CARD ACCESS STANDARDS

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Universal Requirements:

The University’s campus-wide Card Access System is designed to provide access control to campus buildings without the need for staff to manually lock and unlock perimeter exits. It can also provide access control to building offices, computer labs, high-security areas, etc. In the case of perimeter control, each exterior door must be equipped with the following hardware:

- Fail-secure electric locking device
- Door Position switch (DPS)
- Request-To-Exit (REX)

The primary exterior entrance will be equipped with a mag-stripe card reader. The location of this door is typically determined either by the location of the Knox Box, or by the location of the fire alarm annunciator panel. Secondary doors may also be assigned for card access. This will be determined by the Facilities Management department. All exterior entrances will be equipped with a mechanical key-override for emergency situations. At least one door per entry bank will be required to have a mechanical key. If bank is wider than 4 doors, add an additional cylinder. These cylinders should be at opposite ends of the bank.

Door hardware selection is to be coordinated with Facilities Management. The coordination of the wiring of the door hardware and card access components must be carefully coordinated with hardware, electrical, and card system contractors.

Access Control Components:

The card access system in use on UNC campus is Lenel OnGuard 7.0, a Windows based software application. No Substitutions are acceptable. The local integrator is Convergent Technologies. The components typically used by the University consists of the following:

- LNL-2220: The LNL-2220 Intelligent Dual Reader Controller (IDRC) by Lenel provides a single board solution for interfacing one or two doors to an OnGuard® system. In addition, other I/O and reader interface modules can be added on the LNL-2220’s downstream port to expand its capabilities. Utilizing its native Ethernet communications and an advanced 32-bit processor, the LNL-2220 can communicate upstream to the host computer through its Ethernet port. A designated port and static IP address must be assigned by the university’s IM&T department. The downstream RS-485 two-wire port can be used to connect up to 32 devices (maximum 64 doors).

- LNL-1320: The LNL-1320 provides a vital link between the Intelligent System Controller (LNL-2220) and the card reader attached to the interface. As many as 32 DRI modules can be multi-dropped using RS-485 2-wire or 4-wire communication up to 4,000 feet per port away from the ISC. Each LNL-1320 module is individually addressed for increased reporting capabilities with OnGuard® access control software applications. The LNL-1320 includes eight inputs that support normally open, normally closed, supervised, and non-supervised circuits. In addition, six output relays support fail-safe or fail-secure operation.
• MR-10 MS-MR1012 BLK: 12 volt weatherized mag-stripe reader manufactured by Mercury Security.

**Door Hardware:**

**Electric Panic Devices:**

The Von Duprin 98 QEL electrified panic devices, is our standard locking device. Coordinate with PS900 series power supply. Schlage L9080 EUL RX is our standard interior locking device.

**Electric Strikes:**

Electric strikes are no longer being used on new construction. Any use of electric strikes must be previously approved by Facilities Management.

• HES Genesis 9600: This strike is surface-mountable, and jamb preparation is typically limited to drilling 3 holes to accommodate wire and strike installation. The strike voltage is field-selectable at either 12 or 24 volts, and should be set up to utilize 24 volts. In some cases the HES 9600-108 spacer plate (shim) may be needed to mount the strike closer to the latch on the panic device. It is designed to be used with rim-mounted exit devices, and is the preferred device to use for perimeter exits.

• HES 7000-24D: This strike is a lesser alternative to the Genesis 9600. This strike is not surface mountable, and is designed for rim-mounted panic devices. Unlike most other electric strikes (e.g. Von Duprin) two can be installed into a steel center-mullion successfully. Some jamb preparation is required, and steel center-mullions can be ordered prepped to accommodate this strike. This strike is not field selectable for voltage, so the 24 volt strike must be specified. Additionally, the HES 7000-783 strike mounting plate must be specified in addition to the strike itself. In some cases the HES 7000-108 spacer plate (shim) may be needed to mount the strike closer to the latch on the panic device.

• HES 1006: This strike is not surface mountable, and is designed for use with standard locksets. Some jamb preparation is required. This strike is field-selectable for voltage, and should be set up for 24 volts. Unlike the Genesis 9600 and 7000, this strike must be ordered in fail-secure mode unless otherwise specified. Several strike-plate option kits are available depending on the type of lockset used.

• HES 4500: The 4500C series electric strike is designed for installation in 2” UL 10C fire-rated frames with 1/2” drywall penetration. The 4500C features a low profile 1-3/8” depth, heavy-duty stainless steel construction. Its strength is derived from a unique keeper pin locking design, enabling the 4500C to exceed the ratings of the frame, door and locking hardware. This strike is not surface mountable, and is designed for use with standard locksets. Some jamb preparation is required. This strike is field-selectable for voltage, and should be set up for 24 volts. Several strike-plate option kits are available depending on the type of lockset used.
HES 8500: The 8500 series is a fire rated, compact, high performance electric strike featuring a unique concealed design for use with mortise locksets without a deadbolt. Designed for fast, convenient installation, the 8500 installs with little or no modification to the frame. Simply remove the existing strike plate, remove the dust box and install. The 8500 accommodates mortise latchbolts up to 3/4" throw. This strike is field-selectable for voltage, and should be set up for 24 volts. Several strike-plate option kits are available depending on the type of lockset used.

**Electrified Cylindrical:**

- Schlage ND Series: Electrified cylindrical locksets are primarily used in residential applications.

**Electrified Mortise:**

- Schlage L909x Series: The electrified mortise is the application of choice for most installations. They are field selectable for voltage, and should be set up for 24volts. They are also field selectable fail safe or fail secure. Most applications will be fail secure unless noted. Locksets should be ordered with request to exit and door position sensor included. The L909x Series electrified mortise comes standard with Allegion Connect, a factory-installed Molex connector system that utilizes quick-connect harnesses and hinges for simplified installation and maintenance. Alternately, the connector can be cut off and the lock installed with traditional wire splicing methods. Note that the Allegion Connect harnesses and hinges are sold separately.

**Door Position Switches, DPS:**

- Sentrol 1078-C closed-loop recessed door position switch
- Securitron J-1055-04F. We prefer to use the J-1055 magnet in wood doors, with the 1078-C switch in the frame.

Other types of closed-loop door contacts may be used, exceptions to this should be approved by Facilities Management prior to installation. Every effort should be made to use a recessed DPS.

**Request-To-Exit REX:**

It is preferred that Rex be integrated into the electrified hardware if possible.

- Detection Systems DS-150i Request-To-Exit PIR with Wrap-Around Coverage

**Hinges and Power Transfers:**

- Electric Hinge: Command Access 6 EWT HEAVY (2ea 18ga, 4ea 22ga).
- Electric Power Transfers: provide edge-mounted power transfer with ten 24-gauge wires. Electric Power Transfers by Facilities Management approval only.

**Wire Requirements:**

- All Card access wire must be equal to product listed below:
  - 4 Element Access Control Cable
  
  E118871 CMP/CL3P/FPLP
  
  18/4C + 22/3P4 SHLD + 22/4C
  
  (UL) c(UL) (JB# 33501 0 *1)
  
  (OD.415” Nom) Yellow Jacket
  
  Mfg. Windy City Wire

**Power Supplies – Access Control System:**

A 12-volt power supply is required for the card access system. The Alarm-Saf CPS400C-UL/CSA is the preferred power supplies for this application. The Altronix AL400ULX UL would be an alternate. All Von Duprin panic devices will require a PS900 series power supply.

**Enclosures:**

- Lenel CTX and CTX6 enclosures are preferred.

**Panic Alarm Hardware:**

- Innovonics EN4204R: The Inovonics four zone add-on receiver with relay outputs programs and supervises up to four Inovonics transmitters. This receiver includes Form C relays for each output, allowing connection to any hardwire panel, or stand-alone wireless application.

- Innovonics EN4216MR: The Inovonics 16 zone multi-condition receiver with relay outputs programs and supervises up to 16 single or multiple condition transmitters. This receiver includes Form C relays for each output, allowing connection to any hardwire panel, or stand-alone wireless application.

- Innovonics EN5040-20T: The EN5040-20T high power repeater with transformer decodes and re-transmits signals from Inovonics transmitters, acting as a range expander for any Inovonics EchoStream transmission that it hears. Several layers of repeaters can be employed to provide coverage of large facilities, multi-story buildings or sites with multiple buildings. The EN5040-20T high power repeater with transformer sends check-in messages every 20 minutes to allow for use in a UL 2560 certified system.

- Innovonics EN1235SF: The Inovonics single-button fixed position hold up transmitter features a rugged design with simple, single-button activation, and a back tamper for tamper protection.
**Physical Location Requirements:**

The equipment required to operate the Card Access System must be installed in specific locations and environmental conditions. All components are to be installed in accordance with the manufacturer’s instructions.

**Physical Location Requirements – Access Control head end:**

Within the building, space will be needed to accommodate the access control hardware, including the panel, the reader interface devices, and the power supplies.

We need 3’ to 4’ of clear floor space in front of the above listed panels for working space.

**Questions / Contacts:**

To Contact vendors for Lenel:

Convergint Technologies  
7330 S Alton Way #12  
Centennial, CO 80112  
(303) 932-0757  
www.convergint.com
LNL-2220

Overview

The LNL-2220 Intelligent Dual Reader Controller (IDRC) by Lenel provides a single board solution for interfacing one or two doors to an OnGuard® system. In addition, other I/O and reader interface modules can be added on the LNL-2220’s downstream port to expand its capabilities. The LNL-2220 revolutionizes access control system architecture by allowing Ethernet connection directly from an entry location to the OnGuard server, while still providing the security, functionality, and modularity of Lenel’s proven hardware platform. The LNL-2220 is scalable for any access control application, from the most basic to the most sophisticated. In the event of communication loss, the LNL-2220 allows nearly all local functionality to continue unimpaired until the server connection is restored.

Utilizing its native Ethernet communications and an advanced 32-bit processor, the LNL-2220 can communicate upstream to the host computer through its Ethernet port (with a throughput up to eight times greater than the fastest serial connections), or at up to 115.2 Kbps using RS-232 communication directly or through an external dial-up modem. The LNL-2220 can store up to 250,000 cardholders in non-volatile flash memory, and supports selective download for larger cardholder databases. The downstream RS-485 two-wire port can be used to connect up to 32 devices (maximum 64 doors).

Two on-board reader ports support Data1/Data0, Clock/Data, Bioscrypt RS-485 readers and the bidirectional RS-485 Open Supervised Device Protocol (OSDP) communications. Each LNL-2220 supports up to eight different card formats. The LNL-2220 includes eight inputs that support normally open, normally closed, supervised, and unsupervised circuits. In addition, four output relays support fail-safe or fail-secure operation.

FEATURES & FUNCTIONALITY

Controller Functionality
- On-board Ethernet 10/100Base-T port provides up to 8 times greater throughput than serial-to-Ethernet converters. DHCP and fixed IP addressing supported.
- DNS device naming through DHCP extended commands
- 6 MB of available on-board, non-volatile flash memory
- Battery-backed, non-volatile storage of 50,000 events
- Firmware stored in flash memory, background download of firmware updates supported
- Supports up to 16 different formats (8 card formats and 8 asset formats)
- Biometric template storage support for Schlage Recognition Systems®, Bioscrypt®, and Identix®.
- Direct connection of Bioscrypt RS-485 devices
- Enhanced anti-passback capabilities
- Up to 32,000 access level permissions
- 255 holidays with grouping, 255 timezones, each with 6 intervals
- Elevator control support for up to 128 floors
- Individual extended held open and strike times (ADA required)
- Up to 9-digit user PIN codes
- 20 status LEDs
- 2 dedicated inputs for tamper and power failure status
- 12 or 24 VDC input power
- Advanced Encryption Standard (AES) 128-bit algorithm for communications

Reader Interface Functionality
- Supports Data1/Data0, Clock/Data and Lenel OSDP-compatible RS-485 readers and keypads
- 4 Form-C relay outputs, 5 A at 30 VDC
- Door contact supervision (open/closed) and REX push-button monitor for each door
- Strike control and auxiliary output for each door
- Bicolor reader status LED support plus beeper control, or 2-wire LED support
- On-board regulator allows 12 VDC reader power from 24 VDC power source
Controller Features

**LNL-2220**
- 6 MB on-board flash memory available for cardholder & asset database,
- 50,000 event battery backed RAM for event log

**Dial-Up Modem**
- LNL-56KEXT: 56 K external modem with cables
- LNL-DC336K: 12 VDC-powered/33.6 K external modem

Specifications

**Primary Power (DC or AC)**
- The LNL-2220 is for use in low voltage, power-limited, class 2 circuits only.
- DC input: 12 or 24 VDC ± 15%. 500 mA maximum
- AC input: 12 VAC ± 15%. 400 mA RMS

**Memory and Clock backup**
- 3 V lithium, type BR2325, BR2330, CR2330

**Communication Ports**
- Primary (Ethernet) Port: 10/100Base-T Ethernet high-speed port
- Alternate Upstream Port 1: RS-232 9600 to 115.2 Kbps async
- Downstream Port 2: RS-485 (2-wire) 9600 to 38.4 Kbps async

**Inputs**
- Tamper and Power Fail Monitors: Unsupervised, dedicated
- Door position, REX, and AUX: 8, each programmable as normally open or normally closed, supervised or unsupervised circuits

**Outputs**
- Relay outputs: 4 Form-C 5 A at 30 VDC relay outputs: 2 strike, 2 auxiliary

**Reader Power**
- DC output: 12 VDC, 125 mA regulated when 24 VDC powered, or 12 to 24 VDC 125 mA current limited

**Reader Port Compatibility**
- Wiegand Data1/Data0, Magnetic Clock/Data, F/2F single-wire protocol, Bioscrypt RS-485, OSDP (Open Supervised Device Protocol RS-485)

**Environmental**
- Temperature: Operating: 32° to 158° F (0° to +70° C)
- Storage: -67° to 185° F (-55° to +85° C)

**Humidity:**
- 0 to 95% RHNC

**Mechanical**
- Dimensions: 6 x 5 x 1 in. (152 x 127 x 25 mm)
- Weight: 8 oz. (230 g) nominal

**Approvals**
- UL 294, CE-marked, RoHS compliant

**Supported Readers**
- Schlage Wireless - WA 5296, WA 5696, WA 5694, WA 993, WRI, WPR

**Approvals**
- FCC Part 15, CE, RoHS, UL 294, UL 1076, UL CSA-C22.2, CAN/ULC-S319-05, cUL/ORD-C1076

lenel.com

(866) 788-5095

Specifications subject to change without notice.

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LNL_TS_2220_063014
LNL-1320 Series 2

Overview

Lenel offers a Dual Reader Interface (DRI) module for access control solutions. Most access control card readers, keypads, or readers with keypads that use standard Wiegand Data1/Data0 or Clock/Data communication are supported, as are those that support the bidirectional RS-485 Open Supervised Device Protocol (OSDP). Lock, unlock, and facility code offline access modes are supported on all readers connected to the DRI. Each DRI supports up to eight different card formats as well as issue codes for both magnetic and Wiegand card formats.

The DRI provides a vital link between the Intelligent System Controller (ISC) and the card reader attached to the interface. As many as 32 DRI modules can be multidropped using RS-485 2-wire or 4-wire communication up to 4,000 feet per port away from the ISC. Each DRI module is individually addressed for increased reporting capabilities with OnGuard® access control software applications. The DRI includes eight inputs that support normally open, normally closed, supervised, and non-supervised circuits. In addition, six output relays support fail-safe or fail-secure operation.

FEATURES & FUNCTIONALITY

- 12 or 24 VDC power supply
- Supports Data1/Data0, Clock/Data and Lenel OSDP-compatible RS-485 readers and keypads
- Downloadable firmware
- Six Form-C 5 A at 28 VDC relay outputs
- Up to 16 different formats (8 card formats and 8 asset formats)
- Issue code support for magnetic and Wiegand formats
- Door contact supervision (open/closed)
- REX push-button monitor
- Strike control output
- Bicolor reader status LED support and 2-wire LED support
- Beeper control
- Dedicated tamper and power failure circuits
- Support for offline reader access mode
- On-board jumpers for termination
- On-board regulator allows 12 VDC reader support from 24 VDC power source
- DIP switch-selectable addressing
Power Supplies & Enclosures

LNL-AL400ULX  Lenel® UL Listed 4A, 110VAC Power Supply – 12VDC 4A output, 115VAC input, continuous supply current with enclosure (15.5" x 12.5" x 4.5"), lock, tamper switch, UPS capable (Battery Optional) UL & CUL Approved

LNL-AL600ULX-4CB6  Lenel UL Listed Power Supply – 12VDC 6A output, 115VAC (1.6 amps) input, continuous supply current with enclosure (24" x 18" x 4.5"), lock, tamper switch, power distribution module, UPS capable (Battery Optional) UL & CUL Approved

ABT-12  Battery Kit - 12VDC, 12 AH battery (PS-12120)

Specifications

Primary Power
12 to 24Vdc ±10%, 550mA maximum (plus reader current)
12Vdc @ 450mA (plus reader current) nominal, 18.41 BTUs
24Vdc @ 270mA (plus reader current) nominal, 22.09 BTUs

Outputs
6 outputs, Form-C, 5A @ 28Vdc, resistive

Inputs
8 unsupervised/supervised, standard EOL: 1k/1k ohm, 1% 1/4 watt
2 unsupervised, dedicated for cabinet tamper and UPS fault monitoring

Reader Interface
Reader power: 12Vdc ±10% regulated, 125mA maximum each reader (jumper selectable and input voltage (VIN) must be 20Vdc minimum) or 12 to 24Vdc ±10% (input voltage passed through) 125mA maximum each reader

Reader Port Compatibility
Wiegand Data 1/Data 0
Magnetic Clock/Data
F/2F Single Wire
Open Supervised Device Protocol

Mechanical
Dimension: 6" (152mm)W x 8" (203mm)L x 1" (25mm)H
Weight: 11 oz. (312g) nominal

Environmental Temperature
Operating: 32°F to 158°F (0°C to +70°C)
Storage: -67°F to 185°F (-55°C to +85°C)

Humidity
0% to 95% RHNC

Compliance Approvals
FCC Part 15, CE, RoHS, UL 294, UL 1076, ULC CSA-C22.2, CAN/ULC-S319-05, cUL/ORD-C1076

lenel.com
(866) 788-5095
Specifications subject to change without notice.
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# Magnetic-Stripe Card Readers

## Mechanical
**Reader**
- **Case:** Aluminum alloy, **black**
- **Finish:** Warm gray, textured powder coat
- **Size:** 1.95"W x 1.30"H x 5.5"L (50 mm x 33 mm x 140 mm)
- **Weight:** 10 oz. (285 g) Nominal
- **Connection:** 6 conductor modular connector

## Environmental
- **Operating Temperature:** -40°C to +75°C
- **Humidity:** 95% RHNC, standard 100% (weatherized option)

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<table>
<thead>
<tr>
<th>MR-10 Reader</th>
<th>MR-12 Reader</th>
<th>MR-14 Reader</th>
</tr>
</thead>
</table>

### Interface:
- **Interface:** Implements “clock/data” and Wiegand interface formats using the “5-wire” interface common in the access control industry.

### Data Format:
- **Data format:** Multiple built-in data formats are user selectable via DIP switch.
- **Electrical:**
  - **Voltage:** 5 Vdc or (2 Vdc)
  - **Current:** 20 mA, typical

### LEDS:
- **Upper LED:** red
- **Lower LED:** green
- **LED control:** single line

### Applications:
The MR-10 and MR-20 readers are especially well suited for use with Access Control Panels.

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<table>
<thead>
<tr>
<th>MR-12 Reader</th>
<th>MR-22 Reader with Keypad</th>
<th>MR-14 Reader</th>
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</thead>
<tbody>
<tr>
<td>MR-24 Reader with Keypad</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Interface:
- **Interface:** Implements RS-232 interface standard.

### Data Format:
- **Data format:** 8-bit, no parity, 1 stop bit 9600/1200 baud operation ASCII character set

### Electrical:
- **Voltage:** 12 Vdc
- **Current:** 35 mA, typical

###LEDs:
- **Upper LED:** red
- **Lower LED:** green

### Applications:
The RS-232 interface makes the MR-12 and MR-22 readers ideal for direct connection to computers for general data entry, time and attendance, and job costing applications.

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<table>
<thead>
<tr>
<th>MR-14 Reader</th>
<th>MR-24 Reader with Keypad</th>
</tr>
</thead>
<tbody>
<tr>
<td>MR-22 Reader with Keypad</td>
<td></td>
</tr>
</tbody>
</table>

### Interface:
- **Interface:** Implements the “two-wire” configuration of the RS-485 interface standard.

### Data Format:
- **Data format:** 8-bit, no parity, 1 stop bit 9600 baud operation Interrogation/replay protocol

### Electrical:
- **Voltage:** 12 Vdc
- **Current:** 50 mA, typical

### LEDS:
- **Upper LED:** red/green bi-color
- **Lower LED:** red/green bi-color

### Applications:
The RS-485 interface allows up to eight MR-14 and MR-24 readers to share a multi-dropped data channel. Access control and time and attendance are some popular applications.
ND Series
Electrified cylindrical lock

Overview
The Schlage electrified ND Grade 1 Cylindrical lock has been completely redesigned to offer superior energy efficiency and flexibility in wired electrified applications. Key features include:

- Universal Input Voltage - autodetects 12 through 24V DC for installation flexibility
- User selectable Fail Safe/Fail Secure - set for EL or EU operation by moving switch on lock chassis
- More flexibility, less inventory - one lock supports 12-24V DC, EL or EU applications; RX can be added using RX kit
- Low maximum current draw - 0.23 amps (230mA) - allows up to 8 locks on a single 2 amp power supply
- Low holding current - 0.01 amps (10 mA) - produces minimal heat, eliminating “hot levers” in electrically locking applications and allowing reliable operation even in poorly ventilated wood doors
- Standard Allegion Connect quick-connect Molex system (can be cut off if traditional wiring splicing preferred)
- Exceeds ANSI A156.2 Series 4000 Grade 1 requirements
- UL listed for 3 hour fire door

Available functions
- Exit function (no cylinders)
  - ND12DEL: Electrically locking/fail safe
  - ND12DEU: Electrically unlocking/fail secure
- Storeroom function (outside cylinder)
  - ND80PDEL: Electrically locking/fail safe
  - ND80PDEU: Electrically unlocking/fail secure
- Storeroom Vandlgard’ (outside cylinder)
  - ND96PDEL: Electrically locking/fail safe
  - ND96PDEU: Electrically unlocking/fail secure

Vandlgard outside trim “freewheels” when locked, providing extra protection against vandalism

Request to Exit
- Order with lock: specify RX in option field
- Order following components to retrofit (compatible with new electrified ND only):
  - switch (p/n N523-194)
  - screw (p/n N523-135)
  - torque plate (p/n N523-131)
Ordering instructions

Order using standard Schlage order form as follows:

**ND Series electrified cylindrical lock**

<table>
<thead>
<tr>
<th>Function</th>
<th>Cylinder</th>
<th>Latch suffix</th>
<th>Trim</th>
<th>Finish</th>
<th>Door thickness</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>ND80EU</td>
<td>P</td>
<td>D</td>
<td>RHO</td>
<td>626</td>
<td>1 1/4&quot;</td>
<td>NS23-194</td>
</tr>
</tbody>
</table>

**Lock specifications**

Function: ND12EL/EU, ND80EL/EU, ND96 EL/EU (see front of datasheet for model details).

Specifying EL or EU provides the factory pre-set position setting can easily be changed in field by moving a switch on the lock chassis.

**Cylinder**

<table>
<thead>
<tr>
<th>Standard</th>
<th>SFIC</th>
<th>SFIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>P (Everest 29)</td>
<td>R (Everest 29 SFIC)</td>
<td>G (Everest 29 SFIC)</td>
</tr>
<tr>
<td>L (Less cylinder)</td>
<td>J (Less SFIC)</td>
<td>B (Less SFIC)</td>
</tr>
<tr>
<td>C (Less double cylinder)</td>
<td>T (Construction SFIC)</td>
<td>BDC (Disposable SFIC)</td>
</tr>
</tbody>
</table>

Cylinder code N/A for ND/2

**Latch suffix**

D for deadlock functions (all models except ND10 passage, ND30 Patio, ND40 privacy, ND44 hospital privacy)

S for spring latch functions (ND10 passage, ND30 Patio, ND40 privacy, ND44 hospital privacy only)

**Trim**

ATH, OME, SPA, RHO, TLR

**Finish**

| 605 Bright brass | 613 Oil rubbed bronze | 626 Satin chrome |
| 606 Satin brass | 619 Satin nickel | 626AM Satin chrome anti-microbial |
| 612 Satin bronze | 625 Bright chrome | 643e Aged bronze |

**Handing**

<table>
<thead>
<tr>
<th>LH (Left Hand)</th>
<th>RH (Right Hand)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LR (Left Hand Reverse)</td>
<td>RR (Right Hand Reverse)</td>
</tr>
</tbody>
</table>

**Door thickness**

1 1/4" - 2 1/4" standard; see pricebook for additional thicknesses

**Option**

Specify "RX" for Request to Exit. See pricebook for additional options.

**Note:** Mixed lever designs and finishes available; please see pricebook for details.

**Wire length**

<table>
<thead>
<tr>
<th>AWG</th>
<th>14</th>
<th>16</th>
<th>18</th>
<th>20</th>
</tr>
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<tbody>
<tr>
<td>12 volt</td>
<td>500' (152 m)</td>
<td>300' (90 m)</td>
<td>200' (61 m)</td>
<td>100' (30 m)</td>
</tr>
<tr>
<td>24 volt</td>
<td>Up to 1000' (304 m)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Allegion Connect**

The ND Series electrified cylindrical lock comes standard with Allegion Connect, a factory-installed Molex connector system that utilizes quick-connect harnesses and hinges for simplified installation and maintenance. Alternately, the connector can be cut off and the lock installed with traditional wire splicing methods. Note that the Allegion Connect harnesses and hinges are sold separately.

**About Allegion**

Allegion (NYSE: ALLE) is a global pioneer in safety and security, with leading brands like CISA®, Interflex®, LCN® and Von Duprin®. Focusing on security around the door and adjacent areas, Allegion produces a range of solutions for homes, businesses, schools and other institutions. Allegion is a $2 billion company, with products sold in almost 130 countries. For more, visit [www.allegion.com](http://www.allegion.com).
Overview

The Schlage L909x Series is the next generation of electrified mortise lock. The series utilizes the latest technology to offer tremendous utility and flexibility.

- Universal input voltage – accepts 12 or 24V DC for installation flexibility
- User selectable fail safe/fail secure – changing mode between EL and EU is as simple as flipping a switch on the lock case
- Low maximum current draw – 0.4amps - allows multiple locks on a single power supply
- Low holding current – 0.01 amps – produces minimal heat, eliminating “hot levers” in electrically locking applications and allowing reliable operation even in poorly ventilated wood doors
- All-new RX switch monitors the inside lever with enhanced detection level that balances security with lever sensitivity
- New modular RX design – RX can be added on at a later time without opening the lock case
- Standard Allegion Connect quick-connect Molex system (can be cut off if traditional wiring splicing preferred)
- UL listed for 3 hour fire door

Available functions

Models without deadbolt
- No cylinders
  - L9090: Outside lever EL/EU
  - L9091: Both levers EL/EU
- Outside cylinder
  - L9092: Outside lever EL/EU*
  - L9093: Both levers EL/EU
- Inside and outside cylinders
  - L9094: Outside lever EL/EU
  - L9095: Both levers EL/EU**

Deadbolt Models
- Outside cylinder, Inside thumbturn
  - L9492: outside lever EL/EU
  - L9493: both levers EL/EU
- Inside and outside cylinders
  - L9494: Outside lever EL/EU
  - L9495: Both levers EL/EU

Available options
- Request to Exit (RX)
- Latchbolt Monitor (LX)
- Door Position Sensor (DPS) - non-deadbolt functions only
- Deadbolt Monitor (DM) - deadbolt functions only

*L9092 replaces L9080EL/EU; **L9095 replaces L9082EL/EU
Ordering instructions

Order using standard Schlage order form as follows:

<table>
<thead>
<tr>
<th>L Series mortise indicators</th>
<th>Function + cylinder</th>
<th>Trim</th>
<th>Finish</th>
<th>Handing</th>
<th>Option code</th>
</tr>
</thead>
<tbody>
<tr>
<td>L9092EUP</td>
<td>06A 626 RH</td>
<td>RX, LX, DPS</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Lock specifications

<table>
<thead>
<tr>
<th>Function</th>
<th>Cylinder</th>
<th>Trim</th>
<th>Finish</th>
<th>Handing</th>
<th>Option code</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P (Even 29 standard cylinder)</td>
<td>J (Less FSIC)</td>
<td>BD (Less SPIC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>L (Less cylinder)</td>
<td>T (Construction FSIC)</td>
<td>BDC (Disposable SPIC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>R (Even 29 FSIC)</td>
<td>GD (Even 29 SPIC)</td>
<td>HD (Construction SPIC)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Leave cylinder code blank if cylinder not applicable

Trim:
- Standard levers: 01, 02, 03, 05, 06, 07, 12, 17, 1B, ACC, AST, LAT, LON, MER, OME
- Decorative levers: M51, M52, M53, M54, M55, M56, M57, M61, M62, M63, M81, M82, M83, M84, M85
- Sectional (rose) designs: A, B, C, AVA (AVAST lever only), MER (MER lever only)

Escutcheon designs: L and N

Finish:
- 605 Bright brass
- 606 Satin brass
- 609 Satin brass, blackened
- 612 Satin bronze

Handing:
- LH (Left Hand)
- RH (Right Hand)
- LR (Left Hand Reverse)
- RR (Right Hand Reverse)

Option:
- RX (Request to Exit), LX (Latchbolt Monitor), DPS (Door Position Sensor, available non-deadbolt models), DM (Deadbolt Monitor, available deadbolt models). See pricelists for additional lock options.

Note: Messaging indicators are not available for the L9092 Series

Allegion Connect

The L909x Series electrified mortise comes standard with Allegion Connect, a factory-installed Molex connector system that utilizes quick-connect harnesses and hinges for simplified installation and maintenance. Alternately, the connector can be cut off and the lock installed with traditional wire splicing methods. Note that the Allegion Connect harnesses and hinges are sold separately.

Allegion Connect cables

<table>
<thead>
<tr>
<th>Door type</th>
<th>Hollow metal</th>
<th>Wood</th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot; wire harness</td>
<td>Con-6</td>
<td>Con-6P</td>
</tr>
<tr>
<td>12&quot; wire harness</td>
<td>Con-12</td>
<td>Con-12P</td>
</tr>
<tr>
<td>26&quot; wire harness</td>
<td>Con-26</td>
<td>Con-26P</td>
</tr>
<tr>
<td>32&quot; wire harness</td>
<td>Con-32</td>
<td>Con-32P</td>
</tr>
<tr>
<td>38&quot; wire harness</td>
<td>Con-38</td>
<td>Con-38P</td>
</tr>
<tr>
<td>44&quot; wire harness</td>
<td>Con-44</td>
<td>Con-44P</td>
</tr>
<tr>
<td>50&quot; wire harness</td>
<td>Con-50</td>
<td>Con-50P</td>
</tr>
<tr>
<td>192&quot; wire harness</td>
<td>Con-192</td>
<td>Con-192P</td>
</tr>
<tr>
<td>6&quot; extension to power supply</td>
<td>Con-6W</td>
<td>Con-6W</td>
</tr>
</tbody>
</table>

Note: Harness for hollow metal doors have connectors both ends; wood door harness comes with connector on one end with crimped pins on other with/attachable connector (required in wood doors due to more narrow cable raceway)

About Allegion

Allegion (NYSE:ALLE) is a global pioneer in safety and security, with leading brands like CISA®, Interflex®, LCN®, Schlage® and Von Duprin®. Focusing on security around the door and adjacent areas, Allegion produces a range of solutions for homes, businesses, schools and other institutions. Allegion is a $2 billion company, with products sold in almost 130 countries. For more, visit www.allegion.com.
Recessed

1078 Series

1" Dia. Steel Door With Wire Leads

- Special design for steel mounting
- Self-lock mounting
- Rugged construction
- 1 1/8" dia. hole required
- UL approved for specific fire doors

<table>
<thead>
<tr>
<th>ORDERING INFORMATION</th>
<th>Gap Size</th>
<th>Closed Loop</th>
<th>Open Loop</th>
<th>S.P.D.T.</th>
<th>Lead Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular Gap Series</td>
<td>1/2&quot;</td>
<td>1078</td>
<td>1077</td>
<td>1076</td>
<td>1 foot #22 wire</td>
</tr>
<tr>
<td>Wide Gap Series</td>
<td>1&quot;</td>
<td>1078W</td>
<td>1077W</td>
<td>1076W</td>
<td>1 foot #22 wire</td>
</tr>
<tr>
<td>Biased for Higher Security Applications</td>
<td>3/8&quot;</td>
<td>1078H</td>
<td></td>
<td></td>
<td>1 foot #22 wire</td>
</tr>
<tr>
<td>Double Pole Double Throw</td>
<td>3/8&quot;</td>
<td>D.P.D.T. 1078D</td>
<td></td>
<td></td>
<td>1 foot #22 wire</td>
</tr>
</tbody>
</table>

NOTE: Specific sizes given are for sample shown. For Accessories, see page 101.

1078CT Series

3/4" Dia. Steel Door With Wire Leads

- 3/4" diameter for easier drilling in metal
- Self-lock mounting
- Rugged construction
- Attractive, added security of recessed installation

<table>
<thead>
<tr>
<th>ORDERING INFORMATION</th>
<th>Gap Size</th>
<th>Closed Loop</th>
<th>Open Loop</th>
<th>S.P.D.T.</th>
<th>Lead Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular Gap Series</td>
<td>1/2&quot;</td>
<td>1078C1</td>
<td></td>
<td></td>
<td>1 foot #22 wire</td>
</tr>
<tr>
<td>Long Gap Series</td>
<td>1/2&quot;</td>
<td>1078C</td>
<td>1077C</td>
<td>1078C</td>
<td>1 foot #22 wire</td>
</tr>
<tr>
<td>Wide Gap Series</td>
<td>3/4&quot;</td>
<td>1078CW</td>
<td>1077CW</td>
<td>1076CW</td>
<td>1 foot #22 wire</td>
</tr>
<tr>
<td>Biased for Higher Security Application</td>
<td>3/4&quot;</td>
<td>1075CH</td>
<td></td>
<td></td>
<td>1 foot #22 wire</td>
</tr>
</tbody>
</table>

NOTE: Specific sizes given are for sample shown. For Accessories, see page 101.
PART NUMBER 4461030
UL Listed and Rated Type CMP Plenum Composite Cable

CABLE SPECIFICATIONS

DESCRIPTION
Elem1: 18 AWG 4 Conductor Bare Copper; Elem2: 22 AWG 3 Pair OAS Bare Copper; Elem3: 22 AWG 2 Conductor Bare Copper; Elem4: 22 AWG 4 Conductor Bare Copper Plenum Composite Cable, C(UL)US CMP

CONDUCTOR
Element 1: 18, Element 2, 3, and 4: 22; All Elements: Stranded Bare Copper

INSULATION
All Elements: .008" 

COLOR CODE

SHIELD
Element 1, 3 & 4: N/A; Element 2: Overall Aluminum Mylar

DRAIN WIRE
Element 1, 3 & 4: N/A; Element 2: 24 AWG 7 Strand Tinned Copper

JACKET
Inner Jackets: All Elements: Low-Smoke PVC .018"; Outer Jacket: Low-Smoke PVC .020"

MARKING
Elem1: LOCK POWER A B C D E 0 1 2 3 4 5 6 7 8 9; Elem2: CARD READER A B C D E 0 1 2 3 4 5 6 7 8 9; Elem3: DOOR CONTACT A B C D E 0 1 2 3 4 5 6 7 8 9; Elem4: REX/SPARE A B C D E 0 1 2 3 4 5 6 7 8 9 Outer Jacket: SMARTWIRE ACCESS CONTROL CABLE DOOR / ZONE A B C D E 0 1 2 3 4 5 6 7 8 9 C(UL)US CMP ROHS MADE IN THE USA

OVERALL DIAMETER

CABLE WEIGHT
108 Lbs/Mft.

CAPACITANCE

IMPEDANCE
Elem 1: 70 Ohms/Mft.; Elem 2: 27 Ohms/Mft.; Elem 3 & 4: 94 Ohms/Mft.

TEMPERATURE RATING
0 C to 75 C / 300 Volt

INDUSTRY STANDARDS
Approved For Plenum Use Without Conduit Per NFPA 262 Flame Test

FLAME RATING

AGENCY APPROVALS
NEC Article 800; UL Listed C(UL)US CMP, RoHS Compliant, Made in the USA

All specifications referenced are nominal measurements unless otherwise noted.
CPS400-UL/CSA POWER SUPPLY/CHARGER

12/24 VDC, 4 amp switching power supply is agency listed for access control (UL 294 and CSA Certified). Features include field selectable voltage, power limited output, Form “C” relay fault reporting, visual fault indication and an additional output for Fire Alarm Interface (FAI). Systems integration applications include system power, door strikes, mag locks, card readers and fire alarm interface for emergency exit.

FEATURES AND SPECIFICATIONS

Features
• Visual fault indication
• Relay Fault Output
• Class 2, power limited
• Switching technology
• Controlled current battery charging
• Additional output for Fire Alarm Interface (FAI)
• Short circuit protection
• Thermal protection
• Reverse polarity protection (PTC)
• UL-294
• CSA
• Limited lifetime warranty

Specifications
• Input voltage: 120 VAC
• Input current: 1.7 Amp
• Output voltage: 12/24 VDC, Field selectable
• Output current rating: 4 amps continuous
• 1 Standard uncontrolled output
• 1 Fire Alarm Interface controlled output
• Ripple: < 0.240V/AC p-p
• Operating Temperature: 0 °C to 50 °C
• Humidity: 85% @ 30 °C
• Maximum Battery Capacity: 14 AH
• Electronically regulated and filtered output
• Visual fault indicators:
  • AC presence: Green LED
  • DC presence: Red LED
• Fault Reporting:
  • AC Loss
  • Low Battery
  • High/Low DC

LISTINGS
• UL 294
• CSA Certified

APPLICATIONS

• Fire Alarm Interface for emergency exit
• System power
• Door strikes

• Mag locks
• Card Readers
• Proximity readers

MECHANICAL

Board Dimensions
• 4.25” W x 5.75” L

Cabinet Dimensions/Weight
• CPS400C-UL/CSA - 12” W x 12” x 4” H • 13 lbs

ORDER INFORMATION

<table>
<thead>
<tr>
<th>Order Number</th>
<th>Model Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01373</td>
<td>CPS400-UL/CSA</td>
<td>12/24V Field Selectable 4 Amps, Board</td>
</tr>
<tr>
<td>01366</td>
<td>CPS400C-UL/CSA</td>
<td>12/24V Field Selectable 4 Amps, Key Lockable Cabinet</td>
</tr>
</tbody>
</table>

Overview:
The AL400ULX power supply converts a 115 VAC / 60Hz input, to a 12 VDC or 24 VDC power limited output. (see specifications). The AL400ULX is UL Listed for fire alarm, burglar alarm, and access control applications.

Specifications:
- UL listed fire, burglar and access control power supply (UL1481, UL603, UL294).
- ULC listed (Underwriters Laboratories Canada).
- NYC Department of Buildings Approved (MEA).
- California State Fire Marshal Approved (CSFM).
- CSA approved (Canada).
- NFPA 72 compliant.
- Class 2 rated.
- Switch selectable 12VDC or 24VDC power limited output.
- Input 115VAC / 60Hz, 1.45 amp.
- Maximum charge current 1.25 amp.
- 4 amps continuous supply current at 12VDC.
- 3 amps continuous supply current at 24VDC.
- Filtered and electronically regulated outputs.
- Built-in charger for sealed lead acid or gel type batteries.
- Automatic switch over to stand-by battery when AC fails.
- AC input and DC output LED indicators.
- AC fail supervision (form "C" contacts).
- Low battery supervision (form "C" contacts).
- Short circuit and thermal overload protection.
- Unit is complete with power supply, enclosures, cam lock.
- Includes battery leads.
Enclosure Dimensions: 15.5"H x 12"W x 4.5"D

Power Supply Voltage Output Selections:

<table>
<thead>
<tr>
<th>Output</th>
<th>Switch Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>12VDC</td>
<td>SW 1 Closed</td>
</tr>
<tr>
<td>24VDC</td>
<td>SW 1 Open</td>
</tr>
</tbody>
</table>

Stand-by Specifications:

<table>
<thead>
<tr>
<th>Output</th>
<th>4 hr. of Stand-by &amp; 5 Minutes of Alarm</th>
<th>24 hr. of Stand-by &amp; 5 Minutes of Alarm</th>
<th>60 hr. of Stand-by &amp; 5 Minutes of Alarm</th>
</tr>
</thead>
<tbody>
<tr>
<td>12VDC / 40 AH Battery</td>
<td>Stand-by = 4.0 amps Alarm = 4.0 amps</td>
<td>Stand-by = 1.0 amps Alarm = 4.0 amps</td>
<td>Stand-by = 300mA Alarm = 4.0 amps</td>
</tr>
<tr>
<td>24VDC / 12 AH Battery</td>
<td>Stand-by = 200mA Alarm = 3.0 amps</td>
<td>Stand-by = 1.0 amp Alarm = 3.0 amps</td>
<td></td>
</tr>
<tr>
<td>24VDC / 40 AH Battery</td>
<td>Stand-by = 3.0 amps Alarm = 3.0 amps</td>
<td>Stand-by = 1.0 amp Alarm = 3.0 amps</td>
<td>Stand-by = 300mA Alarm = 3.0 amps</td>
</tr>
</tbody>
</table>

Installation Instructions:
The AL400ULX should be installed in accordance with article 760 of The National Electrical Code or NFPA 72 as well as all applicable Local Codes.
1. Mount the AL400ULX in desired location.
2. Connect the black and white transformer leads of AL400ULX to a separate unswitched AC circuit (115VAC, 50/60Hz) dedicated to the Fire Alarm System (Fig. 1).

Altronix is not responsible for any typographical errors. Product specifications are subject to change without notice.
3. Connect AC power to the black and white flying leads of the transformer.

Secure green wire lead to earth ground. *(Fig. 1)*.

Use 18 AWG or larger for all power connections (Battery, DC output).

Use 22 AWG to 18 AWG for power limited circuits (AC Fail/Low Battery reporting).

Keep power limited wiring separate from non-power limited wiring (115VAC / 60Hz Input, Battery Wires). Minimum .25” spacing must be provided.

4. Connect devices to be powered to terminals marked [± DC -] *(Fig. 1)*.

Note: It is good operating practice to measure and verify output voltage before connecting devices to ensure proper operation of equipment.

5. For Access Control applications, batteries are optional. When batteries are not used a loss of AC will result in the loss of output voltage. When the use of stand-by batteries is desired, they must be lead acid or gel type. Connect battery to terminals marked [- BAT +] *(Fig. 1)*. Use two (2) 12VDC batteries connected in series for 24VDC operation (battery leads included).

6. Connect appropriate signaling notification devices to AC Fail & Low battery *(Fig. 1)* supervisory relay outputs marked [N.C., C, N.O.].

**Maintenance:**

Unit should be tested at least once a year for the proper operation as follows:

Output Voltage Test: Under normal load conditions, the DC output voltage should be checked for proper voltage level (see power supply voltage output specifications chart).

Battery Test: Under normal load conditions check that the battery is fully charged, check specified voltage both at battery terminal and at the board terminals marked - BAT + to insure there is no break in the battery connection wires.

Note: Maximum charging current under discharges is 1.00 amp.

Note: Expected battery life is 5 years, however it is recommended changing batteries in 4 years or less if needed.
LED Diagnostics:

<table>
<thead>
<tr>
<th>Red (DC)</th>
<th>Green (AC)</th>
<th>Power Supply Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>ON</td>
<td>ON</td>
<td>Normal operating condition</td>
</tr>
<tr>
<td>ON</td>
<td>OFF</td>
<td>Loss of AC, Stand-by battery supplying power</td>
</tr>
<tr>
<td>OFF</td>
<td>ON</td>
<td>No DC output</td>
</tr>
<tr>
<td>OFF</td>
<td>OFF</td>
<td>Loss of AC. Discharged or no stand-by battery. No DC output.</td>
</tr>
</tbody>
</table>

Terminal Identification:

<table>
<thead>
<tr>
<th>Terminal Legend</th>
<th>Function/Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC/AC</td>
<td>Low voltage AC input (28VAC / 175VA). Altronix part # T28140.</td>
</tr>
<tr>
<td>+ DC -</td>
<td>12VDC - 4 amps continuous power limited output. 24VDC - 3 amps continuous power limited output.</td>
</tr>
<tr>
<td>AC FAIL N.C., C, N.O.</td>
<td>Used to notify loss of AC power, e.g. connect to audible device or alarm panel. Relay normally energized when AC power is present. Contact rating 1 amp @ 120VAC / 28VDC</td>
</tr>
<tr>
<td>LOW BAT N.C., C, N.O.</td>
<td>Used to indicate low battery condition, e.g. connect to alarm panel. Relay normally energized when DC power is present. Contact rating 1 amp @ 120VAC / 28VDC</td>
</tr>
<tr>
<td>- BAT +</td>
<td>Stand-by battery connections. Maximum charge rate 1.25 amp.</td>
</tr>
</tbody>
</table>

Enclosure Dimensions:
AL400ULX - 15.5"H x 12"W x 4.5"D