
Access Controller Specification
Manufacturer - Matrix Research Limited
Product Brand - ACX**1. Integrated Access Control System Software****a. Architecture**

- i. This Client and Server Windows-based application can run on WIN 11/ Windows Server 2022 or higher version.
- ii. The Server Program is a service on the Server. Once the Server is restarted, the server program will run automatically.
- iii. The Client and Server program has multi-language features. English, Traditional Chinese, and Simplify Chinese are a MUST.
- iv. Users can change the software text content online.
- v. The maximum number of concurrent user logins will be under control.
- vi. Same database for storing Facial templates, Palm Vein templates, Fingerprint templates, mobile virtual cards, and physical card numbers.
- vii. Same software interface for managing Facial, Palm Vein, Virtual Card registration, fingerprint, mobile virtual card, and access control distribution.
- viii. The access control system shall be integrated with the Virtual Card Platform.
- ix. The server program can be installed on the cloud or on-premises servers.

b. Communication

- i. The server program uses a multi-threading programming technique, which directs communication to access the control panel, input control module, and output control module on an Ethernet cable, a real-time response.
- ii. TCP/IP communication.

c. Data Security

- i. The user-defined 128-bit master key is used in the server and panel for data encryption.
- ii. A unique 192-bit random key is generated per data transmission.
- iii. In the Data encryption method, the master key encrypts the random key, and the random key encrypts the exchanged data during communication.
- iv. AES128 and 3DES Algorithm mixed.

d. Database requirement

- i. MS SQL 2022 or above

e. Application user authority

- i. Password protection

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- ii. Application's access can be filtered by View / Add / Edit / Delete
 - iii. User data access can be filtered
 - iv. Access panel access can be filtered
 - v. Event status can be filtered
 - vi. Event acknowledgement can be filtered
- f. Reporting
- i. All kinds of reports can be viewed on-screen and sent to the printer
 - ii. The report can be exported to TEXT, EXCEL & PDF files.
- g. Email Service
- i. The user can receive alarm records by email
 - ii. User can receive their daily access record by email
 - iii. The supervisor can view group users' access reports and different kinds of time attendance reports by email
- h. Access control system
- i. Real-time upload parameters to panels
 - ii. Client software can read controller and reader parameters instantly.
 - iii. Controller and reader parameters can be defined by global or individual
 - iv. Door Group
 - Allow 10,000 door groups set up
 - Card access per door of its time zone can be classified by different door group
 - Door group can be assigned to the department
 - v. Fire Alarm Group
 - Allow 255 fire alarm groups for any combination of the door lock released when the fire alarm is triggered
- i. Cardholder management
- i. Provide Import and Export data tools for 3rd party data integration
 - ii. Cardholder access rights can be selected by department or door group
 - iii. Software can define 1,000+ suspected cardholder groups for instant enable or disable their access rights
 - iv. Cardholder access rights can be defined by door group or department
- j. Staff management
- i. Provide Import and Export data tools for 3rd party data integration
 - ii. Online capture of a personal photo, palm vein, fingerprint biometric templates
 - iii. Print staff badge
- k. Time zone control
- i. Each time zone has 4 intervals per day, Mon to Sun & Holiday
 - ii. 100 Holiday dates per door access control panel

- iii. 10,000+ door access time zone in the database, 80 door time zones per door access control panel
- iv. Password time zone
- v. Electric Lock release time zone
- vi. Twin card operation time zone
- vii. Release button time zone
- viii. Door opens too long time zone
- ix. Alarm time zone
- l. Twin card operation
 - i. Twin card operation with time zone control for high-security access control application.
- m. Door access activated by the specified cardholder
 - i. The door is allowed before the specified card authorization
- n. Power Monitoring
 - i. A.C. power failure monitoring
 - ii. Backup failure monitoring (20% of full load)
- o. Transaction and Events viewer
 - i. Global viewer for card access records and events
 - ii. Individual / Multi viewer for card access records to display card holder details and information, e.g., photo, etc.
 - iii. Alarm viewer displays the live camera
 - iv. User, control panel, date and time, and access status filter card access records.
 - v. Different sorting orders, ascending or descending, all access records are only IN or OUT or First IN last OUT record.
 - vi. The control panel, date and time, and status can filter event records.
 - vii. Event records can be previewed, and the file can be sent to the printer.
 - viii. Export the file to EXCEL, text, and PDF
- p. Event monitoring system
 - i. Each event can be defined by different icons
 - ii. Software can define the device input normal status in NC or NO
 - iii. Action taken can be assigned to each device input when the alarm is triggered
 - iv. Action items like acknowledgment requested, opening the door by the fire alarm, enabling surveillance integration, signal integration with third-party BMS, playing music, etc.

2. Networked Single Door Access Panel

- a) PoE+ door access panel
 - i. TCP/IP, PoE+ for single-door panel
 - ii. The overall power consumption is 30W, max. 17W power reserves for E-Lock.
 - iii. Wiring method: Cat 6 cable for the panel to PoE+ switch
- b) 12VDC door access panel
 - iv. TCP/IP, single / two-door panel
 - v. Multi-in two LAN ports
 - vi. Wiring method: Cat 5 cable for the panel to network switch or panel to panel (daisy chain) Cat 6 cable for the panel to PoE+ switch
- c) Communication
 - i. PC to Panel, TCP/IP communication
 - ii. Scramble data encryption during Server-to-controller and controller-to-reader data exchanges through the network cable
 - iii. Active upload for swipe card records and events
- d) Data Security
 - i. Apply scramble data encryption methodology during data exchange
 - ii. Comply to the OSDP V2 standard
- e) Reader supports
 - i. 1 x IN and 1 x OUT for single door panel
 - ii. Supports OSDP V2 reader
 - iii. Support multi-technology reader Card reader (e.g., 5-in-1 Facial + Palm Vein + QR + Bluetooth + 13.56MHz contactless smartcard, 4-in-1 Facial + QR + Bluetooth + 13.56MHz contactless smartcard, 4-in-1 Palm Vein+ QR + Bluetooth + 13.56MHz contactless smartcard, 4-in-1 Keypad + QR + Bluetooth + 13.56MHz contactless smartcard and 3-in-1 QR + Bluetooth + 13.56MHz contactless smartcard)
- f) Card number format
 - i. Support 8 multi-card number format
 - ii. Card number length, maximum 64 bits
- g) Memory storage
 - i. Cardholder
 - Offline mode: 40,000 cardholders
 - Online mode: 1,000,000 cardholders
 - ii. Transactions
 - Offline mode: 42,000 nos. of transactions
 - iii. Events
 - Offline mode: 800 nos. of events

h) Time zone control

- i. Each time zone has 4 intervals per day, Mon to Sun & Holiday
- ii. 100 Holiday dates per door access control panel
- iii. 10,000+ Door access time zone in the database, 80 time zones per door access control panel
- iv. Password time zone
- v. Electric Lock release time zone
- vi. Twin card operation time zone
- vii. Release button time zone
- viii. Door opens too long time zone
- ix. Alarm time zone
- x. LCD reader message time zone

i) Fire Alarm

- i. Panel AUX #1 for fire alarm input
- ii. 255 fire alarm groups per panel
- iii. Fire alarm signal broadcasts through the network card, no need through the PC server

j) Twin card operation

- i. Twin card operation with time zone control for high-security access control application. E.g., Car park system, treasury application.

k) Anti-pass back

- i. Single door panel (single anti-passback)

l) Device Inputs

- i. Auto detect end-of-line resistors installed or not, if yes, enable supervised monitoring
- ii. Supervised monitoring needs end-of-line resistors, 1K ohm + 1K ohm
- iii. Door release button (Normal Open)
- iv. Door Sensor (Normal close)
- v. Panel temper box sensor (Normal Close)
- vi. 2 x AUX inputs
 - Normal mode can be defined by N.O. or N.C.
 - Fire alarm signal, broadcast release E-Lock command instantly through the network cable
 - Non-fire signal depends on COM server command configuration

m) Device Outputs

- i. Access granted output for E-Lock operation. 12VDC, 10A Relay (N.O. / N.C.)

- ii. Alarm output. 12VDC, 5A Reply (N.O. / N.C.)
 - iii. Door Ajar. 5VDC, 10mA output
 - n) High-Security Key Switch
 - i. Tamper proof for the E-Lock override
 - ii. Tamper proof for short circuit or open circuit of the exposed key switch's wires
 - o) Expand RS485 port
 - i. 2 x RS485 port
 - ii. High-level data exchange with a third-party system
 - p) 2 x Auxiliary input
 - i. Auxiliary input # 1 – Fire alarm trigger then auto release E-Lock
 - ii. Auxiliary input # 2 – Trigger alarm relay

- 3. Output Control Module / Networked Lift Control Master Panel
 - a. A multi-purpose device that provides an interface between field-level input, output devices, and a Lift application server
 - b. True IP device, support DHCP
 - c. Supports 2 sets of OSDP / Wiegand readers.
 - d. Timezone controller for the lift floor access
 - e. 2 x LAN Port, allow daisy chain connection.
 - f. Dry contact supervised monitoring
 - g. User-defined NC / NO at normal mode
 - h. 2 x INPUTs for Manual key overwrite and Fire Alarm input
 - i. 28 x RELAY outputs for 28 Floors access, RELAY in 3A DC output
 - j. Panel installation depends on the IP address available
 - k. RS485 port for 8907 Lift control expansion panel
 - l. 12VDC input, 1A

- 4. Networked Lift Control Expansion Panel
 - a. Works with Networked Lift Control Master Panel
 - b. RS485 connection
 - c. User-defined NC / NO at normal mode
 - d. 38 x RELAY outputs for extra 38 Floors access, RELAY in 3A DC output
 - e. 12VDC input, 1A

- 5. Input Control Module / Network Alarm Input Panel
 - a. 2 x LAN Port, allow daisy chain connection
 - b. Suitable for huge sensor monitoring

- c. Dry contact supervised monitoring
 - d. User-defined NC / NO at normal mode
 - e. 28 Input Points, 2 RELAY 10A output per panel
 - f. Panel installation depends on the IP address available
 - g. Relay status triggered by 28 Inputs AND / OR program logic
 - h. RS485 port for proprietary device communication
 - i. 12VDC, 500mA
6. Controller Power Supply
- a. The power supply box shall have a metal casing.
 - b. The power supply box shall have earth wiring.
 - c. The size of the power supply box shall be not more than 340mm(H) x 290mm(W) x 80mm(D).
 - d. The power supply box shall have 12VDC, 3A power supply output for ONE set of electric lock installed; and 5A power supply output for TWO sets of electric locks installed.
 - e. The power supply shall have a battery charging function, and the battery charging voltage is 13.8VDC
 - f. The power supply can output 0VDC or 5VDC voltage level to the controller to indicate the occurrence of the following events: -
 - i. AC. power failure
 - ii. DC battery installed
 - iii. backup battery power was lowered by 20%
 - g. A 7AH DC battery shall be included for a single E-Lock installed. In case of the AC power supply failure, assume the E-Lock power consumption is 12V 0.5ADC, the door access system can be operated for 4 hours.
 - h. A 9AH DC battery shall be included for a double E-Lock installed. In case of the AC power supply failure, assume the E-Lock power consumption is 12V 0.5ADC, the door access system can be operated for 3 hours.

7. Smart Intelligent Door Release
 - a. The device combines the regular and emergency door release features.
 - b. The device is operated by handwave for regular door release and pressing the button for door emergency release. It supports a fail-safe electric lock.
 - c. The device combines regular and emergency door release features. A particular tool can reset the emergency door release button, so replacing any components is unnecessary after the emergency door feature is resumed.
 - d. Once the "CENTER" button is pressed, the fail-safe type E-Lock power is cut off, and the door is released. A dry contact NO / NC output to the Alarm Input Module for notification.
 - e. The user-defined LED color and beep sounds are for routine and emergency operations.
 - f. For regular operation, the LED is BLUE, and the handwave open door is GREEN. Emergency exit in RED (or blinking red) and optional has a beep sound.
 - g. The device has two sets of relay output: one for the regular release and another for the emergency door release notification.
 - h. The device shall have a voltage regulator to support E-Lock power in AC/DC, 12V/24V.
 - i. The device size is 86mm x 86mm x 4mm, which can be directly installed on the electric junction box.

8. High-security override key switch and critical switch controller
 - a. The High-security override key switch works with a critical controller; no matter if the key switch has been tampered with, the electric lock keeps the original lock status
 - b. The key switch front plate has one LED indicator. In a typical operation, it is RED; after the key is overridden, it changes to GREEN. The LED indicator goes off once the key switch has been tampered with.
 - c. If the key switch has been tampered with, whether it short-circuits or cuts the wires between it and the critical switch controller, the electric lock status remains unchanged.
 - d. Reset the button in the key switch controller to activate the critical switch function
 - e. The key cylinder shall have a master operation key that can open all high-security override key switches. The master key is built in a small movable pellet that cannot be physically duplicated, excluding the original cylinder supplier.
 - f. A minimum of 3 master keys shall be provided to the end customer.
 - g. The Key cylinder is by ABLOY PROTEC2, 1.7 billion key combinations