NexWatch

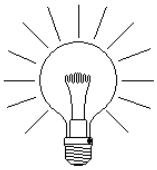
The NEXSENTRY™ Star II

Access Control Unit

User Guide

Revision C, Part # 6600058

Explaining The Three Note Symbols Used In This Manual:



Explanatory Note. These notes are for your information, and pose no threat to equipment or life and limb.



Cautionary Note. These notes are for your information. Pay attention to these items, since system performance or function may be affected.



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IV such defect is not a result of voltage surges/brownouts, lightning, water damage/flooding, fire, explosion, earthquakes, tornadoes, acts of aggression or war, or similar phenomena; and

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NexSentry Star II Access Control Unit

1

More and more businesses require modern, sophisticated, (but affordable) access control technology to protect their employees and their assets. **NexWatch** answers and fulfills this requirement with the NexSentry Star II Access Control Unit. This manual provides the necessary information to install, operate, and maintain a NexSentry Star II ACU. This includes: planning the installation, installing the hardware, setting up the database, and operating and maintaining the system.



CRITICAL NOTES:

The Star II controller uses the Windows®-based NSM Lite User Interface program or a compatible Windows® - based Host system to configure its database. Using chapters 10 and 11 you will learn how to use NSM Lite to configure a single Star II Controller for Stand-Alone applications. Another document, NexSentry Manager 3.0 Manual, p/n 66110229001 Revision E, will guide you in setting up one or multiple Star II database(s) using the NexSentry Manager Host system.



NOTE: Each installation is unique, therefore you, the Owner, must contact your local dealer or installer with site-specific information.

STAR II ACU FEATURES

The basic component of the NexSentry Star II Access Control Unit (ACU) is the controller PC board. The controller-board contains the circuitry for 4 relays and 16 monitor points, and can be configured for from 2 doors to 16 doors. Additional hardware devices, such as input and output devices, make a complete security system. This manual describes all NexWatch devices, with the exception of Digital Readers, which are described in the DigiReader Series Manual, part number 6600025.

NexSentry Star II controls access to a building through the use of digital command cards, and/or magnetic stripe cards, and/or personal identification numbers (PINs), and/or other identification devices (including biometric readers).

A basic (2-door) NexSentry Star II system comprising a controller card and card reader(s) can, by virtue of the 4 on-board relays, control up to two doors. Four of the 16 on-board monitor points are available to provide the door switch inputs and the REX inputs for both doors, and the12 other monitor points are available for other monitoring functions, including perhaps intrusion-detectors or thermostats.

NexSentry Star II Systems can be configured with up to 16 MIRO combinations. (The ACU itself is designated MIRO 1, and there can be up to 15 external MIROs, 2 through 16.)



CAUTION: When a NexSentry Star II ACU is connected either to a Host PC or to a PC running its own terminal interface program, NSM Lite, the *Controller Host Interface Protocol* (**CHIP**) protocol allows recognition of up to 255 Monitor Input Points and of up to 96 Relay Output Points. The NexWatch-proprietary CHIP protocol can communicate with a Host PC or an NSM Lite PC (or with other hosts) via an RS-232 port, an RS-485 port, or a 10-base-T network port .with the optional CoBox installed.

The NexSentry Star II ACU sends Transaction Logs when events occur within the controlled areas to a Host PC software system, such as the NexSentry Manager (and/or to NSM Lite). The Transaction Logs appear in the host's and NSM Lite's **`System Monitor`** window. The ACU can also activate an alarm relay contact if warranted by an event.

The NexSentry Star II ACU database replaces the '**Building Modes**' used with earlier Schlage/Westinghouse/WSE/NexWatch ACUs with '**Zones**.' Each NexSentry Star II controller database allows setting up (up to) 16 **zones** within a building complex. Each **zone** may be in one of two active states: **armed** or **disarmed**, set manually or automatically at either pre-determined times or as a result of system activity.

Digital Readers are the most common input devices used for access control. To gain access, a cardholder places a card near a Digital (card) Reader, mounted at a Door. The Digital Reader consists of a loop antenna and microprocessor-driven digital circuits. It emits a low level RF field. When a card is placed close to the Reader, the card is detected and its coded information is transmitted back to the

Reader, then on to the Star II ACU. The ACU then determines if access is to be denied or granted. DR 4200K or VIP2 Keypads work in the same fashion, except a "Cardholder" enters a Personal Identification Number (PIN), rather than presenting a card. (The DR 4200K or VIP2 may be configured to be used alone or in combination with a Digital card Reader.)

NexSentry Star II ACUs can provide complete data output of all system activity. This appears in the Host's **`System Monitor`** window and/or the NSM Lite **`System Monitor`** window. Transaction logs collected in a Host system can also be filtered, sorted and printed in a report.

The NexSentry Star II ACU constantly monitors the Door switches and monitor points/monitor inputs to detect changes in the controlled area. If an exception or alarm event takes place, the ACU reports the situation through a modem, or other Host interface, to a Central Station, or another defined location, so that security or safety measures can be taken.

While in operation, Star II ACUs are in a constant process of system self-test. If a fault occurs in any S-NET device, a Transaction Log is sent to the Host system and/or the NSM Lite **`System Monitor`** window identifying the specific device that caused the fault. If an uninterruptible power supply is used with the system, or the on-board battery charger is used, a Transaction Log is sent when the system power is switched to the backup batteries or when the battery charge level becomes low. A NexSentry Star II ACU can also send Transaction Logs to prevent arming of the Zones within a building, or to send a message over a dial-up modem, and/or trigger an alarm device.

USING THIS GUIDE

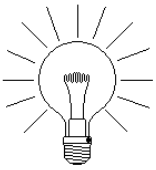
The NexSentry Star II User Guide is written for System Users and Installers. This guide takes you through a step-by-step process that describes how to install the hardware and software, test the system, configure the database, and operate the system. Chapters 1-9 and 12-15 describe the hardware portion of the system. Chapters 10 and 11 discuss the operator-interface software program, **NSM Lite**: chapter 10, the database set up; and chapter 11, the day to day operation.

- **Chapter 2, "Planning the Installation"** discusses the installation procedure, Anti-Passback control, safety precautions, and wiring information.
- **Chapter 3, "Installing the Access Control Unit"** covers details regarding the ACU, including the enclosures, connectors, pinouts, and so forth.
- **Chapter 4, "Installing the MIROs"** goes over each type of MIRO device that is available from NexWatch.
- **Chapter 5, "Installing the Univeral Wiegand Interface Units"** shows you how to install and configure a WIRO 4/8/4 or UWIU.
- **Chapter 6, "Installing the Power Supplies"** describes how to install single or multiple Alarm-Saf and PI-1 power supplies.
- **Chapter 7, "NexStar Multiplexer Features"** discusses all of the components of the Multiplexer.
- **Chapter 8, "Installing the Modem"** covers how to install and enable a modem.
- **Chapter 9, "Remote Station Readers"** shows how a Cardholder can change the Zones without access to the Host or Client PC.

- **Chapter 10, "NSM Lite Database Windows"** describes how to use the windows-based user interface program, **NSM Lite** to configure the database of a NexSentry Star II security system.
- **Chapter 11, "NSM Lite Daily Operation"** explains how to use the NexSentry Star II user interface windows for day to day operation, focussing on monitoring component status and Operator override capabilities.
- **Chapter 12, "Upgrading the Access Control Unit"** discusses how to remove and replace the personality chip on the ACU.
- **Chapter 13, "Maintaining the Access Control Unit"** covers how to replace the ACU battery, and the fuses, as well as how to perform the annual system test.
- **Chapter 14, "Troubleshooting"** discusses the steps to take if you find that the system is malfunctioning.
- **Appendix A, "Database Set Up Sheets"** has a library of forms to be filled out by the owner prior to setting up the NexSentry Star II database.
- The **Index** provides a quick way to find where a specific piece of information is located in the manual.
- The last (back) page of the manual has information for contacting NexWatch.

2 PLANNING THE INSTALLATION

Each installation site is unique, therefore this chapter provides general guidelines to install a NexSentry Star II. Specific power and environmental requirements are listed for each available product. Information regarding connectors, pin-outs, and wiring connections are also provided.



NOTE: The procedures in this manual meet the specifications for a UL 294 access control system. A UL 294 access control system must be tested annually as described in "Performing the Annual System Test" on page 13-3.

This chapter covers the following topics:

- "Creating the Installation Plan" on page 2-2
- "Planning Hardware Location" on page 2-4
- "Anti-Passback" on page 2-7
- "Reviewing the Safety Precautions" on page 2-9
- "Wiring Requirements" on page 2-10
- "S-NET Wiring" on page 2-11
- "Monitor Input Wiring" on page 2-20
- "Relay Output Wiring" on page 2-23
- "Environmental Requirements" on page 2-25
- "S-NET Power Requirements" on page 2-26
- "BackUp Power Requirements" on page 2-26
- "Remote Zone Control Station" on page 2-27

CREATING THE INSTALLATION PLAN

Designing an access control system requires careful consideration of the specific security needs required by the Owner of the building and how to use the capabilities of the system to meet those needs. It is the installer's responsibility to thoroughly discuss the Owner's security requirements to decide which hardware devices are necessary and how the installation plan should be drawn up. The installer must make sure the Owner is aware of all existing hardware that is available to implement all of the requirements.

The information in this section provides general guidelines for the development of a NexSentry Star II system installation plan.

The Hardware Installation Sequence

This section explains the suggested order for installing a NexSentry Star II system. If the installation is an upgrade or an addition to an existing system, the procedures will vary.

THE INSTALLATION SEQUENCE:

1. **Create an installation plan. Read this chapter for details. Make sure you understand all of the following:**
   - a **Safety requirements**
   - a **Wiring requirements**
   - b **Environmental requirements**
   - c **S-NET power requirements**
   - d **Location of all hardware devices**
   - e **Completion of the Data Input Forms, found in Appendix A**
2. **Get all concerned parties to agree to the installation plan.**

3 **Install the S-NET, monitor input, and relay output wiring.**

4 **Mount the ACU, the MIRO(s), the UWIU(s) or WIRO 4/8/4(s), the power supply (or supplies), and the interconnect wiring.**

5 **Mount the Readers and Door hardware.**

6 **Terminate the wiring to all of the hardware, including the Readers and the ACU.**

7 **Double-check and confirm that all of the wiring is finished and that it meets all of the safety requirements.**

8 **Power-up the system and perform the initial testing.**

Planning the Hardware Installation

Use the information in this section to create an outline of the hardware installation plan.

TO CREATE THE INSTALLATION PLAN:

1 **Consult with the Owner and determine the access control requirements. Remember to take notes of the meeting with the Owner.**

2 **Determine the buildings and rooms that are to be controlled, together with which of the 16 Zones will be used.**

3 **Obtain the floor plans for all of the controlled areas and review them in detail with the Owner.**

4 **Make a list of all the Doors that will be controlled.**

5 **Make a list of groups that represent the person or group of persons that need to gain access to which doors and when.**

6 **Determine the Doors that are to be locked and/or unlocked, based on Zone activity.**

7 **Make an assessment of the hardware devices featured in this manual and determine which devices and how many of each are required to fulfill the Owner's security requirements.**

8 **From the floor plan(s), check the location of each hardware device, including the ACU, the Host PC, the power modules, the batteries, the Client PC(s) and/or the Remote Station Reader, the Readers, REX devices, alarm contacts, control devices, and so forth.**

9 **Use copies of the floor plan(s) to draw up a preliminary installation plan. Label all of the controlled Doors and be as detailed as possible.**

PLANNING HARDWARE LOCATION

Determine the proper location for all of the hardware devices as a part of the installation plan.

Placing the NexSentry Star II Access Control Unit



NOTE: Place the NexSentry Star II ACU in a non-controlled area. This allows service personnel to access the ACU in the event of an emergency or an ACU failure.

The ACU location must meet the following requirements:

- Place the ACU a minimum distance of 6 feet (2 meters) from the main AC panels and high inductive loads such as motors, pumps, and so forth, unless the ACU is enclosed in a metal cabinet.
- The ACU must be a minimum of 3 feet (1 meter) from telephone cabling equipment or a public address system.
- The environment must be free of corrosive fumes and vapors.

Placing the Power Supply

The NexSentry Star II ACU distributes the power for the S-NET from the power supply connected to it. NexWatch recommends that you locate the power supply within 25 feet of the ACU.

Placing a Remote Station

System Users and Cardholders use Remote Stations to change the Zone status for controlled areas without the need of the Host or Client PCs. Typically, Remote Station switches are located on the perimeter of the controlled area. A Remote Station consists of a Reader, a Zone indicator light, and a switch to change the Zone status.



NOTE: A DR4205K reader can perform all of these functions. (The DR4205K's LED changes color for Zone status indication.)

Placing the Readers

Place the Readers at a convenient height for the Cardholders. Take into account the requirements of individuals with physical limitations, such as those in wheelchairs.

When you place the Readers, take care to avoid possible external sources of RF interference.

Typical sources of RF interference include:

- Air conditioning systems
- Arc welders
- Diathermy machines
- Electric motors
- Elevator lift motors
- Fluorescent lighting
- Industrial equipment
- Radio transmitters
- Relay panels
- PC monitors
- Telephone switching panels



CAUTION: Direct sunlight can damage a reader by raising its temperature to unacceptable levels.
See “Environmental Requirements” on page 2-25.

ANTI-PASSBACK

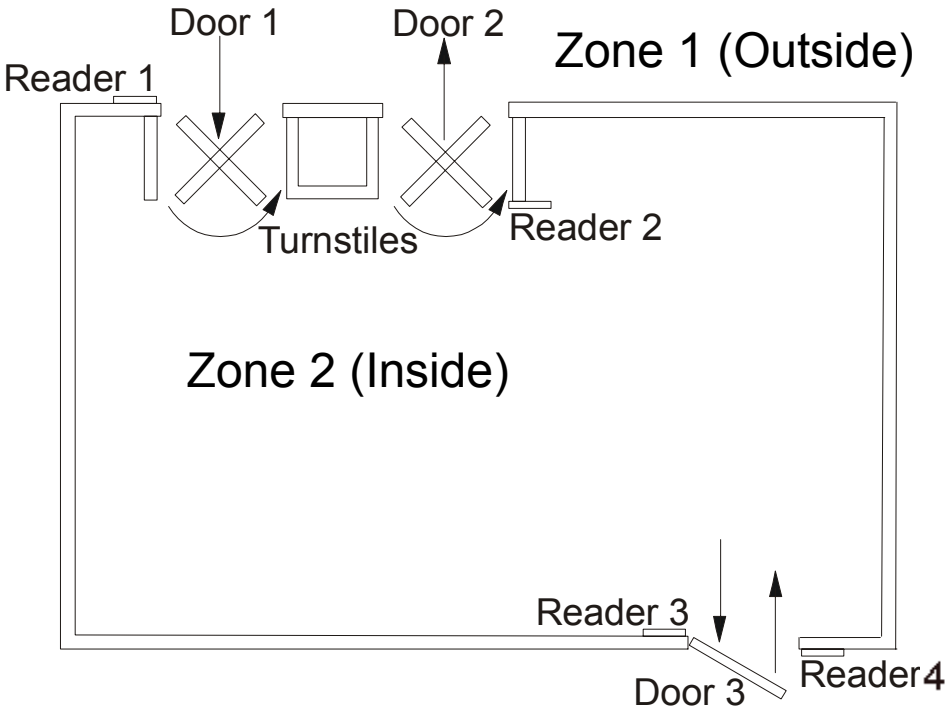
When areas/zones are to be Anti-Passback controlled, do not install REX (Request to Exit) devices at Doors between zones. For Anti-Passback zones, NexWatch recommends, where possible, that you use a separate physical Door from zone A to zone B and another physical Door from zone B to zone A. In such cases, install Door Switches at both Doors. Door Switches are shunted by an ACU as a result of a qualified card having been read at a Reader..

If an Anti-Passback-controlled Door is not monitored by a Door Switch, then the ACU assumes that whenever a card is presented to a Reader, the Cardholder gains access through that door. If Cardholder access is interrupted, the Cardholder cannot present the card a second time. Use of the Door Switch ensures that the ACU waits until the Door opens—signaled by the Door Switch—before changing the Cardholder status as being now in zone B (from A), or now in zone A (from B). For this reason, Door Switches are recommended in Anti-Passback zones.



NOTE: The number of Readers returning from a Zone does *not* have to match the number of Readers entering the Zone. (Also, a person can enter a Zone by one door and return from the same Zone via another door.)

A typical Anti-Passback installation is shown below. Door 1 uses a one-way mechanical turnstile, which grants access when a card is presented to Reader 1. Door 2 uses an electro-mechanical turnstile with an emergency release, which under normal conditions, grants the Cardholder permission to pass through when a card is presented to Reader 2. Door 3 is used for two-way traffic. Cardholders use Reader 4 to enter the zone and they use Reader 3 to exit the zone. All three Doors have installed Door Switches.



Example of an Anti-Passback Installation

USING A CONTROLLED SINGLE DOOR IN BOTH DIRECTIONS

When configuring a door with both in and out readers for passback or trace, this one *physical* door, with one *physical* door switch, must be used in two *logical* door configurations. The sharing of the door switch between logical door 1 (direction 1) and logical door 2

(direction 2) tells the ACU that the REX and alarm states must be processed differently.

REVIEWING THE SAFETY PRECAUTIONS

Take into account the safety precautions listed below when you design the installation plan, and review them thoroughly before the plan is finalized.



WARNING: The NexSentry Star II system **must not** be used as the *primary* system for fire safety monitoring locations.You can, however, use the ACU to monitor auxiliary outputs that provide *supplemental* information.

SAFETY PRECAUTIONS:

- Follow all National, State, and local building and fire codes.
- The installation must allow for a manual exit from all of the controlled Doors in the event of a fire or other emergency.
- The installation plan must provide for appropriate site access by emergency personnel in the event of a fire or any other emergency.
- Place the Host PC in an accessible location so that a System User can unlock the Doors during emergencies that do not involve a power failure. In some buildings or zones, it is desirable to install circuits that can unlock specified emergency doors.
- In the event of a power failure, emergency entrances and exits must unlock automatically. The Locks installed on emergency doors must be rated for Fail safe - continuous duty. Magnetic locks, especially low current versions with inductive damping, are recommended for such applications.

- Make considerations for various types of emergencies such as fires, intrusions, medical alerts, earthquakes, and so forth. Some codes require that emergency personnel have the capability to shut off all electrical power to a building from one outside location. This requirement might or might not apply to backup batteries for an uninterruptible power supply.
- Design the system to avoid the accidental triggering of alarms.

WIRING REQUIREMENTS

The following cable and wiring requirements will satisfy normal safety standards. Refer to local standards for additional information.



WARNING: Install all of the wires in accordance with the National Electrical Code (ANSI/NFPA 70-1993), and local electrical codes.



CAUTION: Do NOT power up the system until the wiring is complete and has been double-checked.

- In general, use power wires that are thicker than 18 gauge. See "S-NET Power Requirements" on page 2-26.
- Ends of wires clamped under binding screws or similar parts must be tinned and terminated through the use of crimping tools.

- Splices in power (or data) wires should be avoided, but if used must be properly insulated to preserve voltage integrity.
- Protect flexible power lines of any type with bushings when they pass through walls and sheet metal.
- Connect all S-NET devices with twisted-pair wire plus shield.

Grounding the System

Proper grounding of the NexSentry Star II system, its power supplies, and all node devices is essential to guarantee proper system operation. Improper grounding can cause problems such as misreads of cards and PINs, ACU hang ups, and invalid Transaction Logs.

The system must be single-point grounded. This means that all signal grounds and all chassis grounds are connected to the ground terminal of the NexSentry Star II ACU power supply. This, in turn, is connected to earth ground through the AC circuit. Unplugging the power supply from the AC wall outlet should "float" the entire system; that is, with the power supply unplugged there should be no continuity between earth or building metal ground and any conductive part on the ACU or any of its system devices.

In general, ground the S-NET shield at one end only. If noise problems or other symptoms such as incorrect reads or false error messages occur when the system is first powered on after installation, contact NexWatch Customer Service for assistance.

S-NET WIRING

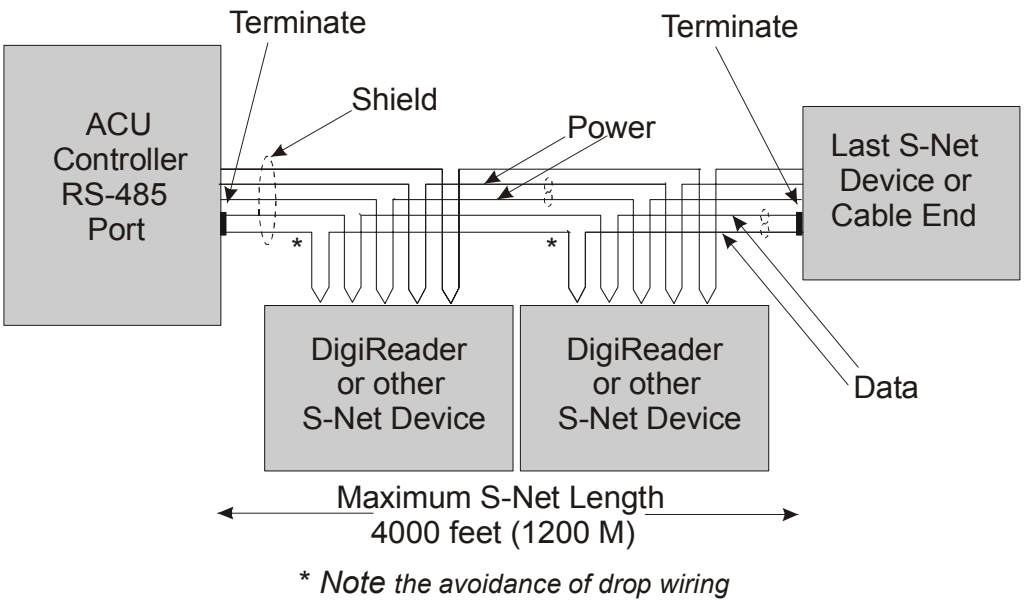
S-NET wiring for NexWatch controllers is a combination of RS-485 communication and DC power delivery. The maximum length of any S-NET run is 4000 ft. (1300M). Two separate twisted pairs of

wire are required. The RS-485 wiring should be 24 or 22 Gauge shielded, twisted pair. Larger gauge wire is not required or recommended regardless of network length. The power wire should be twisted pair, shielding optional, of sufficient size to deliver the required voltage to the last network component. 18 gauge is sufficient for the majority of applications. There are charts and examples in this manual to help you decide what size wire is required for power.

Single cables are available which contain both required pairs. For short runs to small readers, dual 22 gauge shielded, twisted pair may suffice. A cable containing 1 pair 24 (or 22) gauge and 1 pair 18 (or 16) gauge shielded twisted wire would be ideal for the vast majority of applications.

Because it relies on RS-485 communication protocol, S-NET is capable of multi-drop connections. In many installations, this is desirable to reduce wiring costs. Each Reader has a connection pigtail cable that may be spliced into the S-NET bus. This pigtail is approximately 3 ft (1M) in length. Extension of this pigtail to make a longer "T" tap is not recommended.

A 120 Ω End-Of-Line (EOL) Resistor is required at the last device in any S-NET run that is greater than 500 ft. A chart in this manual will fully describe EOL use.



S-NET Wiring

S-NET Cable Recommendations

	Type	Description	Gauge
Data and Power: S-NET Length is over 1000 feet	**SW 179/Gray (Southwest Wire & Cable)**	**2 Conductor: Data 2 Conductor: Power**	**22 AWG 16 AWG**
Data and Power: S-NET Length is over 500 feet	**24 or 22 gauge shielded, twisted pair for RS-485 communication, 18 gauge twisted pair (shielding optional) for power.**		
Data Only: S-NET Length is less than 500 feet	**Belden 9841 (or equivalent: Velocity of propagation = 66% Nominal capacitance = 12.8pf/ft Nominal impedance = 120ohms)**	**1-pair**	**24 AWG**
Power Only: S-NET Length is less than 500 feet	**Belden 9341 Belden 9342 Belden 9343**	**2-conductor**	**18 AWG 16 AWG 14 AWG**

S-NET Cable Recommendations

Cable Power Loss

The hardware devices receive power through the S-NET power wiring. The amount of power loss in the cable has an effect on the overall performance of the system.

The length of the S-NET can be up to 4000 ft (1200 m). To power a 200 mA Reader at this distance, the power wiring must be 16 AWG, (or thicker). For a single run, this allows 16 VDC at the node if 24 VDC is the source. The table below lists the power requirements for various S-NET devices.

Device	Current at 18 VDC	24 VDC	Notes
Controller	300mA	200mA	
MIRO 16/8	200mA	125mA	All relays active
MIRO 2/24	430mA	360mA	All relays active
MIRO 2/16HH	280mA	250mA	All relays active
MIRO 32/0, MIRO 32/0HH	50mA	70mA	
MIRO 64/0 (1)	100mA	70mA	
MIRO 4/2	60mA	45mA	
MIRO 4/0 NexLine Plus	15mA	10mA	
UWIU	200mA	150mA	
WIRO 4/8/4	175mA	150mA	
NexStar	70mA	50mA	
DR 4201	80mA	50mA	
DR 4203	100mA	70mA	
DR 4205, DR 4205K	100mA	70mA	
DR 4208S	270mA	200mA	
DR 4220	500mA	400mA	
VIP2	40mA	35mA	
Magstripe Reader	15mA	10mA	

S-NET Device Power Requirements, MIR 64/0 (1) not evaluated for use in UL installations.

The table below explains typical S-NET wire loss for 18 AWG.

Reference current use @ 16V

Device	Minimum Required Voltage	Required Power	S-NET IR Drop/1000 Feet
Controller	16VDC	5 Watts	1.90 Volts
MIRO 16/8	12.5VDC	2.5 Watts	1.30 Volts
MIRO 2/24, MIRO 2/16HH	12.5VDC	7.8 Watts	4.0 Volts
MIRO 32/0, MIRO 32/0HH	12.5VDC	1 Watt	0.4 Volts
MIRO 64/0	12.5VDC	2 Watts	0.8 Volts
MIRO 4/2	12.5VDC	1 Watt	0.48 Volts
MIRO 4/0 NexLine Plus	24VDC	0.5 Watts	0.13 Volts
WIRO 4/8/4	12.5VDC	2.8 Watts	1.44 Volts
UWIU	12.5VDC	2.8 Watts	1.44 Volts
NexStar	12.5VDC	0.7 Watts	0.32 Volts
DR 4201	12.5VDC	2 Watts	0.32 Volts
DR 4203	16VDC	2 Watts	0.45 Volts
DR 4205, DR 4205K	12.5VDC	2 Watts	0.45 Volts
DR 4208S	12.5VDC	2.5 Watts	1.28 Volts
DR 4220	12.5VDC	10 Watts	2.54 Volts
VIP2	16VDC	1 Watt	0.22 Volts
Magstripe Reader	16VDC	0.26 Watts	0.06 Volts

S-NET Typical Wire Loss, 18 AWG

(6.4 Ohms @ 1000 ft loss)

Determining the S-NET Wire Size

The daisy-chaining of S-NET devices causes significant cable losses. At least 16 volts must be available at each node to ensure proper operation. To find the proper wire gauge for your system, follow a

similar procedure to the Power Wire Size Example, following the Power Wire Size table.

TO FIND THE PROPER WIRE GAUGE:

1. **Add the total amount of load units for the system. Use the S-NET Device Load table to obtain each device's load unit. Add the load unit numbers for only the devices on the S-NET that are at least 50 feet (15 meters) from the power supply location.**
2. **From the Power Wire Size table, cross-reference the total number of load units with the distance from the S-NET to determine the wire size. An example follows the Power Wire Size table.**

Device	Load Units	Notes
Controller	4 Each	
MIRO 16/8	4 Each	With all relays active
MIRO 2/24	13 Each	
MIRO 2/16HH	9 Each	
MIRO 32/0, MIRO 32/0HH	2 Each	
MIRO 64/0	3 Each	
MIRO 4/2	2 Each	With both relays active
MIRO 4/0 NexLine Plus	1 Each	
NexStar	1 Each	
DR 4201, 4203	2 Each	
DR 4205, 4205K	2 Each	
DR 4208S	4 Each	
DR 4220	8 Each	
VIP2	1 Each	
Magstripe Reader	1 Each	

S-NET Device Loads

	Total Cable Route Distance, in feet						
Load Units	**500**	**750**	**1000**	**1500**	**2000**	**3000**	**4000**
5	**24 AWG**	**22 AWG**	**22 AWG**	**20 AWG**	**18 AWG**	**16 AWG**	**16 AWG**
10	**22 AWG**	**20 AWG**	**18 AWG**	**16 AWG**	**16 AWG**	**14 AWG**	**12 AWG**
15	**20 AWG**	**18 AWG**	**16 AWG**	**16 AWG**	**14 AWG**	**12 AWG**	**10 AWG**
20	**18 AWG**	**16 AWG**	**16 AWG**	**14 AWG**	**12 AWG**	**10 AWG**	**8 AWG**
25	**18 AWG**	**16 AWG**	**14 AWG**	**12 AWG**	**12 AWG**	**10 AWG**	**8 AWG**
30	**16 AWG**	**14 AWG**	**14 AWG**	**12 AWG**	**10 AWG**	**8 AWG**	
35	**16 AWG**	**14 AWG**	**14 AWG**	**12 AWG**	**10 AWG**	**8 AWG**	
40	**16 AWG**	**14 AWG**	**12 AWG**	**8 AWG**	**8 AWG**		

Power Wire Sizes for a Range of Load Units

POWER WIRE SIZE EXAMPLE:

For an example, let's say your entire system consists of the following hardware items:

- 1 NexSentry Star II ACU that is located within 50 feet of the power supply
- 2 MIRO 16/8 devices that are located within 50 feet of the power supply
- 4 DR 4205 devices that are located over 50 feet away from the power supply
- 4 VIP Readers that are located over 50 feet away from the power supply

The ACU and the MIRO are located within 50 feet of the power supply, so do not count these loads. The Readers are over 50 feet away from the power supply, so you must add these loads.

Device	Number of Devices	Number of Load Units per Device	Total Number of Load Units
DR 4205	4	2	8
VIP Readers	4	1	4
		Over-All Load Units:	12

Load Unit Calculations (for Above Example)

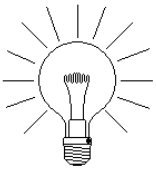
The cable route between the 8 different Readers to the power supply adds up to 1200 feet. When you use the Power Wire Size table, always round the numbers up. Therefore, the example system—12 load units with a cable route of 1200 feet—requires a wire size of 16 AWG.

Alternatives to a Large Power Wire

If you determine that the necessary wire size is very large, there are alternatives:

- Install a second power supply closer to the devices to limit the cable route distance
- Use two or more conductor pairs to increase the load capacity
  2-26 AWG ≈ 1-22 AWG
  2-20 AWG ≈ 1-18 AWG
  2-18 AWG ≈ 1-16 AWG

If the wire size is too large to fit into the compression terminal blocks, then a splice can be made from 16 AWG to the required larger wire.



NOTE: The communication pair should not duplicate the power pair size. The data pair should remain a shielded twisted-pair of 22 or 24 AWG.

If the wire size is not listed for your system, then using a separate power supply to limit the wire length is recommended.

Planning the Wiring for Future System Expansion

The wire size chosen for the installation must accommodate future system growth. If you expect to add more Doors at a later date, consider one or both of these options:

- Use a larger wire size to accommodate additions, or
- Plan to add a new power supply for the new Doors

Termination Resistors

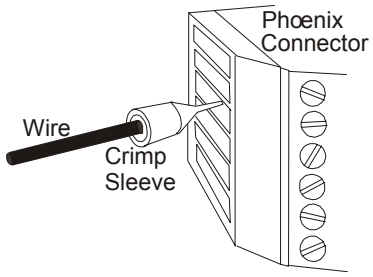
Termination resistors are used to absorb any residual signal at the ends of the S-NET communication bus and to prevent possible reflected secondary lower-power signals from corrupting the primary S-NET communication signal. Termination is made with a 120-ohm, ¼-watt resistor connected between the wires (DATA A and DATA B). The need for termination resistors increases with the bus length. With short S-NET runs—shorter than approximately 500 feet—termination is not needed. Around 500 feet, it becomes desirable for at least one end to be terminated. For runs over 1000 feet, plan to terminate the runs at each end. Most S-NET devices have termination straps included for use when needed.

Inserting a Wire into a Fixed Block or Phoenix Connector

For wire insertion into either fixed block or Phoenix connectors, the following procedure is recommended.

TO INSERT THE WIRE TO A FIXED BLOCK OR PHOENIX CONNECTOR:

1. **Strip the wire end.**
2. **Twist the exposed strands tightly and tin the ends.**
3. **Crimp an appropriate size ferrule on the end of the wire. Be sure that the ferrule is crimped on bare conductor metal, not the insulation.**



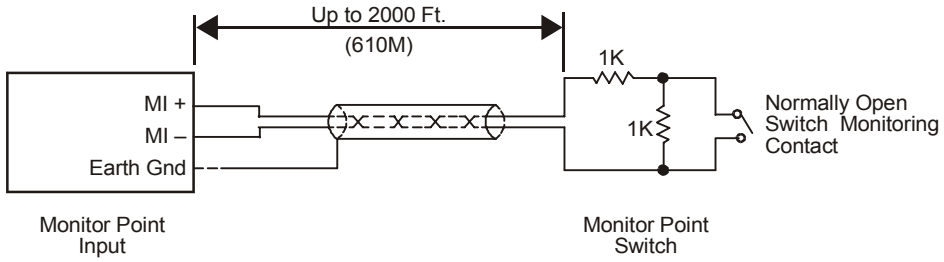
Wire Insertion into a Phoenix Connector

4. **Insert the ferrule in the appropriate Phoenix connector terminal.**
5. **Tighten the connector binding screw and torque to 5 inch-pounds (0.56Nm).**

MONITOR INPUT WIRING

Monitor inputs are provided on the ACU mother-board as well as on the *half-height* WIRO 4/6/4, MIRO 2/16, and MIRO 32/0 boards, on the *full-height* MIRO 16/8, MIRO 2/24, MIRO 32/0, MIRO 64/0, and on the MIRO 4/2, and NexLine Plus (MIRO 4/0) devices. It is important to minimize the length of the cable between a monitor

input and a set of monitoring contacts, since excessive length can affect the status detection capability. The data provided in the Monitor Input Cables table is based on measurements of the resistance required to cause a system to indicate an OPEN (>3.5K), 2K (CLEAR), 1K (ACTIVE), or SHORT (0K) condition. (These are the preferred assignments for the four states, see note below.) A typical monitor input circuit for a four-state switch is shown below.



Monitor Input: Example

Shielded cable lengths of up to 2000 feet (610 meters) can be accommodated if the wire size is 22 AWG or larger. Conductor-to-conductor capacitance should not exceed 40 pf/ft; shield-to-conductor capacitance should not exceed 70 pf/ft.



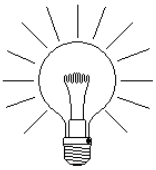
NOTE: The exact functions of any of the four states, >3.5K Ω, 2K Ω, 1K Ω, and 0K Ω can be chosen by the user, so that a customer may choose for his installation the 2K as ACTIVE and the 1K as CLEAR, rather than the reverse of this as shown above.

Un-shielded cables can be used up to a distance of 500 feet (150 meters) if the environment is electrically quiet. Cables up to 1000

feet (305 meters) maximum length can be used, but not if there is excessive electrical noise.

	Cable Type	Maximum Length
Shielded	**22 AWG twisted-pair Belden 87761 (Plenum) or equivalent**	**2000 feet (610 meters)**
Un-shielded	**22 AWG twisted-pair Belden 8443 or 8445 or equivalent**	**1000 feet (305 meters) Noise-free environment**
	24 AWG twisted-pair Alpha 6622 or equivalent	**500 feet (150 meters) Noise-free environment**

Monitor Input Cables: Maximum Allowable Lengths



NOTE: Make sure that the switch contacts consist of high quality materials which provide low contact resistance even when switching very small currents (~2 mADC).

When a Door Switch and a REX device are used on the same Door, install the two devices to adjacent monitor inputs. Install the REX device on the monitor input immediately before the Door Switch. For example, if the Door Switch is installed to monitor input 3.10, (the 10th monitor point on a MIRO device with MIRO address 3), then install the REX device to monitor input 3.9, on the same MIRO device, (either a MIRO 16/8 with 16 monitor points, or a MIRO 32/0 or a MIRO 64/0, with 32 and 64 monitor points, respectively). This minimizes the possibility of the ACU sending erroneous Door Forced Open Transaction Logs.

RELAY OUTPUT WIRING

Use the relay output connections to control devices such as door locks and alarms.

The Phoenix relay connectors on the MIRO 16/8 PC board have two connector pins for each of the eight relays. For instance, on the relay connector TB1 on the MIRO 16/8, relay 8 has pin 8 for the Common connection and pin 7 for connection to either a Normally Open or a Normally Closed device. The adjacent jumper that corresponds to the relay, in this case P8, determines if the connection is to a Normally Open or a Normally Closed device.

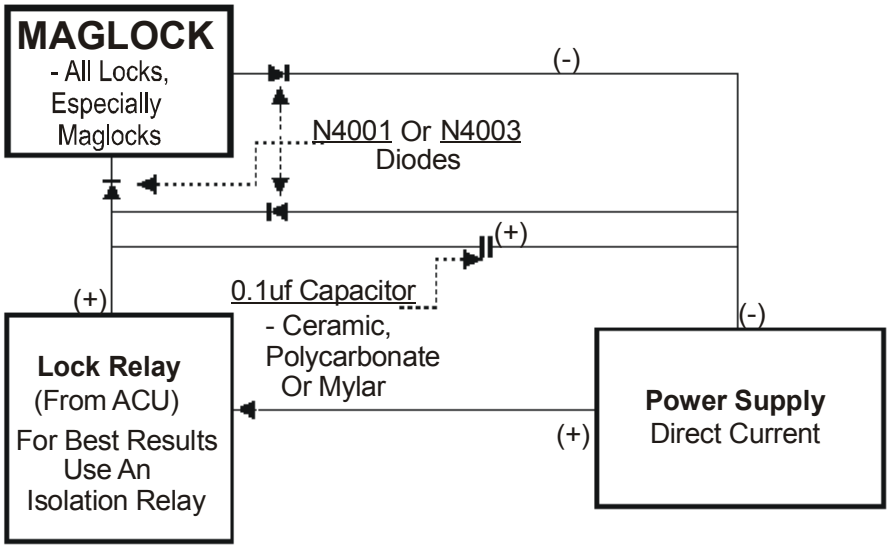
Most Phoenix relay connectors, including those on the MIRO 2/16 *half-height* PCA have three connector pins for each of the 16 relays. For instance, on the 'double-decked' relay connector TB1 on the MIRO 2/16, relay 2 uses the top three pins on the part of the Phoenix connector closest to the PC board. The first pin is the Normally Closed pin, the second (middle) pin is the Common pin and the third pin is the Normally Open pin. To connect a Normally Open device to relay 2, use the second and third pins. To connect a Normally Closed device to relay 2, use the first and second pins.

The Phoenix relay connectors on the MIRO 4/2 PC board also have three connector pins for each of the two relays, labeled K2_NC, K2_C, K2_NO, and K1_NC, K1_C, K1_NO. Where _NC = Normally Closed, _C = Common, and _NO = Normally Open.

Again, the Phoenix relay connectors on the WIRO 4/8/4 have three connector pins for each of the four relays, RO1 (pins 1, 2 and 3: NO, C, NC respectively), RO2 (pins 4, 5 and 6: same), RO3 (pins 7, 8 and 9: same), RO4 (pins 10, 11 and 12: same).

NOTE: To minimize back EMF in electric door strikes, manufacturers wire a protection diode (1N4001 or 1N4003) in parallel with the lock relay coil, using wiring methods and materials in accordance with the US national electrical code (ANSI/NFPA 70-1993). If the door strike you are using has no protection diode in parallel with the lock relay coil, wire one in place yourself, as shown below.

NOTE: All locks should have, at the very least, a metal oxide varistor (MOV). (A diode is much better; multiple diodes, as indicated below, are best.)



Diode Suppression of Lock/Output Wiring

ENVIRONMENTAL REQUIREMENTS

The following table indicates the temperature and humidity operating range for the products used as part of the NexSentry Star II ACU system.

Device	Operating Temperature		Operating Humidity
NexSentry Star II ACU	32°F to 120°F (0°C to 49°C)	(Indoor)	10% to 85% non-condensing
½ height MIRO 2/16, MIRO 32/0, WIRO 4/8/4	32°F to 120°F (0°C to 49°C)	(Indoor)	10% to 85% non-condensing
full height MIRO 16/8, MIRO 2/24, MIRO 32/0, MIRO 64/0	20°F to 120°F (-7°C to 49°C)	(Indoor)	10% to 90% non-condensing
NexLine Plus (MIRO 4/0), MIRO 4/2	20°F to 120°F (-7°C to 49°C)	(Indoor)	10% to 90% non-condensing
Wiegand Interface Unit (WIU)	20°F to 120°F (-7°C to 49°C)	(Indoor)	10% to 90% non-condensing
Universal Wiegand Interface Unit (UWIU)	20°F to 120°F (-7°C to 49°C)	(Indoor)	10% to 90% non-condensing
SE 902 Power Inserter	20°F to 120°F (-7°C to 49°C)	(Indoor)	10% to 90% non-condensing
DR 4208, VIP2 Reader	20°F to 120°F (-7°C to 49°C)	(Indoor)	10% to 90% non-condensing
DR 4203, DR 4205E, DR 4205K, DR 4200K	-31°F to 150°F (-35°C to 66°C)	(Outdoor)	10% to 90% non-condensing
DR 4201, DR 4205, DR 4205W, DR 4208S, DR 4220	-31°F to 150°F (-35°C to 66°C)	(Outdoor)	10% to 90% non-condensing
Magnetic Stripe Readers	-31°F to 150°F (-35°C to 66°C)	(Outdoor)	10% to 90% non-condensing

Environmental Requirements: ACU, MIROs, DRs, etc.

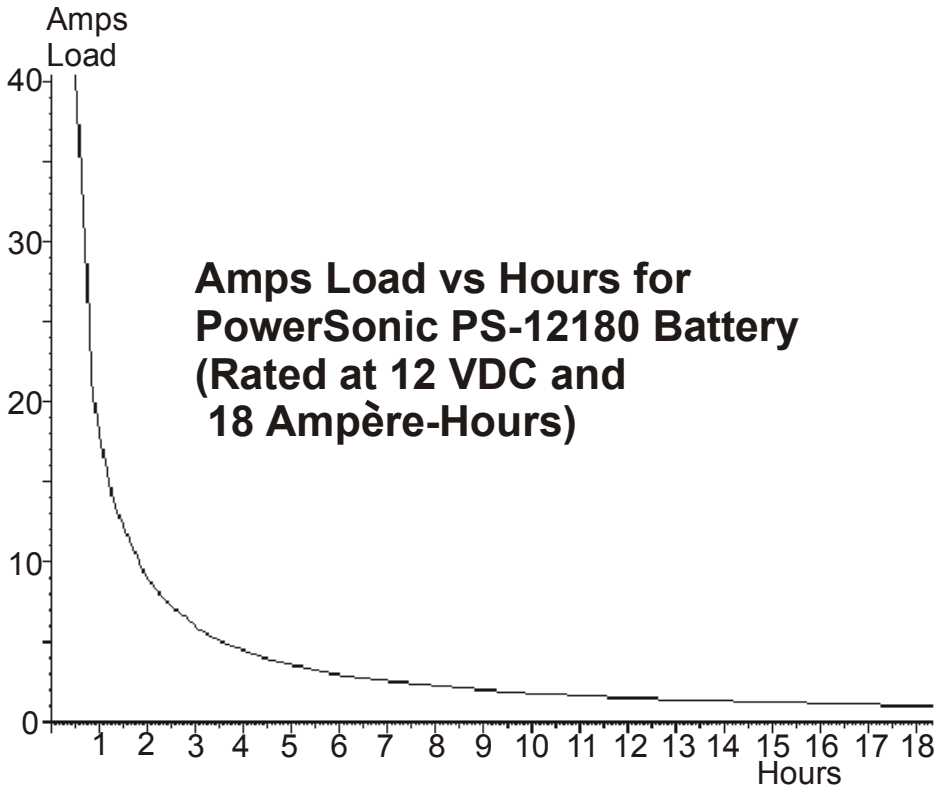
S-NET Power Requirements

One or more power supplies are required to provide DC power to the controller and all S-NET devices. The specific number of power supplies will depend on the number of devices and the overall length of the S-NET cable. The table S-Net Power Requirements on page 2-xx provides a list of nominal power as a guideline to determine power needed.

When multiple power supplies are used, one is connected to TB6 on the controller PCA. Additional power supplies may be placed in-line at the controller PCA or at intervals along the S-NET cable. See the power supply manual for installation details.

BackUp Power Requirements

For system power backup, NexWatch suggests the use of either the Panasonic LC-RD1217P or LC-RD1217AP battteries (both rated at 12 VDC and 17amp-hours) or the PowerSonic PS-12180 battery (rated at 12 VDC and 18 amp-hours).



Hours Available per Backup Battery

REMOTE ZONE CONTROL STATION



NOTE: The DigiReader LEDs in the system indicate the current Zone status.

Zone Mode	Mode Indicator
Armed	**Continually flashes amber and then red**
Disarmed	**Constantly red = locked, green = unlocked**

DKR LED Zone Mode Indicator

The Remote Zone Control Station switches can be assigned to any monitor input in the system and must be connected just as any other monitor input.

A privileged Cardholder, with access to the Remote Zone Control Station Switch, can change the Zone Status from Disarmed to Armed by holding down the mode switch, presenting a valid (privileged) card, and then releasing the mode switch. When the Armed mode is selected, there is a 30-second delay before the Armed mode becomes active.

To Disarm the Zone from a Remote Zone Control Station, the privileged cardholder presents the card and/or makes a valid Keypad entry to a remote Zone Control Station Reader and/or Keypad. (The mode switch, if present, is **not** held down in the Zone Disarming sequence.)

Remote Zone Control Stations can be used to change Zone status without using either NSM Lite, or the host computer to which the ACU may be connected.



NOTE: With or without a Zone Control Station Switch present, but ***with the keypad activated***, a **REMOTE STATION KEYPAD** may also be used to change the Zone status from DISARMED to ARMED. (IMPORTANT: FOR THIS FEATURE TO OPERATE, SEE THE ACU CONFIGURATION: VIP TAB, in Chapter 10.)

To change Zone status from DISARMED to ARMED with both a remote station keypad and reader activated, the privileged cardholder enters his 4 to 6-digit PIN number ***minus one*** into the keypad to start the arming sequence, followed (after about a 2 second pause) by entering his actual PIN number into the keypad and presenting his card to the reader. (For PIN 1234, 1233 and 1234 would be entered; for PIN 1230, 1229 and 1230 would be entered.)

To change Zone status from DISARMED to ARMED with only a remote station keypad activated, the privileged cardholder enters his 4 to 8-digit credential number ***minus one*** into the keypad to start the arming sequence, followed (after about a 2 second pause) by entering his actual credential number into the keypad.



CAUTION: The cardholder must check that everyone has already left the Zone before using the remote station to change the Zone status to ARMED, since an alarm may be activated if anyone is still in the Zone when the 60-second Arming-activation period expires.

3 Installing the Access Control Unit

After you have finalized the installation plan, you are ready to install the hardware devices. Read this chapter for details.

This chapter covers the following topics:

- "Installing the ACU" on page 3-2
- "Enclosures and ACU Specifications" on page 3-3
- "Mounting the Enclosures" on page 3-4
- "ACU Connectors" on page 3-8
- "ACU Pin-Outs" on page 3-9
- "ACU Communication Ports" on page 3-11
- "ACU TB1, TB2 & TB3" on page 3-12
- "ACU TB4 and TB5" on page 3-14
- "ACU TB6" on page 3-16
- "ACU LEDs" on page 3-18
- "ACU Fuses and Poly-Switches" on page 3-20
- "ACU Switches" on page 3-21
- "ACU Straps" on page 3-26
- "ACU Relays" on page 3-32
- "End Of Line Resistors (EOLRs)" on page 3-33

INSTALLING THE ACU

This section covers installing the ACU.

TO INSTALL THE NEXSENTRY STAR II ACU:

1. **Mount the enclosure with the ACU inside.**
2. **Connect the MIRO(s) to the ACU.**
3. **Wire the S-NET connections.**
4. **Connect the Remote Station switch and the latched alarm relay.**
5. **With the Power Inserter (PI) power turned off, connect the ACU to the PI.**
6. **Connect the ACU to the PC(s).**
7. **Check all the connections thoroughly.**
8. **Turn on the power.**

ENCLOSURES AND ACU SPECIFICATIONS

The NexSentry Star II system is designed to meet the requirements specified by the FCC Class B, and EN55022 Class B and the less stringent FCC class A and EN55022 Class A ratings when the ACU is board-only. The system operates best under the following environmental conditions:

- 20° F to 120° F, -7° C to 49° C
- 0% to 90% humidity, non-condensing

	Device	Size	Weight
Enclosures	Single NexSentry Star II ACU Enclosure	5.5"W x 16.25"H x 1.83"D, 14 cm x 41.3 cm x 4.7 cm	24 ounces, 680 grams
	Single MIRO Enclosure: 2/24, 16/8, 32/0, 64/0	5.5"W x 16.25"H x 1.83"D, 14 cm x 41.3 cm x 4.7 cm	28 ounces, 793 grams
	Single Universal Wiegand I/F Unit (UWIU) Enclosure	5.5"W x 16.25"H x 1.83"D, 14 cm x 41.3 cm x 4.7 cm	16 ounces, 454 grams
	Double WIRO 4/8/4, MIRO 32/0HH, 2/16HH Enclosure	5.5"W x 16.25"H x 1.83"D, 14 cm x 41.3 cm x 4.7 cm	28 ounces, 793 grams
	Enclosure for Multiple boards	21"W x 25"H x 4"D, 53.4 cm x 63.5 cm x 10.2 cm	25 pounds, 11.33 kilograms
	MIRO 4/2 & NexLine Plus (MIRO 4/0) Enclosure	7.5"W x 6"H x 1.4"D, 19 cm x 15.3 cm x 3.6 cm	10 ounces, 283 grams
	AD 4305 NexStar Enclosure	7.8"W x 4.4"H x 1.4"D, 19.8 cm x 11.2 cm x 3.6 cm	10 ounces, 283 grams
ACU	NexSentry Star II PC-Board	5.2"W x 15"L x 1.5"H, 13.2 cm x 38.1 cm x 3.8 cm component height included	21 ounces, 420 grams

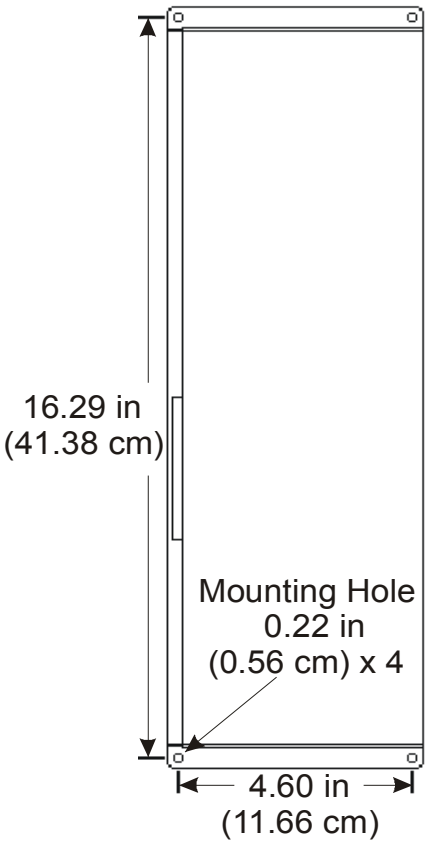
Specifications for Enclosures and ACUs

MOUNTING THE ENCLOSURES

This section covers the mounting details for the several different types of enclosures.

Mounting Details for the NexSentry Star II ACU

The enclosure for a single ACU is shown in the figure. Four #8 screws, two at the top and two at the bottom, secure the enclosure to the wall. Four snap fasteners hold the cover on the enclosure.



Mounting Holes for the NexSentry Star II ACU Enclosure

Mounting Details: MIRO 16/8, 2/24, 32/0, 64/0 and UWIU

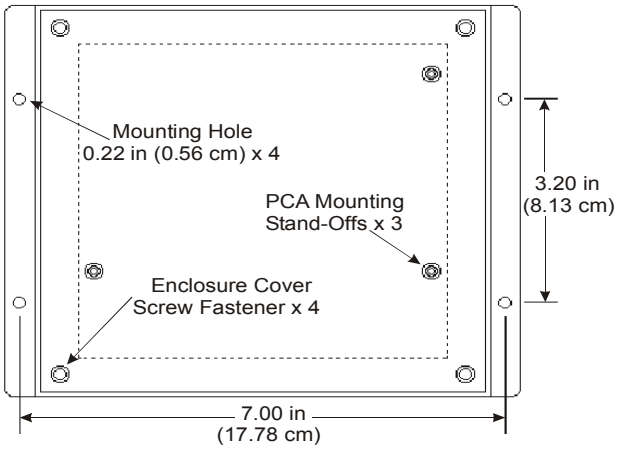
The mounting details for the individual enclosures for the MIRO 16/8, 2/24, 32/0, 64/0, and the Universal Wiegand Interface Unit (UWIU) are similar to those of the NexSentry Star II ACU. Four #8 screws, two at the top and two at the bottom, secure the enclosure to a wall.

Mounting Details: MIRO 2/16HH, 32/0HH and WIRO 4/8/4

The mounting details for the individual enclosures for the MIRO 2/24HH, 32/0HH, and the WIRO 4/8/4 are also similar to those of the NexSentry Star I ACU, except that any two of these half-height units may be installed, one above the other. Four #8 screws, two at the top and two at the bottom, secure the enclosure to a wall.

Mounting Details: MIRO 4/2 and NexLine Plus (MIRO 4/0)

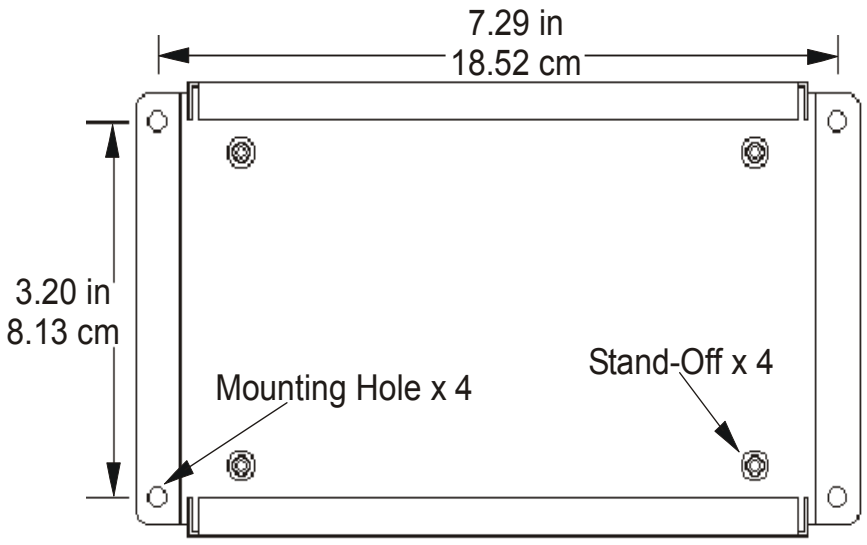
The mounting details for the individual enclosures for the MIRO 4/2 and the NexLine Plus (MIRO 4/0), are shown below. Four #8 screws, two on the left side and two on the right side, secure the enclosure to the wall. Four 3/32" machine screws hold the aluminum rear cover on the enclosure.



Mounting Holes for the MIRO 4/2 and MIRO 4/0 = NexLine Plus Enclosure

Mounting Details: AD 4305 NexStar RS-485 Multiplexer

The mounting details for the individual enclosure for the AD 4305 NexStar are shown below. Four #8 screws, two on the left side and two on the right side, secure the enclosure to the wall. The cover snaps in place on the enclosure.

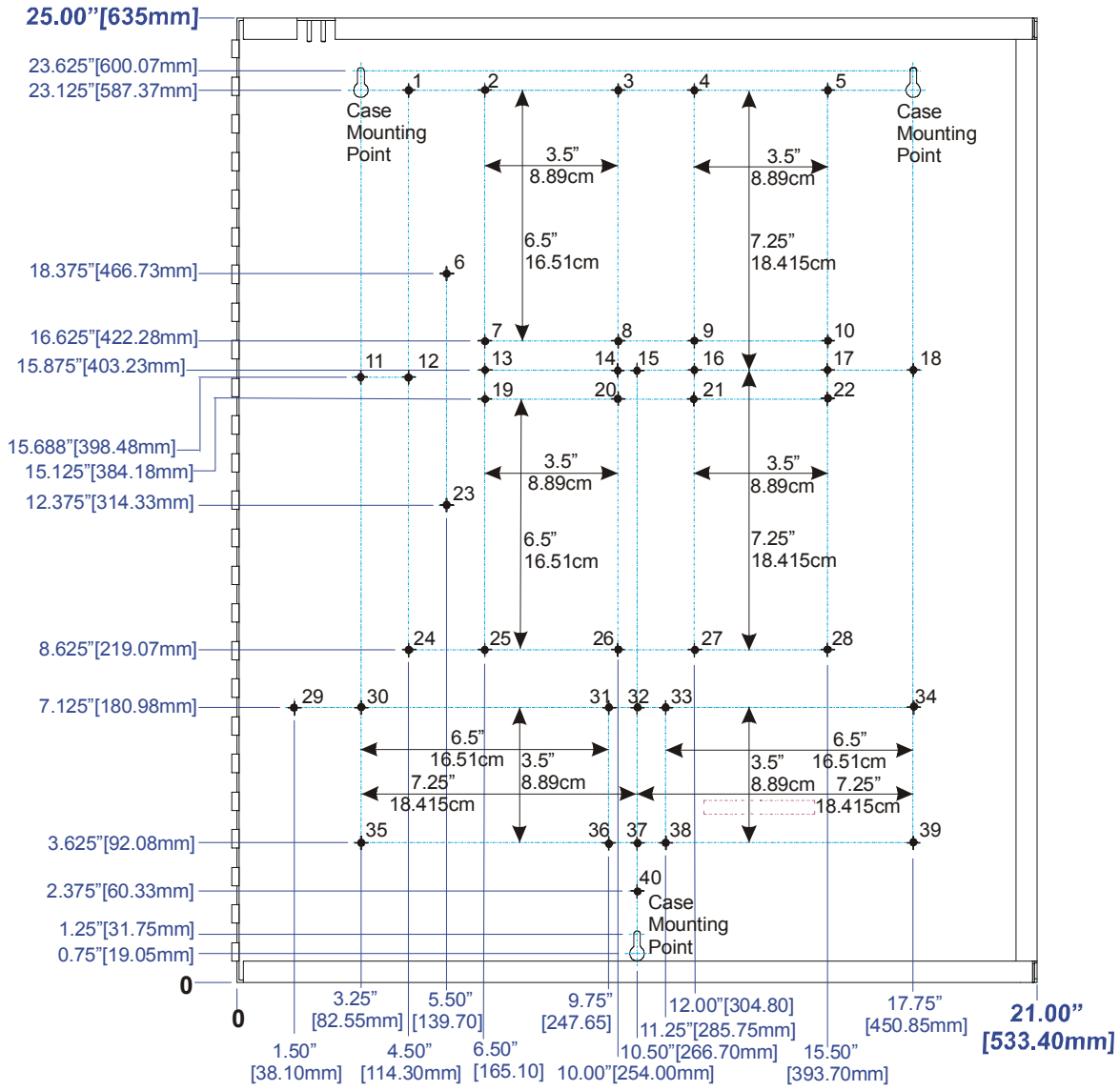


Mounting Holes for the AD 4305 NexStar Enclosure

Mounting Details: Multiple PCA Enclosure

Several different PCA combinations can be mounted in the large, multiple PCA enclosure: Star ACU, MIRO 16/8, 2/24, 32/0, 64/0 or UWIU units, and up to 6 of the WIRO 4/8/4 units, and/or MIRO 32/0HH units, and/or MIRO 2/16HH units.

Three #8 machine screws mount the multiple PCA enclosure to a wall. All of the dimensions for the enclosure, (3 case, 4 ground contacts and 36 internal PCA mounting points), are shown below.



(New) Multiple PCA Enclosure Dimensions

PCA Board	Max # PCBs	# Mounts	Mounting Dimensions	Mount Numbers
WIRO 4/8/4, MIROs 2/16HH, 32/0HH	6	4	6.5" x 3.5" 16.51 cm x 8.89 cm	(2, 3, 7, 8) (4, 5, 9, 10) (19, 20, 25, 26) (21, 22, 27, 28) (30, 31, 35, 36) (33, 34, 38, 39)
Star I & II, MIROs 16/8, 2/24, 32/0, 64/0, & UWIU	3	6	(2@7.5") x 3.5" (2@19.05 cm) x 8.89 cm	(2, 3, 13, 14, 25, 26) (4, 5, 16, 17, 27, 28) (30, 32, 34, 35, 37, 39)
		Mountings Used by 4100 PCB:		(1, 3, 12, 16, 24, 26)
		Ground Contacts (tied to Case)		(11, 18, 29, 40)

Multiple Enclosure PCA Mounting Data by PCA Type

The new large enclosure can accomodate up to 6 of the half-height boards: WIRO 4/8/4 PCA, MIRO 32/0 and MIRO 2/16 via 4 mount points. The Star I (and II) ACU, the MIRO 16/8, 2/24, 32/0 and the 64/0, and the UWIU boards all have the same 6 mounting points, shown above. (Mounts 1, 3, 12, 14, 24 and 26 are used for 4100 PC boards.) (The boards mounted vertically in the upper 2/3 of the case will be mounted with their Phoenix connectors facing outwards, away from the center. The boards mounted horizontally in the lower 1/3 of the case should have their Phoenix connectors facing downwards.)

ACU CONNECTORS

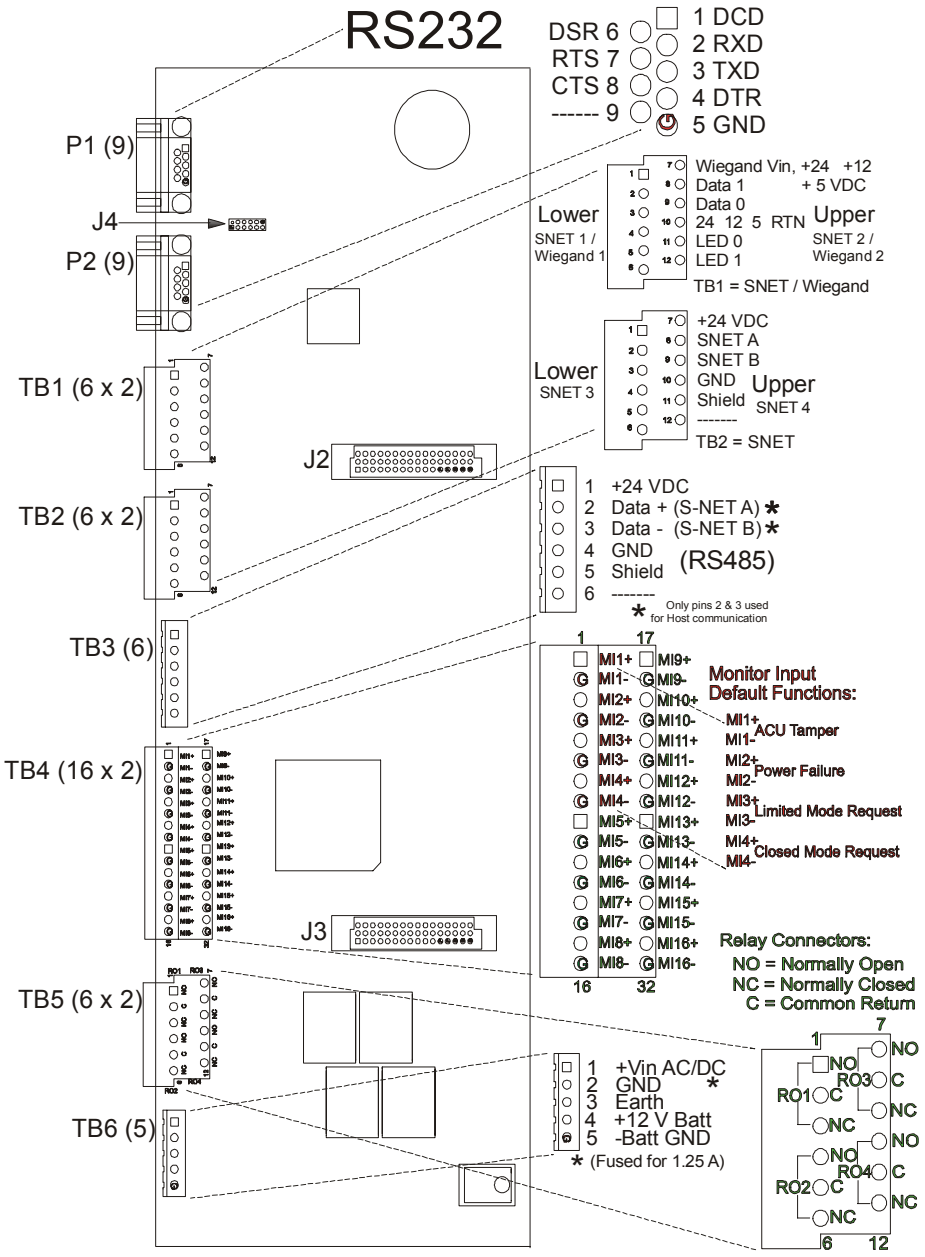
The table below lists the connectors on the NexSentry Star II ACU PC-board, which are shown in their relative positions in the following diagram.

Connector	Type	Function
P1	DB-9 Male	RS-232 Host PC Port
J2	45-Pin Connector	Connectors for Daughter Board (no longer used)
J3	45-Pin Connector	
J4	12-Pin Jack	Host CoBox network 10-base-T (optional)
P2	DB-9 Male	RS-232 Terminal Port
TB1	2 x 6-Pin Phoenix	S-NET 1 or Wiegand 1 (below, pins 1-6), S-NET 2 or Wiegand 2 (above, pins 7-12)
TB2	2 x 6-Pin Phoenix	S-NET 3 (below, pins 1-6), S-NET 4 (above, pins 7-12)
TB3	6-Pin Phoenix	Host RS485
TB4	2 x 16-Pin Phoenix	Monitor Points (MI1+ & MI1- through MI16+ & MI16-)
TB5	2 x 6-Pin Phoenix	Relay Outputs (RO1 through RO4: each NC, C, NO)
TB6	5-Pin Phoenix	Power Connector

ACU Connectors and Terminal Blocks

ACU PIN-OUTS

The diagram below shows the locations of the three connectors and six terminal blocks for the ACU motherboard.



ACU Connectors and Terminal Blocks

ACU COMMUNICATION PORTS

System Users communicate with the ACU through the Host PC or NSM Lite PC using the NexSentry Star II software. The Host PC communications may be accomplished in several different ways,

1) through an RS232 connector P1 or

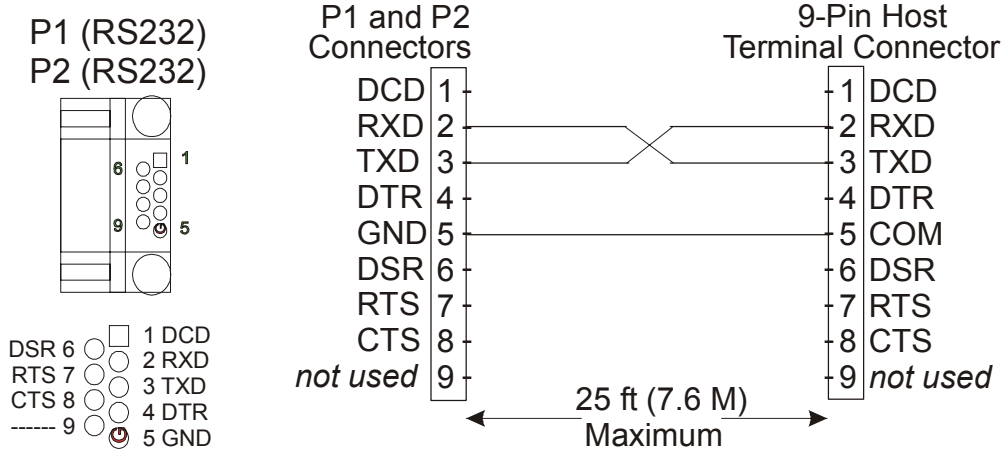
2) through an RS485 connector TB3 (see below) or

3) via a Cobox Micro Ethernet connector or

4) via dial-up, using a standard modem cable connected to P1.

RS232 Host PC Port (P1) and RS232 Terminal Port (P2)

Both the host and terminal ports on the ACU, P1, and P2 respectively, use DB9 male connectors. A standard null-modem cable can be used, or a cable can be made as shown below.



ACU P1/P2 Pin Names and ACU RS232 Cable Connections

* Only these connections are necessary for RS232 direct to Host. (For RS232 dial-up, all of the connections are used.)

ACU TB1, TB2 & TB3

External S-NET and Wiegand devices (MIROs and S-NET or Wiegand Readers) communicate through the two S-NET (or Wiegand) ports on terminal block TB1 and the two exclusively S-NET ports on terminal block TB2. Terminal block TB1 has connectors for S-NET 1 (or Wiegand 1) at the lower level and S-NET 2 (or Wiegand 2) at the higher level. Terminal block TB2 has connectors for S-NET 3 at the lower level and S-NET 4 at the higher level.

Terminal block TB3 is a single level port for RS 485 Host connection.

Terminal Block TB1 for S-NET or Wiegand Connection

The lower row of Terminal Block TB1 can be configured for either S-NET 1 or Wiegand 1 by means of straps JP1, JP2, JP4 and JP5. Note that **all four straps** must be set. Straps JP1, JP2 and JP5 are two-position straps for S-NET or Wiegand; strap JP4 is a three-position strap for S-NET +Vin or any of the three Wiegand voltage selections +24V, +12V, or +5V.

The upper row of Terminal Block TB1 can also be configured for either S-NET (S-NET 2) or Wiegand (Wiegand 2) by means of straps JP6, JP7, JP3 and JP8. Note again that **all four straps** must be set. Straps JP6, JP7 and JP8 are two-position straps for S-NET or Wiegand; strap JP3 is a three-position strap for S-NET +Vin for any of the three Wiegand voltage selections +24V, +12V, or +5V.

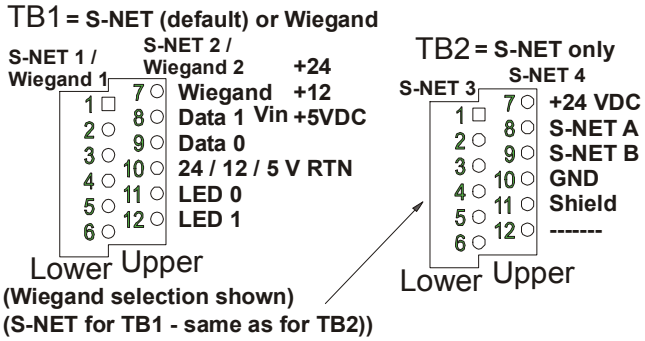
In the diagram below TB1's upper row is labeled for Wiegand 2. (TB1's lower row may also be Wiegand, Wiegand 1.) If either row is configured for S-NET (S-NET 1 or S-NET 2), the labeling is as shown for TB2.

Terminal Block TB2 for S-NET Only Connection

The lower row of Terminal Block TB2 has a fixed configuration for S-NET 3.

The upper row of Terminal Block TB2 also has a fixed configuration for S-NET (S-NET 4).

Since TB2 may only use S-NET connections, in the diagram below TB2's upper row is labeled for S-NET. (TB2's lower row may only be S-NET.)



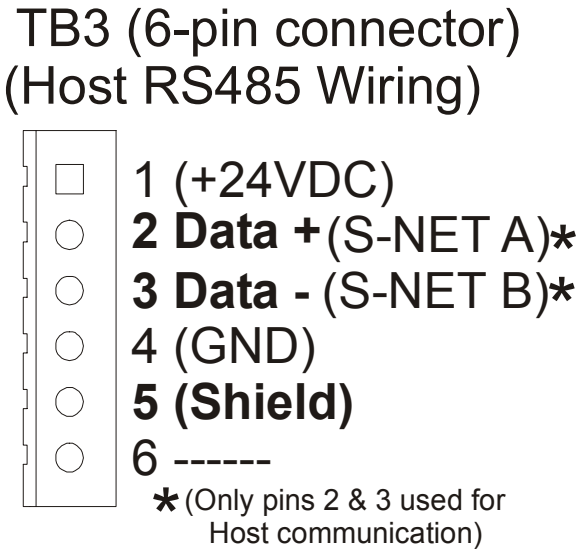
ACU Terminal Blocks TB1 & TB2: Pin Names

TB1 (S-NET or Wiegand)				TB2 (S-NET only)	
S-NET 1 or Wiegand 1 Connection Pins	S-NET 2 or Wiegand 2 Connection Pins	S-NET Pin-Outs	Wiegand Pin-Outs	S-NET 3 (Pins same as for S-NET 1)	S-NET 4 (Pins same as for S-NET 2)
Pin 1	Pin 7	+24 VDC	Power: +24 +12 or +5 VDC		
Pin 2	Pin 8	S-NET A	DATA 1		
Pin 3	Pin 9	S-NET B	DATA 0	S-NET Pin-Outs	S-NET Pin-Outs
Pin 4	Pin 10	GND	Power Return		
Pin 5	Pin 11	Shield	LED 0		
Pin 6	Pin 12	not used	LED 1		

ACU Terminal Blocks TB1 and TB2: Connections

Terminal Block TB3 for RS-485 Host Connection

Terminal block TB3 is a single level port for RS 485 Host connection. Its pin-outs are shown in the diagram and table below.



ACU Terminal Block TB3: Pin Names



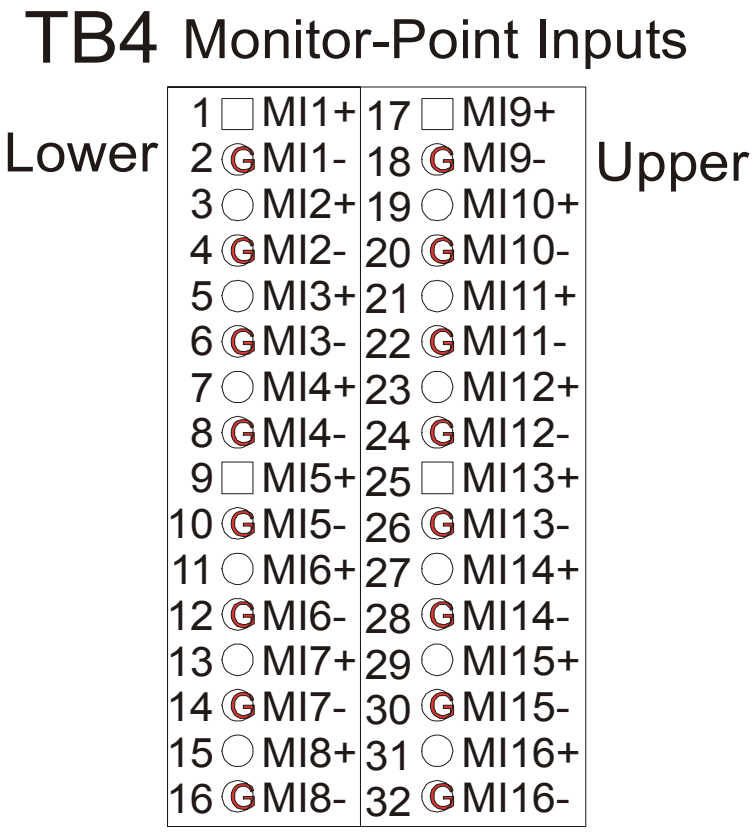
CAUTION: You may be tempted to tie together all of the power supplies on all of your ACUs, just because the pins are there enabling you to do so, and the other S-NET ports are connected that way. **DO *NOT* DO THIS!**

ACU TB4 AND TB5

The NexSentry Star II ACU has 16 on-board general-purpose monitor input points and 4 on-board general-purpose relays, access to which can be made via terminal blocks TB4 and TB5, respectively.

Terminal Block TB4 for 16 On-Board Monitor Inputs

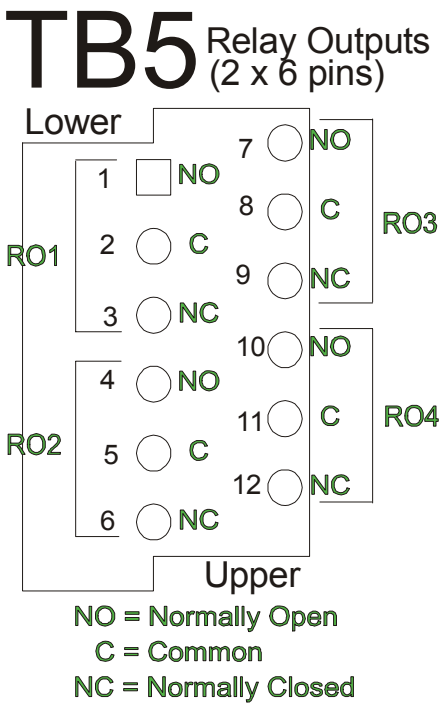
Terminal block TB4 is a double level connector for supplying 16 monitor inputs directly from the ACU. Its pin-outs are shown in the diagram and table below.



ACU Terminal Block TB4: Pin-Outs for Monitor Inputs

Terminal Block TB5 for 4 On-Board Relay Outputs

Double level terminal block TB5 supplies 4 relay outputs directly from the ACU. See the diagram below for pin-outs.



ACU Terminal Block TB5: Pin-Outs for Relay Outputs

ACU TB6

Terminal block TB6 is the Star II ACU power supply connector.

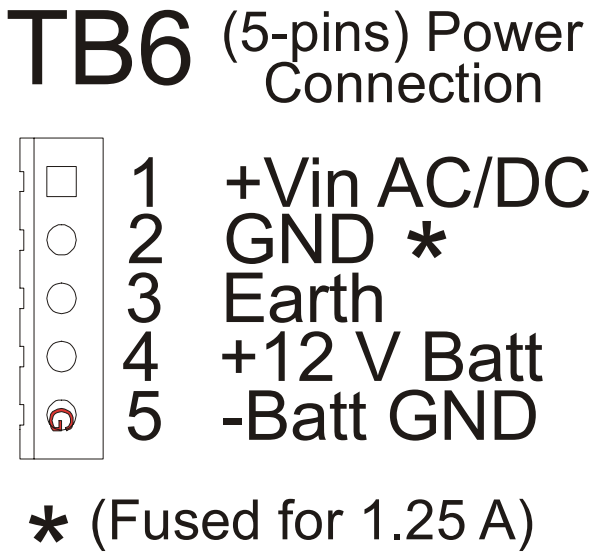
Pins 1, 2, and 3 are for the main 24V AC/DC system power, supplied from a suitable power inserter, such as the PI-1 Power Inserter unit.

Pins 4 and 5 may be connected to a back up 12V DC battery, under continual charge while the main power is present. During a power failure, the back up battery must supply system power for about 4 to

12 hours. (This is entirely dependent on the size of the overall ACU system and the anticipated worst case duration of the power outage.)

CAUTIONARY NOTE: Power Requirements Example: Consider a NexSentry Star II ACU (maximum 300 mA draw at 18 VDC), 5 MIRO 16/8 (200 mA each), and a DR 4201 reader on each of 8 doors (80 mA each). The maximum amperage draw for this configuration is ~ 1.2 amps. An 18-amp/hour battery would be required for about 15 hours. (Do not exceed 18 amp/hours for a NexSentry Star II system.) (See "S-NET Power Requirements" on page 2-26)

The pin-outs are shown in the diagram below.



ACU Terminal Block TB6: Pin-Outs

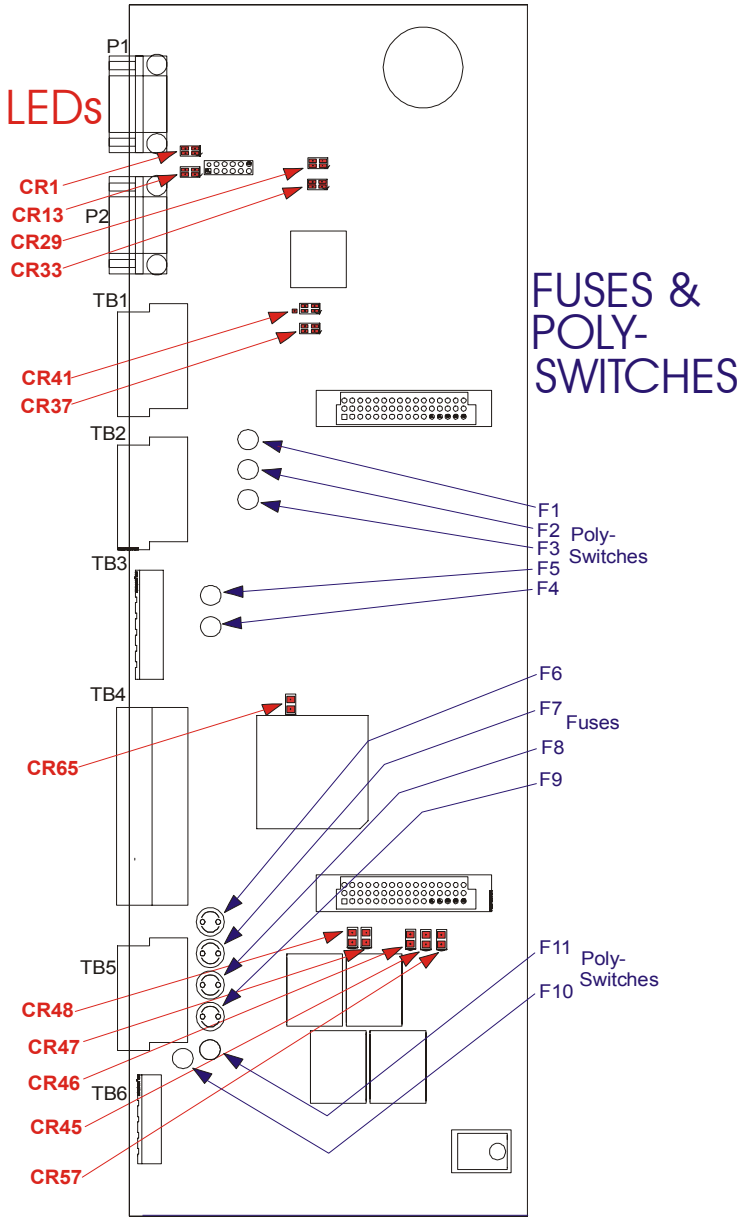
If a large number of S-NET devices are powered from the Star II controller, a DC power supply unit (like the PI-1, Power Inserter) should be used. The connection for the +DC power is pin 1 and the -DC power is pin 3. In addition, install strap JP19, (which reduces the power drop in the voltage rectifier).

ACU LEDs

The table below describes the different LEDs on the ACU, and the diagram shows their positions on the PCB board.

LED	LED Description	Green LED	Red LED
CR1	Host RS-232 communication	Receive	Transmit
CR13	Terminal RS-232 communication	Receive	Transmit
CR29	S-NET 1 communication	Receive	Transmit
CR33	S-NET 2 communication	Receive	Transmit
CR41	S-NET 3 communication	Receive	Transmit
CR37	S-NET 4 communication	Receive	Transmit
CR65	Internal communication to interface processor	Intermit. Flash Green = OK	
CR48	Status of relay 1	Green = active	
CR47	Status of relay 2	Green = active	
CR46	Status of relay 3	Green = active	
CR45	Status of relay 4	Green = active	
CR57	Vital LED blinks for ACU operation	Blinking Green = OK	

ACU LED Descriptions



ACU LEDs, Fuses & Poly-Switches

ACU Fuses and Poly-Switches

There are 4 *replaceable* fuses on the NexSentry Star II ACU. (Poly switches, which provide a re-settable, *non-replaceable* fuse function, are at locations F1-F5 and F10 and F11.) The diagram and table below describe the ACU fuses and *non-replaceable* poly-switches.

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			Approved Manufacturers; Part Numbers		
Fuse	**Description**	**Type**	**Wickman TR5 Series**	**Schurter MST Series**	**Bel MRT Series**
F6	Relay output 3 contact protection	3.15A slow	19372K-124	#34.6620	0692-3150-01
F7	Relay output 1 contact protection	3.15A slow	19372K-124	#34.6620	0692-3150-01
F8	Relay output 2 contact protection	3.15A slow	19372K-124	#34.6620	0692-3150-01
F9	Relay output 4 contact protection	3.15A slow	19372K-124	#34.6620	0692-3150-01

ACU Fuse Descriptions

Poly-Switch	Type	Description
F1	RXE250	$+V_{Input}$ poly-switch for source to S-NET 3 port
F2		$+V_{Input}$ poly-switch for source to S-NET 4 port
F3		+5v poly-switch for optional output to S-NET 1/2
F4		$+V_{Input}$ poly-switch for source to host RS 485 port
F5		$+V_{Input}$ poly-switch for optional source to S-NET 1/2
F10	RXE110	+12v poly-switch for optional output to S-NET 1/2
F11		$+V_{Input}$ poly-switch for ACU logic power

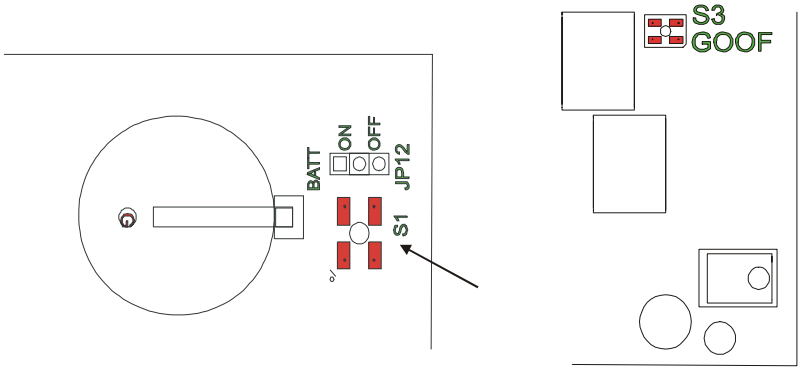
ACU Poly-Switch Descriptions

ACU SWITCHES

This section discusses five switches (S1, S2, S3, S4, and S5) on the ACU mother-board. S1 is the Reset switch, S3 is the Goof switch, and switches S2, S4, and S5 are used for setting the ACU's address and the baud rates for the ACU's internal S-NET functions and the external (host, terminal and CoBox) communications functions.

Reset Switch (S1)

The reset switch is a momentary contact push-button switch used to reset the microprocessor. If the Vital Function LED is not blinking, this indicates that the microprocessor is not functioning properly. Switch S1 is used to restart it. Resetting the microprocessor with this switch does not change any of the system operating parameters but does clear all System User commands.



ACU Reset Switch S1 and ACU Goof Switch S3

Goof Switch (S3)

The goof switch S3 has no function at present for the Star II ACU.

NexSentry Star II ACU Switches (S2, S4, and S5)

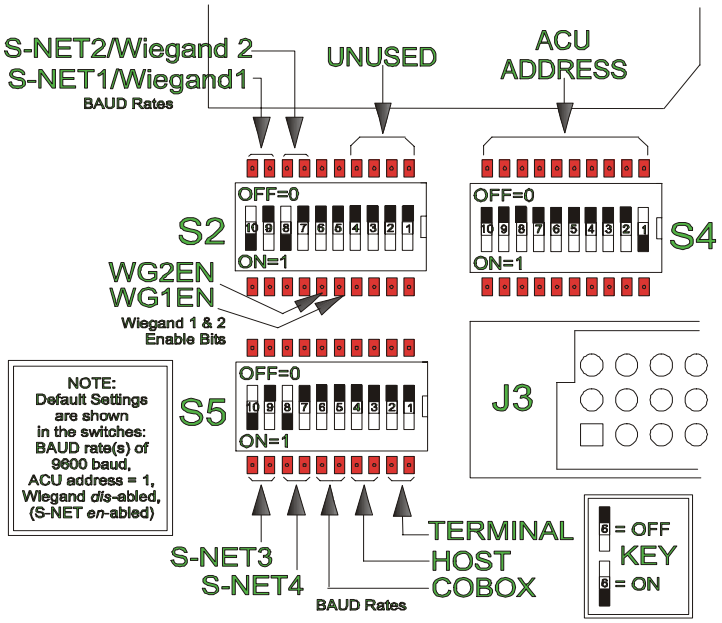
Switches S2, S4, and S5 have ten dips each, determining the ACU's 10-bit address, and the baud rates of the four S-NETs, and of the CoBox, host, and terminal ports.

Switch S4 supplies the 10 bits of the ACU address.

Switch S2 has bits 1-6 designated "address" bits, but bits 1-4 are not used at all (on the Star II ACU), and bits 5 and 6 are used as the Wiegand enable bits to enable S-NET 1 as Wiegand 1 and S-NET 2 as Wiegand 2, respectively. Bits 7 and 8 of switch S2 determine the S-NET 1/Wiegand 1 baud rate and bits 9 and 10 of switch S2 the baud rate of the S-NET 2/Wiegand 2 connection.

Switch S5 has 5 groups of 2 bits for setting the baud rate for the terminal (bits 1 and 2), the host connection (bits 3 and 4), the CoBox connection (bits 5 and 6), S-NET 2 (bits 7 and 8) and S-NET1 (bits 9 and 10).

The pictures and the tables below show how the switches are used.



ACU Address and Baud Rate Switches S2, S4, and S5

All ten positions of S4 are reserved for the ACU address. In the current system setup, only positions 1-5 of S4 are needed in order to provide the ACU address range; all the high order bits must be set OFF (0). The dip switch positions represent a binary array

:

Switch S4	Switch S2		
Dips 1-10	Dips 1-4	Dip 5	Dip 6
ACU address (10 bits)	Unused	Wiegand #1 enable	Wiegand #2 enable

ACU Switch S4 and Switch S2 (Dips 1-6)

Switch S4 Dips 1-5: ACU Addresses						ACU Address	
5	4	3	2	1			
OFF	OFF	OFF	OFF	OFF	=	0	Default
OFF	OFF	OFF	OFF	ON	=	1	
OFF	OFF	OFF	ON	OFF	=	2	
OFF	OFF	OFF	ON	ON	=	3	
OFF	OFF	ON	OFF	OFF	=	4	
OFF	OFF	ON	OFF	ON	=	5	
OFF	OFF	ON	ON	OFF	=	6	
OFF	OFF	ON	ON	ON	=	7	
OFF	ON	OFF	OFF	OFF	=	8	
OFF	ON	OFF	OFF	ON	=	9	
OFF	ON	OFF	ON	OFF	=	10	
OFF	ON	OFF	ON	ON	=	11	
OFF	ON	ON	OFF	OFF	=	12	
OFF	ON	ON	OFF	ON	=	13	
OFF	ON	ON	ON	OFF	=	14	
OFF	ON	ON	ON	ON	=	15	
ON	OFF	OFF	OFF	OFF	=	16	
ON	OFF	OFF	OFF	ON	=	17	
ON	OFF	OFF	ON	OFF	=	18	
ON	OFF	OFF	ON	ON	=	19	
						etc.	

ACU Address Settings Via ACU Dip Switch S4

With the switch-settings as shown, the ACU addresses are 0 (all OFF), and, via the binary array, 1 through 31.

Switch S5 ✲ = Default					
Terminal Port			Host Port		
Baud	Dip 1	Dip 2	Baud	Dip 3	Dip 4
* 9600	0	0	* 9600	0	0
19200	1	0	19200	1	0
38400	0	1	38400	0	1
115200	1	1	57600	1	1

ACU Switch S5 (Dips 1-4: OFF/0, ON/1)

Switch S5 ✲ = Default ✲✲ = Max for NexStar (so 115200 not a NexStar option)							
COBOX (RS-485)			S-NET 4			S-NET 3	
Baud	Dip 5	Dip 6	Dip 7	Dip 8	Baud	Dip 9	Dip 10
* 9600	0	0	0	0	2400	0	0
19200	1	0	1	0	4800	1	0
**38400	0	1	0	1	* 9600	0	1
115200	1	1	1	1	19200	1	1

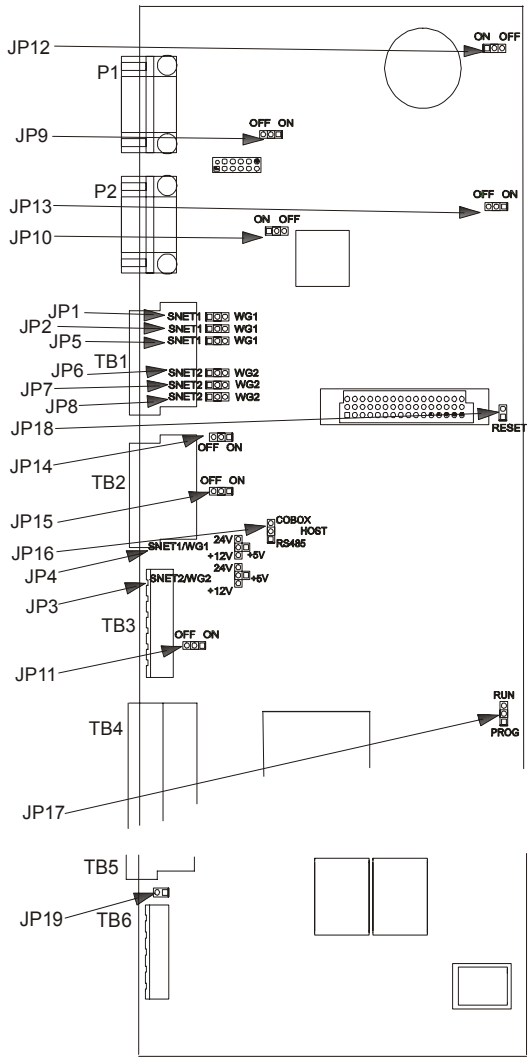
ACU Switch S5 (Dips 5-10: OFF/0, ON/1)

Switch S2 ✲ = Default				
Baud	S-NET 2: Dips 7-8		S-NET 1: Dips 9-10	
	Dip 7	Dip 8	Dip 9	Dip 10
2400	0	0	0	0
4800	1	0	1	0
* 9600	0	1	0	1
19200	1	1	1	1

ACU Switch S2 (Dips 7-10: OFF/0, ON/1)

ACU STRAPS

The diagram and table below list and locate the different straps found on the NexSentry Star II ACU.



ACU Straps

Strap	Positions	Descriptions
JP1	S-NET 1	Connects S-NET 1 port RS 485+ to TB1-2 (lower row second)
	WG 1	Connects Wiegand DATA 0 to TB1-2 (lower row second)
JP2	S-NET 1	Connects S-NET 1 port RS 485- to TB1-3 (lower row third)
	WG 1	Connects Wiegand DATA 1 to TB1-3 (lower row third)
JP3	+Vin	Connects +Vin to TB1-7 (S-NET 2 upper row +power pin)
	+24V	Connects +24VDC to TB1-7 (S-NET 2 upper row +power pin)
	+12V	Connects +12VDC to TB1-7 (S-NET 2 upper row +power pin)
	+5V	Connects +5V to TB1-7 (S-NET 2 upper row +power pin)
JP4	+Vin	Connects +Vin to TB1-1 (S-NET 1 lower row +power pin)
	+24V	Connects +24VDC to TB1-1 (S-NET 1 lower row +power pin)
	+12V	Connects +12VDC to TB1-1 (S-NET 1 lower row +power pin)
	+5V	Connects +5V to TB1-1 (S-NET 1 lower row +power pin)
JP5	S-NET 1	Connects S-NET 1 chassis to TB1-5 (lower row fifth)
	WG 1	Connects Wiegand LED 0 to TB1-5 (lower row fifth)
JP6	S-NET 2	Connects S-NET 2 port RS 485+ to TB1-8 (upper row second)
	WG 2	Connects Wiegand DATA 0 to TB1-8 (upper row second)
JP7	S-NET 2	Connects S-NET 2 port RS 485- to TB1-9 (upper row third)
	WG 2	Connects Wiegand DATA 1 to TB1-9 (upper row third)
JP8	S-NET 2	Connects S-NET 2 chassis to TB1-11 (upper row fifth)
	WG 2	Connects Wiegand LED 0 to TB1-11 (upper row fifth)

ACU Straps

Strap	Positions	Descriptions
JP9	ON	Connects 120 ohm terminator to S-NET 1 RS 485 port
	OFF	Disables terminator
JP10	ON	Connects 120 ohm terminator to S-NET 2 RS 485 port
	OFF	Disables terminator
JP11	ON	Connects 120 ohm terminator to Host RS 485 port
	OFF	Disables terminator
JP12	ON	Connects lithium battery RAM
	OFF	Disables RAM battery backup
JP13	ON	Enables hardware Watchdog timer
	OFF	Disables hardware Watchdog timer
JP14	ON	Connects 120 ohm terminator to S-NET 3 RS 485 port
	OFF	Disables terminator
JP15	ON	Connects 120 ohm terminator to S-NET 4 RS 485 port
	OFF	Disables terminator
JP16	RS 485	Connects UART receive to Host RS 485
	COBOX	Connects UART receive to COBOX Micro ethernet module
JP17	PROG	Used only during manufacturing to disable unit
	RUN	Enables the ACU processor
JP18	RESET	Always installed and removed only during manufacturing
JP19	DC	NOT installed. (Used to bypass AC bridge in power input)

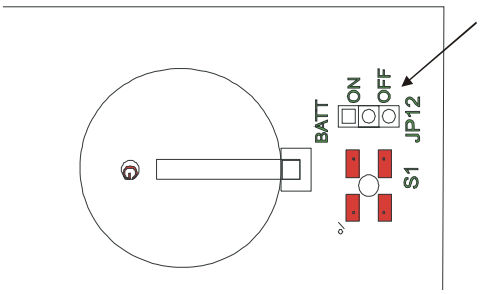
ACU Straps (continued)

Battery Strap

The battery strap is used to enable or disable the lithium battery circuit. The JP12 strap is shipped in the OFF position from the factory and must be placed in the ON position during the installation. JP12 should be moved to the OFF position if there is no need to preserve the data in memory (when, for instance, the ACU is placed in storage). JP12 should also be in the OFF position when the lithium battery is removed and the ACU is used without the battery, (so that there is no chance of shorting the memory power by the battery clip contact touching the other contact beneath it).



CAUTION: System data will be lost after a period of approximately 30 seconds when there is no external power source and the JP12 strap is in the OFF position. Also, the ACU must be kept away from metal or any other conductive surfaces. If the ACU is placed on a metal surface, the battery will short-out.



ACU Battery Jumper

The battery on the ACU maintains the system memory when the +5V logic power is interrupted. The battery is a lithium coin cell, Rayovac or Panasonic part number BR2325. The battery supports RAM for up to 1,000 hours and the battery shelf life is 10 years.



WARNING:

Lithium is a hazardous material. Therefore, observe all applicable regulations when you dispose of the battery. Replace the battery only with a Panasonic or Rayovac 3-volt, BR2325 lithium battery. Use of any other type of battery might cause a fire or explosion. Also, **DO NOT** attempt to **RECHARGE** a **LITHIUM BATTERY**: **IT MIGHT EXPLODE ! ! !**

Built-In Battery Charger:

The charger/battery backup is designed for lead-acid gel-type 12VDC battery. The battery capacity can be from 1.5 amp-hour (AH) to 12 AH.



CAUTION / WARNING:

The battery is meant to back up the Star I controller, MIROs, and selected readers attached on the S-NET. **IT IS NOT RECOMMENDED TO BE USED FOR LOCK POWER OR EMERGENCY LOCK POWER BACKUP**. Some model readers do not operate at 12VDC so the user must contact NexWatch to be sure that the particular reader is designed to operate at this voltage.

The Star II controller will accept 16-24 VAC (from a wall-mount transformer) as its power source. The AC voltages are rectified into the corresponding DC power level before routing to the S-NET ports. The maximum load recommended for the battery backup system includes the Star II controller + 400 mA S-NET (or Wiegand) port load. This load can include for example:

1. up to eight DR4201 readers, or

2. two DR4208 readers, or

3. up to eight MIRO 4/2.

The actual load will depend on the power requirements of each device chosen. When the S-NET load is larger than the backup recommendation there are several options available.

1. Whole system power from a separate UPS battery backup system

2. Provide a battery to backup only the Star II controller. The S-NET power would then be wired directly to another power supply. The positive lead (labeled +V) from the external DC supply must NOT be connected to the Star II S-NET power pin (labeled +) in this case.

3. Provide a battery to backup the Star II and some of the S-NET ports (and perhaps devices required for certain doors), then the external power would be wired to the other S-NET ports. The positive lead (labeled +V) from the external DC supply would not be attached to the Star II power pin (labeled +) in this case.

Some planning is required when considering the battery backup system. In general a 2-Door Star II controller system should be able to use the built-in battery backup feature.

At the recommended load the system will remain powered from a 12 ampere-hour battery for 12-16 hours and 1-2 hours from a 1.5 ampere-hour battery..

Report/Alarm Condition:	**Reason:**
Input Power Low	No power in, battery level higher than 12.5
First battery level alarm	No power in, battery less than 12 volts
Impending battery loss	No power in, battery less than 11 volts
Charger failure	- Input normal, bulk charge, but level too high - Input normal, float charge, level less than 11 volts
Normal	- Input normal, bulk charge, voltage has changed +.25 volts in the last hour - Input normal, overcharge mode, voltage has changed at least +.25 volts in the last hour - Input normal, float charge, level 13-14 volts

ACU Battery Condition Logs and Reasons

Report/Alarm Condition:	Reason:
Battery fault (shorted cell)	- Input normal, bulk charge, voltage has not changed +.25 volts in the last hour or been in same mode for 12 hours - Input normal, overcharge mode, voltage not changed +.25 volts in the last hour or been in same mode for 12 hours
Battery fault (not charging/open)	- Input normal, bulk charge, voltage has not changed +.25 volts in the last hour or been in same mode for 12 hours - Input normal, overcharge mode, voltage not changed +.25 volts in the last hour or been in same mode for 12 hours - Input normal, float charge, level less than 13 volts and voltage has not changed +.12 volts in the last 2 hours

ACU Battery Condition Logs and Reasons (continued)

ACU RELAYS

The NexSentry Star II ACU uses four relay outputs used for Door locks, annunciation and control purposes. All are form C (NO, Common, NC), 5-amp, dry contacts, rated at 30VDC or 250VAC resistive (fused at 3.15A slow blow). They are all controlled by the NexSentry Star II software, based on the database configuration.

The controller can also manage up to 96 relays, any of which may be Timed or Latched. These relays are capable of being actuated by any Action (formerly called Report) created in the controller.

If an event occurs that actuates a Latched relay, it will remain closed until an override command is given by the operator. Any or all Latched relays will also be cleared if the RESET button is pressed, or if the power to the ACU is turned off.

END OF LINE RESISTORS (EOLRS)

The first two S-NET/Wiegand ports, for S-NET 1/Wiegand 1 and S-NET 2/Wiegand 2 on TB1, can be configured for S-NET or Wiegand. Communication with DC power to any of the MIRO units. All of the Wiegand Readers are serviced through these ports.

The second two S-NET ports, for S-NET 3 and S-NET 4 on TB2, can only be configured for S-NET.

An S-NET connection over 1,000 feet should be terminated at each end. To accomplish this, a ¼-watt, 120 ohm resistor is placed between the Data A and Data B lines.



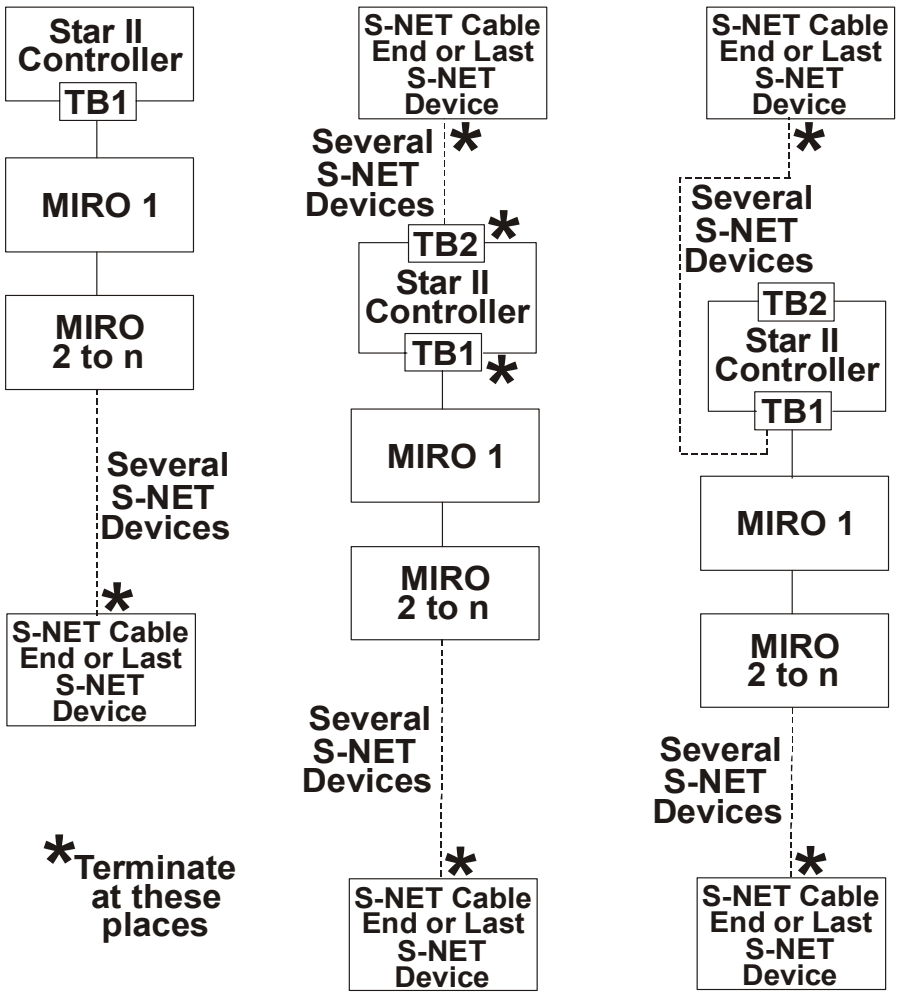
NOTE: For ease of installation, the NexSentry Star I has been equipped with built-in End Of Line Resistors (EOLRs) on each of the four possible S-NETs, S-NET 1 and S-NET 2, from the lower and upper connectors of TB1, and S-NET 3 and S-NET 4, from the lower and upper connectors of TB2 and the Host RS 485 comm port.

The illustrations below show the preferred arrangement of three S-NET branches, requiring four terminating resistors if the length of each branch is over 1,000 feet.

The figure on the left, shows a single—over 1,000 feet—S-NET branch originating from the ACU, going to the first MIRO and continuing to feed to other devices. Termination is placed across pins 2 and 3 of TB1 on the ACU; the other end of the network is terminated across the last device's data pins at the end of the cable.

The figure in the middle shows two branches originating from the ACU, one each from TB1 and TB2, which would require 4 terminating resistors (if either branch is over 1000 feet).

The figure on the right shows two branches originating from the ACU, from the same TB1.



S-NET Termination EOLRs

NOTE: The ideal configuration will have a similar number of devices connected to each S-NET port of the ACU.

INSTALLING THE MIROS

4

MIROs are communication devices that are used to link additional Input and Output devices to the NexSentry Star II ACU. The acronym "MIRO" stands for Monitor Input Relay Output. The x/y numbers that follow the word MIRO, represent the number of Monitor Inputs (x) and Relay Outputs (y) available for that MIRO. (The MIRO 16/8 has 16 monitor inputs, and 8 relay outputs.)

The WIRO 4/8/4 has a w/x/y number, where w is the number of Wiegand connections in this combination Wiegand/MI/RO device. The WIRO 4/8/4 unit is discussed in “Installing the WIRO 4/8/4” on page 5-10 in Chapter 5.

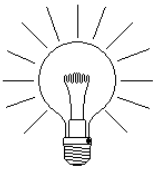
This chapter covers the following topics:

- “Address Switches” on page 4-1
- “Installing the MIRO 32/0 (Half-Height)” on page 4-3
- “Installing the MIRO 2/16 (Half-Height)” on page 4-9
- “Installing the MIRO 16/8” on page 4-16
- “Installing the MIRO 2/24” on page 4-23
- “Installing MIROs 32/0 and 64/0” on page 4-29
- “Installing MIRO 4/2 and 4/0” on page 4-34

ADDRESS SWITCHES

All S-NET node devices have address switches that must be set as part of the installation procedure. The *full-height* MIRO 16/8, 2/24, 32/0 and 64/0, the *half-height* MIRO 2/16 and 32/0, and the MIRO

4/2, the NexLine Plus (MIRO 4/0), and all of the Readers, have either rotary hexadecimal address switches or dip switches.



NOTE: Every MIRO address must be unique. The address of the on-board MIRO is 1. External MIROs are 2-n, where n is the total number of MIROs up to a maximum of 16. (*Rotary hexadecimal address switches have a maximum value of 15*). ***External*** **MIROs must be numbered consecutively, with no gaps: 2, 3, 4, etc., not 2, 4, 5.**

The address numbers of WIRO 4/8/4s and UWIUs are limited to the values of 1 and 2, each of which allows connection through the WIRO 4/8/4 or UWIU to four Wiegand-compatible Readers, with addresses 1-4 and 5-8, respectively.

The WIRO 4/8/4 combines UWIU and MIRO capabilities. The WIRO 4/8/4 supports 4 Wiegand readers, 8 monitor inputs and 4 relay outputs. Its addresses are uniquely adjustable for both the MIRO address and the (Wiegand) Reader starting address.

The address numbers of Readers on the WIRO 4/8/4 are assigned by the unique Door numbers—1 through 16—to which they are physically attached. Readers of two different types, when they share the same Door/S-NET address, will therefore both be set to the same address as the door; for example, both a digital reader (DKR) and a magnetic stripe reader (MSR) attached to Door 2 would both be set to S-NET address 2.



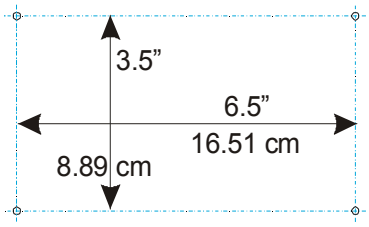
CAUTION: Readers with rotary hexadecimal address switches have a maximum addressability of 15, so a reader with a dip switch, DR4201, DR4208S or DR4220, must be used for door 16.

INSTALLING THE MIRO 32/0 (HALF-HEIGHT)

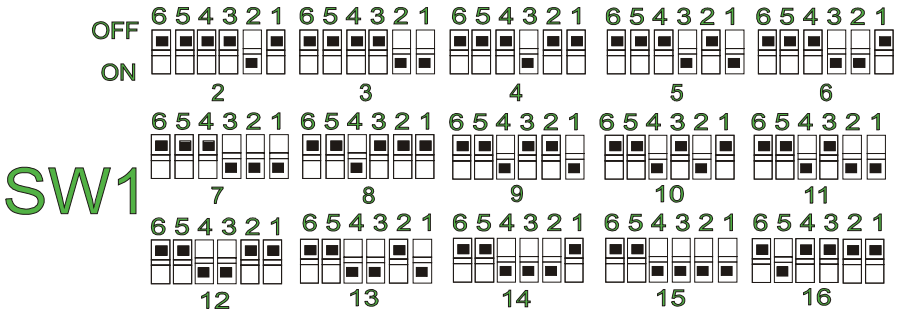
Follow this procedure to install the Half-Height MIRO 32/0.

TO INSTALL THE HALF-HEIGHT MIRO 32/0:

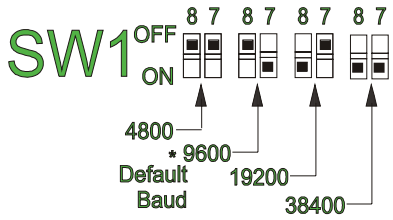
1 **Open the double enclosure for the Half-Height MIRO 32/0, or the multiple PCA enclosure and mount the Half-Height MIRO 32/0 PCA inside. (The multiple enclosure has 6 sets of 4 mounting points, 4 vertical and 2 horizontal, with dimensions that correspond to the Half-Height MIRO 32/0, as shown.)**



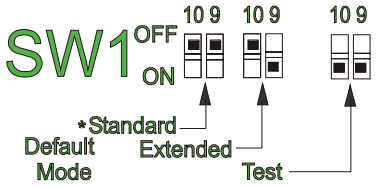
2 **Set the S-NETaddress, 2 through 16, using address switch SW1, to the next available (sequential) S-NET address.**



3 **Set SW1 DIPs 7 and 8 for the S-NET baud rate, 4800, 9600 (default), 19,200 and 38,400 baud.**



4 **Set SW1 DIPs 9 and 10 for the opeerating mode: Standard (default), Extended and Test.**



5 **Set jumper JP1, which supplies the 120 Ω terminator resistor needed if the MIRO 32/0 is the last device on an S-NET chain, but otherwise should be set to OFF.**



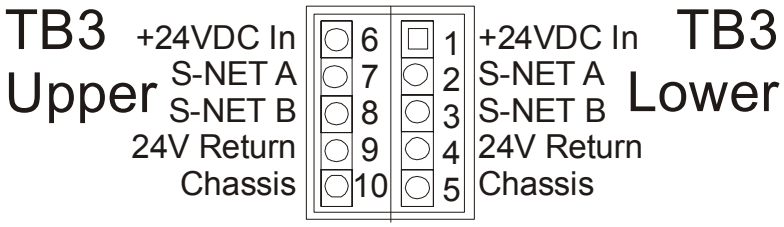
6 **Set jumper JP4 for Low Voltage Programming or NORMal.**



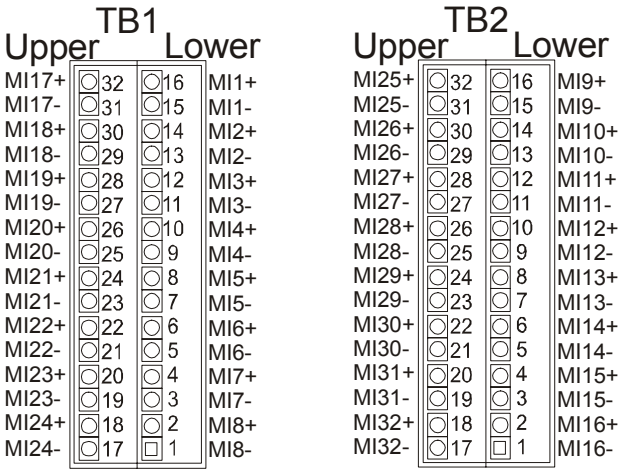
7 Set jumper JP5 for In Circuit Programming or NORMal.



8 With the power OFF, make S-NET connections to the ACU, Readers, other S-NET devices, MIROs, etc, through TB3 (pins 1 to 5) lower and/or (pins 6 to 10) upper.



9 Connect monitor point inputs through TB1 Lower (MP1 to MP8), TB2 Lower (MP9 to MP16), TB1 Upper (MP17 to MP24), and TB2 Upper (MP25 to MP32).



10 Configure the NexSentry Star II ACU database as required.

The exact sequence may vary with the installation requirements.

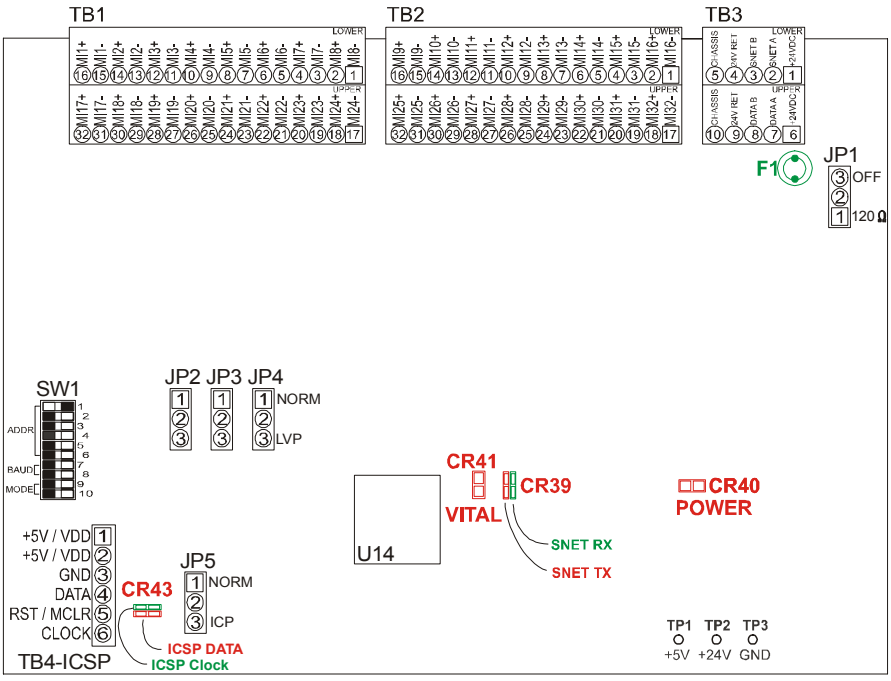
Half-Height MIRO 32/0 LEDs

The Half-Height MIRO 32/0 LEDs are shown in the diagram and listed below.

LED	LED Description
CR39	SNET TX, Red
CR39	SNET RX, Green
CR40	Power On

LED	LED Description
CR41	VITAL
CR43	ICSP Clock, Green
CR43	ICSP DATA, Red

Half-Height MIRO 32/0 LEDs



Half-Height MIRO 32/0 Connectors, LEDs, Switches and Replaceable Fuse

Half-Height MIRO 32/0 Fuse

The replaceable fuse used on the Half-Height MIRO 32/0 is shown in the diagram and listed below.

			Approved Manufacturers' Part Numbers		
Fuse	**Description**	**Type**	**Wickman TR5 Series**	**Schurter MST Series**	**Bel MRT Series**
F1	**Input Power**	**.5-Amp**	**19372K-41**	**#34.6612**	**0692-0500-01**

Half-Height MIRO 32/0 Fuse

Half-Height MIRO 32/0 Address Switch (SW1)

If a Half-Height MIRO 32/0 is the first MIRO on the S-NET, set its address to 2. Set additional MIRO addresses 3 through 16, respectively. Valid settings for the Half-Height MIRO 32/0 are 2 - 16.



NOTE: Relay and monitor point numbers depend on whether they are on the ACU or on a MIRO. The first four relays are assigned to the ACU, and then MIRO by MIRO, until all of the relay output numbers are used, (up to 96). The first 16 monitor points are assigned to the ACU, and then MIRO by MIRO, until all of the monitor point numbers are used, (up to 255).

Half-Height MIRO 32/0 Test Points (TP1, TP2 and TP3)

Use test points TP1, TP2 and TP3 to troubleshoot any input power problems with the Half-Height MIRO 32/0. For satisfactory operation, you need a nominal +5 volts between TP1 and TP3, and a nominal +24 volts between TP2 and TP3.

Half-Height MIRO 32/0 Tamper Connector (MI1+ and MI1-)

When the Half-Height MIRO 32/0 is mounted in a double half-height enclosure, any monitor point (typically MI1+ and MI1-) can

be used as a tamper switch, (with a 2K ohm resistor in series). The ACU will report an active state on the tamper switch.

Half-Height MIRO 32/0 Programmable Micro-Controller (U14/XU14)

This is the micro-controller for the half-height MIRO32/0.

Half-Height MIRO 32/0 Connectors

The table below lists connectors and pinouts for the Half-Height MIRO 32/0 PCA.

	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9	Pin 10	Pin 11	Pin 12	Pin13	Pin14	Pin15	Pin 16
TB1	MI8-	MI8+	MI7-	MI7+	MI6-	MI6+	MI5-	MI5+	MI4-	MI4+	MI3-	MI3+	MI2-	MI2+	MI1-	MI1+
TB2	MI16-	MI16+	MI15-	MI15+	MI14-	MI14+	MI13-	MI13+	MI12-	MI12+	MI11-	MI11+	MI10-	MI10+	MI9-	MI9+

	Pin 17	Pin 18	Pin 19	Pin 20	Pin 21	Pin 22	Pin 23	Pin 24	Pin 25	Pin 26	Pin 27	Pin 28	Pin 29	Pin 30	Pin 31	Pin 32
TB1	MI24-	MI24+	MI23-	MI23+	MI22-	MI22+	MI21-	MI21+	MI20-	MI20+	MI19-	MI19+	MI18-	MI18+	MI17-	MI17+
TB2	MI32-	MI32+	MI31-	MI31+	MI30-	MI30+	MI29-	MI29+	MI28-	MI28+	MI27-	MI27+	MI26-	MI26+	MI25-	MI25+

	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9	Pin 10
TB3	+24 VDC	S-NET A	S-NET B	24V Ret	Chassis	+24 VDC	S-NET A	S-NET B	24V Ret	Chassis

Half-Height MIRO 32/0 Connectors

Half-Height MIRO 32/0 S-NET (TB3 Upper and Lower)

Use the TB3 Upper and Lower connectors for input and output of the daisy-chained S-NET wiring.

Half-Height MIRO 32/0 Monitor Inputs (TB1 and TB2)

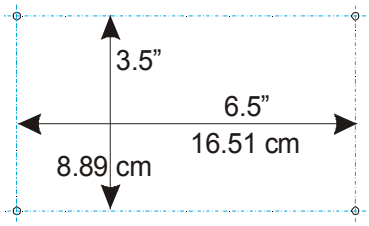
Thirty-two monitor inputs are available on the Half-Height MIRO 32/0. Each monitor point uses two pins, + and -.

INSTALLING THE MIRO 2/16 (HALF-HEIGHT)

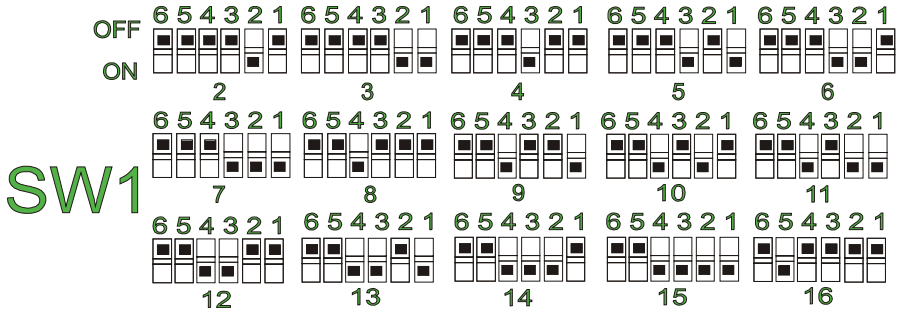
Follow this procedure to install the Half-Height MIRO 2/16.

TO INSTALL THE HALF-HEIGHT MIRO 2/16:

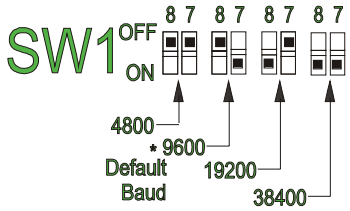
1 **Open the enclosure of the Half-Height MIRO 2/16, or the multiple PCA enclosure and mount the Half-Height MIRO 2/16 PCA inside. (The multiple enclosure has 6 sets of 4 mounting points, 4 vertical and 2 horizontal, with dimensions that correspond to the Half-Height MIRO 2/16, as shown.)**



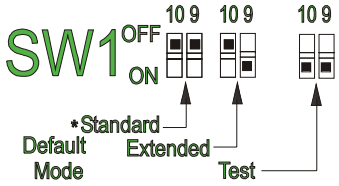
2 **Set the S-NETaddress, 2 through 16, using address switch SW1, to the next available (sequential) S-NET address.**



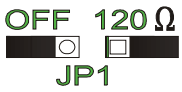
3 **Set SW1 DIPs 7 and 8 for the S-NET baud rate: 4800, 9600 (default), 19,200 and 38,400 baud.**



4 **Set SW1 DIPs 9 and 10 for the operating mode: Standard (default), Extended and Test.**



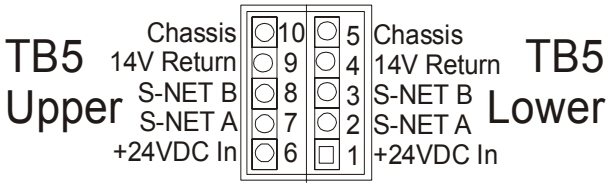
5 **Set jumper JP1, which supplies the 120 Ω terminator resistor needed if the MIRO 2/16 is the last device on an S-NET chain, but otherwise should be set to OFF.**



6 **Set jumper JP2 for In Circuit Programming or NORMal.**

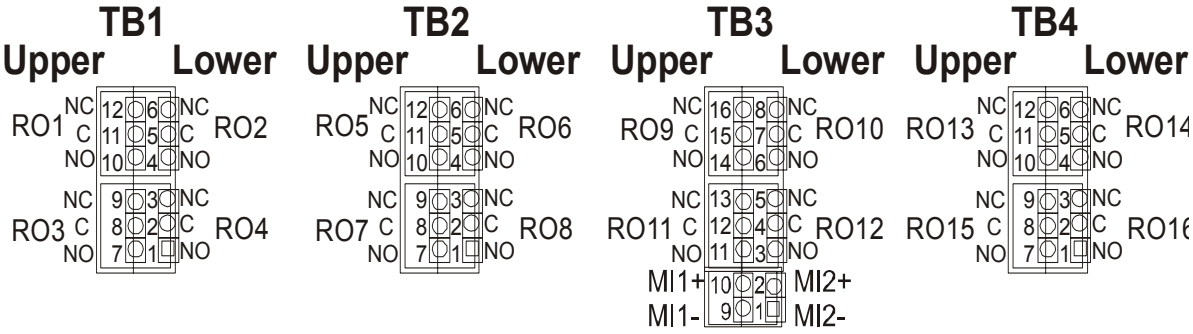


7 **With the power OFF, make S-NET connections to the ACU, Readers, other S-NET devices, MIROs, etc, through TB5 (pins 1 to 5) lower and/or (pins 6 to 10) upper.**



8 **Connect monitor inputs through TB3 (MP1 and MP2). (See the diagram in step 9.) (MP1 may be used as the tamper connection for the MIRO 2/16.)**

9 **Connect relay outputs through TB1 (relays 1 to 4), TB2 (relays 5 to 8), TB3 (relays 9 to 12), TB4 (relays 13 to 16).**



10 **Configure the NexSentry Star II ACU database as required.**

(The exact sequence may vary with the installation requirements.)

Half-Height MIRO 2/16 LEDs

The Half-Height MIRO 2/16 LEDs are shown and listed below.

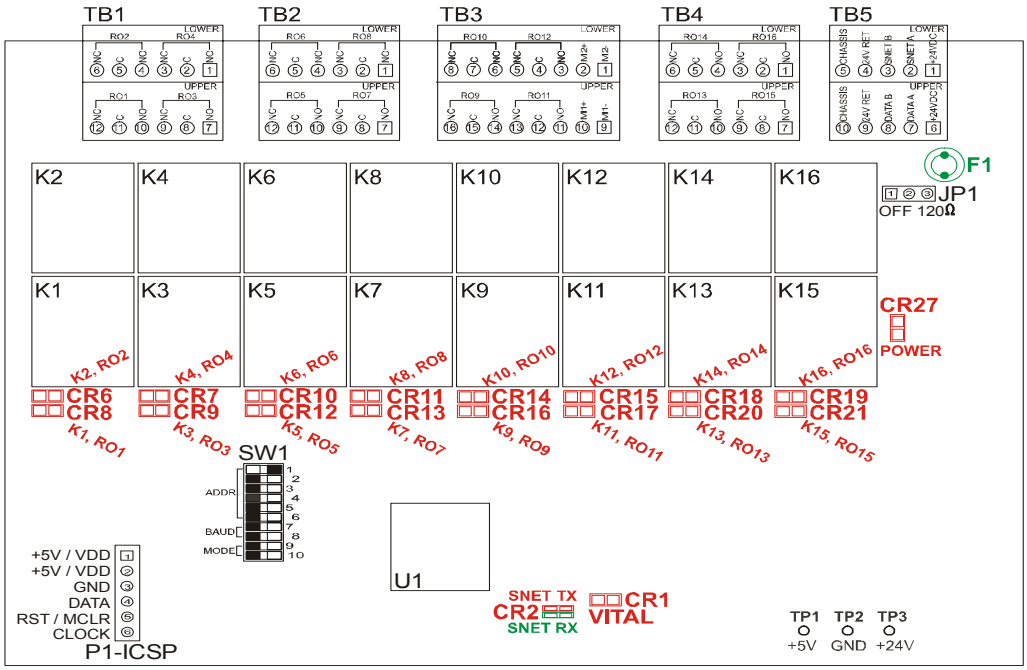
LED	LED Description
CR8	Relay Output 1 / K1
CR6	Relay Output 2 / K2
CR9	Relay Output 3 / K3
CR7	Relay Output 4 / K4
CR12	Relay Output 5 / K5
CR10	Relay Output 6 / K6
CR13	Relay Output 7 / K7

LED	LED Description
CR11	Relay Output 8 / K8
CR16	Relay Output 9 / K9
CR14	Relay Output 10 / K10
CR17	Relay Output 11 / K11
CR15	Relay Output 12 / K12
CR20	Relay Output 13 / K13
CR18	Relay Output 14 / K14

LED	LED Description
CR21	Relay Output 15 / K15
CR19	Relay Output 16 / K16

CR27	Input POWER On
CR1	VITAL
CR2	SNET TX (Red)
CR2	SNET RX (Green)

Half-Height MIRO 2/16 LEDs



Half-Height MIRO 2/16 LEDs

Half-Height MIRO 2/16 Fuses

The Input short protection used on the Half-Height MIRO 2/16 is a Poly-Switch (PTC) type device rated at 1.10A, 40V.

Half-Height MIRO 2/16 Address Switch (SW1)

If a Half-Height MIRO 2/16 is the first MIRO on the S-NET, set its address to 2. Set additional MIRO addresses 3 through 16. Valid settings for the Half-Height MIRO 2/16 are 2 - 16. (MIRO address 1 is reserved for the on-board ACU MIRO.)



NOTE: Relay and monitor point numbers depend on whether they are on the ACU or on a MIRO. The first four relays are assigned to the ACU, and then MIRO by MIRO, until all of the relay output numbers are used, (up to 96). The first 16 monitor points are assigned to the ACU, and then MIRO by MIRO, until all of the monitor point numbers are used, (up to 255).

Half-Height MIRO 2/16 Test Points (TP1, TP2 and TP3)

Use test points TP1, TP2 and TP3 to troubleshoot any input power problems with the Half-Height MIRO 2/16. For satisfactory operation, you need a nominal +5 VDC between TP1 and TP2 and a nominal +24 VDC between TP2 and TP3.

Half-Height MIRO 2/16 Programmable Micro-Controller (U1/XU1)

This is the micro-controller that controls the MIRO2/16's operation.

Half-Height MIRO 2/16 Connectors

Connector	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
TB1 Lower	K2/RO2/NO	K2/RO2/C	K2/RO2/NC	K1/RO1/NO	K1/RO1/C	K1/RO1/NC		
TB1 Upper	K4/RO4/NO	K4/RO4/C	K4/RO4/NC	K3/RO3/NO	K3/RO3/C	K3/RO3/NC		
TB2 Lower	K6/RO6/NO	K6/RO6/C	K6/RO6/NC	K5/RO5/NO	K5/RO5/C	K5/RO5/NC		
TB2 Upper	K8/RO8/NO	K8/RO8/C	K8/RO8/NC	K7/RO7/NO	K7/RO7/C	K7/RO7/NC		
TB3 Lower	MI1-	MI1+	K10/RO10/NO	K10/RO10/C	K10/RO10/NC	K9/RO9/NO	K9/RO9/C	K9/RO9/NC
TB3 Upper	MI2-	MI2+	K12/RO12/NO	K12/RO12/C	K12/RO12/NC	K11/RO11/NO	K11/RO11/C	K11/RO11/NC
TB4 Lower	K14/RO14/NO	K14/RO14/C	K14/RO14/NC	K13/RO13/NO	K13/RO13/C	K13/RO13/NC		
TB4 Upper	K16/RO16/NO	K16/RO16/C	K16/RO16/NC	K15/RO15/NO	K15/RO15/C	K15/RO15/NC		
TB5 Lower	+24VDC	SNET A	SNET B	24V Ret	Chassis			
TB5 Lower	+24VDC	SNET A	SNET B	24V Ret	Chassis			

Half-Height MIRO 2/16 Connectors

Half-Height MIRO 2/16 S-NET (TB5 Upper and Lower)

Use the TB5 Upper and Lower connectors for input and output of the daisy-chained S-NET wiring.

Half-Height MIRO 2/16 Monitor Inputs (TB3)

Two monitor inputs, MI1 and MI2, are available on the Half-Height MIRO 2/16. Each monitor point uses two pins, + and -.

Half-Height MIRO 2/16 Tamper

The Half-Height MIRO 2/16 PCA uses monitor point MI1 as an optional tamper switch. When the Half-Height MIRO 2/16 is mounted in an double half-height enclosure, an enclosure tamper switch can be installed, (with a 2K ohm resistor in series), connected across MI1. The ACU will report an active state on the tamper switch.

Half-Height MIRO 2/16 Relay Outputs (TB1, TB2, TB3 and TB4)

Sixteen relay outputs, RO1 through RO16, are available on the Half-Height MIRO 2/16. Each relay has three pins available, designated Normally Open, Normally Closed and Common.

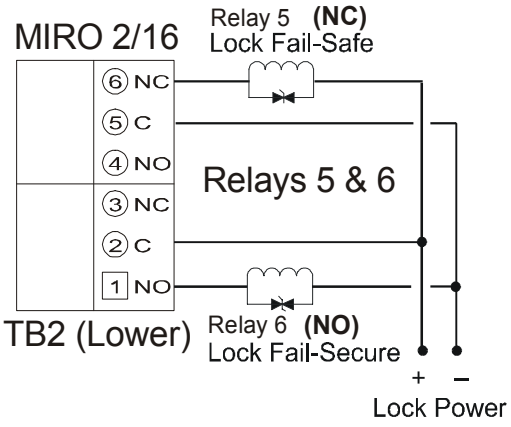
For the Normally Open relay state, connections are made between the Normally Open pin and the Common pin.

For the Normally Closed relay state, connections are made between the Normally Closed pin and the Common pin.

The illustration below shows two relays; one is used to control a fail-safe lock and the other to control a fail-secure lock. The power for the locks is provided by the power supply.



NOTE: To minimize back EMF in electric door strikes, manufacturers wire a diode rectifier (1N4001) in parallel with the lock relay coil, using wiring methods and materials in accordance with the US national electric code, (ANSI/NFPA 70-1993). If the door strike you are using has no diode rectifier in parallel with the lock relay coil, wire one in place yourself.



Half-Height MIRO 2/16 Relay Wiring Example

INSTALLING THE MIRO 16/8

Follow this procedure to install the MIRO 16/8.

TO INSTALL THE MIRO 16/8:

1. **Open the enclosure of the MIRO 16/8, or the multiple PCA enclosure and mount the MIRO 16/8 PCA inside.**
2. **Set the S-NETaddress, 2 through 16, using address switch S1, to the next available (sequential) S-NET address.**
3. **Make S-NET connections to the Readers or other S-NET devices, through TB7 or TB8.**
4. **Connect monitor inputs through TB6 (MP1 to MP4), TB5 (MP5 to MP8), TB4 (MP9 to MP12), and TB3 (MP13 to MP16).**
5. **Connect relay outputs through TB2 (relays 1 to 4) and TB1 (relays 5 to 8).**
6. **Set the relay configuration jumpers (P1 to P8) as required for Normally Open or Normally Closed.**
7. **Make the S-NET connection to the ACU, or to another MIRO, through TB7 or TB8.**
8. **Configure the NexSentry Star II ACU database as required.**

The exact sequence may vary with the installation requirements.

MIRO 16/8 PCA

The MIRO 16/8 PCA is shown with two types of component items, LEDs and fuses (including poly-switches). (The diagram shows other major components.)

MIRO 16/8 LEDs

The MIRO 16/8 LEDs are shown in the diagram and listed below.

LED	LED Description
CR21	Relay Output 8
CR22	Relay Output 7
CR23	Relay Output 6
CR24	Relay Output 5
CR25	Relay Output 4
CR26	Relay Output 3

LED	LED Description
CR27	Relay Output 2
CR28	Relay Output 1
CR30	Input Power
CR31	RXD (Receive Data)
CR32	VITAL
CR33	SCAN (OnLine)

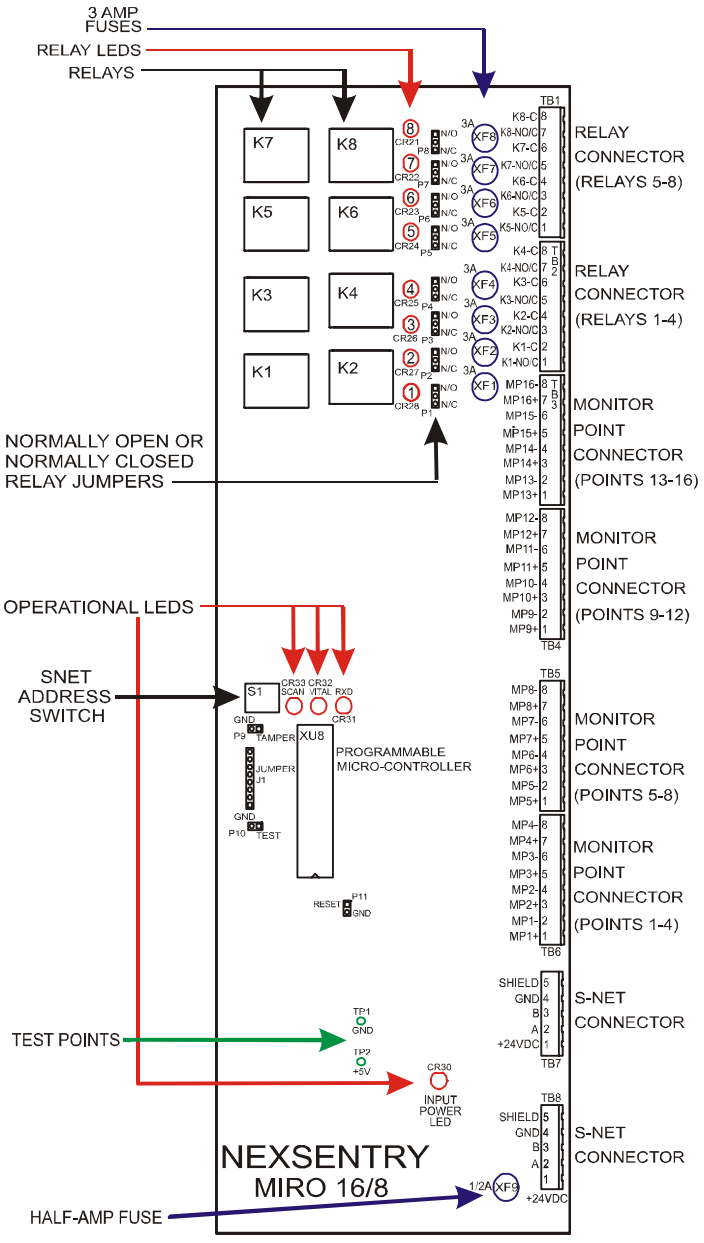
MIRO 16/8 LEDs

MIRO 16/8 Fuses

The replaceable fuses used on the MIRO 16/8 are shown in the diagram and listed below.

			Approved Manufacturers' Part Numbers		
Fuse	Description	Type	Wickman TR5 Series	Schurter MST Series	Bel MRT Series
XF1	Relay Outputs 1	3.15-Amp	19372K-124	#34.6620	0692-3150-01
XF2	Relay Outputs 2				
XF3	Relay Outputs 3				
XF4	Relay Outputs 4				
XF5	Relay Outputs 5				
XF6	Relay Outputs 6				
XF7	Relay Outputs 7				
XF8	Relay Outputs 8				
XF9	Input Power	.5-Amp	19372K-41	#34.6612	0692-0500-01

MIRO 16/8 Fuses



MIRO 16/8 LEDs, Fuses, Jumpers and Other Components

MIRO 16/8 Address Switch (S1)

If a MIRO 16/8 is the first MIRO on the S-NET, set its address to 2. Set additional MIRO addresses 3 through 16, respectively. Valid settings for the MIRO 16/8 are 2 - F (or 2 - 15).



NOTE: Relay and monitor point numbers depend on whether they are on the ACU or on a MIRO. The first four relays are assigned to the ACU, and then MIRO by MIRO, until all of the relay output numbers are used, (up to 96). The first 16 monitor points are assigned to the ACU, and then MIRO by MIRO, until all of the monitor point numbers are used, (up to 255).

MIRO 16/8 Jumper (J1)

This jumper is no longer required.

MIRO 16/8 Test Points (TP1 and TP2)

Use test points TP1 and TP2 to troubleshoot any input power problems with the MIRO 16/8. For satisfactory operation, you need a nominal +5 volts between TP1 and TP2.

MIRO 16/8 Tamper Connector (P9)

A two-pin connector is provided on the MIRO 16/8 PC board for an optional tamper switch. When the MIRO 16/8 is mounted in an individual enclosure, an enclosure tamper switch can be installed, (with a 2K ohm resistor in series), connected at P9. The ACU will report an active state on the tamper switch.

MIRO 16/8 Test Connector (P10)

This connector is for factory use only.

MIRO 16/8 Reset Connector (P11)

This connector is not used during normal operation or maintenance. Shorting the connector will reset the MIRO 16/8.

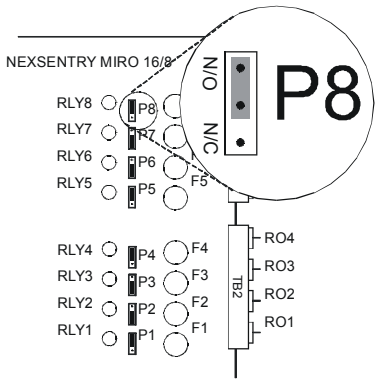
MIRO 16/8 Programmable Micro-Controller (U8/XU8)

This is the micro-controller that controls the MIRO16/8's operation.

MIRO 16/8 Relay Output Jumpers (P1 Through P8)

Eight jumpers, P1 through P8, are used to set the relay outputs as normally open (NO) or normally closed (NC). These jumpers are shown below

.



MIRO 16/8 Relay Output Jumpers

MIRO 16/8 Connectors

The table below lists connectors and pinouts for the MIRO 16/8 PC board. P10 is for factory use only.

Connector	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
TB1	K5-NO/NC	K5-C	K6-NO/NC	K6-C	K7-NO/NC	K7-C	K8-NO/NC	K8-C
TB2	K1-NO/NC	K1-C	K2-NO/NC	K2-C	K3-NO/NC	K3-C	K4-NO/NC	K4-C
TB3	MP13+	MP13-	MP14+	MP14-	MP15+	MP15-	MP16+	MP16-
TB4	MP9+	MP9-	MP10+	MP10-	MP11+	MP15-	MP12+	MP12-
TB5	MP5+	MP5-	MP6+	MP6-	MP7+	MP7-	MP8+	MP8-
TB6	MP1+	MP1-	MP2+	MP2-	MP3+	MP3-	MP4+	MP4-
TB7	+24VDC	Data A	Data B	Ground	Shield			
TB8	+24VDC	Data A	Data B	Ground	Shield			
P9	Tamper	Ground						
P11	Reset	Ground						

MIRO 16/8 Connectors

MIRO 16/8 S-NET (TB7 and TB8)

Use the TB7 and the TB8 connectors for input and output of the daisy-chained S-NET wiring.

MIRO 16/8 Monitor Inputs (TB3 through TB6)

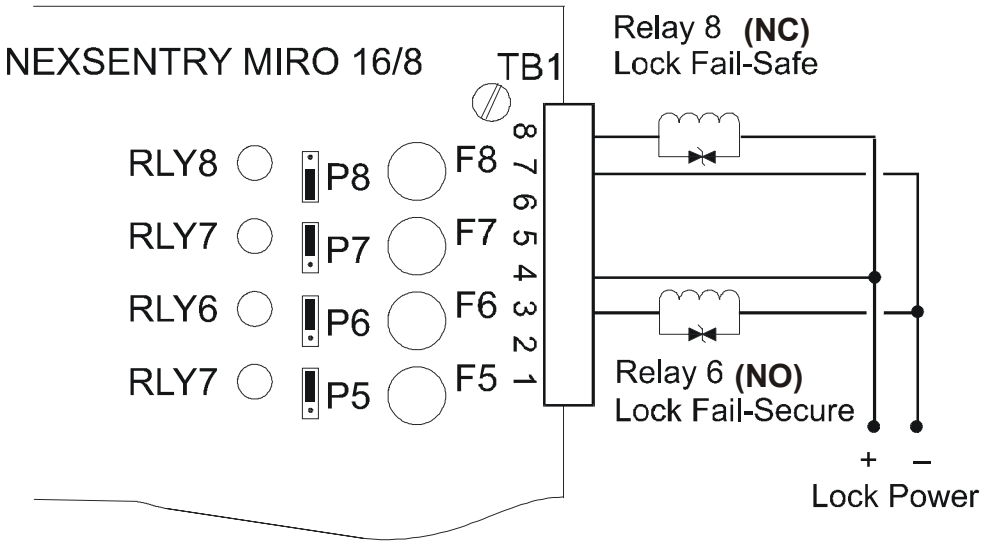
Sixteen monitor inputs are available on the MIRO 16/8. Each monitor point uses two pins, + and -.

MIRO 16/8 Relay Outputs (TB1 and TB2)

Eight relay outputs are available on the MIRO 16/8. Each relay uses two pins, one designated Normally Open or Normally Closed, the other Common. Jumpers are used to set the normal relay state.

The illustration below shows two relays; one is used to control a fail-safe lock and one to control a fail-secure lock. The power for the locks is provided by the power supply.

NOTE: To minimize back EMF in electric door strikes, manufacturers wire a diode rectifier (1N4001) in parallel with the lock relay coil, using wiring methods and materials in accordance with the US national electric code, (ANSI/NFPA 70-1993). If the door strike you are using has no diode rectifier in parallel with the lock relay coil, wire one in place yourself.



MIRO 16/8 Relay Wiring Example

INSTALLING THE MIRO 2/24

The MIRO 2/24 installation procedure is similar to the MIRO 16/8.

TO INSTALL THE MIRO 2/24:

1. **Open the enclosure of the MIRO 2/24 and mount the MIRO 2/24 PC board inside.**
2. **Use address switch S2 to set the S-NET address, 2 through 16.**
3. **Make S-NET connections to the Readers or other S-NET devices, through TB4 (pins 1 to 5) or TB5.**
4. **Connect monitor inputs through TB4 (MP1: pins 6 and 7, MP2: pins 7 and 8).**
5. **Connect relay outputs through TB3 (relays 17 to 24), TB2 (relays 9 to 16) and TB1 (relays 1 to 8), connecting each, as required, for Normally Closed or Normally Open.**
6. **Make the S-NET connection to the ACU, or to another MIRO, through TB5 or TB4 (pins 1 to 5).**
7. **Configure the NexSentry Star I ACU database as required.**

   The steps performed, and their sequence may vary.

MIRO 2/24 PCA

The MIRO 2/24 PCA is shown with all major component items, including LEDs, fuses, switches and test points, in the following diagram.

MIRO 2/24 LEDs

The MIRO 2/24 LEDs are shown in the diagram and listed below.

LED	LED Description
CR1	Relay Output 1
CR2	Relay Output 2
CR3	Relay Output 3
CR4	Relay Output 4
CR5	Relay Output 5
CR6	Relay Output 6
CR7	Relay Output 7
CR8	Relay Output 8
CR9	Relay Output 9
CR10	Relay Output 10

LED	LED Description
CR11	Relay Output 11
CR12	Relay Output 12
CR13	Relay Output 13
CR14	Relay Output 14
CR15	Relay Output 15
CR16	Relay Output 16
CR17	Relay Output 17
CR18	Relay Output 18
CR19	Relay Output 19

LED	LED Description
CR20	Relay Output 20
CR21	Relay Output 21
CR22	Relay Output 22
CR23	Relay Output 23
CR24	Relay Output 24
CR25	RXD (Receive Data)
CR26	TX (Transmit Data)
CR27	VITAL
CR28	POWER

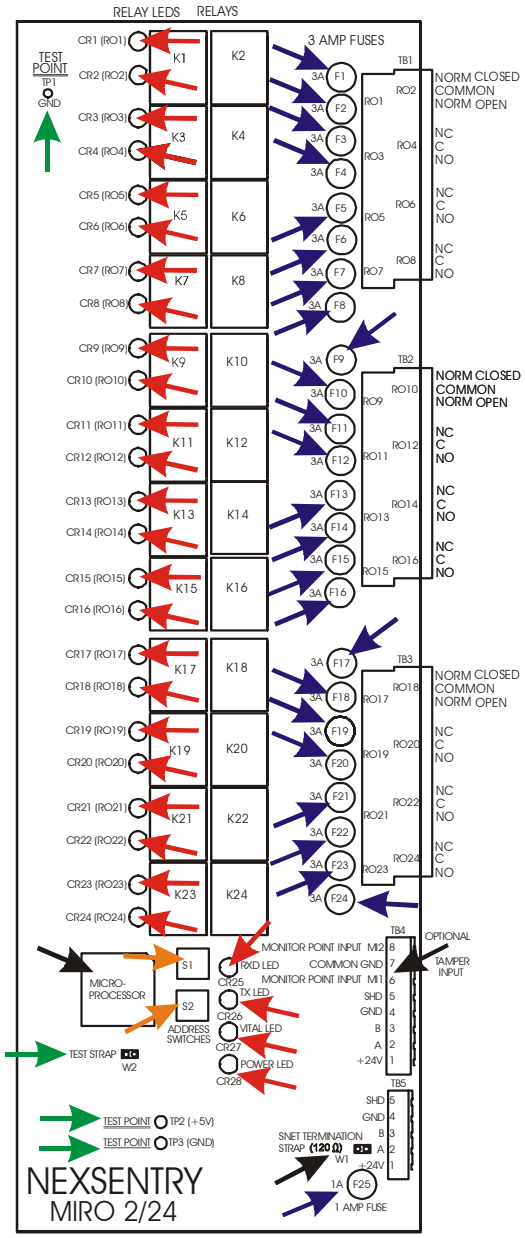
MIRO 2/24 LEDs

MIRO 2/24 Fuses

The replaceable fuses used on the MIRO 2/24 are shown in the diagram and listed below.

			Approved Manufacturers' Part Numbers		
Fuse	Description	Type	Wickman TR5 Series	Schurter MST Series	Bel MRT Series
F1 to F8	Relay Outputs 1 to 8	3.15-Amp	19372K-124	#34.6620	0692-3150-01
F9 to F16	Relay Outputs 9 to 16	3.15-Amp	19372K-124	#34.6620	0692-3150-01
F17 to F24	Relay Outputs 17 to 24	3.15-Amp	19372K-124	#34.6620	0692-3150-01
F25	Input Power	1-Amp	19372K-048	#34.6615	0692-1000-01

MIRO 2/24 Fuses



MIRO 2-24 LEDs, Fuses, Switches, Test Points, etc.

MIRO 2/24 Address Switches (S1 and S2)

If a MIRO 2/24 is the first MIRO on the S-NET, set its address to address 2. Set the subsequent MIROs to addresses 3 through 16.

SWITCH S1

Set switch S1 only to 0. This is the only valid switch position for switch S1.

SWITCH 2 (S-NET ADDRESS)

The 16-position switch S2 on the MIRO 2/24 is used to set a unique S-NET address. Valid settings are 2 through 15 (2 through hex F).

MIRO 2/24 Test Points (TP1, TP2, and TP3)

Test points TP2 (+5V) and TP3 (GND) are used to troubleshoot the MIRO 2/24 PC board with respect to input power. For satisfactory operation, the voltage between TP2 and TP3 should be a nominal +5 volts. Test point TP1 (GND) is an additional ground tap.

MIRO 2/24 Tamper Connector

There is no specific tamper connector provided on the MIRO 2/24 PCA, (see the diagram above). When the MIRO 2/24 is mounted in an individual enclosure, an enclosure tamper switch may be installed and connected at either of the two monitor point connections (MI1, pin 6 or MI2, pin 8, and the Common Ground, pin 7), with a 2KΩ resistor in series. The controller will report an active state on the monitor point used as the tamper connector.

MIRO 2/24 S-NET Termination Strap (W1)

If the MIRO 2/24 is the last device on the end of an S-NET chain, applying a jumper strap at this location provides the 120Ω S-NET termination required.

MIRO 2/24 Test Strap (W2)

This connector is for factory use only.

MIRO 2/24 Programmable Micro-Controller (U7/XU7)

The micro-controller (U7/XU7) controls the MIRO 2/24.

MIRO 2/24 Connectors

The table below lists the connectors and pinouts for the MIRO 2/24 PCA. TB1(a), TB2(a), and TB3(a) are the Phoenix-connector pins farthest from the PCA. TB1(b), TB2(b), and TB3(b) are the Phoenix-connector pins closest to the PCA.

Connector	TB1(a)	TB1(b)	TB2(a)	TB2(b)	TB3(a)	TB3(b)	TB4	TB5
Pin 1	R1-NC	R2-NC	R9-NC	R10-NC	R17-NC	R18-NC	+24V	+24V
Pin 2	R1-C	R2-C	R9-C	R10-C	R17-C	R18-C	DATA A	DATA A
Pin 3	R1-NO	R2-NO	R9-NO	R10-NO	R17-NO	R18-NO	DATA B	DATA B
Pin 4	R3-NC	R4-NC	R11-NC	R12-NC	R19-NC	R20-NC	Ground	Ground
Pin 5	R3-C	R4-C	R11-C	R12-C	R19-C	R20-C	Shield	Shield
Pin 6	R3-NO	R4-NO	R11-NO	R12-NO	R19-NO	R20-NO	MI-1	Earth Gnd
Pin 7	R5-NC	R6-NC	R13-NC	R14-NC	R1-NC	R22-NC	Com Gnd	
Pin 8	R5-C	R6-C	R13-C	R14-C	R21-C	R22-C	MI-2	
Pin 9	R5-NO	R6-NO	R13-NO	R14-NO	R21-NO	R22-NO		
Pin 10	R7-NC	R8-NC	R15-NC	R16-NC	R23-NC	R24-NC		
Pin 11	R7-C	R8-C	R15-C	R16-C	R23-C	R24-C		
Pin 12	R7-NO	R8-NO	R15-NO	R16-NO	R23-NO	R24-NO		

MIRO 2/24 Connectors

MIRO 2/24 S-NET Connectors (TB4 and TB5)

Pins 1 through 5 of these connectors are used for input and output of the daisy-chained S-NET wiring. TB4, pins 6 and 8, are MP+ for the two on-board monitor points, using pin 7 as the common MP-.

MIRO 2/24 Monitor Input Connector (TB4)

Two monitor inputs are available on the MIRO 2/24. Pins 6 and 8 of TB4 provide the + connections for monitor points 1 and 2, respectively, with pin 7 providing the - (common ground).

MIRO 2/24 Relay Output Connectors (TB1, TB2 and TB3)

Twenty-four relay outputs are available on the MIRO 2/24. Each relay possesses three pins, one designated Normally Closed (NC), one designated Common (C), and a third Normally Open (NO). Direct wiring to the appropriate pin determines the normal relay state, which is either Closed or Open.

If any of the 24 relays is used to control a fail-safe lock, set the connection to the NC pin. If any relay is used to control a fail-secure lock, set the connection to the NO pin.

INSTALLING MIROS 32/0 AND 64/0

Follow this procedure to install the (*full-height*)MIRO 32/0 or 64/0.

TO INSTALL THE (FULL-HEIGHT) MIRO 32/0 OR MIRO 64/0:

1. **Open the enclosure and mount the MIRO PCA inside.**
2. **Set the S-NET address, using address switch S1. Use switch 2 to set the mode: use 0 for the MIRO 64/0, and 4 for the MIRO 32/0. Read the rest of this section for more information.**
3. **Connect MIRO 32/0 monitor inputs through TB1 (MI-1 through MI-8), TB2 (MI-9 through MI-16), TB3 (MI-17 through MI-24) and, TB4 (MI-25 through MI-32).**
4. **Make the same thirty-two monitor point connections for the MIRO 64/0; then make thirty-two additional connections for the MIRO 64/0, using the connector pins in the piggy-back portion of Phoenix blocks TB1 to TB4 furthest from the PCA as follows: TB1 (MI-33 through MI-40), TB2 (MI-41 through MI-48), TB3 (MI-49 through MI-56), and TB4 (MI-57 through MI-64).**
5. **Make S-NET connections to the ACU, and/or to another MIRO, through either the upper or the lower of the two TB5 connectors, pins 1 through 5.**
6. **Configure the NexSentry Star II ACU database as required.**

The steps performed, and their sequence may vary.

MIRO 32/0 and MIRO 64/0 PC Boards

The MIRO 32/0 and MIRO 64/0 PCAs are shown in the diagram “MIRO 32/0 and MIRO 64/0 features” on page 4-31.

MIRO 32/0 and MIRO 64/0 LEDs

The LEDs are shown in the diagram "MIRO 32/0 and MIRO 64/0 features" on page 4-31 and listed below.

LED	LED Description
CR69	RX (Receive Data)

LED	LED Description
CR70	TX (Transmit Data)

LED	LED Description
CR71	VITAL

MIRO 32/0 and MIRO 64/0 LEDs

MIRO 32/0 and MIRO 64/0 Fuses

The single replaceable fuse is shown in the diagram "MIRO 32/0 and MIRO 64/0 features" on page 4-31 and listed below.

			Approved Manufacturers' Part Numbers		
Fuse	Description	Type	Wickman TR5 Series	Schurter MST Series	Bel MRT Series
F1	Input Power	.5-Amp	19372K-41	#34.6612	0692-0500-01

MIRO 32/0 and MIRO 64/0 Fuse

MIRO 32/0 and MIRO 64/0 Address and Mode Switches (S1 and S2)

If a MIRO 32/0 (or 64/0) is the first S-NET MIRO, set it to address 2, (see below). Set each subsequent MIRO to consecutive addresses 3 through 15. The positions of these rotary switches are shown in the diagram "MIRO 32/0 and MIRO 64/0 features" on page 4-31.

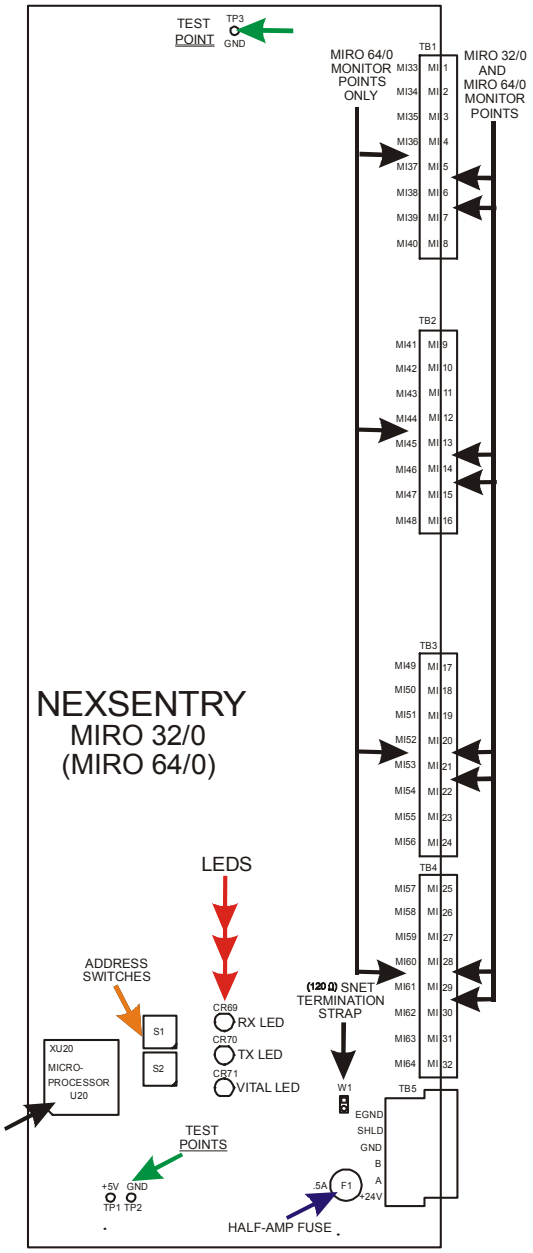
MIRO 32/0 and MIRO 64/0 S-NET Address Switch S1

Use switch S1 on the MIRO 32/0 or 64/0 PCA to set the next available S-NET address. The valid range is 2 - 15 ($2\ F_{16}$).

MIRO 32/0, MIRO 64/0, and the Test Modes for Switch S2

Switch S2 Mode Settings	Either 0 or 1	The MIRO 64/0 has 64 monitor points
	Either 4 or 5	The MIRO 32/0 has 32 monitor points
	8--F	MIRO is in Test Mode and is for NexWatch use only

MIRO 32/0 and MIRO 64/0 S2 Mode Settings



MIRO 32/0 and MIRO 64/0 features



NOTE: Do not use mode settings 2, 3, 6, and 7.

MIRO 32/0 and MIRO 64/0 Test Points

Use test points TP1 (+5V) and TP3 (GND) to troubleshoot the input power of the MIRO 32/0 (64/0). Satisfactory operational voltage between TP1 and TP3 should be a nominal +5 volts. Test point TP2 (GND) is an additional ground tap. The test points are shown in the diagram “MIRO 32/0 and MIRO 64/0 features” on page 4-31.

MIRO 32/0 and MIRO 64/0 Tamper Connector

No specific tamper connector is provided on the MIRO 32/0 - MIRO 64/0 PCA. When the MIRO 32/0 or MIRO 64/0 is mounted in an individual enclosure, an enclosure tamper switch can be installed and connected at any of the monitor point connections. The ACU reports an active state on the monitor point used as the tamper connector.

MIRO 32/0 and MIRO 64/0 S-NET Termination Strap (W1)

If the MIRO 32/0 or MIRO 64/0 is the last device on the end of an S-NET chain, applying a jumper strap at the W1 location provides the 120Ω S-NET termination that is required.

MIRO 32/0 and MIRO 64/0 Programmable Micro-Controller

The micro-controller (U20/XU20) controls the operation of the MIRO 32/0 or the MIRO 64/0. Its location is noted to facilitate any revision changes. It is shown in the diagram “MIRO 32/0 and MIRO 64/0 features” on page 4-31.

MIRO 32/0 and MIRO 64/0 Connectors

The following table lists the connectors and pinouts for the MIRO 32/0 and the MIRO 64/0. TB1(a), TB2(a), TB3(a), and TB4(a) are the connector pins located closest to the PCA. TB1(b), TB2(b), TB3(c), and TB4(b) are the connectors located furthest from the PCA. These are shown in the diagram "MIRO 32/0 and MIRO 64/0 features" on page 4-31.

	MIRO 32/0 and MIRO 64/0				MIRO 64/0 Only				
Connector	TB1(a)	TB2(a)	TB3(a)	TB4(a)	TB1(b)	TB2(b)	TB3(b)	TB4(b)	TB5
Pin 1	MI-1+	MI-9+	MI-17+	MI-25+	MI-33+	MI-41+	MI-49+	MI-57+	+24V
Pin 2	MI-1-	MI-9-	MI-17-	MI-25-	MI-33-	MI-41-	MI-49-	MI-57-	DATA A
Pin 3	MI-2+	MI-10+	MI-18+	MI-26+	MI-34+	MI-42+	MI-50+	MI-58+	DATA B
Pin 4	MI-2-	MI-10-	MI-18-	MI-26-	MI-34-	MI-42-	MI-50-	MI-58-	Ground
Pin 5	MI-3+	MI-11+	MI-19+	MI-27+	MI-35+	MI-43+	MI-51+	MI-59+	Shield
Pin 6	MI-3-	MI-11-	MI-19-	MI-27-	MI-35-	MI-43-	MI-51-	MI-59-	Earth Gnd
Pin 7	MI-4+	MI-12+	MI-20+	MI-28+	MI-36+	MI-44+	MI-52+	MI-60+	
Pin 8	MI-4-	MI-12-	MI-20-	MI-28-	MI-36-	MI-44-	MI-52-	MI-60-	
Pin 9	MI-5+	MI-13+	MI-21+	MI-29+	MI-37+	MI-45+	MI-53+	MI-61+	
|	|	|	|	|	|	|	|	|	
Pin 16	MI-8-	MI-16-	MI-24-	MI-32-	MI-40-	MI-48-	MI-56-	MI-64-	

MIRO 32/0 and MIRO 64/0 Connectors

MIRO 32/0 and MIRO 64/0 S-NET (TB5)

Pins 1-5 of this connector are used for input and output of the daisy-chained S-NET wiring. Pin 6 is available if a true earth ground exists, otherwise, do not use it.

MIRO 32/0 and MIRO 64/0 Monitor Inputs (TB1, TB2, TB3, and TB4)

The MIRO 32/0 has 32 monitor inputs and the MIRO 64/0 has 64. There are two pins, + and -, for each monitor input.

INSTALLING MIRO 4/2 AND 4/0

The **MIRO 4/2** is a small, convenient Input/Output device designed to be installed near a controlled door. It has 2 S-NET connectors to allow the S-NET to pass through it on the way to a DKR or other Reader device. It is used in new installations where new S-NET wiring can be installed.

The **NexLine Plus (MIRO 4/0)** is a special purpose device that is employed only where existing co-axial cable is being used, and an MSM was previously installed at the door location. The Star II controller connects via S-NET to a **NexLine Coax adapter**. At the other end of the coax cable at the door, a **NexLine Plus** will be installed. It converts the wiring from the coax cable back to S-NET, and provides 4 input points to replace the capability of the MSM.



WARNING Note.

DATA Tees in coaxial connections are **NEVER** permitted.

Although the MIRO 4/2 and NexLine Plus share the same enclosure, their connectors and capabilities are very different. They are not interchangeable.

TO INSTALL THE MIRO 4/2 AND THE NEXLINE PLUS (MIRO 4/0):

1. **Remove the metal back and set the address switch to the next available MIRO address, 2 through 15 (2 through F_{16}).**
2. **Connect the input devices (up to 4) to the 4 input points, MI-1 through MI-4. (For the MIRO 4/2 only: connect the two relay points to any devices you wish to control such as locks, alarm sounders, etc.)**

3. **Use the remaining S-NET connector to continue the S-NET wiring to a Reader or another MIRO device, or install the termination strap if this is the last device on this S-NET.**
4. **MIRO 4/2: connect either S-NET connector to the S-NET bus from the ACU.**

   NexLine Plus (MIRO 4/0): Connect the coaxial cable coming from the ACU enclosure to the coax fitting on the device.
5. **Configure the Star II Database as required to match the installation.**

MIRO 4/2 and NexLine Plus (MIRO 4/0) LEDs and Fuses

The surface-mounted LEDs: those of the MIRO 4/2 are shown in blue and those of the NexLine Plus (MIRO 4/0) are shown in red in the diagram above. The following tables list the LEDs and the fuses.

NexLine Plus LEDs	Description
CR4	VITAL
CR6	COMM

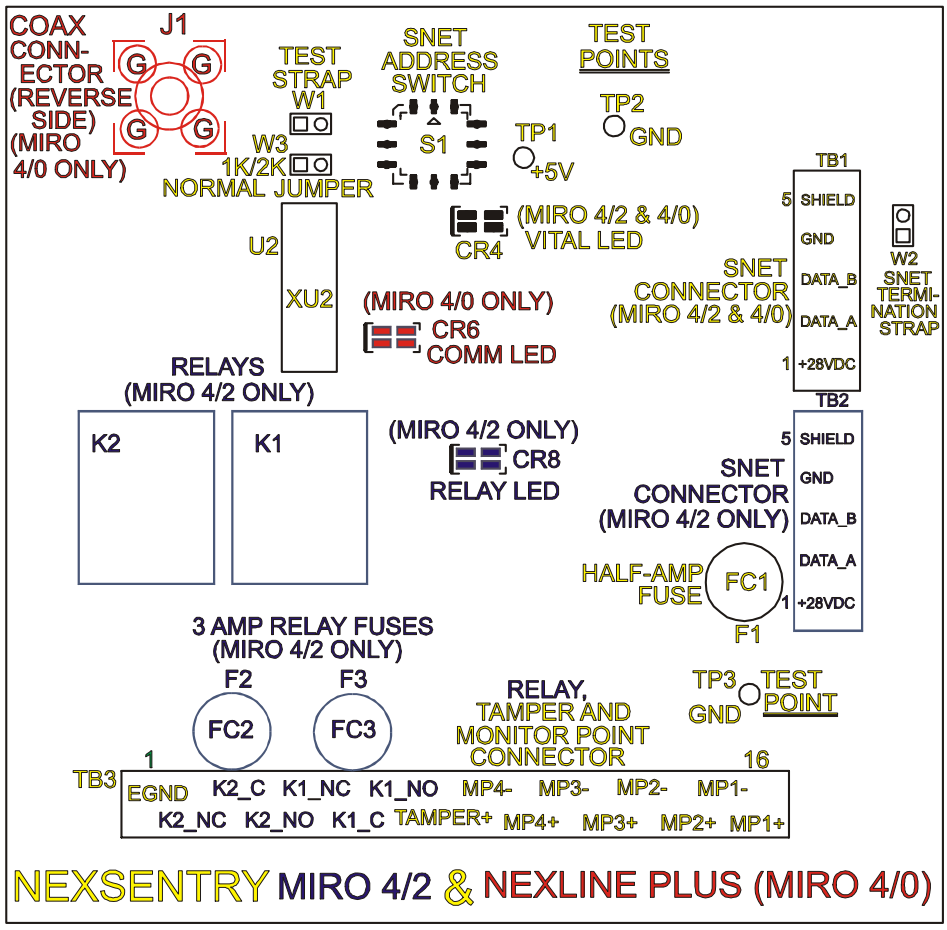
MIRO 4/2 LEDs	Description
CR4	VITAL
CR8	RELAYS

MIRO 4/2 and NexLine Plus (MIRO 4/0) LEDs

.

				Approved Manufacturers' Part Numbers		
	Fuse	Description	Type	Wickman TR5 Series	Schurter MST Series	Bel MRT Series
Both	F1	Input Power	.5-Amp	19372K-41	#34.6612	0692-0500-01
MIRO 4/2 only	F2	Relay Output 1	3.15-Amp	19372K-124	#34.6620	0692-3150-01
	F3	Relay Output 2				

MIRO 4/2 and NexLine Plus (MIRO 4/0) Fuses



MIRO 4/2 and NexLine Plus (MIRO 4/0) PCA(s)
(- showing the common and the unique features of ***both*** devices — MIRO 4/2 in blue, MIRO 4/0 in red and common features in yellow)

MIRO 4/2 and NexLine Plus (MIRO 4/0) Fuses

The three replaceable MIRO 4/2 fuses are shown in blue and the single replaceable MIRO 4/0 (NexLine Plus) fuse is shown in red in the diagram above.

MIRO 4/2 and NexLine Plus (MIRO 4/0) Address Switch (S1)

If a MIRO 4/2 or NexLine Plus is the first MIRO on the S-NET, set its address to 2. Set subsequent MIROs to addresses 3 through 16. For the NexLine Plus, the valid address range is 2 - 8. For a MIRO 4/2, the range is 2 - 15 (2 - F_{16}).



NOTE: Relay and monitor point numbers depend on whether they are on the ACU or on a MIRO. The first four relays are assigned to the ACU, and then MIRO by MIRO, until all of the relay output numbers are used, (up to 96). The first 16 monitor points are assigned to the ACU, and then MIRO by MIRO, until all of the monitor point numbers are used, (up to 255).

MIRO 4/2 and NexLine Plus (MIRO 4/0) Test Points

Use test points TP1 (+5v) and TP2 (GND) or TP3 (GND) to troubleshoot input power on either unit. For satisfactory operation, the voltage between TP1 and TP2/TP3 should be +5 volts.

MIRO 4/2 and NexLine Plus (MIRO 4/0) Test Strap (W1)

(***THE USER SHOULD NEVER TOUCH THIS STRAP.***) Strap in place, the firmware in the U2 micro-controller operates the unit as a MIRO 4/2. Without the strap, the U2 operates as a NexLine Plus.

MIRO 4/2 and NexLine Plus S-NET (MIRO 4/0) Termination Strap (W2)

If the MIRO 4/2 or the NexLine Plus is the last device on the end of an S-NET chain, applying a jumper strap at this location will provide the 120Ω S-NET termination required.

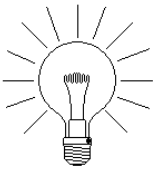
MIRO 4/2 and NexLine Plus (MIRO 4/0) 1K/2K Normal Jumper (W3)

This jumper was designed to convert the normally open inputs to normally closed, and vice versa, but this function was performed as

an operator-selectable feature of the previous user interface `MONITOR` command, so it is now obsolete.

MIRO 4/2 and NexLine Plus (MIRO 4/0) Micro-Controller (U2)

Micro-controller U2, (location XU2), is factory-serviceable only.



NOTE: The U2 firmware is the same for both the MIRO 4/2 and the NexLine Plus (MIRO 4/0). The Test strap, W1, activates the MIRO 4/2 rather than the NexLine Plus (MIRO 4/0).

MIRO 4/2 Connectors

The following table lists the connectors/ pinouts for the MIRO 4/2.

Pins	TB1(a)	TB2(a)	TB3(a)	J1
1	+24VDC	+24VDC	Earth Ground	NOT USED
2	DATA A	DATA A	K2_NC	
3	DATA B	DATA B	K2_Common	
4	Ground	Ground	K2_NO	
5	Shield	Shield	K1_NC	
6			K1_Common	
7			K1_NO	
8			Tamper+	

Pins	TB3(a)
9	MP-4 -
10	MP-4 +
11	MP-3 -
12	MP-3 +
13	MP-2 -
14	MP-2 +
15	MP-1 -
16	MP-1 +

MIRO 4/2 Connectors

MIRO 4/2 S-NET Connectors TB1 and TB2

Pins 1-5 are used to input/output the daisy-chained S-NET wiring.

MIRO 4/2 Relays Through Connector TB3

Pins 2-7 of this connector are used in groups of three for relay K2 (pins 2-4, Normally Closed, Common, Normally Open, respectively) and relay K1 (pins 5-7, NC, C, NO, respectively).

MIRO 4/2 Tamper Through Connector TB3

The Tamper+ connection for the MIRO 4/2 is pin 8. Pin 1 (EGND) is the earth ground (with a 2KΩ resistor wired in series). The unit is un-tampered when the pins 1 and 8 connectiom is in place and closed (2K clear), and tampered when the connection is open (1K active).

MIRO 4/2 Monitor Points Through Connector TB3

Pins 9 through 16 are used in groups of two for monitor points 4, 3, 2, and 1: Pins 9 and 10 for monitor point 4; pins 11 and 12 for monitor point 3; pins 13 and 14 for monitor point 2; and 15 and 16 for monitor point 1, - and +, respectively, for each pair of pins.

NexLine Plus (MIRO 4/0) Connectors

Pins	TB1(a)	TB2(a)	TB3(a)	J1
1	+24VDC	NOT USED	Earth Ground	COAX
2	DATA A	NOT USED	NOT USED	
3	DATA B	NOT USED	NOT USED	
4	Ground	NOT USED	NOT USED	
5	Shield	NOT USED	NOT USED	
6			NOT USED	
7			NOT USED	
8			Tamper+	

Pins	TB3(a)
9	MP-4 -
10	MP-4 +
11	MP-3 -
12	MP-3 +
13	MP-2 -
14	MP-2 +
15	MP-1 -
16	MP-1 +

NexLine Plus (MIRO 4/0) Connectors

NexLine Plus (MIRO 4/0) S-NET Connector TB1

Pins 1 through 5 of connector TB1 are used for input and output of the daisy-chained S-NET wiring. Install termination strap W2 if this is either the last or the first device in the S-NET chain.

NexLine Plus (MIRO 4/0) Tamper Through Connector TB3

Pin 8 of this connector provides the Tamper + connection for the MIRO 4/2, with pin 1 (EGND) providing the earth ground, (with a 2KΩ resistor wired in series). The unit is un-tampered when the connection between pins 1 and 8 is in place and closed (2K clear), and tampered when the connection is open (1K active).

NexLine Plus (MIRO 4/0) Monitor Points Through Connector TB3

Pins 2 through 8 on connector TB3 are not used on the NexLine Plus. Pins 9 through 16 of this connector are used in groups of two: pins 9 and 10 for monitor point 4, negative and positive; pins 11 and 12 for monitor point 3; pins 13 and 14 for monitor point 2; and pins 15 and 16 for monitor point 1, negative and positive, respectively.

NexLine Plus (MIRO 4/0) Co-Axial Connector J1

The NexLine Plus can only be used with a NexLine at the controller end of the cable, and existing coax RG-6U cable from a previous Schlage/WSE/NexSwatch Analog Proximity installation.



NOTE: (New installations typically use standard S-NET wiring. They will never use the NexLine Plus-Nexline combination. Since there is no requirement to convert to and from co-axial cable, they will use the MIRO 4/2 instead.)

5 INSTALLING THE UNIVERAL WIEGAND INTERFACE UNITS

The **WIRO 4/8/4** unit and the Universal Wiegand Interface Unit (**UWIU**) allow readers that communicate with a controller in the Wiegand™ protocol to be used with a NexSentry Star II Controller. Many types of third-party readers use the Wiegand protocol, including Omnitek/ HID/ Sensor Engineering, Motorola/ Indala, and some vehicle recognition products. **WIRO 4/8/4**s and **UWIU**s can interpret this data and convert it to S-NET protocol, which the NexSentry Star II Controller can use. Each **WIRO 4/8/4** and **UWIU** can support four Wiegand-protocol readers. There are settings and alternative firmware configurations on these units and firmware configuration settings for the NexSentry Star II Controller, to provide support for almost all Wiegand-protocol readers on the market. Contact your Area Sales Manager or Application Engineer for more information.

Besides its Wiegand capability, the **WIRO 4/8/4** has eight monitor inputs and four relay outputs, which will be described later in this chapter.

The **WIRO 4/8/4** can, in its Wiegand operation, emulate either a Magnetic Stripe Reader (MSR) os a Digital Key Reader (DKR/DR) to provide the widest range of connectivity options.

The **UWIU** has two modes of Wiegand operation: "Universal" mode and "Standard" mode. Because it has the two modes, the **UWIU** can emulate either a Magnetic Stripe Reader (MSR) or a Digital Key Reader (DKR/DR). The **UWIU** comes from the factory in the Universal mode, with two identical MSR-communicating (Universal mode) micro-controller/personality chips. If the **UWIU** is required to communicate as DKR/DRs, you need to replace the two identical Universal mode chips on the **UWIU** with DKR/DR-communicating (Standard mode) chips.

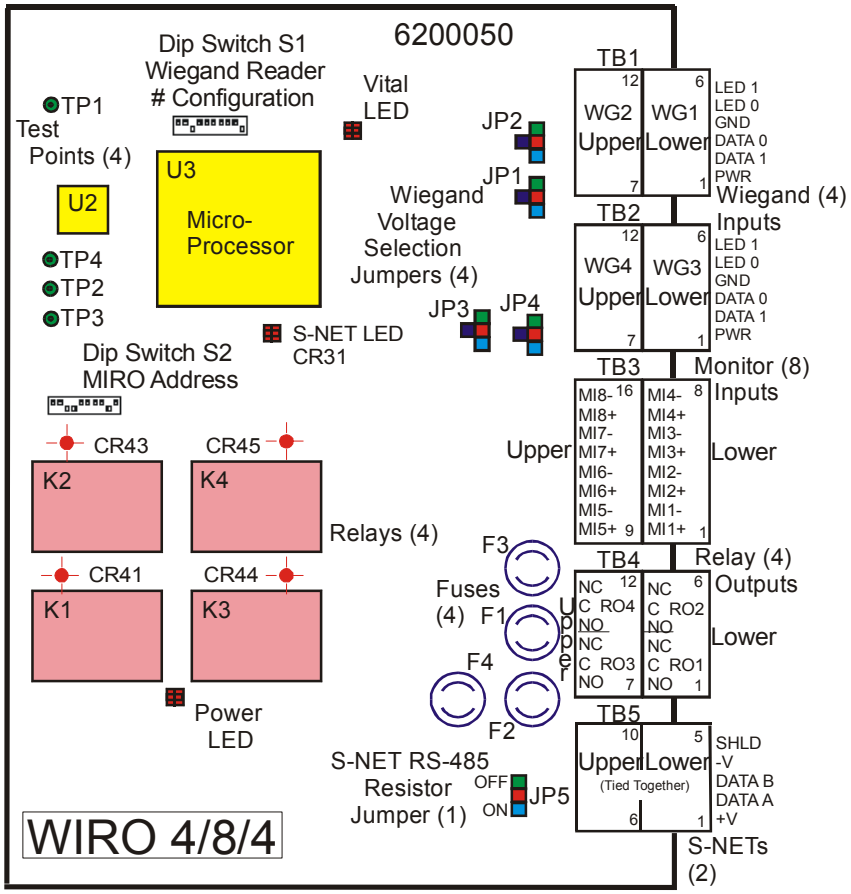
5 INSTALLING THE UNIVERAL WIEGAND INTERFACE UNITS

Use of the pre-installed Wiegand wiring provides an easy migration path for the incorporation of the NexSentry Star II ACU and the advanced Digital Key Readers—with Wiegand-type I/O and data format—available with this product, without incurring the expense of re-wiring an entire building.

This guide covers the following topics:

- "WIRO 4/8/4 PCA Layout" on page 5-3
- "Features of the WIRO 4/8/4" on page 5-3
- "Installing the WIRO 4/8/4" on page 5-10
- "WIRO 4/8/4 Specifications" on page 5-13
- "Wiring the WIRO 4/8/4" on page 5-14
- "UWIU PCA Layout" on page 5-15
- "Features of the UWIU" on page 5-16
- "Installing the UWIU" on page 5-20
- "Specifications for the UWIU" on page 5-22
- "Wiring the UWIU" on page 5-22
- "Configuring the WIRO 4/8/4 or the UWIU for Operation with MSRs" on page 5-24
- "Configuring the UWIU in the Standard Mode" on page 5-31

WIRO 4/8/4 PC BOARD LAYOUT



WIRO 4/8/4 PCA Layout

FEATURES OF THE WIRO 4/8/4

Refer to the figure “WIRO 4/8/4 PCA Layout” on page 5-3, for the features of the **WIRO 4/8/4**. The figure also shows the posi-tion of

the single micro-controller (the **WIRO 4/8/4** version part number is 5400045) and the single vital LED, (which blinks for a properly functioning CPU). It shows the monitor input (TB3); relay output (TB4); power, tamper and data connection (TB5) terminal blocks; the power LED, (which is lit when the board's power is turned on), the S-NET LED, and the four relay LEDs. It shows the fuses and trouble-shooting test-points, the Wiegand Reader # Con-figuration Dip Switch 1 and Dip Switch 2 for the MIRO addresses.

WIRO 4/8/4 Micro-Controller (U3)

The position of the U3 micro-controller is shown in figure "WIRO 4/8/4 PCA Layout" on page 5-3.

WIRO 4/8/4 LEDs

The following table describes the LEDs on the **WIRO 4/8/4**.:

LED	LED Description
CR31	S-NET LED
CR38	Vital LED

LED	LED Description
CR39	Power LED
CRs 41, 43, 44, 45	Relay LEDs K1, K2, K3, K4

WIRO 4/8/4 LEDs

WIRO 4/8/4 Fuses

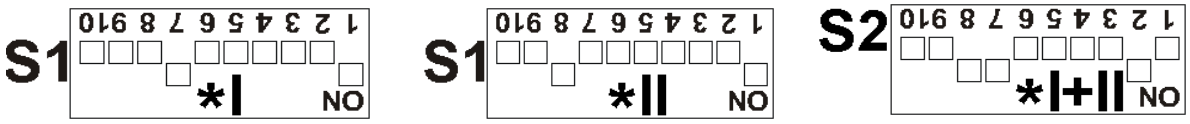
The four identical **WIRO 4/8/4** replaceable fuses are shown in the table "WIRO 4/8/4 Fuses" on page 5-4.

			Approved Manufacturers' Part Numbers		
Fuses	Description	Type	Wickman TR5 Series	Schurter MST Series	Bel MRT Series
F1, F2, F3, F4	Relays K4, K3, K2, K1	3.15-Amp	19372K-124	#34.6620	0692-3150-01

WIRO 4/8/4 Fuses

WIRO 4/8/4 DIP Switches S1 and S2

There are two sets of DIP Switches, S1 and S2 on the **WIRO 4/8/4** PC board. These are shown below, (upside-down, as they appear on the actual board). Note that DIP switch positions ascend in value, when viewed upside-down, from right to left.



WIRO 4/8/4 10-Pos'n DIPs: S1–MSR/Wiegand Rdr Config; S2–MIRO Addr
(Default Settings: *I=Star I=MSR, *II=Star II=Wiegand, *I+II=both)

WIRO 4/8/4 DIP Switch S1 (reader address range & reader S-NET type)

DIP Switch S1 on the **WIRO 4/8/4** is used for selecting reader address ranges (switch positions 1-6), reader S-NET type (positions 7 and 8). The first table shows how S1 positions 1-6 are set to select the four starting S-NET addresses, dependent on whether or not TB1 is configured for Wiegand. (ON = black, OFF = white.)

The second table shows Switch S1 used for the test mode (position 9), which operates with positions 1-6 all OFF.

The S1 and S2 factory defaults are shown in the diagram above. **All S1 switch positions are set to OFF when there is no reader.**.

S1 Switch Positions			Reader Type
7	8	(10 not used)	
		= 0	DKR S-NET
■		= 1	MSR S-NET (default: Star I ONLY!)
D	D	= 2	Wiegand S-NET (default: Star II ONLY!)
■	■	= 3	Both DKR and VIP

S1 Switch Position		Test Mode
9	(10 not used)	
D	= 0	Test Mode OFF
■	= 1	Test Mode ON
(With Positions 1-6 OFF = 0)		

WIRO 4/8/4 S1 DIP Rdr Type & Test Mode
D=Default Factory Setting (see also diagram above)

A **Star II ACU** supports a maximum of four **WIRO 4/8/4** units. These have *WIRO 4/8/4* addresses 1 through 4 on the *Star II ACU*.

Star TB1 Configured for S-NET - therefore addresses 1 & 2 have NOT already been used							Wiegand Connector			
							1	2	3	4
S1 Switch Positions (OK to start at address 1)							Address Range			
1	2	3	4	5	6	(10 not used)				
D	D	D	D	D	D	= 1	1	2	3	4
■		■				= 5	5	6	7	8
■			■			= 9	9	10	11	12
■		■	■			=13	13	14	15	16

Star TB1 Configured for Wiegand - therefore addresses 1 & 2 HAVE already been used							Wiegand Connector			
							1	2	3	4
S1 Switch Positions (MUST start at address 3)							Address Range			
1	2	3	4	5	6	(10 not used)				
■	■					= 3	3	4	5	6
■	■	■				= 7	7	8	9	10
■	■		■			=11	11	12	13	14
■	■	■	■			=15	15	16		

WIRO 4/8/4 S1 DIP (1-6) S-NET Address Settings
D=Default Factory Setting

WIRO 4/8/4 DIP Switch S2

DIP Switch S2 on the **WIRO 4/8/4** is used for the MIRO address of the **WIRO 4/8/4** unit (switch positions 1-5). The tables below show S2 positions 6-8 set for the number of readers, and positions 1-5 set to select the MIRO S-NET addresses, which only start at 2, since address 1 is reserved for the NexSentry Star ACU itself.

(Address 0 = Test Mode or **NO MIRO POINTS USED**.)

S2 Switch Positions				Number of Readers Defined
6	7	8		(S2 Switch Positions 9 and 10 not used)
			= 0	ONE Reader (if First is Defined)
	■		= 1	TWO Readers (if First is Defined)
		■	= 2	THREE Readers (if First is Defined)
D	D	D	= 3	FOUR Readers (if First is Defined) (default)

WIRO 4/8/4 DIP S2 (7-8) for Number of Readers Defined
D=Default Factory Setting

The factory default is S2 switch positions 2, 7 and 8 (only) ON.

Switch	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Address	=Test Mode	D D D D D =2	=3	=4
Address	=5	=6	=7	=8
Address	=9	=10	=11	=12
Address	=13	=14	=15	=16

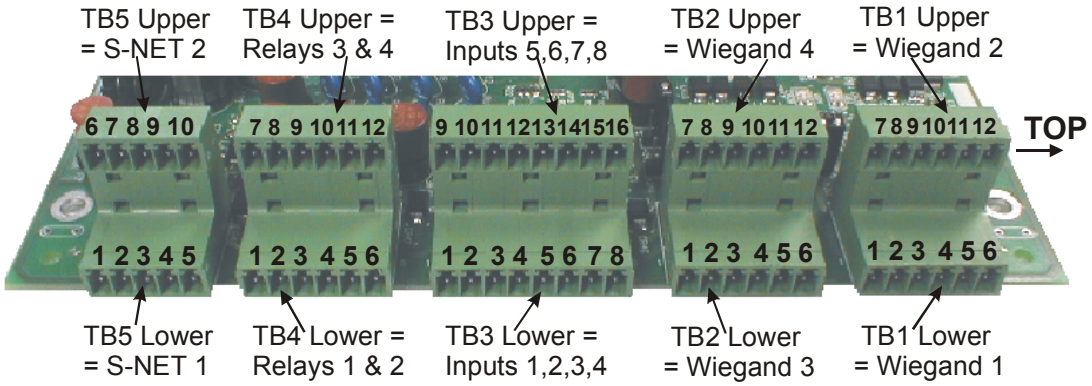
WIRO 4/8/4 DIP S2 MIRO Addresses

D=Default Factory Settings

*NOTE: Address 1 is reserved for the NexSentry Star ACU itself

WIRO 4/8/4 Terminal Blocks TB1-TB5

The diagram below shows the five double terminal block connectors.



WIRO 4/8/4 Terminal Blocks, TB1 - TB5

WIRO 4/8/4 Terminal Block TB3 for Monitor Inputs 1 Through 8

Terminal block TB3 (Upper and Lower) is used to wire the 8 monitor inputs provided on the **WIRO 4/8/4** unit. The table below shows the 8 monitor points and the 16 associated pins.

Pin	Monitor Input	Pin	Monitor Input	Pin	Monitor Input	Pin	Monitor Input
1	MI1+	5	MI3+	9	MI5+	13	MI7+
2	MI1-	6	MI3-	10	MI5-	14	MI7-
3	MI2+	7	MI4+	11	MI6+	15	MI8+
4	MI2-	8	MI4-	12	MI6-	16	MI8-

WIRO 4/8/4 TB3 for Monitor Inputs 1-8

WIRO 4/8/4 Terminal Block TB4 for Relay Outputs 1 Through 4

Upper TB4 and Lower TB4 provide 4 relay output connectors. The table below shows the 12 associated pins for these connectors.

	Relay Output 1			Relay Output 2			Relay Output 3			Relay Output 4		
Pin	1	2	3	4	5	6	7	8	9	10	11	12
Function	NO	C	NC	NO	C	NC	NO	C	NC	NO	C	NC

WIRO 4/8/4 TB4 for Relay Outputs 1-4

WIRO 4/8/4 Test Points

Test points TP1 (GND), TP2 (VCC +5VDC), TP3 (+12VDC) and TP4 (+24VDC) are for making voltage measurements.

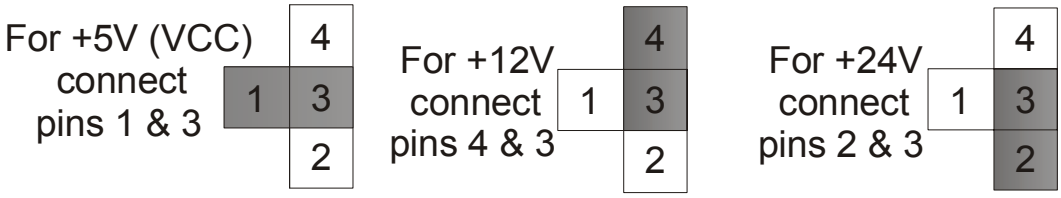
WIRO 4/8/4 Power Selector Jumpers (JP1, JP2, JP3 and JP4)

Each **WIRO 4/8/4** requires an input of 24VDC, supplied either from the power supply used by the ACU or from a separate power supply,

and then each **WIRO 4/8/4** can supply the input voltage directly or convert it to either +5VDC or +12VDC for interfacing (as required) to each of the four Readers on the unit.

CAUTION: 12VDC is only available if the input voltage is 15VDC or greater

Jumpers JP1, JP2, JP3 and JP4 are used to select these reader operating voltage(s), JP1 for RDR1, JP2 for RDR2, JP3 for RDR3 and JP4 for RDR4.



WIRO 4/8/4 Power Selector Jumpers - JP1, JP2, JP3 and JP4: 3 configurations

WIRO 4/8/4 Connectors TB1, TB2 and TB5

The table below lists the TB1, TB2 and TB5 connectors/pinouts for the **WIRO 4/8/4**.

Functions for	Wiegand I/O #1 & #2		Wiegand I/O #3 & #4		S-NET I/O	
Provided by	TB1 Lower & Upper		TB2 Lower & Upper		TB5 Lower & Upper	
	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6
TB1, TB2	PWR +	DATA 1	DATA 0	GND	LED 0	LED 1
TB5	+24VDC	DATA A	DATA B	GND	Earth GND	

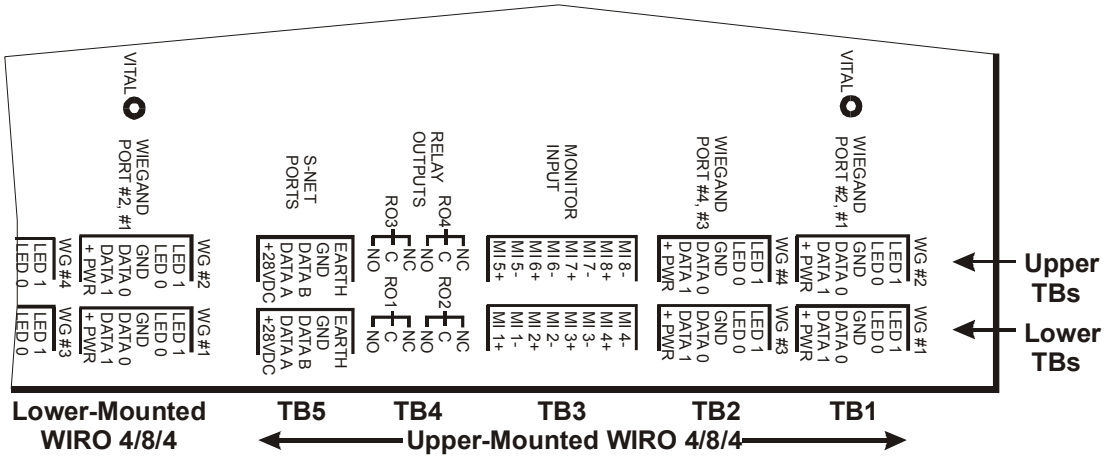
WIRO 4/8/4 Wiegand and S-NET Connectors

Pins 1 through 6 of connectors TB1 and TB2 (Upper and Lower) are used for standard Wiegand wiring. Connectors TB5 Upper and TB5 Lower are internally connected together: pins 1 through 5 are used for input and output of the daisy-chained S-NET wiring.

INSTALLING THE WIRO 4/8/4

TO INSTALL THE WIRO 4/8/4:

1 Open the **WIRO 4/8/4** dual enclosure and mount one or two **WIRO 4/8/4** PC board assemblies within the enclosure. DO NOT CONNECT THE POWER before making all the other connections.

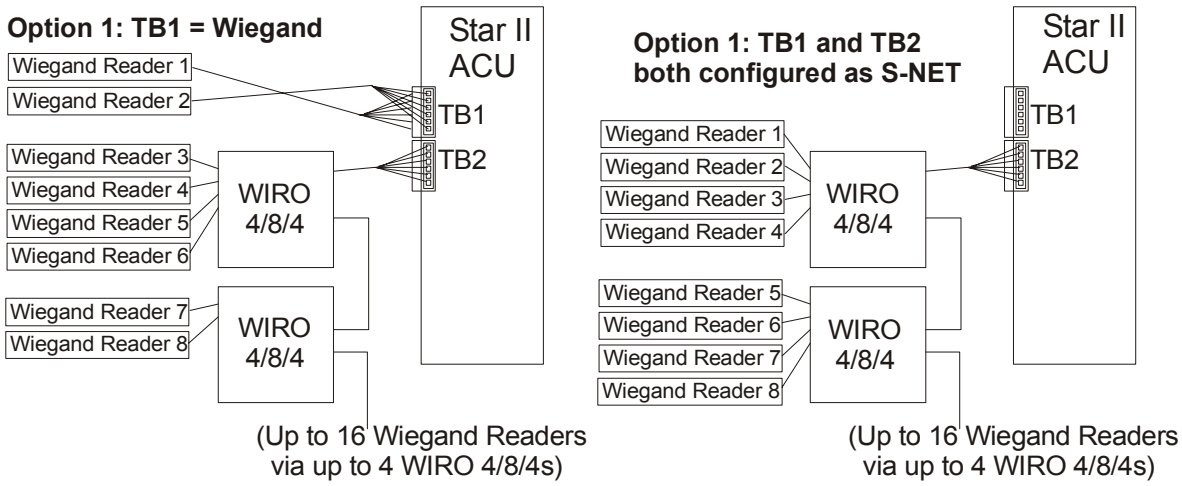


Mounting Case Stencil for the WIRO 4/8/4 Dual Enclosure

2 If terminal blocks TB1 Upper and TB1 Lower on the Star II ACU PC board are configured for Wiegand, rather than S-NET, then two

Wiegand readers with Wiegand addresses 1 and 2 can be ***directly wired*** (without using a **WIRO 4/8/4**) to the Star II's TB1. **WIRO 4/8/4**s can then be daisy-chained to the Star II's TB2, with the first **WIRO 4/8/4** S-NET address switch S1 set to 3 (for readers 3– 6), the second **WIRO 4/8/4** address switch S1 set to 7 (for readers 7–10), the third S1 set to 11 (for readers 11–14) and the fourth S1 to 15 (for readers 15 and 16, only). (See Configuration 1 in the diagram below.)

3 If the Star's TB1 remains configured for S-NET, then either the Star's TB1 or TB2 (or both) can be used to daisy-chain up to 4 **WIRO 4/8/4**s to support up to 16 Wiegand readers, with the S1 switches set to 1, 5, 9 and 13, **respectively**. (See Configuration 2 in the diagram below.)



The Two Basic Star II ACU Options for WIRO 4/8/4s & Wiegand Readers

4 With the POWER STILL OFF, make the S-NET connection to the ACU either through the upper or through the lower TB5 S-NET I/O connector on the **WIRO 4/8/4**, (pins 1 to 5), using 4-wire 18 to 24 AWG for the connections. (Use twisted pair data wires.)

5 Connect the other S-NET connector into a daisy chain of S-NET devices or to a NexStar connector unit to allow other S-NET daisy chains to be connected from it.

6 With the POWER STILL OFF, connect the Wiegand Readers to the TB1 and TB2 Wiegand I/O connectors. TB1 lower is for Weigand #1; TB1 upper, #2; TB2 lower, #3; and TB2 upper, Wiegand #4, using 6-wire 18 to 24 AWG for the connections.

7 Configure each of the power selector jumpers—JP1, JP2, JP3 and JP4—for the Wiegand Reader output power requirements to connectors J4, J5, J6 or J7, respectively. See “WIRO 4/8/4 Power Selector Jumpers (JP1, JP2, JP3 and JP4)”, on .

8 Make the connections for the 8 general purpose monitor inputs and the 4 general purpose relay outputs.

9 Configure the database as required and, after checking connections, now turn on the power.

WIRO 4/8/4 SPECIFICATIONS

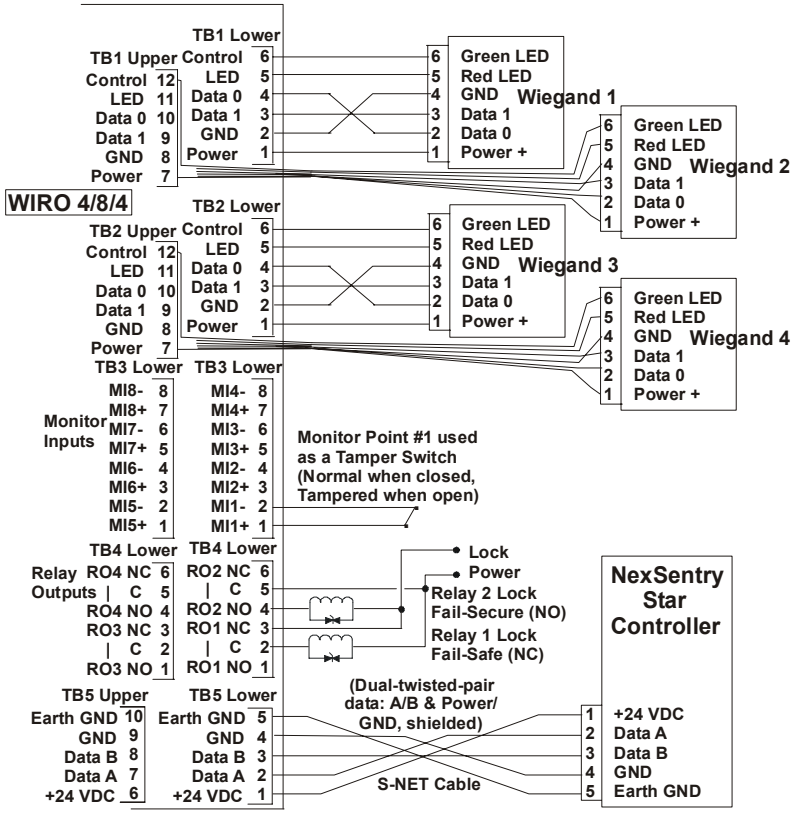
The following table provides the specifications for the **WIRO 4/8/4**.

Input Voltage	**+12.5 to + 24VDC Nominal**
Input Current	**750 mA**
Reader Interface	**TB1, TB2, TB3 & TB4**
Output Voltage	**Strap selectable as** **1) +5VDC (over the full input range)** **2) +12VDC (when the input is greater than 15VDC)** **3) Input voltage**
Output Current	**150 mA maximum**
Operating Temperature	**20º F to 120º F or -7º C to 49º C**
Humidity	**10% to 90% Non-condensing**
Weight	**12 ounces or 340 grams, without the enclosure**
Dimensions	**7" x 5" x 1.25" or 17.8 cm x 12.7 cm x 3.3 cm**
Maximum DKR or MSR Message Length	**34-bit, Hex only for Standard (DKRs). 255-bit, Hex or BCD for Universal (MSRs)**
Maximum Key Length	**36 bits for Universal (MSRs), 32 bits for Standard (DKRs)**
Site Code	**Fixed length, 16 bits, none for Standard**
Company Code	**Fixed length, 16 bits, none for Standard**
Monitor Inputs	**8 general purpose monitor inputs**
Relay Outputs	**4 general purpose relay outputs, all of which can be individually wired for normally open (NO) or normally closed (NC)**
Relay Contact Rating	**28VDC, 3A**

WIRO 4/8/4 Specifications

WIRING THE WIRO 4/8/4

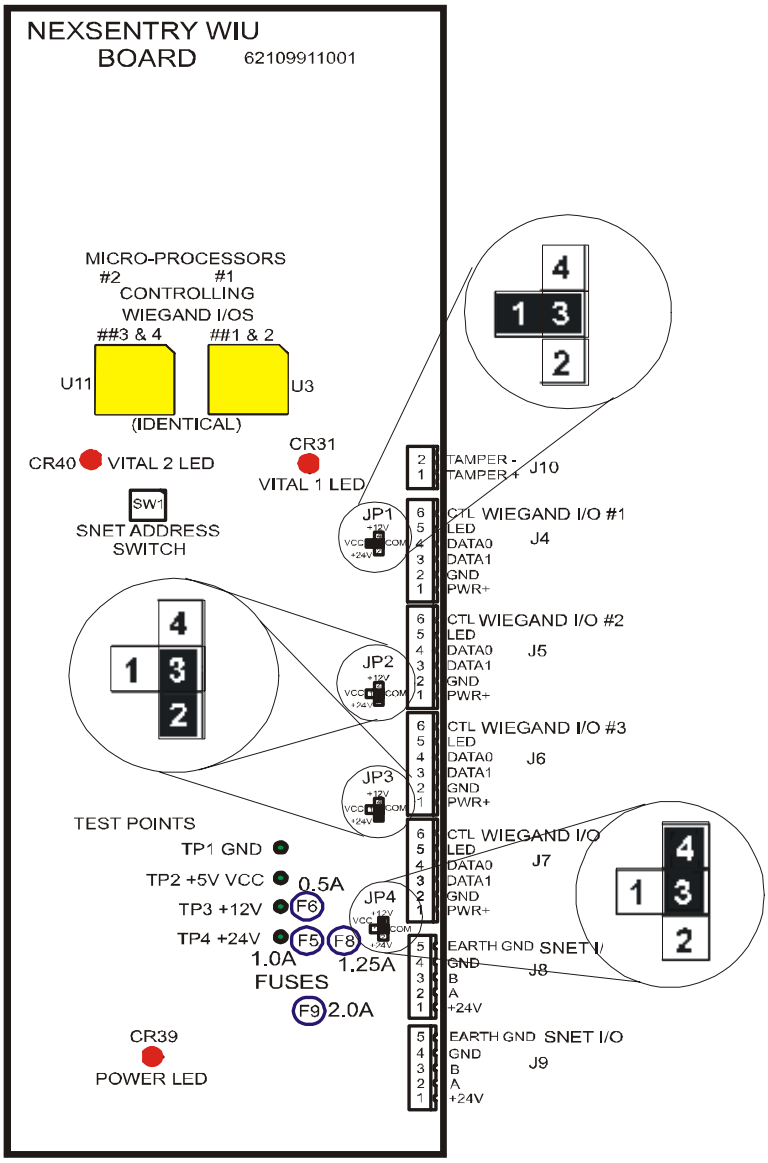
See the figure "Wiring the WIRO 4/8/4 to the S-NET, Readers, Lock Relays & Tamper MP" on page 5-14, as a guide to assist in wiring the **WIRO 4/8/4** to the S-NET, to the four Readers, fail-safe and fail-secure lock relays and a monitor point (in this case the tamper for the **WIRO 4/8/4**'s own component case).



Wiring the WIRO 4/8/4 to the S-NET, Readers, Lock Relays & Tamper MP

Connectors TB5 Upper and TB5 Lower are internally connected together so you can connect one ACU to one connector and use the other connector as a daisy-chain connection for an additional S-NET device.

UWIU PCA LAYOUT



Universal Wiegand Interface Unit (UWIU) PCA

FEATURES OF THE UWIU

Refer to the figure “Universal Wiegand Interface Unit (UWIU) PCA” on page 5-15, which shows a layout of the **UWIU** and an example of the voltage settings for the Readers. The **UWIU** converts Wiegand protocol to the S-NET.

The figure shows jumper JP1 strapped between pins 1 and 3, (VCC, +5V and COMMON), which sets JP1 to +5 volts; jumpers JP2 and JP3 strapped between pins 2 and 3, (+24V and COMMON), which sets both JP2 and JP3 to +24 volts; and jumper JP4 strapped between pins 4 and 3, (+12V and COMMON), which sets JP4 to +12 volts.

The figure also shows the positions of the two micro-controllers and the two vital function LEDs (one for each controller), (which blink for properly functioning CPUs). It shows the power, tamper and data connection terminal blocks; and the power LED, (which is lit when the board’s power is turned on). It shows the fuses and trouble-shooting test-points and the Door address range (or grouping) switch.

UWIU Micro-Controllers (U3 and U11)

The identical micro-controllers U3 and U11 (the Universal version part number is 5400024), at locations XU3 and XU11, respectively, are identified for any possible future updates. With the U3 firmware identical to the U11 firmware, each micro-controller controls two Wiegand input/output ports. Micro-controller U3 controls Wiegand I/Os 1 and 2 through connectors J4 and J5, respectively, and has its own vital LED at location CR31 on the PC board. Similarly, micro-controller U11 controls Wiegand I/Os 3 and 4 through connectors J6 and J7, respectively, and has its own vital LED at location CR40 on the PC board.

Both of the DKR-style micro-controllers (part number 5400024) serve the same functions and cannot be programmed for different

message formats. If an upgrade is performed which requires a micro-controller change, both micro-controllers must be changed together.

UWIU LEDs

The following table describes the three LEDs on the **UWIU**. (The LEDs do not have to be lit in sync with each other.)

LED	LED Description
CR31	Vital 1 LED

LED	LED Description
CR40	Vital 2 LED

LED	LED Description
CR39	Power LED

UWIU LEDs

UWIU Fuses

The replaceable **UWIU** fuses are shown below.

			Approved Manufacturers' Part Numbers		
Fuse	Description	Type	Wickman TR5 Series	Schurter MST Series	Bel MRT Series
F5	+12 Volts Output	1.25-Amp	19372K-050	#34.6616	0692-1250-01
F6	+5 Volts Output	.5-Amp	19372K-41	#34.6612	0692-0500-01
F8	+24 Volts Output	1.25-Amp	19372K-050	#34.6616	0692-1250-01
F9	Input Power	2-Amp	19372K-057	#34.6618	0692-2000-01

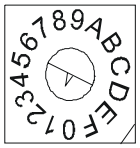
UWIU Fuses

UWIU Door Address Range Switch (S1)

The switch on the **UWIU** is for selecting Reader address ranges. Use position 1 and 2 for normal operation. Positions, 5 or 7, are for message-length reporting for the **UWIU** only, when performing Message length testing. Switch position 1 services Door Reader addresses 1 through 4 and switch position 2 services Door Reader

addresses 5 through 8, which connect through the I/O connectors J4 through J7.

UNIVERSAL WIU READER ADDRESS SWITCH S1



UWIU S-NET Address Switch S1

Use the table below to determine the actual Reader addresses. Refer to the figure "Universal Wiegand Interface Unit (UWIU) PCA" on page 5-15 for the location of address switch S1 on the PC board.

.

	Connector				
	J4	J5	J6	J7	
SW1 Position	S-NET Address Location				How Used
1	1	2	3	4	Normal Operation
2	5	6	7	8	
5	1	2	3	4	During initial installation when the Reader's bit code is not known. Then, set SW1 to 1 or 2.
7	5	6	7	8	
0	Off-Line				
3, 4, 6, 8, 9, A-F	Unused				

UWIU 1 and 2 Setting S-NET Address S1



NOTE: For the **UWIU** Readers to function properly, configure the Readers as Magnetic Stripe Readers (MSRs). (This is only for the **UWIU**.)

UWIU Test Points

Test points TP1 (GND), TP2 (VCC +5V), TP3 (+12V) and TP4 (+24V) and the pins labeled +24V on connectors J8 and J9, are used to troubleshoot the **UWIU** PCA for input and output power.

UWIU Power Selector Jumpers (JP1, JP2, JP3 and JP4)

The power selector jumpers on the UWIU are physically and operationally identical to those described for the WIRO 4/8/4, see "WIRO 4/8/4 Power Selector Jumpers" on page 5-9, above.

UWIU Connectors

The "UWIU Connectors" on page 5-19 lists the connectors/ pinouts for the **UWIU** PC board. Pins 1 through 5 of connectors J8 & J9 are used for input and output of the daisy-chained S-NET wiring.



CAUTION: "UWIU Connectors" on page 5-19 for the UWIU pinouts for Wiegand I/O #1 (J4), #2 (J5), #3 (J6) & #4(J7) do NOT match those on the WIRO 4/8/4 (TB1 Lower & Upper, and TB2 Lower and Upper, respectively) in "WIRO 4/8/4 Connectors TB1, TB2 and TB5" on page 5-9.

Functions for	Wiegand I/O #1	Wiegand I/O #2	Wiegand I/O #3	Wiegand I/O #4	S-NET I/O	S-NET I/O	Tamper
Provided by	J4	J5	J6	J7	J8	J9	J10

	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6
J4, J5, J6, J7	PWR +	DATA 1	DATA 0	GND	LED 0	LED 1
J8, J9	+24VDC	DATA A	DATA B	GND	Earth	
J10	Tamper +	Tamper -				

UWIU Connectors

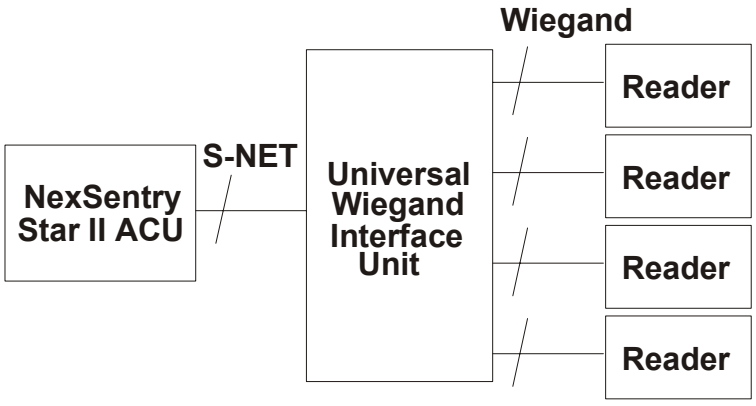
Pins 1 through 6 of connectors J4 through J7 are used for input and output of standard Wiegand wiring. See the DigiReader Series Manual part number 6600025, which has complete details of the wiring required for Wiegand-compatible devices.

Pins 1 and 2 of connector J10 provide the Tamper + and Tamper - connections, respectively, for the **UWIU**. Contact open equals tamper.

INSTALLING THE UWIU

There can be a maximum of two **UWIU**s (addresses 1 and 2) on a NexSentry Star II ACU. The **UWIU** requires 24VDC—which can be supplied from the ACU's power supply or from a separate power supply—and this +24VDC is either passed through or is converted to +5VDC or +12VDC for interfacing (as required) to each of the four Readers on each **UWIU**.

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Block Diagram of the Star II ACU with UWIU and Wiegand Readers

TO INSTALL THE UWIU:

1. Open the **UWIU**'s enclosure. Mount the PC board within the enclosure.
2. Make an S-NET connection to the ACU through the S-NET I/O connectors on the **UWIU**, either J8 or J9 (pins 1 to 5), using 4-wire 18 to 24 AWG for the connections. (Data wires are a twisted pair.)
3. Connect the other S-NET connector into a daisy chain of S-NET devices or to an AD 4305 NexStar connector unit to allow other S-NET daisy chains to be connected from it.
4. Make sure that the power is not connected and then connect the Wiegand Readers to the Wiegand I/O connectors, which are J4, J5, J6 and J7, using 6-wire 18 to 24 AWG for the connections.
5. The Wiegand I/O connector determines the Wiegand Reader's address or Door number, since the Wiegand Reader does not have an address switch.

   For switch (sw1) setting equals 1: J4 is for Reader 1,

   J5 is for Reader 2, J6 is for Reader 3, J7 is for Reader 4

   For switch (sw1) setting equals 2: J4 is for Reader 5,

   J5 is for Reader 6, J6 is for Reader 7, J7 is for Reader 8
6. Configure each of the power selector jumpers—JP1, JP2, JP3 and JP4—for the Wiegand Reader output power requirements to connectors J4, J5, J6 or J7, respectively.
7. Configure the database as required.

SPECIFICATIONS FOR THE UWIU

The following table provides the specifications for the **UWIU**

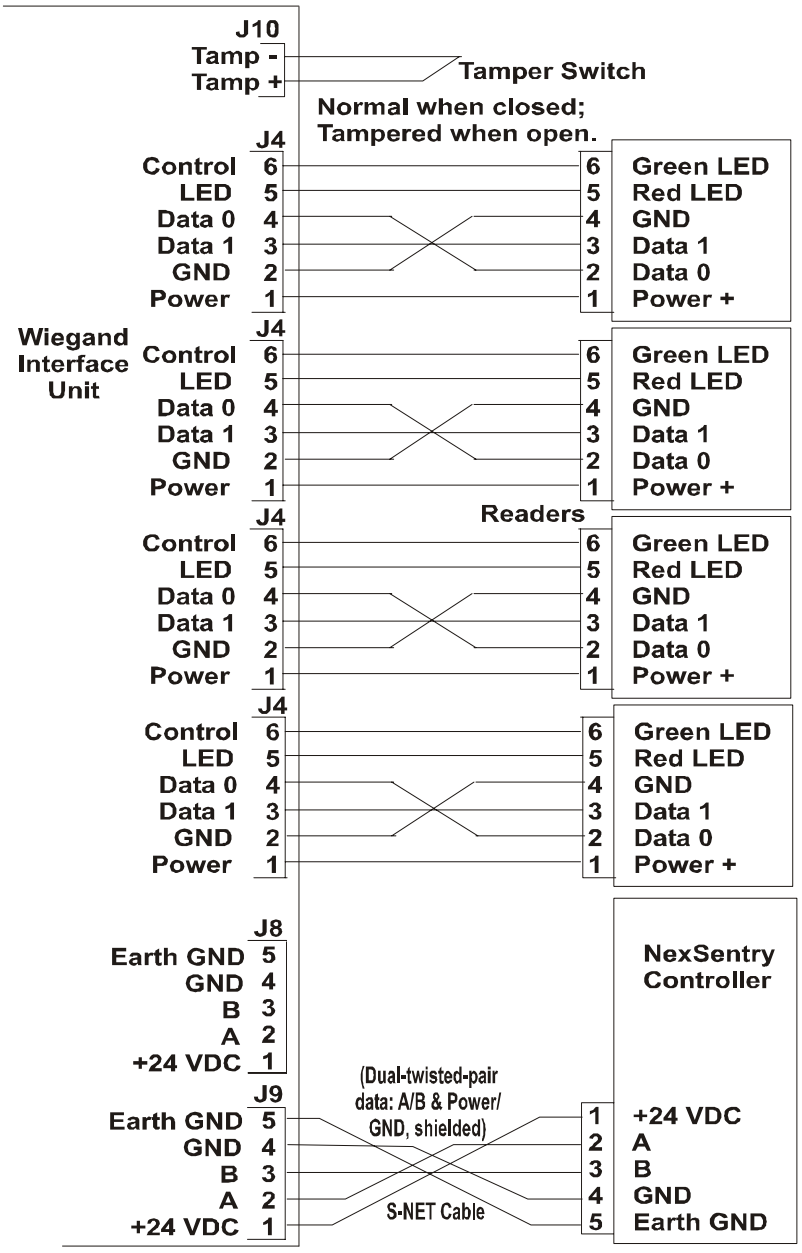
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Input Voltage	**+ 24 VDC Nominal**
Input Current	**150 mA**
Operating Temperature	**20º F to 120º F or -7º C to 49º C**
Humidity	**10% to 90% Non-condensing**
Weight	**12 ounces or 340 grams, without the enclosure**
Dimensions	**15" x 5" x 1.25" or 38 cm x 12.7 cm x 3.3 cm**
Maximum Message Length	**34-bit, Hex only for Standard (DKRs). 255-bit, Hex or BCD for Universal (MSRs)**
Maximum Key Length	**36 bits for Universal (MSRs), 32 bits for Standard (DKRs)**
Site Code	**Fixed length, 16 bits, none for Standard**
Company Code	**Fixed length, 16 bits, none for Standard**

UWIU Specifications

WIRING THE UWIU

See the figure “Wiring the UWIU to the S-NET and the Readers” on page 5-23 as a guide to assist in wiring the **UWIU** to the S-NET and to the four Readers. Connectors J8 and J9 are internally connected together, so you can connect one ACU to one connector and use the other connector as a daisy-chain connection for an additional S-NET device. Connector J10 is used to connect to an external tamper switch. Terminate both ends of the S-NET data twisted pair, when applicable.



Wiring the UWIU to the S-NET and the Readers

CONFIGURING THE WIRO 4/8/4 OR THE UWIU FOR OPERATION WITH MSRS

The **UWIU** comes from the factory ready for use with MSRs (Universal mode). For use with DKRs (Standard mode), the dual microprocessors, U3 and U11, must be replaced.

(The **WIRO 4/8/4** does ***not*** need the single U3 microprocessor to be replaced.)

This section and the following section explain how to configure the NexSentry Star II ACU with a **WIRO 4/8/4** (or a **UWIU**) and third party Wiegand cards and Readers. **NSM Lite** assists in defining the parameters for locating the start position and the length of the key data on the cards.

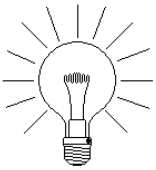
For use with MSRs the **WIRO 4/8/4** (or a **UWIU**) can connect to any device with the following:

- a 2 to 255 bit data stream
- 5, 12 or 24 volts
- 4 to 6 wires
- up to 6 composite fields of data

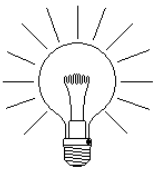
Getting Started

With the **WIRO 4/8/4** (or **UWIU**) connected to the ACU, set the address on the **WIRO 4/8/4** (or **UWIU**) for the block of reader addresses the Wiegand readers will occupy. Set the address switch to 1 on the **WIRO 4/8/4** (or **UWIU**) to use reader addresses 1-4.

For the **WIRO 4/8/4**, set the address switch to 1 to use addresses 1-4, 3 to use addresses 3-6, 5 to use addresses 5-8, 7 to use addresses 7-10, 9 to use addresses 9-12, 11 to use addresses 11 to 14, 13 to use addresses 13-16 and 15 to use addresses 15 and 16.



NOTE: Both the **WIRO 4/8/4** and the **UWIU** use a block of four, (4) S-NET Digital Reader addresses for the Wiegand Readers.



NOTE: The factory default baud rate for the NexSentry Star II ACU P2 terminal port is 9600 baud. (The ACU is shipped from the factory with both ports, P1, the host PC port and P2, the terminal port, set to 9600 baud.)



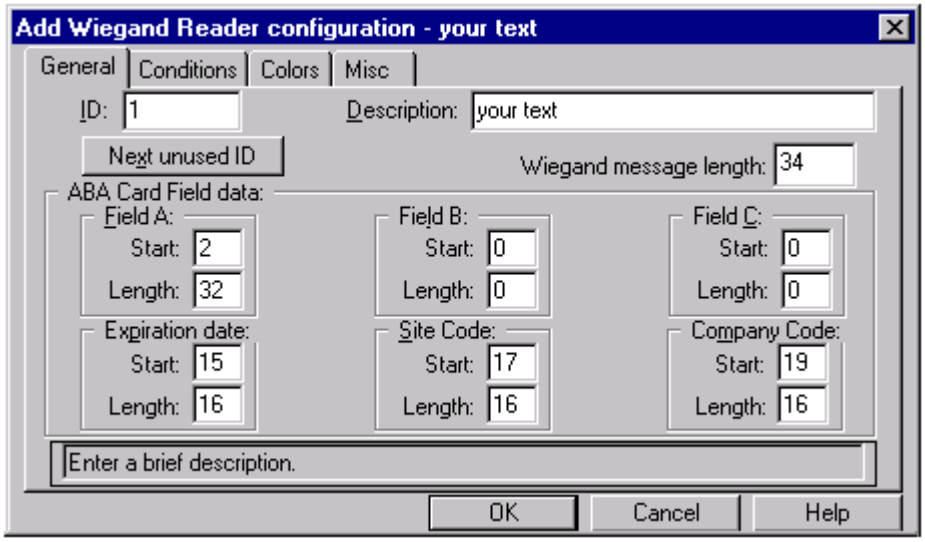
NOTE: For the **UWIU**, make sure that switches 5 and 6 are off wher using the **UWIU** for readers 1-4.

Configuring a Wiegand Reader

A Wiegand Reader on a particular door is configured from the following window (and its four tab selections: General, Conditions, Colors and Miscellaneous).

GENERAL

The first of the four tabs, General, sets up the reader's associated ID, a description of location and/or use, message length (bytes), and, for the "A," "B," "C," "Expiration," "Site Code," and "Company Code" fields, the bit positions where these fields begin and their bit lengths.



Wiegand Reader Configuration Data: General Tab

Wiegand Reader Configuration Data: General Tab

ID	Enter the unique numeric identifier.
Description	Enter a brief description.
Wiegand message length	Enter the message length.
ABA Card Field data	Enter the bit.....
Field A: Start	.....position at which the "A" field begins.
Field A: Length	.....length of the "A" field.
Field B: Start	.....position at which the "B" field begins.
Field B: Length	.....length of the "B" field.
Field C: Start	.....position at which the "C" field begins.
Field C: Length	.....length of the "C" field.

Wiegand Reader Configuration Data: General Tab (continued)

Expiration date: Start .....position at which the "Expiration" field begins.

Expiration date: Length .....length of the "Expiration" field.

Site Code: Start .....position at which the "Site Code" field begins.

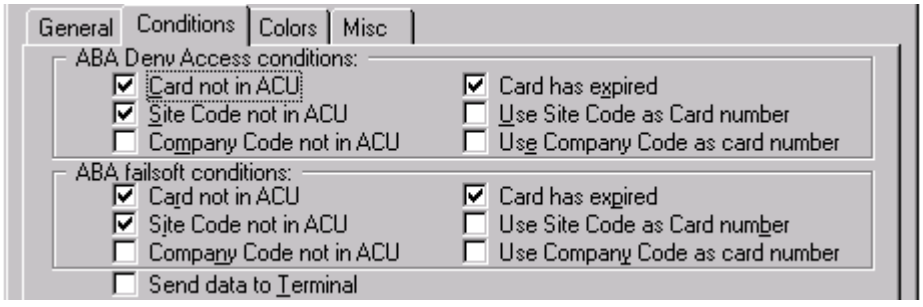
Site Code: Length .....length of the "Site Code" field.

Company Code: Start .....position at which the "Company Code" field begins.

Company Code: Length .....length of the "Company Code" field.

CONDITIONS

The second tab, Conditions, sets up the ABA normal and failsoft conditions under which to Deny Access (or, if unchecked, which conditions to ignore as a basis for denying access). Checking the last box sends to the terminal a full data string of characters generated by an ABA or Wiegand-emulating reader.



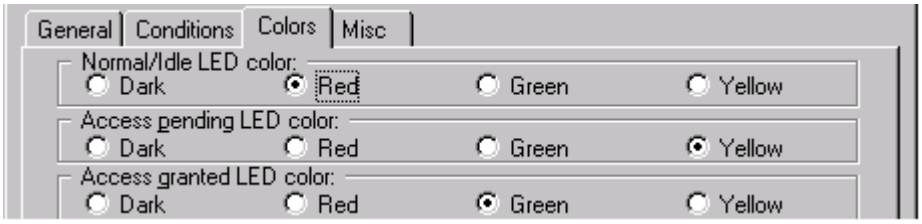
Wiegand Reader Configuration Data: Conditions Tab

Wiegand Reader Configuration Data: Conditions Tab

ABA Deny Access conditions:	
and the parallel	Check each to Deny Access.....
ABA failsoft conditions:	.....(Uncheck otherwise)
Card not in ACU	.....to this card if not in ACU.
Card has expired	.....if the Expiration Date has passed.
Site Code not in ACU	.....if the Site Code is incorrect.
Use Site Code as Card no.	.....based on Site Code.
Company Code not in ACA	.....if the Company Code is incorrect.
Use Company Code as card no.	.....based on Company Code.
Send data to Terminal	Send full data string to terminal

COLORS

The third tab, Colors, sets up how the LEDs should look 1) during normal/idle conditions and while Access is being 2) determined or 3) granted. 1) red, 2) yellow and 3) green, with dark (off) reserved for off-line/non-functioning are the usual choices, but, since these selections are not universal the color options are provided.



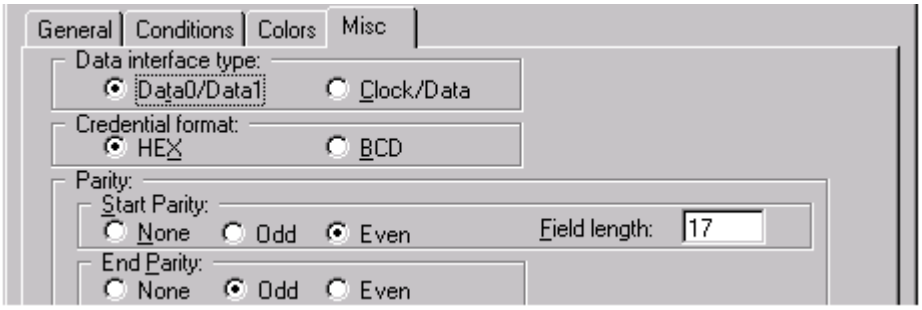
Wiegand Reader Configuration Data: Colors Tab

Wiegand Reader Configuration Data: Colors Tab

Normal/Idle LED color	Choose how LED should look.....
Dark(off)/Red/Green/Yellow	.....during normal/idle conditions.
Access pending LED color	Choose how LED should look.....
Dark(off)/Red/Green/Yellow	.....while Access is being determined.
Access granted LED color	Choose how LED should look.....
Dark(off)/Red/Green/Yellow	.....when Access is Granted.

MISC(ELLANEOUS)

The fourth tab, Misc, is concerned with data interface type, credential format and parity.



Wiegand Reader Configuration Data: Misc Tab

Wiegand Reader Configuration Data: Misc Tab

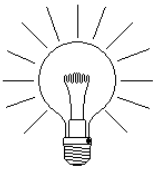
Data interface type:	Choose.....
Data0/Data1 / Clock/Data	.....the S-NET data interface type.
Credential format:	Choose.....
HEX / BCD	.....the format of Credential data.
Parity: Start Parity:	Choose.....
None / Odd / Even	.....(start) parity type.
Field length:	Choose the bit length of the start parity.
Parity: End Parity:	Choose.....
None / Odd / Even	.....(end) parity type.

With the NexSentry Star II ACU and the **WIRO 4/8/4** (or **UWIU**) configured, and you have a Reader connected to the **WIRO 4/8/4** (or **UWIU**), you can now decode the Wiegand proximity card.

Decoding the Card's Message Length

To determine the message length of the reader we must switch the **WIRO 4/8/4** (or **UWIU**) into a decoding mode.

If the **WIRO 4/8/4** (or **UWIU**)'s address is 1 (Readers 1 through 4), set the address switch to address 5. If the **WIRO 4/8/4** (or **UWIU**)'s address is 2 (Readers 5 through 8), set the address switch to address 7. The decoding mode will display all raw card data on the terminal screen when a card is read at the Reader and its ABA Data Card Report set to 1.



NOTE: The **WIRO 4/8/4** does not have to be configured to a different address for decoding the card's message length, but both the **WIRO 4/8/4** and the **UWIU** do require checking the **Send data to Terminal** box on the Wiegand Configuration Data Screen, Conditions tab, to send all 40 characters of raw data to the terminal port.

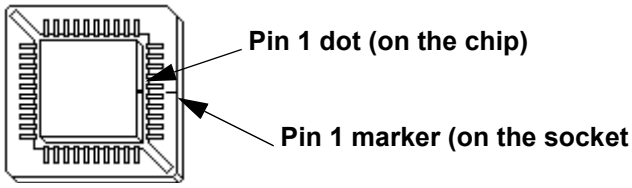
CONFIGURING THE UWIU IN THE STANDARD MODE

This section covers how to configure a NexSentry ACU for use with a **UWIU** that communicates as a Digital Key Reader (DKR). (This is defined as the Standard mode.) To configure the **UWIU** in the Standard mode, you need to replace the two chips on the **UWIU** board with the standard mode chip(s) that are shipped with the units.

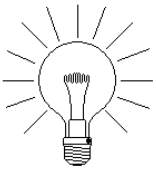
In the Standard mode, the units emulate NexWatch DKRs from either 26 or 34 bit, 4 to 6 wire, Wiegand Interface Protocol Readers.

TO REPLACE THE CHIPS ON THE UWIU BOARD:

1. Find the U3 and U11 sockets on the **UWIU** board.
2. Using an extractor tool or a small screwdriver, carefully wedge out the chips.
3. Place the **UWIU** Standard mode chips into the sockets with the (pin 1) dot on each chip adjacent to the (pin 1) mark on the socket. Both chips will fit into either socket.



U3 and U11 (UWIU): Pin 1 Socket/Chip Matching



NOTE: TheU3 chip on the **WIRO 4/8/4** board does ***not*** have to be replaced to change **WIRO 4/8/4** functionality from Universal mode to Standatd mode.

For the **WIRO 4/8/4**, see “WIRO 4/8/4 S1 DIP Rdr Type & Test Mode” on page 5-5, which indicates S1 DIPs 7 and 8 set OFF and ON, respectively, as the default setting for "Wiegand S-NET" reader type.

To configure the **WIRO 4/8/4** in the Standard mode, no chip(s) are replaced; instead, see “WIRO 4/8/4 S1 DIP Rdr Type & Test Mode” on page 5-5, which indicates S1 DIPs 7 and 8 both set ON as the setting for "DKR (and VIP)" reader type.

6 Installing the Power Supplies

A single power supply can provide enough power for a NexSentry Star II access control system. Additional power supplies might be required depending on the type and number of devices used in the system. See "S-NET Power Requirements" on page 2-26 for more information.

This chapter covers the following topics:

- "Installing the Alarm-Saf Power Supply" on page 6-1
- "Installing a PI-1 Power Supply" on page 6-4

Installing the Alarm-Saf Power Supply

The Alarm-Saf power supply's enclosure is fabricated from 18-gauge steel, is louvered for cooling, and has a key-lockable door. The enclosure is 11 inches (28 cm) high by 15 inches (38 cm) wide by 4 inches (10.2 cm) deep

.

Temperature	**32° to 120° F (0° to 49° C)**
Maximum Humidity	**85% at 120° F (49° C)**
Input Voltage	**120 VAC ± 10%, 60 Hz, single phase**
Input Current	**2.5 amps, maximum**
Output Power	**24 VDC, regulated at 4 amps, maximum**
Ripple (RMS)	**0.005 VDC at 0.5 amp load, 0.350 VAC at 4.0 amps**

Alarm-Saf Power Supply Specifications

Optional 12 VDC, 6.5-amp, sealed 16 AH, lead-acid batteries (part number 42100189001) are available and can be housed within the Alarm-Saf cabinet. The power supply is capable of operating with batteries up to 38 AH.



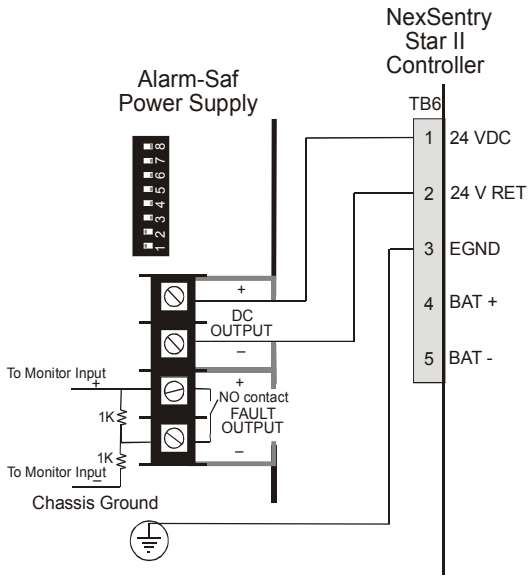
CAUTION: Batteries above 16 AH must be housed in a separate enclosure. (This is the only power supply qualifying for UL-294.)

The Alarm-Saf has two 10-amp, type AGC-10 fuses, one for AC input, the other for the battery charging circuit. The Alarm-Saf power supply PCA has three LEDs to indicate operational status.

LED	LED Description
Green	**Indicates that AC input power is present**
Red	**Indicates that 24-VDC output is present**
Yellow	**Indicates a fault condition, either: low battery, no AC input, blown battery fuse, or a blown AC fuse. A fault signal output will be generated.**

Alarm-Saf Power Supply LEDs

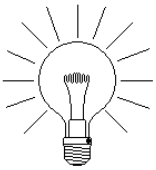
Installation of an Alarm-Saf power supply is shown below.



Alarm-Saf Power Supply Installation

TO INSTALL AN ALARM-SAF POWER SUPPLY:

1. **Connect DC + to TB6, pin 1 and DC– to TB6, pin 2.**
2. **Connect Alarm-Saf chassis ground to TB6, pin 3.**
3. **Install a 1 K-ohm resistor between Fault Output - and + before making (the default) connections to TB4, pins 4 (-) and 3 (+), respectively, of Monitor Input Point MI2.**



NOTE: The Alarm-Saf power supply will have either an 8-position DIP switch or an 8-line jumper block mounted in the position shown. Switches 3 through 8 should be set to the right; switches 1 and 2 should be set to the left. Lines 3 through 8 should be severed; lines 1 and 2 should remain intact.



WARNING: Failure to follow these instructions can result in an electrical fire.

INSTALLING A PI-1 POWER SUPPLY

The PI-1 power supply can be equipped with a battery backup. Separate connectors provide power for S-NET devices and door locks, see the following table for descriptions. (Although this is seldom done: when multiple PIs are used, connectors J1 and J2 can be used to daisy-chain power supplies along the S-NET.)



CAUTION: Batteries above 16 AH must be housed in a separate enclosure.Also, the PI-1 cannot be used to meet UL-294. This means that, if you choose to use a PI-1 (or other low cost) power supply, your whole system will no longer be UL-approved.

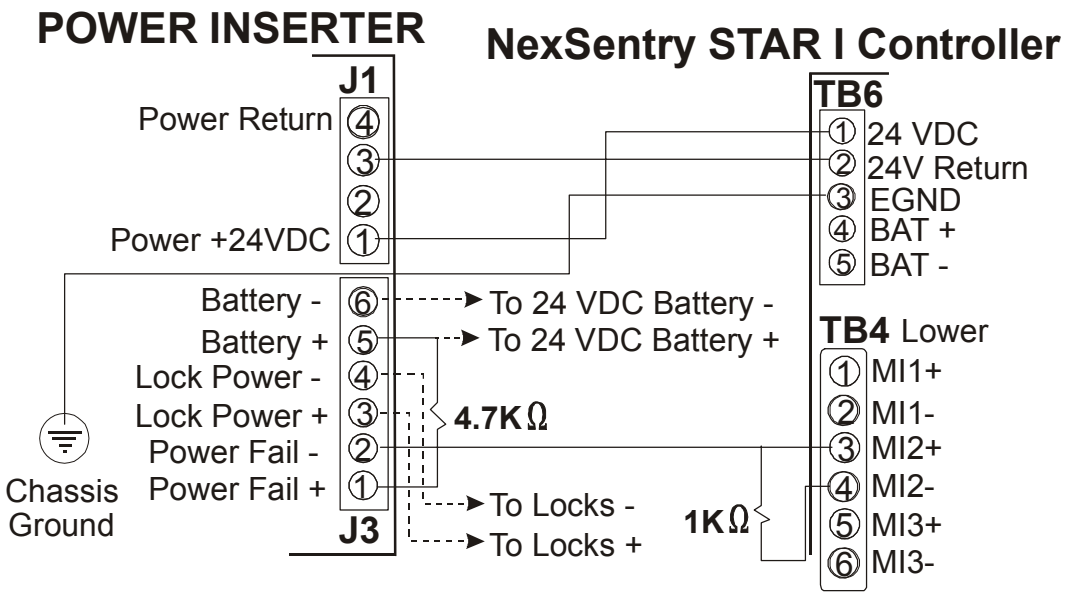
Connector	Description	Pin	Description
J1	S-NET	1	+24 VDC
		2	DATA A
		3	DATA B
		4	GND
J2	S-NET	1	+24 VDC
		2	DATA A
		3	DATA B
		4	GND
J3	Power	1	Power Fail +
		2	Power Fail -
		3	Lock Power +
		4	Lock Power -
		5	Battery +
		6	Battery -

PI-1 Pin-Outs

TO INSTALL A PI-1 POWER SUPPLY:

1. **Connect the shielded cable from J1, pins 1 and 4, of the PI to the ACU TB6, pins 1 and 2, respectively.**
2. **Connect the cable shield to chassis ground of the power inserter and to pin 3 of TB6. If this cable is longer than 3 feet, a separate wire should be used (12 AWG).**
3. **If a large number of S-NET devices are powered from the Star II controller, the connections for the +DC and -DC power are pins 1 and 3, respectively, with strap JP19 installed.**

   The illustration shows a PI providing S-NET power to an ACU



Single PI-1 Power Supply Connected to the ACU Wiring



WARNING: Failure to follow these instructions can result in an electrical fire.

NEXSTAR MULTIPLEXER

7

The AD 4305 NexStar is a symmetrical 5-port repeater with built-in arbitration logic. Any one port relays the data it receives to the other four ports. Bus arbitration is done on a first-come, first-served basis. During periods of no activity, the NexStar automatically places all 5 ports into the receive mode to wait for the next message. Make sure your AD 4305 NexStar is Rev. C or later. (You can confirm this: temporarily remove the case of the NexStar unit; observe the PLD at U6, part number 62109921001: it should have a label stating Rev. C, checksum B5A1.)

The AD 4305 NexStar can be used to link multiple Star controllers to a host. The optional RS-232 adapter module (part number 62110572001) can be placed into one of the channels to allow host connection (25 feet maximum cable length). The controllers can then be up to 4000 feet away from the NexStar.

Additional NexStar(s) can also provide a link between the ACU and multiple S-NET runs. A single S-NET run can be a maximum of 4,000 feet (1,200 meters). Using all of the NexStar 's five symmetrical ports, the end-to-end S-NET length can span up to 8,000 feet (2,400 meters) and contain up to 20,000 feet (6,000 meters) of installed wiring. See “AD 4305 NexStar RS-485 Multiplexer Component Locations” on page 7-5.

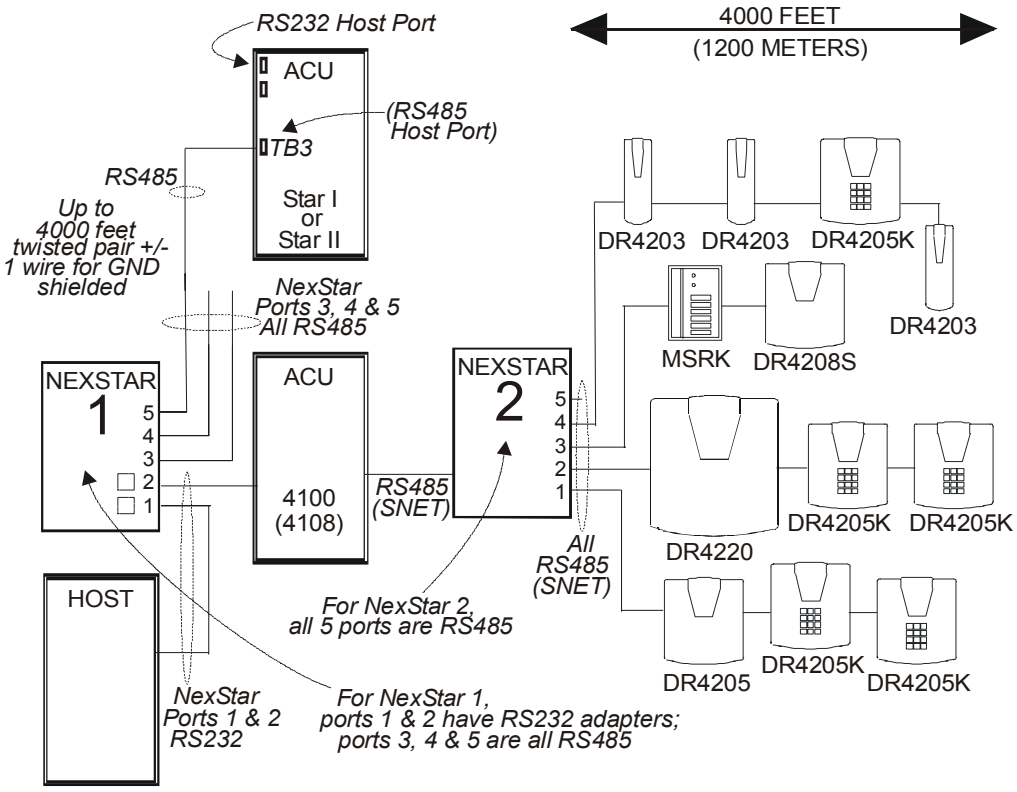
In the simplest configuration, the NexStar allows home-run wiring, which eliminates excessively long wire runs and the need to make multiple connections to a single terminal block.

Any or all of the RS-485/S-NET ports may be configured to communicate via RS-232 by installing an optional RS-232 adapter module. This application is typically employed between a Host PC and several local ACUs. In this configuration, one NexStar port is

connected to the Host, and up to 4 ports may be connected to ACUs. If an ACU port is configured for RS-485, up to 16 Star Controllers may be connected on one RS-485 loop. If an ACU Port is configured for RS-232, one ACU, or one CoBox master Thinserver (Ethernet adapter) may be connected. The NexStar acts as a replacement for the CI-8, or an RS-232 to RS-485 converter, depending on the specific application.

The NexStar consists of a single printed circuit board (PCB) in a two-part housing. Male Phoenix connectors on the PC board are accessed through the side of the housing for port connections.

The cover of the NexStar snaps onto the base. The LEDs mounted on the PC board are visible through the holes on the cover and they are also identified on the cover, together with the RS-485 pin-out wiring for each port. For any of the ports which you have configured with an optional RS-232 Adapter Module, a decal identifying RS-232 pin-out wiring information is provided to overlay the RS-485 wiring information. See “AD 4305 NexStar RS-485/232 (Printed/Decal) Connector Pin-Outs” on page 7-10.



Using AD 4305 NexStars in a Complete System

INSTALLING THE NEXSTAR MULTIPLEXER

The following procedure tells how to install the NexStar Multiplexer. For details, read this chapter, as well as the sections “Wiring Requirements” on page 2-10 and “S-NET Wiring” on page 2-11.

AD 4305 NexStar Specifications

Specifications for the AD 4305 NexStar are shown below.

Input Voltage	**+12.5 VDC to +24 VDC**	
Operating Current	**50 milli-ampères**	
Pass-Through Current	**up to 3.15 ampères (rating of fuses)**	
Operating Humidity	**0% to 90%, non-condensing**	
Operating Temperature	**19°F to 120° F**	**-7°C to 49° C**
Size	**8.0 in x 4.5 in x 1.5 in**	**20.32 cm x 11.43 cm x 3.81 cm**
Weight	**13 ounces**	**400 grams**

AD 4305 NexStar RS-485 Multiplexer Specifications

AD 4305 NexStar PC Board Components

All components and circuitry for RS-485 use are contained on the single PC board. See “AD 4305 NexStar RS-485 Multiplexer Component Locations” on page 7-5 for the board locations of connectors, fuses, LEDs, and switches, with the piggy-back RS-232 module and the RS-485 Comm IC, which it replaces for RS-232 operation, and the RS-485/232 personality switch, all shown as insets. The components/pin usages are listed and described in the “AD 4305 NexStar RS-485 Multiplexer Component Locations” on page 7-5.

		PCA Location				
Label	**Function**	**LED**	**Conn-ector**	**Fuse**	**Comm Switch**	**Comm IC**
TX-1	Port 1 Transmit	CR14	J1	F1	S1	U1
TX-2	Port 2 Transmit	CR15	J2	F2	S2	U2
TX-3	Port 3 Transmit	CR16	J3	F3	S3	U3
TX-4	Port 4 Transmit	CR17	J4	F4	S4	U4
TX-5	Port 5 Transmit	CR18	J5	F5	S5	U5
COM ACTIVE	Activity	CR19				

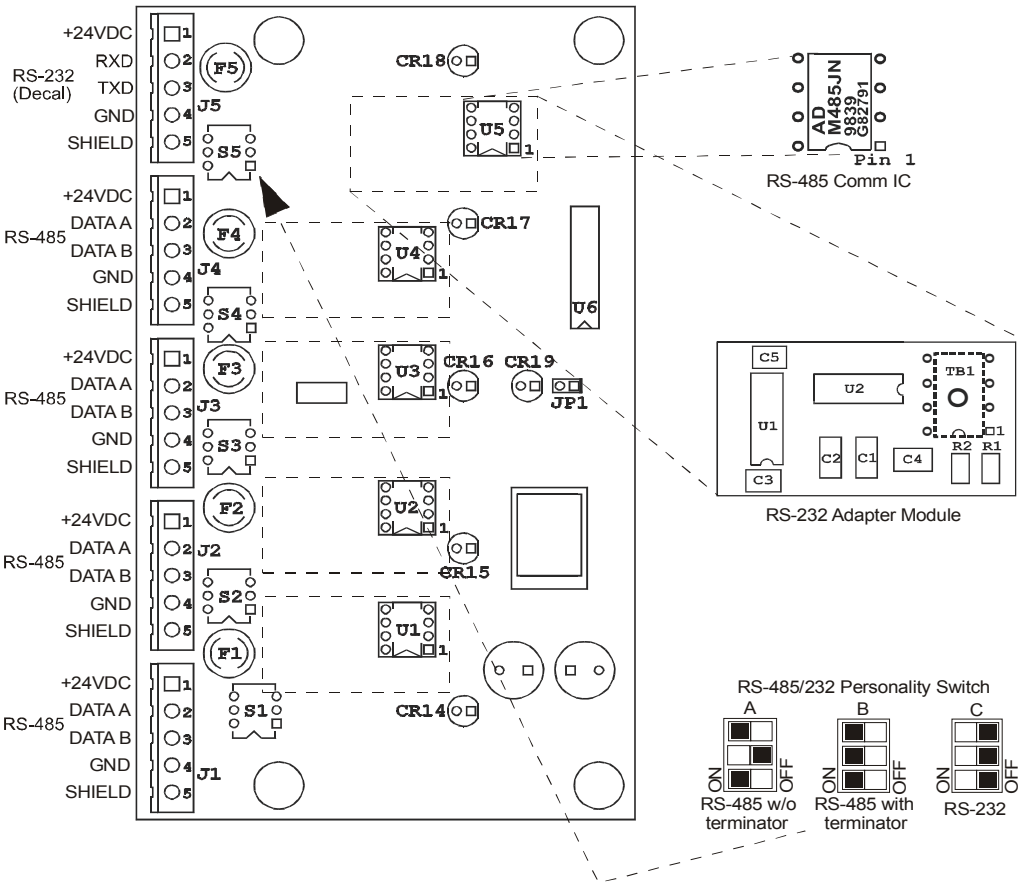
AD 4305 NexStar RS-485 Multiplexer Component Locations

RS485 Pin Use for Pins 1 to 5 for connectors J1 to J5	Pin 5	Shield
	Pin 4	GND
	Pin 3	DATA B
	Pin 2	DATA A
	Pin 1	+ 24 VDC

RS232 Pin Use for Pins 1 to 5 for connectors J1 to J5	Pin 5	Shield *
	Pin 4	GND
	Pin 3	RX D
	Pin 2	TX D
	Pin 1	+ 24 VDC *

*** Not necessary for data-only connection**

AD 4305 NexStar Pin Usages/Designations for RS-485 and RS-232

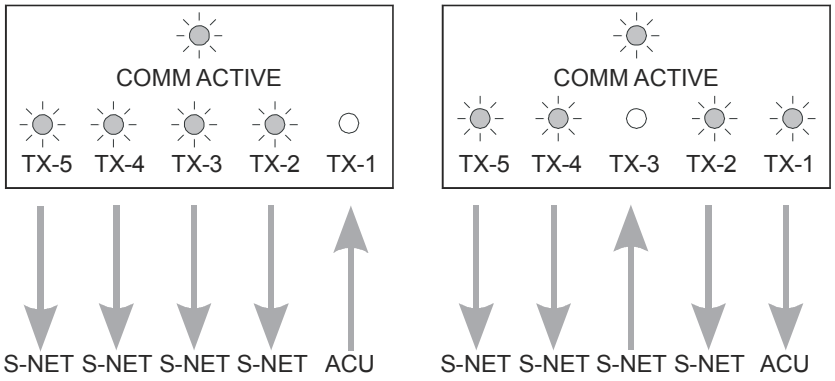


AD 4305 NexStar LEDs, Fuses, Switches, and Connectors

AD 4305 NexStar LEDs

The Com Active LED is lit when data is passed through the NexStar. The five port LEDs illuminate when the associated port transmits data. On the left side of the figure below, the NexStar is receiving data from an ACU on port 1. This data is then transmitted to all of the remaining ports. All LEDs, except TX-1, are lit. On the right side of the figure, the NexStar is receiving data from an S-NET device on

port 3. Again, data is transmitted to all other ports and all LEDs except TX-3 are lit.



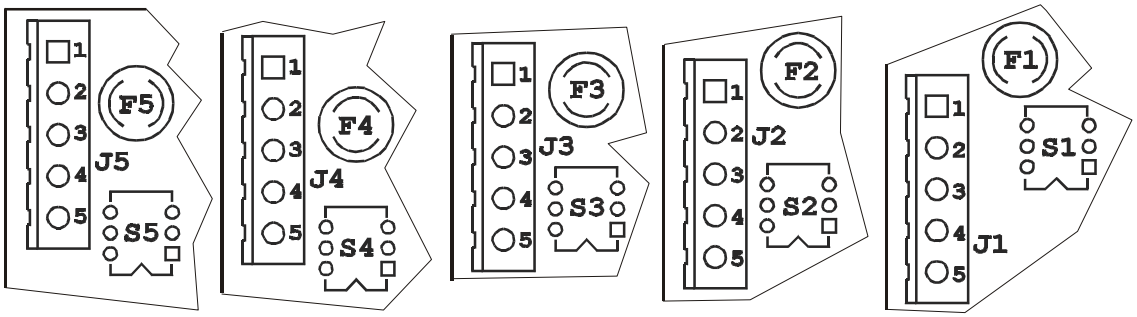
AD 4305 NexStar Com Active and Transmit LEDs



NOTE: High speed network communications can cause all of the LEDs to appear lit.

AD 4305 NexStar Fuses

Each of the five ports on the NexStar is individually fused. Fuses for the ports are located at positions F1 through F5 on the PCA. These fuses are 3-amp, normal-blow. Approved suppliers for replacement fuses and the vendor's part numbers are listed below.



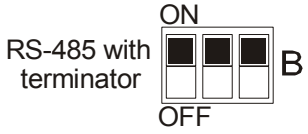
AD 4305 NexStar Switches and Fuses

			Approved Manufacturers' Part Numbers		
Fuse	**Description**	**Type**	**Wickman TR5 Series**	**Schurter MST Series**	**Bel MRT Series**
F1 - F5	S-NET Connector J1-J5	3.15-Amp LF	19372K-124	#34.6620	0692-3150-01

Fuse Vendors for the NexStar

AD 4305 NexStar Termination-Resistor Switches

RS-485 termination is made within the five RS-485/232 personality switches as shown in the figure below.

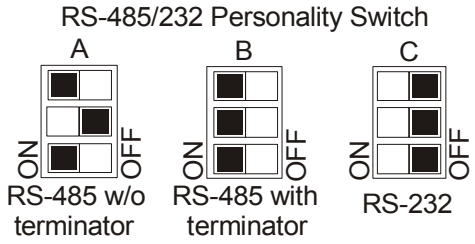


AD 4305 NexStar Termination-Resistor Switch(es)

The need for termination increases with bus length. With short S-NET runs—shorter than 500 feet—termination is not needed. Around 500 feet, it becomes desirable for at least one end to be terminated. For runs over 1,000 feet, terminate the runs at each end.

AD 4305 NexStar Connectors and RS-485/232 Personality Switches

Five connectors, J1 through J5, are used to connect equipment through the NexStar. Five RS-485/232 personality switches, S1 through S5, are associated with these connectors, switch S1 with connector J1, and so forth. One connector may be used to provide a short-range attachment to the ACU and the switch associated with this connector should not be set for termination. Set any of the remaining switches, S1 through S5, appropriately for longer S-NET buses which might require termination, as described below.

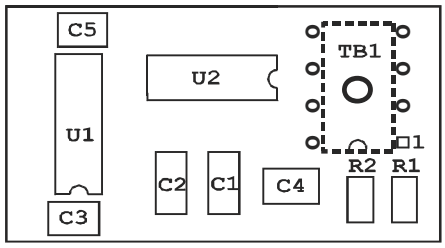


Three Settings of the AD 4305 NexStar RS-485/232 Personality Switch(es)

There are three valid settings for the switches: setting A for RS-485 without termination, the two outside toggles on and the middle toggle off; setting B for RS-485 with termination, all toggles on; setting C for RS-232, all toggles off.

AD 4305 NexStar RS-232 Adapter Module

For S-NET, RS-485 operation, the RS-485 Comm IC, is left in place on the PC motherboard. For RS-232 operation, this IC is replaced by the RS-232 Adapter module (P/N 62110572001) in any—or all—of the locations U1 through U5, making sure the pin 1 notches match. In addition, for any RS-232 Adapter module installed, the RS-485/232 personality switch associated with the installed adapter must be with all toggles off.



AD 4305 NexStar RS-232 Adapter (Piggy-back) Module

AD 4305 NexStar RS-232 Adapter Decal

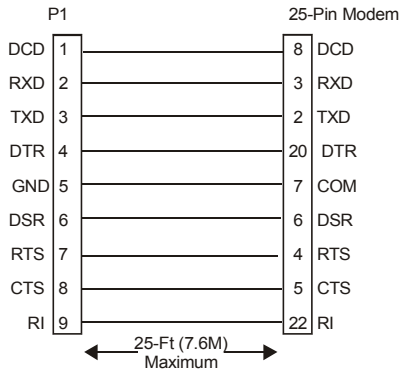
After replacing one or more of the RS-485 Comm ICs with RS-232 Adapter module(s) and setting the RS-485/232 personality switch(es) for RS-232, close and secure the case of the AD 4305 NexStar. For all of the RS-232 Adapter modules installed, apply the RS-232 Adapter decal(s) to the front of the case, overlaying the RS-485 legend(s) appropriately. If, say, U4 has the RS-232 Adapter module installed and the personality switch S4 has been set with all toggles off, then the RS-232 Adapter decal should be applied to change the connector J4 legend from the RS-485 pin-outs to the RS-232 pin-outs, as shown below.

RS-485 Pin-Outs Printed On Case:	RS-232 Pin-Outs Printed On Decal:
SHIELD	SHIELD
GND	GND
DATA B	TXD
DATA A	RXD
+24VDC	+24VDC

AD 4305 NexStar RS-485/232 (Printed/Decal) Connector Pin-Outs

8 INSTALLING THE MODEM

Make the cable connections through the 9-pin male host port connector, P1, (pins 1-9), of the NexSentry Star II ACU to a 25-pin modem, (with the pins as shown below).



25-Pin Modem Cable Connections to the ACU Host Port

From the 9-pin host port to a 9-pin modem, connections are one-to-one—pins 1 through 9 connect to pins 1 through 9—respectively.

The following is the recommended procedure for installing and initializing the modem.



NOTE: If you turn the modem on before it is enabled, you will not be able to login from the Host or Client PC for approximately one minute. If the modem is enabled but not turned on, the ACU sends an error message to the `System Monitor` window and continues to attempt to complete the configuration.

8 INSTALLING THE MODEM

TO INSTALL AND INITIALIZE THE MODEM:

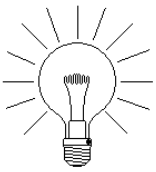
1. **Make the cable connection from the modem to the host port. Do not power on the modem.**
2. **Enable the modem.**
3. **Power the modem on.**

REMOTE STATION READERS

9

Cardholders use the Remote Stations to change status of up to 16 Zones without access to a host or terminal. The Remote Station will have a Zone Arming Switch installed adjacent to a Reader and/or Keypad. When exiting, a Zone Arming switch is held down while the privileged card and/or PIN is presented to the Reader and/or Keypad. When Access is Granted, the Zone status changes, after a delay (selectable, with a default of 30 seconds), to ARMED. Before performing the ARMING function, the Cardholder must make sure that nobody is remaining in the Zone.

The same ARMING feature can be achieved by using either a DR4205K Digital Reader with Keypad, an MSRK5 Magnetic Stripe Reader with Keypad, or a DR4200K Keypad-only device. (Selected third party devices will be qualified for this application in the future.) See the following details for explanations of using a Station Reader and/or Keypad.



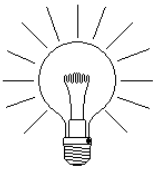
NOTE: The ARMED Mode switches can be assigned to any Input Point on the Star II Controller or any associated MIRO Devices.

TO DISARM THE ZONE FROM THE ARMED MODE:

- **A privileged Cardholder's card (or PIN) is presented to a Remote Station Reader and/or Keypad. <u>The Zone Mode Switch is not pressed</u> when selecting the DISARMED Mode. The Zone is placed in the DISARMED State immediately upon Access Granted.**

TO ARM A ZONE USING A MODE PUSHBUTTON AND A READER:

1. **Press and hold down the ARMED Mode Button. Present the privileged card while holding down the button.**
2. **When Access is Granted, the delayed transition to the ARMED Mode will begin.**



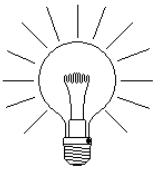
NOTE: Only one Zone may be ARMED for any given ARMING sequence.

TO ARM THE ZONE WITH BOTH A REMOTE STATION KEYPAD AND READER:

1. **A privileged Cardholder enters the PIN number minus one into the Keypad to start the ARMED Mode sequence. For example, if the PIN is 1234, then enter 1233; if the PIN is 1230, then enter 1229.**
2. **After a pause of approximately 1 second, the Cardholder enters the actual PIN, and then presents the card to the Reader. The Zone will begin the delayed transition to the ARMED Mode.**

TO ARM THE ZONE WITH ONLY A REMOTE STATION KEYPAD:

1. **A privileged Cardholder enters the PIN number minus one into the Keypad to start the Armed Mode sequence. For example, if the PIN is 1234, then enter 1233; if the PIN is 1230, then enter 1229.**
2. **After a 1 second pause, the Cardholder enters the actual PIN. The Zone will begin the delayed transition to ARMED Mode.**



NOTE: With or without a station switch present, but with the Keypad activated, a Remote Station Keypad can also be used to ARM the Zone from the DISARMED state. For this feature to work, the **PIN Retry (0-5) must be set to 1** (one) or greater. IT WILL NOT WORK IF SET TO **0** (ZERO).



CAUTION: The Cardholder must check that all other people are planning to exit immediately (or have already left the building) before using the Remote Station to change the Zone Mode to ARMED. Since an alarm will be activated if anyone remains in the Zone, everyone must exit during the delay (selectable, but defaulted to 30 seconds).



NOTE: This alarm feature is not evaluated for UL installations..

OPERATIONAL NOTES:

- When changing from DISARMED to ARMEDthere will be a delay (selectable, with a default of 30 seconds). The Zone stays in the DISARMED Mode for the delay period after the Access Granted transaction occurs. The LED on the Digital Reader/ Keypad will blink yellow during the delay. When the delay interval has expired, the Zone will change to ARMED and the LED will alternatively blink red and yellow.
- All readers in a given Zone will blink their LEDs to indicate the ARMED state of the Zone. There will be no visible difference in the appearance of the Station Reader(s) from the other Reader types.
- When building your Door configurations, the dialog box calls for two Zones, Entering Zone and Leaving Zone. **The Entering Zone is the one that a Station Reader controls.**
- ARMING or DISARMING one Zone cannot affect the state of any other Zone. In other words, a Station Reader can control ONE Zone only. ***may change with new features being added***

  The StarGaze and Pro-Watch hosts have host Event/Task processing that can accomplish multiple Zone control from a Single Reader.
- The Star II Controller allows creation of up to 16 Zones. It is extremely unlikely that any application will ever approach that many real Zones. The Zone feature should be given much thought in advance of implementation. In some cases, it is more logical to use two or more individual Star controllers to manage separate areas rather than to use one controller divided into multiple Zones.

NSM LITE CONFIGURATION PROGRAM



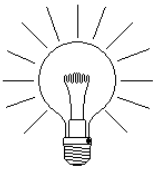
This chapter tells you how to prepare to set up the database and the preferred sequence order for database setup. (Chapter 11, "NSM Lite/Star II Daily Operation" tells you how to use the NSM Lite program to operate the Star II and monitor its activity.)

This chapter covers the following topics:

- "Preparing to Set Up the Database" on page 10-2
- "Installing NSM Lite" on page 10-5
- "Starting and Using NSM Lite" on page 10-7
- "Creating the Database" on page 10-20
- "Time Codes" on page 10-21
- "Time Groups" on page 10-22
- "NSM Lite Users (Operators)" on page 10-23
- "ACU Users" on page 10-24
- "Star II Actions (Reports)" on page 10-25
- "NSM Lite Star II Action (Report) Groups" on page 10-30
- "NSM Lite and Star II Hardware Configuration" on page 10-32
- "Star II Elevator Control" on page 10-68
- "Star II Zones" on page 10-77
- "Star II Access Codes" on page 10-79
- "Star II Cardholders" on page 10-83

PREPARING TO SET UP THE DATABASE

First, hold a meeting with the Owner to review all system Access Control parameters required for setting up the database. This is discussed in chapter 2. When you meet with the owner, take a copy of the installation plan with you.



NOTE: See **Appendix A** for the database setup sheets, which you must complete before you configure the system. Refer to the appropriate setup sheet for the necessary database content.

The NSM Lite database can be configured in a Windows NT 4.0 PC before installing the NexSentry Star II ACU at the site, but the ACU must be connected to the PC for the database to be downloaded.

Default NSM Lite and Star II Database Settings

All NexSentry Star II ACU systems have been pre-programmed at the factory with default settings. Defaults are listed in each NSM Lite table. Typical defaults are commonly required data items like **Time Codes 0** (never active) and **1** (00:00 - 23:59 SMTWTFSH).

In addition, a default NSM Lite Login Password and a default Star II Login Password 1 were configured at the factory. Read the following sections for details.

DEFAULT NSM LITE PASSWORD NEW123

The first time you access NSM Lite, use the default password **`new123`**, which is preassigned for the **administrator** login. The System Administrator may change this password for **administrator**, however the new password should be carefully documented.

DEFAULT STAR II LOGIN

Limited monitoring and administration functions can be performed in the Star II in ASCII Terminal mode. Like all previous WSE ACUs, there is a default login, login name = **operator1**, password = **new** for User #1. Unlike previous ACUs, no system programming is normally done with ASCII User logins. All database creation is done in NSM Lite and downloaded to the Star II Controller



NOTE: To erase the entire database, remove the battery jumper for 1 hour. You can also download an empty database to the ACU from NSM Lite.

DEFAULT ACCESS CODE 1

The default Access Code 1 provides access to the default Door #1 24 Hours X 7 Days, including Holidays. It is recommended to add all other Doors to Access Code 1 with unlimited access since you may need to assign it to a select few Cardholders.

DEFAULT ACTION (REPORT) 1

The default Action 1 sends a Transaction Log to the Star II Terminal and Host ports each time a Transaction Event assigned with Action 1 occurs. The default Action 1 does not trigger any other system reaction, such as closing any Relay contacts, preventing Zone ARMing, or printing an asterisk before the log message on the Terminal port.

Some Transaction Events, such as `ACCESS GRANTED`, `EXIT GRANTED`, or `OPERATOR OVERRIDE`, do not usually require any exceptional system reaction and are logged for record keeping

purposes. In extremely simple systems, you can assign the default Action 1 to all Transaction Events.

TO DEFINE ACTIONS AND ASSIGN ACTION NUMBERS:

1. **Make a list of the Transaction Events to which you want the Star II Controller to react.**
2. **For each Transaction Event on the list, make a note of the Actions that are to be taken each time the Transaction Event occurs. Also note the Zones and/or time intervals in which these actions are to be operative.**
3. **Combine the Transaction Events that require the same reactions during the same Zones and/or time intervals into separate groups. Assign an Action number for each group and enter these assignments in the Action setup sheets found in Appendix A.**
4. **Create Action Groups based on Doors that have common configuration and security priorities.**
5. **During database setup, when you configure the ACU, ACTION GROUPS, DOOR, MAGSTRIPE, and POINT commands, refer to the setup sheets and enter the assigned report number into the appropriate data fields.**

   In some cases, an Action will be assigned to more than one Transaction. For example, any hardware failure events such as, POWER FAIL, READER FAIL, VIP2 FAIL, will most likely require the same report actions during the same time intervals. Thus, one Action can be assigned for all four of these Transaction Events. Similarly, most Doors will require a report for ACCESS GRANTED, ACCESS DENIED, or KEY TRACE during the same time intervals. One

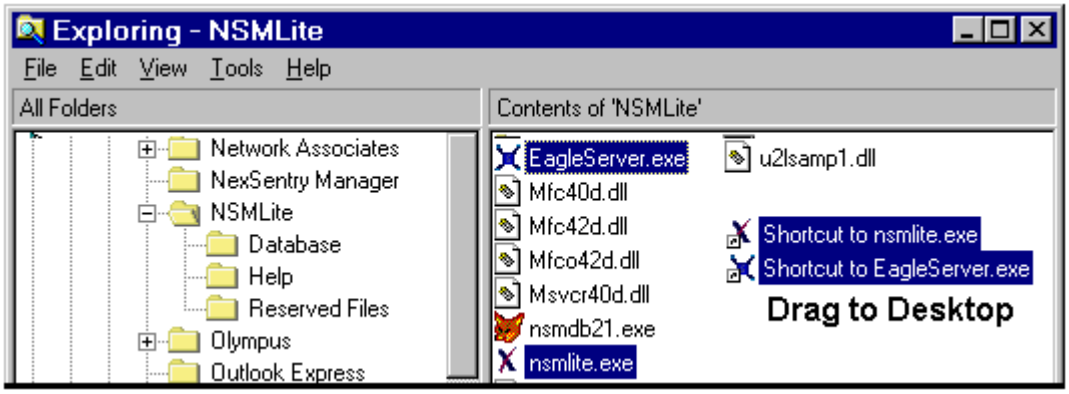
Action Group can be created for all controlled doors that need to generate these same Transaction Events.

INSTALLING NSM LITE

The NSM Lite kit has a single CD-ROM, a Software License Agreement and this manual. Follow these steps exactly – you will find the program is very easy to load. The CD-KEY label in the crystal box will be needed to install the program: keep it handy.

- Place the CD-ROM in your drive.
- Double-click on My Computer (or your own name for this).
- Double click on the icon for your CD-ROM Drive. The program will begin to load, an NSM Lite logo will appear briefly, the Install Shield will load and a **Welcome** window will appear.
- Click the **Next** button in the **Welcome** window.
- The **Software License Agreement** will appear. Click **Yes**.
- The **User Info** dialog will appear. Enter the desired **Name** and **Company**, then click **Next**.
- Choose a **destination** for the **program files**. (To provide for future program upgrades, the **default** location is the best choice.)
- The **CD Key** dialog will appear. Enter the CD Key string from the label on the crystal box. ***The CD-Key is case sensitive!*** If you make a mistake, the program will prompt you to enter it again.
- A **TCP/IP Installed** dialog appears. Click **No**. Even if you do have TCP/IP on your computer, *it is not relevant to NSM Lite*.

- The **Select Program Folder** dialog appears. (As with the **destination** selection, the default is preferred.) Click **Next**.
- The program will now load. A status bar will track the progress and some informative graphics will pulse and flash. When it is done, a **Finish** box will appear.
- It is necessary to re-boot to use NSM Lite, however, you do not have to reboot immediately.
- When you have re-booted, use **Explorer** to locate and open the NSM Lite folder. Make shortcuts of the **Server and Client Icons** and **drag the shortcuts to your desktop** as shown below.



Exploring NSM Lite



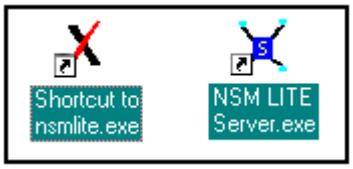
NOTE: Most Windows and Dialog Boxes are shown with dead space removed, but all the information is preserved.

STARTING AND USING NSM LITE

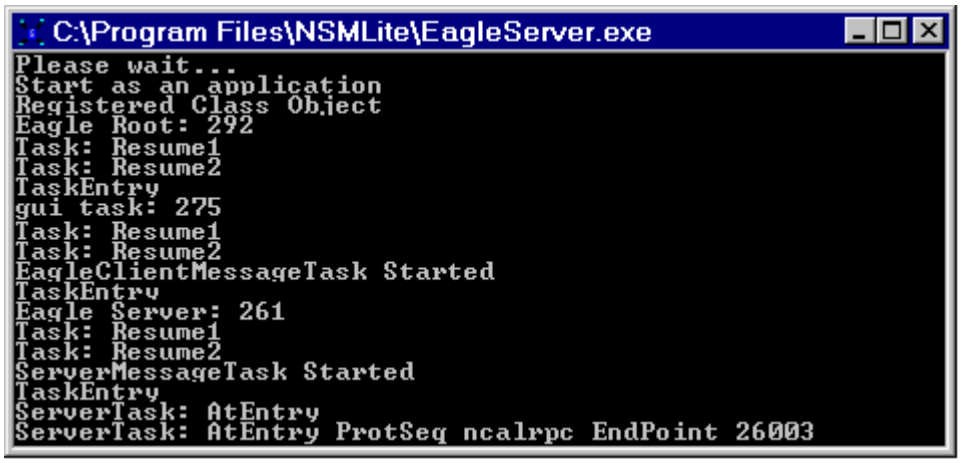
When successfully installed, the NSM Lite program can be started by double-clicking the NSM Lite shortcut Icon on the Desktop.



NOTE: You may end up with two Icons on the desktop, one for the Client and one for the server. You only need to **double-click on the Client Icon** to start the program. The server will start automatically.



NSM Lite Desktop Icons: Client and Server

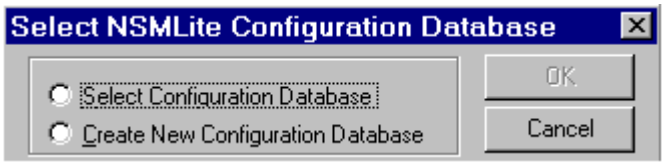


NSM Lite Server start-up window

The Server will start first and a DOS window will automatically appear on the screen looking like the one above.

There is nothing you need to do with the Server window to make it work. You will probably want to minimize it to get it off your desktop, but it will continue to run. You can always bring it back up from the Taskbar to watch activity go back and forth between the PC and the Star II Controller.

After the Server is running, the initial Login dialog box will appear as shown below.

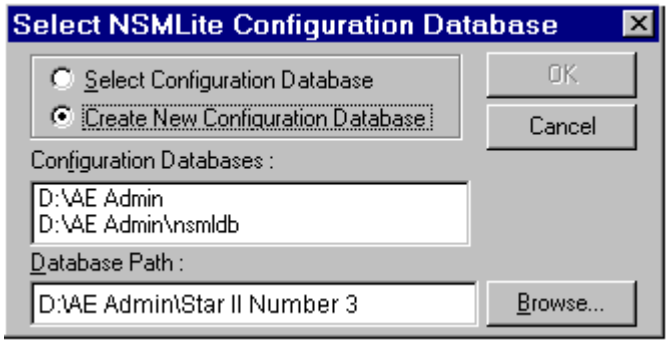


NSM Lite First Login Window

Click on either **Select...** or **Create New...** and then click **OK**.

Create New Configuration Database

If you select **Create New Configuration Database**, the program will advance to the second window shown below. Before reaching this step, you should know what file location you wish to use for your Star II Database file(s) If you will be configuring databases for multiple Star II Controllers, it is recommended to keep them in the same folder for easy management.



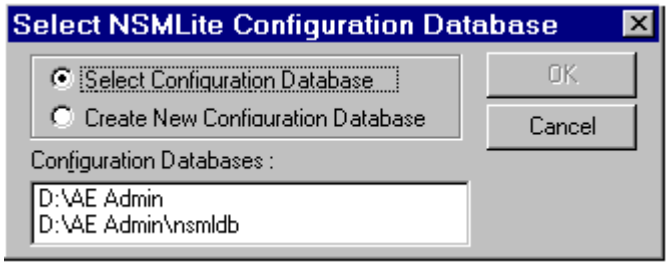
NSM Lite Second Login Window: Create New Database

Here, you must type in a **Database Path** to the location where the new Star II Database will be kept.

Notice in the example on the previous pages that there are already two Configuration Databases on file. These represent Databases that have already been created for other Star II ACUs. When you click on the OK button, the Login process will continue.

Select (Existing) Configuration Database

An already created Star II Controller NSM Lite database can be selected for Monitoring and/or modification. In the First Login dialog box, choose **Select Configuration Database**.

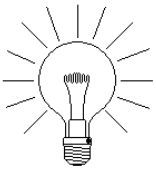


NSM Lite Second Login Window; Select Existing Database

You must click on one of the two **Configuration Databases** on file. These represent Databases that have already been created for the existing Star II ACUs. When you click on the **OK** button, the Login process will continue.

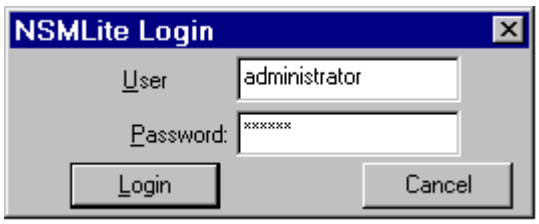
Log In to NSM Lite

The default **User** is **administrator**. The default **Password** is **new123**. Additional logins can be created with unique User names and Passwords.



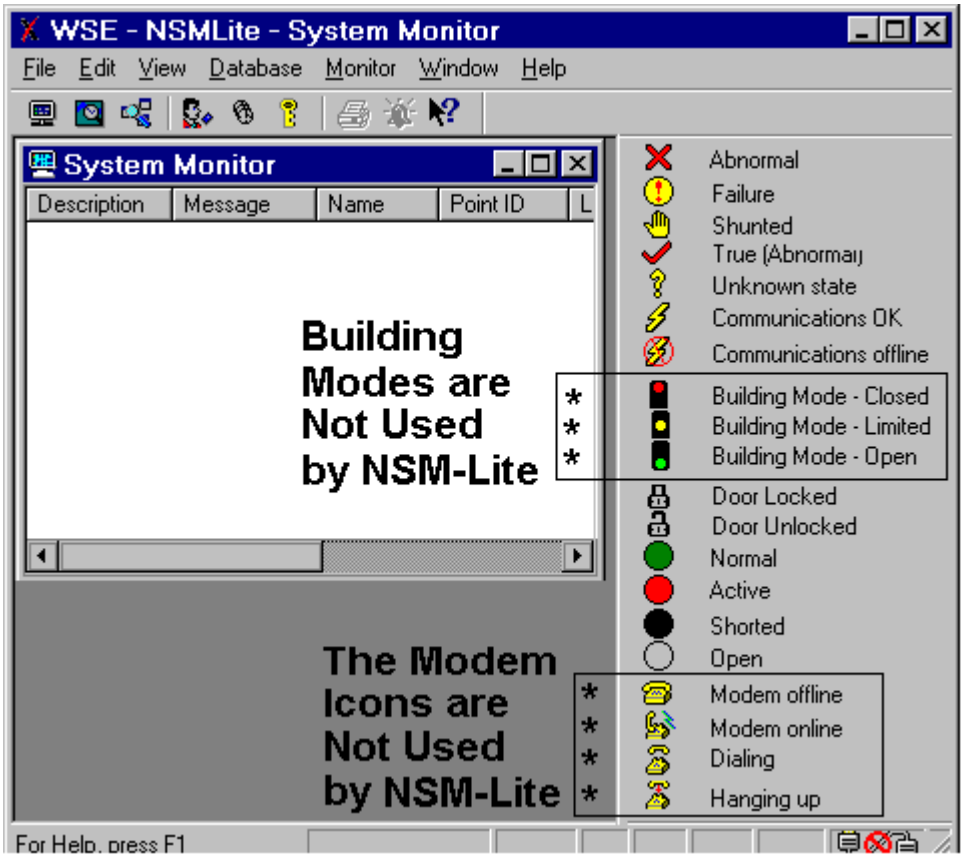
NOTE: The default User and Password use lower case letters.

The Password for administrator can also be changed. If you do change the administrator password, be sure to keep a written record of it in a place where other people can find it in case of emergency.



NSM Lite Login Window

If you log in incorrectly, you will see an error message telling you to try again. When your login is successful, the NSM Lite Client window shown below will appear.



NSM Lite Client Application Parent Window

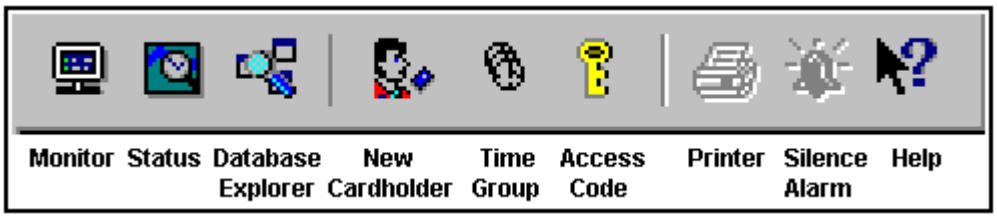
Notice the table of Status Icons on the right side of the window. These Icons appear in the Status Windows for the ACU, Doors, Input Points, etc. There is a thorough discussion of the **Status windows** and **Override commands** in chapter 11.

The Building Modes and Modem related Icons are not applicable to NSM Lite. The Icons shown are the same as the ones in the full **NexSentry Manager** program.

When NSM Lite is first started, the System Monitor window will automatically open. It will be empty as shown above since there are no Transactions to log.

NSM Lite Toolbar and Function Icons

Below is an enlarged view of the nine Functional Icons found in the NSM Lite Toolbar, and their descriptions.



NSM Lite Client Toolbar and Functional Icons

NSM Lite Client Toolbar and Functional Icons

NSM Lite Monitor	Click this Icon to open the NSM Lite Monitor window.
NSM Lite Status	Click this Icon to open the NSM Lite Status selection dialog box shown below.
NSM Lite Database Explorer	Click this Icon to open the NSM Lite Database Explorer window, also shown below.
New Cardholder	Click this Icon to open the Cardholder window. See NOTE below.



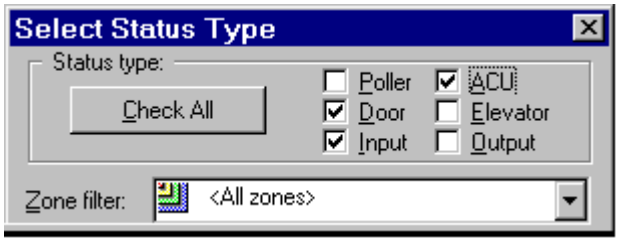
NOTE: You can create a new Cardholder, Time Group or Access Code, but you cannot view or edit an existing Cardholder, Time Group or Access Code.

NSM Lite Client Toolbar and Functional Icons (continued)

Time Group	Click this Icon to open the Time Group window. See NOTE above.
Access Code	Click this Icon to open the Access Code window. See NOTE above
Printer	Click this Icon to send a Database report to the NSM Lite printer.
Silence Alarm	Click this Icon to Silence any Transaction Sound that may be occurring.
Help	Click this Icon to enable Hot-Spot Help. When you click this Icon, your mouse pointer will change to the symbol '**?**' shown. You may then click on any field in a window or dialog box to open the related Help text. **NOTE:** the Help function is only partially completed in the first release of NSM Lite.

NSM Lite Status Window

If you click the Status Icon in the NSM Lite Toolbar, the following dialog box will open. You can click one or more Status categories as well as select a Zone to filter the items shown in the subsequent Status windows. Examples of all Status windows and their corresponding Override commands are at the end of Chapter 11.



NSM Lite Client Status Type Selection Dialog Box

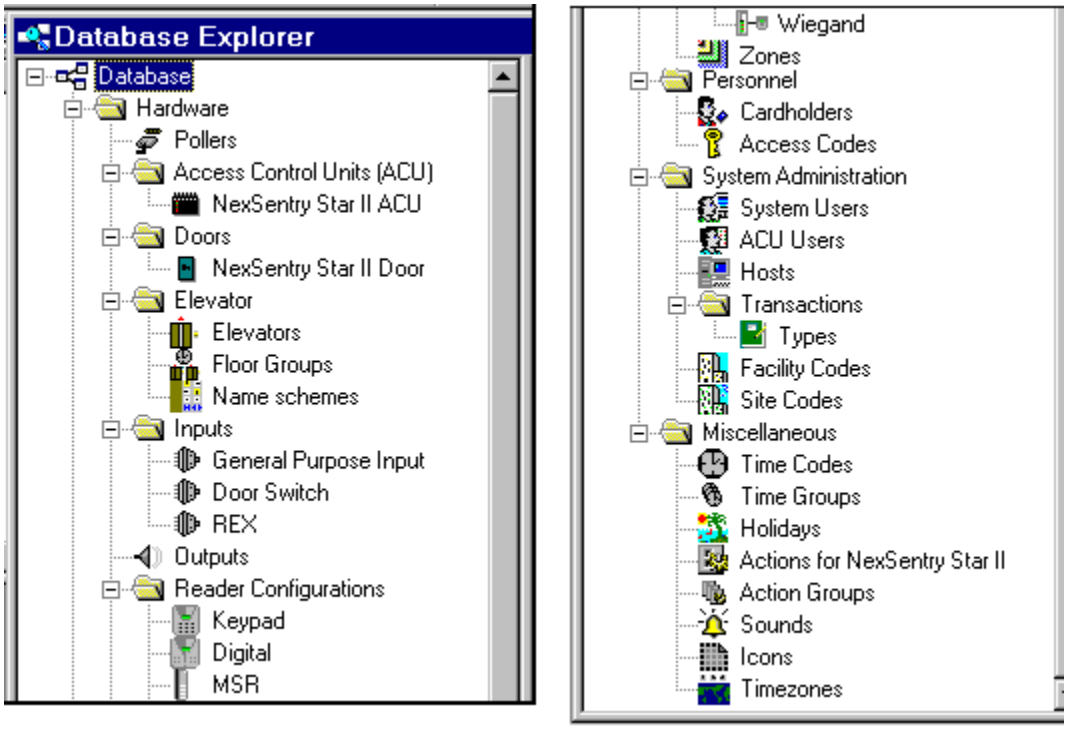
NSM Lite will open a separate window for each of the items selected in the Status dialog. Once they are opened, you can size and position the windows in any manner that suits you. Status windows are real-time and display the current condition of everything you have selected. In the above example, three windows would be opened for ACU, Door and Input Status. There would be no Zone filtering.

The **Zone filter** lets you select a specific Zone from the drop-list. Any components shown in the selected Status windows will be limited to items in the Zone. For example, assume your Star II has 14 Doors configured, but you only want to see Perimeter Doors in the Status window. A Zone would have already been created for Perimeter Doors and assigned to just **four exterior doors** on the building. The Status window, filtered by the Perimeter Zone, would only contain those four Doors.

NSM Database Explorer Window

If you click the Database Explorer Icon found in the NSM Lite Tool-bar, the following dialog box will open. (We have split the single column in two for space-saving purposes.) You can click any one of the Database items in the list to configure that type of item.

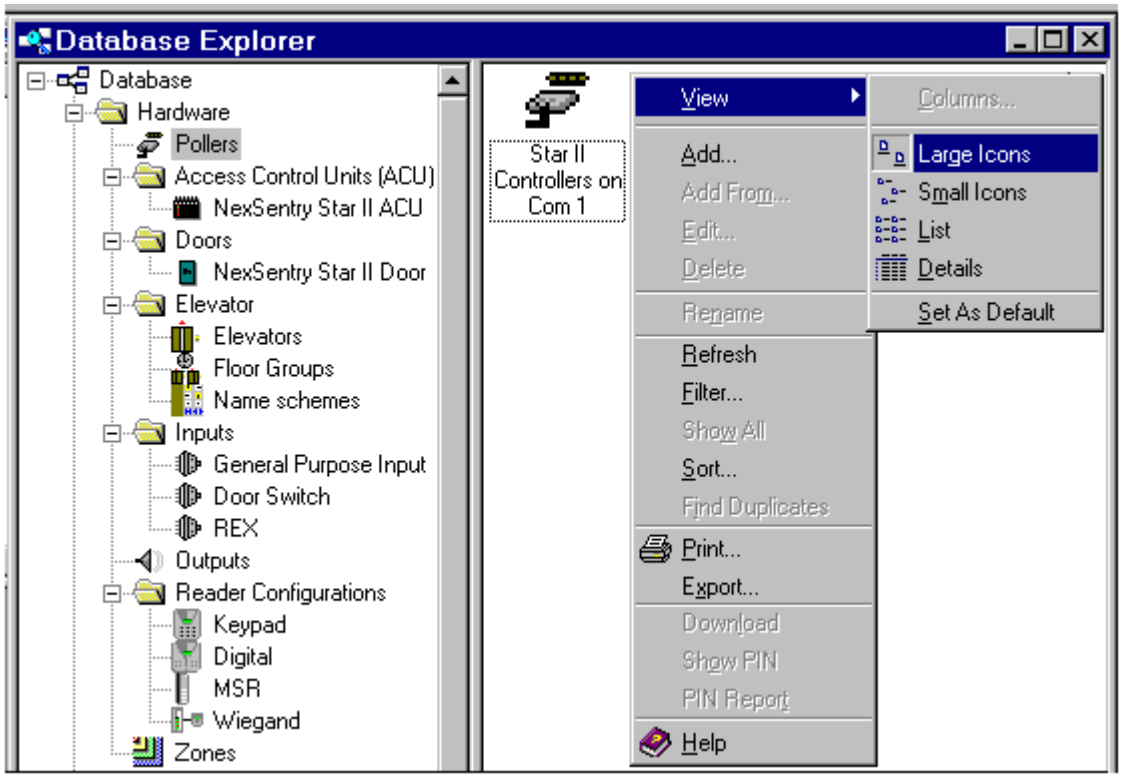
NOTE: Nothing happens if you click on a group heading like "Hardware" or "Access Control Units (ACU)".



NSM Lite Client Database Explorer Window

When you click on a real Database item, any components already configured will be shown in the Right-hand portion of the Explorer window. The example above only shows the Left-hand Database list. The very next figure shows both sides of the window.

Several items shown in the figure above do not pertain to NSM Lite and may be missing from the menu you actually see. They are: *Hosts, Facility Codes* and *Timezones*, which have relevance in the full NexSentry Manager program on which NSM Lite is based.



NSM Lite Client Database Explorer Window: Right-Click Results

Once you have clicked on a Database item to configure (or modify), you must **Right-Click** in the Right-hand portion of the window.

In the example above, **Pollers** has been selected and the ***Right mouse button has been clicked once*** in the Right-hand part of the window. The View item on the Menu has also been clicked to show the possible Database record display options. The Large Icon

selection is currently in use on the Poller window, but another choice will be shown in the next section of this chapter.

The choices in the Right-click column are explained below.

NSM Lite Client DB Explorer Window: Right-Click Results

View	Allows you to select how database records will be displayed in the window. **Details** is often the preferred choice.
Add	Click this to allow creation of a new item.
Add From	Click this to allow creation of a new item based on the existing item on which you right-clicked. If you want to create a new Door that is similar to a door that has already been configured, you will Right-click on the existing Door. Then, select **Add From** from the menu and a new dialog box, a copy of the existing Door, will be opened. You then begin building the new Door from that template.
Edit	Click this to allow modification of an item.
Delete	Click this to allow removal of an item. The program will ask you to confirm your decision.
Rename	Click this to change the description of an item.
Refresh	Not applicable to NSM Lite.
Filter	Use this to filter a list of database records based on various record criteria. Example: Limit a list of Cardholders to only those with a last name that begins with R. It is most useful for the Cardholder Database table.

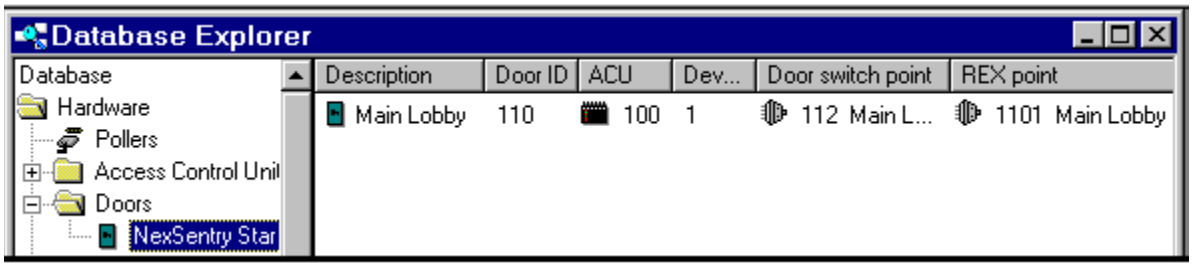
NSM Lite Client DB Explorer Window: Right-Click Results (continued)

Show All	Wipes out any filters and restores the complete database table.
Sort	Enables arrangement of displayed data in a user-defined order. It is most useful for the Cardholder Database table.
Find Duplicates	Not applicable to NSM Lite.
Print	Sends a configured database table to the printer.
Export	Sends a delimited database table to another file.
Download	Commands the entire Cardholder Table to be downloaded to the Star II Controller.
Show PIN	Commands the program to show PIN Numbers as part of the Cardholder database Table.
PIN Report	Causes a report of all Cardholders to be created that displays their PIN Numbers. It includes both User Defined and system generated PINs.
Help	Calls up the Help screen for a particular Database table.

NSM Database Detail Column Configuration

The View option on the Right-click column gives you four choices of how to display each database table. The default is always Large Icons. Many people prefer to use the Details choice because it can show much more about each record than just the description.

In the example below, the Doors database has been set up using the Columns feature to display several of the possible database fields along with the Door Name.



NSM Lite Client Database Explorer: Doors with Column Selections

The Door table above has been set up with the **Columns** feature to include:

Door Description
Door ID #
ACU ID# and Description
Device Number (Reader Number 1 - 16)
Door Switch Point ID# and Description
REX Point (Request to Exit) Switch ID# and Description

Other database elements exist for the doors, but only the ones selected were viewed as significant by the system administrator. The width of each column can be set and the entire layout will automatically be saved.

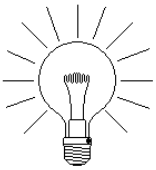
Different Database tables can be displayed in different ways. for example, Large Icons may be fine for Pollers and DKR Configurations because there will only be one item. Columns are more appropriate for Doors, Input Points and Cardholders because there are more details in each and many more items in each table.

CREATING THE DATABASE

Once all of the desired database parameters have been defined by filling in the set up sheets from Appendix A, begin entering data into the NexSentry database.

Recommended Database Entry Sequence

Once all of the database setup sheets are filled in, follow this recommended command sequence for creating a new database



NOTE: Many Database categories will not be applicable to any one specific installation. The most **common and necessary ones are in bold type**, below.

- **"Time Codes" on page 10-21**
- **"Time Groups" on page 10-22**
- Holidays (First 30)
- "NSM Lite Users (Operators)" on page 10-23
- "ACU Users" on page 10-24
- **"Star II Actions (Reports)" on page 10-25**
- **Star II Action Groups**
- **NSM Lite Poller Definition**
- **NexSentry Star II ACU**
- ABA/Wiegand Site Codes and Company Codes (if applicable)
- **Door Switch Inputs**
- **REX Switch Inputs**
- **General Purpose Inputs**
- **Digital Reader Configurations**
- MSR (Magnetic Stripe) Reader Configurations
- Keypad Configurations
- Wiegand Reader Configurations
- **NexSentry Star II Doors**
- Elevator Name Schemes

- Elevator Configuration
- Elevator Floor Groups
- Zones
- **Access Codes**
- **Cardholders**
- NSM Lite Sounds
- NSM Lite Icons
- NSM Lite Transaction Types

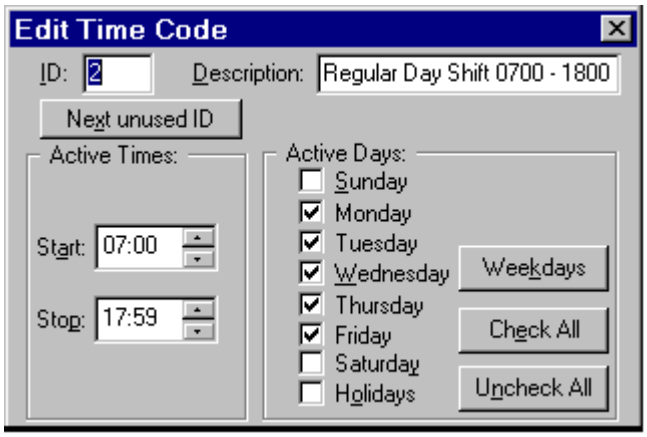
TIME CODES

A TIME CODE has three parts, a **Start Time**, a **Stop Time** and one or more **Days**. All three parts must be completed in order for the Time Code to work. All times are based on a **24 hour clock**.

In the Star II Controllers, the Start Time begins at the start of the indicated minute and the Stop time continues to the end of the indicated minute. As a Stop Time, Midnight is entered as 23:59, which continues to the end of the 59th minute.

Example: 09:00-09:00 Monday is a legitimate Time Code covering ONE Minute on Monday.

All-the-Time is entered as 00:00-23:59 with Check All selected.



Star II Time Code Dialog Box

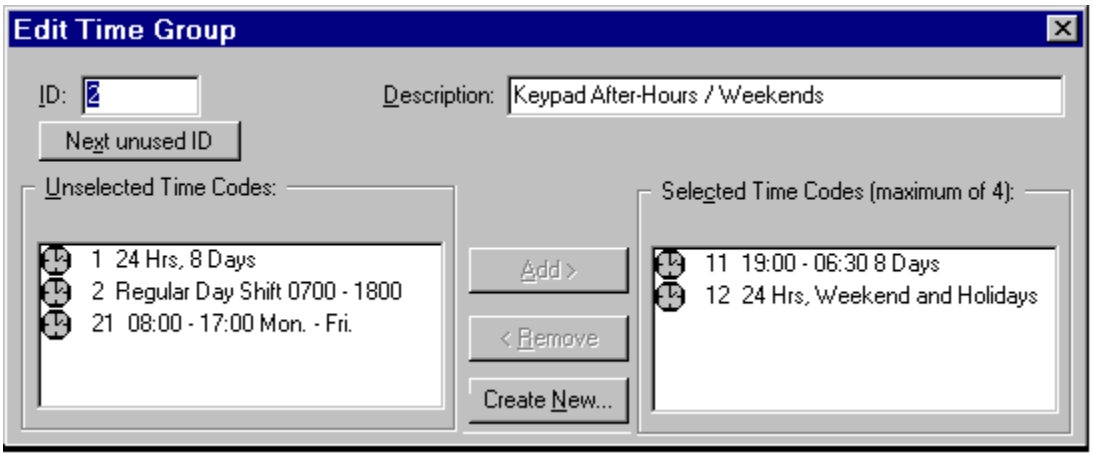
Time Codes in all WSE Systems can cross over Midnight. This is extremely useful for creating Time Codes for Night-Shift access or for times when intrusion detectors should be active.

Example: **22:00-07:30 Monday** begins on Monday night and carries over to Tuesday morning, even though Tuesday is not checked.

Example: **22:00-07:30 with Sunday -Thursday** checked would be a legitimate **Night-Shift Access** time for a shift that begins on Sunday night and ends on Friday morning.

TIME GROUPS

A Time Group.contains up to 4 Time Codes. Time Groups make it convenient to combine logically related Time Codes together for assignment in the database.



Star II Time Group Dialog Box

In the example above, Time Codes 11 and 12 have been combined together to cover night and weekend periods. This Time Group #2 can now be linked to a Keypad to determine the periods when it is necessary to use the Keypad in addition to a Reader.

NSM LITE USERS (OPERATORS)

NSM Lite comes with a single default user called **administrator**. When you first log into NSM Lite, as shown earlier in this chapter, you used the **administrator** login name and the default password, **new123**. You may create additional NSM Lite users, however, there are no permission controls in NSM Lite, so that *all operators have full access to the NSM Lite database and Operator Override commands*.



NSM Lite System User

NSM Lite System User Data

ID Number	Enter the ID # for an individual NSM Lite User.
Description	Enter full name for the User.
Security Level	Not Selectable in NSM Lite.
User Name	Up to 12 alphanumeric characters. Example: SECURITY.
Password	Up to 12 alphanumeric characters. Example: GUARDFORCE.

ACU USERS

Some limited set-up and administrative functions may be performed in Star II in an ASCII text Terminal interface. Any User (Operator) wishing to log directly into Star II will need an ACU User Login.



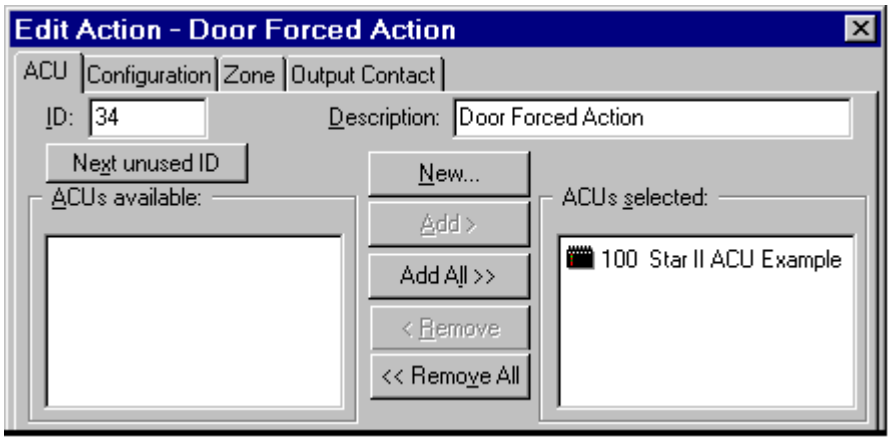
Star II ACU User

Star II ACU User Data

ID Number	Enter the ID # for an individual Star II User.
Description	Enter full name for the User.
Rank	**A - F**; A has unlimited permissions.
User Name	Up to 12 alphanumeric characters. Example: SECURITY.
Password	Up to 12 alphanumeric characters. Example: GUARDFORCE.

STAR II ACTIONS (REPORTS)

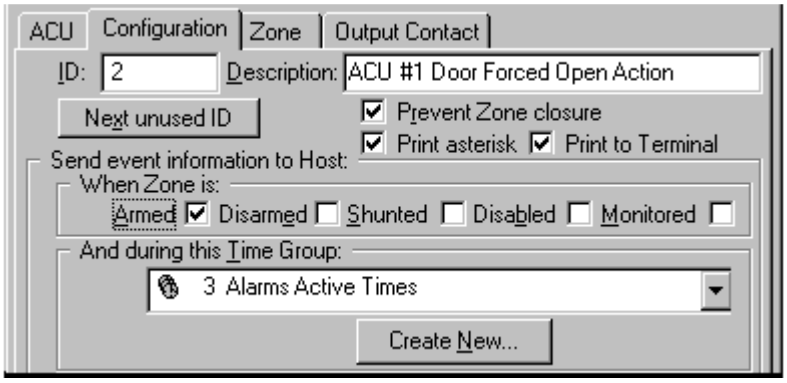
Star II Actions are the re-action plans in the ACU allowing it to react to every event that takes place in the ACU. Up to 64 different Actions can be constructed to respond specific events in the ACU. An Access Granted Action could be vastly different from a Door Forced Open Action. There are four tabs to each Action.



Star II Action Data: ACU Tab

Star II Action Data: ACU Tab

ID Number		Enter the ID # (1 - 64) for a new Action.
Description		Enter a description of the event to which the Action is related.
New	***button***	Self-explanatory buttons.
Add >	***button***	
Add All >>	***button***	
< Remove	***button***	
<< Remove All	***button***	
ACUs available **ACUs selected**		NSM Lite only supports one Star II ACU. As a result, only one ACU is available and it must be selected for all Actions and Action Groups. The fields are much more vital for NexSentry Manager 3.0, which can support up to 32 ACUs. Controlling linkage between ACUs and Actions is vital in NSM 3.0.



Star II Action Data: Configuration Tab

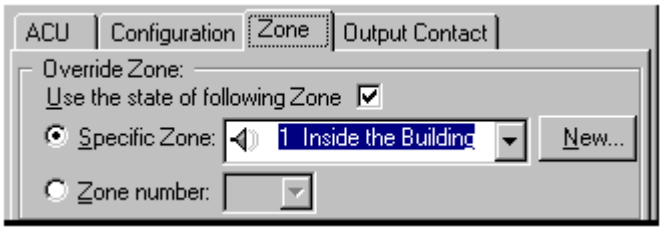
Star II Action Data: Configuration Tab

ID Number	Enter the ID # (1 - 64) for a new Action.
Description	Enter a description of the event to which the Action is related.
Prevent Zone Arming	If this box is checked, this Action can determine whether a related **Zone** can be put in the **Armed** Mode. Example: If a door is currently Forced Open, you could not **Arm** a related **Zone**.
Print Asterisk (*)	If this report sends text to a printer, should the first character in the message be * ? This is used to identify alarm type events.
Print to Terminal	Should a log message about a related event be sent to the Terminal port on the Star II in an ASCII text string?
	Send information to Host when Zone is...
Armed, Disarmed, Shunted, Disabled, Monitored	Should the Star II send a message to a Host PC (NSM Lite, NexSentry Manager or StarGaze) when a related Zone is in any of the indicated states? See Zones later in this chapter.

Star II Action Data: Configuration Tab (continued)

And During Time Group

Should the Star II send a message to a Host PC during the selected Time Group. This will send the message during the selected Times regardless of the state of any related Zone.

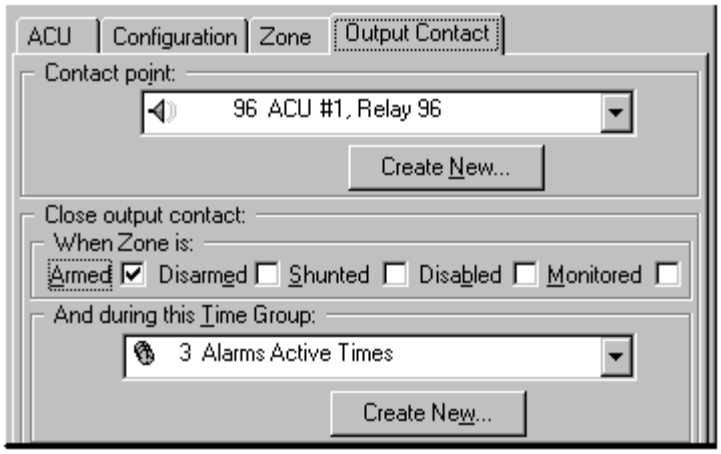


Star II Action Data: Override Zone Selection Tab

Star II Action Data: Override Zone Selection Tab

Specified Zone or Zone Number

If the Action is to be conditional based upon a Zone, you must select the Zone here. Zones can be created that have specific characteristic(s), as in the example shown.



Star II Action Data: Output Contact Tab

Star II Action Data: Output Contact Tab

Output Contact Point — Should a Relay on the Star II system be closed as a result of an Event going active? The Output Contact must be defined first as described later in this chapter.

Close Output Contact when Zone is...

Armed, Disarmed, Shunted, Disabled, Monitored — Should the Star II close the selected relay when a related Zone is in any of the indicated states? See Zones later in this chapter.

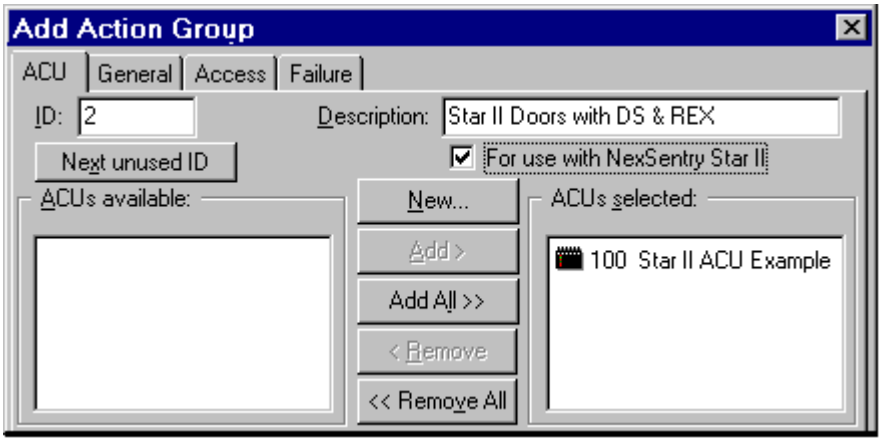
And During Time Group — Should the Star II close the selected relay during the selected Time Group. This will close the relay during the selected Times regardless of the state of any related Zone.

NSM LITE STAR II ACTION (REPORT) GROUPS

Star II Action Groups are intended to combine all of the individual actions needed at the Star II Doors into a convenient Group. This makes it easier to assign the Actions to Doors with similar characteristics. All you need to do is assign an appropriate Action Group to the door and all reporting requirements are covered.

NOTE: The Star II is not aware of the Action Group. It is only aware of the individual Actions inside the Group.

The **Action Group** is divided into four sections with individual tabs: **ACU, General, Access** and **Failure**. They are shown below.

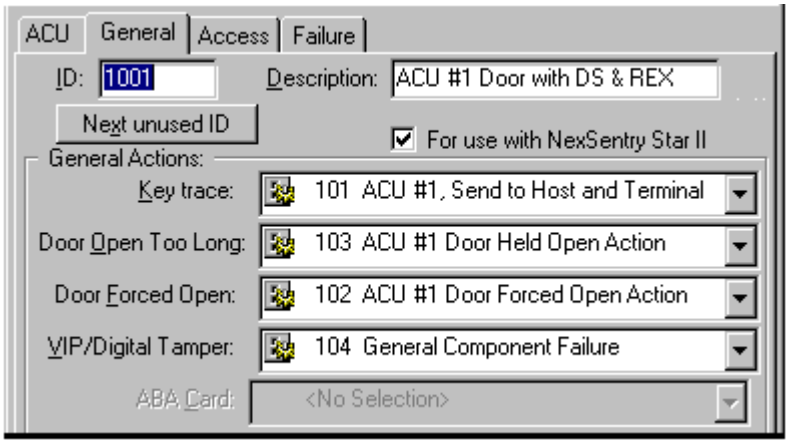


NSM Lite/Star II Action Group: ACU Tab

No specific instructions for the individual fields are given since the fields are the same as for "Star II Action Data: ACU Tab" on page 10-26

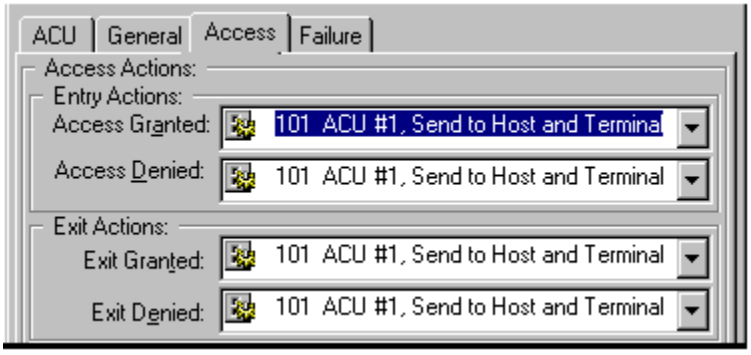
Different **Action Groups** can be made to reflect **Doors** with different hardware configurations and usage patterns. Some **Doors** may have both a Door Switch and REX, others may have two Readers and no REX, still others may have a Reader or Keypad only. Each configuration would logically need a different Action Group with only the appropriate Actions selected.

These **Action Groups** will be assigned to the individual **Doors** in the **NexSentry Star II Door** configuration window. Specifically, the Access Group field is under the **Misc. Tab**.

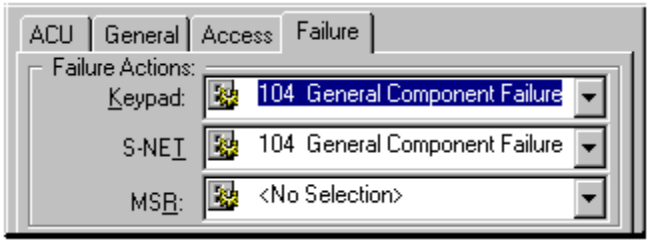


NSM Lite/Star II Action Group: General Tab

No specific instructions for the individual fields are given since the purpose of each field should be clear.



NSM Lite/Star II Action Group: Access Tab



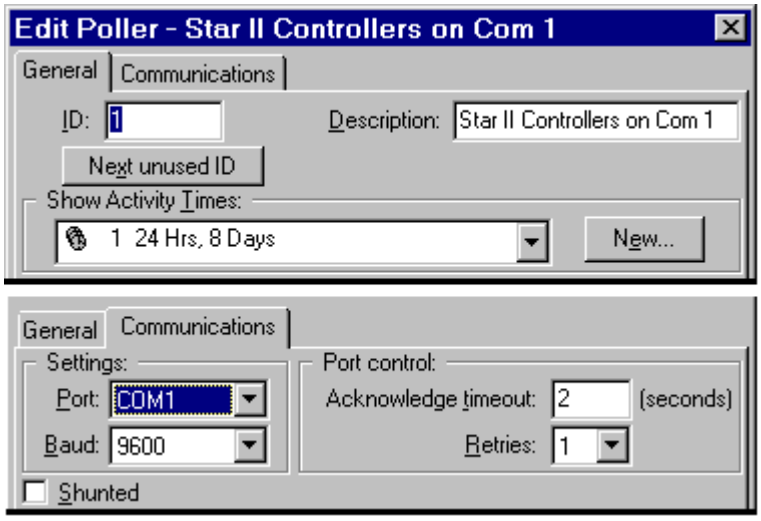
NSM Lite/Star II Action Group: Failure Tab

NSM LITE AND STAR II HARDWARE CONFIGURATION

NSM Lite Poller

The PC that is running the NSM Lite program needs to have a serial port defined for communication with the Star II Controller.

The Poller window is used to set up the communication parameters needed for this task. There is normally **only 1 Poller** in NSM Lite.



NSM Lite Poller Configuration

NSM Lite Poller: Configuration Data

ID Number	Enter an ID # for the Poller. The logical choice is **1**.
Description	Enter a description of the Poller.
Show Activity Times	Select a Time Group when the NSM Lite Monitor program should display activity from the Poller.
Port	Select the PC Serial port that will be used for connection to the Star II Controller.
Baud	Select the desired Baud rate for Star II Communication, 9600; 19,200; 38,400 or 57,600.
Acknowledge Timeout	This is the number of seconds that the NSM Lite server will wait for a response from the Star II before determining it to be off line. Default is **2**.

NSM Lite Poller: Configuration Data (continued)

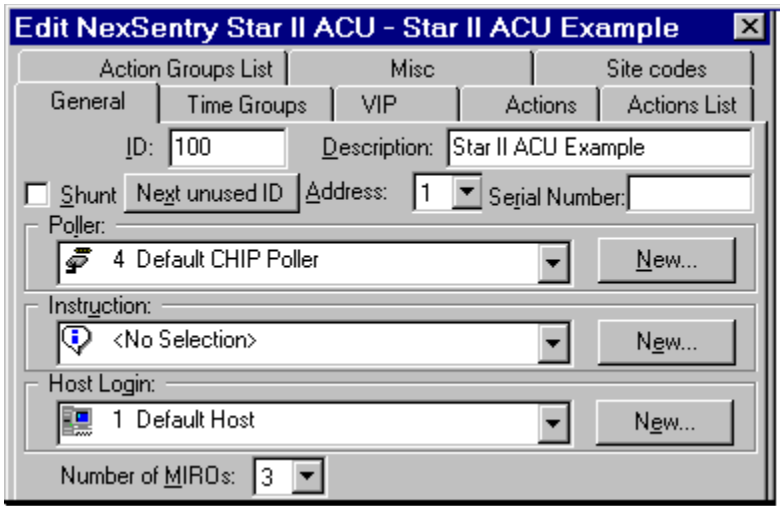
Number of Retries	How many times the Server must detect the Star II to be off line before sending a log message to the Monitor window. Default is **1**.
Shunted	If checked, the Poller is shunted.

Star II ACU Configuration

This window determines the basic configuration for the Star II Controller itself. It establishes parameters for Host and Terminal Port communication, Keypad performance Characteristics, fault actions, etc. You only need to configure the portions of the ACU Capabilities that apply to your specific installation. For example, if you don't intend to use Keypads, you can skip that Tab.



NOTE: Since the same NSM Lite program can be used to configure multiple Stand-Alone Star II Controllers, each unique Database may have very different configurations. That is why you begin by selecting a specific database path name to work on. Be sure to name each ACU in the Description field so that you can quickly tell which unit you are configuring.



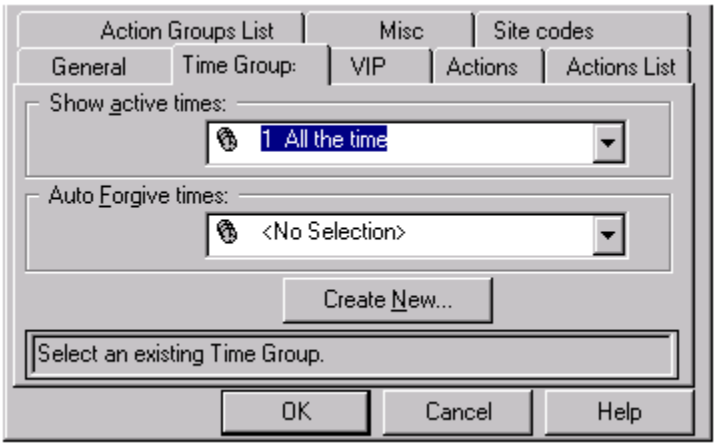
Star II ACU Configuration Data: General Tab

Star II ACU Configuration Data: General Tab

ID Number	Enter the ID # for the Star II ACU. There is no absolutely logical choice since this ID # is only for use by NSM Lite to organize its Database. See the description of Numbering Scheme logic at the beginning of this chapter.
Description	Enter a descriptive name for the Star II ACU.
Shunt	A check box to enable NSM Lite to stop polling the Star II. This is normally used when you are building the database while your PC is not connected to the ACU.
Address	Select an Address (other than 0) if this Star II will be connected to a Host system in the future.
Serial Number	Not valid for Stand-Alone applications. Enter a **1** to satisfy the program requirements. (This field may be removed in future revisions.)

Star II ACU Configuration Data: General Tab (continued)

Poller	Select the Poller you created from the drop-list.
Host Login	May be ignored for Stand-Alone applications. (This field may be removed in future revisions.)
Number of MIROs	Select the total number of MIRO devices that will be attached to the Star II. The minimum is **1** since the on-board 16 Inputs and 4 Relays count as MIRO #1. Range is **1 - 16**.



Star II ACU Configuration Data: Time Groups Tab

Star II ACU Configuration Data: Time Groups Tab

Show active times	Select a Time Group when the NSM Lite Monitor program should display activity from the Poller.

Star II ACU Configuration Data: Time Groups Tab (cont'd)

Auto Forgive times — This feature is typically used in parking lots with Anti-Passback enabled. (If the Exit gate has been opened during high exit traffic hours, it is then necessary to forgive passback, since otherwise those exiting unrecorded would violate passback on their next entry. The same Time Group will be selected for both Auto-Unlock and Anti-Passback to ensure reliable performance.



Star II ACU Configuration Data: VIP Tab

Star II ACU Configuration Data: VIP Tab

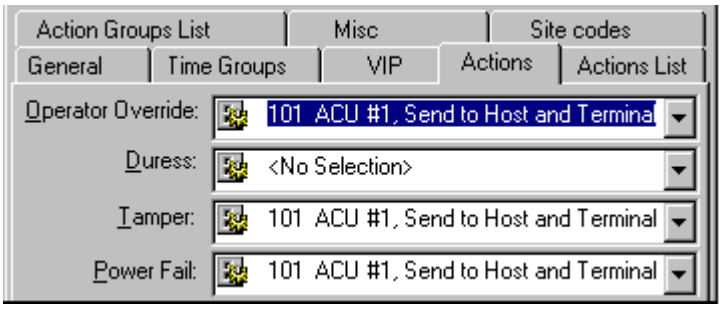
Number of Digits — Select **4, 5 or 6**. If you are using Keypads in conjunction with Card Readers, and intend to let the Star II calculate the table of PIN numbers. This value will set the length of the PIN Numbers.

Number of Digits if using Keypad Only — Select **4 - 8**. Use this field to set PIN number length for Keypad only applications.

Display PIN Number — For Keypad only applications, should a Cardholder's PIN number appear on the Monitor window with an Access Granted or Denied event.

Star II ACU Configuration Data: VIP Tab (continued)

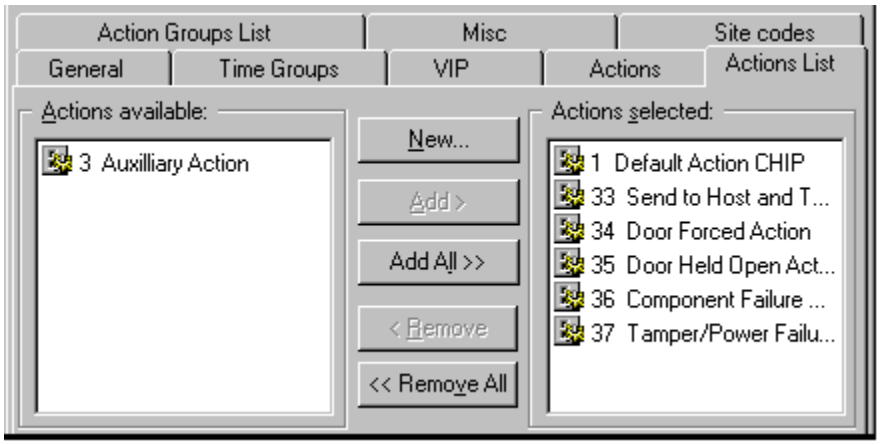
Duress Enable — Duress allows a person using a Keypad to enter an **altered version of their PIN** to cause a Duress Alarm. The first digit of the PIN is moved to the end: PIN = **1**2345, Duress PIN = 2345**1**.



Star II ACU Configuration Data: Actions Tab

Star II ACU Configuration Data: Actions Tab

Operator Override, Duress, Tamper, Power Fail — Select appropriate Star II Actions from the set you previously created for each of the listed events.



Star II ACU Configuration Data: Actions List Tab

Star II ACU Configuration Data: Actions List Tab

and

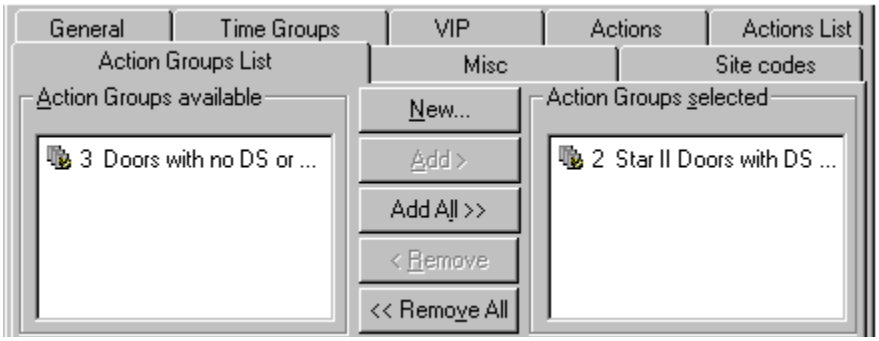
Star II ACU Configuration Data: Action Groups List Tab

New	***button***	Self-explanatory buttons.
Add >	***button***	
Add All >>	***button***	
< Remove	***button***	
<< Remove All	***button***	

ACUs available

ACUs selected

Since NSM Lite only supports one Star II ACU, all Actions and Action Groups must be selected for the one ACU.



Star II ACU Configuration Data: Action Groups List Tab



Star II ACU Configuration Data: Misc Tab.

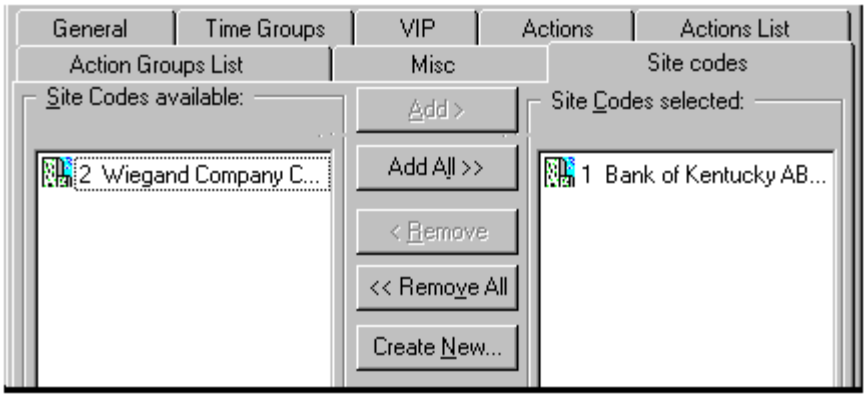
Star II ACU Configuration Data: Misc Tab

Host Port Connection Baud Xon/Xoff — Select the desired Baud Rate for the Star II Host port to use. Valid choices are 9600; 19,200; 38,400 and 57,600. ***Do not check Xon/Xoff.***

Terminal Port Connection Baud Xon/Xoff — Select the desired Baud Rate for the Star II Host port to use. Valid choices are 9600; 19,200; 38,400 and 115,200. ***Do not check Xon/Xoff.***

Star II ACU Configuration Data: Misc Tab (continued)

Enable "Zone not Armed" reminder message	Check here if you want the Star II to be able to send a log message to the Monitor window at the time a Zone should have been Armed.
Interval (seconds)	Enter the number of of minutes between reminder messages about **Zone Should Be Closed**. The messages will repeat until the specific Zone is Armed or Shunted.
Access Denied, Not in memory time	Enter the number of seconds that a Reader should be disabled in the event or an **Access Denied, Not In Memory** Transaction.
Timezone of ACU	*Not applicable to NSM-Lite.*



Star II ACU Configuration Data: (ABA/Wiegand) Site Codes Tab

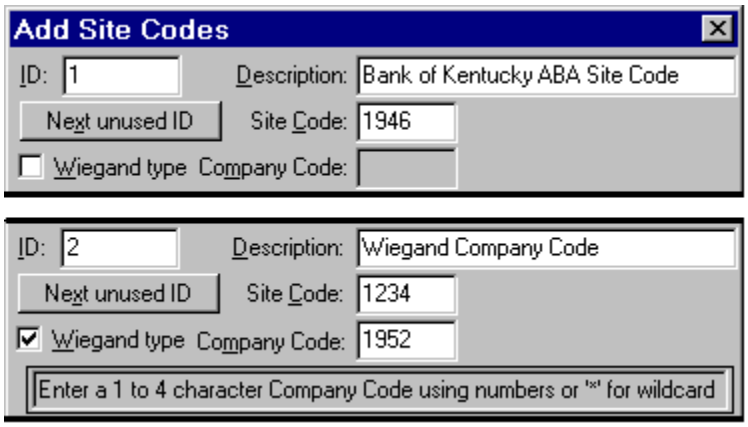
Star II ACU Configuration Data: (ABA/Wiegand) Site Codes Tab

Site Code (ABA Magnetic Stripe and Wiegand)

A table of Site Codes will be created based on procedures found next in this chapter. Select the appropriate Site Code(s) for use in this ACU. Typically, you will only create the Site Codes that are needed for the specific application.

Star II ABA/Wiegand Site Code and Company Code Configuration

This window allows creation of Site Codes for ABA format Magnetic Stripe Cards. The same window also works to create both Site Codes and Company Codes for Wiegand or Wiegand-emulating card data. Many types of Access Control card readers transmit data in a Wiegand Reader-to-Controller protocol. The Star II Controller can be used with those readers to make a superior Access Control system.



Star II ABA/Wiegand Site and Company Code Data

Star II ABA/Wiegand: Site and Company Code Data

ID Number	Enter the ID # for a Site/Company Code.
Description	Enter a description of the group of cards using the Site/Company Code.
Wiegand Type	Check box for configuration of Wiegand type Site and/or Company Code.
Site Code	Enter a 4-digit number to identify the desired Site Code. An Asterisk * will work as a wild-card. Example: **234*** covers all Codes **2340 - 2349**.
Company Code	*For Wiegand emulating card data only!* Enter a 4-digit number to identify the desired Company Code. An Asterisk * will work as a wild-card. Example: **53**** covers all Codes **5300 - 5399**.

Door Switch, REX and General Purpose Input Points

An input point is any device that closes a switch or relay that can measure a physical phenomenon. Magnetic Door Contacts, Passive Infrared motion detectors, thermostats and humidity sensors are all examples of Input Points.

NSM Lite uses three separate windows to create Input Point records for the Star II. These windows are in unique tables depending on the function of the Input Points. This is done to enhance the logical assignment of the points in later configuration steps.

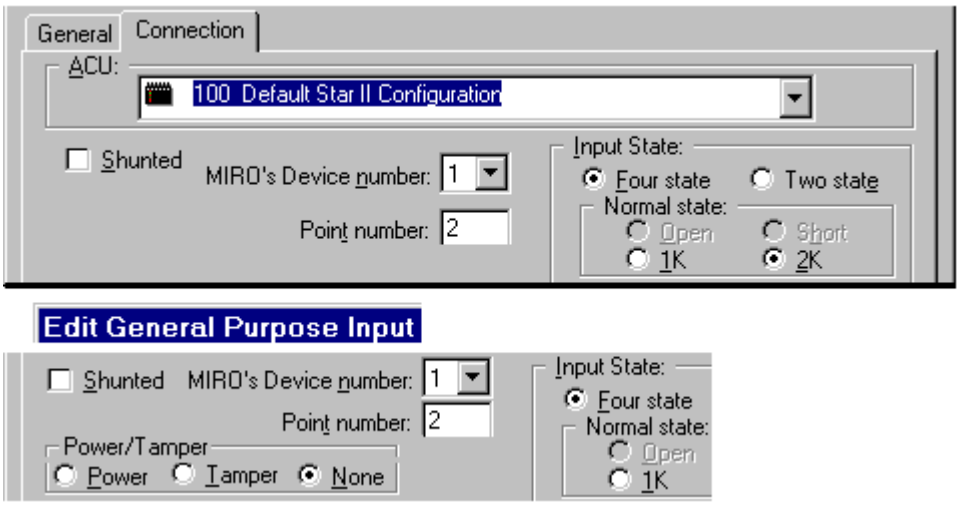
We will show a Door Switch window as an example, but the REX window is identical in appearance and function.and the General Purpose window is also identical in appearance, except for the addition of the Power/Tamper selections, which we show as a separate sub-screen.



Star II Input Point Definition: General Tab

Star II Input Point Data: General Tab

ID Number	Enter the ID # for each Input Point.
Description	Enter a description of the Input Point.
Show Activity Times	Select a Time Group, usually Group #**1**.
Action	Select the previously created Star II **Action** needed for this Input Point. If needed, a new Action can be created at this time by clicking **New**. **Door Switch & REX Points** usually use **Action 0**.
Zone	Select a Zone in which this Input Point will be included. You may skip this field if Zones are not being employed in this particular installation.



Star II Inp Pt Def: Connect Tab + Genl Purp Inp screen added fields

Star II Input Point Data: Connection Tab

ACU — Only one choice is available in NSM Lite. This field becomes more important in the full NexSentry Manager program where up to 32 ACUs can be connected.

Shunted — Check here if this point is to be disabled.

MIRO's Device Number — Star II can have up to 16 MIRO Devices. Select which one to which each Input Point is connected. Default is **1** which is the Star II ACU itself.

Point Number — Each MIRO device type can handle a different quantity of Input Points from **2 - 64**. Enter the specific Input Connection for each Input Point.

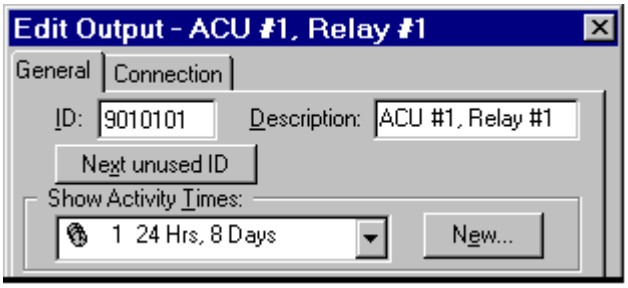
Input State — Star II Controllers can support many different Input Point End-of Line resistor configurations. The preferred arrangement is 2k ohm = Clear, 1 k ohm = Active. Make a selection for each Input Point here.

Star II Inp Pt Data: Genl Purp Inp: Connect Tab: Added Fields

Power/Tamper Select Power Fail input, and/or Tamper input, or None.

Output Points (Relays)

An Output Point is a relay on Star II or a MIRO that can be used to control an electrically operated device. Output Points can control Door Locks, Lights, Sounders, Alarm Panel Inputs and LEDs on Status Map displays. There are relays on most MIRO devices. (Any relay may be used for any purpose, so there is no default use.)



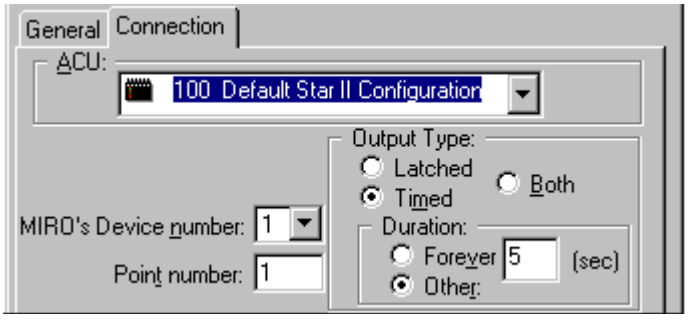
Star II Output Point Definition: General Tab

Star II Output Point Data: General Tab

ID Number Enter the ID # for each Output Point.

Description Enter a description of the Output Point, specifically, what it controls.

Show Activity Times Select a Time Group, usually Group #**1**.

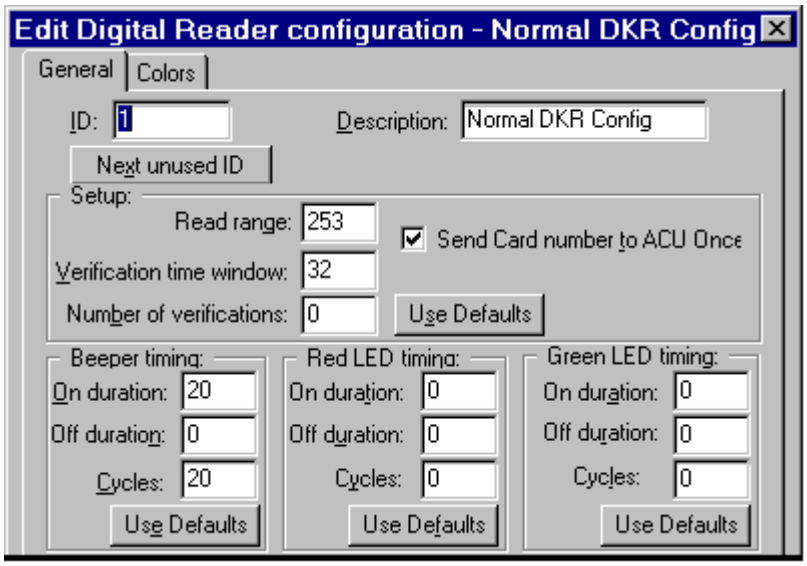


Star II Output Point Definition: Connection Tab

Star II Output Point Data: Connection Tab

ACU	Only one choice is available in NSM Lite. This field becomes more important in the full NexSentry Manager program where up to 32 ACUs can be connected.
MIRO's Device Number	Star II can have up to 16 MIRO Devices. Select which one to which each Output Point is connected. Default is **1**, which is the Star II ACU itself.
Point Number	Each MIRO device type can handle a different number of Output Points from **0 - 24**. Enter the specific Output Connection for each Output Point.
Output Type - Latched	A Latched Output has two specific applications. ***All Door Locks are Latched Outputs.*** The time that they are closed is then controlled by the Door configuration. (Alarm annunciations that must be Silenced by an Operator are also Latched Outputs.)
Output Type - Timed	A Timed Output is used where a finite relay closed time is needed. Example: A **Key Trace** Transaction should actuate a buzzer in the Guard Station for 30 seconds.
Duration: Forever or ??? Seconds	**Forever** means to **close the Relay for as long as an event remains active**. The Relay follows the Event. **??? Seconds** sets the specific number of seconds as described above. Maximum = **255** Seconds.

DKR (Digital Key Reader) Configuration

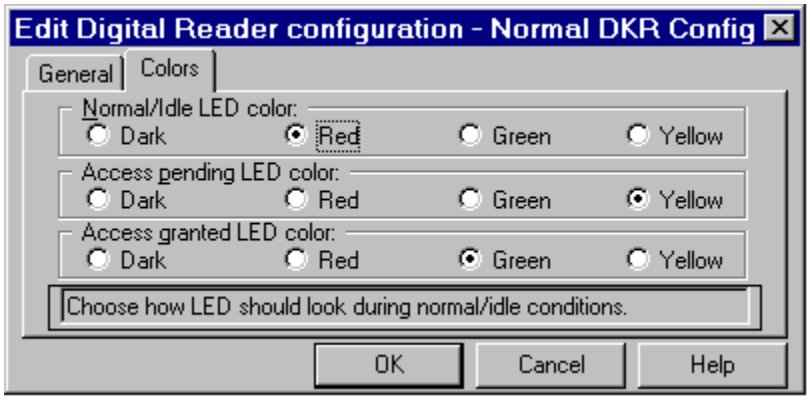


Star II DKR Configuration Data: General Tab

The WSE DKR 4200 family of Digital Key Readers are Proximity card readers used with the Star II Controller. Some performance features, such as beeper duration can be tailored for specific readers. using the DKR Configuration window.

Star II DKR Configuration Data: General Tab

ID Number	Enter the ID # for each DKR Configuration.
Description	Enter a description of the DKR Configuration, specifically, how the Reader behaves.
Show Activity Times	Select a Time Group, usually Group #**1**.



Star II DKR Configuration Data: Colors Tab

NOTE: Typically, only one DKR Configuration is used in any one system.

Star II DKR Configuration Data: Colors Tab

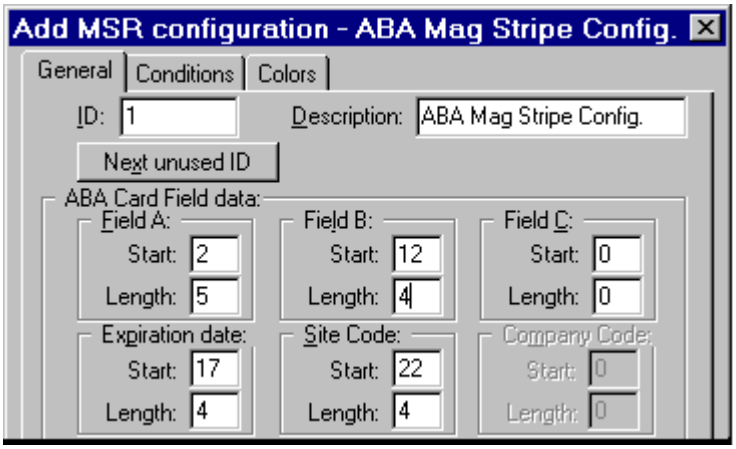
Normal/Idle LED color **Access Pending LED color** **Access Granted LED color**	This screen provides the capability for selecting the color for the three states of the Star II Digital Key Reader units. The most common selection is Normal/ Idle = red, Access Pending = yellow and Access Granted = green. The customer has complete freedom of choice, often dictated by localization considerations.

MSR (Magnetic Stripe Reader) Configuration

Star II can also use the MSR5 (without Keypad) and MSRK5 (with Keypad) Magnetic Stripe Readers. The ACU needs to be set up to

correctly receive and interpret the 40 characters that come from the Mag Stripe on the card. Different groups of cards have data scattered across different parts of the stripe. The MSR Configuration window lets you tailor the ACU to capture this data and make logical decisions based on it.

Typically, only one MSR Configuration is required for any given installation using Magnetic Stripe Readers and cards. There are, however occasional exceptions. Theoretically, each reader could have its own configuration.



Star II Magnetic Stripe Reader Configuration Data: General Tab

Star II MSR Configuration Data: General Tab

ID Number Enter the ID # for each MSR Configuration.

Description Enter a description of the MSR Configuration, specifically, what group of cards will be decoded.

Star II MSR Configuration Data: General Tab (continued)

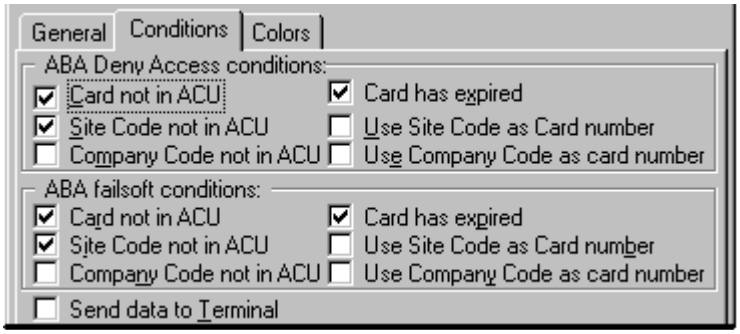
Field A, B and C Start and Length	It is possible to use up to three groups of numbers (out of the 40 total) to assemble the card number. The Card number can be up to 9 digits long. 3 segments of the 40 character string can be pieced together to make the Card number. Enter the Start point and length of up to 3 blocks of numbers for fields A, B and C. In the example above, **5 digits** from **Field A** and **4 digits** from **Field B** will make up a **9 digit Card No**.
Expiration Date	The Location of the Expiration Date must be entered if Access decisions are to be based on the card Expiration. *The length is always **4 digits**.*
Site Code	The Location on the card of the Site Code must be entered if Access decisions are to be based on the Site Code. *The length is always **4 digits**.*

When you are using ABA Format Mag Stripe cards, there are three characteristics that can be used for access decisions.

Card Number, Site Code, Expiration Date

Each of these data fields can be used by Star II to decide whether to grant access or not. **Card Number** is, by far, the most common. Some applications in financial institutions will grant access to all cardholders who have a **Site Code** belonging to that bank. Many Universities will also use the **Expiration Date** to decide access since a student with an expired card should not be allowed into University buildings.

The two sets of identical questions (Deny Access conditions and Failsoft conditions) should be configured the same in 99% of installations. A small number of StarGaze / SE 6000 applications use Smart Fail Soft to decide access differently if the ACU is on-line with the Host PC or is operating in an off-line mode. This is the only case where the questions in the two blocks could be answered differently.



Star II Magnetic Stripe Reader Configuration Data: Conditions Tab

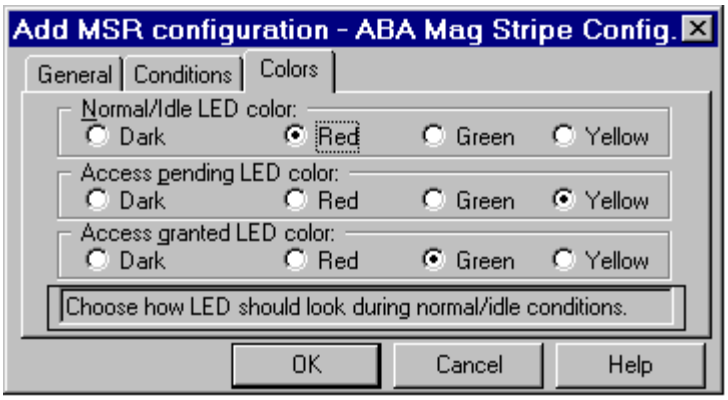
Star II MSR Configuration Data: Conditions Tab

Card not in ACU	Access Decision based upon the Card Number. Can also apply to Wiegand Emulation readers.
Site Code not in ACU	Access Decisions based upon the ABA Site Code. Can also apply to Wiegand Emulation readers.
Company Code not in ACU	For Wiegand Emulation readers only. Not applicable to ABA Mag Stripe Readers and cards.
Card has Expired	Access Decisions based upon the ABA Expiration Date. For ABA Mag Stripe readers only.
Use Site Code as Card Number	Access Decisions based upon the ABA Site Code. An individual Site Code can be entered as a Card-holder. This allows anyone having a card with a valid Site Code to be granted access. (The name shown with the Access Transaction will be the same for everyone with the same Site Code.)
Use Company Code as Card Number	For Wiegand Emulation readers only. (Not applicable to ABA Mag Stripe Readers and cards.)

Star II MSR Configuration Data: Conditions Tab (continued)

Send Data to Terminal

Sometimes it is desirable to see the full string of characters generated by an ABA or Wiegand-emulating reader. Check this box to enable a full data string to be transmitted from the Star II Terminal Port.
NOTE: Access will NOT be granted by the reader when the complete data string is being displayed.



Star II Magnetic Stripe Reader Configuration Data: Colors Tab

Star II MSR Configuration Data: Colors Tab

Normal/Idle LED color

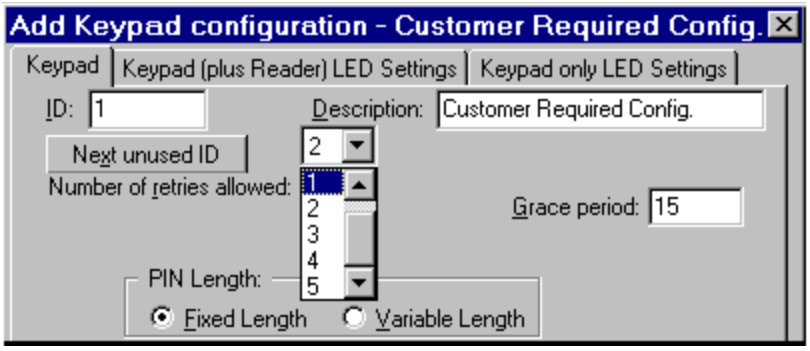
Access Pending LED color

Access Granted LED color

This screen provides the capability for selecting the color for the three states of the Star II Mag Stripe Reader units. The most common selection is Normal/ Idle = red, Access Pending = yellow and Access Granted = green. The customer has complete freedom of choice, often dictated by localization considerations.

Keypad (DR 4200 / 4205K, MSRK5 and VIP-2) Configuration

Star II Controllers can use Keypads, either alone or integrated (DKR 4205K) into Readers. The DR4200 (which looks like a DKR) and the VIP-2 (in an aluminum double-gang box) are stand-alone Keypads. The MSRK5 is a Mag Stripe Reader with a built-in Keypad. (The VIP-2 is no longer sold, but thousands are still in use.)



Star II Keypad Configuration Data: Keypad Tab

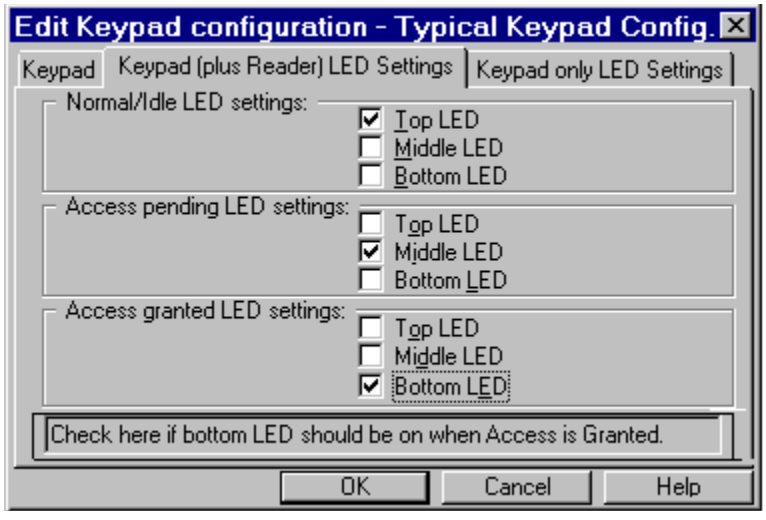
Star II Keypad Configuration Data: Keypad Tab

ID Number — Enter the ID # for each Keypad Configuration. Although multiple configurations are possible, usually only one configuration is used in each Star II Controller.

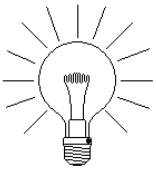
Description — Enter a description of the Keypad Configuration, specifically, which Keypads are included.

Star II Keypad Configuration Data: Keypad Tab (continued)

Number of Retries Allowed	When a Keypad is used, each person is allowed a minimum of one attempt to enter a valid **PIN** Number. This field sets the number of ***Additional*** attempts a person may have if the entry was an incorrect **PIN** number on the first try.
Grace Period	Enter the number of seconds that a person will have to complete an attempt at access. This time will include one PIN entry plus one card-read plus any number of allowed retries.
PIN Length Fixed or Variable	The Star II allows **Variable** length PINs. If you selected, in the ACU Configuration, the use of User-Defined PIN numbers, a PIN length of 4 - 8 digits will have been chosen. Variable length PINs allow the use of a PIN number that is shorter than the chosen length. If you click **Fixed**, **all PIN entries must be the 4 - 8 digit length** you have selected.



Star II KP Config Data: KP + Reader and KP only LED Settings Tab



NOTE: The format shown in the Dialog box corresponds to the three positional LEDs on the VIP-2. In DR4200K and 4205K units, there is one LED with Red/Yellow Green color capability. The correlation is as follows:

LED 1 = Red
LED 2 = Yellow
LED 3 = Green

Star II KP Config Data: KP + Rdr & KP only LED Settings Tab

Normal/Idle LED Settings

Access Pending LED Settings

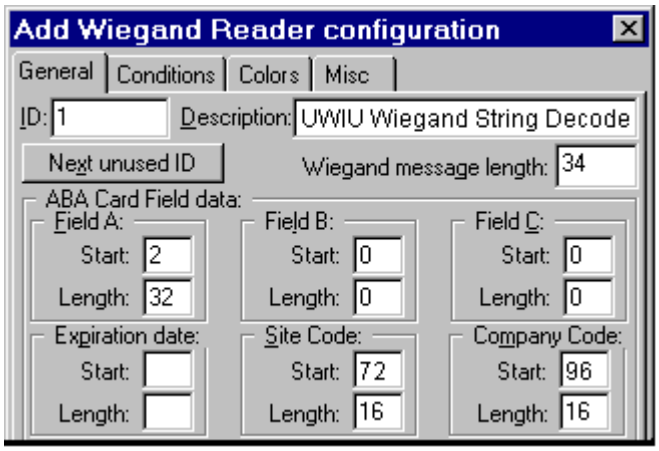
Access Granted LED Settings

Top LED
Middle LED
Bottom LED

This screen allows the user to choose which of the three possible LEDs (Top, Middle or Bottom) to select for the three possible LED Settings (Normal/Idle, Access Pending and Access Granted).

Universal Wiegand Interface (UWIU or WIRO 4/8/4) Configuration

As described earlier in this manual, Star II Controllers can be used with third-party readers using Wiegand Reader-to-Controller data protocol, such as readers used for vehicle recognition, long read-range and Asset Protection. Each Wiegand emulation uses a specific data transmission structure that must be decoded by the ACU.



Star II Universal Wiegand Configuration Data: General Tab

Star II has two S-NET Ports that can be converted for Wiegand use. If more than two readers are to be used, there are two models of UWIU devices available that handle 4 readers each. See complete details in **Chapter 5** of this manual.

Many vendors of Wiegand or Wiegand-emulating Readers will provide the necessary data to configure the NexWatch WIU devices. In the event that you must use readers that don't have a detailed data sheet, use the **WIU Setup program**. It is available from the **WSE Web Site** and is **free**. There is also an **instruction sheet** detailing how to interpret the data obtained from the WIU Setup utility.

Star II Universal Wiegand Configuration Data: General Tab

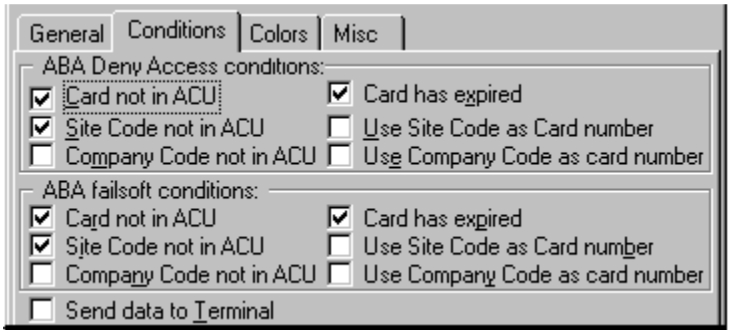
ID Number Enter the ID # for each Wiegand Configuration. Although multiple configurations are possible, usually only one configuration is used in each Star II Controller.

Description Enter a description of the Wiegand Configuration, specifically, the group of readers to be set up in this configuration.

Star II Universal Wiegand Config Data: General Tab (continued)

Wiegand Message Length	Set to match the number of bits in the Wiegand emulation string. Common values are 26, 34, 36 and 40, although many custom versions exist.
Field A, B and C Start and Length	It is possible to use up to three groups of numbers to assemble the card number. The Card number can be up to 9 digits long. 3 segments of the complete data string can be pieced together to make the Card number. Enter the Start point and length of up to 3 blocks of numbers for field A, B and C. This is very similar to the ABA Card configuration. Most cards have only one block of numbers to capture.
Expiration Date	This field is only used with ABA Magnetic Stripe Cards. It is not relevant to Wiegand emulation cards.
Site Code	Enter the card Location of the Site Code if Access decisions are to be based on the Site Code. *Length usually **16 bits**.*
Company Code	The Location on the card of the Wiegand protocol Company Code must be entered if Access decisions are to be based on the Site Code. *Length usually **16 bits**.*

Like the Magnetic Stripe Reader configuration, the Card Number, Site Code and Company code can all be used to grant and deny access to Cardholders. The Conditions Tab contains the decision fields for determining which data fields will be used to decide access.



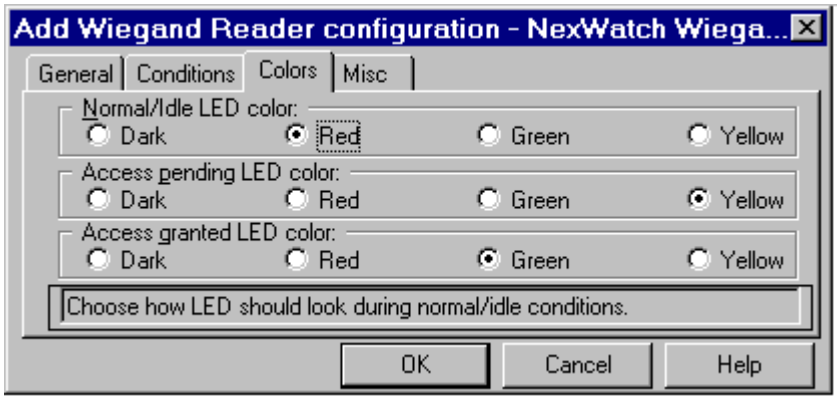
Star II Universal Wiegand Configuration Data: Conditions Tab

Star II Universal Wiegand Configuration Data: Conditions Tab

Card not in ACU	Access Decision based upon the Card Number.Can also apply to ABA readers.
Site Code not in ACU	Access Decisions based upon the Wiegand Site Code. Can also apply to ABA readers.
Company Code not in ACU	Access Decisions based upon the Wiegand Company Code. Does not apply to ABA readers.
Card has Expired	For ABA Mag Stripe readers only.
Use Site Code as Card Number	Access Decisions based upon the Site Code. An individual Site Code can be entered as a Cardholder. This allows anyone having a card with a valid Site Code to be granted access. The name shown with the Access Transaction will be the same for everyone with the same Site Code.
Use Company Code as Card Number (not applicable to Mag Stripe Readers)	Access Decisions based upon the Company Code. An individual Company Code can be entered as a Cardholder. This allows anyone having a card with a valid Com-pany Code to be granted access. The name shown with the Access Transaction will be the same for everyone with the same Company Code.

Star II Universal Wiegand Config Data: General Tab (continued)

Send Data to Terminal — Sometimes it is desirable to see the full string of characters generated by an ABA or Wiegand-emulating reader. Check this box to enable a full data string to be transmitted from the Star II Terminal Port.

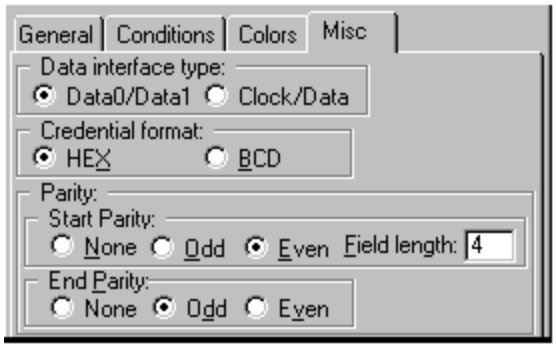


Star II Universal Wiegand Configuration Data: Colors Tab

Star II Universal Wiegand Configuration Data: Colors Tab

Normal/Idle LED color
Access Pending LED color
Access Granted LED color — This screen provides the capability for selecting the color for the three states of the Star II Universal Wiegand unit. The most common selection is Normal/Idle = red, Access Pending = yellow and Access Granted = green. The customer has complete freedom of choice, often dictated by localization considerations.

The Wiegand Misc Tab contains complex set-up fields for Wiegand-Emulating readers to use. See **Chapter 5** for details regarding these data fields.

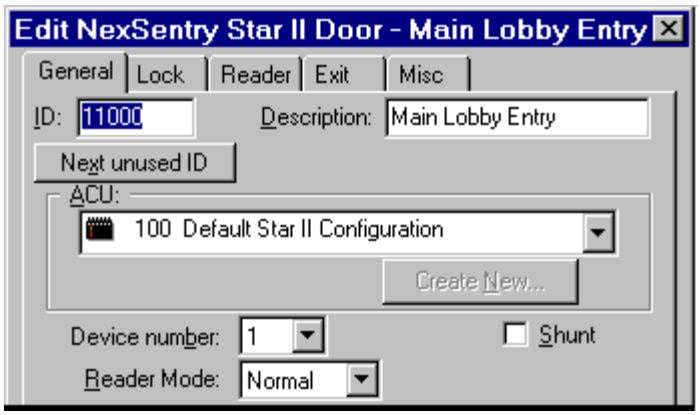


Star II Universal Wiegand Configuration Data: Misc Tab

Star II Door Configuration

Every **Door** in the Star II Controller will need to be defined in the Door window. This is one place where the **Add From** feature is worth its weight in gold. See the **Right Click detail** earlier in this chapter. When you have configured the first door, you can often use Add From to create the rest of the doors, only making changes to the Name, Device #, Door Switch, REX Input and Lock Relay Output.

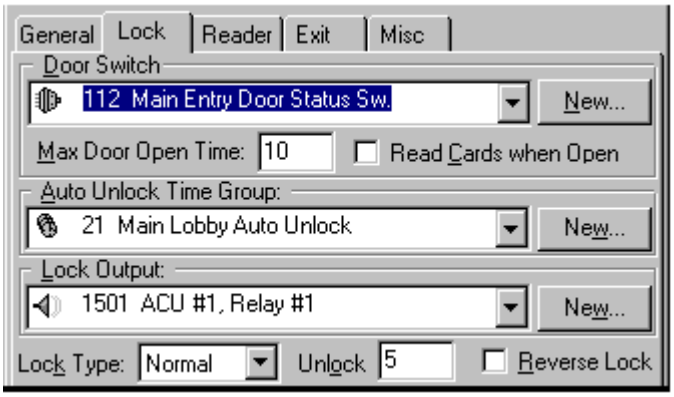
You should have already created your list of Door Switches, REXes, Action Groups and Time Groups before you begin to create Doors. Having the linked items ready to use will enhance the set-up.



Star II Door Configuration Data: General Tab

Star II Door Configuration Data: General Tab

ID Number	Enter the ID # for each Door. A logical numbering scheme is suggested for easy database management.
Description	Enter a description of the door based on physical location or the primary people who us it.
ACU	Select the only available ACU from the drop-list.
Device Number	Enter the number (**1 - 16**) for the Reader at the Door being defined.
Reader Mode	Select the Reader Mode from the drop-list. Modes include Normal, Open, Closed, Station and Continuous. See the Zones discussion elsewhere in this manual
Shunt	Check this box to disable the Reader at this door.



Star II Door Configuration Data: Lock Tab

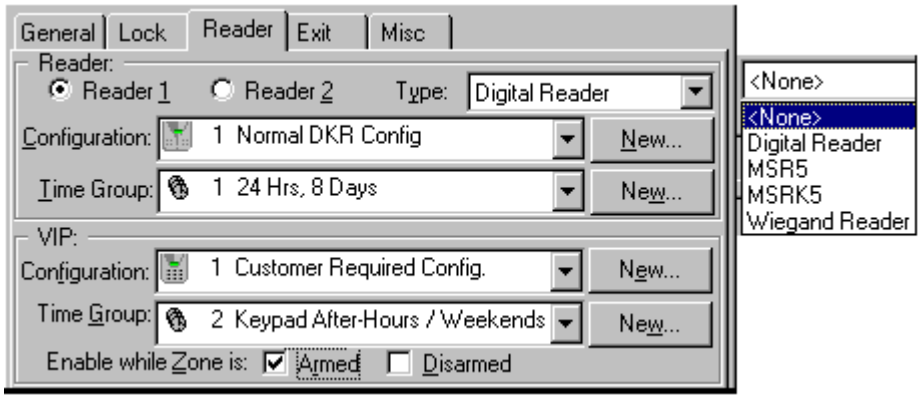
Star II Door Configuration Data: Lock Tab

Door Switch	Select the Door Switch (if any) that has been defined for this Door.
Max Door Open Time	Enter the number of seconds (0 - 240) that the Door may remain open after a valid access. The default is 15, but 30 - 60 are more realistic values for most doors.
Read Cards When Open	If the Door is equipped with a Door Switch, should the Card Reader still be able to read cards when the door is Open or Unlocked?
Auto-Unlock Time Group	Select a Time Group from the drop-down list if this Door is to be Automatically Unlocked during a portion of the day or days.
Lock Output	Select the Output Relay definition to be used to control the Lock for this Door.
Lock Type	**Leave as Normal**: Reserved for future use.

Star II Door Configuration Data: Lock Tab (continued)

Unlock Time — Enter the **number of seconds** the lock should **unlock after Access Granted or REX Granted**.
If Door has a Door Switch, Normal and Reverse locks will relock the instant the Door opens.

Reverse Lock — Check this box if you are using a Magnetic Lock and have not selected the Normally Closed Relay contact. *All relays on the Star II and on most MIRO modules have Form C Connections; Common, Normally Open and Normally Closed.* Do not check the box ***AND*** select the **NC** connection as they will cancel each other out.



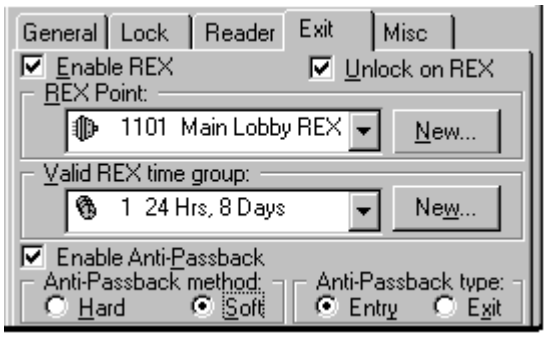
Star II Door Configuration Data: Reader Tab

Star II Door Configuration Data: Reader Tab

Reader 1 / Reader 2 — Normally, **select Reader 1 only.** If two separate and different kinds of readers (such as DKR and MSR) are used at the same door, then select both Reader 1 and Reader 2.

Star II Door Configuration Data: Reader Tab (continued)

Type	Select the type of reader being used from the Drop-list as shown above.
Reader Configuration	Select the previously configured Reader Configuration.
Reader Time Group	Select a Time Group from the drop-down list to determine when this **Reader** will be needed to gain access.
VIP (Keypad) Configuration	Select the previously configured Keypad Config. The choices will be based upon the Keypad Type.
Keypad Time Group	Select a Time Group from the drop-down list to determine when this **Keypad** will be needed to gain access.
Enable while Zone is: Armed or Disarmed	Check either or both boxes to determine when the Keypad will be needed. Armed / Disarmed state can be used in conjunction with Time Groups. Changing the associated Zone to the checked state will override any Time Code.



Star II Door Configuration Data: Exit Tab

Star II Door Configuration Data: Exit Tab

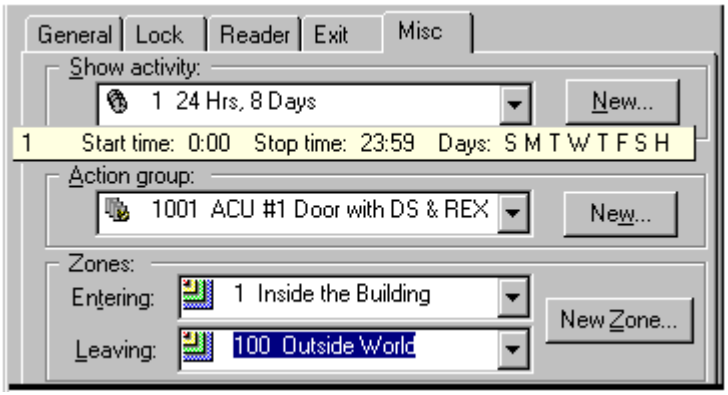
Enable Rex	Check this box if the Door will have a **Request to Exit** device.
Unlock on REX	Check this box if the Door is to be unlocked on Exit Granted.



NOTE: The primary REX function is to allow free exit without causing a Door Forced Open alarm. In addition, Exit Granted can also unlock the door, if desired. A door with a magnetic lock is an example of where this is necessary.

REX Point	Select the input Point for REX Granted.
Valid REX Time Group	Select the Time Group when you want REX to be Granted. Some applications only allow REX to be valid during the working hours and require use of the Card Reader or Keypad during other times.
Enable Anti-Passback	Check this box if Anti-Passback is to be used at this Door.
Anti-Passback Method Hard or Soft	Click the radio button for **Hard or Soft** Anti-Passback. **Hard will deny access** on Passback violation and will send a **Passback Violation Transaction**. **Soft will allow access** but will still send a **Passback Violation Transaction**.
Anti-Passback Type Entry or Exit	Click the Radio Button for **Entry or Exit**. Most Anti-Passback Doors will have two readers; one Entry and one Exit. Some installations have two separate doors, one each for entry and exit.

NOTE: **If you are using Zone configurations to control Anti-Passback, then all Readers in the Passback environment should be configured as Entry Readers.**



Star II Door Configuration Data: Misc Tab

Star II Door Configuration Data: Misc Tab

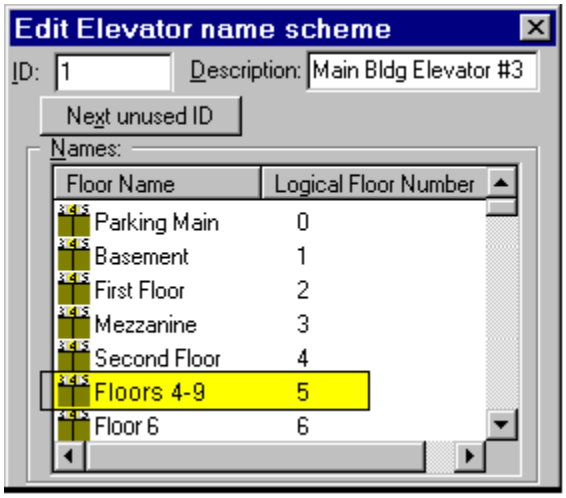
Show Activity Times	Select a Time Group when the NSM Lite Monitor program should display activity from the Door. Usually use Time Group #1.
Action Group	Select an Action Group from the Drop-list. The Action Group(s) should have been previously defined.
Entering Zone	Select the Zone from the drop-list that a person using this reader will be going into (if applicable). The default Zone is *None Selected*.
Leaving Zone	Select the Zone from the drop-list from which a person using this reader will be leaving (if applicable).

STAR II ELEVATOR CONTROL

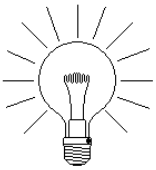
Star II Elevator Floor Names Configuration

The first step in using the Elevator Control feature in Star II is to logically name the Elevator Floors.

In this example, the owner wants any employee of the tenant who occupies floors 4 - 9 to get to all of those floors. *Logical Floor Number 5 actually controls six building floors (4 - 9)*. One relay on the Star II will enable all 6 elevator floors. Determine (with the system owner) the floors and groups of floors to be controlled from the elevator. For this screen just enter the Floor Names. Logical Floor Numbers are from **0 - 95** (for a maximum number of 96 Relays).



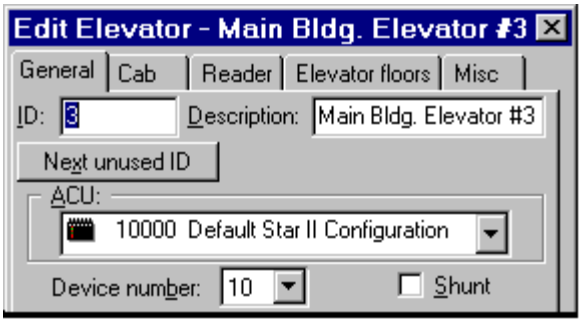
Star II Door Elevator Floor Naming Window



NOTE: As in the example above, the names can be different from a simple list of floor numbers.

Star II Elevator Configuration

The second step in using the Elevator Control feature in Star II Controllers is to set up the elevators themselves. This is the most complicated part. Carefully study the instructions below. Then the logic of the process will become apparent. Each individual elevator to be controlled will need to be set up in this manner



Star II Door Elevator Configuration Data: General Tab

Star II Door Elevator Configuration Data: General Tab

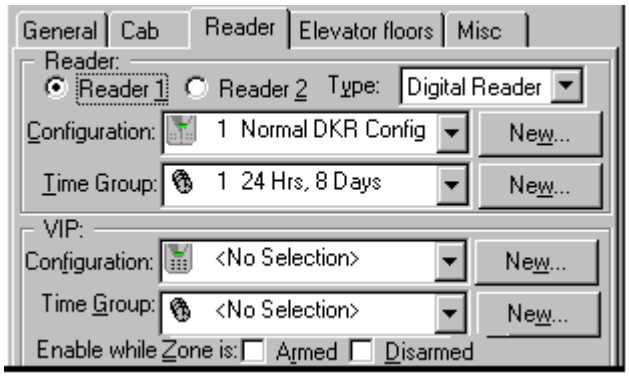
ID Number	Enter an ID # for each Elevator. A logical numbering scheme is suggested for easy DB management.
Description	Enter a description of the Elevator based on physical location or the primary people who us it.
ACU	Select the only Star II ACU Available.
Device Number	Select the Address (1 - 16) for the Reader in this elevator.
Shunt	Check to disable the Reader in this Elevator Cab.



Star II Door Elevator Configuration Data: Cab Tab

Star II Door Elevator Configuration Data: Cab Tab

Operating Mode	***ONLY NORMAL SECURITY*** is functional in this release.
Cab Type	***ONLY CAB TYPE 1*** is functional.
Read Cards while Floor Buttons are Enabled	Check to allow the card reader to remain active while Floor button(s) have been activated by a previous card read. This is the same as Read Cards When Open in the Door Configuration window.
Floor button wait time	The number of seconds that Floor Buttons will be enabled upon an Access Granted Transaction. (Functionally the same as Unlock Time.)

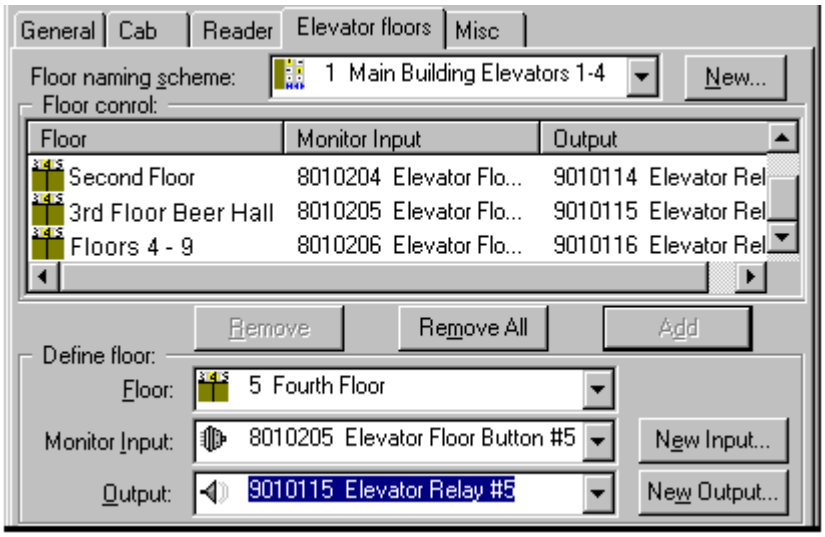


Star II Door Elevator Configuration Data: Reader Tab

This window is identical to the **Reader Tab** in **Door Configuration.**

Star II Door Elevator Configuration Data: Reader Tab

Reader 1 / Reader 2	Normally, **select Reader 1 only.** If two separate and different kinds of readers (such as DKR and MSR) are used in the same cab, then select both Reader 1 and Reader 2.
Type	Select the type of reader being used from the Drop-list. See the Door configuration section for an Example..
Reader Configuration	Select the previously configured Reader Config. The choices will be based upon the Reader Type.
Reader Time Group	Select a Time Group from the drop-down list to determine when this **Reader** will be needed to gain access.
VIP (Keypad) Configuration	Select the previously configured Keypad Configuration.
Keypad Time Group	Select a Time Group from the drop-down list to determine when this **Keypad** will be needed to gain access.
Enable while Zone is: Armed or Disarmed	Check either or both boxes to determine when the Keypad will be needed. Armed / Disarmed state can be used in conjunction with Time Groups. Changing the associated Zone to the checked state will override any Time Code.



Star II Door Elevator Configuration Data: Elevator Floors Tab

Star II Door Elevator Configuration Data: Elevator Floors Tab

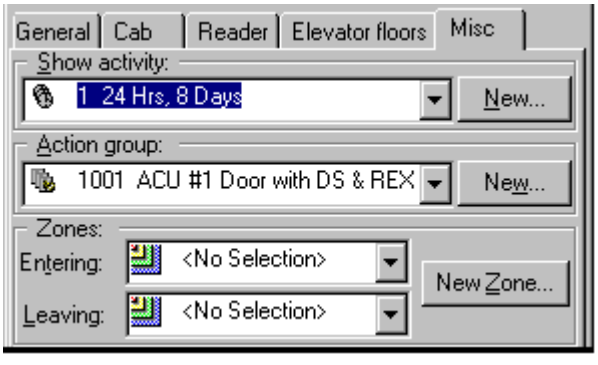
Floor Naming Scheme — Select a previously defined Floor Naming Scheme from the Drop-list. The naming scheme(s) list the descriptions of the floors or groups of floors that are controlled by each elevator control relay.

Floor Control — This is a **summary box** listing the details of the combinations created in the **Define Floor** box. When you begin to create a new Elevator Config-uration, this box will be empty.

Floor — Select the individual Floor Description from the Floor Naming Scheme from step 1. The field will display both the Logical Floor Number and the description. This selected floor will be mated with a controlling Relay (and Input if so configured) in the next two steps.

Star II Door Elevator Config Data: Elevator Floors Tab (continued)

Monitor Input	Some Elevator Control applications have an Input Point to monitor if a button is pushed. In some cases, all floors have inputs; in other cases, only selected floors. If this floor button is to be monitored, select the appropriate Input from the Drop-list.
Output (Relay)	Select the Relay that will be used to enable the floor selection button or buttons.
Add Button	When the three steps above have been completed, the **Add button** will be highlighted as shown. You must **click Add** to move the combination you just created up to the **Floor Control box**.
Repeat the above steps for each floor selection	You must repeat the above 4 steps for each Floor you wish to add. The three selection fields will automatically index after each **Add** function.
Remove Button	To remove a floor from the **Floor Control summary box**, first click on the floor, then click **Remove**.
Remove All Button	This button will remove All floors from the **Floor** Control summary box and allow you to start over. The program will verify this selection.



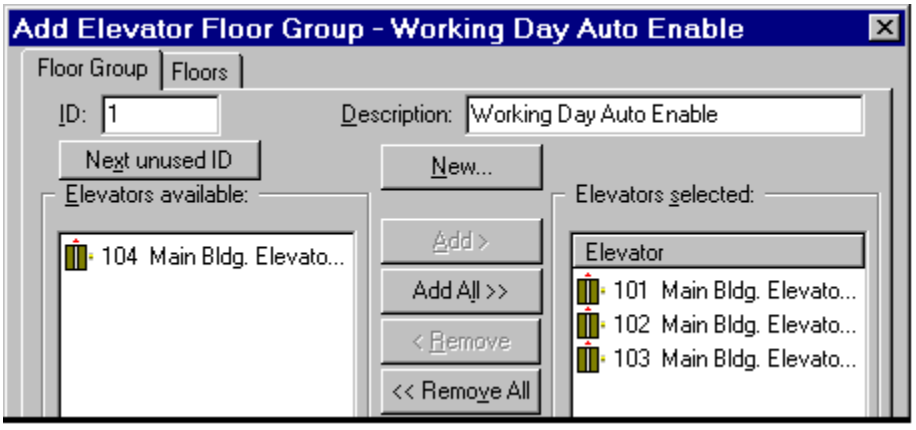
Star II Door Elevator Configuration Data: Misc Tab

Star II Door Elevator Configuration Data: Misc Tab

Show Activity	Select Time Group from the Drop-list. Always choose **Time Group 1** for this task.
Action Group	Select the appropriate **Action Group** from the Drop-list. These are the same Action Groups that are used in the **Door** Configuration.
Entering Zone	Select the Zone from the drop-list that a person using this reader will be going into.
Leaving Zone	Select the Zone from which a person will be leaving.

Star II Elevator Floor Group Configuration

The final step in using the Elevator Control feature in Star II Controllers is to combine individual **Elevator Definitions** together into logical groups for inclusion in **Access Codes**. This function also determines when Elevator Floors will be **Automatically Enabled**. This is analogous to Auto-Unlock of a regular Door.

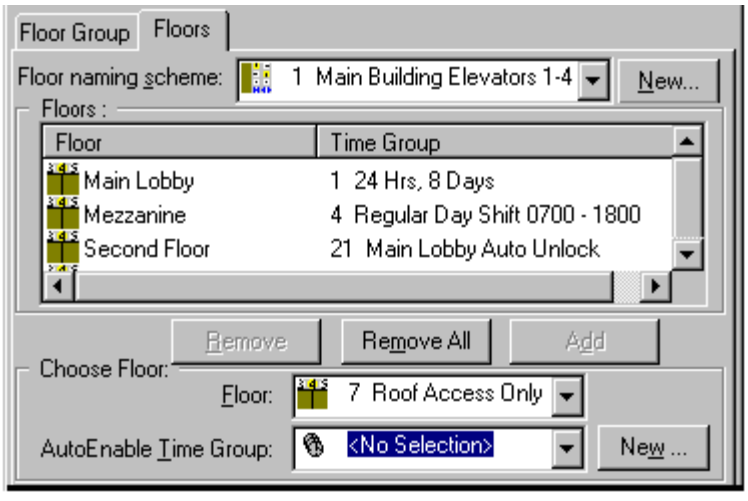


Star II Door Elevator Floor Group Configuration Data: Floor Group Tab

Small buildings that have only one Star II Controller will probably have only one or two elevators. This simplicity usually dictates that there will be only one Floor Group. Larger applications with a NexSentry Manager or StarGaze Host may involve many buildings with many different Elevator and Floor Group combinations.

Star II Door Elevator Floor Group Config Data: Floor Group Tab

ID Number	Enter the ID # for each Elevator Floor Group. A logical numbering scheme is suggested for easy database management.
Description	Enter a description of the Floor Group based on physical location or the primary people who us it.
Elevators Available	Select one or more Elevators from the list to Add to the Selected list.
Elevators Selected	The list of Elevators to be included in the Group.



Star II Door Elevator Floor Group Configuration Data: Floor Tab

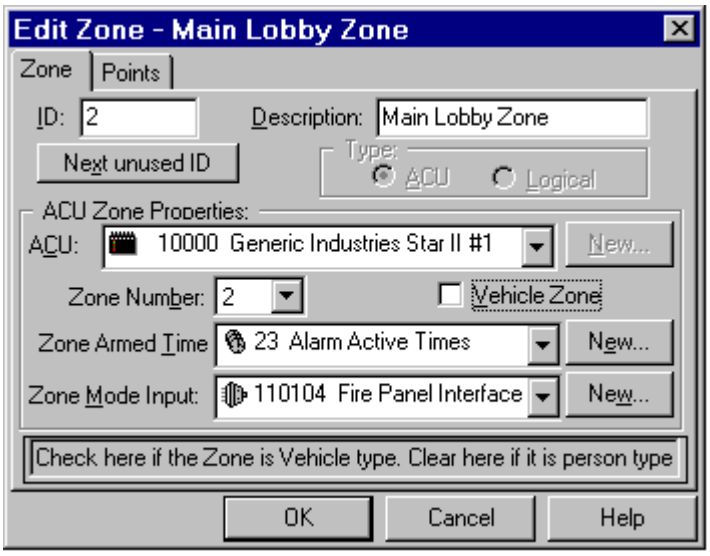
Star II Door Elevator Floor Group Configuration Data: Floor Tab

Floor Naming Scheme	Select a previously defined Floor Naming Scheme from the Drop-list. The **Floor Names** will appear in the **Floors box** below.
Floors (box)	Displays the list of Floor Names associated with the Floor Naming Scheme selected above.
Choose Floors - Floor	Displays the Floors from the Floor Names table one by one.
Choose Floors - Autoenable Time Group	Allows a Time Group to be associated with each Floor to automatically enable the Elevator Floor buttons during the duration of the Time Group.
Add Button	When the two steps above have been completed, the **Add button** will be highlighted as shown. You must **click Add** to move the combination you just created up to the **Floors box** above.
Repeat the above steps for each floor selection	You must repeat the above 3 steps for each Floor you wish to add. The **Floor** selection field will automatically index after each **Add** function.
Remove Button	If you wish to remove a floor from the **Floors summary box**, you must first click on the **Floor**, then click **Remove**.
Remove All Button	This button will remove All floors from the **Floors summary box** and allow you to start over. The **program will verify this selection**.

STAR II ZONES

The Star II Controller allows the building owner to logically divide the building into up to sixteen **Zones**, each **Zone** being an individual controlled entity, capable of being **Armed** or **Disarmed**, **Shunted**, **Disabled**, or **Monitored**. All of the items within the **Zone**: Input Points, Readers (especially station readers), Door Relays, other Relays, etc., (being part of the **Zone**), directly affect the ability to **Arm** or **Monitor** the **Zone**, (unless an item itself is shunted). To **Disable** a **Zone** is to totally cease any ineraction of the ACU with the **Zone**. To **Shunt** a **Zone** is to continue to receive inputs from the **Zone**, but to issue no outputs or commands to the **Zone** (except the **Unshunt** command) as long as the **Shunt** condition remains.

(The Star II **Zone** feature replaces the **Building Modes** feature used in previous ACUs and is considerably more powerful, since each ACU can control up to 16 **Zones**.)



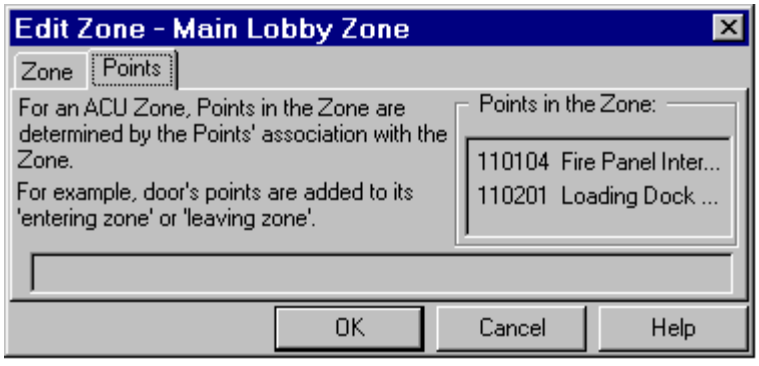
Star II Zones: Zone Tab

Star II Zones: Zone Tab

ID Number	Enter the ID # for each Zone.
Description	Enter a description of the Zone based on physical location or the primary people who use it.
Type	This entry is only applicable to the full NexSentry Manager 3.0 system and is not available in NSM-Lite.

ACU Zone Properties:

ACU	Select the only available ACU from the drop box.
Zone Number	This is a pull-down list of zone numbers(1-16).
Vehicle Zone	(If this item is checked, the Zone will be used for vehicles. If the item is not checked, the Zone will be used for persons.)
Zone Armed Time	Select a previously-configured Time Group determining when the Zone is to be Armed.
Zone Mode Input	Select a previously-configured input point that will be used in conjunction with a **Station Reader** to Arm or Disarm this zone.



Star II Zones: Points Tab

Star II Zones: Points Tab

Points in the Zone This is an informative screen which lists the Readers and Points, (monitor Input Points and Relay Output Points), within the Zone.

STAR II ACCESS CODES

Access Codes in the Star II Controller are very similar to previous ACUs with the addition of the Elevator Control feature. Individual **Doors** and **Elevators** are linked to **Time Groups** to control when **Access** will be **Granted** to **Cardholders**. Access Codes are created for the needs of specific groups of people. Completed **Access Codes** are then linked with each **Cardholder** when the Cardholder records are created. In order to efficiently create Access Codes, it is necessary to have already completed **Time Codes, Time Groups, Doors** and **Elevators**.

The first step is to number and name the Access Code. Subsequent steps will link Doors and Elevators with the Time Groups,

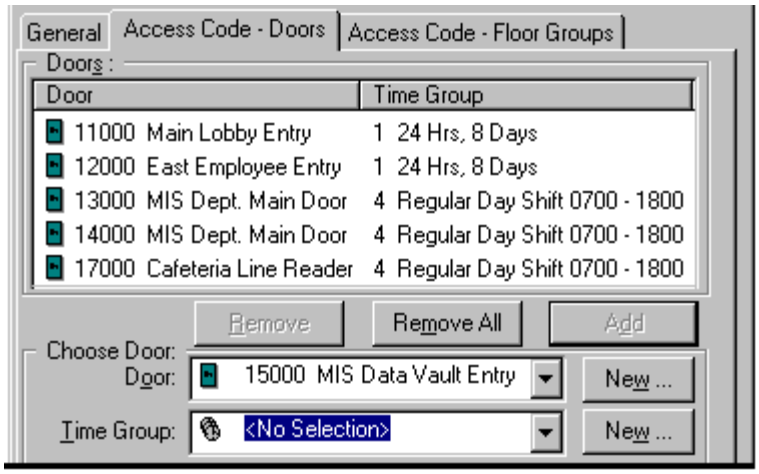


Star II Door Access Code Configuration Data: General Tab

Star II Door Access Code Configuration Data: General Tab

ID Number Enter the ID # for each Access Code. Access Code #1 is almost always unlimited access.

Description Enter a description of the Access Code based on where it can be used or the primary people who use it.



Star II Door Access Code Configuration Data: Access Code - Doors Tab

Star II Door Access Code Config Data: Access Code - Doors Tab

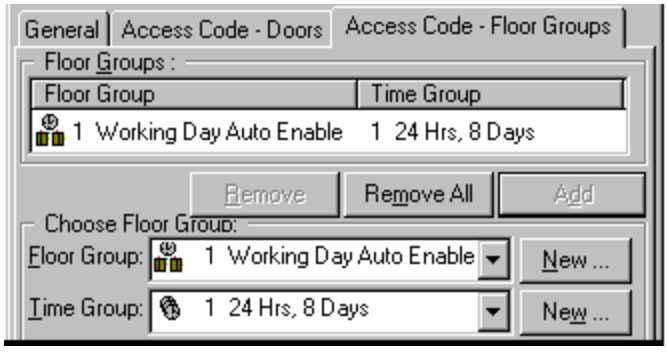
Doors (box) Displays the list of Doors that have been added to this Access Code. When you begin to create a new Access Code, this box will be empty.

Choose Doors - Door Displays the Doors from the Door table, one by one.

Choose Doors - Time Group Allows a Time Group to be associated with each Door to determine when Access will be Granted.

Star II Door Access Code Config Data: Access Code - Doors Tab (continued)

Add Button	When the two steps above have been completed, the **Add button** will be highlighted as shown. You must **click Add** to move the combination you just created up to the **Doors box** above.
Repeat the above steps for each door selection	You must repeat the above 3 steps for each Door you wish to add. The **Door** selection field will automatically index after each **Add** function.
Remove Button	If you wish to remove a Door from the **Doors summary box**, you must first click on the **Door**, then click **Remove**.
Remove All Button	This button will remove All Doors from the **Doors summary box** and allow you to start over. The **program will verify this selection**.



Star II Door Access Code Config Data: Access Code - Floor Groups Tab

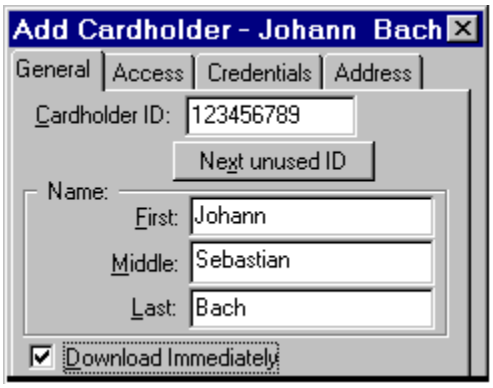
Star II Door Access Code Config Data: Access Code - Floor Groups Tab

Floor Groups (box)	Displays the list of Floor Groups that have been added to this Access Code. When you begin to create a new Access Code, this box will be empty.
Choose Floor Group - Floor Group	Displays the Floor Groups from the Floor Group table, one by one.
Choose Floor Group - Time Group	Allows a Time Group to be associated with each Floor Group to determine when Elevator Access will be Granted.
Add Button	When the two steps above have been completed, the **Add button** will be highlighted as shown. You must **click Add** to move the combination you just created up to the **Floor Groups box** above.
Repeat the above steps for each floor selection	You must repeat the above 3 steps for each Floor Group you wish to add. The **Floor Group** selection field will automatically index after each **Add** function.
Remove Button	If you wish to remove a floor from the **Floor Group summary box, you must first click on the Floor Group, then click Remove.**
Remove All Button	This button will remove All floors from the **Floor Group summary box** and allow you to start over. **The program will verify this selection**.

STAR II CARDHOLDERS

In the Star II Controller, A Cardholder is defined as any person programmed into the ACU Database for Access Control and tracking purposes. Cardholder is possibly misleading in that in also includes persons with only a PIN Number for use at a Keypad. A Cardholder is not necessarily going to have access to any Doors in the system. It is possible to assign Access Code **0** (zero) to an individual, which will deny access at all readers. This is occasionally done to track attempted access by terminated individuals who have not surrendered their card.

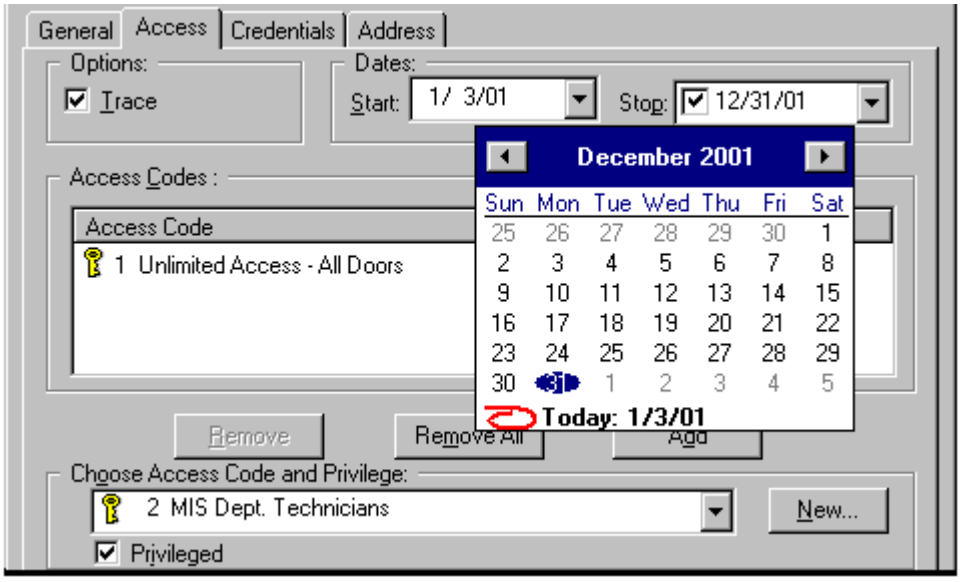
Much of the data in the four Cardholder windows is for the NSM Operator's benefit. The data that will be downloaded to the Star II will be noted.



Star II Door Cardholder Configuration Data: General Tab

Star II Door Cardholder Configuration Data: General Tab

ID Number	Enter the ID # for each Cardholder. The field is 9 digits long with the specific intent that it can be a Social Security Number. *NSM Lite data only.*
Names: First Middle Last	Enter the Cardholder's name. *NSM Lite data only.*
Download Immediately	Check this box if you want NSM Lite to send the Cardholder data to the Star II immediately.



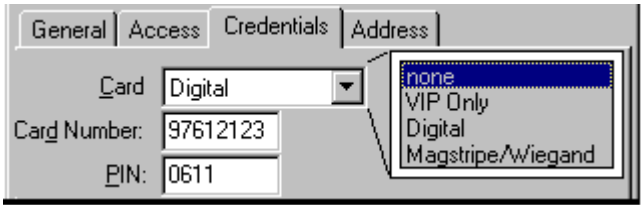
Star II Door Cardholder Configuration Data: Access Tab

Star II Door Cardholder Configuration Data: Access Tab

Trace	Check this box if you wish the Cardholder to be Traced. Trace causes a KEY TRACE event to occur along with every Access Transaction. KEY TRACE can be set up as an alarm event to alert an NSM Lite or Host system Operator.
Start Date	Select the starting date for the Cardholder from the hyper-link calendar. You can choose a date in the future and the card won't be granted access until that day. *NSM Lite data only.*
Stop Date	Select the Ending date for the Cardholder from the hyper-link calendar. Access privileges will stop on that day. *NSM Lite data only.*
Access Codes (box)	Displays up to four Access Codes that have been assigned to the Cardholder in the steps below.
Choose Access Code	Use the Drop-list to select an Access Code to be assigned to this Cardholder. **Up to four Access Codes may be assigned to each Cardholder.**
Add Button	When an Access Code has been selected above, the **Add button** will be highlighted as shown. You must **click Add** to move the Access Code you just created up to the **Access Codes box** above.
Repeat the above steps for each floor selection	You must repeat the above 2 steps for each Access Code you wish to add. The **Access Code** selection field will automatically index after each **Add** function.
Remove Button	If you wish to remove an Access Code from the **Access Codes box** summary box, you must first click on the Access Code, then click Remove.

Star II Door Cardholder Config Data: Access Tab (continued)

Remove All Button	This button will remove All Access Codes from the **Access Codes** summary box and allow you to start over. The program will verify this selection.
Privileged	Check this box if the Cardholder is to have **Special Permissions in a Zoned** environment.



Star II Door Cardholder Configuration Data: Credentials Tab

Star II Door Cardholder Configuration Data: Credentials Tab

Card	Select the Type of card to be used.
Card Number	Enter the Card number on the assigned card.
PIN	In a system using both **Card Readers *AND* Keypads,** enter a **user selected PIN** Number here.



NOTE: In a **Keypad-ONLY system**, enter the desired PIN Number in the **Card Number** field.

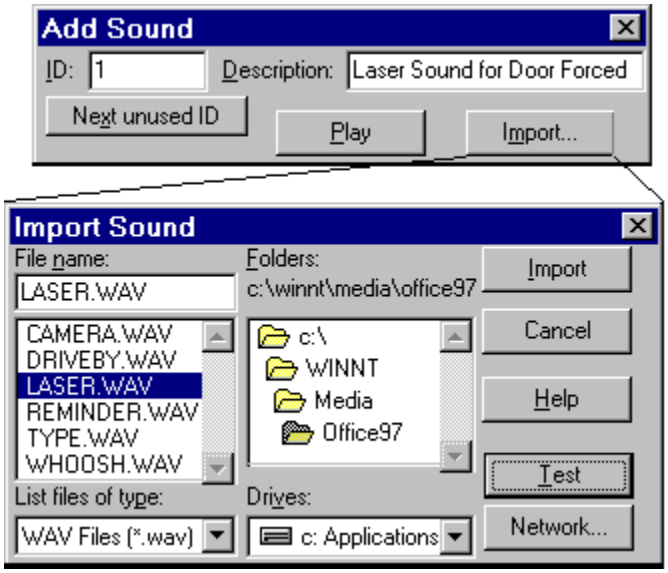


Star II Door Cardholder Configuration Data: Address Tab

NSM Lite data only. The three Address lines are for Operator information only and are not downloaded to the Star II ACU. If you choose to use these fields, our only advice is to establish a standard and STICK TO IT. In the example above, Line 2 has only the city while Line 3 has only the state and ZIP code. This makes locating the data and using it in NSM Lite (or any Host) much more reliable.

NSM Lite Transaction Sounds Configuration

The **Sounds** feature, used by NexSentry Manager, is also a part of NSM Lite. It allows you to define and import **.wav** files from any source for use in annunciating specific system Transactions. Windows NT has a small library of sounds in the Media folder. Other **.wav** files may be obtained on commercial CD ROM libraries or downloaded from the Internet. You may also record your own, such as a powerful voice saying: "DOOR FORCED OPEN," for instance. How you use these is completely up to the system owner.



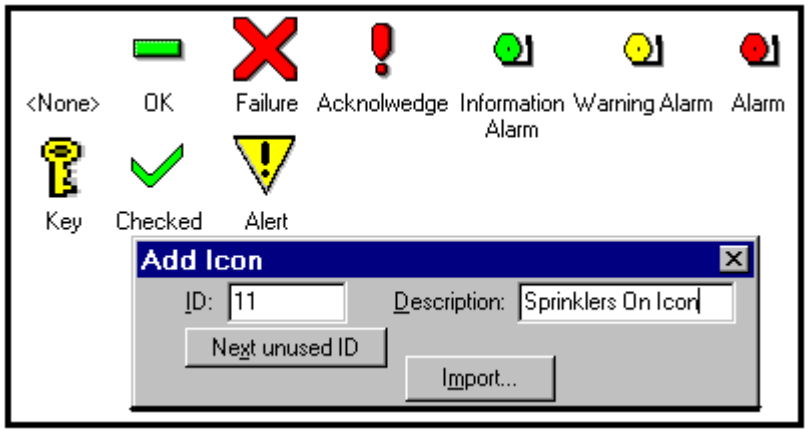
NSM Lite Sounds Config Data

NSM Lite Sounds Config Data

ID Number	Enter the ID # for each Sound.	*NSM Lite data only.*
Description	A description of the Sound.	*NSM Lite data only.*
Import Sound	Example of the Import Sounds selection dialog. *NSM Lite data only.*	

NSM Lite Transaction Icons Configuration

The **Transaction Icons** feature, used by NexSentry Manager, is also a part of NSM Lite. It allows you to define and import **Microsoft standard Icons**, from any source, for use in visually identifying specific system Transactions. Icons can only be assigned to Transactions which will be shown in the next section.



NSM Lite Icons Config Data

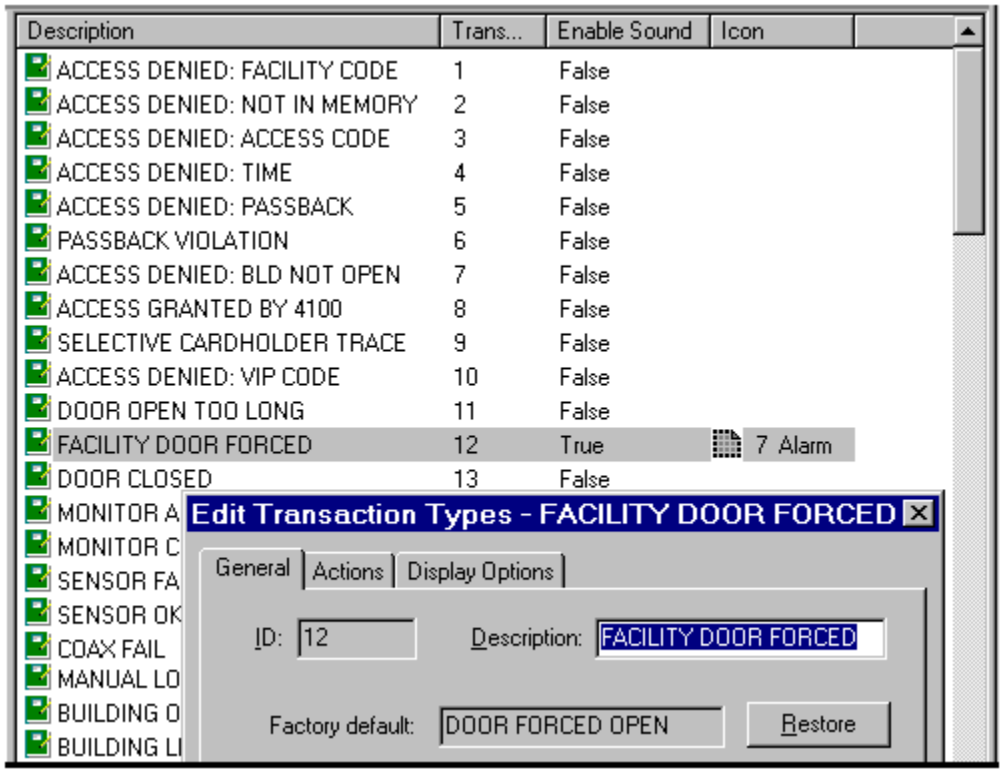
NSM Lite Icons Config Data

ID Number	Enter the ID # for each new Icon.	*NSM Lite data only.*
Description	A description of the Icon.	*NSM Lite data only.*
Import Icon	the appearance of this dialog box is identical to import Sounds above. *NSM Lite data only.*	

NSM Lite Transaction Types Configuration

The **Transactions** feature, used by NexSentry Manager, is also a part of NSM Lite. Every possible event that can happen within the Star II Controller is defined in NSM Lite as a Transaction. When an event occurs in the Star II, a CHIP Protocol message is sent to the PC. The NSM Lite program receives that message and handles it according to the Transaction configuration.

In the figure below, the Transaction Types dialog box for DOOR FORCED OPEN is shown on top of the Transaction table. You can see that the **Description** has been changed from the default.



NSM Lite Transaction Types Config Data: General Tab

NSM Lite Transaction Types Configuration Data: General Tab

ID Number The Transaction Type ID numbers are frozen. *NSM Lite data only.*

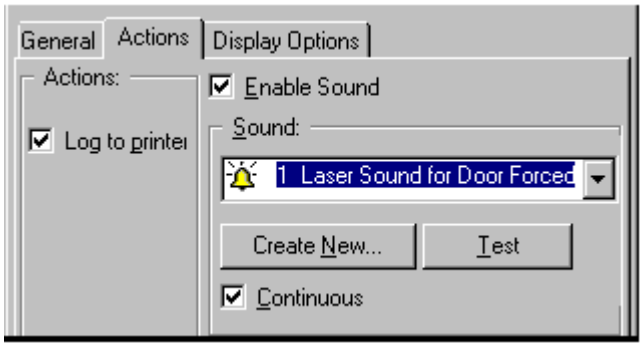
Description The message that you want to appear in the NSM Lite Monitor window will be typed here. *NSM Lite data only.*

NSM Lite Transaction Types Config Data: General Tab (continued)

Factory Default and Restore Button — The original WSE text for every Transaction is kept in a protected file. The Restore button will replace any text in the Description field with the factory default. *NSM Lite data only.*



NOTE: Be extremely cautious who has access to this function. A Mischievous person could reword many transactions as a prank. Just imagine if Access Granted were re-worded *Free Beer on Friday*, or worse, *Access Denied*.



NSM Lite Transaction Types Config Data: Actions Tab

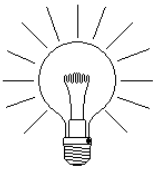
NSM Lite Transaction Types Configuration Data: Actions Tab

Actions Log To Printer — If a Log printer is to be used on the NSM Lite PC, Click here to cause a particular Transaction to go to the printer. *NSM Lite data only.*

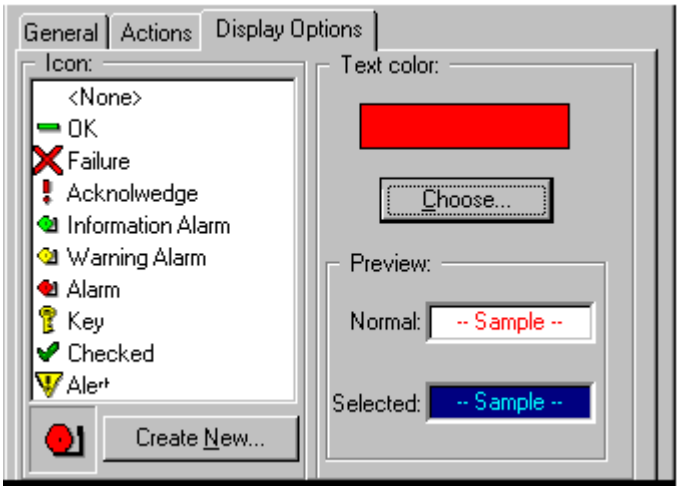
Enable Sound — Check this box to associate a Sound with the particular Transaction. *NSM Lite data only.*

NSM Lite Transaction Types Config Data: Actions Tab (continued)

Sound	Select a previously created Sound from the Drop-list. *NSM Lite data only.*
Continuous	Check this box to cause a Sound to be repeated continuously until an Operator silences it with the toolbar icon. *NSM Lite data only.*



NOTE: You can ***hyper-link*** to the Sounds Dialog box and create a new sound. You can also ***Test*** the Sound you have chosen.



NSM Lite Transaction Types Config Data: Display Options Tab

NSM Lite Transaction Types Config Data: Display Options Tab

Icon	Click on an Icon to link it to the Transaction. All default and imported Icons will appear in the box. The selected Icon will be shown in the lower left. *NSM Lite data only.*
Text Color (Box) and Preview	The current Text Color parameters will be shown in this box. The color determines the appearance of each **Transaction message in the Monitor window**. *NSM Lite data only.*
Choose button	Click this button to bring up a matrix of Text Color choices. *NSM Lite data only.*

NSM LITE/STAR II DAILY OPERATION



Typical daily operation of a Star II Controller with NSM Lite interface involves four basic functions:

- Monitoring system activity (Access Granted, Door Held Open, etc.).
- Monitoring component status (Doors Unlocked, Inputs Active, etc.)
- Overriding current system status (Unlocking a Door, etc.)
- Routine Database management (New Cardholders, Access Assignments, etc.)

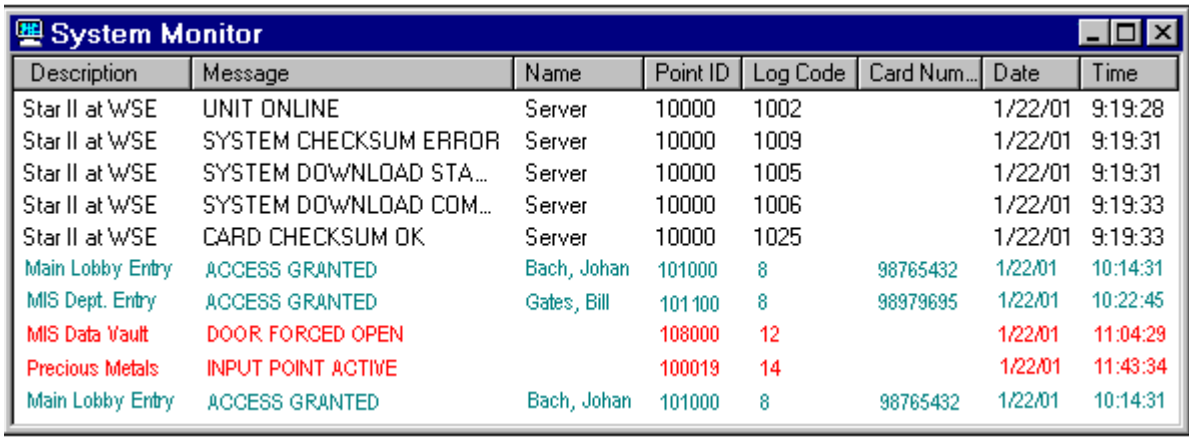
This chapter covers the following topics pertaining to the above:

- "Monitoring the System" on page 11-2
- "NSM Lite Client Window Menu Operation" on page 11-4
- "NSM Lite/Star II Status and Override Functions" on page 11-9
- "Poller Status and Overrides" on page 11-11
- "Door Status and Overrides" on page 11-12
- "Input Point Status and Overrides" on page 11-15
- "Output Point (Relay) Status and Overrides" on page 11-17
- "ACU (Star II Controller) Status and Overrides" on page 11-18
- "Star II Zone Status and Overrides" on page 11-20
- "Star II Elevator Control Status and Overrides" on page 11-22

MONITORING THE SYSTEM

When you first log on to the NSM Lite program, the **Monitor** window is opened automatically. The Monitor window will display Transaction Logs for all events that take place in the combined Star II and NSM Lite system. You can adjust the size of the window, and the width individual columns to suit your own viewing preferences. The Monitor window, however, can't exist without the **NSM Lite Client window** being open. Also, the Monitor Window can't be larger than the Client window.

There is a Scroll Bar on the Right edge of the Monitor window. This allows you to scroll back and forth through the Monitor table to see all Transactions currently held in the table. The size of the Monitor table is set in the Database menu at the top of the Client window.



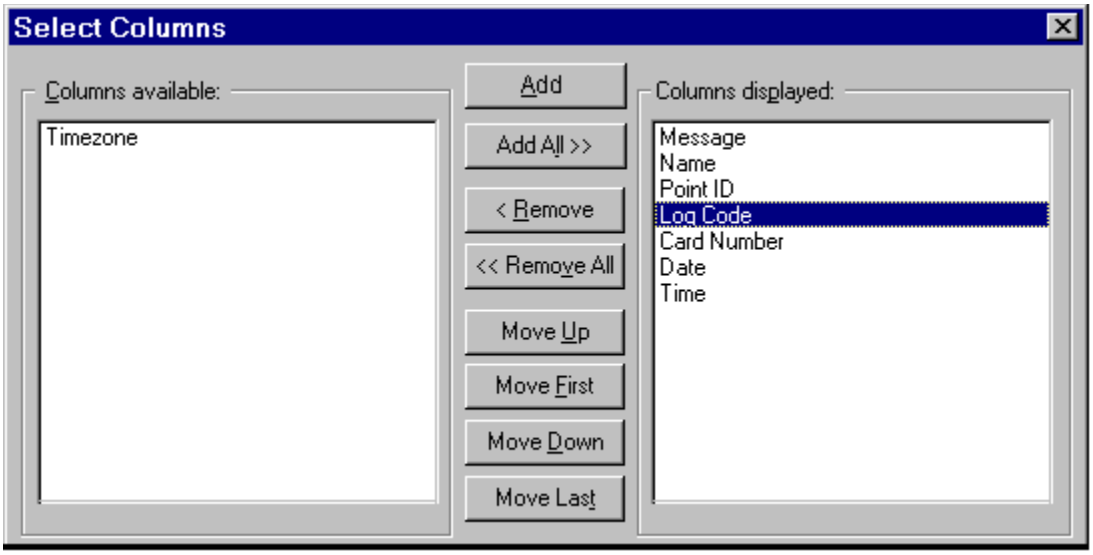
Description	Message	Name	Point ID	Log Code	Card Num...	Date	Time
Star II at WSE	UNIT ONLINE	Server	10000	1002		1/22/01	9:19:28
Star II at WSE	SYSTEM CHECKSUM ERROR	Server	10000	1009		1/22/01	9:19:31
Star II at WSE	SYSTEM DOWNLOAD STA...	Server	10000	1005		1/22/01	9:19:31
Star II at WSE	SYSTEM DOWNLOAD COM...	Server	10000	1006		1/22/01	9:19:33
Star II at WSE	CARD CHECKSUM OK	Server	10000	1025		1/22/01	9:19:33
Main Lobby Entry	ACCESS GRANTED	Bach, Johan	101000	8	98765432	1/22/01	10:14:31
MIS Dept. Entry	ACCESS GRANTED	Gates, Bill	101100	8	98979695	1/22/01	10:22:45
MIS Data Vault	DOOR FORCED OPEN		108000	12		1/22/01	11:04:29
Precious Metals	INPUT POINT ACTIVE		100019	14		1/22/01	11:43:34
Main Lobby Entry	ACCESS GRANTED	Bach, Johan	101000	8	98765432	1/22/01	10:14:31

NSM Lite Monitor Window

The data columns that appear in the Monitor window and the order in which they appear can be configured using the **Monitor Columns** feature as shown below. For example, the **Log Code** column shown

above is not very useful. It simply displays the Transaction number from the Transaction types Table. Every ACCESS GRANTED that ever happens will be Log Code 8.

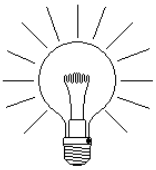
If you remove **Log Code** from the window, you can re-adjust the sizes of the other columns to better use the width available. Similarly, you might want to have the Time and Date at the extreme left side of the window. With the **Monitor Columns** feature, you can use the **Move Up** or **Move First** buttons and relocate the fields up the list to become the first and second columns in the window.



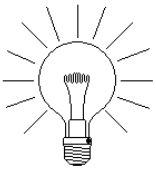
NSM Lite Monitor Columns Dialog Box

NSM LITE CLIENT WINDOW MENU OPERATION

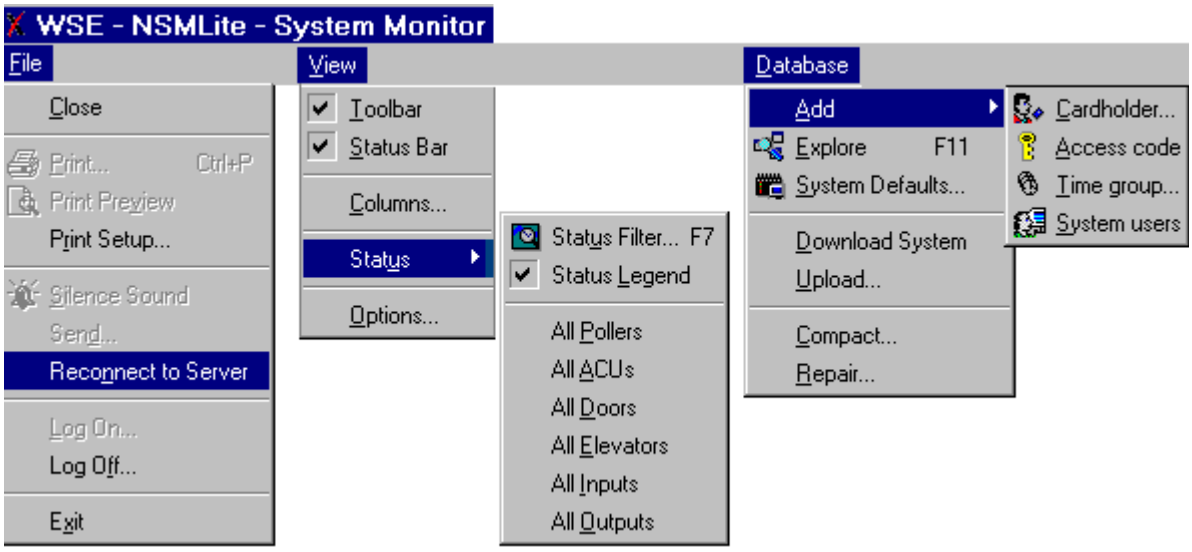
There is a standard **Microsoft Menu Bar** in the **NSM Lite Client** window. Some of the Menu options duplicate **Toolbar** and **Database** Explorer functions.



NOTE: These duplicated functions will not be discussed in any detail in this manual. Other functions in the Menu Bar are unique. These will be explained below each illustration. If a Drop-down Menu has sub-menus, these will be shown alongside, rather than partly overlaying the primary drop-down, as it would be in the actual product.



NOTE: Showing multiple drop-down menus in the same illustration is also not how the actual system will look, but this procedure is more instructive, (and conserves printing space).



NSM Lite Client Window Menu Bar #1

NSM Lite Client Window Menu Bar #1

File

Log On	Allows an operator to log on from a monitor-only condition.
Log Off	Logs the Operator off from NSM Lite but the Monitor window will remain open and running.
Exit	Shuts down NSM Lite, both Client and Server.

View

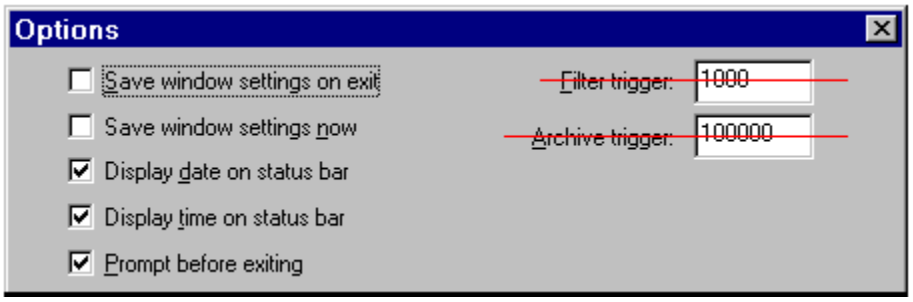
Toolbar **Status Bar**	The check-boxes allow you to select both the Toolbar and Status Bar to be shown in the Client Window
Columns	Invokes the Columns window shown on the previous page.
Status	Allows Status Window (no Zone Filter) selection.

NSM Lite Client Window Menu Bar #1 (continued)

Options	Invokes the **Options Dialog Box** as shown below.

Database

Add	Opens the secondary menu as shown.
Explore	Opens the **Database Explorer** Window.
System Defaults	Invokes the System Defaults Dialog Box as shown below.
Download System	Transmits the Star II Database from NSM Lite.
Upload	Extracts a Database from an existing Star II.
Compact and Repair	Utilities to manipulate the NSM Lite Database. More commonly used in the full NexSentry Manager Host system.



NSM Lite Client Window Options Dialog Box

The five check-boxes on the left should be clear in their purpose.

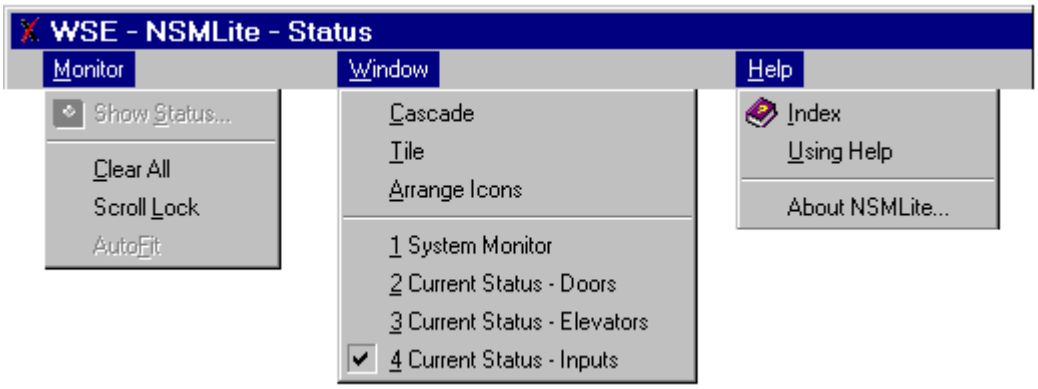
The two fields on the right are only used in the full **NexSentry Manager** Host and ***do not apply to NSM Lite***.



NSM Lite Client Window System Defaults Dialog Box

NSM Lite Client Window System Defaults

Company Name	Enter the name that you want to be printed on every database report you generate.
Download database on discrepancy	Leave **Unchecked**. It is not applicable to NSM Lite.
Log printer port	If you will use a real-time Log Printer, where will it be connected. **LPT1 - LPT4** or **None**.
Image Format	A remnant from the full **NexSentry Manager** Host. It is not applicable to NSM Lite.
Number of Monitor Messages to track	This value establishes how many **Transaction Logs will be stored in the Monitor Window Queue.**



NSM Lite Client Window Menu Bar #2

NSM Lite Client Window Menu Bar #2

Monitor

Clear All	Deletes the contents of the Monitor Window.
Scroll Lock	Locks the Monitor Window at a particular place. Prevents new Transactions from automatically scrolling the window to the bottom.

Window

Cascade and Tile	Arranges the Child windows within the Parent Window.
Arrange Icons	For future use.
System Monitor Current Status - Doors Etc.	A list of all windows open within NSM Lite Client. This will even display windows that may be minimized and hidden by other windows.

Help

Invokes the NSM Lite **Help** and **About** functions.

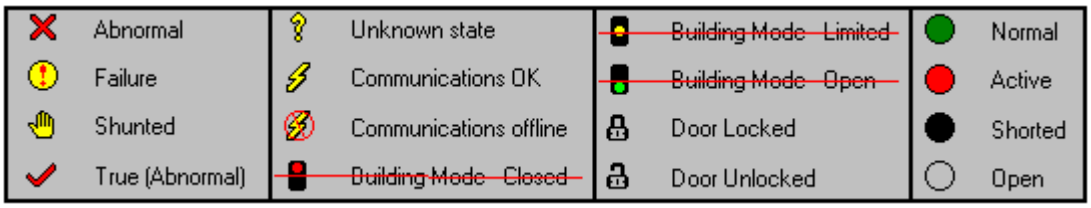
NSM LITE/STAR II STATUS AND OVERRIDE FUNCTIONS

There are six Status Windows that can be opened in the **NSM Lite Client window**. The six are **Poller, Door, Input, Output, ACU and Elevator**. Each Status window has a corresponding list of Overrides that can be performed. To access the Override list, you must Right-click on a component within a Status window. The appropriate Override menu for that particular component will appear.

If you use **Control+Click** or **Shift+Click**, you can select multiple components, then **Right-click** in them to make the same Override action on all selected items. For example, to manually Unlock 4 doors, hold down the Control (Ctrl) Key and Left-click each door. Then, do a Right-click on any one of them to open the override menu. Click on Unlock and all four doors will unlock at the same time. This is extremely useful for manually Locking all Doors in case of a weather or power-outage emergency or shunting a large group of alarm-monitoring Inputs in case of a party or open-house in the building.

The Status and Override windows will be shown in the order mentioned above.

There is a table of Status Icons on the right side of the Client window. It is shown below (in an altered format). The **Modem** icons have been intentionally left off since they don't apply to NSM Lite. An explanation of each Icon follows to insure clarity and understanding.



NSM Lite Status Icons

NSM Lite Status Icons

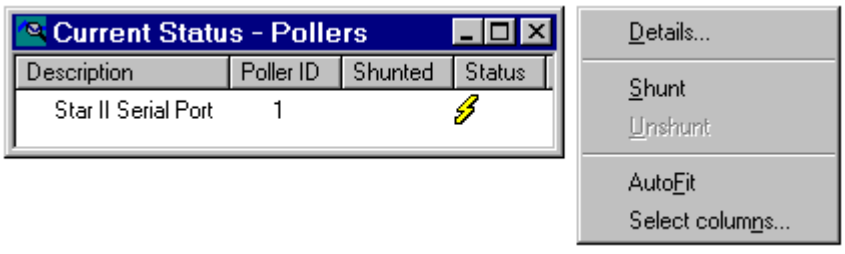
Abnormal	Appears for a Door that is Forced or Held open.
Failure	Identifies a Reader, Keypad, or other component that is not responding to the Star II.
Shunted	Any component that has been stopped from sending Transaction logs about its status.
True (Abnormal)	Indicates a benign abnormal condition such as an Unlocked Door or an Actuated Output.
Unknown State	The component is connected to a Star II Controller which is off-line from the NSM Lite.
Communications OK	Indicates communication between the NSM Lite and the Star II Controller.
Communications Offline	Indicates failed communication between the NSM Lite and the Star II Controller.
~~**Building Closed**~~	Not Applicable to Star II.
~~**Building Limited**~~	Not Applicable to Star II.
~~**Building Open**~~	Not Applicable to Star II.

NSM Lite Status Icons (continued)

Door Locked	Indicates a Door that is Locked. It can be locked either by Time Group or by a previous override.
Door Unlocked	Indicates a Door that is Unlocked. It can be unlocked either by Time Group or by a previous Operator override. It will not show Unlocked following Access or Exit Granted.
Normal	An Input or Output that is in its expected state.
Active	Identifies an Input Point that is in an Active state. This could indicate an intrusion, abnormal temperature or other exceptional condition.
Shorted	An Input (4-state) that is shorted out.
Open	An Input (4-state) that is in an open circuit.

POLLER STATUS AND OVERRIDES

The figure below shows the Status window and the Overrides list for the NSM Lite Poller.



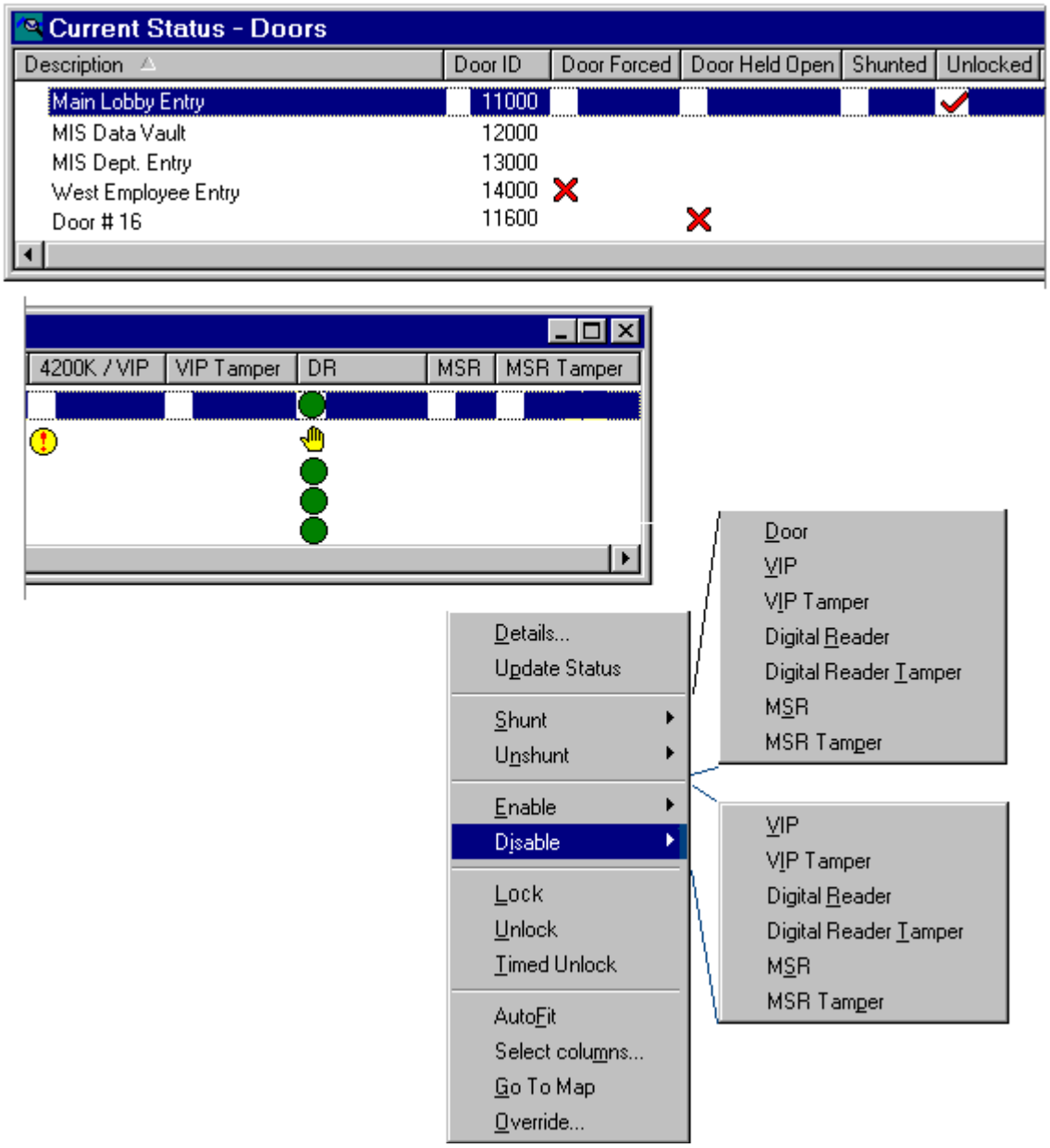
NSM Lite Poller Status and Overrides

NSM Lite Poller Overrides

Shunt	Stops the Poller from communication.
Unshunt	Restores Poller communication to Star II ACU.
AutoFit	Adjusts window width for all columns selected.
Select Columns	Chooses which component condition columns to display in the Status Window.

DOOR STATUS AND OVERRIDES

The figure below (contrived to show all possibilities in one illustration) shows the **Door Status** window and all of its **Override** possibilities. (The Shunt menu and Disable menu will never appear at the same time in a real system.)



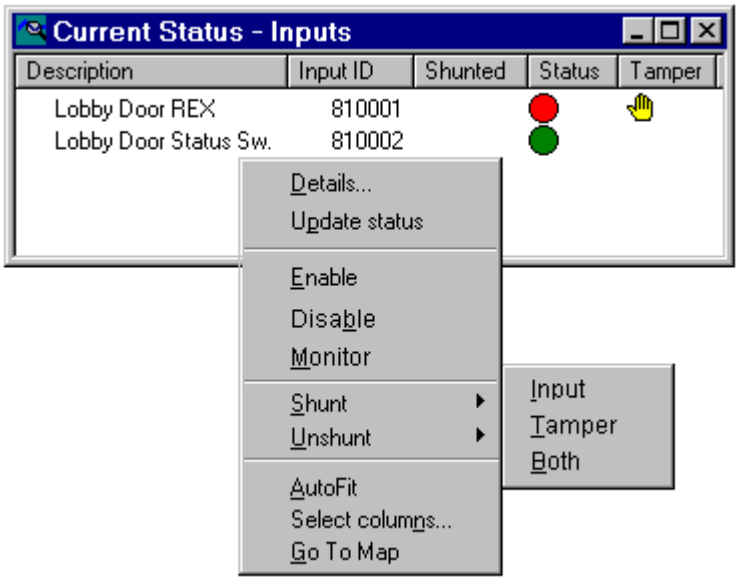
NSM Lite / Star II Door Status and Override Window

NSM Lite Door Overrides

Details	Shows all possible Status items for Door Status.
Update Status	Commands the Poller to extract the most current component status from the Star II Controller.
Shunt	Stops any selected component or function from sending Transaction logs about its status.
Unshunt	Restores any selected component or function back to sending Transaction logs about its status.
Lock	Puts a selected Door(s) in the Locked State.
Unlock	Puts a selected Door(s) in the Unlocked State.
Timed Unlock	Puts a selected Door(s) in the Unlocked State for the time period programmed as Unlock Time (0-240). The door will behave as if an Access Granted Transaction has occurred.
AutoFit	Adjusts window width for all columns selected.
Select Columns	Chooses which component condition columns to display in the Status Window.
Go to Map	Opens the first map ID # that contains this selected Door.
Override	Opens a matrix dialog box where multiple Override functions can be performed at the same time. For example, you could first select several Doors (Ctrl+Click), then Unlock ***and*** Shunt DR on all of them at once.

INPUT POINT STATUS AND OVERRIDES

The figure below shows the **Input Point Status** window and all of its **Override** possibilities. The **Shunt** menu and **Unshunt** menu will never appear at the same time in a real system. The figure was contrived to show all possibilities in one illustration.



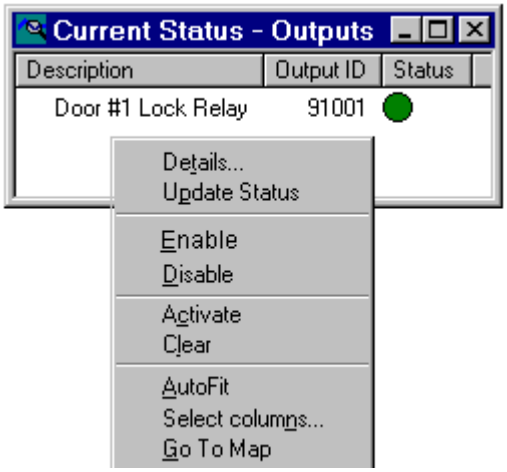
NSM Lite / Star II Input Point Status and Override Window

NSM Lite Input Point Overrides

Details	Shows all possible Status items for Input Status.
Update Status	Commands the Poller to extract the most current component status from the Star II Controller.
Enable	Turns an Input Point on and let it report activity.
Disable	Turns an Input Point off completely.
Monitor	Turns an Input Point off, but allows it to continue to show any Short/Open conditions.
Shunt	Stops any selected component or function from sending Transaction logs about its status.
Unshunt	Restores any selected component or function back to sending Transaction logs about its status.
AutoFit	Adjusts window width for all columns selected.
Select Columns	Chooses which component condition columns to display in the Status Window.
Go to Map	Opens the first map ID # that contains this selected Input Point.

OUTPUT POINT (RELAY) STATUS AND OVERRIDES

The figure below shows the **Output Point Status** window and all of its **Override** possibilities.



NSM Lite / Star II Output Point Status and Override Window

NSM Lite Output Point Overrides

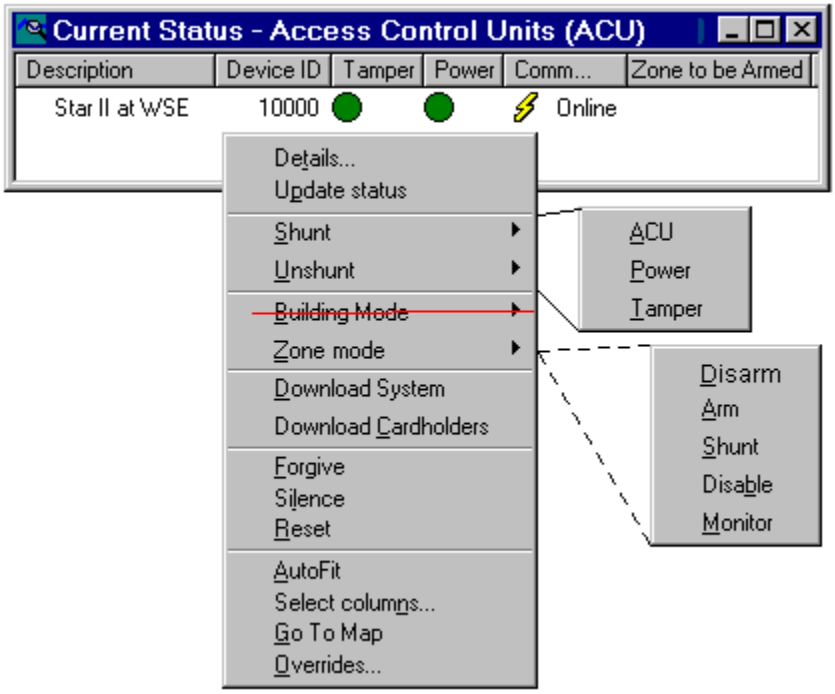
Details	Shows all possible Status items for Output Status.
Update Status	Commands the Poller to extract the most current component status from the Star II Controller.
Enable	Allow an Output Point to receive and respond to commands.
Disable	Turns an Output Point off completely so it will not respond to activation commands of any kind.

NSM Lite Output Point Overrides (continued)

Activate	Turn a Relay on to Close its Normally Open contact.
Clear	Turn a Relay off to Open its Normally Open contact.
AutoFit	Adjusts window width for all columns selected.
Select Columns	Chooses which component condition columns to display in the Status Window.
Go to Map	Opens the first map ID # that contains this selected Output Relay.

ACU (Star II Controller) Status and Overrides

The figure below shows the **ACU Status** window and all of its **Override** possibilities.



NSM Lite / Star II ACU Status and Override Window

NSM Lite ACU Overrides

Details	Shows all possible Status items for Output Status.
Update Status	Commands the Poller to extract the most current component status from the Star II Controller.
Shunt *and* **Unshunt**	**ACU**: stop and start ACU Communications. **Power**: disable and enable Power Fail logs. **Tamper**: disable and enable ACU Tamper logs.
Zone 1 mode	Changes the current mode of ACU Zone 1.

NSM Lite ACU Overrides (continued)

Forgive	Forgive Passback. Resets all cards to the default, **Unknown** state.
Silence	Clears all **Latched** Output Relays.
Reset	Recycles the ACU. It is the same as turning the power off and back on.
AutoFit	Adjusts window width for all columns selected.
Select Columns	Chooses which component condition columns to display in the Status Window.
Go to Map	Opens the first map ID # that contains this selected Door.
Override	Opens a matrix dialog box where multiple Override functions can be performed at the same time. For example, you could **Shunt Power, Shunt Tamper** and **Silence Latched Contacts** all at once.

STAR II ZONE STATUS AND OVERRIDES

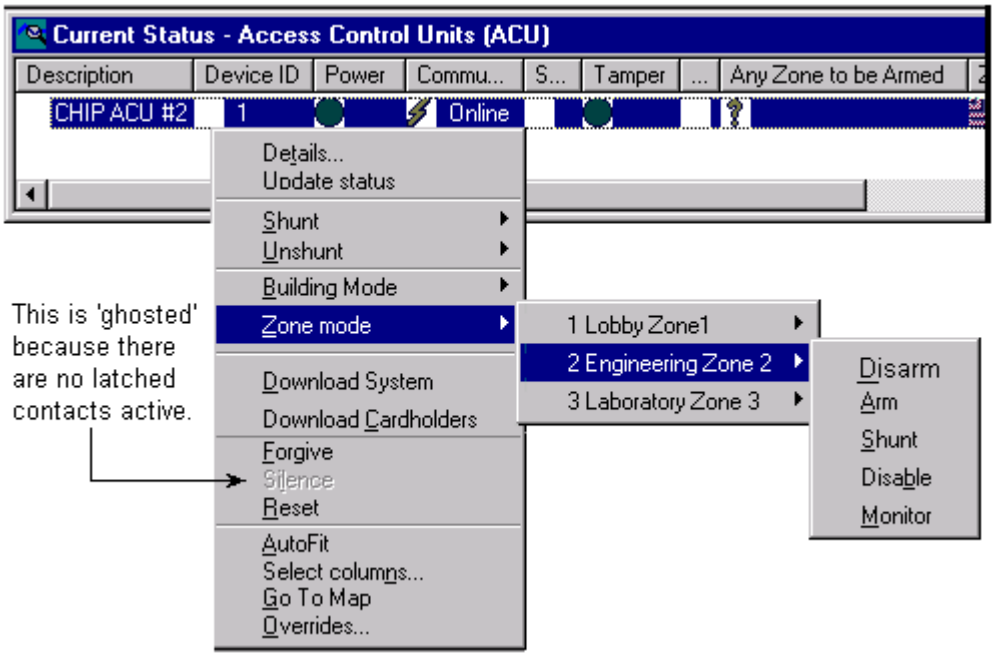
Zone Status and Override control is accomplished as a component of the **ACU Status** window:

- Open the **ACU Status** window
- **Right-click** on the **ACU Description** to open the **Override** menu.
- **Click Zone Mode.** All existing Zones (up to 16) will be listed .
- Move the mouse pointer into the Zone list.

To change the mode of a specific Zone:

- Scroll down until the desired Zone is highlighted. The Override menu will change to list the options available for that particular Zone as shown in the example. The current Zone status will be shown in reverse text.
- **Select** and **left-click** the **Zone Override** action you wish to engage.

When a Zone has been placed in an abnormal state, it will remain in that state until a manual override or an automatically scheduled command returns the Zone to its normal condition



NSM Lite/Star II Zone Status and Override Control Window

NSM Lite/Star II Zone Status and Override Control Commands

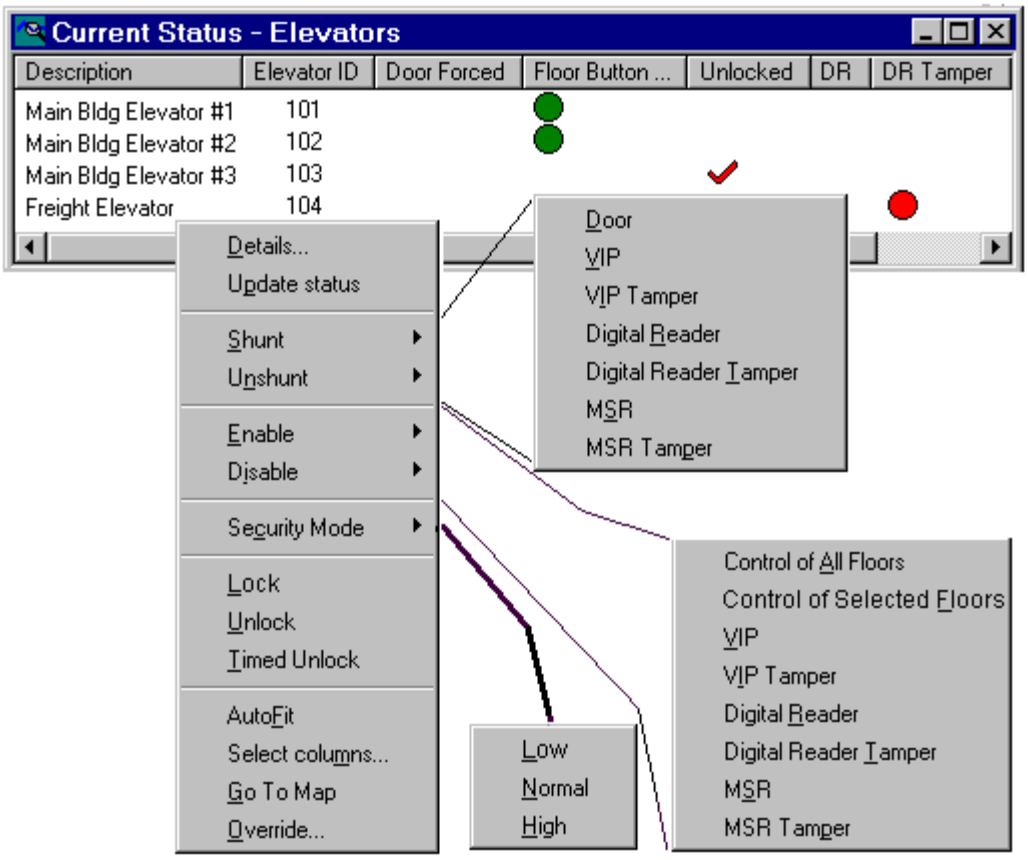
Disarm (Disarmed)	Places the Zone in its **normal state** when the space within the Zone is normally occupied. Typically, all Readers in the Zone will work normally, and intrusion detectors will be ignored
Arm (Armed)	Places the Zone in an **active state** when the Zone is unoccupied. Some readers may be disabled or available only to Privileged cards. Monitor points will be active.
Shunt (Shunted)	A Shunted Zone will **shunt all Readers, Input Points and Output Relays** associated with the Zone.
Disable (Disabled)	A Disabled Zone will **turn off all Readers** within the Zone. It will also place all Output Relays in their non-energized state.
Monitor (Monitored)	A Monitored Zone will stop all **Input Active** or **Clear** activity, but will still allow **Open** or **Short** messages to come through.

STAR II ELEVATOR CONTROL STATUS AND OVERRIDES

The figure below shows the **Elevator Status** window and all of its **Override** possibilities. The Elevator function is very similar to the Door function in its application and management. The first release of Star II has modest Elevator Control capability matching that of

most other commercially available systems. This feature will be significantly enhanced in future product releases.

‘



NSM Lite Elevator Status and Override Window

NSM Lite Elevator Overrides

Details	Shows all possible items for Elevator Status.
Update Status	Commands the Poller to extract the most current component status from the Star II Controller.
Shunt ***and*** **Unshunt**	**Prevent or Allow** each item in the list to be reported and displayed in Monitor.
Enable ***and*** **Disable**	**Turn on or off** each capability in the correspon-ding list.
Security Mode	For future use. Does not function with Release 1.
Lock	Puts selected Elevator Relay(s) in the Locked State.
Unlock	Puts selected Elevator Relay(s) in the Unlocked State.
Timed Unlock	Puts a selected Elevator Relay(s) in the Unlocked State for the time period programmed as Unlock Time (0-240). The Relay will behave as if an Access Granted Transaction has occurred.
AutoFit	Adjusts window width for all columns selected.
Select Columns	Chooses which component condition columns to display in the Status Window.
Go to Map	Opens the first map ID # that contains this selected Door.
Override	Opens a matrix dialog box where multiple Override functions can be performed at the same time. For example, you could Shunt DKR Tamper, Enable a Keypad and Unlock a set of Relays, all at once.

12 Upgrading the Access Control Unit

The basic NexSentry Star II ACU is a 2-Door system. You can upgrade the system to handle 4, 8, or 16 Doors by placing a personality chip on the ACU.

This chapter covers the following topics:

- "Placing the Personality Chip" on page 12-1
- "Removing the Personality Chip" on page 12-3

Placing the Personality Chip

This section covers how to place the personality chip on the NexSentry Star II ACU.

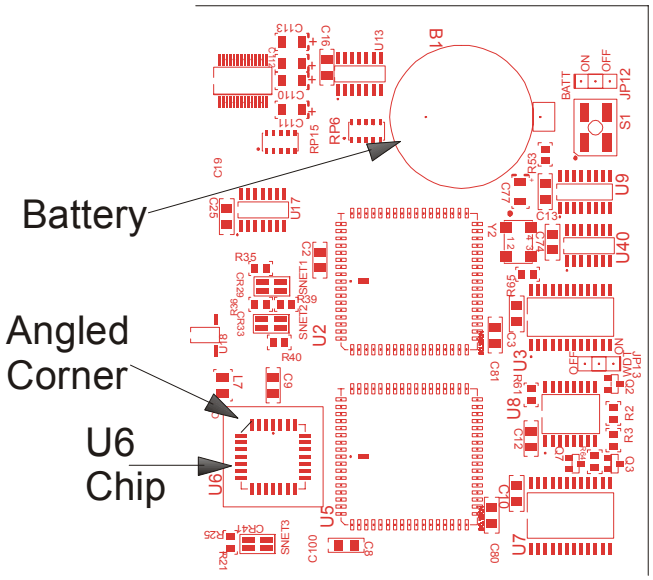


CAUTION: Refer to the specific release notes for more information.

To place the chip:

1. **Check that the battery switch is turned on.**
2. **Ground yourself to the work area and the ACU to discharge static electricity.**
3. **Turn off the AC power supply to the ACU.**

4 Find the U6 position on the ACU.



Placing the ACU U6 Personality Chip

5 Place the chip into the U6 position with the angled corner in the top-left hand corner. Make sure the label is facing up.

6 With very firm pressure, push the chip until it snaps into place.

7 Turn the AC power back on and confirm the vital LED is flashing.

REMOVING THE PERSONALITY CHIP

This section covers how to remove the personality chip from the NexSentry Star II ACU. You need to have either an extractor tool, or a pocket knife to carefully ease the chip out of the socket.



WARNING: This chip is easily damaged during extraction. Use extreme caution, especially if you plan to re-use the chip in future installations.

TO REMOVE THE CHIP:

1. **Check that the battery switch is turned on.**
2. **Ground yourself to the work area and the ACU to discharge static electricity.**
3. **Turn off the AC power supply to the ACU.**
4. **Find the U6 position on the ACU. (See the diagram above.)**
5. **With an extractor tool, (or a pocketknife), carefully ease the U6 chip out of the socket.**

STAR CONTROLLER FLASH MEMORY DOWNLOAD INSTRUCTIONS

NexWatch has designed the Star I and Star II Controllers to employ the latest Flash Memory technology. The Controller's program can be updated simply by downloading a new program from a PC instead of replacing E-PROMS. Whenever a new revision of the program is available, and desired, it can be downloaded into the Star Controller. A Star I can be converted to a Star II. A Star II can be upgraded to a newer revision of firmware.



CAUTION. Although the process is relatively simple, it is vital to follow the instructions below exactly as presented.

You will need to use a PC operating under Windows 95, Windows 98 or Windows NT 4.0. An Internet connection and/or a CD-ROM drive will be required.

Getting the New Star Controller Program Revision

The new revision of Star Controller firmware may be obtained from our NexWatch Web-site or from a CD-ROM. You will need to load it into a specified file so you can find it later to download it into the controller.

Preparing the PC for Controller Set-Up

- Make sure that both ***Hyperterminal***™ (or a familiar equivalent) and the ***NexFlash*** program are loaded and accessible on the PC.
- Start ***Hyperterminal*** and configure it to operate at **115,200** baud; Use **8** Data Bits, **1** Stop Bit and **NO** Parity for ***Star II Controllers***; Use 7 Data Bits, 1 Stop Bit and ODD Parity for ***Star I Controllers***; Use your choice of serial port on the PC.

Preparing the Star Controller for Downloading

- Make sure the battery jumper is in the **ON** position and the shipping insulator is removed. Make sure the battery is good. If the download is interrupted for any reason and the battery is not on, it becomes very difficult to recover the unit.
- Move DIP switch S5 positions 1 and 2 to the **ON** position. (This enables the 115,200 baud rate at the Terminal Port.)
- Turn on the Power Supply for the controller.
- Connect a normal Null Modem cable from the PC serial port to the Star I Controller.
- Set up the ACU for the program download using the following steps:

1. Press **<esc>**;
2. Operator Name: **operator1** (not case sensitive);
3. **Password: new - (A list of 6 items will appear);**
4. **Enter item number: 2 - (A list of 19 items will appear);**
5. **Enter item number: 16;**
6. **Enter: 1: Host Port, 2, Terminal Port, 3: Cobox : 2**
7. **Boot Config 1:Change Boot Sec, 2: Change all: 1**
8. **Download Firmware (Y/N): N? Y**

Important: Verify that the Vital Function LED is GREEN and then goes OFF. This means that the memory has been erased. No further text will appear and the Star Controller is ready for the NexFlash Download.

Preparing the PC for Firmware Downloading

- Close the ***Hyperterminal*** program.
- Start the ***NexFlash*** program (like any other program). A Dialog Box will open.
- Click **Open** and browse to find the Firmware program revision obtained in the instructions under the ***Getting the New Star Controller Program Revision*** section above.
- Click **Configure Comm Properties**. A dialog box will open which is defaulted to Comm 1 and 115,200 baud. You may use any serial port (1 – 4) but **YOU MUST USE 115,200 Baud**.
- Click **OK**.

Downloading the Firmware

- Click **Start**.
- The program will now be downloaded into the Star Controller. There is a progress bar to indicate the progress of the program. **Start time**, projected **end time** and **elapsed time** are also displayed.
- When the downloading is finished, a pop-up box will say that the **Download is Complete**.
- The Star Controller should automatically reset and its Vital Function LED should resume its normal pulsing cycle.

Checking that the Download was Successful

Repeat the initial steps in the section ***Preparing the Star Controller for Downloading*** above to determine that the controller will respond. When this is successful, you may disconnect the PC and reset the Terminal Port Baud switches to their previous setting.

MAINTAINING THE ACCESS CONTROL UNIT

13

Although the NexSentry Star II ACU requires no on-going maintenance, it is recommended that the annual system inspection—which is required for UL 294 systems—be performed on all NexSentry installations. Otherwise, typical service on a NexSentry Star II ACU is limited to the replacement of batteries and fuses.

This chapter covers the following topics:

- "Replacing the ACU's Battery" on page 13-1
- "Replacing an ACU's Fuse" on page 13-2
- "Performing the Annual System Test" on page 13-3

REPLACING THE ACU'S BATTERY

This section covers how to replace the battery..



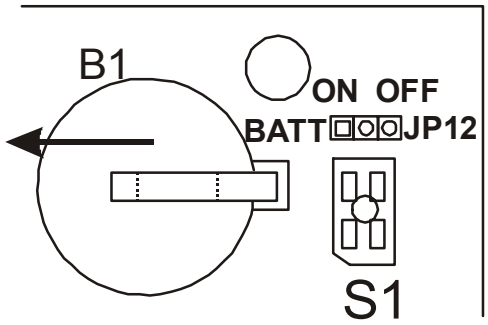
CAUTION: To retain the database in the system memory, the following procedure is performed with the AC power on. Use extreme caution to prevent personal injury or damage to the ACU.



WARNING: Lithium is a hazardous material. Therefore, observe all applicable regulations governing the disposal of such hazardous material when discarding the lithium battery. Replace the battery only with a 3-volt, BR 2325 lithium battery manufactured by Rayovac or Panasonic. Use of any other battery can present the risk of fire or explosion. Do not attempt to recharge a lithium battery, since the battery might explode.

TO REPLACE THE BATTERY:

1. **Turn the battery off – (jumper straddling right 2 pins of JP12).**
2. **Slide the battery out. Gently lift the retaining clip if necessary.**
3. **Slide the replacement battery under the retaining clip.**
4. **Turn the battery back on – (jumper straddling left two pins).**



Replacing the ACU Battery

REPLACING AN ACU'S FUSE

This section covers how to replace a fuse.

TO REPLACE A FUSE:

1. **Gently pull the fuse away from the ACU (or any other PCA).**
2. **Use a multimeter to verify whether the fuse is good or not.**
3. **Replace the fuse as necessary.**

PERFORMING THE ANNUAL SYSTEM TEST

For all UL 294 systems, you must perform the following test after the NexSentry Star II system has been installed, and annually thereafter. This ensures proper operation.

TO PERFORM THE ANNUAL SYSTEM TEST:

1. **Visual Inspection–Inspect all of the connectors, wiring, and cables for looseness, damage, or wear. Replace them if necessary.**
2. **AC Input Power Check–Measure the AC input power and verify that it is within 10% of the rating on the name plate of the power supply.**
3. **Power Supply Check:**
   a. **Inspect the backup batteries for cracks, warping, corrosion, and so forth, and replace them if damaged.**
   b. **With the power supply turned on, measure the voltage at the backup battery terminals and verify that the voltage is a nominal 24 VDC.**
4. **Backup Battery Check—If your system has a backup battery installed, disconnect the AC power to the power supply and verify that the system is still operational. Check only the portions of the system that are powered from the backup battery. Restore AC power to the power supply.**

5 **NexSentry Check:**

- a **Verify operation of the NexSentry LEDs on the NexSentry Star II ACU and the MIRO PC boards.**
- b **Visually check all fuses on the controller and the MIRO PCBs.**
- c **Check the voltage of the lithium battery on the ACU. If the voltage is less than 2.8 VDC, replace the lithium battery.**
- d **Verify the reporting of alarm conditions that are defined in the database by creating the alarm condition. For example, hold a door open for too long.**
- e **Verify that each monitor input on the ACU and the MIRO function correctly. Connect the appropriate resistor or wire to check each state.**
- f **Verify the proper operation of all relay outputs as defined in the system database.**

6 **Door Hardware Check:**

- a **Inspect the Door Switches for damage; replace them if required.**
- b **Inspect the door locks and hardware, replace them if necessary.**
- c **Using the system wiring diagram(s), setup sheets, installation plan(s), and building specifications, verify the operation of all Request-To-Exit switches, and Door Switches.**
- d **Verify the proper operation of all Keypads and Readers.**

TROUBLESHOOTING

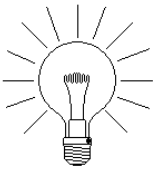
14

Field troubleshooting methods for the NexSentry Star II ACU, and any of the components connected to it (MIROs, WIROs, etc.), fall into three categories, Power, Communication Errors, and Communication Failures. The table below lists the most common symptoms of these conditions and provides suggested actions to identify and remedy the problem.

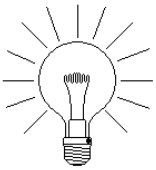
Symptom	Troubleshooting Action	
No VITAL function LED	Check the power	Check the power supply
		Check the Phoenix connector
		Check the fuses
		Check the socketed ICs (properly seated, no bent pins)
Com Failure	Check for VITAL function LED	See above
	Check the S-NET	Check the cable connections
		Check the grounding on the power supply
Com Errors	Check the S-NET	Verify correct termination (length considerations)
		Check the network length (AD4305 NexStar needed?)
		Add/Remove termination jumpers as required
		Check/Establish a common grounding sink
		Check the shield connections/apply shields as needed

Star II Troubleshooting Symptoms/Actions

14 TROUBLESHOOTING

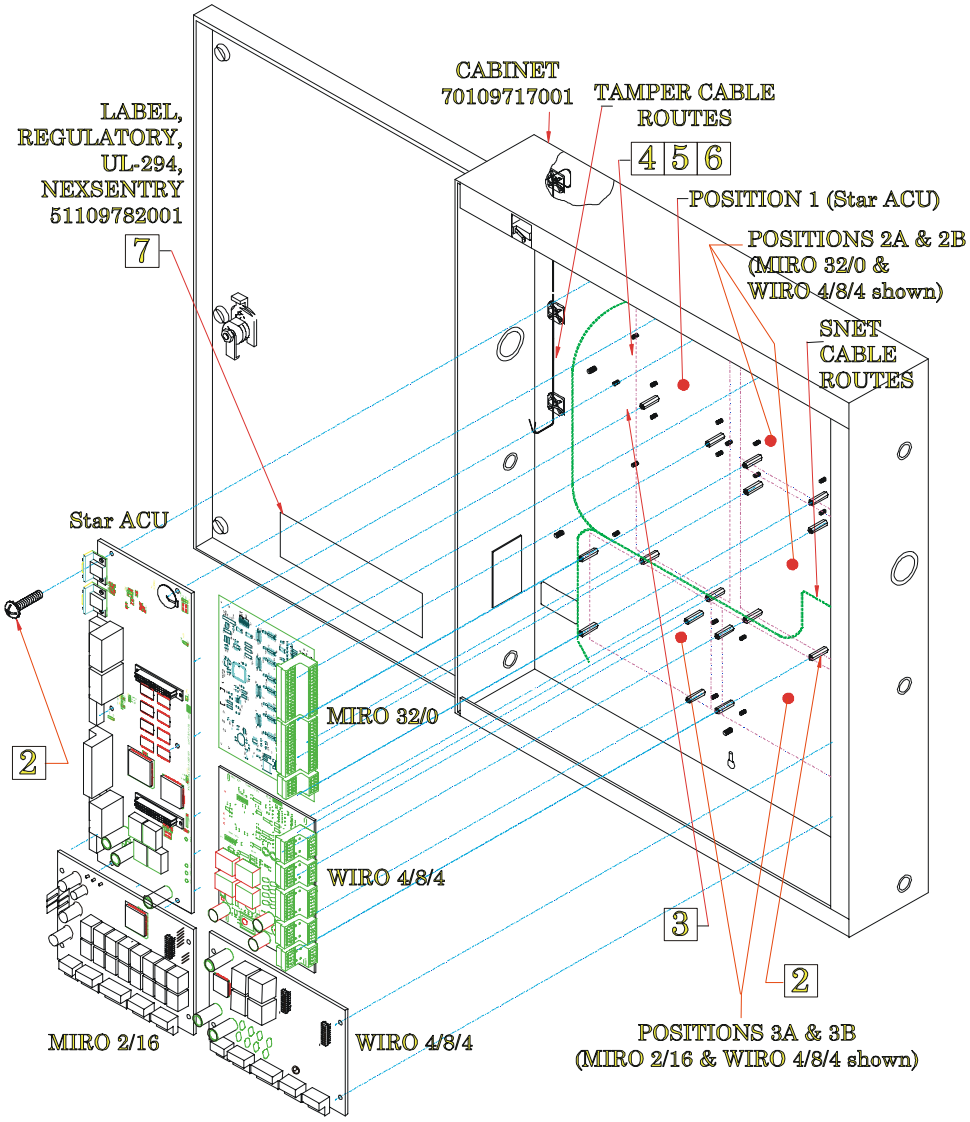


NOTE: Advances in technology and quality assurance measures have rendered previous troubleshooting commands, (such as TEST1, TEST2 and TEST3), obsolete.



NOTE: If we believe it to be necessary, future versions of this manual may include more extensive trouble-shooting techniques.

APPENDIX A: UL-294



Example Multiple PCA Enclosure (70109717001) Set Up

MOUNTING DETAILS: MULTIPLE PCA ENCLOSURE

Several different PCA combinations (full height –FH– and/or half height –HH–) can be mounted (vertically –V– or horizontally –H–) in the large, multiple PCA enclosure. The enclosure can accomodate 3 FH PCAs, 2V and 1H, or 2 FH (2V or 1V/1H) and 2 HH , or 1 FH (V or H) and 4 HH, or 6 HH (4V and 2H).

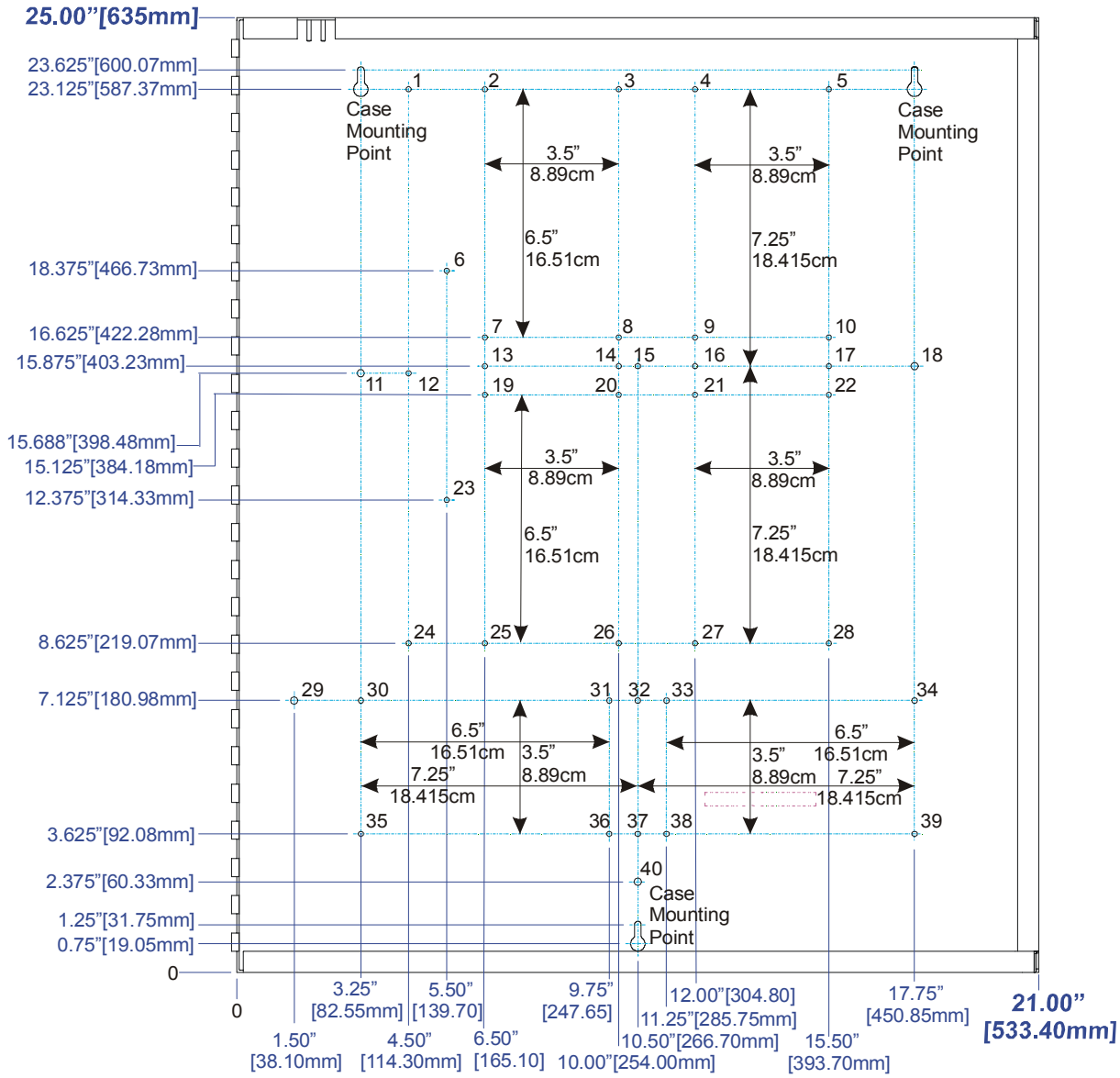
Full height units, (mounting dimensions 15" x 3.5"), include: Star ACU (I or II), MIRO 16/8, 2/24, 32/0, 64/0 and UWIU, with vertical mount positions (2, 3, 23, 14, 25, 26) and (4, 5, 16, 17, 27, 28) and horizontal mount positions (30, 32, 34, 35, 37, 39).

Half height units, (mounting dimensions 6.5" x 3.5"), include: WIRO 4/8/4, MIRO 2/16 and 32/0, with mount positions (2, 3, 4, 8), (4, 5, 9, 10), (19, 20, 25, 26), (21, 22, 27, 28), (30, 31, 35, 36) and (33, 34, 38, 39).

(To mount the wider NexSentry 4100 ACU in the enclosure, use the special mounts 1, 3, 12, 14, 24 and 26, with the ACU in the left vertical position only.)

Turn the boards mounted vertically in the upper 2/3 of the case so that their Phoenix connectors face outwards, away from the center. Turn the boards mounted horizontally in the lower 1/3 of the case so that their Phoenix connectors face downwards.)

Three #8 machine screws mount the multiple PCA enclosure to a wall. All of the dimensions for the enclosure, (3 case, 4 ground contacts and 36 internal PCA mounting points), are shown below.



(New) Multiple PC Board Enclosure Dimensions

PC Board	Max # PCBs	# Mounts	Mounting Dimensions	Mount Numbers
WIRO 4/8/4 MIRO 2/16 MIRO 32/0	6	4	6.5" x 3.5" 16.51 cm x 8.89 cm (half height)	(2, 3, 7, 8) (4, 5, 9, 10) (19, 20, 25, 26) (21, 22, 27, 28) (30, 31, 35, 36) (33, 34, 38, 39)
Star I & II, MIROs 16/8, 2/24, 32/0, 64/0, & UWIU	3	6	(2@7.5") x 3.5" (2@19.05 cm) x 8.89 cm (full height)	(2, 3, 13, 14, 25, 26) (4, 5, 16, 17, 27, 28) (30, 32, 34, 35, 37, 39)
		Mountings Used by 4100 PCB:		(1, 3, 12, 14, 24, 26)
		Ground Contacts (tied to Case)		(11, 18, 29, 40)

Table of Mounting Dimensions and Mount Numbers

STAR II GENERAL CONSIDERATIONS

Star II System: Monitor Inputs, Relay Outputs, etc. — Capabilities

A Star II System (either attached to a Host or stand-alone) has a maximum addressing capa-bility of 255 monitor inputs, 96 relay outputs and 16 Wiegand inputs

System Maximums	255 MIs	96 ROs	16 WIs

Consider these figures when planning which of the following PC boards to include in your Star II system.

Star II Controller Monitor Point and Relay (MIRO) Capability

There are 16 on-board monitor inputs (MIs) and 4 on-board relay outputs (ROs). Four MIs have default functions: 1.1 = ACU tamper; 1.2 = Limited Mode Request; 1.3 = Power Failure and 1.4 = Closed Mode Request. ***(The default points can be changed to other func-***

tions, if desired, and the four default functions can also be moved to other input points in the system.) The remaining 12 on-board MIs and the 4 on-board ROs are available for general use. The Star II controller can also handle 2 directly wired Wiegand inputs (WIs).

Star II ACU	**16 MIs**	**4 ROs**	**2 WIs**

Half-Height MIRO and WIRO, and Full-Height Capabilities

Nexwatch offers 3 types of half-height and 4 types of full-height boards with the following capabilities:

HALF-HEIGHT MIRO 32/0

This PC-board can address up to 32 monitor inputs.

H/H MIRO 32/0	**32 MIs**	**0 ROs**	**0 WIs**

HALF-HEIGHT MIRO 2/16

This PC-board can address up to 2 monitor inputs and 16 relays.

H/H MIRO 2/16	**2 MIs**	**16 ROs**	**0 WIs**

HALF-HEIGHT WIRO 4/8/4

Maximum capability: 4 Wiegand, 8 monitor inputs, 4 relay outputs.

H/H WIRO 4/8/4	**8 MIs**	**4 ROs**	**4 WIs**

FULL-HEIGHT MIRO 32/0

This PC-board can addressing up to 32 monitor inputs.

F/H MIRO 32/0	**32 MIs**	**0 ROs**	**0 WIs**

FULL-HEIGHT MIRO 2/24

This PC-board can address up to 2 monitor inputs and 24 relays.

F/H MIRO 2/24	2 MIs	24 ROs	0 WIs

FULL-HEIGHT MIRO 16/8

This PC-board can address up to 16 monitor inputs and 8 relays.

F/H MIRO 16/8	16 MIs	8 ROs	0 WIs

FULL-HEIGHT UWIU

This PC-board can address up to 4 Wiegand inputs.

MIRO UWIU	0 MIs	0 ROs	4 WIs

Example MIRO and WIRO Capabilities from the Page 2 Diagram

PC Board	MIs	ROs	WIs
Star II ACU	16	4	2
MIRO 32/0	32	0	0
MIRO 2/16	2	16	0
WIRO 4/8/4	8	4	4
WIRO 4/8/4	8	4	4
Totals	66	28	10
System Maximums	255	96	16
Unused Capacity	*189*	*68*	*6*

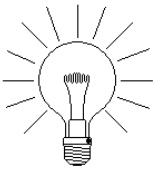
Create a table like this to give you the information you need to configure a Star II System using one or more multiple PCA enclosure(s).

INSTALLING PC BOARDS

1 Remove the cardboard sleeve from the enclosure. DO NOT DAMAGE THE SLEEVE.

2 Open the enclosure and use the 6-32 hex xtandoffs and screws provided in the enclosure kit to install the PC boards (Star II Controller, half-height MIRO 2/16, MIRO 32/0, and/or WIRO 4/8/4 boards – up to 4; or 1 or 2 half-heights and 1 full-height; or 1 or 2 full-heights):

Position 1: If the Star II Controller (6200016) is included in the kit, install it.



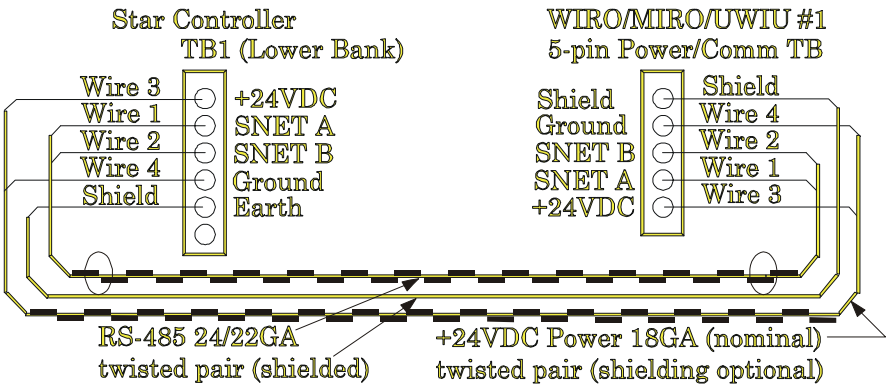
NOTE: For the Star II, the on-board MIRO ***will always be addressed as #1***.

Positions 2A and 2B: Install the 1st and 2nd half-height MIRO 2/16, MIRO 32/0, or WIRO 4/8/4, (or a full-height board, MIRO 2/24, MIRO 32/0, MIRO 16/8 or UWIU) straddling positions 2A and 2B. Address each module as required, based on system architecture.

Positions 3A and 3B: Install the 3rd and 4th half-height MIRO 2/16, MIRO 32/0, or WIRO 4/8/4, (or a full-height board, MIRO 2/24, MIRO 32/0, MIRO 16/8 or UWIU) straddling positions 3A and 3B. Address each module as required, based on system architecture.

3 Connect the wires of the tamper cable to the Star II Controller's Terminal Block TB3, pins 1 and 2. (USE THE CONNECTOR IN THE SHIP KIT.)

4 Install the S-NET cable provided between the Star II Controller and the first half-height (or full-height) MIRO or WIRO or UWIU, as follows: Route the cable approximately as shown. (USE THE CONNECTORS IN THE SHIP KIT.)

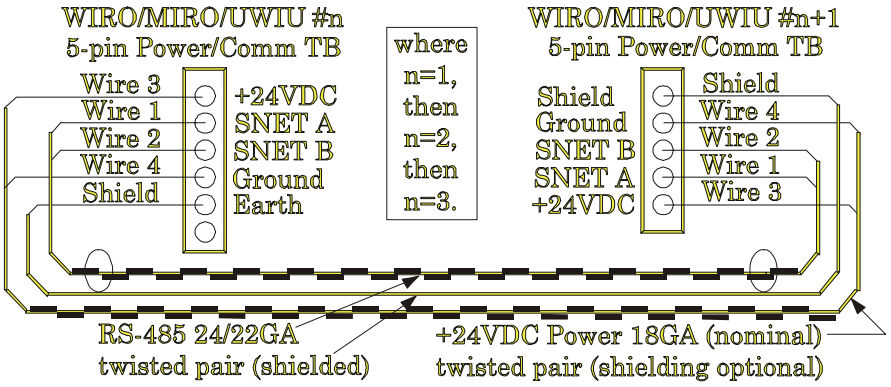


Wiring the Star Controller to the First WIRO/MIRO/UWIU

5 Install another SNET cable provided between the first MIRO/WIRO/UWIU and the second MIRO/WIRO/UWIU (if included) in a similar manner.



NOTE: The SNET A and SNET B must be one of the cable's twisted pairs; the +24 VDC nominal power and the DC return will be the other twisted pair; finally the earth connection with be provided from the encasing shield around the two twisted pairs.



Wiring Subsequent WIRO/MIRO/UWIUs

6 Install the third and fourth MIRO/WIRO (if included) in a similar manner.

APPENDIX B: PLANNING THE DATABASE



Take some time to consider thoroughly all of your access control needs to formulate a plan for creating the database for your NexSentry Star II installation. When you create the database, you need to have complete details of

1. **the Hardware installation and configuration,**
2. **site-specific information about the building and**
3. **all of the Personnel information.**

This appendix contains the Master Input Forms for the NexSentry Star II database. Make copies of these Master Input Forms (*and extra copies, to allow for changes*) directly from the PDF of this appendix. Fill these out as you plan the database for your NexSentry Star II ACU.

DATABASE SETUP SHEETS

The NexSentry Star II NSM Lite DataBase SetUp Sheets are organized as follows:

- **Sheet 1, "Time Codes" on page B-3**
- **Sheet 2, "Time Groups" on page B-4**
- **Sheet 3,** "Holidays (First 30)" on page B-5
- **Sheet 4,** "NSM Lite Users" on page B-6
- **Sheet 5,** "ACU Users" on page B-7
- **Sheet 6, "Star II Actions (Reports)" on page B-8**

- **Sheet 7, "Star II Action Groups" on page B-11**
- **Sheet 8, "NSM Lite Poller Definition" on page B-12**
- **Sheet 9, "NexSentry Star II ACU" on page B-13**
- **Sheet 10,** "ABA/Wiegand Site & (Wiegand Only) Company Codes" on page B-14
- **Sheet 11, "Door Switch Inputs" on page B-15**
- **Sheet 12, "REX Switch Inputs" on page B-16**
- **Sheet 13, "General Purpose Inputs" on page B-17**
- **Sheet 14, "Digital Reader Configurations" on page B-18**
- **Sheet15,** "MSR Reader Configurations" on page B-19
- **Sheet 16,** "Keypad Configurations" on page B-20
- **Sheet 17,** "Wiegand Reader Configurations" on page B-21
- **Sheet 18, "NexSentry Star II Doors" on page B-22**
- **Sheet 19,** "Elevator Name Schemes" on page B-23
- **Sheet 20,** "Elevator Configurations" on page B-24
- **Sheet 21,** "Elevator Floor Groups" on page B-25
- **Sheet 22,** "Zones" on page B-26
- **Sheet 23, "Star II Access Codes" on page B-27**
- **Sheet 24, "Cardholders" on page B-28**
- **Sheet 25,** "NSM Lite Sounds" on page B-29
- **Sheet 26,** "NSM Lite Icons" on page B-30
- **Sheet 27,** "NSM Lite Transaction Types" on page B-31

TIME CODES

TC ID	Time Code Description	Active Times		Active Days							
		Start	Stop	S	M	T	W	T	F	S	H
1	Default = Always	00:00	23:59	x	x	x	x	x	x	x	x
		:	:								
		:	:								
		:	:								
		:	:								
		:	:								
		:	:								
		:	:								
		:	:								
		:	:								
		:	:								
		:	:								
		:	:								
		:	:								
		:	:								
		:	:								
		:	:								
		:	:								
		:	:								
		:	:								
		:	:								

SHEET 1 (Copy as required)

TIME GROUPS

TG ID	Time Group Description	Select up to 4 Time Codes from the Time Code table (per Time Group)			
1	Default = Always	1			

SHEET 2 (Copy as required)

HOLIDAYS (FIRST 30)

(Pick from Pop-Up Calendar)

Holiday	MM - DD - YY
1	- -
2	- -
3	- -
4	- -
5	- -
6	- -
7	- -
8	- -
9	- -
10	- -
11	- -
12	- -
13	- -
14	- -
15	- -

Holiday	MM - DD - YY
16	- -
17	- -
18	- -
19	- -
20	- -
21	- -
22	- -
23	- -
24	- -
25	- -
26	- -
27	- -
28	- -
29	- -
30	- -

SHEET 3 (Copy as required)

NSM LITE USERS

(* Security Not Selectable in NSM Lite)

ID	Description (User's Full Name)	*~~Security~~	User-Name	Password
1	Administrator (Default)		administrator	new123

SHEET 4 (Copy as required)

ACU USERS

ID	Description (User's Full Name)	RANK A-F	User-Name (12)	Password (12)
1	Default	A	Operator 1	new
2				
3				
4				
5				
6				
7				
8				

SHEET 5 (Copy as required)

STAR II ACTIONS (REPORTS)

SHEET 6A TAB 1: GENERAL *(Copy as required)*

ID	Description of Event	Send event information to host (Y/N and TG #)	When Zone is Armed	When Zone is Disarmed	Prevent Zone Closure	Print Asterisk	Print to Terminal	Shunted	Disabled	Monitored	& during TG
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											

STAR II ACTIONS (REPORTS)

SHEET 6B TAB 2: OUTPUT CONTACT *(Copy as required)*

Close output contact When Zone is (Y/N)

Armed	Disarmed	Shunted	Disabled	Monitored	Contact point #	Contact point Name	& during TG (# and name)

STAR II ACTIONS (REPORTS)

SHEET 6C TAB 3: ZONE *(Copy as required)*

Action #	Override Zone	Use the state of the following Zone (Y/N)			
	(Either / or)	Specific Zone (Description)		Zone Number	

Action #	Override Zone	Use the state of the following Zone (Y/N)			
	(Either / or)	Specific Zone (Description)		Zone Number	

Action #	Override Zone	Use the state of the following Zone (Y/N)			
	(Either / or)	Specific Zone (Description)		Zone Number	

Action #	Override Zone	Use the state of the following Zone (Y/N)			
	(Either / or)	Specific Zone (Description)		Zone Number	

Action #	Override Zone	Use the state of the following Zone (Y/N)			
	(Either / or)	Specific Zone (Description)		Zone Number	

Action #	Override Zone	Use the state of the following Zone (Y/N)			
	(Either / or)	Specific Zone (Description)		Zone Number	

STAR II ACTION GROUPS

ID		Description		Star II Use (Y/N)	

General Actions

Key Trace	
Door Open Too Long	
Door Forced Open	
VIP/Digital Tamper	
ABA Card	

Access Actions

Entry Actions

Access Granted	
Access Denied	

Exit Actions

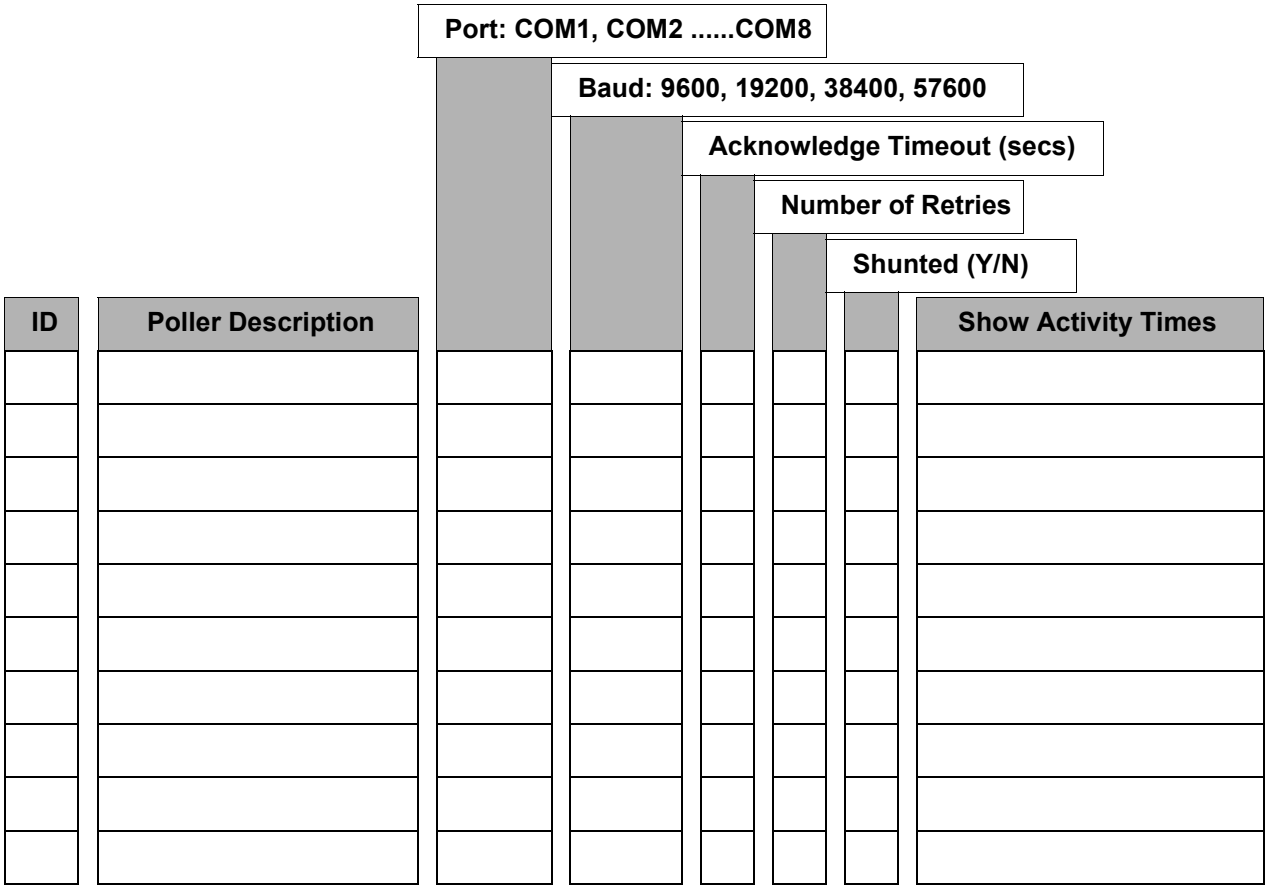
Exit Granted	
Exit Denied	

Failure Actions

Keypad	
S-NET	
MSR	

SHEET 7 (Copy as required)

NSM LITE POLLER DEFINITION



SHEET 8 (Copy as required)

NEXSENTRY STAR II ACU

ID		Description		Shunt		Addr	

Poller		# MIROs	

VIP: PIN

# Digits		# Digits KeyPad only		Display PIN #		Duress Enable	

Actions

Operator Override		Duress	

Tamper		Power Fail	

Connection

Host BAUD		Xon/Xoff	N	Terminal BAUD		Xon/Xoff	N

Enable 'Zone not Armed' Reminder		Access Denied not in memory time (secs)	

Site Codes Selected

SHEET 9 (Copy as required)

ABA/WIEGAND SITE & (WIEGAND ONLY) COMPANY CODES

ID	Description	Wiegand type (Y/N)	Site Code	Company Code

SHEET 10 (Copy as required)

DOOR SWITCH INPUTS

ID		Description	
Show Activity Times			
Action		Zone	
ACU		Shunted (Y/N)	
MIRO Device #		Point #	

Input State		Normal State	Open	Short	1K	2K
Four State						
Two State						

ID		Description	
Show Activity Times			
Action		Zone	
ACU		Shunted (Y/N)	
MIRO Device #		Point #	

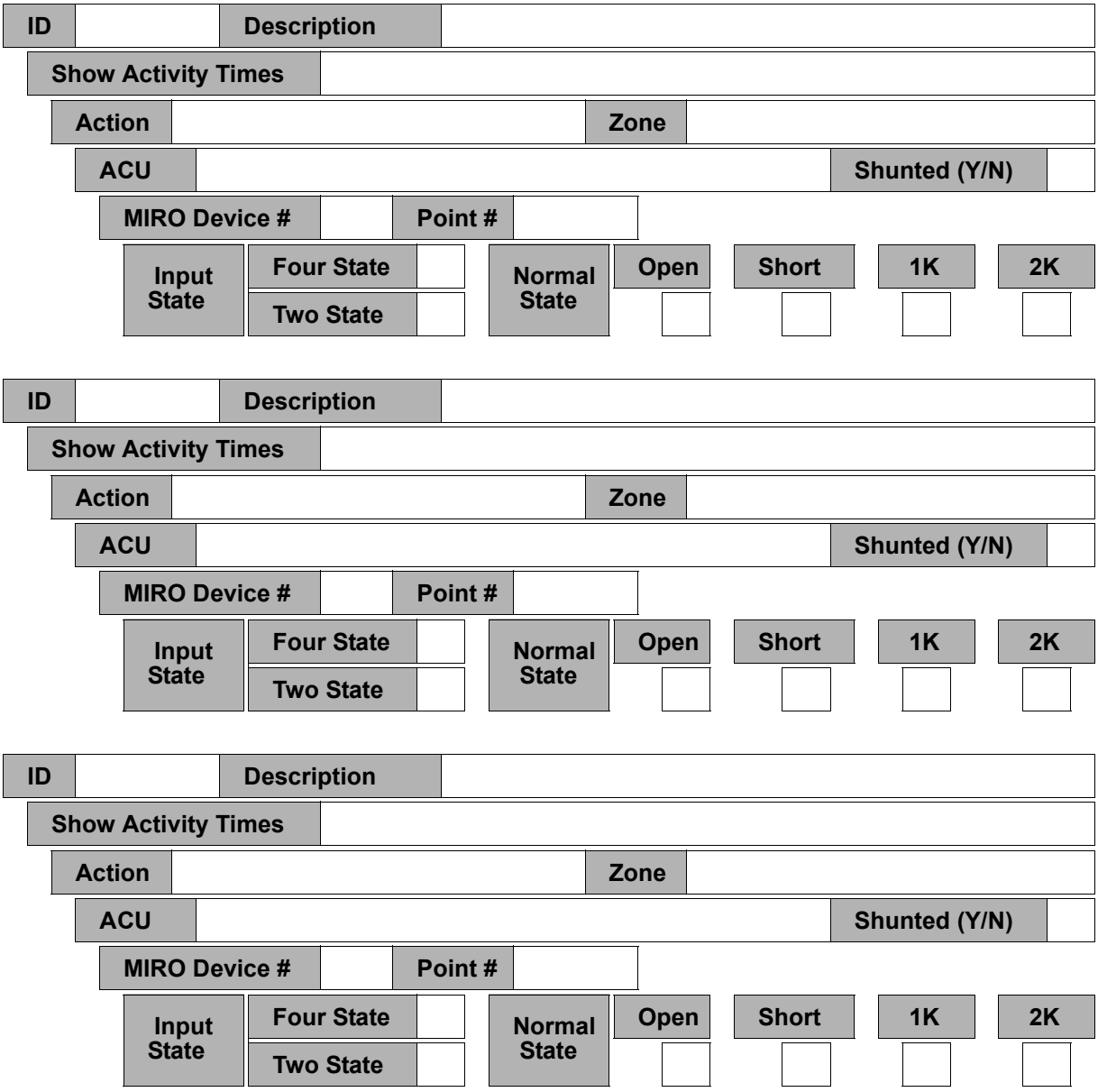
Input State		Normal State	Open	Short	1K	2K
Four State						
Two State						

ID		Description	
Show Activity Times			
Action		Zone	
ACU		Shunted (Y/N)	
MIRO Device #		Point #	

Input State		Normal State	Open	Short	1K	2K
Four State						
Two State						

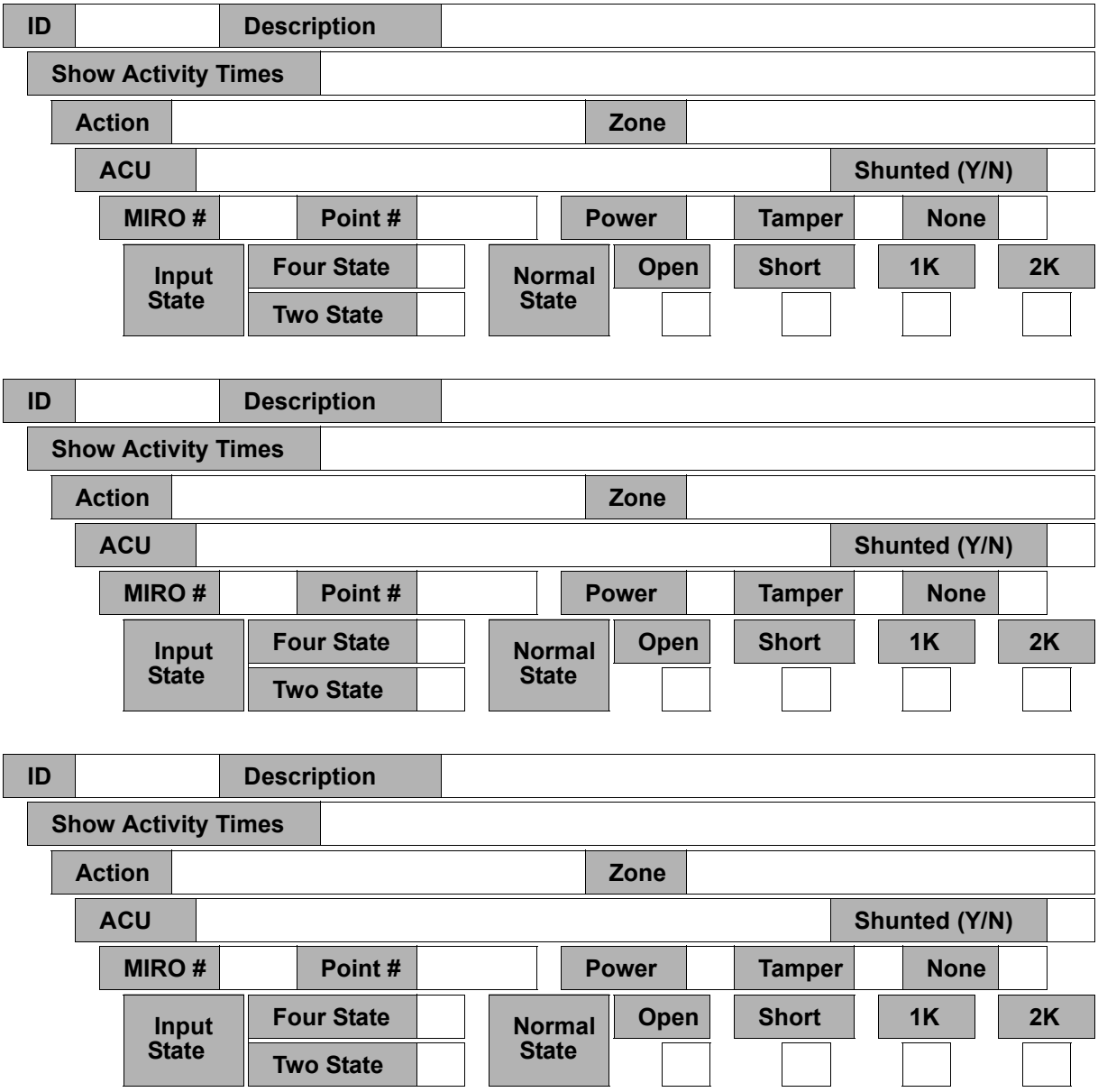
SHEET 11 (Copy as required)

REX SWITCH INPUTS



SHEET 12 (Copy as required)

GENERAL PURPOSE INPUTS



SHEET 13 (Copy as required)

DIGITAL READER CONFIGURATIONS

ID		Description									
Read Range		Verify Time Wind.		# Verifies		Send Cd # Once					
Beeper	On		Off		Cycle		Red LED	On		Off	
Green LED	On		Off		Cycle		Cycle				
Normal / Idle LED Color		Dark		Red		Green		Yellow			
Access Pending LED		Dark		Red		Green		Yellow			
Access Granted LED		Dark		Red		Green		Yellow			

ID		Description									
Read Range		Verify Time Wind.		# Verifies		Send Cd # Once					
Beeper	On		Off		Cycle		Red LED	On		Off	
Green LED	On		Off		Cycle		Cycle				
Normal / Idle LED Color		Dark		Red		Green		Yellow			
Access Pending LED		Dark		Red		Green		Yellow			
Access Granted LED		Dark		Red		Green		Yellow			

ID		Description									
Read Range		Verify Time Wind.		# Verifies		Send Cd # Once					
Beeper	On		Off		Cycle		Red LED	On		Off	
Green LED	On		Off		Cycle		Cycle				
Normal / Idle LED Color		Dark		Red		Green		Yellow			
Access Pending LED		Dark		Red		Green		Yellow			
Access Granted LED		Dark		Red		Green		Yellow			

SHEET 14 (Copy as required)

MSR READER CONFIGURATIONS

ID		Description			Wiegand Message Length	
ABA Card Field Data						
Field A		**Field B**			**Field C**	
Start		**Length**		**Start**		**Length**		**Start**		**Length**	
Expiration Date:		**Site Code:**			**Company Code**	
Start		**Length**		**Start**		**Length**		**Start**		**Length**	
ABA Deny Access Conditions						
Card not in ACU		**Use Site Code as Card Number**				
Card has expired		**Company Code not in ACU**		*(only Wiegand)*		
Site Code not in ACU		**Use Company Code as Card Number**		*(only Wiegand)*		
ABA Failsoft Conditions						
Card not in ACU		**Use Site Code as Card Number**				
Card has expired		**Company Code not in ACU**		*(only Wiegand)*		
Site Code not in ACU		**Use Company Code as Card Number**		*(only Wiegand)*		
Send Data to Terminal						
Normal / Idle LED Color	**Dark**		**Red**		**Green**		**Yellow**	
Access Pending LED	**Dark**		**Red**		**Green**		**Yellow**	
Access Granted LED	**Dark**		**Red**		**Green**		**Yellow**	
Data Interface Type	**Data0/Data1**		**Clock/Data**					
Credential Format	**HEX**		**BCD**					
Start Par.	**None**		**Odd**		**Even**		**Field Length**	
End Parity	**None**		**Odd**		**Even**			

SHEET 15 (Copy as required)

KEYPAD CONFIGURATIONS

SHEET 16 TAB 1: KEYPAD *(Copy as required)*

ID		Description	
# of Retries Allowed		Grace Period (secs)	
PIN Length		Fixed Length		or Variable Length	

TAB 2: KEYPAD (PLUS READER) LED TAB 3: KEYPAD ONLY LED

TAB 2	Normal / Idle LED Color	Dark		Red		Green		Yellow	
	Access Pending LED	Dark		Red		Green		Yellow	
	Access Granted LED	Dark		Red		Green		Yellow	
TAB 3	Normal / Idle LED Color	Dark		Red		Green		Yellow	
	Access Pending LED	Dark		Red		Green		Yellow	
	Access Granted LED	Dark		Red		Green		Yellow	

TAB 1: KEYPAD

ID		Description	
# of Retries Allowed		Grace Period (secs)	
PIN Length		Fixed Length		or Variable Length	

TAB 2: KEYPAD (PLUS READER) LED TAB 3: KEYPAD ONLY LED

TAB 2	Normal / Idle LED Color	Dark		Red		Green		Yellow	
	Access Pending LED	Dark		Red		Green		Yellow	
	Access Granted LED	Dark		Red		Green		Yellow	
TAB 3	Normal / Idle LED Color	Dark		Red		Green		Yellow	
	Access Pending LED	Dark		Red		Green		Yellow	
	Access Granted LED	Dark		Red		Green		Yellow	

WIEGAND READER CONFIGURATIONS

ID		Description							Wiegand Message Length		
ABA Card Field Data											
Field A				Field B				Field C			
Start		Length		Start		Length		Start		Length	
Expiration Date:				Site Code:				Company Code			
Start		Length		Start		Length		Start		Length	
ABA Deny Access Conditions											
Card not in ACU		Use Site Code as Card Number									
Card has expired		Company Code not in ACU									
Site Code not in ACU		Use Company Code as Card Number									
ABA Failsoft Conditions											
Card not in ACU		Use Site Code as Card Number									
Card has expired		Company Code not in ACU									
Site Code not in ACU		Use Company Code as Card Number									
Send Data to Terminal											
Normal / Idle LED Color		Dark		Red		Green		Yellow			
Access Pending LED		Dark		Red		Green		Yellow			
Access Granted LED		Dark		Red		Green		Yellow			
Data Interface Type		Data0/Data1		Clock/Data							
Credential Format		HEX		BCD							
Start Par.		None		Odd		Even		Field Length			
End Parity		None		Odd		Even					

SHEET 17 (Copy as required)

NEXSENTRY STAR II DOORS

SHEET 18 TAB 1: GENERAL *(Copy as required)*

ID		Description									
ACU											
Device #		Shunt		Reader Mode		Normal		Open		Closed	
								Station		Continuous	

TAB 2: LOCK

Door Switch Point											
Max Door Open Time (secs)		Read Cards When Open									
Auto Unlock Time Group											
Lock Output											
Lock Type	Normal	X	*Future*	?	Unlock Time (secs)		Reverse Lock				

TAB 3: READER

Reader	Reader 1		Reader 2		Type			Enable While Zone is	
Configuration							Armed		
Time Group							Disarmed		
VIP	Configuration						Both		
	Time Group								

TAB 4: EXIT

Enable REX		Unlock on REX		REX Point							
Valid REX TG					Enable Anti-PassBack						
	APB Method	Hard		Soft		Type	Entry		Exit		

TAB 5: MISC

Show Activity		Zones	Entering	
Action Group			Leaving	

ELEVATOR NAME SCHEMES

ID		Description	

Floor Name	Logical Floor Number	Floor Name	Logical Floor Number

SHEET 19 (Copy as required)

ELEVATOR CONFIGURATIONS

SHEET 20 TAB 1: GENERAL *(Copy as required)*

ID		Description		Device #		Shunt	
ACU							

TAB 2: CAB

Operating Mode		Normal Security		High Security		Priority Call	
Cab Type	1	Read Crds/Flr Btns Enabled		Flr Btn Wait (secs)			

TAB 3: READER

Reader	Reader 1		Type		Enable While Zone is	
	Configuration ID #				Armed	
	Time Group ID #				Disarmed	
VIP	Configuration ID #				Both	
	Time Group ID #					

TAB 4: ELEVATOR FLOORS

Floor Naming Scheme	
Floor Control	

Floor	Monitor Input	Output

TAB 5: MISC

Show Activity		Zones	Entering	
Action Group			Leaving	

ELEVATOR FLOOR GROUPS

SHEET 21 TAB 1: FLOOR GROUP *(Copy as required)*

ID		Description	

Elevators Available	Elevators Selected

TAB 2: FLOORS

Floor Naming Scheme	

Floor	Time Group

ZONES

ID	Description	ACU #	Zone #	Vehicular Zone		Zone Armed Time	Zone Mode Input
		1		1			
				2			
				3			
				4			
				5			
				6			
				7			
				8			
				9			
				10			
				11			
				12			
				13			
				14			
				15			
				16			

SHEET 22 (Copy as required)

STAR II ACCESS CODES

SHEET 23 TAB 1. GENERAL *(Copy as required)*

ID #		Description	

TAB 2: ACCESS CODE – DOORS

Door	Time Group	Door	Time Group
1		9	
2		10	
3		11	
4		12	
5		13	
6		14	
7		15	
8		16	

TAB 3: ACCESS CODE – FLOOR GROUPS

Floor Group	Time Group	Floor Group	Time Group

CARDHOLDERS

TAB 1. GENERAL | Cardholder ID | | Download immediately |

Name | 1st | | Mid | | Last |

TAB 2. ACCESS | Access Codes | Trace | | Start: / / | Stop: | / /

TAB 3. CREDENTIALS | Card # | None | | VIP only | | Digital | | Card # | | Magstripe/Wiegand | | PIN |

TAB 4. ADDRESS | Line 1 |
| Line 2 |
| Line 3 |

SHEET 24 *(Copy as required)*

TAB 1. GENERAL | Cardholder ID | | Download immediately |

Name | 1st | | Mid | | Last |

TAB 2. ACCESS | Access Codes | Trace | | Start: / / | Stop: | / /

TAB 3. CREDENTIALS | Card # | None | | VIP only | | Digital | | Card # | | Magstripe/Wiegand | | PIN |

TAB 4. ADDRESS | Line 1 |
| Line 2 |
| Line 3 |

NSM LITE SOUNDS

ID #	Description	File-Name	Type	Drive	Path

SHEET 25 (Copy as required)

NSM LITE ICONS

ID #	Description	File-Name	Type	Drive	Path

SHEET 26 (Copy as required)

NSM LITE TRANSACTION TYPES

SHEET 27 TAB 1. GENERAL *(Copy as required)*

ID #		Your Description		Enable Sound	
		Factory Default			

TAB 2. ACTIONS

Enable Sound		Log to Printer		Sound		Contin	

TAB 3. DISPLAY OPTIONS

Icon		Text Color	

TAB 1. GENERAL

ID #		Your Description		Enable Sound	
		Factory Default			

TAB 2. ACTIONS

Enable Sound		Log to Printer		Sound		Contin	

TAB 3. DISPLAY OPTIONS

Icon		Text Color	

TAB 1. GENERAL

ID #		Your Description		Enable Sound	
		Factory Default			

TAB 2. ACTIONS

Enable Sound		Log to Printer		Sound		Contin	

TAB 3. DISPLAY OPTIONS

Icon		Text Color	

APPENDIX C: REPORTING MODES FOR DRS

SNET REPORTING FORMATS

DR4201, DR4208K and DR4208S readers recognize multiple types of non-NexWatch credentials as well as the NexWatch credential. They can also be programmed to report the credential data in:

- Digital Key Reader format (DKR format) or
- Magnetic Stripe Reader format (MSR format).

The Access Control Unit (ACU) downloads the report configuration to the reader during initialization.

DKR Data Report

The 32-bit credential is stored in the DKR report:

Data byte	Data Description	Comment
1	Key most significant byte (bits 31-24)	Upper bits are 0 if the key is less than 32 bits long.
2	Key (bits 23-16)	
3	Key (bits 15-8)	
4	Key least significant byte (bits 7-0)	
5	Credential check byte (bits 7-0)	Not used
6	Credential check byte (bits 7-0)	

Notes:

1 The NexWatch key type is always 32 bits long.

2 The non-NexWatch key number is found by using the default key position and a key length based on the key type. See “Key Processing (non-NexWatch keys only)” on page C-4.

MSR Data Report (Normal Format)

The data is stored in the MSR message as shown below:

Data byte	Data Description	Comment
1	0	
2	Key most significant byte (bits 31-24)	Upper bits are 0 if the key is less than 32 bits long.
3	Key (bits 23-16)	
4	Key (bits 15-8)	
5	Key least significant byte (bits 7-0)	
6	Site code most significant byte (bits 15-8)	Upper bits are 0 if the code is less than 16 bits long.
7	Site code least significant byte (bits 7-0)	
8	Year (7-0)	Year defaults to 10
9	Month (7-0)	Month defaults to 7
10	Company code most significant byte (bits 15-8)	Upper bits are 0 if the code is less than 16 bits long. Defaults to 9999
11	Company code least significant byte (bits 7-0)	
12	0	
13	0	
14	0	
15	0	
16	0	
17	0	
18	0	
19	0	
20	0	

Notes:

1. The NexWatch key type is always 32 bits long; the site code is 9984; the year is 10; the month is 7; and the company code is 9999.
2. The reader uses the non-NexWatch key type to find the key and the site codes. The year, month, and company code contain the default data shown when the key is not processed.

MSR Data Report (Raw Data Format)

The raw data format is used to send the non-NexWatch key **only when the downloaded configuration includes the raw data flag, and only for Star I version 2.40 or Star II version 2.00 (or later):**

Data byte	Data Description	Comment
1	Key length	Must be 16 or greater
2	Data field least significant bits (bits 7-0)	Bytes 2-13 contain the data as defined by the length (16-96).
3	Data field (bits 15-8)	
4	Data field (bits 23-16)	
5	Data field (bits 31-24)	
6	Data field (bits 39-32)	
7	Data field (bits 47-40)	
8	Data field (bits 55-48)	
9	Data field (bits 63-56)	
10	Data field (bits 71-64)	
11	Data field (bits 79-72)	
12	Data field (bits 87-80)	
13	Data field most significant bits (bits 95-88)	
14	0	
15	0	
16	0	
17	0	
18	0	
19	0	
20	0	

KEY PROCESSING (NON-NEXWATCH KEYS ONLY)

1. **In DKR mode the reader always finds the key code using the default parameters described in this section.**
2. **In MSR mode the reader can be configured to send the data in "raw data format" or to process it. If processed, the reader checks the type against the length downloaded in the Wiegand Interface Unit (WIU) configuration parameters. If the length is the same as the detected type then the key is processed using the down-loaded parameters. If the length is NOT the same, the reader locates the site and key codes by using default parameters as described in this section.**

Default Processing

26-BIT DEFAULT FORMAT

Key bits

1 2 3 4 12345678901234567890123456789012345678	tens units bit addresses
xxxxxxxxxxxxxxxxxxxxxxxxx default 26-bit xxxxxxxx xxxxxxxxxxxxxxxx	data in 26-bit key site code key code
The default reports the site code: start bit 24, 8 bits long, and the key code: start bit 32, 16 bits long.	

34-BIT DEFAULT FORMAT

Key bits

1 2 3 4 12345678901234567890123456789012345678	tens units bit addresses
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx default 34-bit xxxxxxxx xxxxxxxxxxxxxxxx	data in 34-bit key site code key code
The default reports the site code: start bit 24, 8 bits long, and the key code: start bit 32, 16 bits long.	

35-BIT CORPORATE 1000 CREDENTIAL DEFAULT FORMAT

Key bits

1 2 3 4 12345678901234567890123456789012345678	tens units **bit addresses**
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx default 35-bit xxxxxxxxxxxx xxxxxxxxxxxxxxxxxxxx	data in 35-bit key site code key code
The default reports the site code: start bit 16, 12 bits long, and the key code: start bit 28, 20 bits long.	

36-BIT DEFAULT FORMAT

Key bits

1 2 3 4 12345678901234567890123456789012345678	tens units **bit addresses**
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx default 36-bit xxxxxxxx xxxxxxxxxxxxxxxxxxxx	data in 36-bit key site code key code
The default reports the site code: start bit 20, 8 bits long, and the key code: start bit 28, 20 bits long.	

37-BIT DEFAULT FORMAT

Key bits

1 2 3 4 12345678901234567890123456789012345678	tens units **bit addresses**
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx default 37-bit xxxxxxxx xxxxxxxxxxxxxxxx	data in 37-bit key site code key code
The default reports the site code: start bit 24, 8 bits long, and the key code: start bit 32, 16 bits long.	

96-BIT DEFAULT FORMAT

The most significant 32 bits are sent as key code and the next 16 bits make up the site code.

Configuration Parameters

PARAMETERS FOR 26-BIT FORMAT

Key bits

1 2 3 4 12345678901234567890123456789012345678	tens units addresses
xxxxxxxxxxxxxxxxxxxxxxxxxx xxxxxxxx xxxxxxxxxxxxxxxx	data in 26-bit key = start 24, length 8 = start 32, length 16

The recommended configuration is the same as the default:

- Message length = 26
- key field A start bit = 32
- Site code A start bit = 24
- key field A length = 16
- Site code A length = 8

PARAMETERS FOR 34-BIT FORMAT

Key bits

1 2 3 4 12345678901234567890123456789012345678	tens units addresses
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx xxxxxxxxxxxx xxxxxxxxxxxxxxxxxxxx	data in 34-bit key = start 16, length 12 = start 28, length 20

The recommended configuration is the same as the default:

- Message length = 34
- key field A start bit = 28
- Site code A start bit = 16
- key field A length = 20
- Site code A length = 12

PARAMETERS FOR 35-BIT CORPORATE 1000 CREDENTIAL FORMAT

Key bits

1 2 3 4 12345678901234567890123456789012345678	tens units addresses
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx xxxxxxxxxxxx xxxxxxxxxxxxxxxxxxxx	data in 35-bit key = start 16, length 12 = start 28, length 20

The recommended configuration is the same as the default:

- Message length = 35
- key field A start bit = 28
- Site code A start bit = 16
- key field A length = 20
- Site code A length = 12

PARAMETERS FOR 36-BIT FORMAT

Key bits

1 2 3 4 123456789012345678901234567890123456789012345678	tens units addresses
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx xxxxxxxx xxxxxxxxxxxxxxxxxxxxxxxx	data in 36-bit key = start 16, length 8 = start 24, length 24

The recommended configuration is:

- Message length = 36
- key field A start bit = 24
- Site code A start bit = 16
- key field A length = 24
- Site code A length = 8

PARAMETERS FOR 37-BIT FORMAT

Key bits

1 2 3 4 123456789012345678901234567890123456789012345678	tens units addresses
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx xxxxxxxxxxxxxxxx xxxxxxxxxxxxxxxxxxxx	data in 37-bit key = start 12, length 16 = start 28, length 20

The recommended configuration is:

- Message length = 37
- key field A start bit = 28
- Site code A start bit = 12
- key field A length = 20
- Site code A length = 16

PARAMETERS FOR 96-BIT FORMAT

The 96-bit key is really only compatible with raw data reporting.

Raw Data Mode

In the Star I this mode is enabled by entering Yes to the "raw data" prompt (terminal command MAG question 23). Configurations 1-8 are programmable in the Star I. Configuration #1 is only used for processing by the reader when "raw data" mode is disabled. When raw data is enabled the reader sends the data as shown in this section and the ACU should have entries as shown for each type.

RAW DATA SETUP 26-BIT FORMAT

The recommended raw data entries (for one of the configurations 2-8) should be:

- Message length = 26
- Site code A start bit = 2
- Site code A length = 8
- key field A start bit = 10
- key field A length = 16

Preamble				**Customer codes**							**S = 27 # = 26**												
				c	**c**	**c**	**c**	**c**	**c**	**c**												**s**	**#**
48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	
				0	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	

	Site in 25-18 = 0xC3 = 195 decimal								**Key in bits 17-2 = 0xDA80 = 55936 decimal**																
	s	**s**	**s**	**s**	**s**	**s**	**s**	**s**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**p**
	C				**3**				**D**				**A**				**8**				**0**				
	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
	1	**1**	**0**	**0**	**0**	**0**	**1**	**1**	**1**	**1**	**0**	**1**	**1**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

A typical printout at the terminal appears as follows

```
raw(1) = 000000da8000c3000000
raw(20) = 00000000000000000000
key code = 55936, site = 195, year = 0, month = 0, company = 0
issue code = 0
72 23:47:58  (3) ABA CARD DATA 1 1A00B587
73 23:47:58  (3) ABA CARD DATA 2 07200000
74 23:47:58  (3) ABA CARD DATA 3 00000000
75 23:47:58  (3) ABA CARD DATA 4 00000000
76 23:47:58  (3) ABA CARD DATA 5 00000000
```

RAW DATA SETUP 34-BIT FORMAT

The recommended raw data entries (for one of the configurations 2-8) should be:

- Message length = 34
- Site code A start bit = 6
- Site code A length = 12
- key field A start bit = 18
- key field A length = 16

Preamble				**Customer codes**							**S = 35 # = 34**								**Site Code in bits 29-18**				
				c	**c**	**c**	**c**	**c**	**c**	**c**			**s**	**#**					**s**	**s**	**s**	**s**	
																			0				
48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	
				0	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	

= 0x065 = 101 decimal								**Key in bits 17-2 = 0x032D = 813 decimal**																
	s	**s**	**s**	**s**	**s**	**s**	**s**	**s**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**p**
	6				**5**				**0**				**3**				**2**				**D**			
	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
	0	**1**	**1**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**1**	**0**	**1**	**1**	**0**	**1**	**0**

A typical printout at the terminal appears as follows

```
raw(1) = 000000032d0065000000
raw(20) = 00000000000000000000
key code = 813, site = 101, year = 0, month = 0, company = 0
issue code = 0
98 18:21:51  (3) ABA CARD DATA 1 225A06CA
99 18:21:51  (3) ABA CARD DATA 2 00240000
00 18:21:51  (3) ABA CARD DATA 3 00000000
01 18:21:51  (3) ABA CARD DATA 4 00000000
02 18:21:51  (3) ABA CARD DATA 5 00000000
```

RAW DATA SETUP 35-BIT CORPORATE 1000 CREDENTIAL FORMAT

The recommended raw data entries (for one of the configurations 2-8) should be:

- Message length = 35
- Site code A start bit = 3
- Site code A length = 12
- key field A start bit = 15
- key field A length = 20

Preamble				**Customer codes**							**S = 36 # = 35**				**Site Code in bits 33-22 = 0xFFF = 4095 decimal**								
				c	**c**	**c**	**c**	**c**	**c**	**c**		**s**	**#**		**s**	**s**	**s**	**s**	**s**	**s**	**s**	**s**	
															F				**F**				
48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	
				0	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	

in bits 33-22				**Key in bits 21-2 = 0xFFFFE = 1048574 decimal**																				
s	**s**	**s**	**s**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**p**
F				**F**				**F**				**F**				**F**				**E**				
25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
1	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**0**	**1**

A typical printout at the terminal appears as follows

```
raw(1) = 00000ffffe0fff000000
raw(20) = 00000000000000000000
key code = 1048574, site = 4095, year = 0, month = 0, company = 0
issue code = 0
45 19:27:15  (3) ABA CARD DATA 1 23FDFFFF
46 19:27:15  (3) ABA CARD DATA 2 FF2B0000
47 19:27:15  (3) ABA CARD DATA 3 00000000
48 19:27:15  (3) ABA CARD DATA 4 00000000
49 19:27:15  (3) ABA CARD DATA 5 00000000
```

RAW DATA SETUP 36-BIT FORMAT

The recommended raw data entries (for one of the configurations 2-8) should be:

- Message length = 36
- Site code A start bit = 4
- Site code A length = 8
- key field A start bit = 12
- key field A length = 24

Preamble				**Customer codes**							**S = 37 # = 36**				**Site Code in bits 33-26 = 0x64 = 100 decimal**								
				c	**c**	**c**	**c**	**c**	**c**	**c**	**s**	**#**			**s**	**s**	**s**	**s**	**s**	**s**	**s**	**s**	
															6				**4**				
48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	
				0	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**1**	**1**	**1**	**0**	**1**	**1**	**0**	**0**	**1**	**0**	**0**	

	Key in bits 25-2 = 0x6525D0 = 6628816 decimal																								
	k	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**p**
	6				**5**				**2**				**5**				**D**				**0**				
	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
	0	**1**	**1**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**1**	**1**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**1**

A typical printout at the terminal appears as follows

```
raw(1) = 00006525d00064000000
raw(20) = 00000000000000000000
key code = 6628816, site = 100, year = 0, month = 0, company = 0
issue code = 0
43 22:41:38  (3) ABA CARD DATA 1 24A14BCA
44 22:41:38  (3) ABA CARD DATA 2 C83E0000
45 22:41:38  (3) ABA CARD DATA 3 00000000
46 22:41:38  (3) ABA CARD DATA 4 00000000
47 22:41:38  (3) ABA CARD DATA 5 00000000
```

RAW DATA SETUP 37-BIT FORMAT

The recommended raw data entries (for one of the configurations 2-8) should be:

- Message length = 37
- Site code A start bit = 5
- Site code A length = 12
- key field A start bit = 17
- key field A length = 20

Preamble				**Customer codes**							**# = 37**				**Site Code in bits 33-22 = 0x4B7 = 1207 decimal**								
				c	**c**	**c**	**c**	**c**	**c**	**c**	**#**				**s**	**s**	**s**	**s**	**s**	**s**	**s**	**s**	
															4				**B**				
48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	
				0	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**1**	**0**	**1**	**0**	**0**	**1**	**0**	**1**	**1**	

in bits 33-22				**Key in bits 21-2 = 0x2FFF0 = 196592 dec**																				
	s	**s**	**s**	**s**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**k**	**p**
	7				**2**				**F**				**F**				**F**				**0**			
	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
	0	**1**	**1**	**1**	**0**	**0**	**1**	**0**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**0**

A typical printout at the terminal appears as follows

```
raw(1) = 000002fff004b7000000
raw(20) = 00000000000000000000
key code = 196592, site = 1207, year = 0, month = 0, company = 0
issue code = 0
43 22:41:38  (3) ABA CARD DATA 1 25E0FFE5
44 22:41:38  (3) ABA CARD DATA 2 96160000
45 22:41:38  (3) ABA CARD DATA 3 00000000
46 22:41:38  (3) ABA CARD DATA 4 00000000
47 22:41:38  (3) ABA CARD DATA 5 00000000
```

RAW DATA SETUP 96 BIT FORMAT

To configure this:

- ANSI format (Y/N) ? Y (This initiates a 5-bit processing mode, with the **least significant bit** –**LSB**– first and with each byte having a trailing odd parity bit —shown shaded in the diagrams below.) **IT IS IMPORTANT TO STRESS THIS ORDER:** ***LSB*** on the **LEFT**, (since more often the ***MSB*** is on the left). With the parity bit included, the numbers 0 — 9 are then as follows:

0					1					2					3					4				
0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	1	1	0	0	1	0	0	1	0	0

5					6					7					8					9				
1	0	1	0	1	0	1	1	0	1	1	1	1	0	0	0	0	0	1	0	1	0	0	1	1

- Site Code start bit: 36. (This ***is*** the Site Code start bit used in the coding, because of the way the data is arranged.)
- Site Code length: 16. (This is the actual data length, not including the parity bits.)
- Key Code start bit: 58. (This ***is*** the Key Code start bit used in the coding, because of the way the data is arranged.)
- Key Code length: 24. (This is the actual data length, not including the parity bits.)
- Issue Code start bit: 83. (This ***is*** the Issue Code start bit used in the coding, because of the way the data is arranged.)
- Issue Code length: 4. (This is the actual data length, not including the parity bits.)
- The Site Code presently has a maximum bit-length of 16 bits. (In the example, the Site Code '78901' presently has the '7' dropped.)

Note:
The data does not start at the beginning of the message. There are 96 total bits received. The first 21 bits are not used. The remaining 75 bits are grouped into fifteen 5-bit characters, 4 bits (1 byte) of **BCD** data with 1 parity bit. (Parity is ODD.) The first character is fixed as

a 'B' (as with the magnetic stripe beginning character). The next 5 characters are the site code (in BCD). Then 6 characters for the key (in BCD). Then 1 character for the issue level (in BCD). Then a fixed 'F' (as with the magnetic stripe final character). Finally there is a longitudinal redundancy check (LRC) character.

.....First 21 bits are not used.....																				Begin = B			...not used...								
	8							9							1					0				B				(7)				
addresses:								1												2										3	-tens
1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	-units
0	0	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	1	0	1	0	1	1	1	0	0	

.....Site Code = 8901.....																				.....											
	8							9							0					1				9				9				
	start bit *							4												5				start bit *						6	
	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	
	0	0	0	1	0	1	0	0	1	1	0	0	0	0	1	1	0	0	0	0	1	0	0	1	1	1	0	0	1	1	

.....Credential Key Code = 999999.....																				Issue = 1							Final = F						LRC = 2					
	9							9							9					9							1						F						2					
								7												8				* start bit							9										
	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6			
	1	0	0	1	1	1	0	0	1	1	1	0	0	1	1	1	0	0	1	1	1	0	0	0	0	1	1	1	1	1	0	1	0	0	0			

A typical printout at the terminal appears as follows

```
raw(1) = 00009999998901000000
raw(20) = 01000000000000000000
key code = 999999, site = 8901, year = 0, month = 0, company = 1
issue code = 0
83 23:14:56  (3) ABA CARD DATA 1 60E8C339
84 23:14:56  (3) ABA CARD DATA 2 E79C1386
85 23:14:56  (3) ABA CARD DATA 3 29B80650
86 23:14:56  (3) ABA CARD DATA 4 0A000000
87 23:14:56  (3) ABA CARD DATA 5 00000000
```

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CONTACT INFORMATION

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