Card Access Control System
Configuration Guide

November 23, 1998

NORTHERN COMPUTERS, INC.

Access Control

Access control is computerized control over entry to any area that can be secured with a lock and key. Entry is only allowed to authorized people at authorized times. Control of who is allowed to come and go is easily maintained.

The weakness of a lock and key security system is the key. The key is a readily duplicated piece of metal that gives anyone who holds it access to an area. The risk of lost or stolen keys, with the expense of changing locks, is a costly problem. Access control is an effective and affordable solution to this problem. With access control, each person receives a card or keycode which restricts access to authorized areas at authorized times. A small, programmable control panel allows or denies access. If a card is lost or stolen, or if a keycode is no longer secure, the control panel can be reprogrammed quickly and easily.

An additional benefit of access control is report capability. The system provides reports of all card/keycode activity, including whether access was granted or denied, and why. A permanent record of all entries to an area can be maintained.

The *Card Access Control System Configuration Guide* describes basic Northern Computers, Inc. access control configurations and shows required equipment.

Table of Contents

N-1000-II/N-1000-II-UL

CARD ACCESS CONTROL PANEL

▰ Two door access control.

▰ Supports two card readers or two keypads.

▰ Supports Wiegand, Magstripe, Proximity, Keypad, and Biometric technologies.

▰ 16 normally-closed, non-supervised alarm points (8 when matrix keypads are used).

One alarm input reserved for primary power fail indication and one alarm input reserved for tamper.

▰ 4 double pole, double throw (DPDT) dry contact relays with both normally-open and normally-closed sides, rated for 12 VDC at 2.5 amps or 24 VDC at 1.25 amps.

▰ 4,000 standard card/keycode capacity and 5,000 standard buffer capacity.

▰ Power requirements: 12 VAC, 40 VA (X-2 transformer) *or* 12 VDC linear 2 amp continuous (PS-1-12).

▰ Battery backup: 8 VDC (5 amp/hour) battery for up to three hour backup.

▰ Memory backup: 3 VDC lithium battery for up to 30 day memory backup.

▰ Enclosure: Hinge cover with lock and key. Enclosure tamper switch (requires one alarm point).

▰ The N-1000-II-UL is UL listed 294 for access control.

The N-1000-II-X/N-1000-II-X-UL provides four additional relays (eight total) and has expanded memory.
Consult factory for systems requiring more than 10,000 card/keycode or 6,000 buffer capacity.
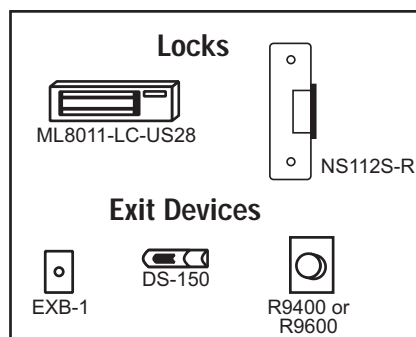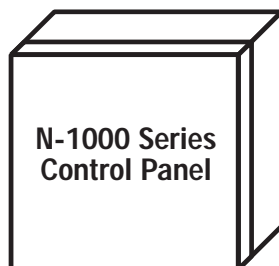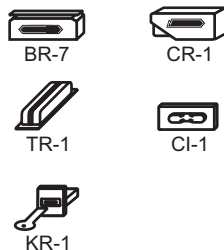
N-1000-III/N-1000-IV

CARD ACCESS CONTROL PANEL

▶ Two door access control / four door

▶ Supports two card readers or two keypads / four readers two keypads

▶ Supports Wiegand, Magnetic Stripe, Proximity, Keypad, and Biometric technologies.

▶ 16 normally-closed, supervised alarm points or non-supervised point selectable/system alarms for communications, power, tamper, ground fault, low power, 5-volt short, and reset.

▶ 4 double pole, double throw (DPDT) dry contact relays with both normally-open and normally-closed sides, rated for 30 VDC at 2 amp inductive 5 amp resistive.

▶ 5,000 standard card/keycode capacity and 10,200 standard buffer capacity.*

▶ Power requirements: 16.5 VAC, 50 VA (X-4 transformer) or 12 VDC linear 2 amp continuous (PS-1-12).

▶ Battery backup: 12 VDC (4 amp/hour) battery for up to 3 hour backup – load dependent.

▶ Memory backup: Super capacitor for up to seven days.

▶ Enclosure: Hinge cover with lock and key. Enclosure tamper switch (system alarm point).

▶ FIFO Buffer

▶ Supports 5 digit Wiegand (1-65,500) or 12-digit card numbers (12 of 37 digits definable for a number range of 1 to 999,999,999,999).

▶ Anti-Passback Learn Mode

▶ "Split" Timezones

▶ Programmable card/buffer size from defaults

▶ 20ma or RS485 communications jumper selectable

▶ Resetable fuses

▶ Both N-1000-III & N-1000-IV are UL listed 294 for access control.

▶ Options:

   • **AEP-3:** 8 Additional Relays (DPDT). Up to 2 AEP-3s are supported.
   • Detachable terminal blocks

The N-1000-III-X/N-1000-IV-X provides four additional relays (eight total) and 25,000 card / 6,600 buffer memory.
   Consult factory for systems requiring more than 25,000 card/keycode or 6,000 buffer capacity.
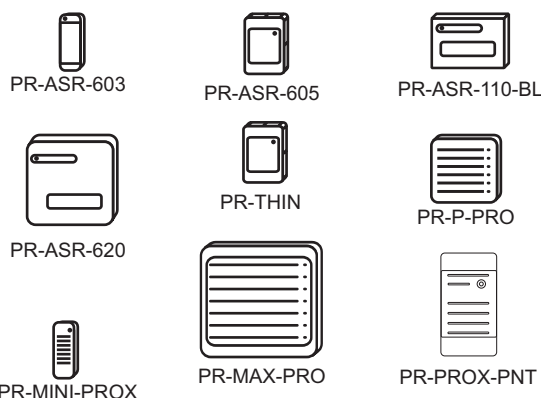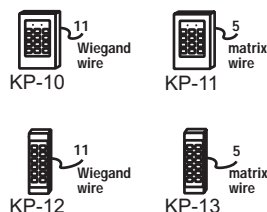
N-1000 Readers and Cards

Wiegand Technology

BR-7 CR-1

TR-1 CI-1

KR-1

N-1000 Series
Control Panel

Locks

ML8011-LC-US28 NS112S-R

Exit Devices

EXB-1 DS-150 R9400 or R9600

Magstripe Technology

NR-1-WR

Proximity Technology

PR-ASR-603 PR-ASR-605 PR-ASR-110-BL

Keypad Technology

KP-10 (11 Wiegand wire) KP-11 (5 matrix wire)

PR-ASR-620 PR-THIN PR-P-PRO

KP-12 (11 Wiegand wire) KP-13 (5 matrix wire)

PR-MINI-PROX PR-MAX-PRO PR-PROX-PNT

Compatible Cards

WIEGAND TECHNOLOGY

1
SC-1: Wiegand cards with no hot-stamped number. For CR-1, TR-1, and CI-1.
SC-2: Wiegand cards printed with encoded number. For CR-1, TR-1, and CI-1.
PVC-W-2: Similar to SC-2 with one side suitable for direct printing.

2
KI-1: Wiegand keys with no hot-stamped number. For KR-1.
KI-2: Wiegand keys hot-stamped with encoded number. For KR-1.

MAGSTRIPE TECHNOLOGY

3
NC-2: Magstripe cards printed with encoded number. For NR-1-WR.
PVC-M-1: Similar to NC-2 with one side suitable for direct printing.

PROXIMITY TECHNOLOGY

4
PX-121-I: Proximity card for use with PR-ASR-603/PR-ASR-605/PR-ASR-620, PR-ASR-110/PR-ASR-112. Encoded number on label.
PVC-I-3: Similar to PX-121-I with one side suitable for direct printing.

5
PX-4-H: Proximity cards for use with PR-PROX-PNT, PR-MINI-PROX, PR-P-PRO, PR-MAXI-PRO, and PR-THIN.
PVC-H-1: Similar to PX-4-H with one side suitable for direct printing.

Photo ID cards (laminate or PVC) are also available for all readers.

N-1000-II: TWO DOOR CONTROL

X-2
Transformer

N-1000-II

S-4
Suppressor
Kit

S-4
Suppressor
Kit

PS-1-12E
12VDC power
supply for locks

Ⓐ Ⓑ Ⓒ

ML8011-LC-US28
Maglock

Ⓑ

Ⓐ Ⓑ Ⓒ

ML8011-LC-US28
Maglock

Ⓑ

Card Reader #1
OR
Keypad #1*

Exit Device

Card Reader #2
OR
Keypad #2*

Exit Device

DOOR #1

DOOR #2

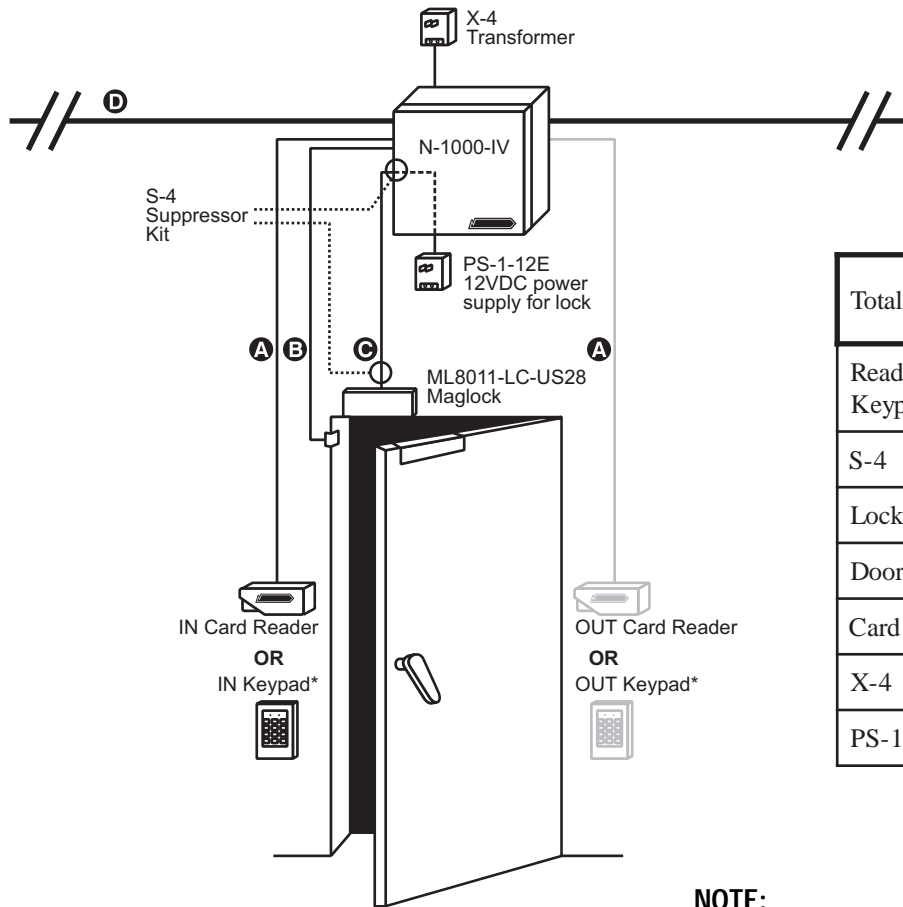**NOTE:**
Door strikes (NS112S-R) or magnetic locks
(ML8011-LC-US28) can be used to secure doors.

CABLE SPECIFICATIONS

	LOCATION	WIRE TYPE	NCI PART NUMBER		DISTANCE RATING
			Non Plenum	Plenum	
A	N-1000-II to card reader	6 conductor, 18 gauge (0.75 mm²) shielded	NC1861/BL	NCP1861/BL	500'
B	N-1000-II to exit device/alarm point	Twisted pair, 22 gauge shielded	NC2221/BR	NCP2221/BR	2000'
C	Door power cable	Twisted pair, 18 gauge shielded	NC1821/OR	NCP1821/OR	2000'
D	Comm. loop cable (20 ma)	Twisted pair, 18 gauge shielded	NC1821/GR	NCP1821/GR	2000'/Paul
*	For keypads (when card & pin are used), limited to 2 keypad (card-pin) per panel N-1000-IV	12 conductor, 18 gauge shielded	NC18121/YL	NCP18121/YL	500'

N-1000-IV: FOUR DOOR CONTROL

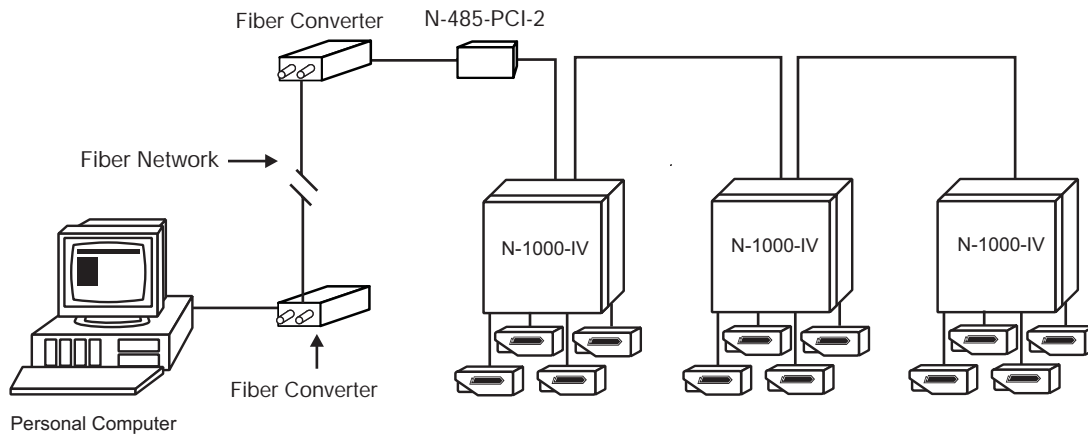| Total possible devices	For: N-1000-III	For: N-1000-IV
Readers or Keypads: KP-11/13	2	4
S-4	2	4
Lock	2	4
Door Sensor	2	4
Card PIN/Keypads	2	2
X-4	1	1
PS-1-12E	1	1

NOTE:
Door strikes (NS112S-R) or magnetic locks
(ML8011-LC-US28) can be used to secure doors.

CABLE SPECIFICATIONS

	LOCATION	WIRE TYPE	NCI PART NUMBER		DISTANCE RATING
			Non Plenum	Plenum	
A	N-1000-II to card reader	6 conductor, 18 gauge (0.75 mm²) shielded	NC1861/BL	NCP1861/BL	500'
B	N-1000-II to exit device/alarm point	Twisted pair, 22 gauge shielded	NC2221/BR	NCP2221/BR	2000'
C	Door power cable	Twisted pair, 18 gauge shielded	NC1821/OR	NCP1821/OR	2000'
D	Comm. loop cable (20 ma)	Twisted pair, 18 gauge shielded	NC1821/GR	NCP1821/GR	2000'/Paul
*	For keypads (when card & pin are used), limited to 2 keypad (card-pin) per panel N-1000-IV	12 conductor, 18 gauge shielded	NC18121/YL	NCP18121/YL	500'

FIBER OPTICS WIRED SYSTEMS

OR

	LOCATION	WIRE TYPE	NCI PART NUMBER		DISTANCE RATING
			Non Plenum	Plenum	
A	PC to C-100-A1	6 ft. 9-25 converter cable fiber optics	CBL-2		
B	C-100-A1 to first controller, controller to controller, and last controller to C-100-A1	Twisted pair, fiber optics 18 gauge (0.75 mm²) shielded	NC1821/GR	NCP1821/GR	2000'
C	N-485 dropline cable	120 ohm, 20.3 pF Twisted pair shielded, fiber optics	NC2021/GY	NCP2021/WH-A	2000'

LOCAL CARD ACCESS CONTROL CONFIGURATION

20mA Communication Loop

Standard Configurations use 2 Com-ports for 2 loops. Optional configuration of up to 32 Ports/Loops is available.

Printer

Ⓐ   C-100-A1   Ⓑ

Recommended 31 control panels
Maximum 63 control panels

20 mA Communication Loop

IBM Compatible PC
running Northern Computer's software
PC-AC-101

N-1000-II
N-1000-III
or
N-1000-IV

N-1000-II

N-1000-II
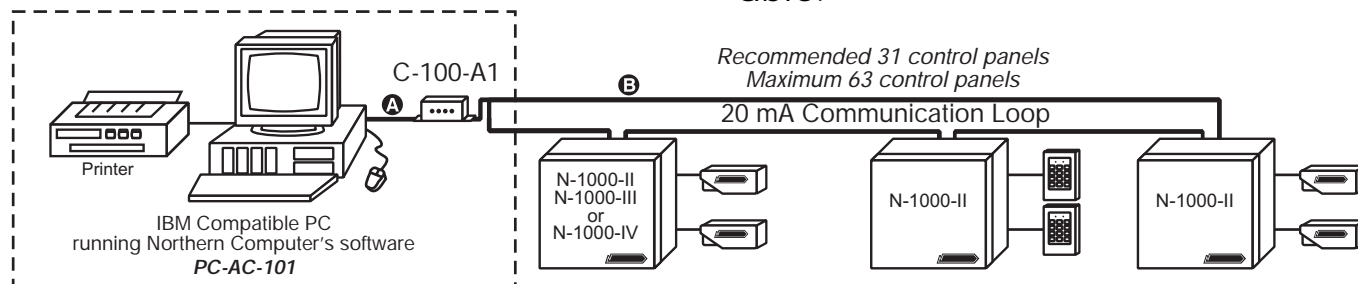
RS-485 Communication

Standard Configurations use 2 Com-ports for 2 loops. Optional configuration of up to 32 Ports/Loops is available.
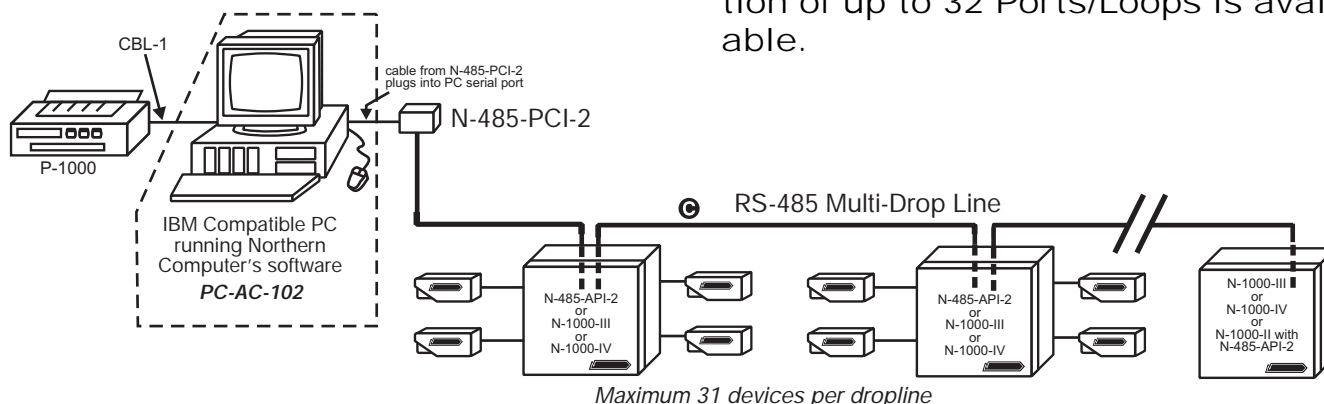

CBL-1

cable from N-485-PCI-2
plugs into PC serial port

N-485-PCI-2

P-1000

IBM Compatible PC
running Northern
Computer's software
PC-AC-102

Ⓒ   RS-485 Multi-Drop Line

N-485-API-2
or
N-1000-III
or
N-1000-IV

N-485-API-2
or
N-1000-III
or
N-1000-IV

N-1000-III
or
N-1000-IV
or
N-1000-II with
N-485-API-2

Maximum 31 devices per dropline

CABLE SPECIFICATIONS

	LOCATION	WIRE TYPE	NCI PART NUMBER		DISTANCE RATING
			Non Plenum	Plenum	
A	PC to C-100-A1	6 ft. 9-25 converter cable	CBL-2		
B	C-100-A1 to first controller, controller to controller, and last controller to C-100-A1	Twisted pair, 18 gauge (0.75 mm²) shielded	NC1821/GR	NCP1821/GR	2000'
C	N-485 dropline cable	120 ohm, 20.3 pF Twisted pair shielded	NC2021/GY	NCP2021/WH-A	2000'

REMOTE SITE CONFIGURATIONS
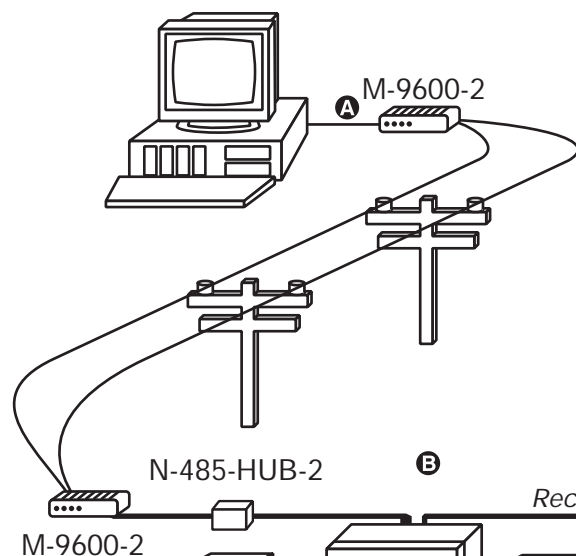
M-9600-2 Configuration
Dial-Up

****20 mA Configuration available, consult factory**
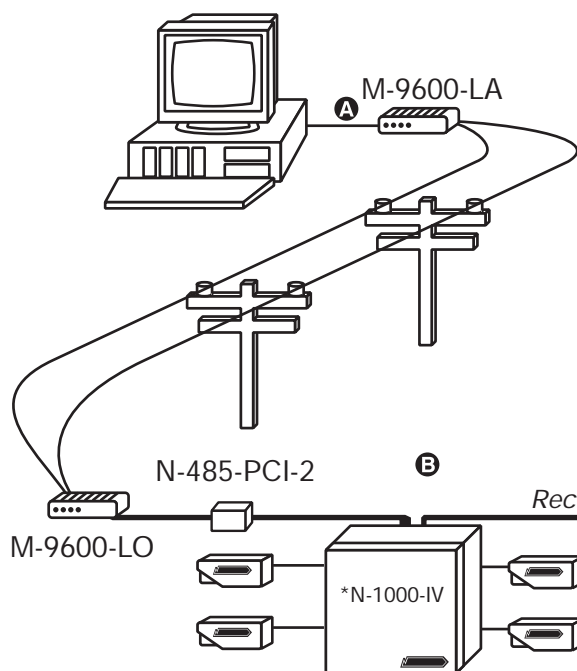
Ⓐ M-9600-2

* 4 readers only when
used with N-1000-IV

N-485-HUB-2   Ⓑ   RS-485 Multi Dropline
Recommended 31 control panels

M-9600-2

*N-1000-IV   *N-1000-IV   N-1000-III or N-1000-IV or N-1000-II with N-485-API-2

Ⓐ M-9600-LA

M-9600-LO/LA Configuration
Lease Line (Real time)

****20 mA Configuration available, consult factory**

* 4 readers only when
used with N-1000-IV

N-485-PCI-2   Ⓑ   RS-485 Multi Dropline
Recommended 31 control panels

M-9600-LO

*N-1000-IV   *N-1000-IV   N-1000-III or N-1000-IV or N-1000-II with N-485-API-2

CABLE SPECIFICATIONS

	LOCATION	WIRE TYPE	NCI PART NUMBER		DISTANCE RATING
			Non Plenum	Plenum	
A	PC to modem	6 ft. 9-25 converter cable	CBL-2		
B	N-485 dropline cable	120 ohm, 20.3 pF Twisted pair shielded	NC2021/GY-A	NCP2021/WH-A	2000'/Pair

WIN-PAK Integrated Facility Management System Configuration ■

X = Up to 63 panels per local or remote 20 mA loop.
Y = Up to 31 panels per local or remote 485 dropline.

NOTE:
Up to 32 communication loops
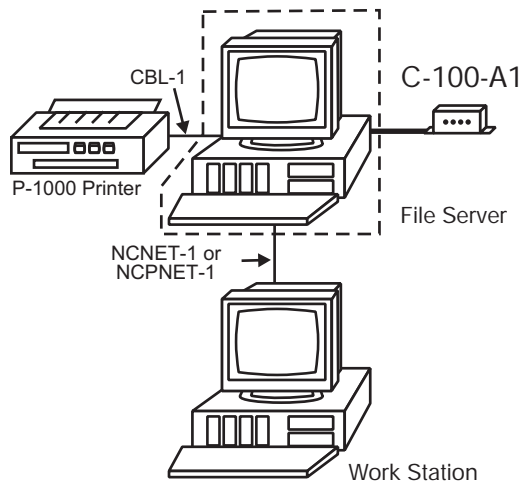Up to 5 workstations

WIN-EXP-8

CBL-2

To Local Doors

X

Dial-Up (20 mA Configuration does not support the Remote site calling in).

COM 1 C-100-A1

X

COM 2 M-200

Leased-Line

COM 3 M-300-LO or LA

X

Local

COM 4 N-485-PCI-2

Y

To Dial-Up Remote Doors

COM 5 M-9600-2

Y

COM 6 M-9600-LO or LA

Y

To Leased-Line Remote Doors

COM 7

CBL-1

P-1000
Alarm & Report Printer

PC-FS-101
File Server Station
WIN-PAK File Server

PB-VP-4T
Badge Printer

NCNET-1/607 or
NCPNET-1/607

PB-CAM-4

CBL-VB-CAM

PB-L8MM

120 VAC

PB-LK-1
Lighting Kit

PB-TRI-POD

PC-WS-114
Workstation
(up to 5 workstations)

PB-SIG-CAP
Signature Capture
Pad (optional)

6 ft. cable incl.
with PC-CCTV
Module

PC-CCTV Interface Module
Required for some CCTV systems.
Consult Factory for CCTV Interface Compatibility.

CCTV System

CABLE SPECIFICATIONS

	LOCATION	WIRE TYPE	NCI PART NUMBER		DISTANCE RATING
			Non Plenum	Plenum	
A	PC to C-100-A1	6 ft. 9-25 converter cable	CBL-2		
B	C-100-A1 to first controller, controller to controller, and last controller to C-100-A1	Twisted pair, 18 gauge (0.75 mm²) shielded	NC1821/GR	NCP1821/GR	2000'/Paul
C	PC-CCTV to CCTV System	Dependent upon CCTV System model			
D	CCTV System to cameras	Coax video cable	NCC59206/BK	NCP59206/WH	

NETWORK CONFIGURATION

CBL-1

C-100-A1

*Refer to pgs. 5 & 6
for panel wiring detail*

P-1000 Printer

File Server

NCNET-1 or
NCPNET-1

Work Station

	WIN-PAK
Server with 8 Ports	PC-FS-101
Work Station	PC-WS-101
8 Port Badging Server	PC-FS-114
Badging Workstation	PC-WS-114

NOTES

EQUIPMENT CHECKLIST

PROGRAMMING DEVICE

WIN-PAK Software (order separate C-100-A1) ❏

PANELS / PANEL EQUIPMENT

N-1000-II ❏

N-1000-II-UL* ❏

N-1000-II-X ❏

N-1000-II-X-UL* ❏

N-1000-III/IV ❏

N-1000-III/IV-X ❏

X-2 Transformer (one per N-1000-II panel) ❏
   OR

PS-1-12E Power Supply & Enclosure ❏
(Can be used with either N-1000-II/III/IV)
   OR

X-4 Transformer (one per N-1000-III/IV panel) ❏

S-4 Suppressor Kit (one per door) ❏

CARD READERS / CARDS

CR-1 ❏

TR-1 ❏

CI-1 ❏
   SC-1 Cards ❏
   SC-2 Cards ❏
   PVC-W-2 Cards ❏

KR-1 ❏
   KI-1Keys ❏
   KI-2 Keys ❏

NR-1-WR ❏
   NC-2 Cards ❏
   PVC-M-1 Cards ❏

PR-ASR-603 ❏

PR-ASR-605 ❏

PR-ASR-110-BL (requires PS-1-12E) ❏

PR-ASR-120 (requires PS-1-12E) ❏

PR-ASR-122 (requires PS-1-12E) ❏
   PX-121-I Cards ❏
   PVC-I-7 Cards ❏

PR-P-PRO (requires PS-1-12E) ❏

PR-MINI-PROX ❏

PR-MAX-PRO (requires PS-1-24E) ❏
   PX-4-H Cards ❏
   PVC-H-4 Cards ❏

PS-1-12E (powers 2 prox readers on same panel) ❏

PS-1-24E (powers 2 prox readers on same panel) ❏

KEYPADS

KP-10 (11 conductor, J box mount) ❏

KP-11 (5 conductor, J box mount) ❏

KP-12 (11 conductor, mullion mount) ❏

KP-13 (5 conductor, mullion mount) ❏

INPUT / OUTPUT DEVICES

EXB-1 Exit Pushbutton ❏

DS-150 Motion Detecting Egress** ❏

ML8011-LC-US28 Magnetic Door Lock** ❏

Output device power supplies ❏

NS112S-R Ansi Prep Strike** ❏

COMMUNICATIONS

C-100-A1 ❏

N-485-PCI-2 ❏

N-485-API-2 ❏

N-485-HUB-2 ❏

*M-300-LO & M-300-LA, M-9600-LO & M-9600-LA
are used in pairs:*

   M-300-LO leased-line originate modem ❏
   (1 LO & LA set per remote communication loop)

   M-300-LA leased-line answer modem ❏
   (1 LO & LA set per remote communication loop)

   M-9600-LO ❏
   (1 LO & LA set per remote communication loop)

   M-9600-LA ❏
   (1 LO & LA set per remote communication loop)

M-9600-2 auto-answer/auto-dial modem ❏
(one at personal computer PLUS
one per remote communication loop)

CABLE

CBL-2 (personal computer to C-100-A1 ❏
or modem)

Modem (at remote loop) to C-100-A1 ❏

Communication loop (C-100-A1 to first ❏
controller, controller to controller and
last controller to C-100-A1)

NC1821-GR or NCP1821-GR (N-1000 ❏
to comm. loop 20ma)

NC18121-YL or NCP18121-YL (N-1000 ❏
to keypads) (11 conductor)

NC2221-BR or NCP2221-BR (N-1000 ❏
to alarm input devices)

NC1821-OR or NCP1821-OR (N-1000 ❏
to output devices)

NC2021-GY-A or NCP2021-WH-A ❏
(RS-485 dropline cable)

NCC59206-BK or NCP59206-WH ❏
(Coax video cable)

* includes X-2 transformer
** requires PS-1-12E

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NOTICES

Fire Safety Notice: Never connect any card reader devices or locks to doors, gates or barriers without first consulting the local fire codes. You must consult with and get approval of, local fire officials before installing locks or devices on any doors that may be fire exits. Use of egress push buttons may not be legal. Single action exit may be required. Always obtain proper permits and approvals in writing before installing equipment.

Notice: This equipment complies with the limits for class A computing devices in accordance with the specifications in Subpart S of Part 15 of FCC Rules which are designed to minimize radio frequency interference in a residential installation. There is no guarantee that radio or television interference will not occur by activating this equipment.

Notice: The information in this document is subject to change without notice.

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