

## Wayne State University Police Department

### Alarm/Card Access Specification's & Standards

*This document only provides general system requirements and product standards. Every project has unique characteristics and requirements necessary to properly secure the building. Modification of submitted security system proposals may be required upon further review by the W.S.U. Police Department.*

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#### 1.01 Overview

WSU Police uses JCI (Johnson Controls Inc.) Cardkey Pegasys 2000 Access Control and Alarm Monitoring software to monitor all alarms and control building access on our campus wide system. Systems at any University building on or off campus must be compatible with Pegasys 2000 and should communicate with the server at WSU Police. Currently, the compatible controller is the JCI Cardkey CK721A network controller.

#### 2.01 System Controllers

ACP (Access Control Processor): Each building is equipped with a CK721A ACP. The ACP is the main control processor for each building and stores all the pertinent data for that respective building i.e. card holders, monitor points, output control points, time schedules etc. The ACP interfaces with multiple terminal boards (e.g. reader boards, input boards, and output boards) and also communicates directly with the P2000 Server.

- A. Card reader, alarm input and output control boards will be from the JCI Cardkey S300 series of terminal boards.
- B. The S300-DIN-I8O4 or S300-DIN-I32O16 input x output boards are designed to monitor both supervised and non-supervised devices. Each board can be configured and terminated for supervision to support critical device, such as the reporting of Fire Alarm, Fire Trouble and Fire Supervisory alarms to WSU PD and should be programmed as Terminal 1 inputs 1, 2 & 3 respectively. Non-supervised devices that may be connected to these boards include but not limited to perimeter doors, roof hatches, roof doors, environmental alarm devices, glassbreak detectors, motion detectors, water detectors etc. Each building on campus is required to have at minimum (1) S300-DIN-I8O4 input board configured to report supervised alarms.
- D. The S300-DIN-I8O4 or S300-DIN-I32O16 input x output control board is also utilized to control devices remotely (e.g. unlocking perimeter doors on time schedules, resetting glass break detectors, shunting alarm points during business hours).
- E. The S300-DIN-RDR2SA is a two reader board and is required for every one or two card readers. The S300-DIN-RDR2SA is the interface between the card reader and the CK721A network controller.

- F. The S300-DIN-RDR8SA is an 8 reader board and is typically used when the number of readers for a particular building exceeds 6 readers total. The S300-DIN-RDR8SA is the interface between the card reader and the CK721A network controller.
- F. A 12v/7Ah gel cell battery must be provided with every equipment cabinet containing a power supply for controllers or terminal boards.

### **3.01 Communication**

- A. All building security systems are to communicate to the P2000 Server via the University Fiber Optic Backbone dedicated for security. The fiber backbone is arranged in a hub and spoke configuration with (9) fiber hub locations. Each hub is associated with a number of end buildings. These buildings are equipped with multi-mode fiber between the end building and the respective fiber hub. All hubs are arranged in a self-healing ring configuration utilizing single mode fiber with a primary and secondary path to WSU Police.
- B. Radiant Communications DL221-SM-RE3 fiber converters will be used and will have APC300 Backups or similar protection. The UPS will contain a 12v/7 Ah battery with Fasten connectors.
- C. Locations without University Fiber Optic Backbone, will have to communicate to the P2000 Server via a fractional T-1 line or if the location is close enough to another location with fiber connectivity then via a microwave link. Consult the WSU Police Alarm System Administrator for specifics.

### **4.01 Inputs and Monitoring Requirements**

- A. Most University facilities are designed for authorized users to enter 24/7, therefore system design must have perimeter security using door switches shunted for request to exit (RX) and glass break protection rather than motion detection.
- B. Perimeter security will monitor all doors for both door position and latch position.
- C. Use electrified Von Duprin rim/panic device. The use of electric strikes is prohibited unless there is no other option available as these devices are not reliable over the long haul.
- D. Use RX switches mounted inside Von Duprin rim/panic device. The use of overhead motion detectors to shunt door alarms on doors is not acceptable.
- E. All security devices will be monitored for tampering, including all card readers, all alarm control keypads, all motion sensors and all glass break sensors. Tamper alarms for security devices will be wired to separate input points than their respective security device's input point.

- F. All panels and equipment cabinets containing alarm circuits, terminals, termination strips, fiber converter, etc. will be monitored for tampering and power failure. Non-JCI Cardkey cans will use GE 3012-N tamper switches. Power fail circuits must be configured to monitor for extended power loss, not power “bumps”. Circuit/device protection (fuses) must be included and designed to expedite troubleshooting of the alarm system.

### **5.01 Card Reader Requirements**

- A. The standard card reader for perimeter access is Mercury Security Model MS-BR20-0W-T3. This is a track 3 magnetic stripe card reader. Card readers will be equipped with GE Sentrol 1035W magnetic switches and will be installed and lubricated per manufacturers’ specification. Each card reader is to control (unlock) only one door. Any card reader exposed directly to the elements must be protected by a weatherized rain hood positioned for card reader ease of use and removal for servicing.

### **5.02 Door Hardware Requirements**

#### **A. Perimeter Card Reader Doors to be equipped as follows:**

1. Doors must be fitted with Von Duprin Rim exit devices. Concealed and/or surface vertical rod exit devices are not permitted. Exit devices are to be fitted with EL (Electric Latch Retraction) functionality, RX (Request to Exit) monitoring switch, LX (Latch Bolt) monitoring switch and LC (Low Current) - rated contacts. All rim/panic devices shall be mounted to doors per Allegion specifications which include using 10x24x1” pan head Phillips-type machine screws with holes drilled and tapped to accommodate said machine screws. Case covers and end caps shall be secured with the Phillips-type screws provided with the rim device. Use Molex receptacle (mfg. part # 03-06-1062) with female pin connectors (mfg. part# 02-06-1103-C) where cable from EPT enters exit device. Use Molex receptacle (mfg. part # 03-06-2061) with male pin connectors (mfg. part # 02-06-2103-C) on exit device solenoid and switch wires. EPT wires transmitting power should be doubled up at both frame and exit device side to accommodate high current loads.
2. EL exit devices are to be powered with Von Duprin PS914-2RS power supply only. Not more than two EL devices shall be connected to a single PS914-2RS.
3. Von Duprin EPT-10 (Electric Power Transfer) to be used for the transferring of power and data signals from door frame to door. Use Molex receptacle (mfg. part # 03-06-1062) with female pin connectors (mfg. part# 02-06-1103-C) where cable from door frame meets EPT. Use Molex receptacle (mfg. part # 03-06-2061) with male pin connectors (mfg. part # 02-06-2103-C) on door frame side of EPT wires. Molex connectors used on exterior door EPT must be lubricated with dielectric lubricant (white petrolatum) and must be wrapped in electrical tape to protect pin connectors and wire from exposure to moisture.

4. DSM (Door Switch Monitor) Sentrol 1078 1" diameter concealed magnetic door switch to be installed on all monitored doors. Doors to be monitored on a schedule. Consult WSU Police alarm system administrator for specific times.
  - a. Mercury Security Model MS-BR20-0W-T3 Magnetic Stripe card reader to be installed. This is a track 3 magnetic stripe card reader. Card readers will be equipped with magnetic tamper switch GE Sentrol 1035W. Reader will be installed and lubricated per manufacturers' specifications. Each card reader is to control (unlock) only one door. Any card readers exposed directly to the elements must be protected by a weatherized rain hood positioned for card reader ease of use and removal for servicing.
  - b. When ADA Auto Operators exist they must be interfaced to access control system/electrified hardware. Exterior ADA actuators must be disabled whenever the electrified hardware is locked and enabled only after the card and PIN have been presented at the reader to allow access.

**B. Routinely used Non Card Reader Pedestrian Doors to be equipped as follows:**

1. Doors must be fitted with Von Duprin Rim exit devices. Concealed and/or surface vertical rod exit devices are not permitted. Exit devices to be fitted with EL (Electric Latch Retraction) functionality, RX (Request to Exit) monitoring switch, LX (Latch Bolt) monitoring switch and LC (Low Current)-rated contacts. All rim/panic devices shall be mounted to doors per Ingersoll-Rand specifications which include using 10x24x1" pan head Phillips-type machine screws with holes drilled and tapped to accommodate machine screws. Case covers and end caps shall be secured with the Phillips-type screws provided with the rim device. Use Molex receptacle (mfg. part # 03-06-1062) with female pin connectors (mfg. part# 02-06-1103-C) where cable from EPT enters exit device. Use Molex receptacle (mfg. part # 03-06-2061) with male pin connectors (mfg. part # 02-06-2103-C) on exit device solenoid and switch wires. EPT wires transmitting power should be doubled up at both frame and exit device side of EPT to accommodate high current loads.
2. EL exit devices are to be powered with Von Duprin PS914-2RS power supply only. Not more than two EL devices shall be connected to a single PS914-2RS.
3. Von Duprin EPT-10 (Electric Power Transfer) to be used for the transferring of power and data signals from door frame to door. Use Molex receptacle (mfg. part # 03-06-1062) with female pin connectors (mfg. part# 02-06-1103-C) where cable from door frame meets EPT and where cable enters rim device. Use Molex receptacle (mfg. part # 03-06-2061) with male pin connectors (mfg. part # 02-06-2103-C) on door frame side of EPT and on wires leading to rim device's switches. Molex connectors used on exterior door EPT must be lubricated with dielectric lubricant (white petrolatum) and must be wrapped in electrical tape to protect pin connectors and wire from exposure to moisture.
4. DSM (Door Switch Monitor) Sentrol 1078 1" diameter concealed magnetic door switch to be installed on all perimeter doors. Doors to be monitored on a schedule; consult WSU Police alarm system administrator for specific times.

**C. Emergency Exit Doors to be equipped as follows:**

1. Doors must be fitted with Von Duprin Rim exit devices. Concealed and/or surface vertical rod exit devices are not permitted. Exit devices to be fitted with RX (Request to Exit) monitoring switch, LX (Latch Bolt) monitoring switch and LC (Low Current) - rated contacts. All rim/panic devices shall be mounted to doors per Allegion specifications which include using 10x24x1" pan head Phillips- type machine screws with holes drilled and tapped to accommodate said machine screws. Case covers and end caps shall be secured with the Phillips type screws provided with the rim device. Use Molex receptacle (mfg. part # 03-06-1062) with female pin connectors (mfg. part# 02-06-1103-C) where cable from EPT enters exit device. Use Molex receptacle (mfg. part # 03-06-2061) with male pin connectors (mfg. part # 02-06-2103-C) on exit device solenoid and switch wires. EPT wires transmitting power should be doubled up at both frame and exit device side of EPT to accommodate high current loads.
2. Von Duprin EPT-10 (Electric Power Transfer) to be used for the transferring of power and data signals from door frame to door. Use Molex receptacle (mfg. part # 03-06-1062) with female pin connectors (mfg. part# 02-06-1103-C) where cable from door frame meets EPT and where cable enters rim device. Use Molex receptacle (mfg. part # 03-06-2061) with male pin connectors (mfg. part # 02-06-2103-C) on door frame side of EPT and on wires leading to rim device's switches. Molex connectors used on exterior door EPT must be lubricated with dielectric lubricant (white petrolatum) and must be wrapped in electrical tape to protect pin connectors and wire from exposure to moisture.
3. DMA (Door Management Alarm) Design Security Inc. DSI 4200-K4-T1 Local audible exit alarm with output control capability. DMA to be wall mounted on gang back box. DMA to be powered via hardwired DC power source from ACP (Access Control Processor) auxiliary power supply location. RX, LX and DSM to be interfaced with DMA. DMA audible alert to activate upon egress. Audible alert to auto-reset 30 seconds after door secures. Consult WSU Police alarm system administrator for specific DMA configuration.
4. DSM (Door Switch Monitor) Sentrol 1078 1" diameter concealed magnetic door switch to be installed on all perimeter doors. Doors to be monitored on a schedule. Consult WSU Police alarm system administrator for specific times.

**D. Roof and Mechanical Room Doors to be equipped as follows:**

1. DSM (Door Switch Monitor) Sentrol 1078 1" diameter concealed magnetic door switch to be installed on all perimeter doors. Doors to be monitored on a schedule. Consult WSU Police alarm system administrator for specific times.
2. Custom Signage shall be installed at roof hatch indicating the hatch is armed and to contact WSU Police before opening.

**E. Perimeter Overhead Doors to be equipped as follows:**

1. DSM (Door Switch Monitor) Sentrol 2205AL x 1912L surface-mounted overhead magnetic door switch to be installed on all perimeter overhead doors. Doors to be monitored on a schedule. Consult WSU Police alarm system administrator for specific times.
2. Custom Signage shall be installed at roof hatch indicating the hatch is armed and to contact WSU Police before opening.

**F. Roof Hatches to be equipped as follows:**

1. DSM (Door Switch Monitor) Sentrol 2505A x 1912L surface-mounted, magnetic door switch to be installed on all roof hatches. Roof hatches are to be monitored on a schedule. Consult WSU Police alarm system administrator for specific times.
2. Custom Signage shall be installed at roof hatch indicating the hatch is armed and to contact WSU Police before opening.

**5.03 Perimeter Building Protection**

All perimeter glass accessible from grade or some other nearby elevated platform (e.g. overhangs, canopies, half story roofs, second story roofs, adjacent buildings, trees, etc.) are to be protected with Glassbreak Sensors or PIR Motion Sensors. Perimeter monitoring devices are interfaced with the building ACP input and output boards and are monitored and controlled by WSU Police via the P2000 Server. All perimeter sensors are connected to individual inputs on JCI I/O boards. WSU Police must have the ability to shunt, arm and disarm all perimeter sensors via outputs on the JCI I/O boards. Consult with WSU Police alarm system administrator for specific intrusion alarm programming configurations. Acceptable sensors are as follows:

- A. GB (Glassbreak Sensor) GE Sentrol Shatterbox II model 5775N glass break sensors to be used where protecting perimeter windows is necessary. Where multiple glass break sensors are located in close proximity to each other, they must be wired to a nearby centrally-located junction box. The glass break sensors must be wired in series with each other to said junction box with a single cable pair wired to the JCI I/O board. This configuration reduces the number of required inputs. The junction box must contain termination strips and associated components required for proper monitoring and control of the sensors. Junction boxes must be documented on CAD drawings as a single zone and include all termination points, cable colors, cable types, etc. Sensors wired in a daisy chain configuration are not acceptable. A dedicated output on the JCI I/O board controlled by WSU Police is required to remotely reset power to sensors after activation.
- B. VGS (Vestibule Glassbreak Sensor) Honeywell FG1625T glassbreak sensor to be used in conjunction with T-REX REX motion sensors when protecting entryway vestibule glass doors. VGS sensors must be home run to the JCI I/O board and not part of a zone configuration. Motion sensor shall shunt glassbreak sensor when pedestrians are exiting the building.

- C. MD (PIR Motion Sensor) Visonic SRN-2000 PIR Motion Sensors. PIR sensors are only acceptable when interior spaces are not occupied after normal business hours and building is armed by scheduled output from P2000 Server.

### **6.01 Intrusion Alarms for Interior Rooms & Office Suites**

Intrusion alarms are implemented for the protection of personnel and property on interior office suites, animal labs, distance learning labs, computer labs etc. The intrusion alarms are managed locally by the end users and monitored remotely by WSU Police. Intrusion alarms consist of the following devices:

- A. Use Ademco/Honeywell Vista -128B controller with Ademco/Honeywell 6160 keypad to control internal alarms on any internal suite or alarmed areas. WSUPD must have ability to arm/disarm intrusion alarm with P2000 server. Use GE3012-N tamper switch on keypad and equipment cabinets.
- B. All intrusion alarms must be equipped with a Honeywell 4204 relay module. The 4204's outputs will interface directly to JCI S300-DIN-I804 or S300-DIN-I32O16 input/output boards via a hardwire connection and will report four general alarm conditions: Intrusion, Low Battery, Tamper, keypad armed. (Note: Large systems may require additional zone reporting and therefore additional 4204 relay boards).
- C. An output from a JCI I/O board will be hardwired to the keyswitch input of the Honeywell Vista 128B controller. The output shall be programmed to allow WSUPD the ability to disarm the intrusion alarm system from the P2000 server when necessary.
- D. DSM (Door Switch Monitor) Use Sentrol 1078 1" diameter magnetic door switch.
- E. GB (Glassbreak Detector) Use Ademco Flex Guard V-Plex model FG1625SN glass break sensors.
- G. MD (PIR Motion Detector) Use Honeywell DT 7500 SN Dual TEC motion sensors when using V-PLEX polling loop or Visonic SRN-2000 motion sensors when used in a home run configuration.
- H. A 12v/7Ah gel cell battery must be provided with every Vista 128B controller.
- I. A separate equipment cabinet must be provided to properly house Honeywell 4204 relay interface boards, Honeywell loop extenders (when necessary), terminal strips, timers, transformers, 120VAC receptacles, etc. Cabinet must also include GE3012-N tamper switch and cabinet lock 4T3252.

### **7.01 Miscellaneous System Requirements:**

- A. Non Card Reader doors, should unlock via electrified Von Duprin rim/panic device and output controls.

- B. Equipment Cabinet/Terminal Cabinets locks: Use # 237 cam lock for JCI Cardkey panels, and CCL # 15748-US26D-C4L-KA4T3252 for terminal cabinets. Terminal Cabinet Locks may require Brass Spacer CCL # 2540 x US4 for proper operation of tamper switch.
- C. No splicing of wire runs allowed; all wire runs shall be complete runs without wire nuts, splices or splice boxes. Wire and cables to card readers, magnetic door switches and between EPT must be soldered and shrink wrapped to protect cables.
- D. Surface-mounted cable runs of any kind are not permitted; all cable runs will be concealed.

**8.01 As-Built and Riser Drawing Requirements:**

- A. As-built drawings must be provided, and must include cable designations, wire type, gauge and color.
- B. As-built drawings must detail model and/or part number of devices being used and include an illustrated parts list
- C. As-built drawings must also detail interconnection wiring between terminal boards as well as the location, address and switch settings of terminal boards.
- D. As-built drawings must detail CK721A wiring and communication path. As-built drawings must detail support hardware (e.g. power supply, UPS, and fiber converters).
- E. Riser drawings must show elevation detail of doors, glassbreak detectors, card readers and other devices.
- F. As-built and riser drawings must be sized on 42 inch by 30 inch paper.

**9.01 Cable Requirements**

<b>Application</b>	<b>Wire Type</b>
1. Fiber converter to Cardkey panel	24 AWG x 4 Pair – Solid Jacketed Copper Plenum CAT – 5
2. Fire & Fire Trouble inputs to board	18 AWG x 1 Pair - Solid Jacketed Fire Rated Plenum
3. Auto operator or temp probe to board	22 AWG x 4 Cond. w/Stranded Flexible Jacketed Plenum
4. Cabinet tamper / glass break reset	22 AWG x 2 Cond. w/Stranded Flexible Jacketed Plenum
5. Auto operator buttons or input	18 AWG X 2 Cond. w/Stranded Flexible Jacketed Plenum
6. Power to Vista 128BP glassbreak to terminal strips	22 AWG X 6 Cond. w/Stranded Shielded Flexible Jacketed Plenum

7. Data	24 AWG x 1 Pair w/Overall Braided Shield Plenum
8. Rim device alarm to terminal strips	22 AWG x 2 Pair w/Stranded Overall Braided Shield Plenum
9. Input board from various devices	22 AWG x 1 Pair w/Stranded Overall Braided Shield Plenum
10. Rim device to power boosters	14 AWG x 2 with Stranded Flexible Jacketed Plenum
11. Terminal strips to alarm boards	22 AWG x 4 Pair Stranded Shielded Jacketed Plenum
12. Card reader to RDR2 board	22 AWG x 8 Cond. w/Overall Shielded Jacketed Plenum
13. Power to ALK / DMA	18 AWG x 1 Pair Stranded Jacketed Plenum