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# Warnings and Cautions

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**⚠ WARNING: Fire Safety and Liability Notice:** *Never connect card readers to any critical entry, exit door, barrier, elevator or gate without providing an alternative exit in accordance with all fire and life safety codes pertinent to the installation. These fire and safety codes vary from city to city and you must get approval from local fire officials whenever using an electronic product to control a door or other barrier. Use of egress buttons, for example, may be illegal in some cities. In most applications, single action exit without prior knowledge of what to do is a life safety requirement. Always make certain that any required approvals are obtained in writing. Verbal approvals are not valid.*

**⚠ WARNING:** *Northern never recommends using NStar or related products for use as a primary warning or monitoring system. Primary warning or monitoring systems should always meet local fire and safety code requirements. The installer must also test the system on a regular basis by instructing the end user in appropriate daily testing procedures. Failure to test a system regularly could make installer liable for damages to the end user if a problem occurs.*

**⚠ WARNING:** *Earth ground all enclosures for proper installation.*

**⚠ WARNING:** *Use suppressors on all door locks. Use S-4 suppressors for installation. Northern recommends only DC locks.*

**⚠ CAUTION:** *If any damage to the shipment is noticed, a claim must be filed with the commercial carrier responsible.*

**⚠ CAUTION:** *Electro-static discharge (ESD) can damage CMOS integrated circuits and modules. To prevent damage always follow these procedures:*

**NOTE:** *Use static shield packaging and containers to transport all electronic components, including completed reader assemblies.*

**NOTE:** *Handle all ESD sensitive components at an approved static controlled workstation. These workstations consist of a desk mat, floor mat and an ESD wrist strap. Workstations are available from various vendors.*

**⚠ WARNING:** *Personal injury or death could occur, and the equipment could be damaged beyond repair, if this precaution is not observed!*

- *Before installation, turn off the external circuit breaker which supplies power to the system, including door locks.*
- *Before connecting the device to the power supply, verify that the output voltage is within specifications of the power supply.*
- *Do not apply power to the system until after the installation has been completed.*

# Disclaimer

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## Product Liability, Mutual Indemnification

In the event that a Customer receives a claim that a Product or any component thereof has caused personal injury or damage to property of others, the Customer shall immediately notify Northern in writing of all such claims. Northern shall defend or settle such claims and shall indemnify and hold the Customer harmless for any costs or damages including reasonable attorneys' fees which the Customer may be required to pay as a result of the defective Product or the negligence of Northern, its agents or its employees.

The Customer shall hold harmless and indemnify Northern from and against all claims, demands, losses and liability arising out of damage to property or injury to persons occasioned by or in connection with the acts or omissions of the Customer and its agents and employees, and from and against all claims, demands, losses and liability for costs of fees, including reasonable attorneys' fees in connection therewith.

## Limited Warranty

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All Products sold or licensed by Northern include a warranty registration card which must be completed and returned to Northern by or on behalf of the end user in order for Northern to provide warranty service, repair, credit or exchange. All warranty work shall be handled through the Customer which shall notify Northern and apply for a Return Merchandise Authorization (RMA) number prior to returning any Product for service, repair, credit or exchange. Northern warrants that its Products shall be free from defects in materials and workmanship for a period of two years from date of shipment of the Product to the Customer. The warranty on Terminals, Printers, Communications Products and Upgrade kits is 90 days from date of shipment. Satisfaction of this warranty shall be limited to repair or replacement of Products which are defective or defective under normal use.

Northern's warranty shall not extend to any Product which, upon examination, is determined to be defective as a result of misuse, improper storage, incorrect installation, operation or maintenance, alteration, modification, accident or unusual deterioration of the Product due to physical environments in excess of the limits set forth in Product manuals.

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THIS PROVISION. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. NO REPRESENTATION OR WARRANTY OF THE DISTRIBUTOR SHALL EXTEND THE LIABILITY OR RESPONSIBILITY OF THE MANUFACTURER BEYOND THE TERMS OF THIS PROVISION. IN NO EVENT SHALL NORTHERN BE LIABLE FOR ANY RE-PROCUREMENT COSTS, LOSS OF PROFITS, LOSS OF USE, INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES TO ANY PERSON RESULTING FROM THE USE OF NORTHERN PRODUCTS.

# Description

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The NS2 is a two reader panel providing access control for up to two doors by providing connections for Wiegand readers.

The NS2 may be used as a stand-alone panel with independent card and transaction storage or, with a software upgrade, as a fully monitored online access control device. Communication is achieved through an RS-232 serial cable (included with installation kit) or an optional RS-485 loop to the front-end computer. Each RS-485 loop is capable of communicating with up to 31 panels.

The NS2 is designed for tile mount using the ENC10 enclosure. The I/O terminals are organized by operational utility with connectors for power and RS-485 communications located on the lower right followed from right to left by the relays, auxiliary power, door control inputs, readers and reader multiplexer. The Tamper and External Power Fail terminal are located at the left edge above the main line of connectors.

Power is supplied to the panels using a 16.5 VAC, 50VA UL approved Class 2 transformer which powers the panels and readers, and charges a 12V battery backup. The NS2 provides 12 VDC, 600 mA power for the combined power usage of the two readers and an auxiliary power output which is capable of powering other devices.

**⚠ CAUTION:** *The NS2 must not be used to power locks.*

Eight inputs are capable of four state supervision: Normal, Alarm, Short and Open. Four inputs are used as door control with one input used for communication on each door and one input used for door status on each door. Supervised inputs for Tamper, External Power Fail and two Reader Tamperers are supplied as well and can be used as additional inputs when not required for their default purpose.

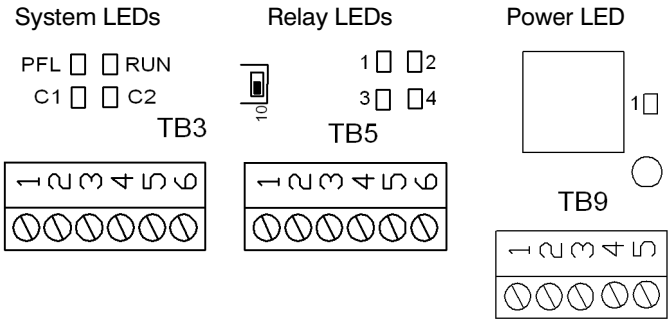
Four relays (12 Amp resistive/6 Amp inductive 28 VDC, Form C SPDT) allow for lock control and signaling.

**TABLE 1: Parts List**

Description	Qty
NS2	1
ENC10 Cabinet, Universal Beige	1
Lock with Retaining Ring	1
Tamper Assembly	1
Resistor, 1K ohm, 1/4 W 5% CF	16
Battery Harness, 18" L, 18 awg	1
Power On LED Assembly	1

# LED Operation

**Figure 1: System, Relay & Power LEDs**



**TABLE 2: LED Status**

LED	GREEN	RED	AMBER	OFF
PWR	Power OK	N/A	N/A	Power Off
PFL	N/A	Power Fail	N/A	N/A
RUN	N/A	N/A	Run Heart Beat	N/A
C1	COM 1 TXD	COM1 RXD	COM1 TXD & RXD	No Com.
C2	COM2 TXD	COM2 RXD	COM2 TXD & RXD	No Com.

## Power

The NS2 is capable of operating on AC or DC power input. AC input must be supplied at 16.5 VAC utilizing a UL approved 50 VA Class 2 transformer. Use two wire 18 AWG shielded cable to run the AC power from the wall transformer to the enclosure. The AC in is non-polarized and connected to TB9-4 and TB9-5. A POWER ON LED assembly is supplied with the ENC10. It is required to be mounted on the front of the cabinet and connected to TB9-4 and TB9-5. While sufficient AC power is supplied to the NS2 the LED will be red; if AC is lost then the LED will turn off.

DC power is polarized and can be supplied at 24 VDC, 1.25 Amp and must be supplied using TB9-4 (+DC) and TB9-5 (-DC).

The panel memory is backed up using a super capacitor. The super capacitor will backup panel memory and real-time clock for one week in the absence of power or back up battery. The super capacitor does not require maintenance or replacement. Power should be initially applied to the super capacitor for 24 hours to provide a full charge.

A Casil 12VDC, 4Ah, sealed acid/lead backup battery (NCI part no. BAT-3) must be supplied in order to have backup battery capability. The battery will provide 2.5 hours of standby backup power. The battery cables are connected to the battery quick connects located at J6 (+DC) and J7 (-DC). The panel is capable of supplying up to 300 mA for battery charging. The total charging voltage is 13.7 +/- .1 VDC. When AC is lost the NS2 will automatically switch to the backup battery, if supplied, without loss of data or continuity. The panel has deep discharge protection built in for the protection of the battery and will only utilize a backup battery down to 10.2 VDC before the NS2 shuts down. Replace batteries every 2 to 2.5 years: more often if panel has a high rate of backup use.

Reader and AUX power is supplied at 12 VDC nominal with a maximum current distribution of 600 mA. Five volt (5 VDC) readers require five volt regulators (part no. 5VRDREG). The current can be distributed through the Reader Power or Aux Power in any configuration as long as the maximum draw is less than 600mA: Reader 1 + Reader 2 + Aux Power < 600 mA.

**⚠ CAUTION: AUX POWER MUST NOT BE USED TO POWER LOCKS.**

For NS2 maximum current draw refer to panel specifications.

# Communications

**⚠ CAUTION:** Do not route communication wires with power or locking device.

## RS-232 Communications

The NS2 starter kits ship with a 50 ft. RS-232 serial communications cable (NCI part no. CBL50). The cable is used to provide communication to a single panel. A second cable can be used with another NS2 control panel connected to a second COM (communication) port, which would enable four readers to be used, see Figure 3, RS-232 Configuration, on page 7.

The NS2 panel communicates to the PC via RJ-45/RS-232 serial communication. Figure 2 illustrates the connections for an RS-232, DB9 (9 pin) connector to the panel's RJ-45 serial port. Every NStar starter kit includes a 50 ft. cable. Replacement cables can be obtained by calling Northern.

**Figure 2: RJ-45 Serial Port**

RJ-45		RS-232 DB9
2	Request To Send (RTS)	8
3	Signal Ground (TXD)	5
4	Receive Data (RXD)	2
5	Transmit Data (TXD)	3
7	Clear To Send (CTS)	7

## RS-485 Communications

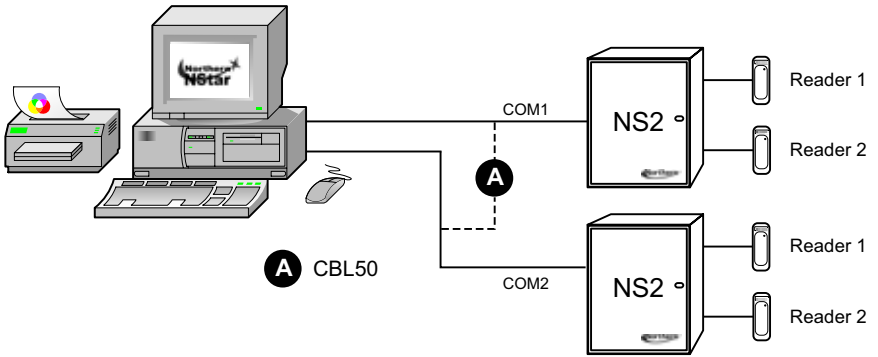
The NS2 communicates to the host computer via an RS-232 interface and a N-485-PCI-2, see Figure 4, RS-485 Configuration, on page 7. The interface allows for a multi-drop communication of up to 4000 ft. (1200 m) total from the N-485-PCI-2 to the furthest NS2 on the communications loop. Use two twisted pair (minimum 24 AWG) with a shield for communications. The default baud rate is set at the factory.

DIP switches 8 and 9 are provided for supplying biasing with end-of-line termination for an RS-485 communications loop that does not use a N-485-PCI-2 and where biasing with EOL is required.

IP Switch 10 is provided to supply the end-of-line termination for the RS-485 communication line that begins with a N-485-PCI-2 and ends with a NS2 panel. The end-of-line termination (S10 ON) is added only on the panel that is at the end of the communication path.

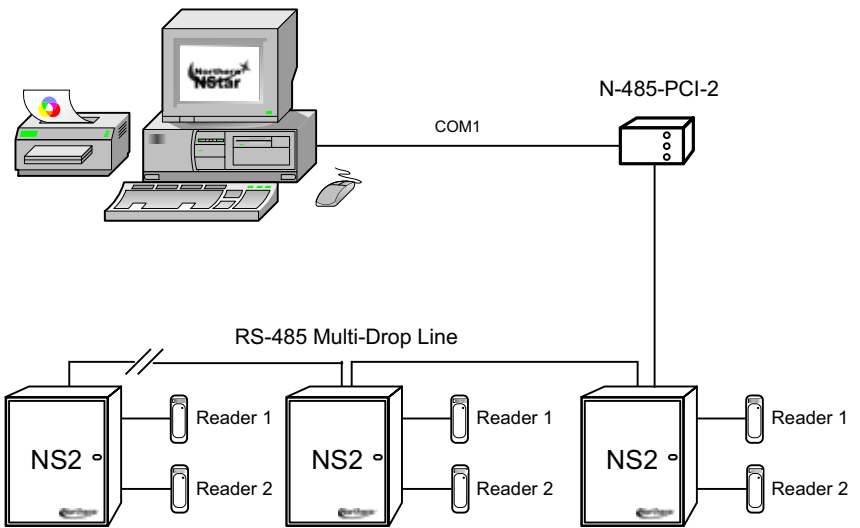
See the N-485-PCI-2 manual for instructions in general field wiring and settings.

**Figure 3: RS-232 Configuration**



*One NS2 panel per COM port. Two COM ports possible.*

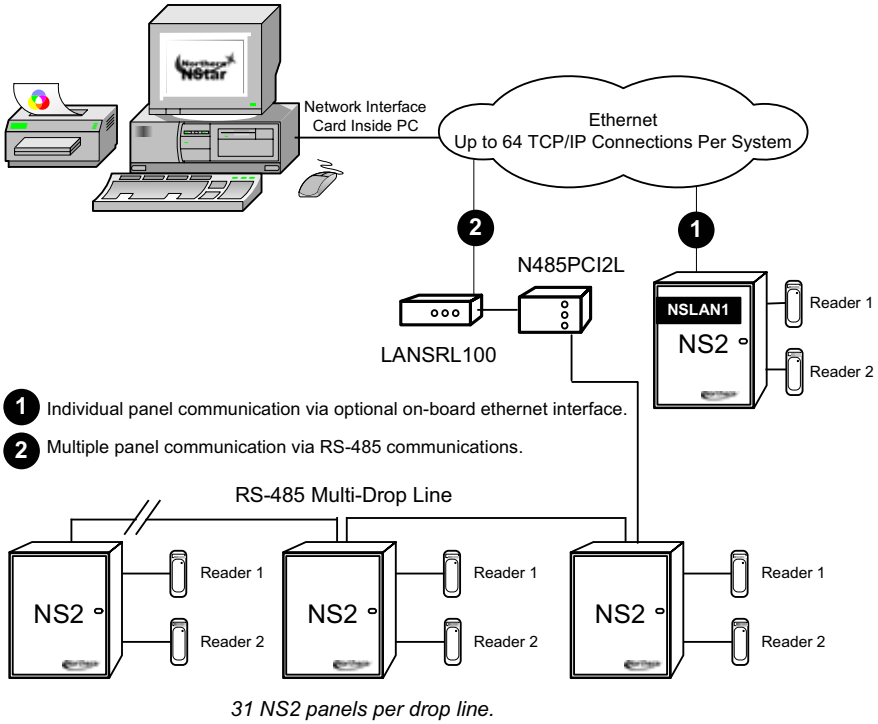
**Figure 4: RS-485 Configuration**



*31 NS2 panels per drop line.  
With second COM port, additional 31 panels possible.*

# Ethernet TCP/IP Communications

Figure 5: Ethernet TCP/IP Configuration



Each NS2 contains an ethernet port for an optional ethernet TCP/IP interface (NCI part no. NSLAN1), see Figure 5. The optional ethernet TCP/IP interface provides 10 Mbit ethernet support for each panel. Up to 64 TCP/IP connections are possible.

Using a Lantronix MSS-100 ethernet adapter (NCI part no. LANSRL100) in combination with a N485PCI2L interface, up to 31 panels can be configured on each TCP/IP drop line.



# Reader Wiring

Each reader port supports a single 12-volt reader with Wiegand output format. Power to the readers is shared with the AUX Power port TB6. The maximum power draw is 600mA for both readers and Aux Power.

To fully utilize each reader port, a shielded 6-conductor cable (18 AWG) is required (NCI part no. NC1861-BL). The cable shield should be grounded at the panel only. Grounding at both ends can cause ground loops which can be disruptive. The maximum recommended length of wiring is 500 ft. per reader. Reader port configuration is set via host software.

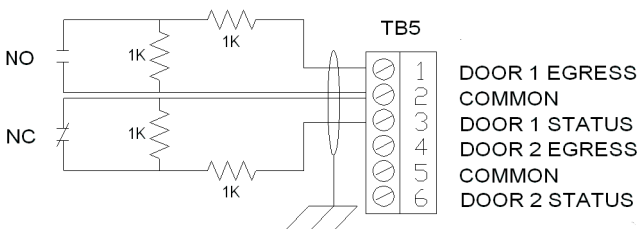
**TABLE 3: Reader Wiring**

Terminal	Wire Color	Weigand Reader
TB3-1/TB4-1	Brown	LED Control
TB3-2/TB4-2	Green	Data 0 signal
TB3-3/TB4-3	White	Data 1 signal
TB3-4/TB4-4	Black	Common
TB3-5/TB4-5	Red	12VDC Power
TB3-6/TB4-6	Variable	Tamper

# Supervised Input Wiring

The supervised inputs are located on TB5. Refer to Figure 6. Input 1 through Input 4 may be configured for normally open or normally closed contacts with supervised (using standard 1K ohm 5% resistors) or non-supervised. All four inputs have default functions, but can be configured for general purpose inputs. Input 1 (TB5-1) is defaulted for Door 1 REX (egress) and Input 2 (TB5-3) is defaulted for Door 1 Status. Likewise Input 3 (TB5-4) is defaulted for Door 2 REX (egress) and Input 4 (TB5-6) is defaulted for Door 2 Status. The inputs share a common terminal located at TB5-2 and TB5-5.

**Figure 6: TB5 Contacts**



In addition, the Tamper TB1-1 and External Power Fail TB1-3 are supervised and capable of being used as additional inputs if the default functionality is not needed. They also share a single common at TB1-2.

The wire used for the inputs should be shielded and cannot exceed 30 ohms over the entire length of the cable. Remember that the distance from the panel to the door must be doubled to determine the total resistance.

**⚠ CAUTION:** *The cable shield should be grounded only at the panel earth ground lug. Grounding at both ends can cause ground loops which can be disruptive.*

**⚠ CAUTION:** *The system has not been verified for compliance with UL1076 Burglar Alarm units and systems.*

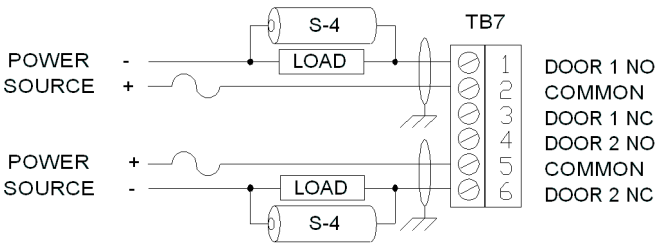
# Control Output Wiring

Four form-C relay contacts are provided for controlling door locks or other devices. Each may be assigned to door related functions or general purpose outputs. They are configurable as standard (energize to activate) or fail safe (energize to de-activate) via host software.

The energized or ON time for each relay can be configured using on/off time control or a programmable time pulse via host software.

Relay 1 is defaulted for control of the Door 1 lock and Relay 2 is defaulted for Door 2 lock. Relay 3 & 4 are used as auxiliary relays for signaling other devices. All 4 relays are rated at 12 Amps/28 VDC for resistive loads and 6 Amps/28 VDC for inductive loads with gold contacts. The gold contacts are designed for data switching such as for a “burg” input. If the relay is used for load switching (lock/strikes), the gold contacts burn away, thus compromising its operation for data switching. Switching of inductive loads can also cause EMI (electromagnetic interference) which may interfere with the normal operation of other equipment.

**Figure 7: Recommended Contact Protection Circuits**



To minimize premature contact failure and increase system reliability, contact protection circuit is highly recommended. Refer to Figure 7 for recommended circuits. Locate the protection circuit as close as possible to the load.

**⚠ CAUTION:** *The cable used must be sized for the current load and should be shielded. The cable shield should be grounded at the panel only. Grounding at both ends can cause ground loops which can be disruptive. Do not bundle these wires with communication, reader or supervised input wiring.*

# DIP Switch Settings

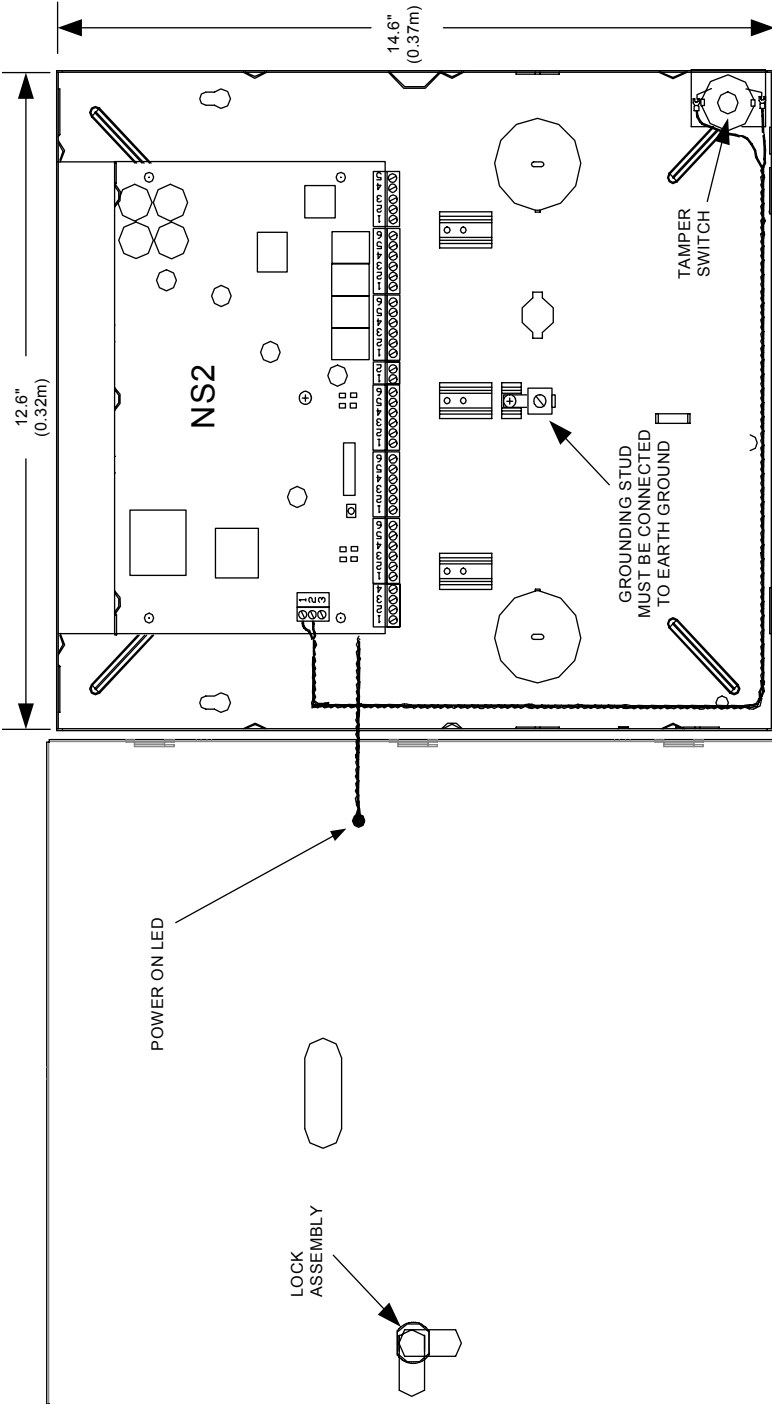
S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	SELECTION
ON	OFF	OFF	OFF	OFF						Address 1 (default)
OFF	ON	OFF	OFF	OFF						Address 2
ON	ON	OFF	OFF	OFF						Address 3
OFF	OFF	ON	OFF	OFF						Address 4
ON	OFF	ON	OFF	OFF						Address 5
OFF	ON	ON	OFF	OFF						Address 6
ON	ON	ON	OFF	OFF						Address 7
OFF	OFF	OFF	ON	OFF						Address 8
ON	OFF	OFF	ON	OFF						Address 9
OFF	ON	OFF	ON	OFF						Address 10
ON	ON	OFF	ON	OFF						Address 11
OFF	OFF	ON	ON	OFF						Address 12
ON	OFF	ON	ON	OFF						Address 13
OFF	ON	ON	ON	OFF						Address 14
ON	ON	ON	ON	OFF						Address 15
OFF	OFF	OFF	OFF	ON						Address 16
ON	OFF	OFF	OFF	ON						Address 17
OFF	ON	OFF	OFF	ON						Address 18
ON	ON	OFF	OFF	ON						Address 19
OFF	OFF	ON	OFF	ON						Address 20
ON	OFF	ON	OFF	ON						Address 21
OFF	ON	ON	OFF	ON						Address 22
ON	ON	ON	OFF	ON						Address 23
OFF	OFF	OFF	ON	ON						Address 24
ON	OFF	OFF	ON	ON						Address 25
OFF	ON	OFF	ON	ON						Address 26
ON	ON	OFF	ON	ON						Address 27
OFF	OFF	ON	ON	ON						Address 28
ON	OFF	OFF	ON	ON						Address 29
OFF	ON	ON	ON	ON						Address 30
ON	ON	ON	ON	ON						Address 31
					OFF					RS-232 (default)
					ON					RS-485 PCI Loop
						OFF				19200 Baud (RS-232 only)
						ON				57600 Baud (RS-232 only, default)
							OFF	OFF		RS-485 Bias & EOL Off (default)
							ON	ON		RS-485 Bias & EOL On
									OFF	RS-485 EOL Off
									ON	RS-485 EOL On

**NOTE:** Address 0 is not a valid setting.

**NOTE:** DIP switch S7 sets baud rate for both COM ports (RS-232 and Ethernet adapter port).

# Mounting

Figure 8: ENC10 Cabinet Mounting



The NS2 can be mounted in the ENC10 enclosure. The ENC10 enclosure comes with a power-on LED, tamper switch, grounding stud, keyed lock and removable door. Table 4 shows the ENC 10 Cabinet electrical entries.

Mounting holes are located in a rectangular pattern 11.5" (0.292 m) W x 10.5" (0.267 m) H. The mounting holes can accommodate an anchor up to .25" (0.064 m) bore width.

**TABLE 4: ENC Cabinet Electrical Entries**

ENC10 ENCLOSURE	CONDUIT 1/2" (0,0127 m)	CONDUIT 1 1/2" (0,0381 m)
Top	2	N/A
Bottom	2	N/A
Right Side	1	N/A
Left Side	2	N/A
Back	N/A	2

## NS2 Panel Installation

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1. Pre-design panel layout, cable runs and power needs.
2. Mount enclosure at the proper location on the wall. Use appropriate anchors for the mounting material.
3. Mount the tamper switch into the holder and slide onto the edge of the enclosure as pictured in Figure 8, ENC10 Cabinet Mounting, on page 12.
4. Run the Power On LED assembly from the outside of the door towards the inside. Secure by pressing the LED through the designated hole.
5. Remove the knockout for the lock and press the Key Lock assembly into the opening making sure the locking tang points to the closest edge of the door for proper alignment. Do not mount the door at this time.
6. Run all I/O wires to the enclosure making sure to properly mark each wire for use.
7. Run appropriate length two-wire 18 AWG shielded cable from the enclosure to the wall transformer location.

**⚠ CAUTION:** *Do not plug the wall transformer in at this time.*

8. Run a 14 AWG green wire from the enclosure to a proper Earth Ground.

**⚠ CAUTION:** *Use a static strap whenever touching the panel to ensure protection from ESD.*

9. Remove each terminal plug one at a time to wire the properly labeled cables. See wiring diagram. Leave enough shield drain length to secure to the grounding stud.

**⚠ CAUTION:** *Do not plug the wall transformer in at this time.*

10. Wire the tamper switch to TB1-1 and TB1-2.
11. Gather the shield and the green earth ground together and place into the grounding stud.
12. Place the door on sliding into the slots. Wire the Power On Light assembly into TB9-4 and TB9-5 no polarity.
13. Set DIP switch settings for address and communication termination.
14. Check all wiring at this time.

**⚠ CAUTION:** *Improper wiring can cause damage to the NS2 at power up resulting in a loss of warranty.*

15. Plug in the wall transformer and power up the panel. Configure panel following host software instructions.

**⚠ CAUTION:** *Do not connect to a receptacle controlled by a switch.*


16. If using a battery backup, connect the positive terminal to J6 and the negative terminal to J7.

# Maintenance

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Perform the following maintenance on the NS2 and ENC10 enclosure:

- Change lead-acid backup battery (NCI part no. BAT-3) every 2 to 2.5 years

 **CAUTION:** Do not connect an uncharged battery to the panel.

- Oil the lock once per year

# Troubleshooting

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**Problem:** LEDs C1 and C2 flashing red.

**Solution:** Ensure that DIP switch 7 is set for the correct baud rate. ON = 57600. OFF = 19200. The setting of DIP switch 7 affects RS-232 communication only. Set DIP switch 6 to OFF (RS-485 disabled) when using RS-232.

**Problem:** RUN LED remains steadily on or off, not flashing.

**Solution:** The RUN LED is an indicator of the NS2 panel's processor activity. A steady on or off condition normally indicates that the processor is locked up. To reset the processor: Set the panel address to zero (DIP switches 1–5 off), then recycle power to the panel. See Caution below.

After the RUN LED begins to flash, reset the panel address (DIP switches 1–5) to their original values, then recycle power to the panel again. The panel database will need to be restored by initializing the panel with the NStar software program. Refer to Initializing Panels of Quick-Start Wizard on page 20.

 **CAUTION:** Recycling power with the address set to zero will clear the NS2 database and require that the panel be initialized with the NStar software program. Refer to Initializing Panels of Quick-Start Wizard on page 20.

# Specifications

## Primary power

Basler Electric 16.5VAC, 50VA, Class 2 UL approved wall transformer (NCI part no. BAT-3). Alternate DC supply (24VDC, 4A) can be provided using AlarmSaf part no. PS5-BFS-24-UL.

**TABLE 5: Maximum Current Draw**

Nominal Power Supply	VAC 16.5	VDC Backup 12	VDC 24
Control Panel	570 mA	360 mA	275 mA
12 Volt Reader & Aux Power	1300 mA	600 mA	625 mA
Battery Charging	730 mA	N/A	350 mA
Total	2600 mA	960 mA	1250 mA

**NOTE:** *The NS2 is designed for low voltage Class 2 circuits.*

## Relay Contacts

Four Form-C SPDT gold contact relays:

12A @ 28 VDC Resistive Load

6A @ 28 VDC Inductive Load

## Reader Interface

Reader Power: 12 VDC nominal with 600 mA combined current with readers and Aux Power.

Reader LED output: Open collector driver capable of sinking up to 8 mA.

Reader Tamper: Supervised input

Reader Data Input: TTL compatible inputs

## Wire requirements

Power: One twisted pair shielded, 18 AWG.

RS-485: 24 AWG, 4,000 ft (1,200 m) max, twisted pairs with shield, 120 ohm, 23 pf (NCI part no. NC2021-GY-A).

RS-232: Use cable supplied with installation kit (NCI part no. CBL50). Maximum distance per COM port is 50 ft.

Supervised Inputs: One twisted pair per input, shielded 30 ohms maximum.

Outputs: As required by load.

Readers: 6 conductor, 18 AWG, shielded, 500 ft (150m) max

## Common Connections

Common connections are all connected together internally. They are not connected to the panel chassis.

## Mechanical

Panel Dimensions: 6" (0.152 m) W x 9" (0.229m) H.

Panel Weight: 14 oz (0.40 kg) nominal.

ENC10 Dimension: 12.6" (0.32 m) W x 14.6" (0.370 m) H x 3" (0.076 m) D.

Enclosure Weight: 5.5 lb (2.5 kg) nominal.

## Environment

Temperature: 0C to 49C operating, -55C to +85C storage.

Humidity: 0% to 85% RHNC.

## UL Note

The NS2 panel was UL294 tested as a stand-alone unit only using the Basler Electric transformer, part number BE11625CAA-0042 (NCI part no. X-4). The input points monitor the door position only. The panel is not intended as a proprietary burglar alarm (UL1076).

The NS2 panel was UL294 tested using the following card readers:

- HID MiniProx
- OmniTek OmniProx
- HID ProxProK
- Essex KP11

# NStar Software Installation

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## Operating System

NStar is a 32-bit application which is designed to run in Windows XP Professional or Windows 2000.

## Hardware Requirements

### Minimum Requirement Configuration

Pentium II-400Mhz CPU

256 megabytes of RAM

2.1 gigabyte hard disk

2 serial communication ports

Tape backup drive

15" SVGA color monitor (1024 x 768, 256 color)

Supported Operating Systems:

Microsoft Windows XP Professional or Windows 2000 Professional/ Server/ Advanced Server with Service Pack 2

## System Setup

BEFORE installing NStar software for the first time, ensure that the following conditions are met:

- Disable all energy management from both the BIOS and Operating System, as this can adversely affect the installation and operation of NStar.
- Install printer drivers.

**NOTE:** *Some software applications may not function properly on different versions of Internet Explorer. If Internet Explorer is not version 5.50.4522.18001C or greater, it will automatically be updated.*

- Before beginning installation, make a note of the CD Key number located inside the cover of this installation guide. The number will be needed during installation and when contacting Northern regarding the software.
- Read the text files on the NStar CD and any release notes that are shipped with the software. Additional installation information may be contained therein.
- TCP/IP protocol must be installed for the MSDE to work properly. A network card doesn't have to be installed. Use Microsoft Loopback adaptor or Dialup adaptor, depending on the operating system used.

## Complete or User Interface Installation

Choose either a Complete installation or User Interface Only installation:

### Complete Installation

Select Complete installation when setting up a stand-alone system [an access control system installed on one computer], or User Interface Only if installed on a networked system as a workstation.

**NOTE:** *In a networked system, one computer must have a complete installation.*

### User Interface Only

Select User Interface Only installation when installing a workstation on a networked system.



## Installation Procedure

**NOTE:** *In certain applications it may be preferable to place the database files on a different drive partition to protect them from operating system failure, or to place them on a separate hard drive to isolate them from the database server. Refer to the "Limits and Capacities" section of the NStar Help file.*

When prompted, fill in the User Information, then click Next to continue. The Name and CD Key fields must be filled in. The Company field is optional. The CD Key number is located inside the cover of this installation guide.

The Question screen will appear, querying the operator whether to stop the database engine in order to continue the installation. Click Yes to continue the installation.

After the installation is complete, the Setup Complete window will be displayed. Click Finish to complete the installation process.

## First Log In

All services should be running, if not, double-click the NStar Services icon and start all services.

Double-click the NStar User Interface icon. The User Interface opens and the Connect to Server window is displayed:

Enter ADMIN as the default operator Name.

**NOTE:** *No password is required for the initial log in, but a password should be added in order to ensure the security of the system.*

## Licensing and Registration

NStar has a 30-day initial license period. For evaluation purposes, the software can be installed and used for up to 30 days without registration. At the end of the 30-day period, the initial license expires and is invalidated.

Once the license expires, only the Help menu is accessible until the software is registered and a valid license restored.

## Registering Software

Before beginning software registration, select the License option from the NStar Help menu.

When the License window is displayed, note the CD Key and Site Code numbers. These are unique numbers that identify the computer and options that will be authorized when registered.

### Registering Software Online

NStar software can be registered online by visiting the Northern web site at:  
[www.nciaccessworld.com](http://www.nciaccessworld.com)

Otherwise, select Registration from the Northern option on the NStar Help menu. Internet Explorer will open at the registration site.

### Fax Registration

The registration form found on the NStar CD can be printed and faxed to Northern at the number indicated on the form.


### Call-in Registration

Call Northern Customer Service at 414-766-1700. Be prepared to give the Customer Service representative both the CD Key and the Site Code.

A License Key number will be given. Enter this number in the License Key field and click on Save License Key to complete registration and activation.

The number of clients and number of servers licensed for the system is now displayed in the License dialog.

## Norton Speed Disk Utility

 **CAUTION:** *Using Norton Speed Disk can invalidate the license. Do Not use Norton Speed Disk before making changes to the utility indicated below.*

Speed Disk is the defragmentation utility included in Symantec's Norton Utilities. To prevent losing license files:

1. Open Speed Disk and select Options/Customize, and then Unmovable Files from the File menu.
2. Specify that the \*.ent, \*.key, and \*.rst files cannot be moved.
3. Save the new profile by selecting Files/Options/ Optimization/Save. Speed Disk can now be run without affecting license files.

## User Overview


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The NStar user interface allows a user to setup, monitor and maintain all aspects of the access control system.


### Title Bar and Menu Bar


Once a user is logged in, the title bar at the top of the screen displays the name of the operator and the license information. If the software has not been licensed, it gives the number of days left on the 30-day trial license.


### Toolbar Buttons


 **Log In:** Logs the user out of NStar and reopens the log-in window, allowing the user to log in again, and reconnect to the database server.


 **Alarm View:** Opens the Alarm View window, from which incoming alarms can be viewed, acknowledged, and cleared. This function is optional.


 **Event View:** Opens the Event View window, which displays current system activity in real-time.

 **Control Map:** Opens the Control Map window for operator control of devices. When the option package is used, it also provides an alternate means of acknowledging and clearing alarms.

 **Card Holder Database:** Opens the Card Holder Database window, allowing the operator to search and sort the cardholder list and to add, and to edit, or delete card holders.

 **Reports:** Opens the Reports database window, allowing the user to generate, view, and print reports.

 **Help Topics:** Opens the Help menu, providing access to on-line help files.

 **Log Out:** Logs the operator out of the user interface and logs the client out of all servers.

## General Database Access

Each of the NStar databases are accessed through a main database window. It displays a list of records in the database, which can be searched and sorted. Records can be removed from the database by deleting them from the list in the main database window. A detail view opens from the main database window, displaying record details, and also allowing database records to be edited and (in most databases) added.

### Search and Sort Fields

Use these fields to choose the search characteristics to be applied to the records list.

**Search Field:** Select the name of the field desired to search.

**Criteria:** Choose one of the operators from this list. The available options vary depending on the database, but include greater than, equal to, or less than.

**Search For:** Type in the desired letter, word, phrase or numeric expression to search for.

**Sort By:** This selection designates the order in which the search results will be displayed (e.g. cards can be displayed by card number or last name.)

**Update List:** This button initiates a search based on the information entered in the Search and Sort fields.

### Operations

**Edit:** Opens the Edit View window to the selected record, allowing the record to be changed.

**Add:** Opens a blank Record View window for entry of a new record.

**Delete:** Removes the selected record from the database. In the Card database, a confirmation dialog box appears if the Confirm Card Deletes option is selected in Workstation Defaults. Click OK to confirm.

**Copy:** Some databases have a Copy function. Select a record and click the Copy button to make a duplicate which can be renamed and edited.

**Isolate:** Some databases have an Isolate function, which expedites item deletion. NStar does not permit an item to be deleted, unless it is first removed from all areas (panels, access levels, cards, etc) where it is implemented.

The Isolate function allows the operator to view and edit all areas where an item is implemented without having to manually access each area where the item may be implemented.

Selecting an item and clicking Isolate brings up the Isolate window, which provides access, via tabs, to all areas where the selected item is implemented. After the item is removed from each area, clicking OK at the bottom of the window returns the operator to the main database window, from which the item can now be removed.

## Right-Click Menus

Right-clicking on items in the NStar User Interface to display item specific menus. For example, right-clicking on a panel icon in the Device Map window opens a menu which allows the operator to change the panel configuration or to isolate or delete it from the Device Map.

## Database Tree

Several NStar databases use trees to display information. The trees allow information to be organized into logical or geographical groups.

The tree can be collapsed so that only the top level information is displayed. By clicking on the plus signs (+), the tree structure can be expanded, one level at a time, to show all branches.

# Quick-Start Wizard

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After logging in to NStar for the first time, the Quick Start Wizard window will appear on the computer where the complete installation was performed. It will not appear on other workstations.

After using the Quick Start Wizard for the first time, it is necessary to log out of NStar, stop and start the communication server and log in to NStar again. This procedure is required only once, after the initial use of the Quick Start Wizard.

Restart the communication server by stopping it from the NStar Service Manager and then start it. An error indicating that the communication server is not responding may appear [if the NStar UI is open]. Click OK. When the communication server is started, another message may appear several seconds later indicating that it is now working. This procedure is required only once, the first time. All other additions made by the wizard will become available after the wizard is finished.

## Initializing Panels

To initialize the panel(s) click on Operations then Control Map and click on the plus sign (+) by the Quick Start Control Area to open the branch. Right click on the panel that was added and select Initialize, Select All and click OK. A panel initialization status window will display the initialization progress. Repeat the procedure for as many panels as were added to the system. Multiple panels can be initialized at the same time.

On systems where the option package is enabled, alarms will popup during the panel initialization. To acknowledge all the alarms, click on the first event and then hold the shift key down and select the last event. [Scroll bars may be used to reach the end of the list.] Then click on Ack, which will acknowledge the alarms. Use the same process to select the acknowledged alarms, then click on clear to clear the alarms.

The system is now operational. Use the standard Window help Index, Search and Contents for detailed help. Or press F1, while a window is open to access context sensitive help.

# Programming

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## To Edit a Panel

The panel configuration contains a great deal of information about the setup of the access control system. This information can be edited by locating the panel on the Device Map, right-clicking the panel, and then selecting Configure and the desired tab. When finished editing the information click Finish to save the entries, or Cancel to exit without saving.

Panel definitions are added to the Device Map.

1. In the Configuration menu point to Device, and then click Device Map. The Device window appears.
2. Click the plus signs (+) to open branches, until the desired panel is displayed.
3. Right-click the desired panel for editing, and then select Configure. The Panel Configuration window opens.
4. Select the desired tab then make the desired changes.
5. Click OK to save changes and close the Panel Configuration window. Or click Cancel to exit without saving changes.

**NOTE:** *Even when clicking Cancel some changes are retained. Any edited abstract devices (ADVs) keep their changes and any deleted ADVs are not restored.*

## To Add a Time Zone

1. On the Configuration menu, point to Time Management, and then click Time Zone. From the Time Zone database window select a time zone and click Edit or click Add. The detail window becomes active, allowing editing of an existing time zone or defining a new time zone.

For a new time zone, enter a name and a brief description, then use the mouse to drag the time line to the desired hours.

2. The Snap Time option enables the time to be set in increments of 60, 30, 15 or 0 minutes. Selecting 0 minutes allows the time to be set to the minute.
3. Once a range of time is entered for Monday, it can be copied to the other weekdays by clicking Copy Monday to Weekdays. Otherwise the time line can be created for each day separately.
4. Create a time range for Saturday, Sunday and Holidays (if desired).
5. Click OK to save the time zone. Clicking Cancel returns to the main database window without saving the entries.

## To Delete a Time Zone

1. Use the Isolate dialog to change Operators, Panels, Access Levels, Cards, Action Groups and ADVs that use the time zone that will be deleted.
2. In the Time Zone database window, highlight the time zone to be deleted, then click Delete. Then click OK to the confirmation prompt to delete.

## To Add a Time Zone to a Panel

To have the desired effect, a time zone may need to be added to the panels, access levels, ADVs and Action Groups. Time zone changes must be reinitialized to the panel before becoming active.

1. On the Configuration menu, point to Device, and then click Device Map. The Device window appears.
2. Click the plus sign (+) to display the desired panel. Right-click the desired panel for editing, click Configure then click the Time Zone tab.
3. In the Available Time Zones list (upper pane), double-click the time zone to be added. The added time zone(s) appear in the Selected Time Zones list.
4. If the new time zone is to be applied to inputs, outputs, or groups, click those tabs and select the new time zone from the list of available time zones.
5. When all changes are completed, click OK to save them.

## To Add a Card Holder

1. Select Card menu, click Card Holder. The Card Holder window appears.
2. Click Add. The Card Holder Record window opens to the Name Information tab.
3. Enter the card holders first and last names in the respective fields. This is the minimum information required. Add any optional information on the appropriate tabs.
4. To assign a card to the card holder, click the Cards tab, and then click Attach. The Select dialog box appears.
5. Click Find to display a list of available cards.
6. From the list, select the desired card for attaching to the card holder, then click OK. The selected card is now assigned to the card holder, along with the access level for that card.
7. If there are no cards available, click Add. The Card Record window appears displaying the Card Properties tab.
8. In the Card Number box, enter the card number.
9. Click the pull-down arrow in the Access Level box, and select an access level for the card. Custom Access Levels can be created. See “Custom Access Levels” in the Help for further information.
10. If the system requires a PIN (personal identification number), enter it in the PIN field. A PIN can be added to the card later.
11. Set the card status and select any other desired options.
12. To associate a badge layout (optional) with the card, click the Badge tab. Click the pull-down arrow in the Badge Front and Badge Back boxes and select a front and back layout for the badge.
13. After finishing the card definition, click OK to save it. Otherwise, click Cancel to return to the Card window without saving the new card.
14. To Add a Card Holder Photo or Signature (optional), click the Card Biometrics tab and click the Import or Capture buttons for either photos or signatures.

## To Add an Access Level

1. Select the Card menu, click Access Levels. The Access Level window appears.
2. Click Add. The Define Access Level window appears.
3. In the Name box, enter a name for the Access Level [required]. Use up to 30 characters.
4. In the Description box, enter a description of the Access Level [optional]. Use up to 60 characters.
5. Click OK. The new access level is added to the list, but it has no access rights to any entrances. The access level must be configured.
6. Right-click on an Access Area branch, then click Configure. The Configure Area Access window appears.
7. To allow access to all doors in the area, select Set Access for all entrances in this area.
8. Click the pull-down arrow in the Time Zone box and select a time zone from the list.
9. Click OK.
10. In the Access Level window, right-click individual entrances on the branch to customize the settings as necessary. Continue this procedure until the access level has the required configuration.

**NOTE:** *It is easy to tell at a glance what areas are included in a given access level. Select a level from the list in the left pane. The branches of the Access Areas are color-coded for the selected level: red means no access to any doors in the area. Yellow means access to some entrances in this area. Green means access to all entrances in this area during the assigned time zone. Click a branch to view the entrances which are also color coded and have a time zone notation.*

## UL Approved Procedure To Activate Relay Output for a Tamper Condition

**NOTE:** *The following is a UL approved procedure indicating how to enable the Auxiliary Relay output to actuate during a tamper input from the enclosure switch. NStar software may supercede the necessity of this procedure, however, that software feature has not been reviewed by UL.*

1. From the Configuration pull-down menu, scroll down to Device and select Device Map.
2. From the Device Map window, select Communication Server and the appropriate communication ADV (abstract device). Right click then select the appropriate panel shown. The Panel Configuration window will appear.
3. Select the Inputs tab on the panel screen.
4. Click on the Input 8 selection box to add a checkmark.
5. Click on the Interlock box to assign an output to activate when Input 8 is active.
6. Select the Output option by clicking on the circle next to the 'O'.
7. In the Name box, choose the Point, select output 3 or 4 to be the relay that turns on when the Tamper is active. Then set the Alarm Action to Energize and the Normal Action to De-Energize.
8. When completed, send the new information to the panel to update its configuration.

# Operations

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## To Open the Control Map

1. Click the Control Map toolbar button or select Control Map from the Operations menu. The Control Map window opens. Expand the tree by clicking the plus signs (+) to display the desired devices for control.
2. Right-click any device to open its control menu, and then click the desired command.

## Status Symbols

One of three status symbols may appear before an ADV icon on the Control Map screen.

- Red square = alarm
- Green circle = normal
- Yellow triangle = trouble
- Purple question = unknown

The status symbols will darken after their respective conditions have been acknowledged and cleared (optional). A forbidden symbol  overlaid over a status symbol indicates that the corresponding point is shunted.

Placing the mouse over the status symbols will bring up a textual description of the status for each ADV.

## To Generate, View,

## Print or Export a Report

1. Click the Run Reports toolbar button or select Reports from the Reports menu.
2. From the database record list, select the desired report, then click Report Options. A detail window appears. Some reports have a variety of filters and sort options. Select the desired options.
3. Click Estim. Pages to find out the about how long the printed report is.
4. After selecting the desired options, click Print Preview to view the report.
5. Use the Zoom tool to enlarge the page view. Use the Next Page and Previous Page buttons to scroll through a multiple page report.
6. To print the report, click Print. A standard Print window appears. Select the desired printer, the page range, and number of copies.
7. To export the report, click Export File. The Export File window appears. In the window set the Delimiter option and give the report a file name.



# Database Backup and Restore Utility

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The NStar Backup and Restore utility is a stand-alone application that allows the user [typically a database administrator] to create and modify a backup and restore plan.

The Backup and Restore utility will only backup the NStar hardware and history database information. Other data, such as badge images, signatures and badges are not backed up by this utility. This data is normally found in the NStar\DATA-BASE folder with BadgeImage and UserImage subfolders. During the NStar installation, prompts are provided to allow the installer to place these subfolders at other locations in the system. Therefore, these subfolders may not be found in the NStar folder. Backup of these data folders can be accomplished using standard Windows backup or copying utilities. Both should be done at the same time to keep all information current.

The NStar Backup and Restore Utility is automatically installed when the NStar System is installed. The utility is accessed from the NStar Program group on the Start menu. The NStar Backup and Restore Utility is made up of three components: Backup, Schedule and Restore.

## Backup

1. Select Backup & Schedule from the main Backup and Restore window to create a new backup.
2. When the Backup Information window is displayed, enter a unique Backup Name, as well as an (optional) Description.
3. Select a database Backup Type. Complete will make a complete backup and Differential will backup only the differences from the last complete, appended or differential backup.
4. Select a Destination and file name for the backup. If a tape drive is not installed on the computer, Tape can not be selected. If a tape drive is on the computer, then the option to format the tape is also given.
5. Click Continue to bring up the Scheduling window.
6. Select the Schedule Type. Run Once will prompt for the time and date. Schedule to occur later will bring up Daily, Weekly and Monthly options. Daily allows the back up to be run every so many days as defined from 1-999 day(s) at the specified time. Weekly allows the back up to be run on a specified day of the week at a specified time. Monthly allows the backup to be run on the selected day of the month (1-31) or at regular monthly intervals.

## Schedule

Schedules can be modified by selecting Modify Schedule from the main Backup and Restore Window. To open a list of currently-scheduled backups, highlight a backup in the main schedule list and click on modify. This will bring up the Schedule screens shown above. Modify the schedule and click Finish.

To remove a schedule, select the backup schedule and click Delete.

Click Cancel to return to the main Backup and Restore window.

## Restore

1. Select Restore from the main Backup and Restore window to restore a backup. NStar's database knows the locations that the backups were made on this machine. If the backup is to be recovered from a different location, then select the View list of backups on a specific device option and navigate to the desired location.
2. Once the appropriate backup file is selected, a viewer (next illustration) shows the contents of that backup. Select the backup file desired. If selecting a differential backup, the last complete backup is automatically selected, as that is required to complete the restore process.
3. Use the Restore list to set the parameters for the backup. Restoring the NStar Database requires that the NStar database services be turned off. The restoration process will not proceed if the services are running. Restoring to NStar Archive Database replaces the existing archive database and allows reports to be generated for the archive.

Restoring to New Database allows advanced users to view the database without adversely affecting the current or backup database.

4. Click Restore to continue. When finished, click Cancel or Exit.

**NOTE:** *Scheduled backups run automatically as long as the MSSQLServerAgent components are running. By default these components are set to run when the operating system starts.*

5. To check if MSSQLServerAgent components are running, double click on the icon in the tray on the bottom of the Window.



**SQL Server Service Manager**

6. From the Services box, select MSSQLServer.

The message on the bottom of the SQL Server Service Manager windows displays the computer name followed by "MSSQLServer-Running". Select the SQLServerAgent. The message on the bottom of the SQL Server Service Manager windows displays the computer name followed by "SQLServer-Agent-Running".

7. If MSSQLServerAgent components are not running, click on the Start/Continue button.

# Options Package

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**NOTE:** *The options described below are included with NStar options package (NCI part no. NSOPT1). To obtain the options package, contact your Northern representative.*

**NOTE:** Underwriters Laboratories (UL) does not require nor test the following NStar options for Access Control System standard UL294.

## Networked Systems

To operate in a networked system, before installing NStar software, ensure that conditions listed under System Setup under Software Installation, page 16, and the following listed conditions are met.

- Ensure that machine names use only alphanumeric characters without spaces, and that the first character is always alpha (i.e. standard UNC connections).
- Ensure that networked computers are communicating with each other. They should be able to ping back and forth, ie from client-to- server and vice-versa. Any firewalls, proxies, routers, etc. between workstations could cause problems, unless a clear, unrestricted, permanent path can be established.

## Opening an Alarm View

Click the Alarm View toolbar button or select Alarms from the Operations menu to open the Alarm View window.

It is possible to open multiple alarm views by repeating the above procedure.

Colors of incoming messages indicate the type of event. Red indicates an alarm, green indicates normal and yellow is a trouble condition.

Selecting the Details check box opens the Alarm Details screen showing details of the state changes indicated by the counter and allowing a note to be written for that alarm.

**NOTE:** *When options are enabled, the "Alarm priority for required acknowledgement" threshold, found in the communication server configuration window, should be changed from '9' to '50'.*

## Command Buttons

**Ack:** To acknowledge an alarm, select it from the list of incoming alarms and click the Ack button.

**Clear:** To clear one or more transactions, select them from the list of acknowledged transactions and click the Clear button.

**NOTE:** *If an alarm cannot be cleared, it may be due to a setting in Workstation Defaults that requires an alarm to return to normal before clearing.*

**Freeze:** To temporarily stop the display of incoming messages, click the Freeze button. [The button changes to Release.] This stops the screen from scrolling as new information appears. To release the screen, click the Release button.

**Close:** To exit the Alarms view, click the Close button.

## Alarms View Right-Click Menus

Right-click a message in the Alarms view and a control menu appears. The list of available commands depends on the type of alarm selected.

## To Add a Note

1. Select an alarm, and then click the Add Note button to open the Add/Edit Operators Note dialog.
2. Type the message and then click OK. These notes are included in history and can be printed with the History report.

## Operating Digital Video

1. Select Digital Video from the Operations menu to open the Digital Video window.
2. In the Digital Video window, select a desired camera.
3. Select whether to view live video or recorded video [Clip From] in the View Video section of the window, then click Show to operate the desired camera or display recorded video from the camera.

The recorded video displayed will be for the time selected in the View Video section of Digital Video window. For live video, use the camera controls in the lower left portion of the digital display window to adjust the camera as necessary.

4. Repeat the above steps to display additional camera views.

**NOTE:** *Multiple cameras can be selected by using the Shift or Control keys while selecting cameras.*

## Digital Video Filter Control

1. Click the Filter button to open the Event Filter window.
2. Click on the Event Filter tabs to define which events to display in the Digital Video window. Defined events will subsequently be displayed in the Digital Video window.

Events associated with a digital camera will be displayed with a camera icon [either fixed or PTZ (pan tilt zoom), represented with a zoom lense]. Selecting one of these events will automatically select its associated camera and recorded video clip for display. Clicking Show will display the associated recorded video clip, unless live video is selected, in which case the associated camera will display live video.

## Printing a Badge

1. Select the Card Holder menu then click on a Card Holder. The Card Holder window appears.
2. Select the Cards tab. From the list of cards, select a card then click Print. The Print Badge Preview window appears.
3. Click Print.

**NOTE:** *The Print Badge Preview allows the user to view badges before printing.*

# Technical Support

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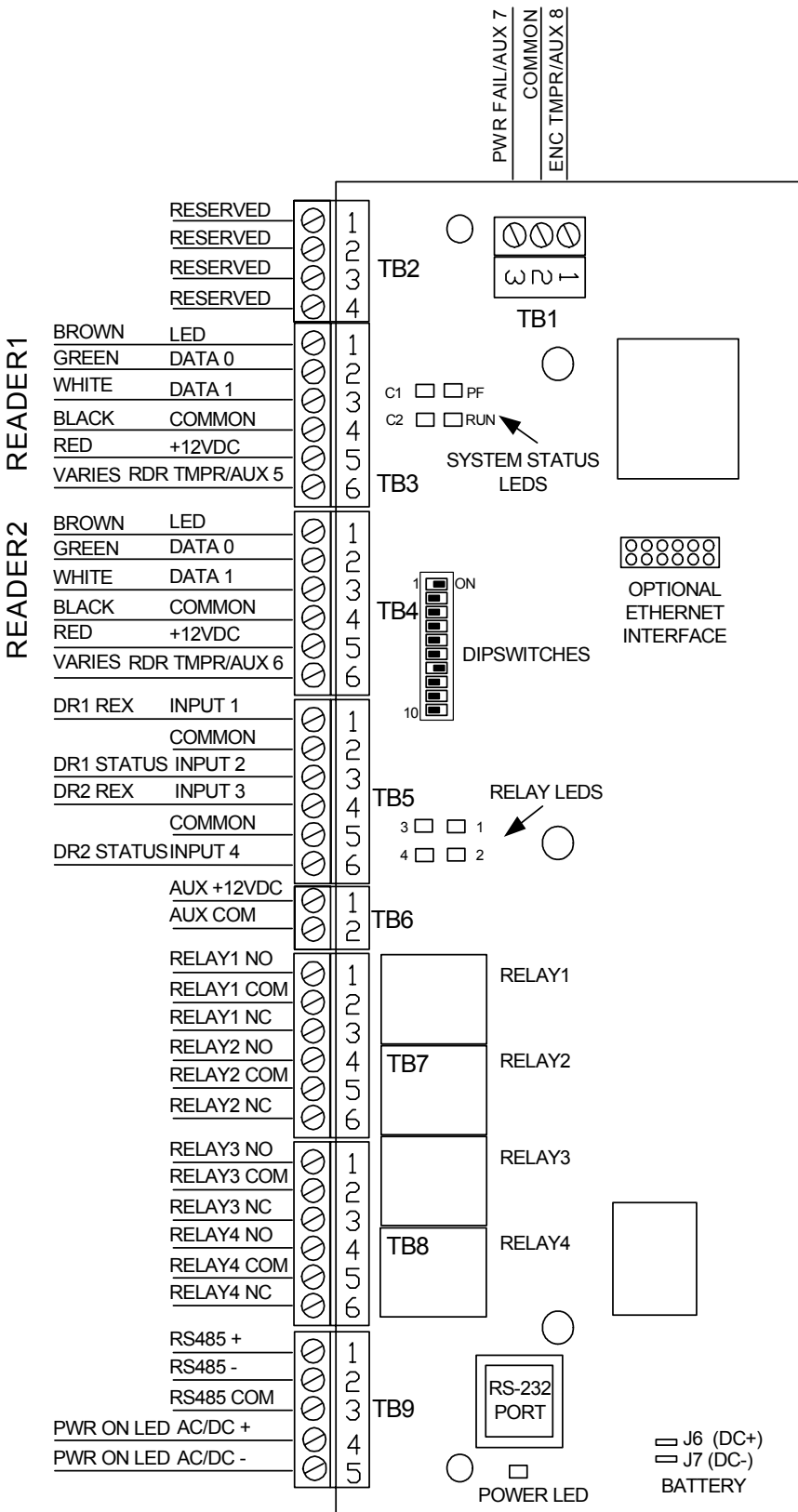
**Normal Support Hours:** Monday through Friday, 7:00 AM to 7:00 PM  
CST, except company holidays.  
1-800-323-4576 When calling, follow menu  
options.

**WEB:** [www.nciaccessworld.com](http://www.nciaccessworld.com)





# Wiring Diagram



**Northern by ADEMCO Systems Inc.**

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