DIVISION 28 00 00 ELECTRONIC SAFETY AND SECURITY

SECTION 28 10 00 ELECTRONIC ACCESS CONTROL

1. GENERAL.

   A. Any spaces requiring access control shall be identified during the design phase of all projects in consultation with the building occupants.

   B. The following locations must receive access control:
      1. At minimum one main, ADA accessible exterior entrance to the building.

   C. Additionally, the following locations should be considered for access control:
      1. Spaces requiring increased security, admittance tracking, and logging containing sensitive information, dangerous assets, or items of high value are stored and admittance logging or tracking is requested. These include spaces containing student records, records covered by HIPAA or FERPA, data centers, chemical storage spaces, etc.
      2. Exterior building doors where utilizing an access-controlled door may eliminate the need to issue multiple physical master keys.
      3. Spaces where shared departmental assets are located and where utilizing an access-controlled door may eliminate the need to issue multiple physical master keys. This includes departmental suites, storage areas, printing or copying rooms, breakrooms, etc.
      4. Spaces where students will require entry in the absence of faculty/staff. This includes graduate study rooms, graduate offices, labs, and workrooms; where utilizing an access-controlled door may eliminate the need to issue multiple physical keys.
      5. Residential living spaces.

   D. Additional spaces may be desired to be provisioned for future access control. If this is applicable for a project, provisioning shall include conduit ½" or larger installed from above the ceiling, in wall, to the hinge side of the door frame with a junction box installed in the door frame adjacent to the middle hinge and conduit ½" or larger installed from above the ceiling, in wall, to the top side of the door frame close to the strike side to support future Door Position Sensor (DPS) installation.

   E. All doors with electronic access controls shall have a key override for security, maintenance, and emergency access. Cylinder shall be small format 7 pin Best Access System; see section 08 70 00 HARDWARE.

   F. Any double leaf door location with access control will include hardware and wiring such that both doors are controlled by the reader and access control system.

   G. All access control doors will include Magnetic Door Position Sensors (DPS) for each controlled door leaf. DPS on double doors must be wired as a single series circuit back to the access control system.

H. All access control doors will include Request to Exit (REX) Sensors for each controlled set of hardware.

I. All conduit shall be installed in walls. In some renovations, surface mounted conduit may be pre-approved only if existing conditions require.

J. All access control systems will be installed using wired hardware. Wireless access control installations are not permitted.

K. All access control systems shall be contact-less readers with smart card technology supporting Desfire and Near Field Communication (NFC) credentials associated with the existing campus Transact/Mercury Access Control system.

L. Components for emergency power shall be sized to support the desired amount of run time in hours.

M. Components for the access control system shall fail secure in the event of loss of power. Options and exceptions should be discussed during design phases of a project.

N. Crash bar and similar door hardware shall be set so that unlocking or dogging functionality is key controlled to the small format 7 pin Best Access System. Allen wrench dogging systems are not permitted.

O. Drawings and specifications for the access control system shall be included in the construction documents indicating the location and door label for all field devices.
   1. A wiring plan should be included showing termination to termination wiring.
   2. Coordinate access control system with the door schedule.
   3. Comply with typical O&M requirements and submittals for the access control system components.
   4. Wherever possible, discuss specific wiring system components for access control during design phases.

2. PRODUCTS.
   A. Basis of design cable from door reader to door controller is Belden 5304FE (6 conductor, 18 AWG 7x26 AWG stranded copper) or better. Alternate products must be pre-approved by the Owner.
   B. Basis of design cable from door lock to door controller is Belden 5202UE (4 conductor, 16 AWG 19x29 AWG stranded copper) or better. Alternate products must be pre-approved by the Owner.

C. Basis of design cable from door position sensor to door controller is Belden 5300UE (2 conductor, 18 AWG 7x26 AWG stranded copper) or better. Alternate products must be pre-approved by the Owner.

D. Pass through hinge for door must support 4 conductors with minimum 18 AWG for each conductor.

3. SUBMITTALS.

A. The contractor shall be required to submit to the engineer for review the following items:
   1. Wire other than 120/208 volt shall be verified by TTU ITS for compatibility.

4. EXECUTION.

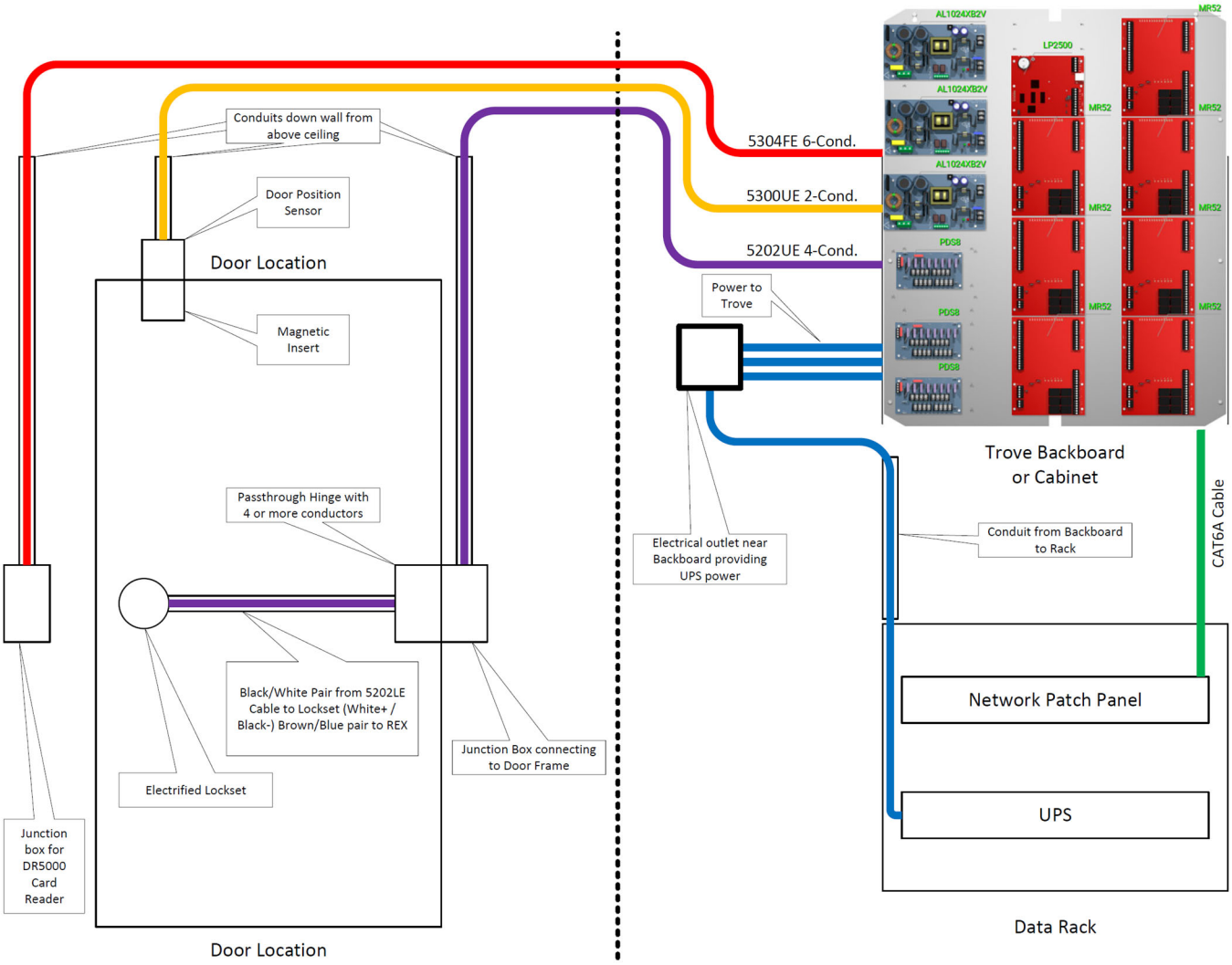
A. The following equipment shall be supplied by Owner, the Contractor shall install as required:
   1. Card Reader for each door location.
   2. Door power supply (Altronix AL1024XB2V) for each 8 doors
   3. Door power distribution card (Altronix PDS8) for each 8 doors
   4. Door Controller (Mercury MR52-S3)
   5. Building Controller (Mercury LP2500)
   6. Altronix Trove Backplane for secure wiring closets, or Altronix Trove cabinet for unsecure installation locations.
   7. Power Supply for Door Controllers and Building Controller (Altronix AL1024XB2V)
   8. Power distribution card for Door Controllers and Building Controller (Altronix PDS8)
   9. Owner will terminate all connections.

B. The Contractor shall furnish and install all equipment, except as noted above, to make a complete, functional, and code compliant system.
   1. Junction boxes
   2. Conduit
   3. Wiring

C. Coordination and hardware review meetings will be held with the Designer, Installer/Contractor, TTU Project Manager, and IT representative prior to start-up of any access control project.

D. At the completion of the project, a final walkthrough will be performed with TTU, the Installer, and Contractor where applicable.

E. INSTALLATION REQUIREMENTS:
   1. Panel and any network device server will be wired through a dedicated power supply with battery backup.
   2. Access control panels are to be installed in network or electrical closets as approved by TTU ITS.
      a. Each panel will be labeled and posted on the exterior of the door or on the backplane.
      b. Each panel will have a list of card readers, named by university door numbers, connected to it posted on the interior of the door, or on the wall near the backplane.
      c. A detailed door and reader layout drawing shall be located on the inside panel door or on the wall near the backplane in an appropriate sleeve/envelope.
      d. Installations in unsecure locations will be in lockable Trove cabinets provided by Owner and installed by Contractor. These cabinets will have the tamper relay switch connected to the Door controller.
      e. Installations in secure locations will require a Magnetic Door Position Sensor installed on the closet door connected to the Door Controller provided and installed by the Contractor.
   3. Installation of network connection drops is to be coordinated through TTU ITS Network Operations.
   4. Field wiring must be one piece from source terminal to destination terminal. Splices in field wiring will NOT be allowed.
   5. Use tamper-resistant screws to attach surface mounted components.

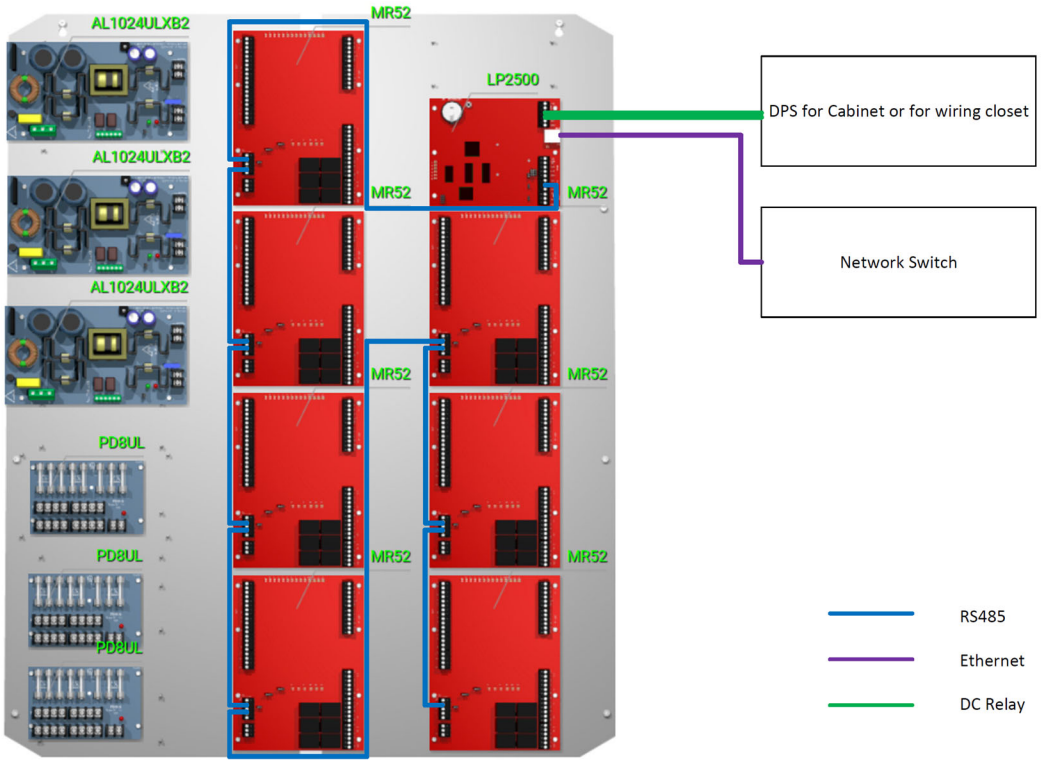


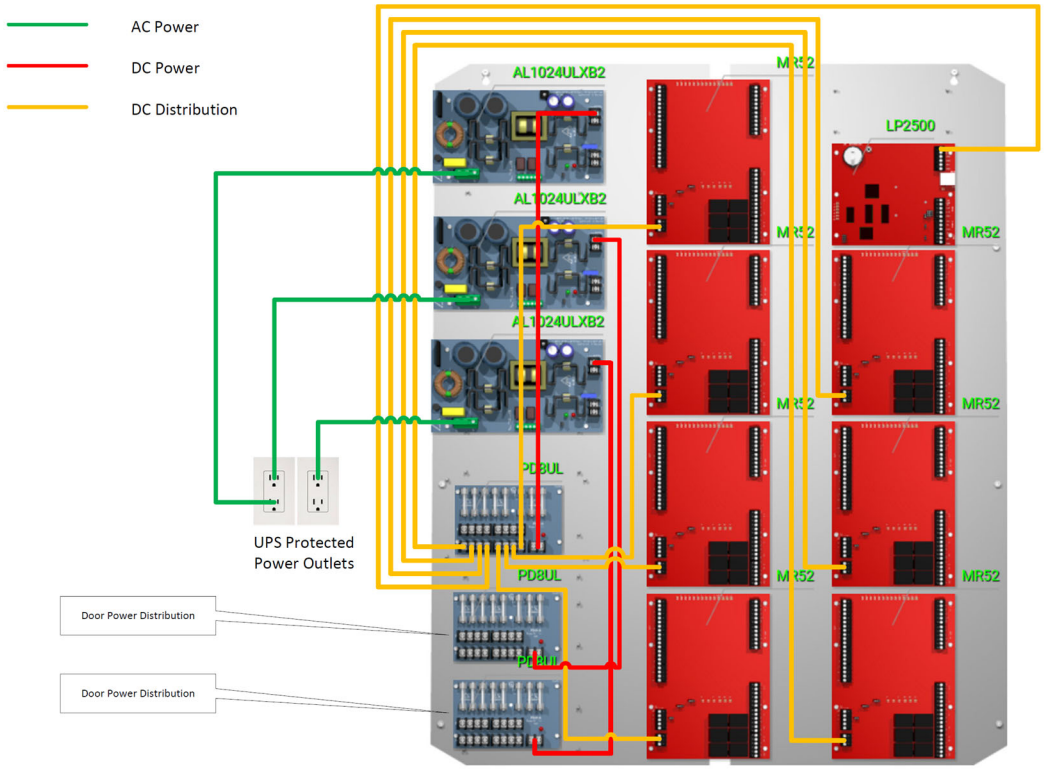
5. DIAGRAM NOTES.

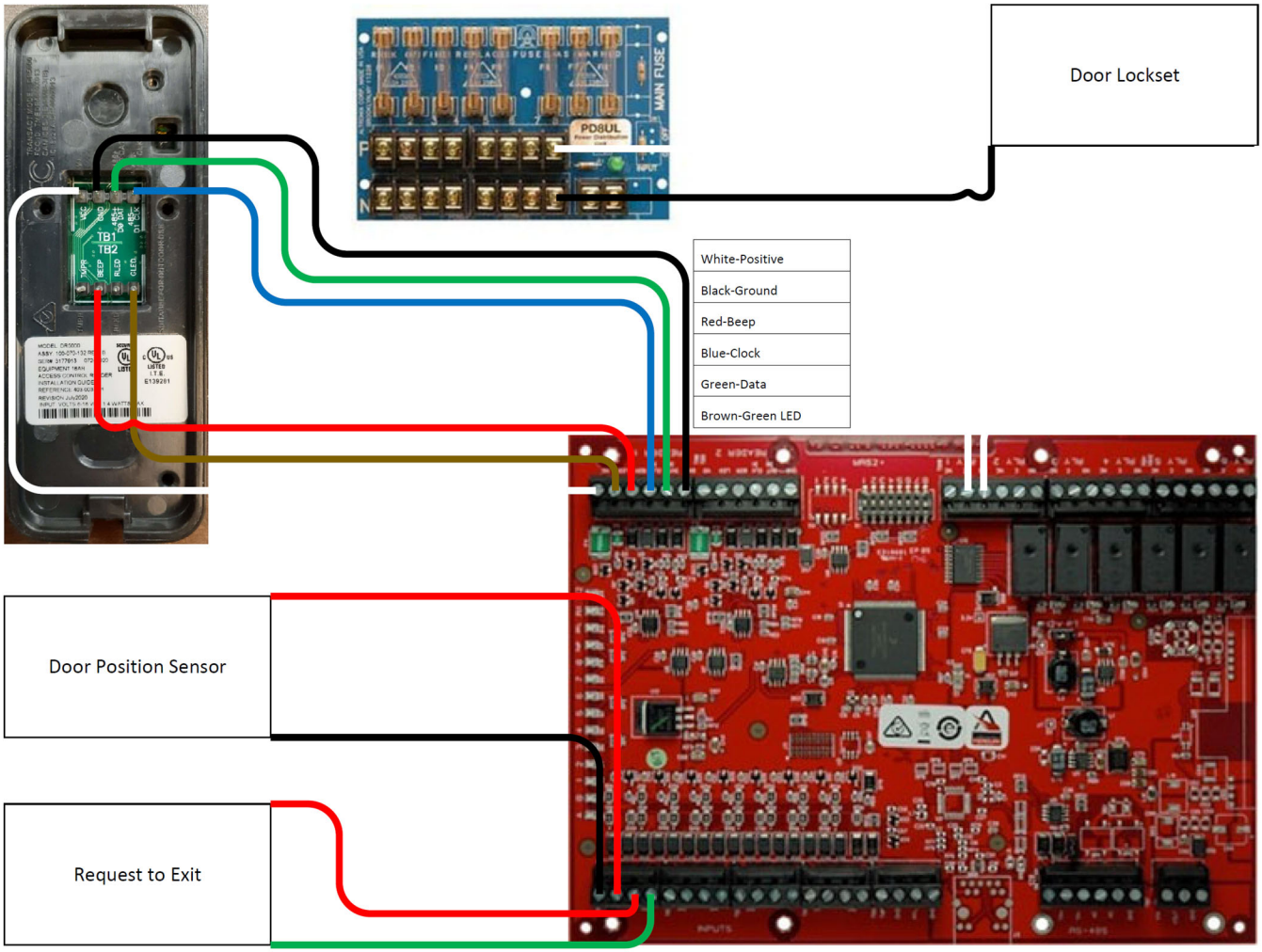
1. Specified hard-wired lock mechanism, to be provided and installed by the Contractor including connections to four conductors of wire through door leaf.
2. Door Position Sensor (DPS), to be provided and installed by the Contractor including connections to two conductor cable through conduit above ceiling.
3. Contractor supplied door leaf equipped with magnetic insert and wire pathway from passthrough hinge to lockset.
4. Contractor supplied electrified pass-through hinge with four or more electrical conductors. All connections to be made by Contractor. Pass through hinge conductors must be at least 18 AWG each.

5. Connections from electrified pass through hinge into door frame of junction box to four conductor distribution cable to be made by Contractor.
6. Lockset/REX distribution cable to be installed in wall through ½" or larger electrical conduit by Contractor.
7. DPS distribution cable to be installed in wall through ½" or larger electrical conduit by Contractor.
8. Single gang junction box for door reader provided and installed by Contractor. Door reader module to be supplied by Owner and installed by Contractor using pinout and installation instructions provided in this section.
9. Door Reader distribution cable to be installed in wall through ½" or larger electrical conduit by Contractor.
10. Distribution cables to be installed by Contractor in compliance with all applicable data and low voltage cabling standards to include appropriate penetrations, firestopping, and use of J-hooks, trays, or conduits.
11. Positive lead from door power distribution unit to be connected through relay on door controller board to door distribution cable. Negative lead from door power distribution unit to be connected to door distribution cable.
12. Trove Cabinet/Backboard to be provided by Owner and installed by Contractor. Controllers, power supplies, and modules to be provided by Owner and mounted to backboard by Contractor.
13. Cabling between controllers, power supplies, and modules on backboard to be installed by Owner.
14. 208V power cables to be provided by Owner and installed by Contractor. Power cables to be connected to outlets provided and installed on wall near backboard/cabinet by Contractor.
15. Outlets to be fed by UPS system installed in data rack as part of the data network specifications. Cabling and necessary connections between outlets and UPS system are to be provided and installed by Contractor.
16. CAT6A data cable connection from building controller to data network patch panel to be installed by Contractor.

6. Wiring Diagrams






Door Lockset
White-Positive
Black-Ground
Red-Beep
Blue-Clock
Green-Data
Brown-Green LED
Door Position Sensor
Request to Exit