

## NS2 Configuration Guide

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### Description

The NS2 is a two reader panel providing access control for up to two doors through the use of Wiegand readers.

The NS2 may be used as a standalone panel with independent card and transaction storage or, with a software upgrade, as a fully monitored online access control device. Communication to the front-end computer is achieved through an RS-232 serial cable (included with installation kit) or an optional RS-485 interface. Each RS-485 interface 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, and readers. The Tamper and External Power Fail terminal are located at the left edge above the main line of connectors.

### Specifications

#### Power

AC Non-Polarized:

16.5 VAC utilizing a UL-listed 50 VA Class 2 transformer (TB9-4 AC+/TB9-5 AC-)

or

DC Polarized:

24 VDC, 1.25 Amp (TB9-4 DC+/TB9-5 DC-)

Power Wire

Two-wire, 18 AWG, shielded cable.

#### Backup Battery

Casil 12 VDC (NCI Part #: BAT-3) 4Ah, sealed acid/lead backup battery (J6 DC+/J7 DC-)

Backup battery will provide 2.5 hours of standby backup power.

Charging voltage: 13.7 +/- 0.1 VDC

NOTE: *The NS2 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. Backup battery should be replaced 2 to 2.5 years: more often if panel has a high rate of backup use.*

#### Secondary Backup Battery

The NS2 panel memory is backed up using a super capacitor for one week in the absence of power or a backup battery. The super capacitor will backup panel memory and real-time clock and does not require maintenance or replacement.

#### Reader & Aux Power

Reader and AUX power is supplied at 10.8-12.7 VDC with a maximum current of 600 mA.

Five volt (5 VDC) readers require five-volt regulators (Northern part no. 5VRDREG)

Maximum draw is less than 600 mA: (Reader 1+ Reader 2 + Aux Power) < 600 mA.

NOTE: *Aux power must not be used to power locks.*

### Reader Wiring

Each reader port supports a single 12-volt reader with Wiegand output format.

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

NS2 version 1.01.01 - 1.03.09 supports only the defaulted Wiegand formats:

F=PN 1 26 S 1 D 1 B1 B2 B3 B4

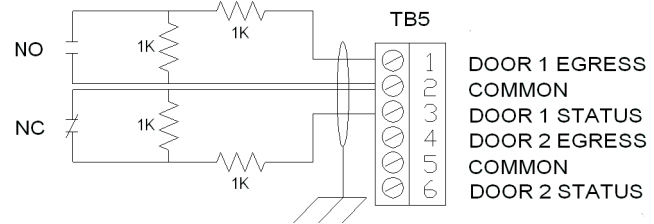
F=PN 2 32 S 0 D 0 B1 B2 B3 B4

F=PN 3 34 S 1 D 1 B1 B2 B3 B4

NOTE: NS2 version 1.01.01 - 1.02.04 at this time does not support the ABA card format, the OL, OJ, and OH Options, Anti-Passback and Lock Down Time.

NOTE: NS2 version 1.03.09 does not support the ABA card format or the Lock Down Time option, but does support the NS2MEM module, the OL, OJ, and OH Options, as well as Anti-Passback (In card only mode).

### Supervised Input Wiring



The NS2 supervises inputs 1 through 8 and may be configured for supervised or non-supervised normally open or normally closed contacts. Use standard 1K ohm 5% resistors for supervision.

All eight inputs are assigned default features but can be changed for other configurations as needed.

### Inputs

The NS2 has 8 input points located on the following terminals:

Input Terminal	Description	Input/Aux Number
TB5-1	Door 1 Rex	1
TB5-3	Door 1 Status	2
TB5-2	Door 1 & 2 Common	1 & 2
TB5-4	Door 2 Rex	3
TB5-6	Door 2 Status	4
TB5-5	Input 3 & 4 Common	3 & 4
TB3-6	Reader Tamper or Aux Input 5	5
TB3-5	Common (Input 5 Common)	5
TB4-6	Reader Tamper or Aux Input 6	6
TB4-4	Common (Input 6 Common)	6
TB1-3	Power Fail or Aux Input 7	7
TB1-1	Enclosure Tamper or Aux Input 8	8
TB1-2	Common (Input 7 & 8 Common)	7 & 8

NOTE: Tamper and External Power Fail are supervised and capable of being used as additional inputs if the default functionality is not needed.

NOTE: 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.

### Outputs

Four form-C relays SPDT (Single Poll Double Throw) gold-contact relays are provided for controlling door locks or other output devices (I.E. sounder, burg panel, phone dialer....etc.).

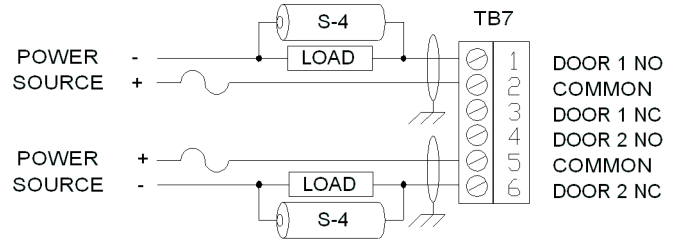
Output Terminal	Description	Relay/Output Number
TB7-1	Normally Open (NO)	Relay 1 (Door 1)
TB7-2	Common (COM)	Relay 1 (Door 1)
TB7-3	Normally Closed (NC)	Relay 1 (Door 1)
TB7-4	Normally Open (NO)	Relay 2 (Door 2)
TB7-5	Common (COM)	Relay 2 (Door 2)
TB7-6	Normally Closed (NC)	Relay 2 (Door 2)
TB8-1	Normally Open (NO)	Relay 3
TB8-2	Common (COM)	Relay 3
TB8-3	Normally Closed (NC)	Relay 3
TB8-4	Normally Open (NO)	Relay 4
TB8-5	Common (COM)	Relay 4
TB8-6	Normally Closed (NC)	Relay 4

The energized or ON time for each relay can be configured by using either time zone control, or programmable pulse time via the host software.

Relay 1 is defaulted to control the Door 1 lock & Relay 2 is defaulted for the Door 2 lock. Relay 3 & 4 are used as auxiliary relays for signaling other devices. All 4 relays are rated at 12 Amps / 28VDC for resistive loads and 6 Amps / 28VDC for inductive loads (data switching).

NOTE: *Once the relay pole has been used for an inductive load (including door strikes and magnetic locks) it should not be used for low current dry circuit applications.*

NOTE: *Switching of inductive loads can cause EMI (Electromagnetic Interference) which may interfere with the normal operation of other equipment.*



To minimize premature contact failure and increase system reliability, contact circuit protection such as the S-4 suppressor is required. Locate this device as close as possible to the Door Strike / Maglock.

## Enclosure Specifications

Mounting	
One NS2 panel in a standard 19-inch, high density enclosure. Up to eight NS2 panels in a single 19-inch rack mountable enclosure	
Dimensions	
Board	9-inch Length x 5.5-inch Wide x 1-inch High
Enclosure	12.5-inch Wide x 14.5-inch High x 3.5-inch Deep
Environmental	
Temperature	35–110° F operational
Humidity	0–85% RHNC

## Communications &amp; Wiring

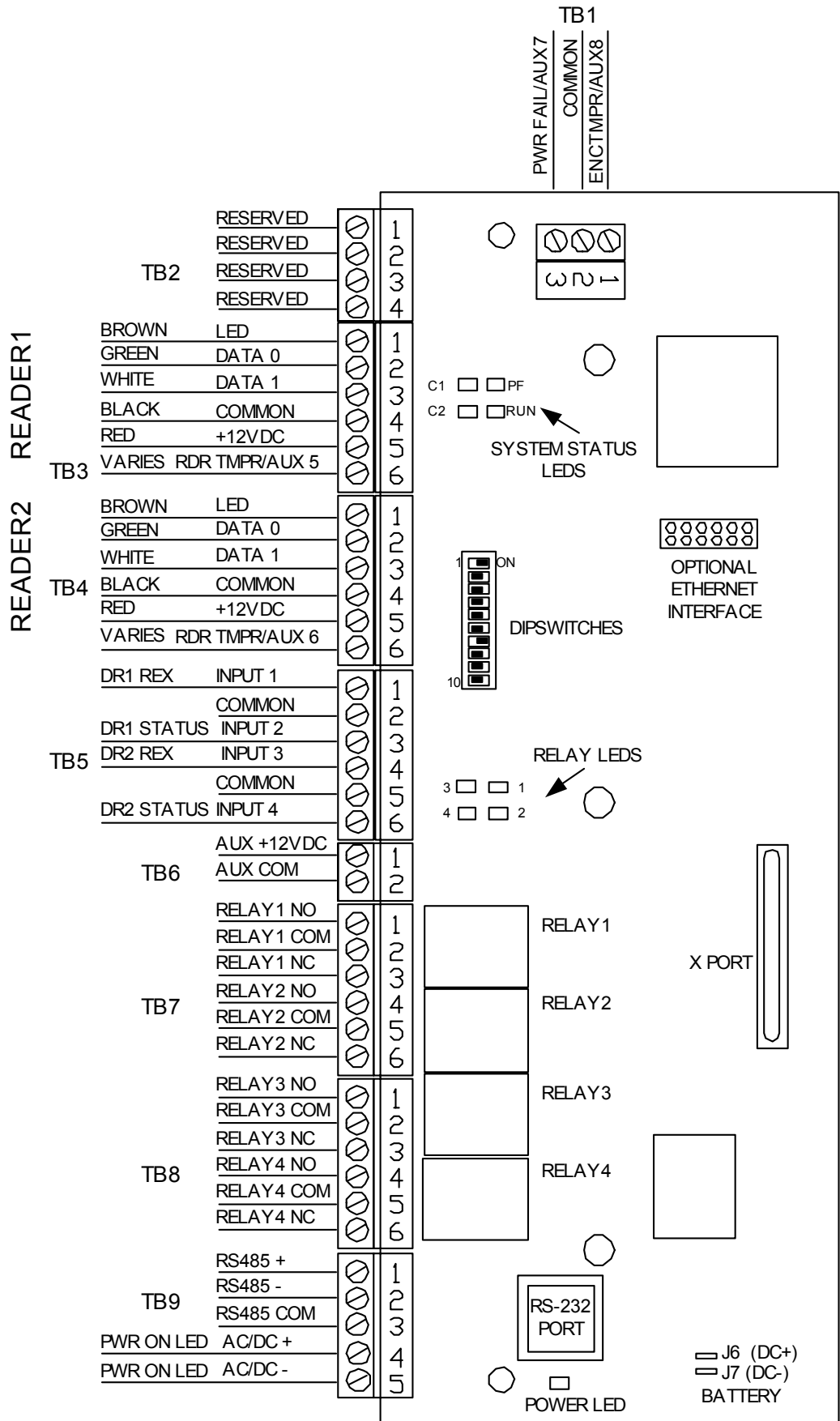
Communication Type	Description	Maximum Panels	Maximum Distance Feet / Meters	
Direct to COM Port				
CBL50, RS-232 Cable	9-pin to RJ-45	1	50	15.25
N-485-PCI-2	RS-485 9-pin to CPU	31	4K	1219.5
Network				
NSLAN1	Cobox Unit (RS-232)	1 NS2 panel per NSLAN1 64 max IP connections per system	328	100
LANSRL100/N-485-PCI-2L	Ethernet to RS-485	31 NS2 panels per 485 interface 64 max IP connections per system	328/4K	100/1219.6
LANSRLU1/N-485-PCI-2L	Ethernet to RS-485	31 NS2 panels per 485 interface 64 max IP connections per system	328/4K	100/1219.6
Modems				
M-9600-LA (LO)/N-485-PCI	Lease-line Modem to RS-485	31	NA/4K	NA/1219.6
SHM-B-ASYNC/N-485-PCI	Short-haul Modem to RS-485	31	5279.9/4K	1609.84/ 1219.6
SHM-B-ASYNC/CBL50	Short-haul Modem to RS-232	1	5279.9/50	1609.84/ 15.25
M-9600-2/N-485-HUB-2	Dial-up Modem to RS-485	31	NA/4K	NA/1219.6
M-56/N-485-HUB-2	Dial-up Modem to RS-485	31	NA/4K	NA/1219.6
Fiber				
FC485	Fiber converter to RS-485	31	10K/4K	3049/ 1219.6
Cable Specifications	Description	AWG	Maximum Distance Feet / Meters	
Readers				
NC1861-BL	6 Conductor, Shielded	18	500	152.5
Alarm Input				
NC1821-GR	Twisted Pair, Shielded	18	2K	609.8
Relay Outputs				
NC1821-GR	Twisted Pair, Shielded	18	2K	609.8

NOTE: *The C-100-A1/A2 (RS-232 communication loop), M-200 (1,200 Baud rate dial up modem), M-300-LO/LA (1,200 Baud Leased line modem), F210D (Fiber to RS-232) [Discontinued] and F290D (Fiber to RS-485) [Discontinued] are not supported with the NS2 panel(s).*

DIP Switch Settings

S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	SELECTION
OFF	OFF	OFF	OFF	OFF						Address 0
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 Interface
						OFF				19200 Baud (RS-232 only)
						ON				57600 Baud (RS-232 only, default)
							OFF	OFF		RS-485 Bias Off (default)
							ON	ON		RS-485 Bias On
									OFF	RS-485 EOL Off
									ON	RS-485 EOL On

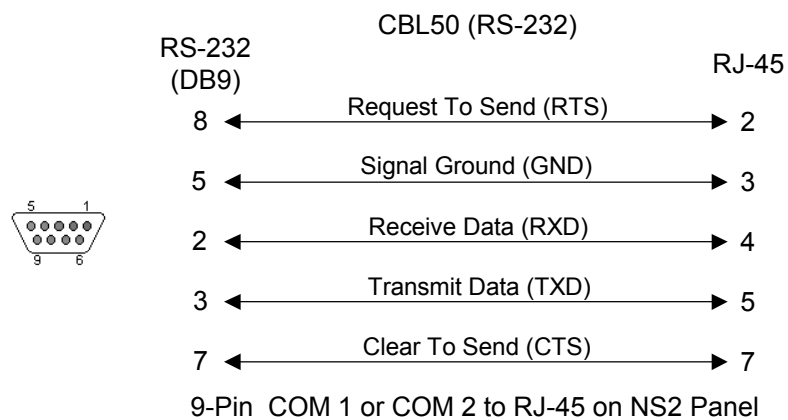
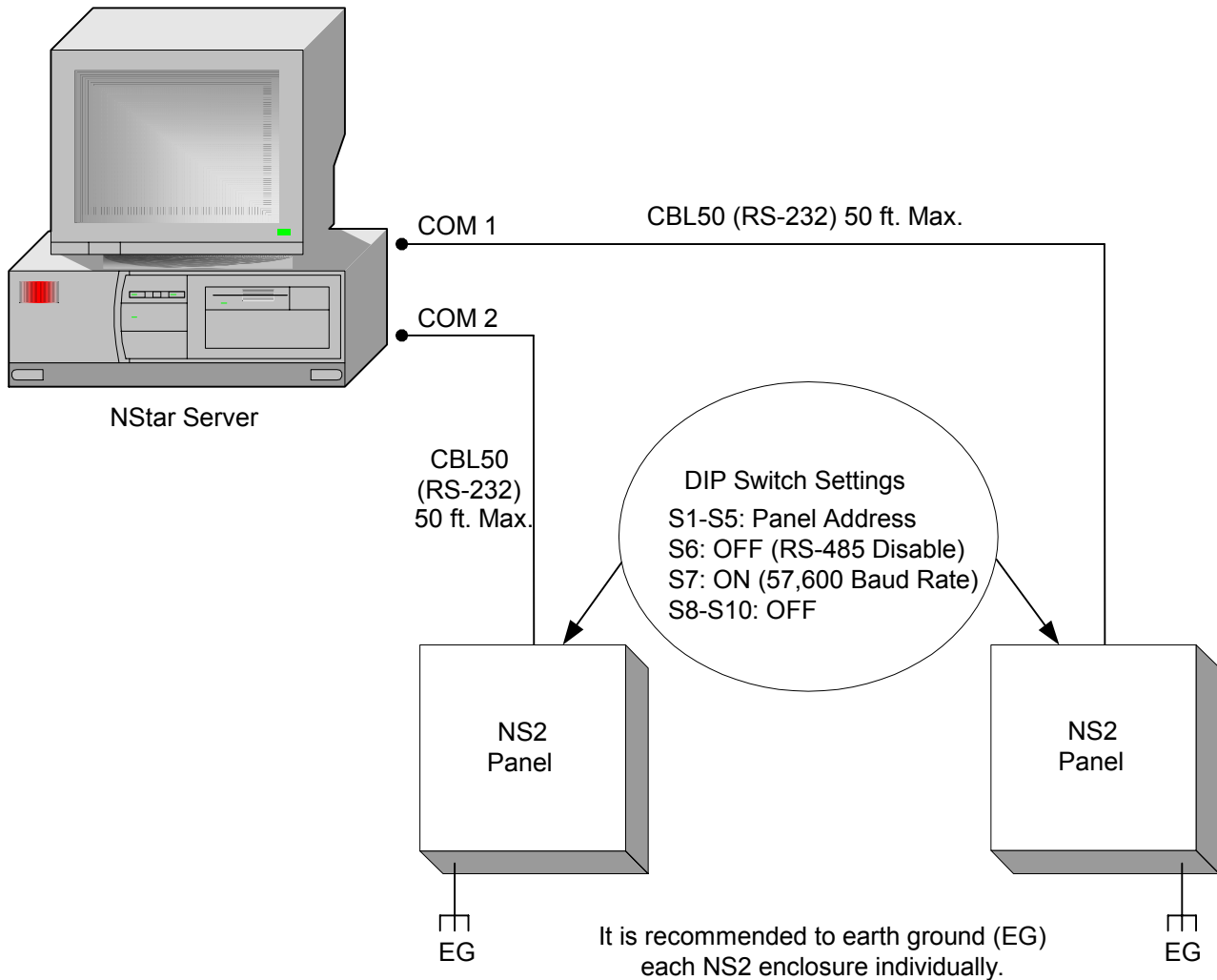
Connection Schematic



# Configuration Diagrams

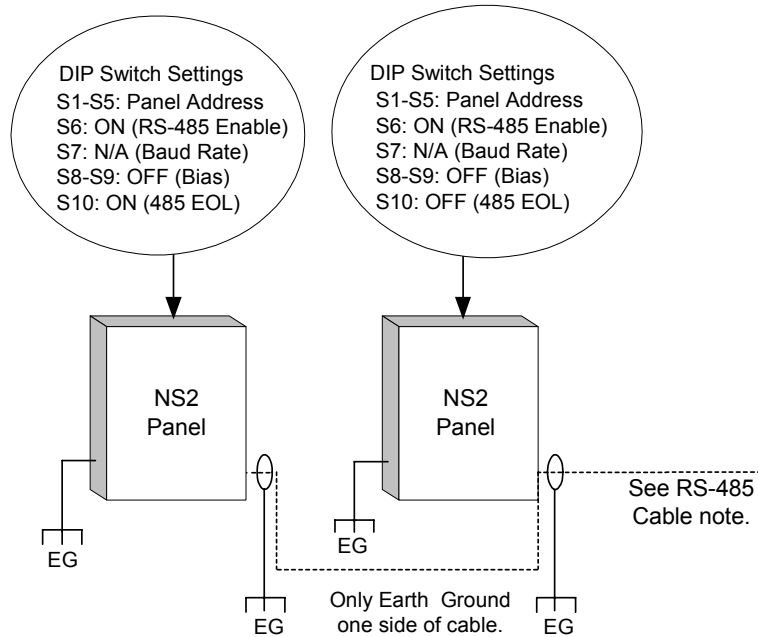
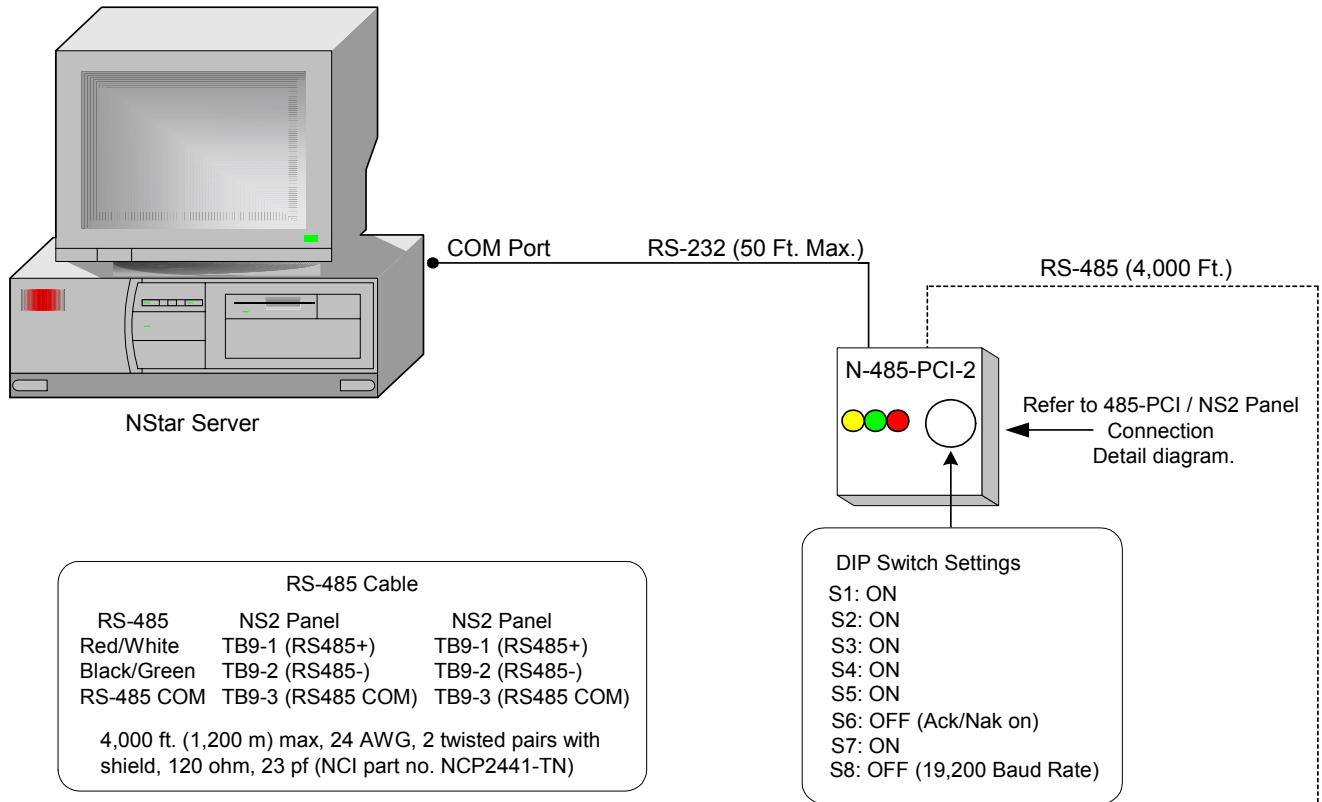
## RS-232 Connection

One NS2 panel for each COM port.



## RS-485 Connection

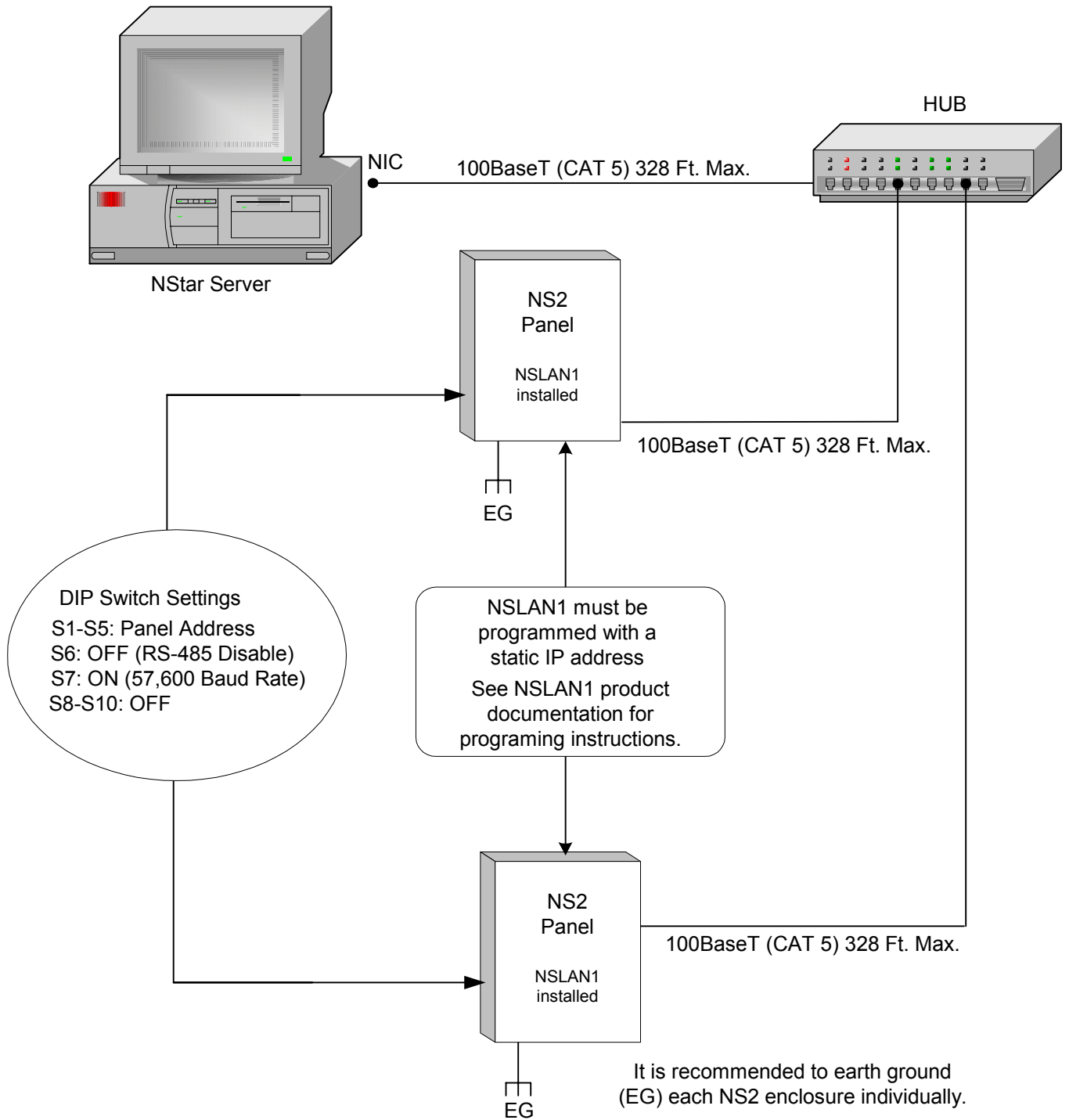
Thirty-one NS2 panels for each drop line.



It is recommended to earth ground (EG) each NS2 enclosure individually.

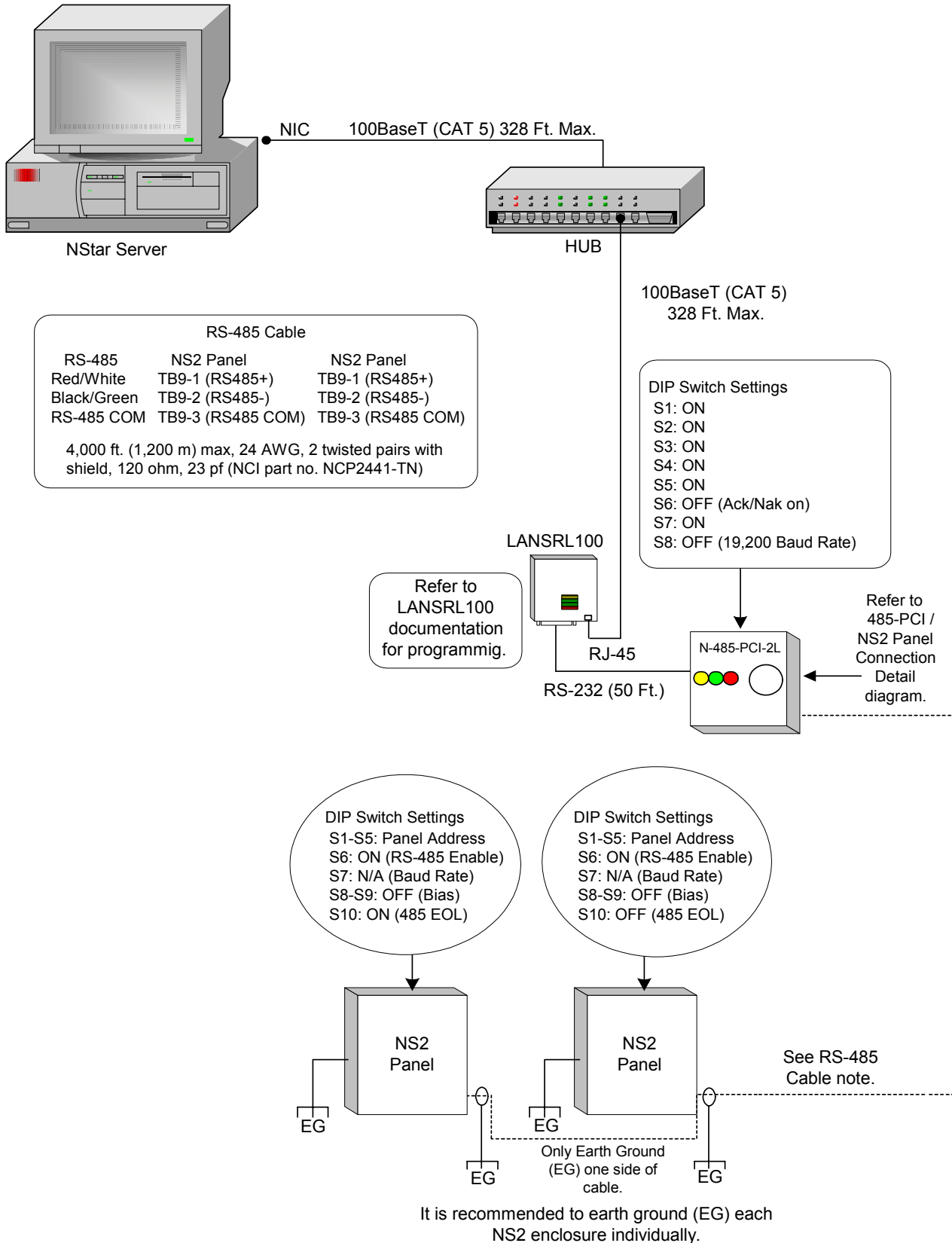
### NSLAN1 Connection

One NSLAN1 for each NS2 panel, Maximum sixty-four IP connections.



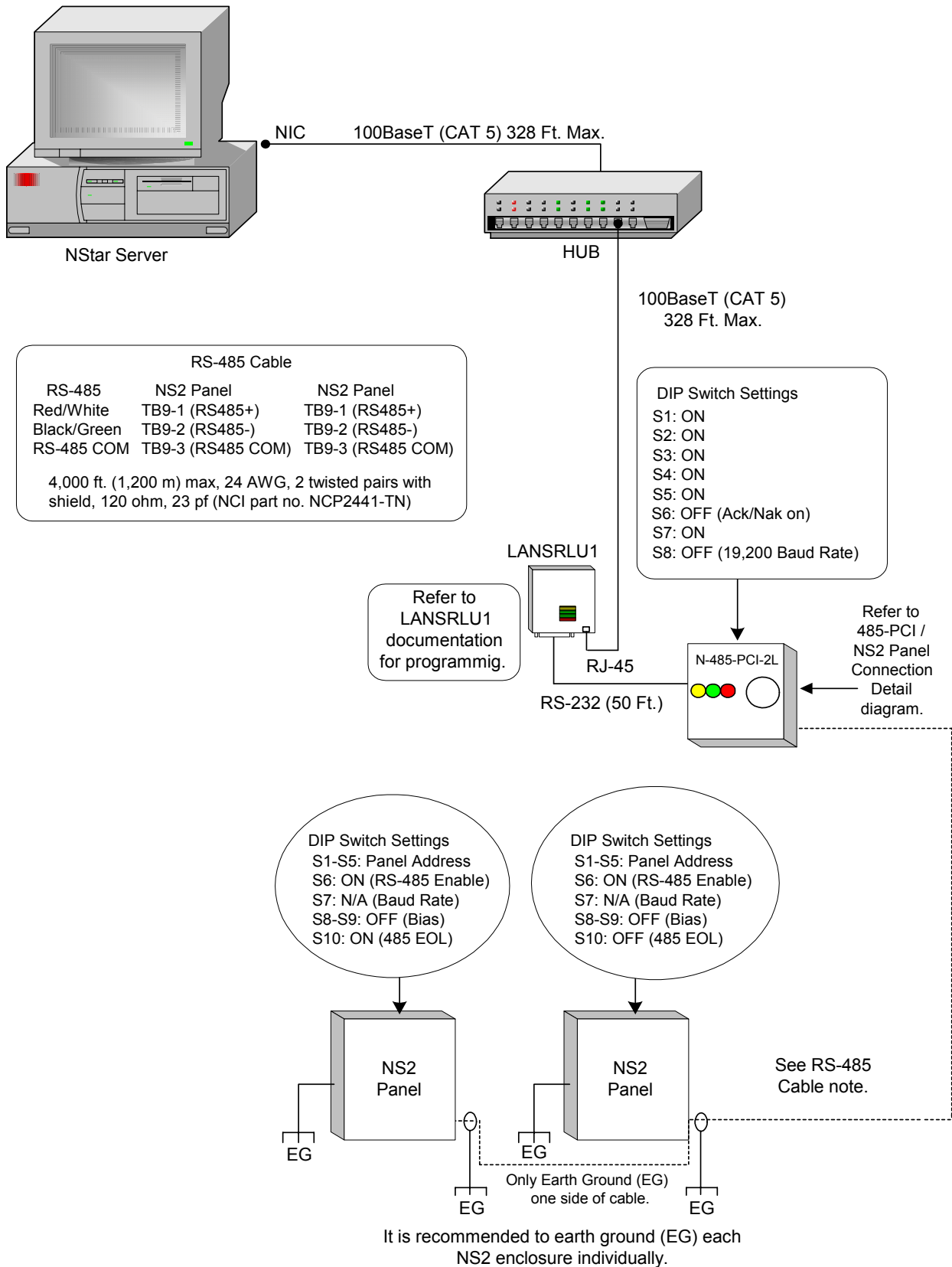
# LANSRL100 Connection

Thirty-one NS2 panels for each drop line, Maximum sixty-four IP connections.



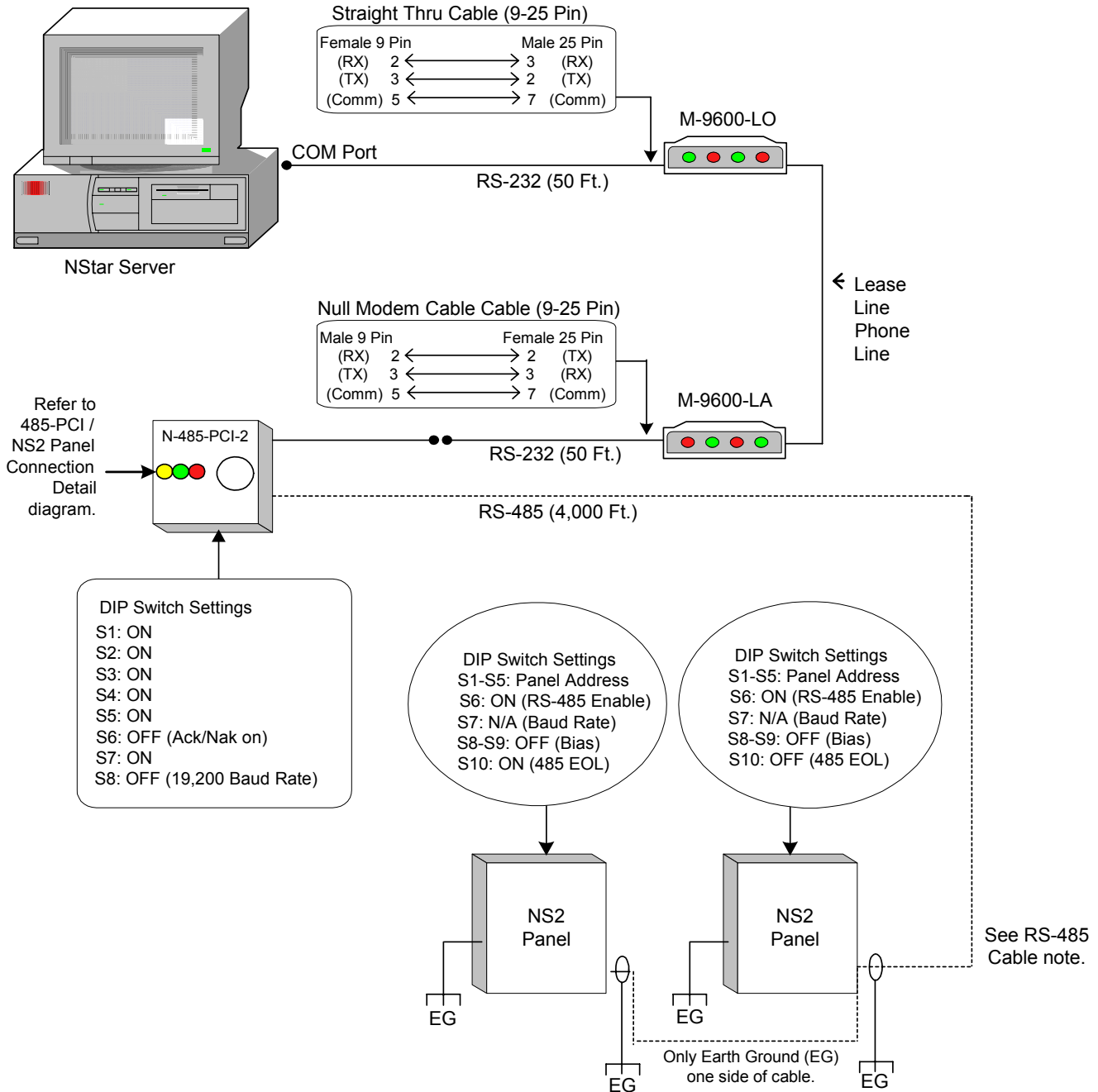
## LANSRLU1 Connection

Thirty-one panels for each drop line, Maximum sixty-four IP connections.

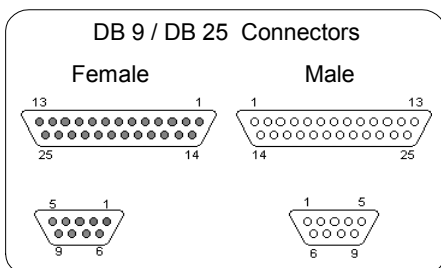


## Lease Line Modem Connection

Thirty-one NS2 panels for each drop line.



It is recommended to earth ground (EG) each NS2 enclosure individually.

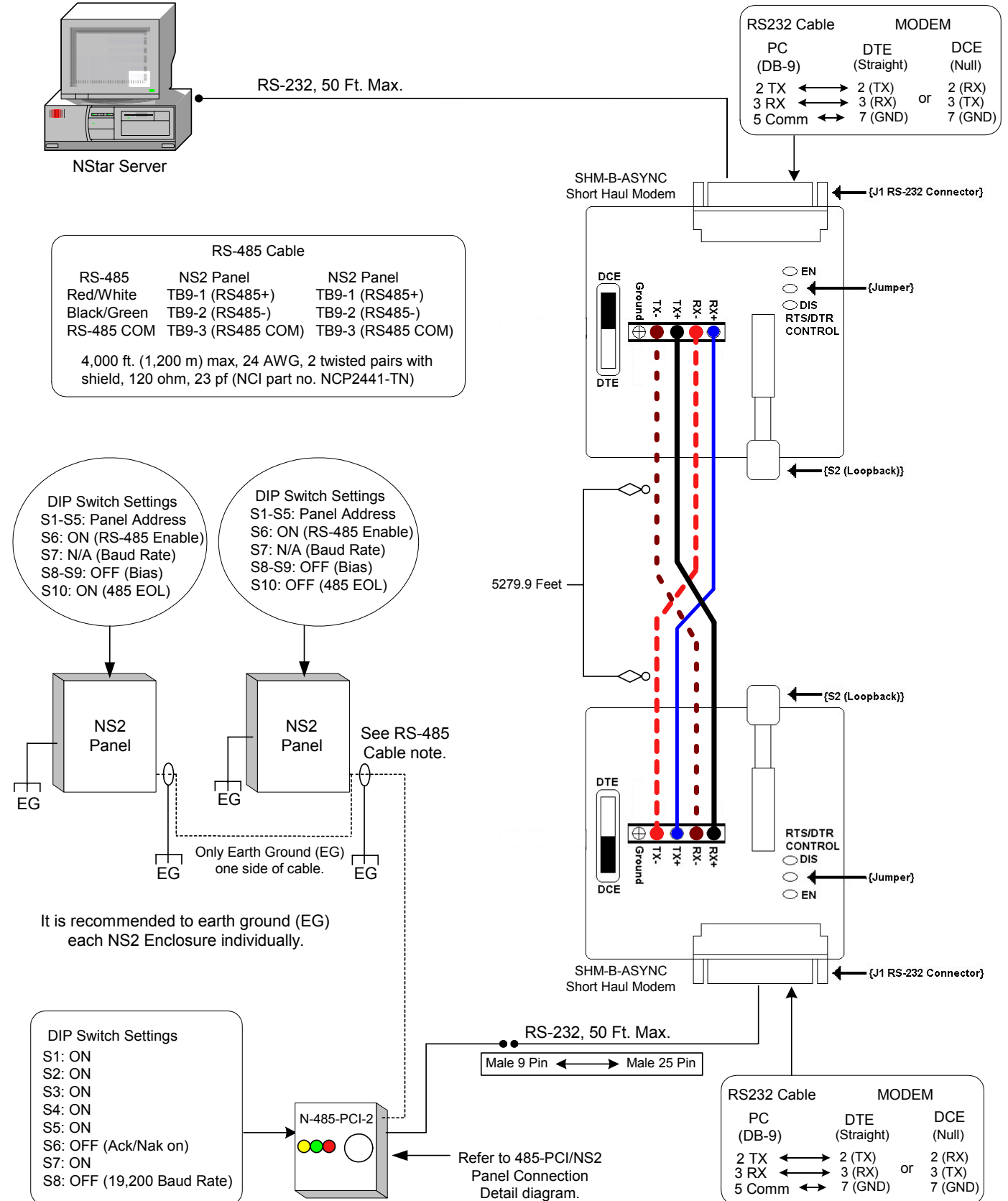


RS-485	NS2 Panel	NS2 Panel
Red/White	TB9-1 (RS485+)	TB9-1 (RS485+)
Black/Green	TB9-2 (RS485-)	TB9-2 (RS485-)
RS-485 COM	TB9-3 (RS485 COM)	TB9-3 (RS485 COM)

4,000 ft. (1,200 m) max, 24 AWG, 2 twisted pairs with shield, 120 ohm, 23 pf (NCI part no. NCP2441-TN)

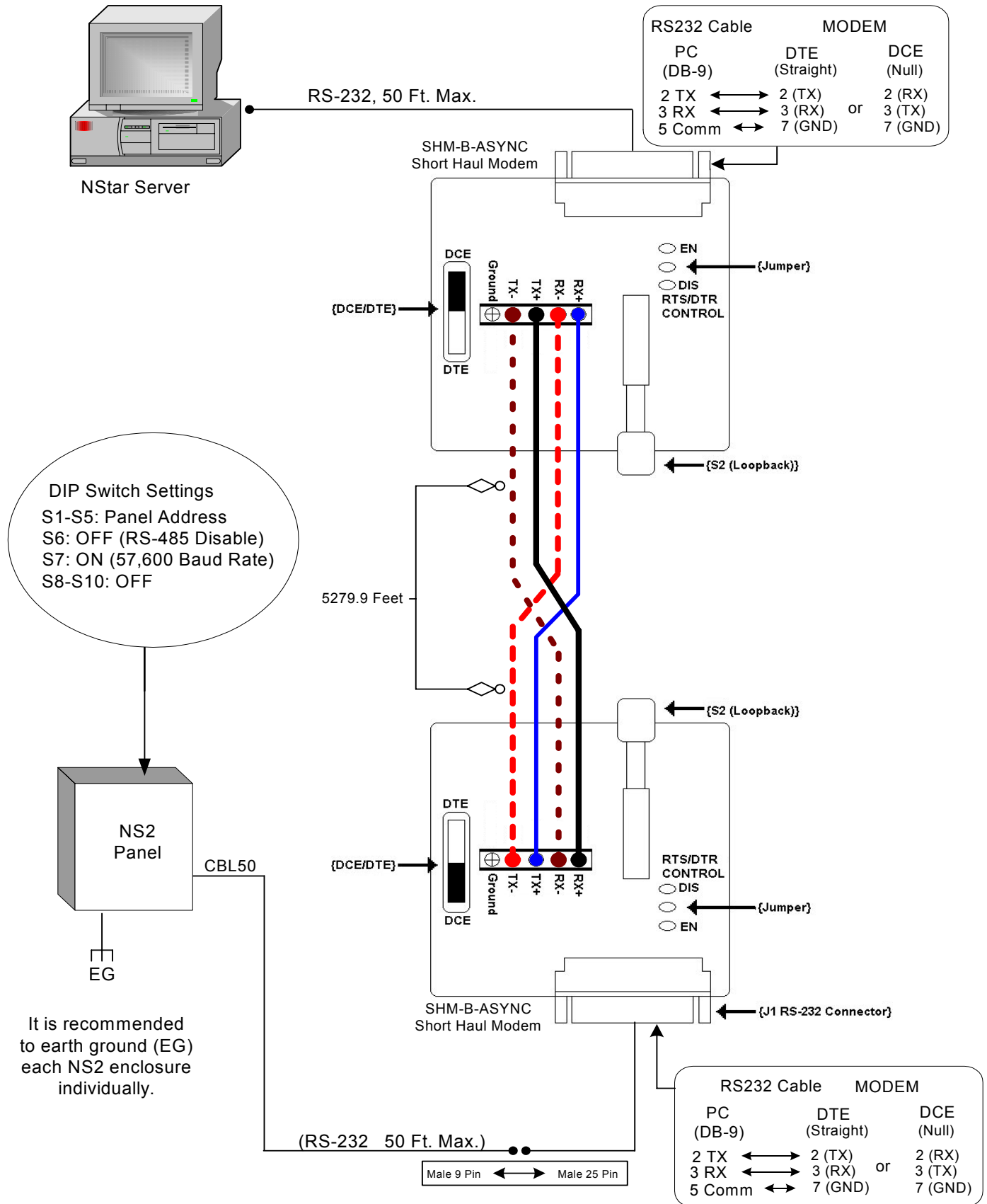
# RS-485 Short Haul Modem Connection

Thirty-one NS2 panels for each drop line.



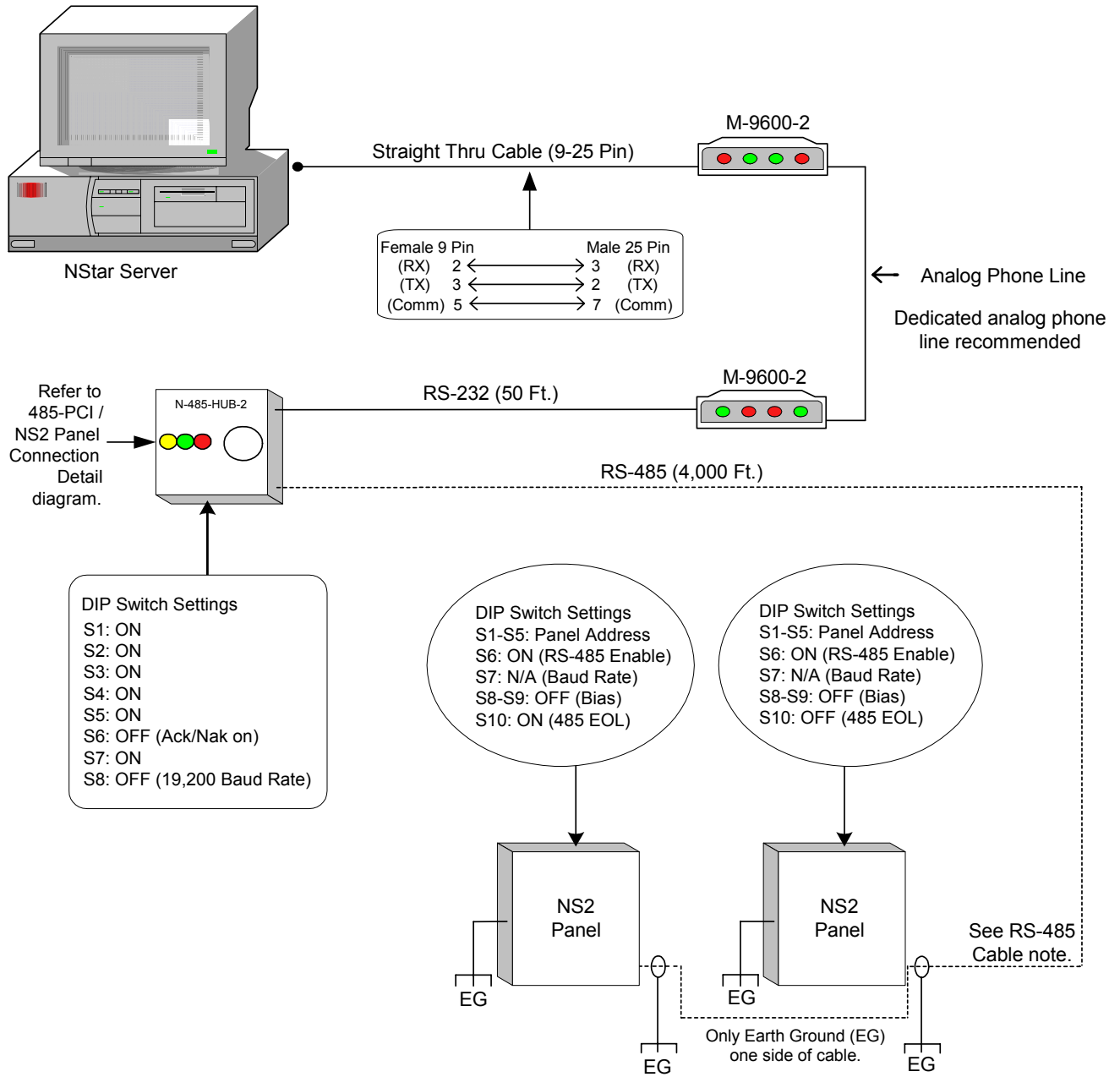
### RS-232 Short Haul Modem Connection

One NS2 panel for each loop.

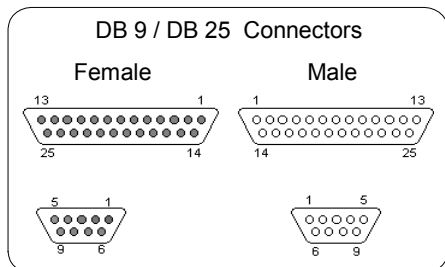


# M-9600 Dial-up Modem, RS-485 Connection

Thirty-one NS2 panels for each drop line.



It is recommended to earth ground (EG) each NS2 enclosure individually.

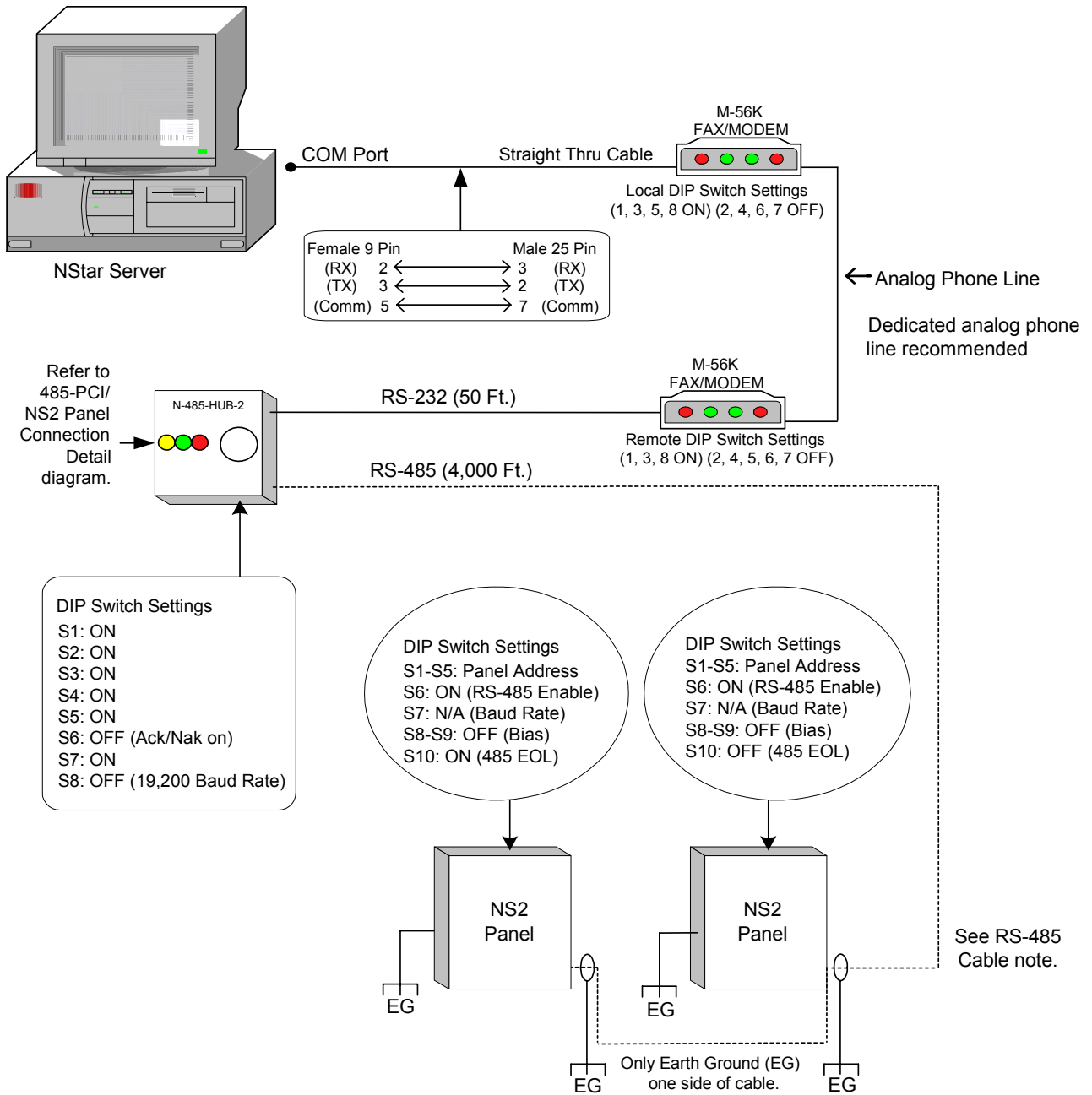


RS-485	NS2 Panel	NS2 Panel
Red/White	TB9-1 (RS485+)	TB9-1 (RS485+)
Black/Green	TB9-2 (RS485-)	TB9-2 (RS485-)
RS-485 COM	TB9-3 (RS485 COM)	TB9-3 (RS485 COM)

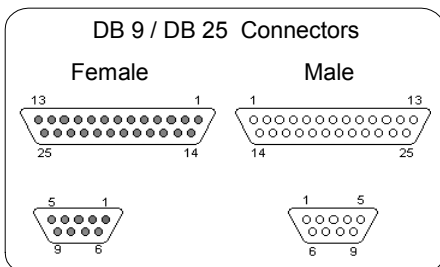
4,000 ft. (1,200 m) max, 24 AWG, 2 twisted pairs with shield, 120 ohm, 23 pf (NCI part no. NCP2441-TN)

# M-56K Dial-up Modem, RS-485 Connection

Thirty-one NS2 panels for each drop line.



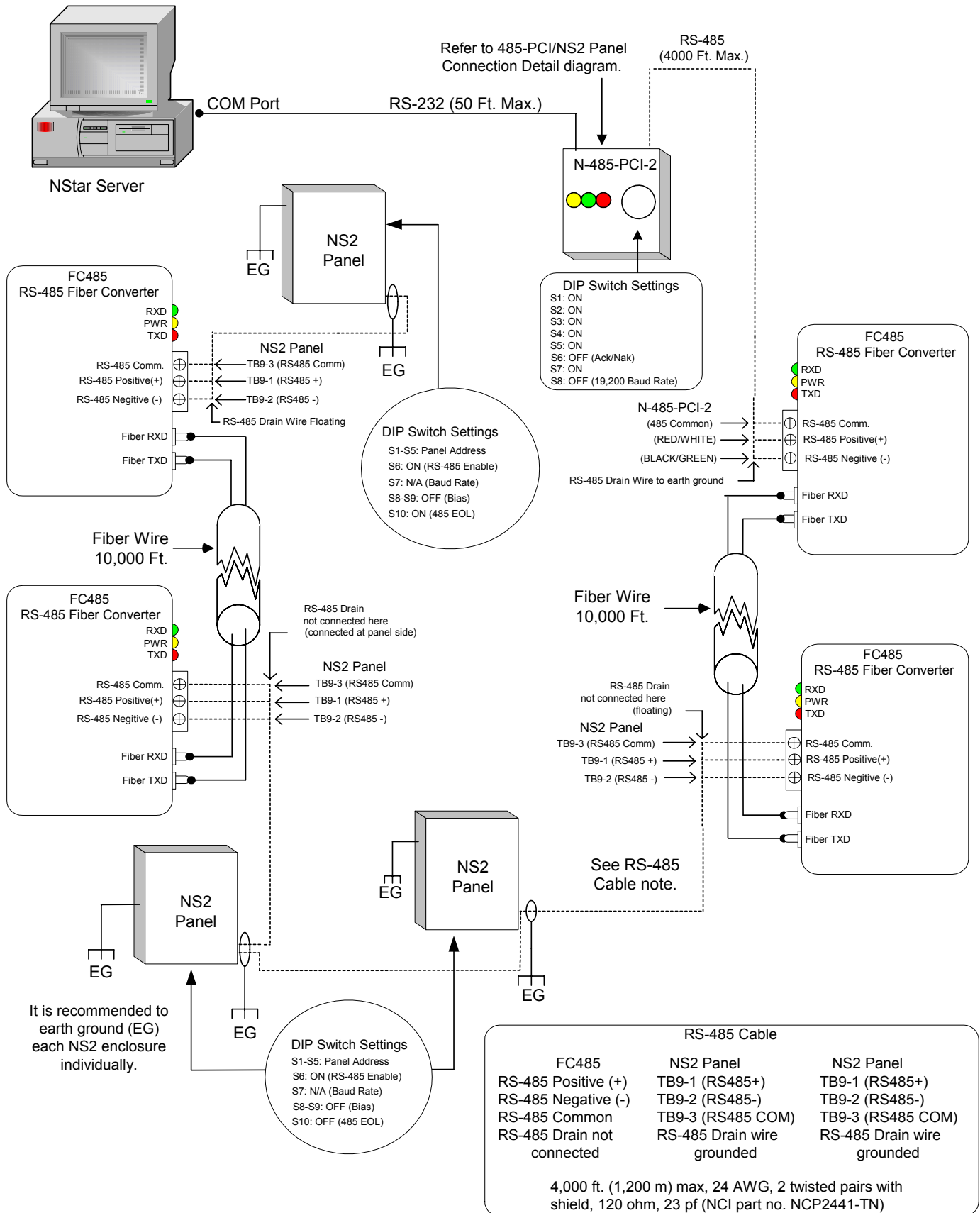
It is recommended to earth ground (EG) each NS2 Enclosure individually.



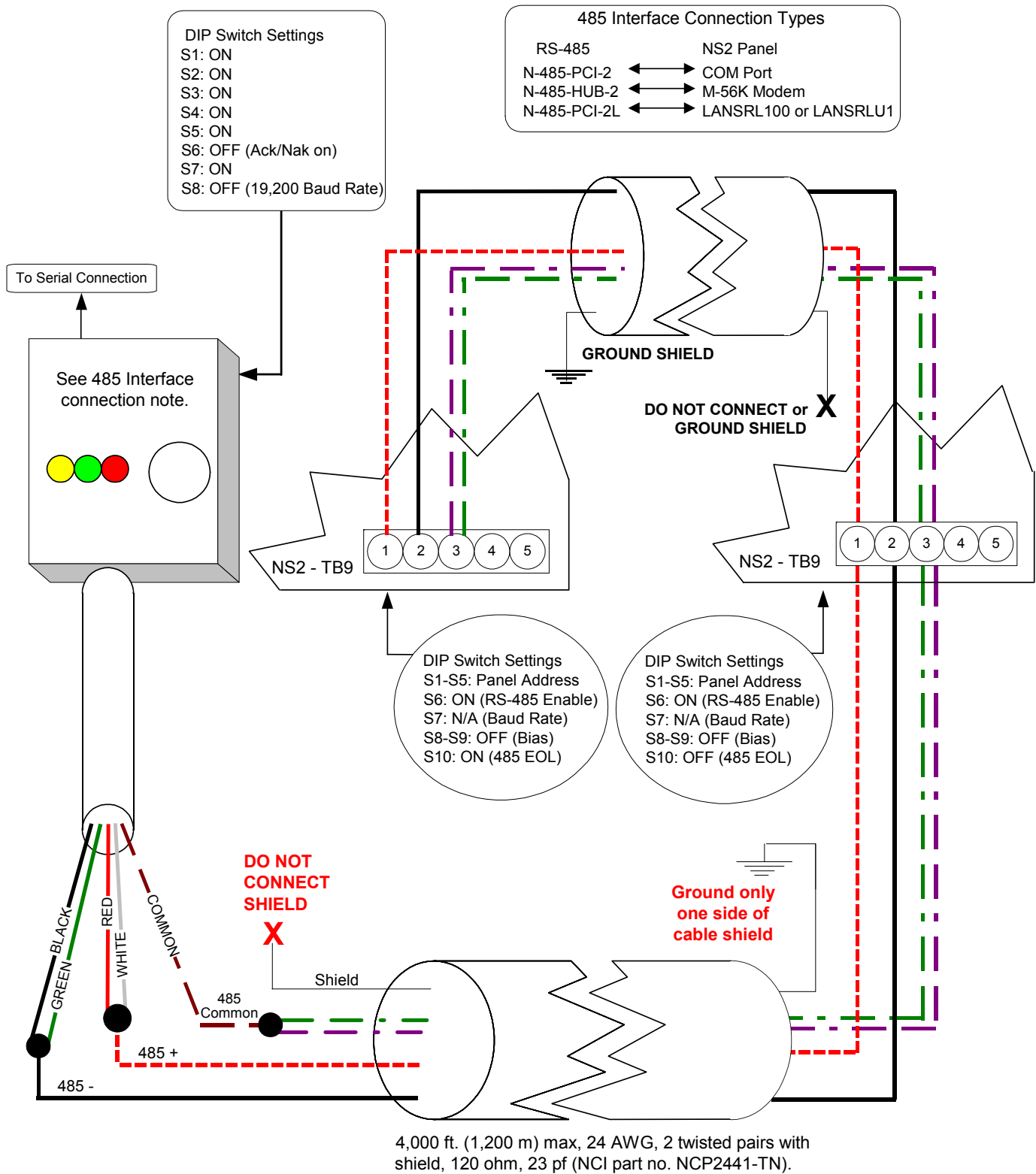
RS-485 Cable		
RS-485	NS2 Panel	NS2 Panel
Red/White	TB9-1 (RS485+)	TB9-1 (RS485+)
Black/Green	TB9-2 (RS485-)	TB9-2 (RS485-)
RS-485 COM	TB9-3 (RS485 COM)	TB9-3 (RS485 COM)
4,000 ft. (1,200 m) max, 24 AWG, 2 twisted pairs with shield, 120 ohm, 23 pf (NCl part no. NCP2441-TN)		

### Fiber Converter to RS-485 Connection

Thirty-one NS2 panels for each drop line.



### 485-PCI/NS2 Panel Connection Detail



## Frequently Asked Questions

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Question: What pre-packaged kits are available?  
Honeywell Access has made the NS2 available in pre-packaged kits to make ordering easier.

Part No.	Kit Description	Contents
NSSKR	Starter kit with readers.	Software, panel, 2 readers, accessories.
NSSK	Starter kit.	Software, panel, accessories.
NSEKR	Expansion kit with readers.	Panel, 2 readers, accessories.
NSEK	Expansion kit.	Panel, accessories.

Question: How many access points can I control with the NStar access control system?  
NStar software will support up to 128 access points. System expansion is via RS-485 or TCP/IP.

Question: How does the NStar software communicate to the NS2 panel?  
NS2 panels communicate using either RS-485 or RS-232 protocol.

Question: Can I upgrade my NStar software to WIN-PAK 2.0?  
Not at this time. Future releases may allow upgrade capabilities.

Question: Does Nstar software and hardware support the Northern AEP-3 or AEP-5 relay output boards?  
Neither the NS2 panel nor the NStar software supports the AEP-3 or AEP-5 board.

Question: What are the minimum PC requirements to run the NStar software?

- Pentium II 400 MHz CPU
- 256 Megabytes of RAM (512 megabytes recommended)
- 20 Gigabyte hard drive
- 2 serial communication ports
- Backup device (Tape Drive, DVD/CD burner, Network backup utility)
- Microsoft Windows XP Pro; Windows 2000 Pro / Server (SP4)

Question: Which video Capture Card can be used with the NStar software?  
Honeywell Access Systems recommends the PB-VC-15 or higher capture card. Call Honey Access Systems for more details.

Question: What localized language support does the NStar software offer?  
The initial release of NStar will be available only in English. Future plans are to release Spanish, Portuguese and French localized versions.

Question: What database engine does the Nstar software use?  
Microsoft Data Engine (MSDE)

Question: Does the NStar software or hardware support USB ports for communications?  
Please contact Honeywell Access Systems for further details.

Question: What is the maximum distance I can run the RS-232 connection?  
The industry standard for RS-232 is limited to 50 feet.

Question: Can the NS2 panel be mounted in a 19" rack to save on installation space?  
Yes, the NS2 panel is designed to fit into a 19" rack mount enclosure.

- Question: Can the NS2 panel run in a LAN/WAN environment?  
Yes, each NS2 panel can be fitted with NSLAN1 interface board to allow a single direct TCP/IP connection (64 max), or up to 31 panels can be connected using the 485-PCI-2L and a LANSRL100 or NLANSRLU1 (64 max).
- Question: Does the NS2 panel support Anti-Passback?  
Yes.
- Question: What is the Xport expansion port used for?  
The XPort expansion port allows for future expansion to other devices as well as the NS2MEM.
- Question: What is the NS2MEM used for?  
The NS2MEM module is a "Plug and Play" memory board that attaches to the "Xport" and allows memory expansion of up to 10,000 cards and 100,000 buffers.  
The NS2MEM module is ONLY SUPPORTED WITH NS2 FIRMWARE VERSION 1.03.09 OR HIGHER.
- Question: How do I upgrade the NS2 Firmware?  
The NS2 panel uses FLASH memory. This means never having to replace a firmware chip to take advantage of system upgrades or new features. See Honeywell Access Systems website ([www.honeywellaccess.com](http://www.honeywellaccess.com)) for further details and downloads.
- Question: How do I default the NS2 panel?  
  1. Change all of the NS2 Panel DIP switches to OFF (address Zero)
  2. Power down NS2 panel by removing backup battery then removing AC power for 10 seconds.
  3. Restore power to the NS2 Panel by reconnecting AC power then backup battery to reset the panel.
  4. Power down again by removing backup battery then removing AC power.
  5. Reset the DIP switches with correct panel address, and power back up the panel.
  6. Re-initialize panel through the Nstar software to download current data.

Default LED conditions for the NS2 panel after default are: run LED blinking green and power LED solid green.
- NOTE: *Using firmware version 1.01.1 & 1.02.01: By default the run LED is blinking and power LED is solid. When there is information in the NS2 panel(s), after a full initialization of the NS2 panel, C1 & C2 will flash red.*
- NOTE: *Only One NS2 panel at a time should be defaulted.*
- Question: How do I control the reader LEDs on the NS2 Panel?  
In the NStar software, output 5 controls the LED on reader 1, while output 6 controls the LED on reader 2.  
By default Outputs 5 and 6 are set for a two-second pulse time. It is recommended that any time zone assigned to the door lock output also be assigned to the corresponding reader LED output so the LED will follow the correct time schedule.

*The configurations described in this document have not been reviewed by Underwriters Laboratories.*

# Honeywell

## Honeywell Access Systems

135 West Forest Hill Avenue, Oak Creek, WI 53154

PH: 414-769-5980 FX: 414-766-1798

[www.honeywellaccess.com](http://www.honeywellaccess.com)

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