Fitchburg State University
Construction Standards
Access Control - Security Cameras - Digital Signage
Last Updated 6/21/21

Electronic Access Control

A. System Overview:
   i. Security contractor shall install an Access Control system manufactured by Lenel OnGuard.
   ii. Access Control "Security Contractor" shall be factory trained and certified for sales and installation of Lenel OnGuard.
   iii. System components to include reader, concealed door status switch, electomechanical door locking hardware, request to exit (REX) device, transfer hinge/knuckle (when applicable), cabling, power supplies, and access control panels necessary to accommodate all online doors.
   iv. Security contactor shall provide necessary licenses to incorporate all equipment within this specification.
   v. **Designer must specify which contractor is responsible** for furnishing and installing each of the various electronic security system components.
      1. The General Contractor shall furnish and install the hard security system components, including mortise door prep, locksets, and door components (closers, operators, transfer hinges, panic hardware, etc).
      2. The Electrical Sub-Contractor shall furnish and install the security control can(s) & control panel(s), and power supply(s), composite cable between doors and security control panel, electrical components such as card readers, door contacts, Request to Exit devices, etc., wiring for power to Security Control Panel and Power Supply(s), including those installed at the doors, and a CAT6 cable from the Lenel Panel to the patch panel on the nearest data rack.
      3. The Electrical Contractor shall employ a certified Security Access System contractor to provide final low-voltage connections at door components, control panel(s) and power supply panel(s).
      4. The Electrical Contractor shall employ a Lenel OnGuard certified technician to provide programming and commissioning of the electronic card access system.
      5. **This must be stated both in the Door Hardware Section and in the Electrical Section of the Specifications.**

B. System Controllers
   i. System controllers consist of "Intelligent System Control" (ISC) boards and "Reader Interface Modules" (RIM). ISC are used to handle communication to and from university servers and the RIMs. RIMs are used to handle communication from door peripherals and the ISC.
   ii. The components do not come wired, and must be wired up in the field.
   iii. All ISCs and RIMs are to be mounted inside a UL listed panel.
   iv. Preferred security panel is a LNL-AL600ULx-4CB6. This package includes UL listed panel and can accommodate up to 6 Lenel boards, 12v power supply and fused distribution. Larger installations may require a larger panel.
   v. All ISCs shall be Lenel 3300 Intelligent System Control boards. Only one of these boards will be required at each head-end and can handle up to 64 reader interface

modules (RIM). If additional RIMs are needed a second LNL 3300 will need to be installed. These boards also include two available reader ports.

vi. All RIMs shall be Lenel 1320 Series 2 Reader Interface Module boards. These ports include two available reader ports. The necessary amount of RIMs shall be purchased to cover project scope.

vii. Input/Output Modules may be required on some installations where remote monitoring may be called out. Input modules shall be Lenel 1100 Series 2 boards capable of handling 16 inputs per module. Output modules shall be Lenel 1200 Series 2 boards capable of handling 16 outputs per module.

viii. Elevator cab readers should be terminated on 1320 RIM's only and located in the same room as the elevator control panel. All wiring for elevators, cab and call button readers, should be wired back to the access control panel in the elevator control room.

C. Power Supplies

i. Power supply(s) shall be installed in or adjacent to the security panel unless otherwise specified.

ii. All power supplies shall be UL listed, include low battery warning, AC failure supervision, reverse polarity protection, over current protection, battery backup with charging and thermal protection.

iii. Do not exceed 90% of the overall power supply rating.

iv. A 12v power supply is required to power system controllers and peripherals. A 12v power supply with a fused distribution unit is required.

1. Preferred 12VDC power supply security enclosure is a LNL-AL600ULX-4CB6. This package includes UL listed panel and can accommodate up to 6 Lenel boards, 12v power supply and fused distribution. Larger installations may require a larger panel.

v. A 24v power supply(s) is required to power electromechanicall locks at the doors.

1. All 24VDC power supplies shall be equipped with a fused distribution unit.
2. Altronix AL600ULACM preferred. Includes the enclosure, powers supply and eight (8) independently fused PTC protected outputs on an ACM8 board.

D. Batteries

i. All power supplies, including local lock power supplies (where applicable) shall be furnished with backup batteries.

ii. One 12V-7.0Ah battery is required for each 12v power supply and two for each 24v power supply

iii. Genesis NP7-12 is the preferred battery.

iv. A low power disconnect module should be wired between the 12VDC backup battery and the 12VDC power supply feeding the card readers. The disconnect module's low voltage cutoff should be set no less than 8VDC. An Altronix LPD is preferred.

v. Installer will date stamp batteries upon installation.

E. Electrical

i. Direct electrical power shall be installed at each security panel location; door operator and wherever local lock power supplies are required at the doors.
ii. All electrical feeds should be tied into building emergency power circuits where available (generator power).
iii. Contractor(s) are responsible for verifying amperage requirements of cables due to selected cable path and are to calculate amperage requirements and assignments of power supplies accordingly.

F. Communication/Data
   i. Electrical contractor will be responsible for running and terminating data cable from the closest data closet to the security panel.
   ii. Only CAT6 cable shall be used. Plenum when called for.
   iii. IP address information for programming the security panel will be provided by the university

G. Online Electronic Locking Device
   i. Online doors shall be installed with electrified mortise, electrified crash bar or electrified strike. Electrified mortise locks or electrified crash bars shall be used in all new installations, and wherever possible on retrofit applications. Electrified Mortise locks require that the door slab to be cross-bored to the middle hinge, and doors shall be prepped to accept the mortise lockset, a standard mortise pocket, but using the hole template provided by the manufacturer.
   ii. Mortise Locks
      1. Stanley 45HW7-TDEU-15R-626-RQE-DS-24Volt electrified mortise lock with the following:
         a. 45HW Lever
         b. 7 Pin core housing
         c. Fail Secure unless fails safe is specified
         d. 24 Volt
         e. Deadbolt
         f. Integrated Door Status switch
         g. Integrated Request to Exit (RQE)
         h. 626 Finish is the University standard; or other as specified by architect.
         i. Contour Angle Return Lever Style
         j. Mortise Rose Trim shale be used unless in retrofit situations. If it's a retrofit, use full plate escutcheon trim (J).
      2. To minimize lever temperature, install a TCM (temperature control module) in series with the power and ground wiring within 20 feet of the lock. Use only one TCM per lock. This module is supplied with electrically locked (EL) functions and is optional with electrically unlocked (EU) functions.
      3. Provide mortise locks certified as ANSI A156.13, Grade 1 Operational, Grade 1 Security, and manufactured from heavy gauge steel, containing components of steel with a zinc dichromate plating for corrosion resistance. Lock case

shall be multi-function and field reversible for handing without opening the case.
4. Lever design shall be Best 15H.
5. Provide weatherseal gasketing at exterior applications.

iii. Electrified strikes shall only be used where electrified mortise is not possible or unfeasible. All electrified strike installations must be approved by the university prior to installation.
1. Von Duprin 5100 Electric Strike or equivalent preferred.

iv. If an Electrified crash bar (panic bar) is called for, a Von Duprin Electrified crash bar or equivalent is preferred.
1. Von Duprin 98 series exit devices are Fitchburg State's standard with QEL (quiet electric latch retraction) and RX (request to exit) features are preferred.
   a. Dorma and Precision are avoided due to mechanical deficiencies.
2. If a power supply is required locally at the door to power the electronic hardware, an extra 14 gage 4 conductor cable should be run from the local power supply to each electronic locking device.
3. Each local power supply should not exceed a two door capacity.
4. If the electrified crash bar is placed near classrooms or other noise sensitive areas, quite electronic latch retraction feature must be specified to reduce the noise of the lock.

v. Mag locks are not preferred and must be approved by university prior to installation. If a mag-lock is used, a RTM-8 relay module and pneumatic auto-resetting emergency release button with stopper cover must be installed. STI Stopper Station series SS-2108 push button pneumatic timer button with STI Stopper II with horn and relay flush mount is preferred. Cover horn must be able to accept 9v batter to power device. Cover and Button should have green signage with University approved language. Pneumatic timer must be configured to local code.

H. Wireless Locks
i. SEE SUPLEMENTAL WIRELESS LOCK SPECIFICATIONS

I. Offline Electronic and Mechanical Locks
i. Kick Plates – required on push side of Janitor and bathroom doors ONLY.
ii. Door stops - floor mounted, required for office & classroom doors; hinge pin stops not acceptable, and wall stops only acceptable where floor stops are unfeasible. Blocking required for wall stops.
iii. Private closet doors (within an office) to have passage set. No lock required.

J. Door Position Switch (Door Contact)
i. Door contacts shall only be use where an electrified mortise with built in door contact is not present.
ii. All door contacts to be flush mounted, installed per the specifications and manufacturer instructions.

iii. All door contacts shall match the color of the door frame. Door contacts shall be installed within 3" of the active (locking) side of the door and sealed with silicone to prevent water and moisture ingress.
iv. Sentrol 1078 or equal magnetic door contacts are preferred.

K. Request to Exit Device (REX)
i. All locking devices shall incorporate a request-to-exit (REX) mechanism.
ii. If a locking device cannot accept a concealed REX, a General Electric RCR-REX must be specified.
iii. REX should be adjusted to capture only people who are exiting the door.

L. Card Reader
i. HID Signo series readers must be used. They are capable of reading PROX, iClass, MIFARE Classic, MIFARE DESFire EV1, AWID, NFC, HID Mobile Access® Mobile IDs via NFC and/or Bluetooth Smart. with wiegand out.
1. Mullion Mount Style Readers – HID Signo 20 shall be used. HID Part # 20NKS-00-000000
2. Mullion Mount Style Reader with Keypad - HID Signo 20 Keypad shall be used. HID Part # 20KNKS-00-000000
3. Standard Style Reader – HID Signo 40 shall be used. HID Part # 40NKS-00-000000
4. Reader With Keypad – HID Signo 40 Keypad shall be used. HID Part # 20KNKS-00-000000
ii. Keypad style readers are the University Standard and shall be specified on suite, classroom, office, and multi-use doors.
iii. Card readers shall transmit at minimum the following frequencies 13.56MHz and 125HZ.
iv. Card readers shall be mounted flush with the wall and meet ADA mounting height requirements, 42" on center.
v. Card readers shall be weatherproof and installed per manufacture specifications to protect against corrosion and the elements.
vi. All card readers must be black unless otherwise specified.
vii. All card reader locations must be coordinated with University.
viii. Keypad style readers shall be specified on suite, classroom, and multi-use doors.

M. Electrified Transfer Hinge
i. Provide hinges with electrified option where specified. Provide with sufficient number and gage of concealed wires to accommodate electric function of specified hardware. Locate electric hinge at second hinge from bottom or nearest to the electrified locking component.
ii. A minimum of six conductor hinges shall be specified. University standard is a two conductor 18GA to be used for the locking device and six 28GA wires to be used by the REX, DPS, and a spare.

iii. Specified transfer hinges must meet the minimum amperage load required by the locking device.
iv. Acceptable manufacturers and/or products: Stanley, Hager, or Von Duprin pocket transfer hinges.
v. Preferred model: Stanley CECB179-66 (4 wires at 28 AWG, 2 wires at 24 AWG), or Hager ETW-8-1828 (2 wires at 18GA, 6 wires at 28GA), Concealed Bearing Standard Weight Full Mortise CE Electric Butt Hinges.
vi. Do not use PBB transfer hinges.

N. Cable
i. All cabling shall be plenum rated security composite cabling.
ii. Contractor is responsible for determining the minimum wire gauge based on the number of doors sharing the power supply and the total length of the wire run. In some cases the standard 18 AWG for the lock power will not be sufficient. E.g. If the wire run to a Stanley 45HW electrified mortise lock is over 250 ft., it will require 16 AWG wire.
iii. Contractor responsible for running the cable will leave the individual conductors within the cable at the various field device points per the wiring typical diagrams.
iv. No intermediate splice points will be allowed. All wiring shall run from the head end to the field device.
v. All cabling shall be labeled with unique identifiers six (6) inches prior to each connection point.
vi. All wiring in panels shall be neatly dressed and provide adequate slack for future maintenance and servicing.
vii. A minimum of ten (10) feet of slack will be left at each termination point.
viii. Smartwire Access Control Cable from Wind City Wire of Bolingbrook, IL, SMRTWRE Composite Cable PLNM, Item #4461030-S preferred. If wire runs are longer than 250 ft., alternative wiring may be necessary.
ix. Banana peel structure to cable allows for separation at both field device end and head end equipment for connection to devices.
x. In some cases door operators require additional wiring to a door. This should be determined in the early stage of the project prior to running the cabling.
xi. If a power supply is required locally at the door to power the electronic hardware, an extra 14 gage 4 conductor cable should be run from the local power supply to each electronic locking device.

O. Emergency Release Button
i. If a door calls for a mag-lock to be installed, the door shall be furnished with a mechanical emergency release button to break the power going to the mag-lock to meet local building code requirements.
ii. Button shall be pneumatic and self-resetting.
iii. Button shall include localized sounder if button is triggered.
iv. Alarmed stopper cover must be installed over the button.
    1. STI SS-2108X with stopper cover STI-6600 preferred model.

v. Button lettering shall be coordinated with university prior to labeling.

P. Door Holders
   i. Doors outfitted with magnetic holders and tied into the electronic access control system must be integrated.
      1. If the door is placed in a schedule, when the door locks the magnetic holders should disengage. Conversely, if the doors are unlocked during a schedule, the magnetic holders should be enabled.
      2. Magnetic door holders should be tied into the fire alarm system and drop on fire where fire code requires.

Q. Door Operators
   i. All doors furnished with door operators shall be integrated with the operation of the access control system.
   ii. Every exterior door that is handicap accessible shall have a door opener. The door operator push buttons shall be hard-wired, not wireless, and shall be tied into the card access system. The exterior door operator button shall not be operational without a valid card and interlock with both sets of vestibule doors. Door operator buttons shall be located outside next to the card reader, inside, and in the vestibule, if any. Handicapped door operators shall have integral door closers, and shall be adjustable.
   iii. Additional wiring to the door from the security panel may be required and shall be coordinated between electrical, security, door hardware, and general contractors prior to the installation.
   iv. Operational Objectives:

Single door with one Operator:

Outside Entry: The handicap operator button on the outside of the building must be disabled until a valid card is read on the access control reader. Once a valid card is presented, the access control system will enable the outside button and unlock the door allowing an individual to actuate the door operator button. If the door is set in an unlock schedule, the outside operator button must be enabled until the door is relocked.

Inside Exit: The handicap button on the inside should be activated 24/7. If an individual actuates the button, it must first unlock the door and then trigger the handicap door operator after the door has been unlocked (the operator is usually programmed with a delay).

Vestibule with two Handicap Operators:

Outside Side Entry: The handicap operator must be disabled until a valid card is read on the access control reader. Once a valid card is presented, the access control system will unlock the door and enable the outside button, allowing an individual to actuate the door operator button. When the button is triggered it will allow the exterior door to open first, only after it has been unlocked. Immediately following the second handicap door operator should be triggered to open, thus only requiring an

individual to press a single button to actuate both door operators. If the door is set in an unlock schedule, the outside operator button must be enabled until the door is relocked.

Inside Exit: The handicap button on the inside should be activated 24/7. If an individual actuates the button, it must unlock the exterior door and then trigger the handicap door operator on the first door. Closely following the exterior handicap door operator should then open. Again, only requiring an individual to push one button to open both doors.

Vestibule Entry/Exit: Both handicap operator buttons on the inside of the vestibule should be activated 24/7. If an individual actuates the button to exit the building, it must unlock the exterior door and then trigger the door operator after a delay.

R. Commissioning and Acceptance
   i. Upon completion, the security contractor will label each LNL-1320 with the door number specified by the University. The contractor will also label each output in the 24v power supplies with the door number.
   ii. Security contractor shall perform system testing with designated university personnel.
   iii. Testing of the system shall include:
      1. Valid access
      2. Invalid access
      3. REX allowing for proper egress
      4. Door status (open/close)
      5. Door held open
      6. Door forced open
      7. Door operator functionality
      8. Car reader keypad functionality
   iv. Contractor shall provide the university written description of access control operation and shop wiring diagrams for each door.

S. Door Closers
   i. All online doors shall have door closers.
   ii. Door closer shall be LCN 4010 Series closers or equal.
   iii. Provide Kick-Downs on door holders as directed by university

T. Warranty
   i. Security Contractor shall warranty the installed system and all hardware to be free of defects of materials and workmanship for a period of one (1) year following the date of system acceptance by “owner”. System acceptance shall be when all system equipment has been installed, configured, tested, and shown to be working in accordance with the specification.