P2000
Security Management System

hardware
installation

CKM-EP1501
authentic Mercury™ controller
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**Single Point of Contact by Region**

<table>
<thead>
<tr>
<th>European Single Point of Contact</th>
<th>NA/SA Single Point of Contact</th>
<th>APAC Single Point of Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>JOHNSON CONTROLS WESTENDHOF 3 45143 ESSEN GERMANY</td>
<td>JOHNSON CONTROLS 507 E MICHIGAN ST MILWAUKEE WI 53202 USA</td>
<td>JOHNSON CONTROLS C/O CONTROLS PRODUCT MANAGEMENT NO. 22 BLOCK D NEW DISTRICT WUXI JIANGSU PROVINCE 214142 CHINA</td>
</tr>
</tbody>
</table>

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United States: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Canada: CAN ICES-3 (A)/NMB-3(A)

European Union: This product complies with the requirements of the EMC Directive.

This equipment must not be modified for any reason and it must be installed as stated in the Manufacturer’s instruction.

If this shipment (or any part thereof) is supplied as second-hand equipment, equipment for sale outside the European Economic Area or as spare parts for either a single unit or system, it is not covered by the Directives.
UNDERWRITERS LABORATORIES COMPLIANCE VERIFICATION SHEET

The following model number is listed under Underwriters Laboratories® (UL) 1076 for Proprietary Burglar Alarm Units and Systems, UL 294 for Access Control Systems Units and Underwriters Laboratories of Canada ULC/ORD-C1076-86.

CKM-EP1501

When installed at the site the following requirements must be met to comply with these standards.

1. The CKM-EP1501 shall be mounted in Listed Enclosures CKM-CE75-E1M, CKM-CE75-E2M, CKM-CE150-E4M, and Listed Burglar Alarm and Access Control System Units SPE10000-1H00, SPH10000-1H00, SPF10000-1100, SPF11000-1100 or SPF11300-1J00.

2. A CKM-EP1501 mounted in Listed Enclosures CKM-CE75-E1M, CKM-CE75-E2M, CKM-CE150-E4M, and Listed Burglar Alarm and Access Control System Units SPE10000-1H00, SPH10000-1H00, SPF10000-1100, SPF11000-1100 or SPF11300-1J00 shall be powered through the CKM-F8P power distribution module.

3. Transient protection devices that are installed must not be removed or defeated.

4. Do not connect equipment to an AC power source that is controlled by a switch.

5. Mounting on a three-gang steel blank cover has not been investigated by Underwriters Laboratories.

6. A 1.5Kohm/750ohm custom end-of-line resistance supervised circuit was investigated by Underwriter Laboratories.

7. Power for devices connected through relay/control output wiring must be provided by a UL Listed power limited power source.

8. RS485-type readers have not been investigated by Underwriters Laboratories.

9. Encrypted communication has not investigated by Underwriters Laboratories.

10. Assa Abloy Aperio 1-to-8 communication hub and locks have not been investigated by Underwriters Laboratories.

11. For a UL 294 Listed system the following Listed readers may be used.

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Models</th>
</tr>
</thead>
<tbody>
<tr>
<td>HID Global Corp.</td>
<td>30387, 31503, 31815, 31880, 32005, 32788, 32985, 5355, 5365, 5395, 5405, 5455, 6005, 6100, 3110-6445, R10T, R10N, R15N, R15T, RP15N, RP15T, R40N, R40T, RK40N, RK40T, RP40N, RP40T, RPK40N, RPK40T</td>
</tr>
<tr>
<td>Mercury Security Corp</td>
<td>MR-5, MR-20</td>
</tr>
<tr>
<td>Schlage Lock Co</td>
<td>Schrage Engage Gateway and Schrage NDE wireless locks.</td>
</tr>
</tbody>
</table>

12. The maximum Wiegand line impedance is 8 ohms, representing 22 AWG @ 500 feet.

13. The HID 3110-6445 shall be powered by a separate power source that is UL 294 or UL 603 power limited power source.

14. Suitable for use with the model P2K-nnn-UL-X Security Management System, where n may be any number 0 through 9 and where X may be any three letters A through Z.

15. UL 294 Performance Levels

<table>
<thead>
<tr>
<th>Performance Level</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Destructive Attack</td>
<td>I</td>
</tr>
<tr>
<td>Endurance</td>
<td>IV</td>
</tr>
<tr>
<td>Line Security</td>
<td>II</td>
</tr>
<tr>
<td>Standby Power</td>
<td>I</td>
</tr>
</tbody>
</table>
CKM-EP1501 CONTROLLER

This document provides hardware installation and setup instructions for CKM-EP1501, the authentic Mercury™ intelligent system controller. This document is divided into the following sections:

- **General Information** on page 1
- **Mounting Information** on page 2
- **Wiring Information** on page 4
- **Setup Information** on page 9
- **Addressing Mode Configuration (Static IP or DHCP)** on page 11
- **Status LEDs** on page 14
- **Specifications** on page 15
- **Maintenance** on page 16
- **Connecting Third Party Devices (Schlage® and Assa Abloy®)** on page 17

**GENERAL INFORMATION**

The CKM-EP1501 intelligent system controller provides decision making, event reporting, and database storage for the Mercury hardware platform. Two reader interfaces configured as single or paired readers provide control for one door.

Host communication is via the onboard 10-BaseT/100Base-TX Ethernet port.

**NOTE:** For UL installations, do not use Power over Ethernet (PoE) powered devices. Provide power for these devices by a UL 294 listed power limited source (12 VDC).

With the CKM-EP1501, you can control one physical barrier using single or paired readers. The first reader port can accommodate a read head that utilizes Wiegand or magnetic stripe signalling, one- or two-wire LED controls; and buzzer control (one-wire LED mode only). This port can also utilize multiple RS-485 multidropped devices, such as up to eight remote serial I/O devices.

The second reader port can accommodate a read head that utilizes Wiegand or magnetic stripe signaling, one or two wire LED controls; and buzzer control (one-wire LED mode only). Two Form-C contact relay outputs may be used for door strike control or alarm signaling.
The relay contacts are rated at 2 A at 30 VDC, dry contact configuration. Two inputs are provided for monitoring the door contact, exit push button or alarm contact. The CKM-EP1501 requires 12 VDC for power or PoE.

The CKM-EP1501 may be mounted in a three-gang switch box. A mounting plate is supplied with the unit, or may be mounted in an enclosure; the supplied mounting plate has mounting holes that match the CKM-MR50 mounting footprint.

**Mounting Information**

![Diagram of CKM-EP1501 Hardware](image)

**Additional Mounting Information**

Optional mounting items are shown in Figure 2:

- Three-gang stainless steel blank cover: Leviton part number 84033-40, available from Graybar, part number 88158404
- Magnetic switch set: G.R.I., part number 505
Figure 2: CKM-EP1501 Mounting Side View

Figure 3: CKM-EP1501 Mounting Plate Dimensions
**WIRING INFORMATION**

This sections covers the following:

- **Cable Routing**
- **Input Power**
- **Communications Wiring**
- **Reader and Serial I/O Device Wiring**
- **Input Circuit Wiring**
- **Relay Circuit Wiring**

**Cable Routing**

The cables should run in grounded conduit or at least two feet from AC power, fluorescent lights, or other high energy sources.

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**IMPORTANT:** All data cables should be physically separated from power lines. If conduit is used, do not run data cables in the same conduit as power cables or certain door strike cables, e.g. strike voltage greater than 42V or Magnetic door locks without EMI suppression.

All cables must conform with the following regulations:

- National Electrical Code
- NFPA 70
- Local electrical codes
- Canadian Electric Code C22.1 (installations in Canada)
- BSI Standard BS7671, latest edition (installations in Great Britain)

Cabling should be made using good wiring practices and should be long enough to allow service loops at their terminations in the enclosure.

**Input Power**

The CKM-EP1501 is powered by one of two ways (jumper selected, J3):

- Power is supplied via the Ethernet connection using PoE, fully compliant to IEEE 802.3af
- External 12 VDC power supply, TB4-3 (VIN), TB4-4 (GND).
Communications Wiring

The CKM-EP1501 controller communicates to the host via the onboard 10-BaseT/100Base-TX Ethernet interface (port 0).

Reader and Serial I/O Device Wiring

The first reader port supports Wiegand or magnetic stripe electrical interfaces. The second reader port supports Wiegand, magnetic stripe electrical interfaces. Power to the first reader is 12 VDC, current limited to 150 mA. You can power the second reader from the auxiliary power output on TB4-1 and TB4-2. You should separately power readers that require different voltage or have high current requirements. Refer to the reader manufacture specifications for cabling requirements. In the two-wire LED mode, use the Buzzer output to drive the second LED. Set the reader port configuration via the host software.

As an alternative to a reader, the first reader port supports up to eight two-wire RS-485 remote serial I/O devices using MSP1 protocol. The maximum cable length is 2,000 ft (609 m). If you use this configuration, use the second reader port to support a reader.

**IMPORTANT:** When powering any remote device by the CKM-EP1501, do not exceed the maximum current available and evaluate cable gauge. See Specifications for details.

Figure 4, Figure 5, and Figure 6 depict wiring details.

![Figure 4: CKM-EP1501 First Reader Wiring](image-url)
Figure 5: CKM-EP1501 Remote Serial I/O Device Wiring

Figure 6: CKM-EP1501 Second Reader Wiring
Input Circuit Wiring

Typically, you use these inputs to monitor door position, request to exit, or alarm contacts. You can configure input circuits as unsupervised or supervised.

When request to exit (REX) input is supervised, the strike remains locked when a transition to open state or short state occurs. Such transitions do not generate notifications. The strike relay unlocks only when the REX input changes to the active state, that is, when the REX switch contact opens or closes depending on the configuration.

When you configure input circuits as unsupervised, reporting consists of only the open or closed states.

When you configure input circuits as supervised, the input circuit reports not only open and closed states, but also open and short. A supervised input circuit requires two resistors added to the circuit to facilitate proper reporting. The standard supervised circuit requires 1k Ohm, 1% resistors, and should be located as close to the sensor as possible. Configure custom end of line (EOL) resistances via the host software.

Input circuit wiring configurations shown in Figure 7 are supported, but may not be typical.

![Figure 7: CKM-EP1501 Input Circuit Wiring](image-url)
Relay Circuit Wiring

Two Form-C contact relays are provided for controlling door lock mechanisms or alarm signaling devices. The relay contacts are rated at 2 A at 30 VDC, dry contact configuration. Each relay has a Common pole (C), a Normally Open pole (NO) and a Normally Closed pole (NC). When you control the delivery of power to the door strike, the Normally Open and Common poles are used. When you momentarily remove power to unlock the door, as with a mag lock, the Normally Closed and Common poles are used. Check with local building codes for proper egress door installation.

Door lock mechanisms can generate EMF feedback to the relay circuit that can cause damage and premature failure of the relay. For this reason, we recommend that you use either a diode or MOV (metal oxide varistor) to protect the relay. To avoid voltage loss, use wire of sufficient gauge.

From the Auxiliary output, the CKM-EP1501 can provide 12 VDC power for external devices provided that the maximum current is not exceeded. See Specifications for details. If an external power supply is required, it must be UL Listed Class 2 rated.

Figure 8: CKM-EP1501 Relay Circuit Wiring
MEMORY BACKUP BATTERY

The SRAM is backed up by a rechargeable battery when input power is removed. This battery should retain the data for a minimum of 3 days. If data in the SRAM is determined to be corrupt after power up, all data, including flash memory, is considered invalid and is erased. All configuration data must be re-downloaded.

**NOTE:** The initial charge of the battery may take up to 48 hours to be fully charged.

SETUP INFORMATION

Use the Jumpers to set up Power over Ethernet (PoE) or external power source. Use the four DIP Switches on S1 to configure the processor operating mode. DIP switches are read on power-up except where noted. Pressing switch S2 resets the controller. All other switch settings are unassigned and reserved for future use.

<table>
<thead>
<tr>
<th>Connection</th>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TB1-1</td>
<td>IN1</td>
<td>Input 1</td>
</tr>
<tr>
<td>TB1-2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TB1-3</td>
<td>IN2</td>
<td>Input 2</td>
</tr>
<tr>
<td>TB1-4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TB2-1</td>
<td>VO</td>
<td>Reader 1 Power Output – 12 VDC</td>
</tr>
<tr>
<td>TB2-2</td>
<td>LED</td>
<td>Reader 1 LED Output</td>
</tr>
<tr>
<td>TB2-3</td>
<td>BZR</td>
<td>Reader 1 Buzzer Output</td>
</tr>
<tr>
<td>TB2-4</td>
<td>CLK</td>
<td>Reader 1 CLK/Data 1/TR+</td>
</tr>
<tr>
<td>TB2-5</td>
<td>DAT</td>
<td>Reader 1 DAT/Data 0/TR-</td>
</tr>
<tr>
<td>TB2-6</td>
<td>GND</td>
<td>Reader 1 Ground</td>
</tr>
<tr>
<td>TB3-1</td>
<td>LED</td>
<td>Reader 2 LED Output</td>
</tr>
<tr>
<td>TB3-2</td>
<td>BZR</td>
<td>Reader 2 Buzzer Output</td>
</tr>
<tr>
<td>TB3-3</td>
<td>CLK</td>
<td>Reader 2 CLK/Data 1 Input</td>
</tr>
<tr>
<td>TB3-4</td>
<td>DAT</td>
<td>Reader 2 DAT/Data 0 Input</td>
</tr>
<tr>
<td>TB4-1</td>
<td>VO</td>
<td>Auxiliary Power Output – 12 VDC</td>
</tr>
<tr>
<td>TB4-2</td>
<td>GND</td>
<td>Auxiliary Power Output Ground</td>
</tr>
</tbody>
</table>
Table 1: Connections

<table>
<thead>
<tr>
<th>Connection</th>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TB4-3</td>
<td>VIN</td>
<td>Input Power – 12 VDC (from local power supply)</td>
</tr>
<tr>
<td>TB4-4</td>
<td>GND</td>
<td>Input Power Ground</td>
</tr>
<tr>
<td>TB5-1</td>
<td>NO</td>
<td>Relay K1 – Normally Open Contact</td>
</tr>
<tr>
<td>TB5-2</td>
<td>1-C</td>
<td>Relay K1 – Common Contact</td>
</tr>
<tr>
<td>TB5-3</td>
<td>NC</td>
<td>Relay K1 – Normally Closed Contact</td>
</tr>
<tr>
<td>TB5-4</td>
<td>NO</td>
<td>Relay K2 – Normally Open Contact</td>
</tr>
<tr>
<td>TB5-5</td>
<td>2-C</td>
<td>Relay K2 – Common Contact</td>
</tr>
<tr>
<td>TB5-6</td>
<td>NC</td>
<td>Relay K2 – Normally Closed Contact</td>
</tr>
</tbody>
</table>

Table 2: Jumpers

<table>
<thead>
<tr>
<th>Jumper</th>
<th>Set at</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>J1</td>
<td>N/A</td>
<td>Factory Use Only</td>
</tr>
<tr>
<td>J2</td>
<td>N/A</td>
<td>Factory Use Only</td>
</tr>
<tr>
<td>J3</td>
<td>PoE</td>
<td>CKM-EP1501 powered from the Ethernet connection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12 V CKM-EP1501 powered from an external 12 VDC power</td>
</tr>
<tr>
<td>J4</td>
<td>N/A</td>
<td>Factory Use Only</td>
</tr>
<tr>
<td>J5</td>
<td>N/A</td>
<td>Factory Use Only</td>
</tr>
<tr>
<td>J6</td>
<td>N/A</td>
<td>10Base-T/100Base-Tx Ethernet Connection (Port 0)</td>
</tr>
<tr>
<td>J7</td>
<td>N/A</td>
<td>Cabinet Tamper Switch Input: Short = tamper secure</td>
</tr>
</tbody>
</table>

Table 3: DIP Switches

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>OFF</td>
<td>either</td>
<td>OFF</td>
<td>Normal operating mode.</td>
</tr>
<tr>
<td>ON</td>
<td>either</td>
<td>either</td>
<td>either</td>
<td>After initialization, enable default user name (admin) and password (password). The switch is read on the fly, you do not need to reboot.</td>
</tr>
<tr>
<td>OFF</td>
<td>ON</td>
<td>either</td>
<td>OFF</td>
<td>Use factory default communication parameters.</td>
</tr>
<tr>
<td>ON</td>
<td>ON</td>
<td>either</td>
<td>OFF</td>
<td>Use OEM default communication parameters. Contact system manufacture for details. See Bulk Erase Configuration Memory.</td>
</tr>
<tr>
<td>either</td>
<td>either</td>
<td>ON</td>
<td>either</td>
<td>Disable TLS secure link. Switch is read only when logging on.</td>
</tr>
</tbody>
</table>
Bulk Erase Configuration Memory

Use the bulk erase function to erase all configuration and cardholder databases. When you apply power with S1 switches set to 1 and 2 ON and 3 and 4 OFF, there is a 10-second window that if switch 1 or 2 changes to the OFF position, memory is erased. The LEDs flash the following pattern when in the reset window: LED 1 and 2 and LED 3 and 4 flash alternately at a 0.5-second rate.

**NOTE:** When erasing memory, LED 2 flashes at a 2-second rate. Do not cycle power. It takes less than 60 seconds to erase the memory. LEDs 1 and 4 flash for 10 seconds after the memory has been erased, then the CKM-EP1501 reboots.

### Addressing Mode Configuration (Static IP or DHCP)

The CKM-EP1501 controller uses two addressing modes: static IP addresses or public DHCP. This section provides information on how to set up either addressing mode.

For the controller’s default communication parameters, see Table 4.

---

<table>
<thead>
<tr>
<th>Setting</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network</td>
<td>Static IP address 192.168.0.251</td>
</tr>
<tr>
<td>Subnet Mask</td>
<td>255.255.0.0</td>
</tr>
<tr>
<td>Default Gateway</td>
<td>92.168.0.1</td>
</tr>
<tr>
<td>DNS Server</td>
<td>192.168.0.1</td>
</tr>
<tr>
<td>Host port</td>
<td>IP server, no encryption, port 3001</td>
</tr>
</tbody>
</table>
NOTE: If you are using static IP addressing mode, assign a unique IP address setting to the controller before connecting it to the network, to avoid IP addresses conflict.

Network Address Configuration Procedure

Follow the steps in this section to configure the controller’s addressing mode (static IP or DHCP) and parameters.

For communications between the computer and the controller, use a crossover cable. Use a straight-through Ethernet cable if connecting via a hub/switch.

**To connect to the controller:**

1. Configure your computer to be on the same subnet as the controller.

2. Establish a physical connection between the computer and the controller.

3. From the computer, connect to the controller using its default IP address (see Table 4).

4. When prompted to login, enter credentials. The default login name and password are: admin and password.

   You may have to accept warning messages about a security certificate and a default user login.

5. Configuration Manager opens.
To configure network address:

1. In the Configuration Manager, click **Network**.

![Configuration Manager](image)

2. In Network Settings:
   - For the DHCP mode select **Use DHCP method to obtain IP address automatically** and specify the host name, or
   - For static IP mode, select **Use Static IP configuration**, then specify **IP Address**, **Subnet Mask**, and **Default Gateway**.

3. Click **Accept**.
STATUS LEDS

Table 5: LED Information

<table>
<thead>
<tr>
<th>Process</th>
<th>LED Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power-up</td>
<td>All LEDs OFF</td>
</tr>
<tr>
<td>Initialization</td>
<td>LEDs 1 through 7 are sequenced during initialization. LEDs 1, 3, and 4 are turned ON for approximately 4 seconds after the hardware initialization completes, and then the application code initializes. The amount of time the application takes to initialize depends on the size of the database, about 3 seconds without a card database. Each 10,000 cards add about 3 seconds to the application initialization. When LEDs 1, 2, 3, and 4 flash at the same time, data is being read from or written to flash memory. Do not cycle power when in this state. If the sequence stops or repeats, perform the Bulk Erase Configuration Memory procedure in DIP switch note in section 2. If clearing the memory does not correct the initialization problem, contact technical support.</td>
</tr>
<tr>
<td>Running</td>
<td>After initialization is complete, the LEDs have the following meanings: at power up, LEDs 2 through 7 are turned ON then OFF in sequence.</td>
</tr>
</tbody>
</table>

Table 6: LED Description

<table>
<thead>
<tr>
<th>LED</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Offline / Online: Offline = 20% ON, Online = 80% ON</td>
</tr>
<tr>
<td>2</td>
<td>Host Communication Activity</td>
</tr>
<tr>
<td>3</td>
<td>Readers (Combined) Reader 1: Clock/Data or D1/D0 Mode = Flashes when Data is Received, Either Input RS-485 Mode = Flashes when Transmitting Data</td>
</tr>
<tr>
<td>4</td>
<td>Input IN1 Status:¹ OFF = Inactive, ON = Active, Flash = Trouble</td>
</tr>
<tr>
<td>5</td>
<td>Input IN2 Status:¹ OFF = Inactive, ON = Active, Flash = Trouble</td>
</tr>
<tr>
<td>6</td>
<td>Cabinet Tamper</td>
</tr>
<tr>
<td>7</td>
<td>Not used</td>
</tr>
<tr>
<td>YEL</td>
<td>Ethernet Speed: OFF = 10 Mb/S, ON = 100 Mb/S</td>
</tr>
<tr>
<td>GRN</td>
<td>OFF = No Link, ON = Good Link, Flashing = Ethernet Activity</td>
</tr>
</tbody>
</table>

¹. If this input is defined, every 3 seconds the LED is pulsed to its opposite state for 0.1 seconds; otherwise the LED is off.
**SPECIFICATIONS**

Use this interface in low voltage, Class 2 circuits only. When installing this device, comply with all local fire and electrical codes.

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**NOTE:** For UL installations, PoE powered devices shall not be used. Power for these devices must be provided by a UL 294 listed power limited source (12 VDC).

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Table 7: CKM-EP1501 Specifications

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power Input</strong></td>
<td>PoE Power Input 12.95 W, compliant to IEEE 802.3af, or 12 VDC 10%, 200 mA minimum, 900 mA maximum</td>
</tr>
<tr>
<td><strong>Power Output</strong></td>
<td>12 VDC at 650 mA including reader and AUX output</td>
</tr>
<tr>
<td><strong>Backup Battery</strong></td>
<td>SRAM rechargeable battery</td>
</tr>
<tr>
<td><strong>Host Communication</strong></td>
<td>Ethernet: 10BaseT/100Base-TX</td>
</tr>
<tr>
<td><strong>Inputs</strong></td>
<td>2 supervised, Programmable End of Line resistors, 1k/2k Ohm, 1% 0.25 W standard, and dedicated tamper input</td>
</tr>
<tr>
<td><strong>Relays</strong></td>
<td>2 outputs, Form-C contacts: 2 A at 30 VDC</td>
</tr>
</tbody>
</table>

**Reader Interface**

- **Reader Power**: PoE: 12 VDC 10% or local power supply (12 VDC). (PTC limited 150 mA maximum)
- **Reader Data Inputs**: Two TTL reader ports, or one two-wire RS-485 reader port capable of supporting two readers
- **RS-485 Mode**: 9600 bps, asynchronous, half-duplex, 1 start bit, 8 data bits, and 1 stop bit. Maximum cable length: 2,000 ft (609.9 m)
- **LED Output**: TTL compatible, high > 3 V, low < 0.5 V, 5 mA source/sink maximum.
- **Buzzer Output**: Open collector, 5 VDC open circuit maximum, 10 mA sink maximum.

**Cable Requirements**

- **Power**: 1 twisted pair, 18 AWG
- **Ethernet**: CAT-5, minimum
- **Alarm Input**: 1 twisted pair per input, 30 ohm maximum loop resistance
- **Reader data (TTL)**: 18 AWG, 6 conductors, 500 ft (152 m) maximum
- **Reader data (RS-485)**: 24 AWG, 120-ohm impedance, twisted pair with shield, 2,000 ft (609.6 m) maximum
MAINTENANCE

Impaired Performance

The following is a list of the impaired performance conditions:

- Unit environment not as specified
- Unit power not as specified
- Cable type and length not as specified

Test Procedure

To check for proper operation of the device:

1. Verify LED status indicates device is online.
2. Present a valid card to a reader connected to the device and verify access is granted.
3. Present an invalid card to a reader connected to the device and verify access is denied.
4. Change the state of any input and verify change of state.
5. Change the state of any output and verify change of state.
Rechargeable Battery

The rechargeable battery is not field replaceable. If you need to replace the unit, return it to the manufacturer.

Fully charging the battery used in the CM-EP1501 controller may take up to 48 hours. A fully charged battery can store the database for a minimum of 3 days.

CONNECTING THIRD PARTY DEVICES (SCHLAGE® AND ASSA ABLOY®)

This section describes how to connect selected third party devices to the CKM-EP1501 controller or, in case of Schlage PIM400-1501, directly to the P2000 SMS.

Schlage PIM400-1501

The Schlage PIM400-1501 panel interface module integrates the functionality of both a Schlage PIM and a Mercury controller in one device. Therefore, Schlage PIM400-1501 intelligent controller connects directly to the P2000 server. Each PIM400-1501 supports 16 wireless locks.

See also System Architecture with Schlage Devices on page 18.

Schlage AD-300 Series

The Schlage AD-300 series locks connect directly to the CKM-EP1501 controller and use RS485 communications. This integration requires CKM-EP1501 Firmware Version 1.18 or higher.

See also System Architecture with Schlage Devices on page 18.
System Architecture with Schlage Devices

Figure 9: CKM-EP1501 System Architecture with Schlage Devices

- CKM-EP1501
- Schlage PIM400-1501
- Schlage AD-300 series
- Schlage PIM400-485
- Wide Area Network
- IP Network

Supports up to 16 wireless locks.

Supports up to 16 wireless locks (CKM-EP1501 limits apply.)

Scalable to 8 Schlage devices (PIM400-485 modules or AD300 series locks). Maximum number of Schlage locks per CKM-EP1501 controller is 16.
**Assa Abloy® Aperio™ 1-to-8 Communication Hub**

Use Aperio 1-to-8 communication hub to connect Aperio locks to a Mercury controller. The hub connects to port TB2 on the CKM-EP1501. See **Communications Wiring** for details.

Switches on the Aperio 1-to-8 hub allow you to configure 15 unique hub addresses. You can connect up to 8 Aperio 1-to-8 hubs to a single CKM-EP1501 controller.

Each Aperio 1-to-8 hub supports 8 locks; however, the total number of locks Aperio locks per the CKM-EP1501 controller is 16.

**Note:** When one or more Aperio devices are on the bus, all devices on this bus must be configured to operate at 38,400 baud.

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**Figure 10: System Architecture with Aperio 1-to-8 Hub**