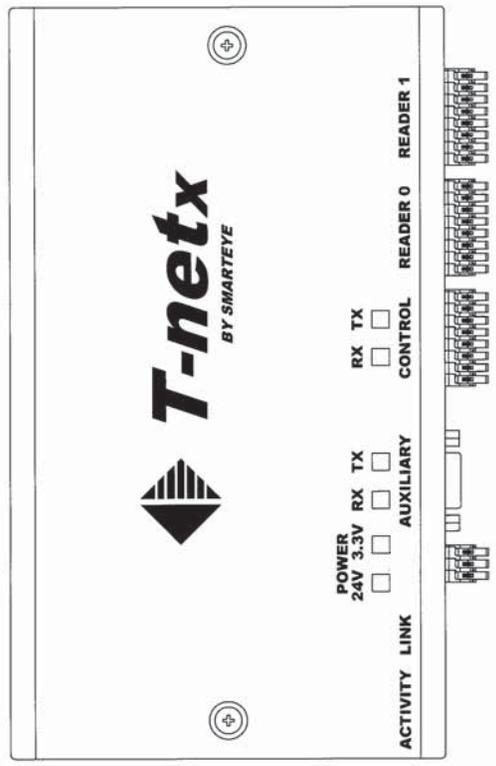
DRAWN BY: RSA
 CHECKED BY: MOB
 ENGINEER: MOB
 DATE: 06/19/08
 SHEET: 1 OF 1
 SCALE: 1" = 1" D

TITLE: SMARTEYE T-NETX - DIN RAIL MOUNT (NO P.O.E. - 24V)
 INSTALLATION DETAILS

DRAWING NO. SP4050/01-420

MATERIAL:
FINISH:
 UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES
 TOLERANCES UNLESS OTHERWISE SPECIFIED:
 2-PLACES +/- .010
 3-PLACES +/- .005
 ANGLES +/- 2 DEGREES
 REMOVE ALL BURRS
 ALL BENDS ARE RADIUS

REV	DESCRIPTION	DATE	APPR. BY
0	INITIAL RELEASE	01/16/09	MDB
1	ADDED CONNECTOR DETAIL	04/30/09	MDB
2	REVISED 24V CONNECTOR SYMBOLS	01/29/14	MDB
3	REVISED DIN RAIL MTC CLIP	01/11/17	MDB



ETHERNET CONNECTION
1A56BB

PN 1 - TX+
PN 2 - TX-
PN 3 - RX+
PN 4 -
PN 5 -
PN 6 - RX-
PN 7 -
PN 8 -

FROM FIELD

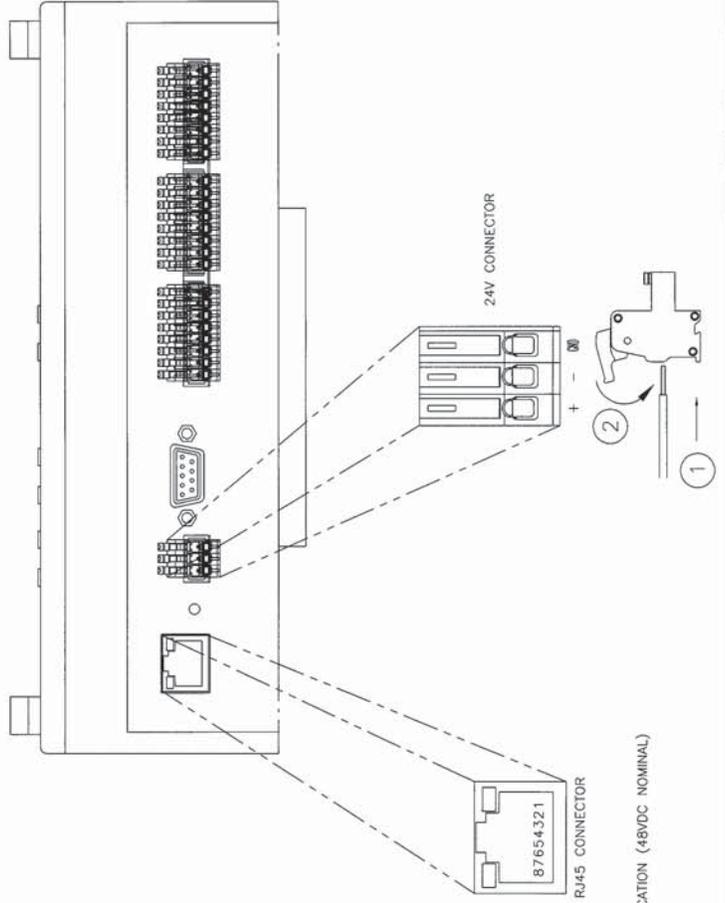
NOTE:
PINS 4, 5, 7 & 8 NOT USED



2637 BOND STREET
ROCHESTER HILLS, MICHIGAN 48309
PHONE (248) 853-4495 FAX (248) 853-8539

DRAWN BY:	RSB	TITLE:	SMARTEYE T-NETX - DIN RAIL MOUNT
CHECKED BY:	MDB	ENGINEER:	SMARTEYE T-NETX (NO P.O.E. - 24V)
DATE:	01/13/09	SHEET:	1 OF 1 - FIELD CONNECTION DETAILS
SCALE:	1" = 1"	DRAWING NO.:	SP4050/01-410
SIZE:	D		

REV	DESCRIPTION	DATE	APPR. BY
0	INITIAL RELEASE	04/30/09	MOB
1	REVISED DIN RAIL MTC CLIP	01/11/17	<i>[Signature]</i>



ETHERNET CONNECTION	1A5685
PN 1 - TX+	
PN 2 - TX-	
PN 3 - RX+	
PN 4 -	
PN 5 -	
PN 6 - RX-	
PN 7 -	
PN 8 -	

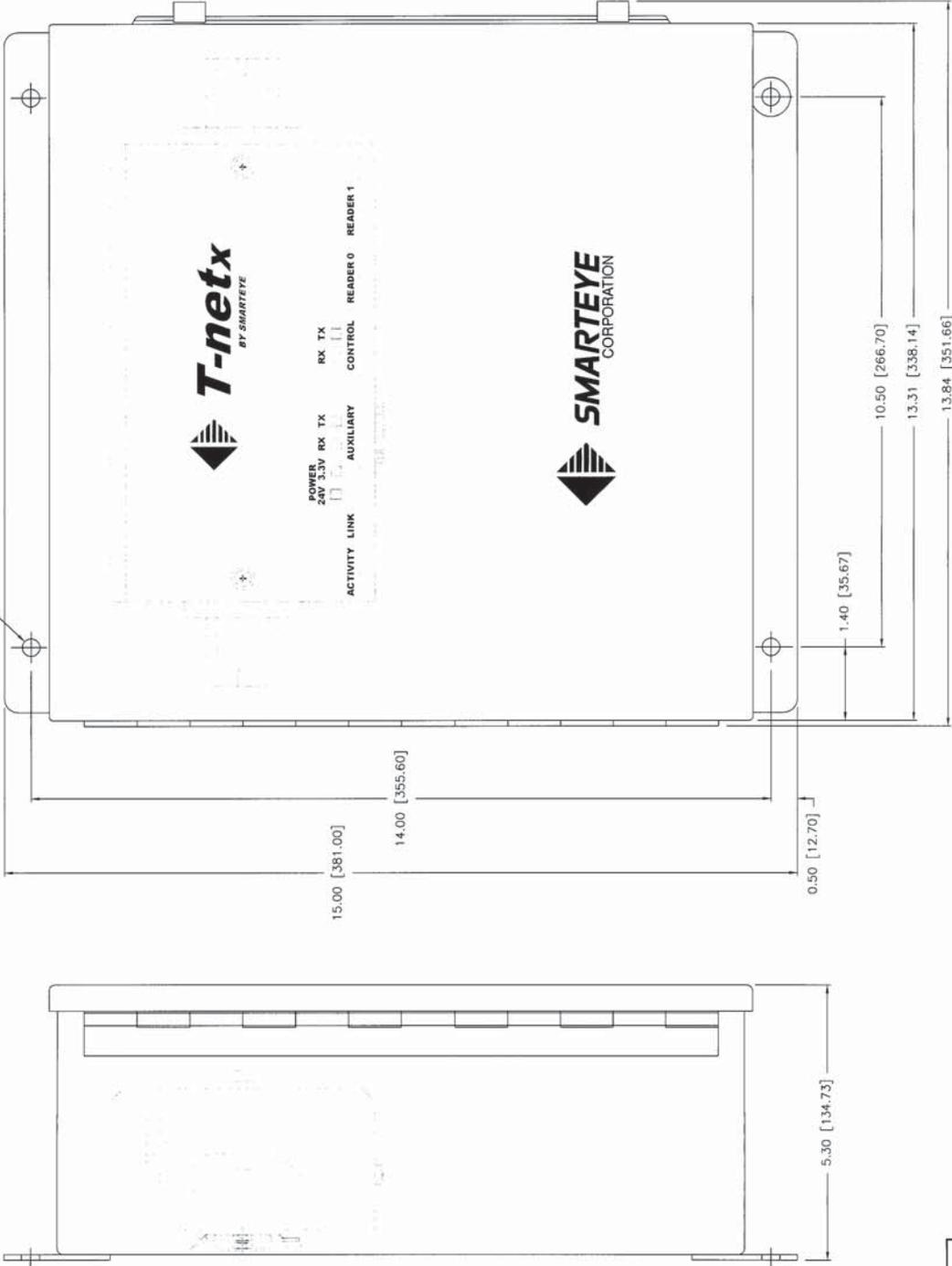
NOTE:
POWER SUPPLIED PER IEE 802.3af SPECIFICATION (48VDC NOMINAL)



2637 BOND STREET ROCHESTER HILLS, MICHIGAN 48309
PHONE (248) 853-4495 FAX (248) 853-8539

DRAWN BY:	RSA	TITLE:
CHECKED BY:	MOB	SMARTEYE T-NETX - DIN RAIL MOUNT
ENGINEER:	MOB	(P.O.E. 802.3af - 48V)
DATE:	04/28/09	
SHEET:	1 OF 1	- FIELD CONNECTION DETAILS
SCALE:	1" = 1"	DRAWING NO. SP4050/02-410
SIZE:	D	

REV	DESCRIPTION	DATE	APPR. BY
0	INITIAL RELEASE	01/16/09	MOB
1	REVISED DIN RAIL MTG CLIP	01/13/09	MOB



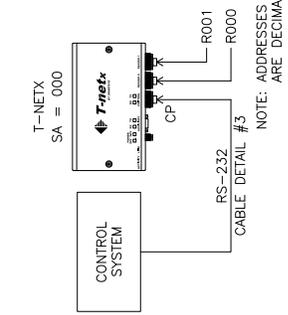
SMARTEYE CORPORATION
 2637 BOND STREET ROCHESTER HILLS, MICHIGAN 48069
 PHONE (248) 853-4465 FAX (248) 853-8639

DRAWN BY:	RSJ	TITLE:	SMARTEYE T-NETx - NEMA-12
CHECKED BY:	MOB	(AC P.O.E. - 24V)	
ENGINEER:	MOB	INSTALLATION DETAILS	
DATE:	01/13/09		
SHEET:	1 OF 1		
SCALE:	1" = 1"	DRAWING NO.	SP4051/01-420
SIZE:	D		

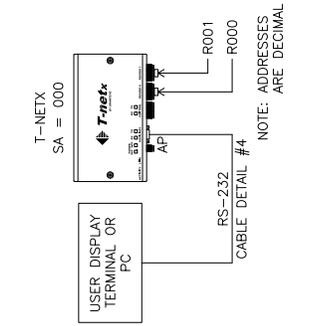
MATERIAL:
 FINISH:
 UNLESS OTHERWISE SPECIFIED
 ALL DIMENSIONS ARE IN INCHES
 TOLERANCES ON DIMENSIONS
 2-PLACES $\pm .010$
 3-PLACES $\pm .005$
 ANGLES ± 2 DEGREES
 REMOVE ALL BURRS
 ALL RENDS ARE MINIMUM RADIUS

REV	DESCRIPTION	DATE	APPR. BY
0	INITIAL RELEASE	07/17/14	MOB

(RS-485) CONFIGURATION #1
POINT TO POINT



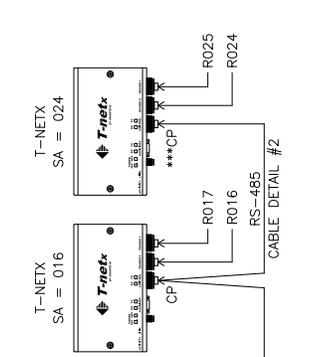
(RS-485) CONFIGURATION #2
MULTIDROP



(RS-232) CONFIGURATION



AUXILIARY PORT CONFIGURATION



LEGEND

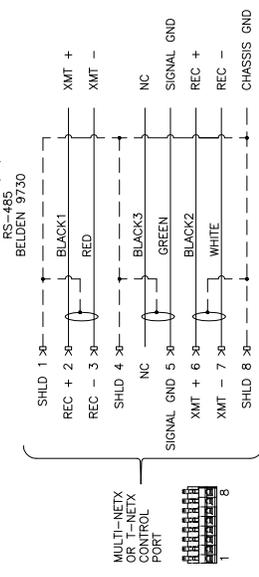
- ⊔ = PLUG-IN LEVER LOCK TERMINATION
- *** = INDICATES LINE TERMINATION INSTALLED
- NC = NO CONNECTION
- SA = STARTING ADDRESS OF MULTI-NETX OR T-NETX
- CP = CONTROL PORT
- AP = AUXILIARY PORT

NOTES:

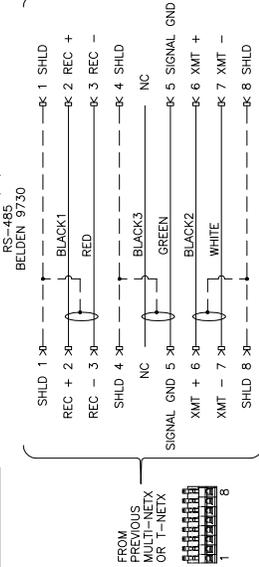
1. MAXIMUM LENGTH OF RS-485 IS 4000'
2. MAXIMUM LENGTH OF RS-232 IS 50'
3. THE LAST T-NETX OR MULTI-NETX ON THE MULTIDROP LINE MUST HAVE LINE TERMINATION
4. IN THE MULTIDROP CONFIGURATION EACH T-NETX OR MULTI-NETX MUST HAVE A UNIQUE STARTING ADDRESS
5. SEE THE NETX USER MANUAL FOR ADDRESSING DETAILS

CABLE DETAILS

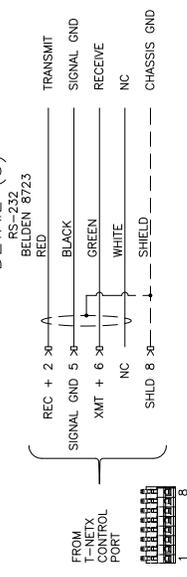
DETAIL (1)



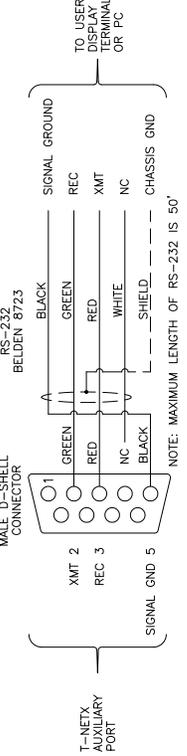
DETAIL (2)



DETAIL (3)



DETAIL (4)



2637 BOND STREET ROCHESTER HILLS, MICHIGAN 48309
PHONE (248) 853-4495 FAX (248) 853-8539

DRAWN BY: MOB
CHECKED BY: MOB
ENGINEER: MOB
DATE: 07/17/14
SHEET 1 OF 1
SCALE: NTS
DRAWING NO. SP4150/01-411
SIZE: D

Appendix C Multi-netx SP4060 Series Drawings

Sender/Receiver Cable Details – SP1054/01-424

This drawing shows the wiring details for a reader using a customer supplied junction box.

Multi-netx Installation Details – SP4060/01-420

This drawing shows the mounting dimensions of the Multi-netx.

Multi-netx Connection Wiring Details 24VDC– SP4060/01-410

This drawing shows the location and wiring details for the Ethernet and power connections.

Multi-netx NEMA-12 Installation Details 24VDC– SP4061/01-420

This drawing shows the mounting dimensions of the Multi-netx.

Multi-netx NEMA-12 Connection Wiring Details 24VDC– SP4061/01-410

This drawing shows the location and wiring details for the Ethernet and power connections.

Multi-netx NEMA-12 Installation Details 110/220VAC – SP4061/04-420

This drawing shows the mounting dimensions of the Multi-netx.

Multi-netx NEMA-12 Connection Wiring Details 110/220VAC – SP4061/04-410

This drawing shows the location and wiring details for the Ethernet and power connections.

Multi-netx Auxiliary and Communication Port Wiring Details – SP4060/01-411

This drawing shows the wiring details for the auxiliary and communication port for all Multi-netx models.

Multi-netx Upgrade Kit Installation Details – SP4062/02-201

This drawing shows the installation details for the Multi-netx upgrade kit.

REV	DESCRIPTION	DATE	APPR. BY
0	INITIAL RELEASE	01/12/10	RSA

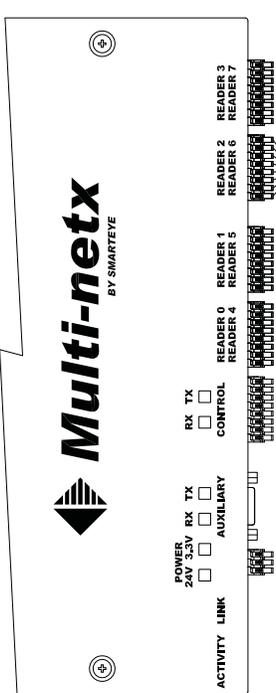
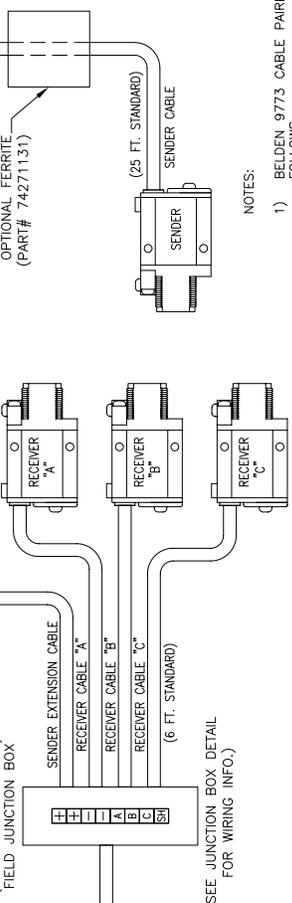


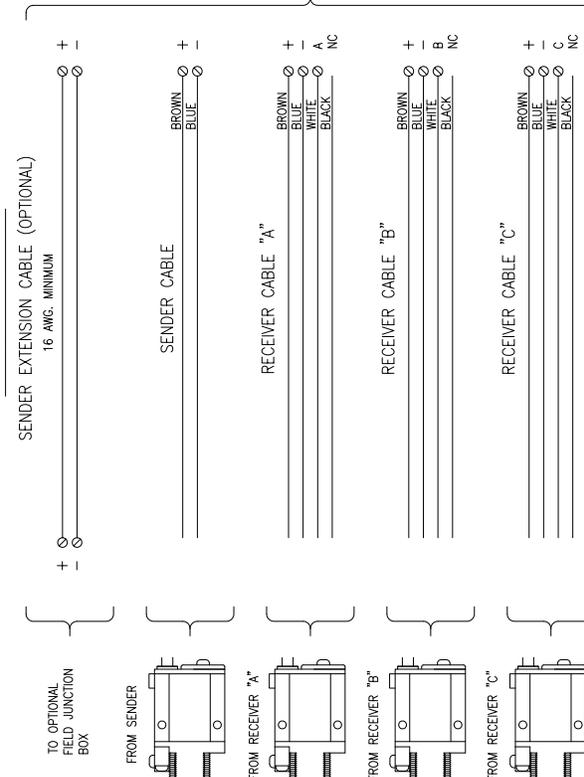
TABLE #1
CABLE TYPE AND Lrx MAX. DISTANCE

AWG	BELDEN#	DISTANCE FEET
18	9773	1500

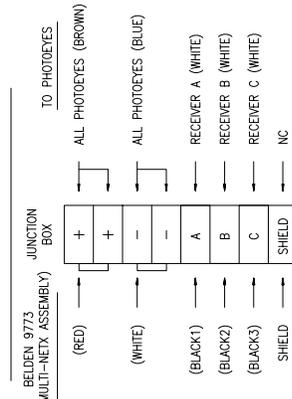
Lrx (SEE TABLE #1)



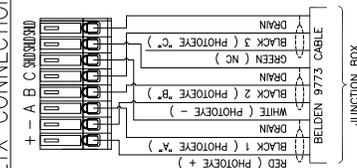
CABLE DETAILS



JUNCTION BOX DETAILS



MULTI-NETX CONNECTION DETAILS



- LEGEND**
- ⊗ - SCREW TERMINATION
 - ⊐ - SPRING CLAMP TERMINATION
 - NC - NO CONNECTION

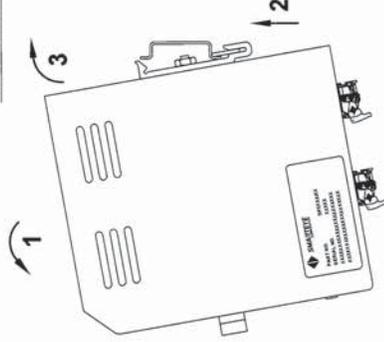
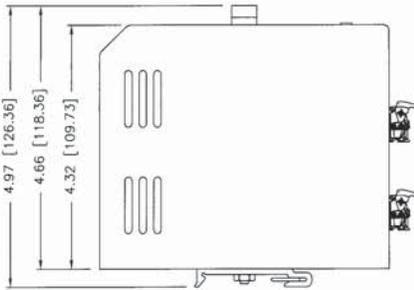
- NOTES:**
- 1) BELDEN 9773 CABLE PAIRED AS FOLLOWS.
 - 2) BLACK 1 IS PAIRED WITH RED, BLACK 2 IS PAIRED WITH WHITE, BLACK 3 IS PAIRED WITH GREEN.
 - 3) GREEN IS NOT USED (SEE CABLE DETAIL Lrx).
- THE SHIELD OF CABLE Lrx MUST BE CONNECTED AT ONE END ONLY. THE SH TERMINAL IN THE REMOTE JUNCTION BOX IS FOR LANDING THE SHIELD WIRE ONLY. IT IS NOT CONNECTED TO GROUND.
- THE SHIELD OF CABLE Lrx NORMALLY CONNECTED TO 24V CIRCUIT BOARD VIA JUMPER J1-8. IN A NOISY ELECTRICAL ENVIRONMENT, IT MAY BE NECESSARY TO GROUND THE SHIELD AT THE REMOTE JUNCTION BOX. REFER TO THE "READER MOUNTING" SECTION OF THE USER MANUAL FOR DETAILS.

SMARTEYE CORPORATION
2637 BOND STREET ROCHESTER HILLS, MICHIGAN 48309
PHONE (248) 853-4495 FAX (248) 853-8539

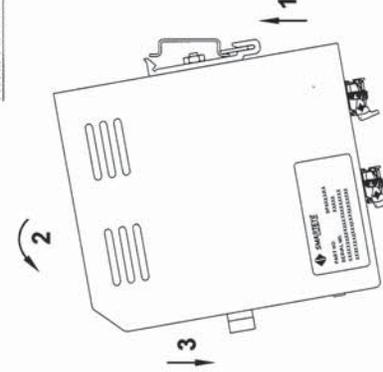
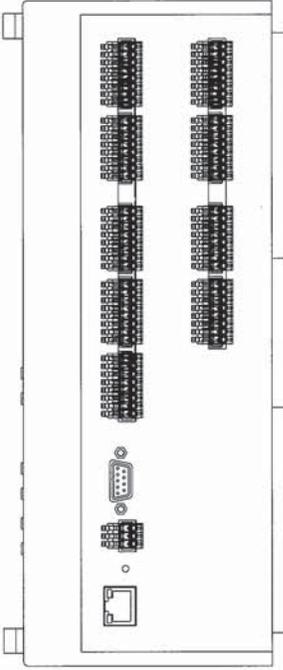
DRAWN BY: RSA TITLE:
CHECKED BY: RSA SMARTEYE SENDER / RECEIVER
ENGINEER: MOB CABLE DETAILS FOR MULTI-NETX
DATE: 01/12/10 INSTALLATION
SHEET 1 OF 1
SCALE:
NTS DRAWING NO. SP1054/01-424
SIZE: D

REV	DESCRIPTION	DATE	APPR. BY
0	INITIAL RELEASE	06/02/09	MDB
1	ADDED MULTI-NETX MOUNTING AND REMOVAL INSTRUCTIONS	12/06/10	RSA
2	REVISED DIN RAIL CLIPS	02/12/12	MDB
3	REVISED DIN RAIL MTG CLIPS	01/17/17	<i>[Signature]</i>

MOUNTING MULTI-NETX ONTO DIN RAIL



REMOVING MULTI-NETX FROM DIN RAIL



2637 FOND STREET ROCHESTER HILLS, MICHIGAN 48309
PHONE (248) 853-4465 FAX (248) 853-8839

DRAWN BY:	RSA	TITLE:	SMARTEYE MULTI-NETX
CHECKED BY:	MDB	ENGINEER:	DIN RAIL MOUNT (24V)
DATE:	05/26/09	SHEET:	1 OF 1
		SCALE:	1" = 1"
			D

MATERIAL:
FINISH:
UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS ARE IN INCHES
TOLERANCES ON DIMENSIONS
2-PLACES +/- .010
3-PLACES +/- .005
ANGLES +/- .7 DEGREES
REMOVE ALL BURRS
ALL BENDS ARE MINIMUM RADIUS

REV	DESCRIPTION	DATE	APPR. BY
0	INITIAL RELEASE	06/02/09	MOB
1	REVISED DIN RAIL CLIPS	02/21/12	MOB
2	REVISED DIN RAIL MTC CLIPS	01/17/12	

Multi-netx

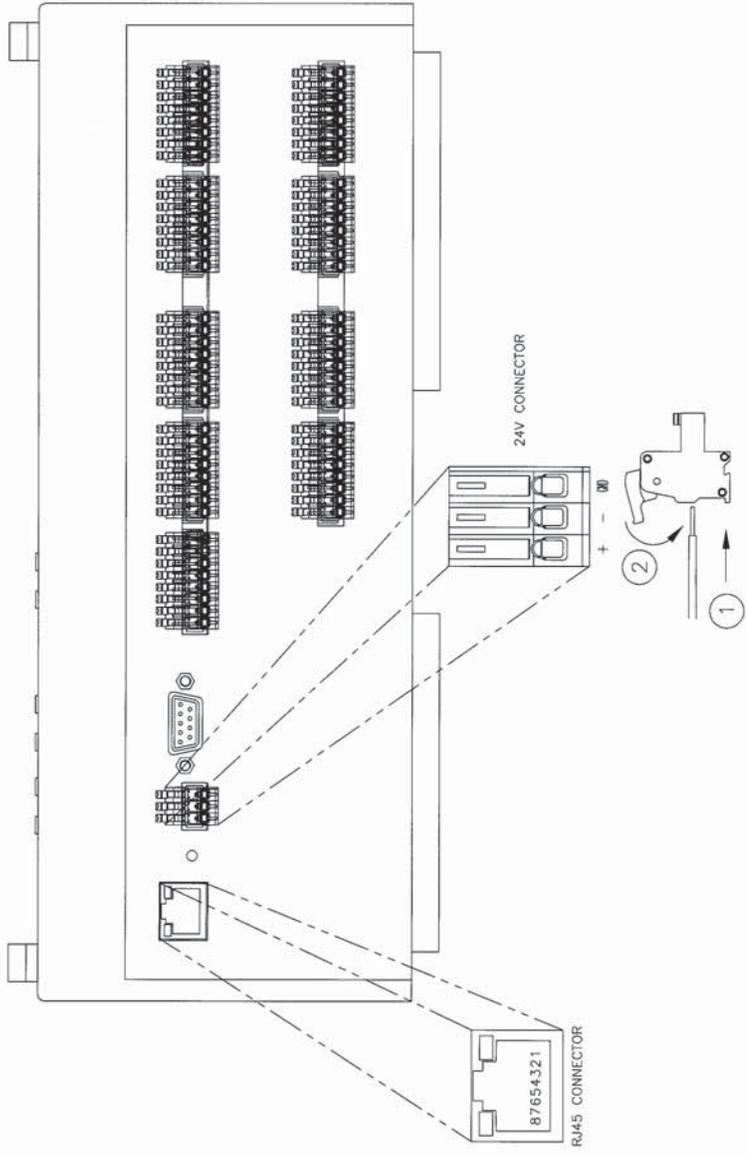
BY SMARTEYE

POWER
 24V 3.3V RX TX

AUXILIARY

CONTROL

ACTIVITY LINK
 READER 0 READER 1 READER 2 READER 3
 READER 4 READER 5 READER 6 READER 7



ETHERNET CONNECTION
TIA568B

PIN 1 - TX+
 PIN 2 - TX-
 PIN 3 - RX+
 PIN 4 -
 PIN 5 -
 PIN 6 - RX-
 PIN 7 -
 PIN 8 -

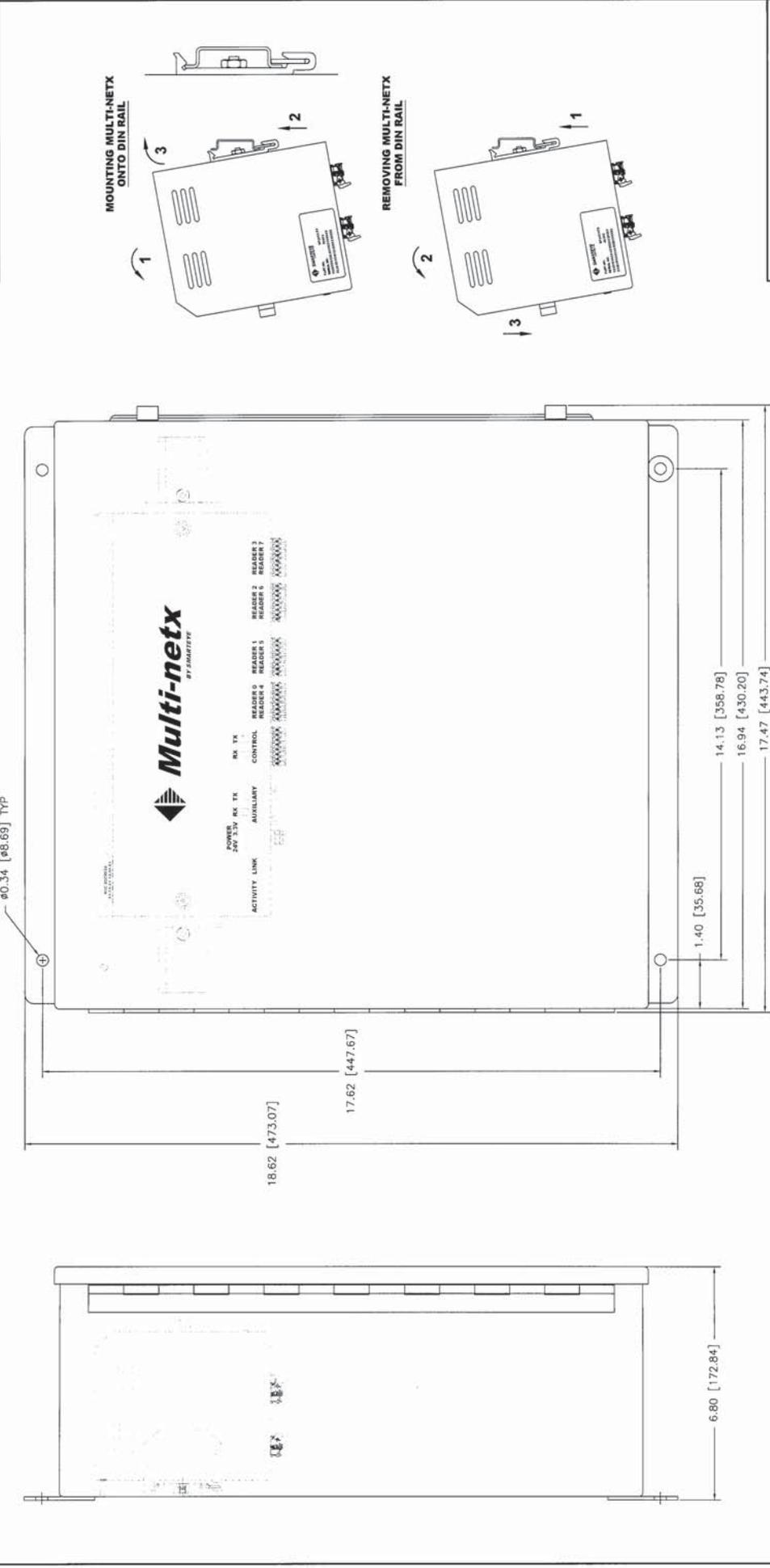
FROM FIELD

NOTE:
PINS 4, 5, 7 & 8 NOT USED



DRAWN BY: RSA TITLE:
 CHECKED BY: MOB SMARTEYE MULTI-NETX
 ENGINEER: MOB DIN RAIL MOUNT (24V)
 DATE: 05/26/09
 SHEET: 1 OF 1 - FIELD CONNECTION DETAILS
 SCALE: 1" = 1" DRAWING NO. SP4060/01-410
 SIZE: D

REV	DESCRIPTION	DATE	APPR. BY
0	INITIAL RELEASE	05/02/09	MOB
1	REVISED DIN RAIL CLIPS	02/21/12	MOB
2	REVISED DIN RAIL MTC CLIPS	01/18/12	MOB

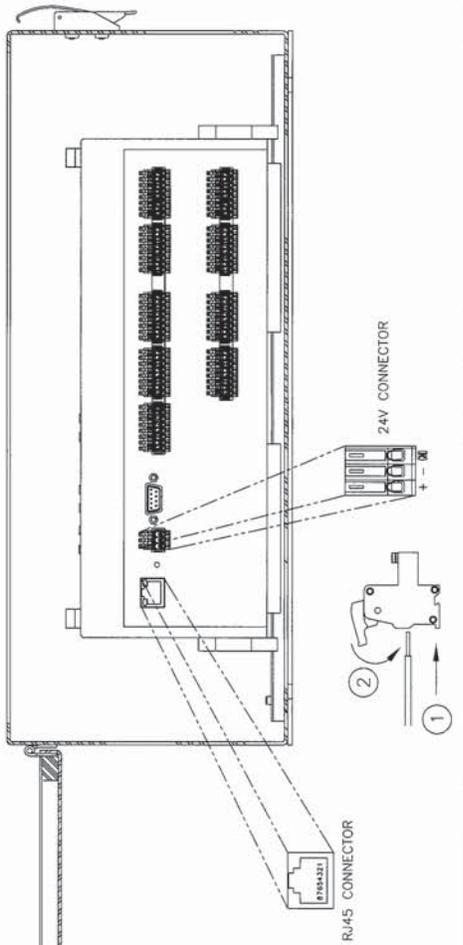
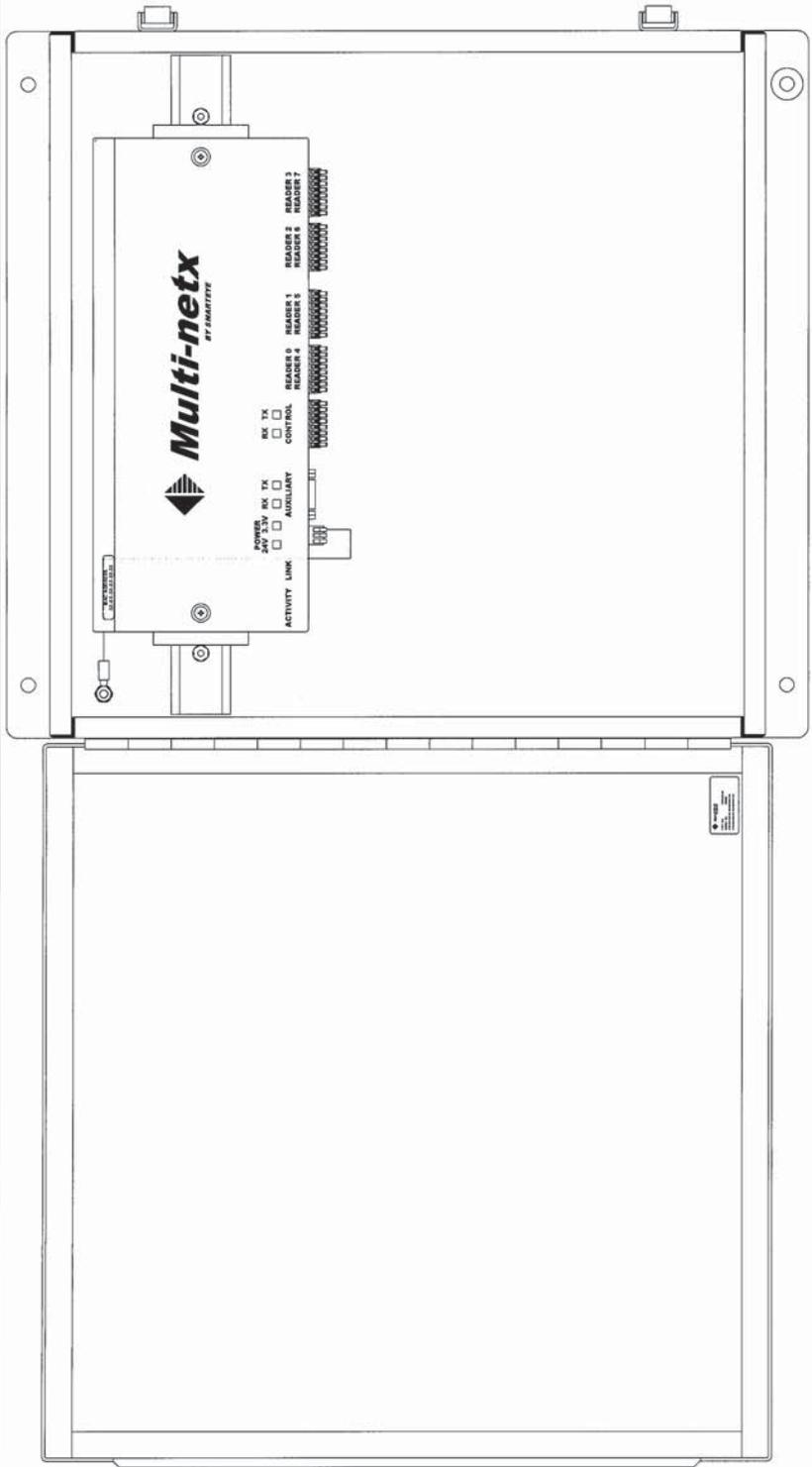


SMARTEYE CORPORATION
 2637 BOND STREET ROCHESTER, N.Y. 14626
 PHONE (716) 853-4485 FAX (716) 853-8539

DRAWN BY: RJA TITLE: MULTI-NETX
 CHECKED BY: MOB NEMA-12 (24V)
 ENGINEER: MOB
 DATE: 05/26/09
 SHEET 1 OF 1 - INSTALLATION DETAILS
 SCALE: 3/4" = 1" DRAWING NO. SF4061/01-420
 SIZE: D

MATERIAL:
FINISH:
 UNLESS OTHERWISE SPECIFIED
 ALL DIMENSIONS ARE IN INCHES
 TOLERANCES ON DIMENSIONS
 2-PLACES $\pm .010$
 3-PLACES $\pm .005$
 ANGLES $\pm .2$ DEGREES
 REMOVE ALL BURRS
 ALL BENDS ARE MINIMUM RADIUS

REV	DESCRIPTION	DATE	APPR. BY
0	INITIAL RELEASE	06/02/09	MOB
1	REVISED DIN RAIL CLIPS	02/21/12	MOB
2	REVISED DIN RAIL MTC CLIPS	01/18/17	MOB



ETHERNET CONNECTION
TIA568B

PIN 1	- TX+
PIN 2	- TX-
PIN 3	- RX+
PIN 4	-
PIN 5	-
PIN 6	- RX-
PIN 7	-
PIN 8	-

FROM FIELD

NOTE:
PINS 4, 5, 7 & 8 NOT USED

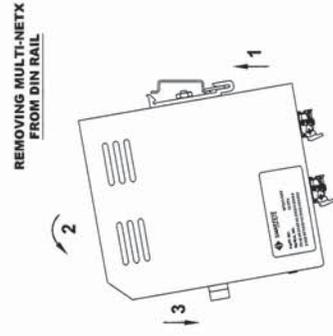
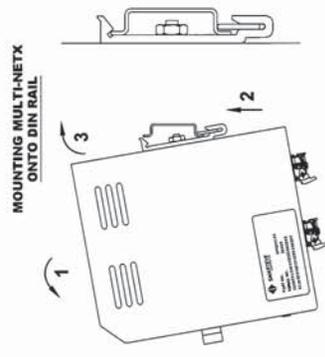
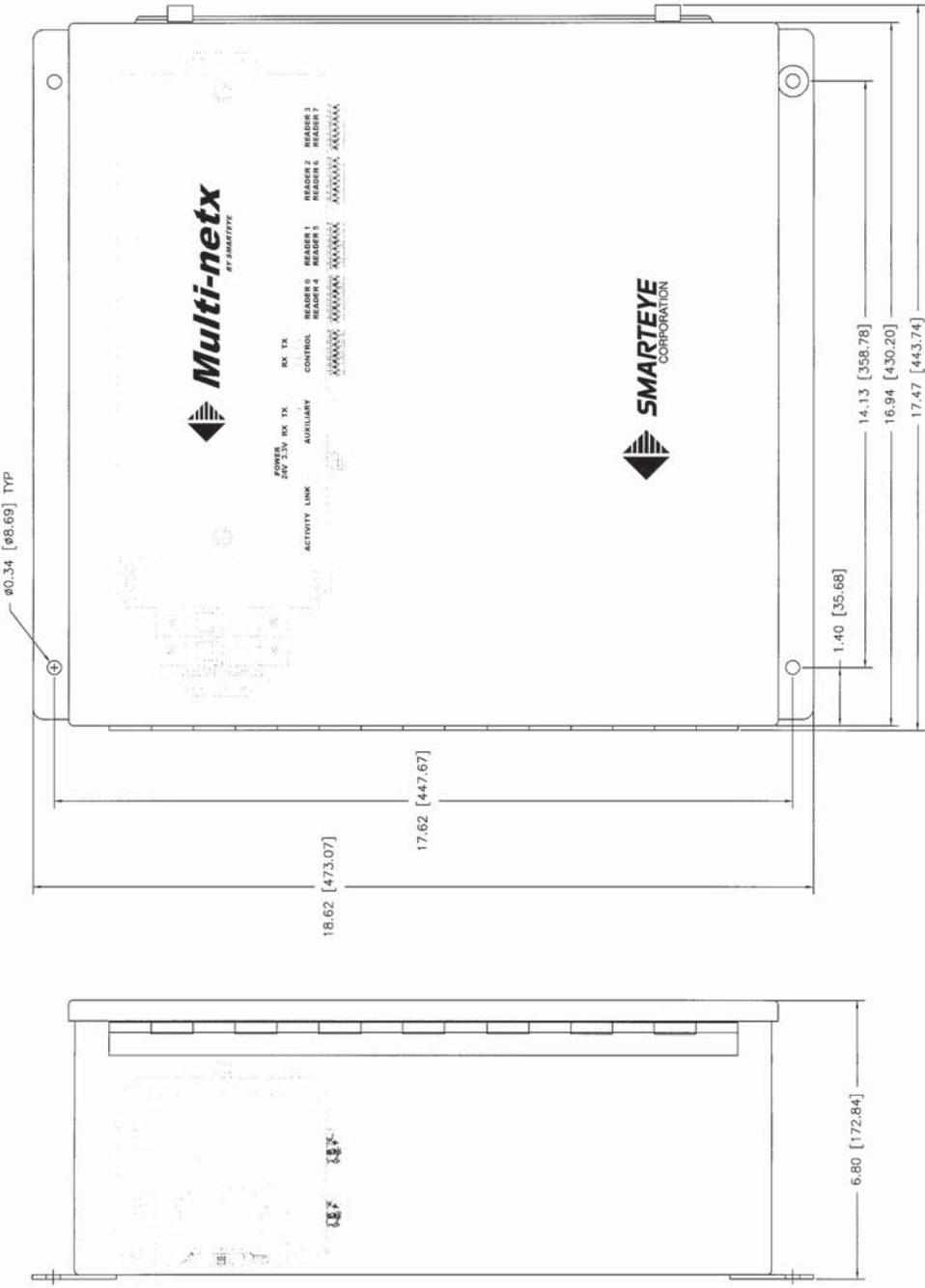
MATERIAL:
FINISH:
UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS ARE IN INCHES
TOLERANCES ON DIMENSIONS
1-PLACES ±.005
2-PLACES ±.010
ANGLES 1/2 - 2 DEGREES
REMOVE ALL BURRS
ALL BENDS ARE MINIMUM RADIUS



2837 BOND STREET ROCHESTER N.Y. 14626-4839
PHONE: (748) 853-4485 FAX: (748) 853-8539

DRAWN BY: RSA TITLE: SMARTEYE MULTI-NETX
CHECKED BY: MOB
ENGINEER: MOB
DATE: 05/26/09
SHEET: 1 OF 1 - FIELD CONNECTION DETAILS
SCALE: NTS DRAWING NO. SP-4061/01-410
SIZE: D

REV	DESCRIPTION	DATE	APPR. BY
0	INITIAL RELEASE	11/21/11	MOB
1	REVISED DIN RAIL CLIPS	02/21/12	MOB
2	REVISED DIN RAIL MTC CLIPS	01/20/12	MOB

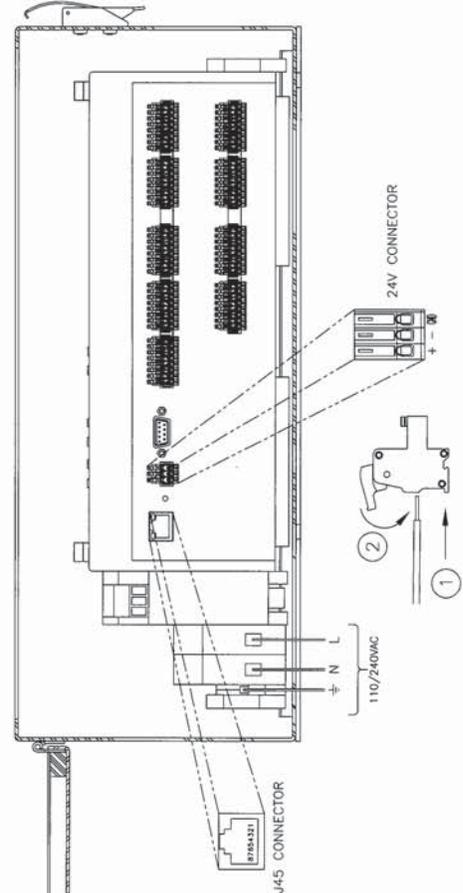
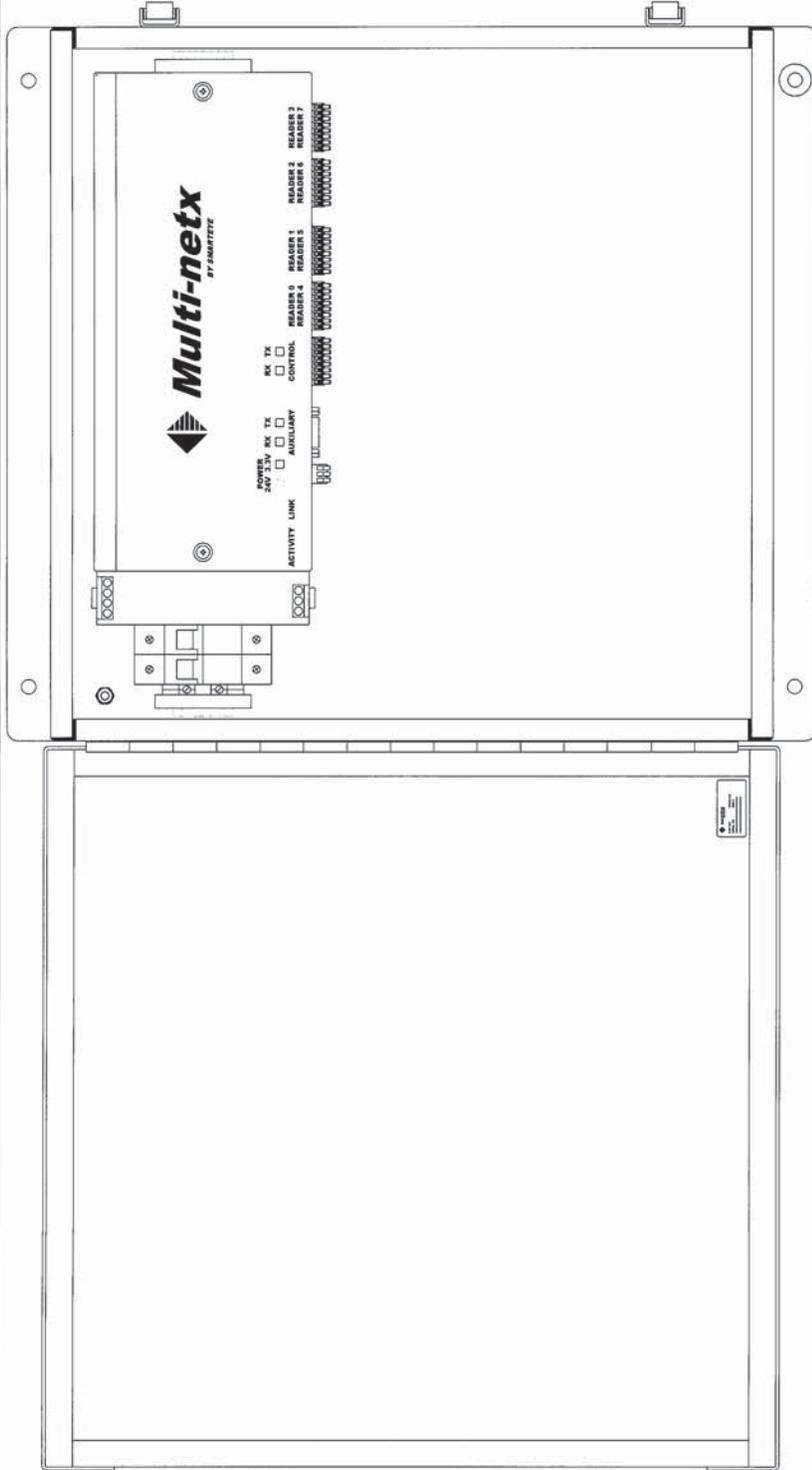


SMARTEYE CORPORATION
 2637 BOND STREET, ROCHESTER HILLS, MICHIGAN 48309
 PHONE (248) 853-4465 FAX (248) 853-8639

SMARTEYE CORPORATION
 TITLE: RSA
 DRAWN BY: MOB
 CHECKED BY: MOB
 ENGINEER: MOB
 DATE: 11/15/11
 SHEET: 1 OF 1
 SCALE: 3/4" = 1"
 DRAWING NO.: SP4-061/04-420

MATERIAL:
FINISH:
 UNLESS OTHERWISE SPECIFIED
 ALL DIMENSIONS ARE IN INCHES
 TOLERANCES ON DIMENSIONS
 UNLESS OTHERWISE SPECIFIED
 3-DIGIT 1/100
 ANGLES 1/2 - 2 DEGREES
 REMOVE ALL BURRS
 ALL ROUNDS ARE MINIMUM RADIUS

REV	DESCRIPTION	DATE	APPR. BY
0	INITIAL RELEASE	11/21/11	MOB
1	REVISED DIN RAIL CLIPS	02/21/12	MOB
2	REVISED DIN RAIL MTC CLIPS	01/20/17	MOB



- ETHERNET CONNECTION
TIA568B
- PIN 1 - TX+
 - PIN 2 - TX-
 - PIN 3 - RX+
 - PIN 4 -
 - PIN 5 -
 - PIN 6 - RX-
 - PIN 7 -
 - PIN 8 -

FROM FIELD

NOTE:
PINS: 4, 5, 7 & 8 NOT USED

MATERIAL:
FINISH:
UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS ARE IN INCHES
TOLERANCES ON DIMENSIONS
DIMENSIONS IN PARENTHESES
3-PLACES +/- .005
ANGLES +/- 2 DEGREES
REMOVE ALL BURRS
ALL BENDS ARE MINIMUM RADIUS

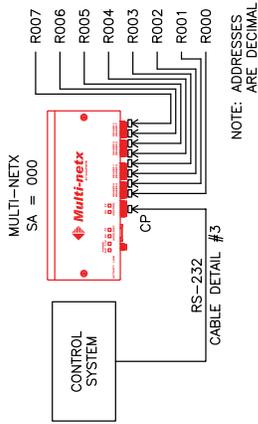


2837 60th STREET ROCHESTER, N.Y. 14626
PHONE (248) 853-4488 FAX (248) 853-8539

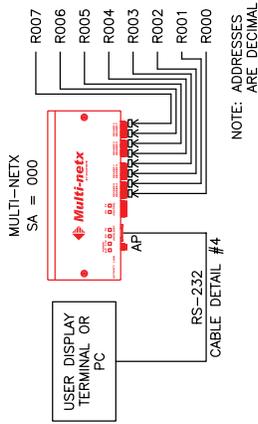
DRAWN BY:	RSA	TITLE:	SMARTEYE MULTI-NETX
CHECKED BY:	MOB	ENGINEER:	NEMA-12 WERNER
DATE:	11/15/11	DATE:	11/15/11
SHEET:	1 OF 1	FIELD CONNECTION DETAILS	
SCALE:	1 OF 1	DRAWING NO.	SP4061/04-410
SIZE:	D		

REV	DESCRIPTION	DATE	APPR. BY
0	INITIAL RELEASE	06/02/09	MOB
1	REVISED TO SHOW MULTIPLE COMMUNICATION CONFIGURATIONS	01/12/11	MOB
2	REVISED DETAIL (3) PINOUT	07/21/11	MOB

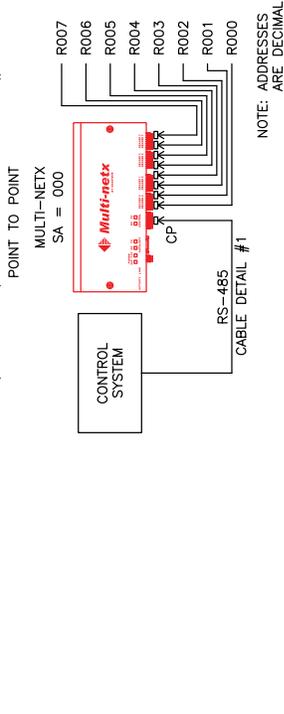
(RS-232) CONFIGURATION



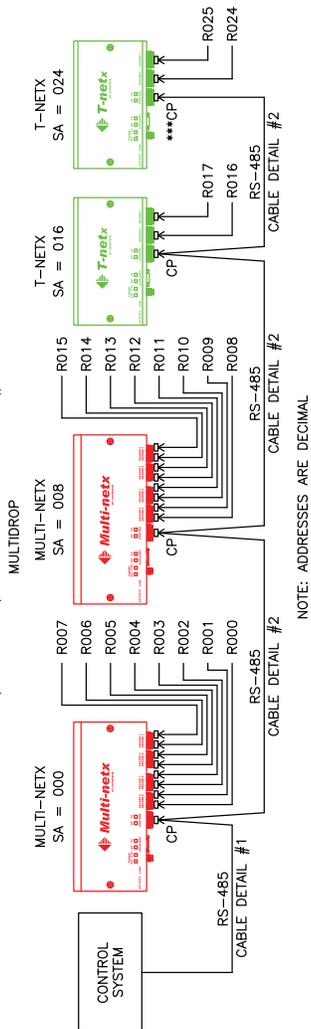
AUXILIARY PORT CONFIGURATION



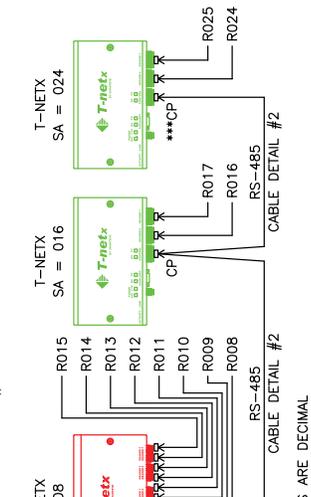
(RS-485) CONFIGURATION #1



(RS-485) CONFIGURATION #2



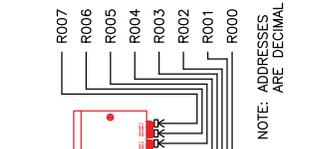
MULTIDROP



T-NETX



MULTI-NETX



NOTES:

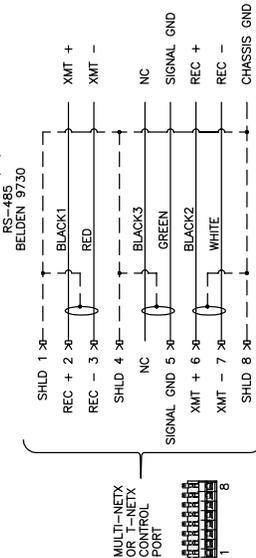
1. MAXIMUM LENGTH OF RS-485 IS 4000'
2. MAXIMUM LENGTH OF RS-232 IS 50'
3. THE LAST T-NETX OR MULTI-NETX ON THE MULTIDROP LINE MUST HAVE LINE TERMINATION
4. IN THE MULTIDROP CONFIGURATION EACH T-NETX OR MULTI-NETX MUST HAVE A UNIQUE STARTING ADDRESS
5. SEE THE NETX USER MANUAL FOR ADDRESSING DETAILS

LEGEND

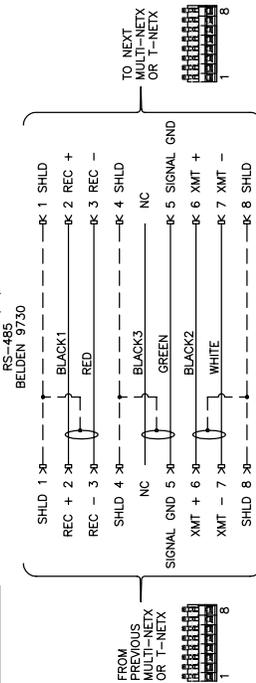
- ⊠ = PLUG-IN LEVER LOCK TERMINATION
- *** = INDICATES LINE TERMINATION INSTALLED
- NC = NO CONNECTION
- SA = STARTING ADDRESS OF MULTI-NETX OR T-NETX
- CP = CONTROL PORT
- AP = AUXILIARY PORT

CABLE DETAILS

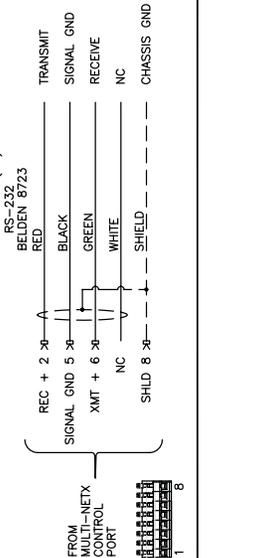
DETAIL (1)



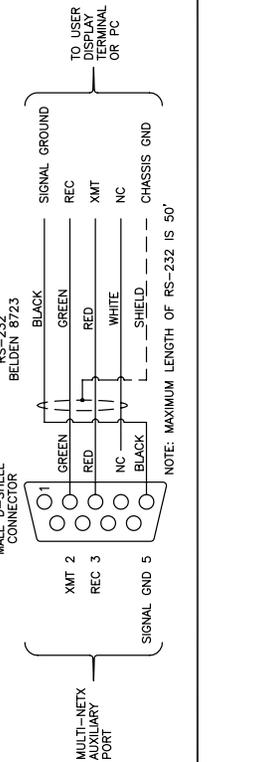
DETAIL (2)



DETAIL (3)



DETAIL (4)



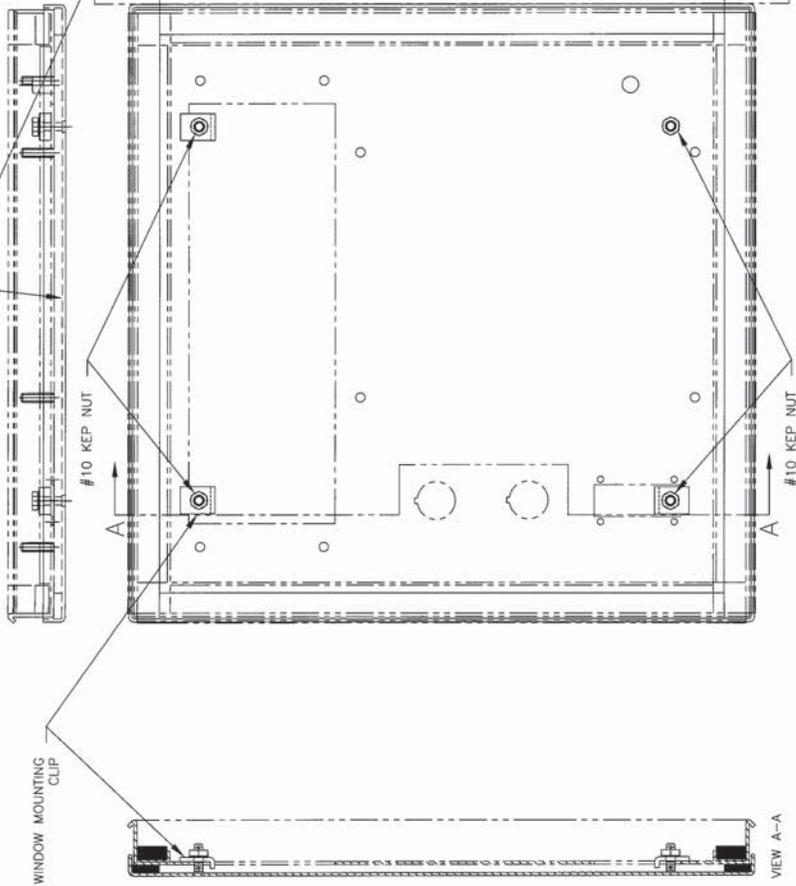
2837 BOND STREET ROCHESTER HILLS, MICHIGAN 48309
PHONE (248) 853-4485 FAX (248) 853-8539

DRAWN BY: MOB
CHECKED BY: MOB
ENGINEER: MOB
DATE: 05/28/09
SHEET 1 OF 1
SCALE: NTS
SIZE: D

PROJECT TITLE: SMARTEYE MULTI-NETX
MULTI-NETX AUXILIARY COMMUNICATION PORT AND
COMMUNICATION PORT
NTS DRAWING NO. SP4060/01-411

REV	DESCRIPTION	DATE	APPR. BY
0	INITIAL RELEASE	11/21/11	MOB
1	REVISED DIN RAIL CLIPS	02/21/12	MOB
2	REVISED DIN RAIL MTC CLIPS	01/20/12	

SMARTEYE MULTI-NETX
CONVERSION KIT
SP4062/01-200



WINDOW MOUNTING CLIP

#10 KEP NUT

VIEW A-A

1 1 3/16 [46.04]

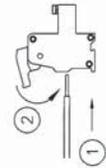
2 3/4 [69.85]

DOOR IN THE CLOSED POSITION
Ø0.250 [Ø6.35] THRU HOLE

DETAIL#1

CONVERSION KIT INSTALLATION INSTRUCTIONS:

1. DISCONNECT AC POWER FROM EXISTING SEA UNIT.
2. DISCONNECT CONTROL PORT/READER WIRING FROM EXISTING SEA UNIT.
3. REMOVE ALL COMPONENTS FROM DOOR. SAVE WINDOW CLIPS!
4. REMOVE EXISTING SUBPLATE AND COMPONENTS. SAVE 3/8-16 KEP NUTS!
5. DRILL A Ø.250 DIA HOLE IN DOOR AS NOTED IN DETAIL#1.
6. INSTALL CONVERSION KIT COVER AS SHOWN REUSING (3) ORIGINAL WINDOW MOUNTING CLIPS AND SUPPLIED (4) #10 KEP NUTS.
7. INSTALL CONVERSION KIT SUBPLATE, LOWERING LEFT SIDE FIRST.
8. RE-TERMINATE CONTROL PORT/READER WIRING TO NEW CONNECTORS AND RECONNECT CONTROL PORT/READER WIRING.
9. RECONNECT AC POWER.



ETHERNET CONNECTION
TIA/EIA-568B

- PN 1 - TX+
- PN 2 - TX-
- PN 3 - RX+
- PN 4 -
- PN 5 -
- PN 6 - RX-
- PN 7 -
- PN 8 -

NOTE:
PINS 4, 5, 7 & 8 NOT USED



2637 BOMB STREET BOCKFELTERS HILLS, WICHITA, KS 67209
PHONE (781) 853-4465 FAX (781) 853-6539

DRAWN BY:	RSA	TITLE:	SMARTEYE MULTI-NETX
CHECKED BY:	MOB	PROJECT:	UPGRADE KIT
ENGINEER:	MOB	DATE:	11/15/11
SHEET:	1 OF 1	INSTALLATION INSTRUCTIONS	
SCALE:	3/4" = 1"	DRAWING NO.:	SP-4062/02-201
SIZE:	D		

SP-4062/02-201



SMARTEYE
CORPORATION

www.smarteyecorporation.com
