KT-400
Ethernet Four-Door Controller

Installation Manual
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Pre-Installation Information

To the Installer: If you are familiar with the installation, you can use the installation checklist on page 37 with the □ symbol.

Copyright Information

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Safety Instructions

Important: NEVER INSTALL THE EQUIPMENT DURING A LIGHTNING STORM!

This equipment, KT-400 Ethernet Four-Door Controller Model KT-400-EU, shall be used installed and used within an environment that provides the pollution degree max 2 and over voltages category II NON HAZARDOUS LOCATIONS, INDOOR only. The equipment is FIXED and PERMANENTLY CONNECTED and is designed to be installed by Service Persons only; [service person is defined as a person having the appropriate technical training and experience necessary to be aware of hazards to which that person may be exposed in performing a task and of measures to minimize the risks to that person or other persons.] The equipment is installed in a metallic cabinet that meets the applicable requirements for a FIRE ENCLOSURE.

1. The connection to the mains supply must be made as per the local authorities rules and regulations: In the UK as per BS6701. An appropriate disconnect device must be provided as part of the building installation. Where it is not possible to rely on the identification of the NEUTRAL in the AC MAINS SUPPLY, the disconnecting device must disconnect both poles simultaneously (LINE and NEUTRAL).

2. AVOID setting up the equipment near heaters, air conditioners, ventilators, and/or refrigerators; DO NOT select a place that exposes your controller to direct sunlight, excessive heat, moisture, vapors, chemicals or dust.

3. If during the installation a knockout on the cabinet is removed, it is the installer's responsibility to ensure that the same degree of protection for the cabinet is provided by the use of bushings, fittings, adequate sealant, etc.

4. The metallic cabinet must be secured to the building structure before operation. Use four (4) stainless steel tapping screws #8, 32 mm (1.25 in) to mount the cabinet.

5. The ground connection must be as shown within the included diagram, or equivalent.

6. Internal wiring must be routed in a manner that prevents:
   - Excessive strain on wire and on terminal connections;
   - Loosening of terminal; connections;
   - Damage of conductor insulation.

7. It is the end-user and/or installer's responsibility to ensure that the disposal of the used batteries is made according to the waste recovery and recycling regulations applicable to the intended market.

8. There are no serviceable parts within the equipment; For any issues regarding the equipment please contact your installer.

9. Before leaving the premises, the Ethernet communication lines must first be connected to an approved (acceptable to local authorities) type Network Interface Device (NID), (UL installations, UL 60950 listed NID, for ULC installations CAN/CSA C22.2, No. 60950-1 Certified NID). All wiring shall be performed according to the local electrical codes.

10. DISCONNECT POWER BEFORE SERVICING.
Technical Support

For technical assistance with the KT-400 Ethernet Four-Door Controller and other Kantech products, contact technical support, Monday to Friday. See the following table for the technical support phone numbers.

<table>
<thead>
<tr>
<th>Country/Region</th>
<th>Phone Numbers</th>
<th>Support Hours</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>North America</strong></td>
<td><strong>Toll Free +888 222 1560 (GMT -05:00)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US and Canada</td>
<td>Direct: +450 444 2030</td>
<td>8:00 to 20:00</td>
<td><a href="mailto:kantechsupport@tycoint.com">kantechsupport@tycoint.com</a></td>
</tr>
<tr>
<td></td>
<td>Fax: +450 444 2029</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Latin America</strong></td>
<td><strong>(GMT -03:00)</strong></td>
<td></td>
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</tr>
<tr>
<td>Argentina</td>
<td>Direct: +5411 4717 2929</td>
<td>9:00 to 18:00</td>
<td><a href="mailto:ingenieria@tycoint.com">ingenieria@tycoint.com</a></td>
</tr>
<tr>
<td></td>
<td>Direct: +5411 4717 1320</td>
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<td>Direct: +5411 4717 5525</td>
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<tr>
<td></td>
<td>Fax: +5411 4717 1060</td>
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<tr>
<td><strong>Asia</strong></td>
<td><strong>(GMT +08:00)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Singapore</td>
<td>Direct: +65 6319 9820</td>
<td>8:30 to 18:00</td>
<td><a href="mailto:swhuin@tycoint.com">swhuin@tycoint.com</a></td>
</tr>
<tr>
<td></td>
<td>Direct: +65 6389 8297</td>
<td></td>
<td><a href="mailto:wtooh@tycoint.com">wtooh@tycoint.com</a></td>
</tr>
<tr>
<td></td>
<td>Direct: +65 6389 8292</td>
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<tr>
<td><strong>Europe</strong></td>
<td><strong>Toll Free +800 CALL TYCO / +800 2255 8926 (GMT +01:00)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bahrain</td>
<td>+800 04127</td>
<td>8:00 to 18:00</td>
<td><a href="mailto:tfsemea.support@tycoint.com">tfsemea.support@tycoint.com</a></td>
</tr>
<tr>
<td>France</td>
<td>+33 04 72 79 14 83</td>
<td></td>
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<tr>
<td>Greece</td>
<td>+00 800 31 22 94 53</td>
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<tr>
<td>Russia</td>
<td>+8 10 800 2052 1031</td>
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<td>Spain</td>
<td>+900 10 19 45</td>
<td>8:00 to 18:00</td>
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<tr>
<td>Turkey</td>
<td>+00 800 31 92 30 37</td>
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<tr>
<td>United Arab Emirates</td>
<td>+800 0 31 0 7123</td>
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<tr>
<td>United Kingdom</td>
<td>+44 08701 ADT SUP / 44 08701 238 787</td>
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<tr>
<td></td>
<td>Direct: +31 475 352 722</td>
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<tr>
<td></td>
<td>Fax: +31 475 352 725</td>
<td></td>
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</tbody>
</table>
Compliance Specifications

FCC & IC Compliance
This device complies with Part 15 of the FCC rules Class A. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation. This class A digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations. The KT-400 Ethernet Four-Door Controller is also compliant with EN55022:1998, amendment 1:1995, Class A.

UL Compliance
To comply with UL listings, the following requirements must be met:
• Use of a UL listed computer
• Use of UL listed readers (Wiegand 26 and 34 bits, mag stripe 26 and 34 bits, XSF 39 bits have been tested and found to comply)
• Use of a UL recognized tamper switch on every housing cabinet for the KT-400 Ethernet Four-Door Controller
• Do not use the SmartLink option
• Do not use a 240 VAC transformer (not UL listed)
• Use only UL listed cables
• Use only UL listed adaptors
• Use only a UL listed transformer Hammond BF2F such as Kantech part number TR1675 (Available through Kantech distributors or dealers, please refer to the Technical Support contact information on page 2 to obtain the specific transformer)
• The KT-400-EU has not been validated as a UL Listed system.
• The KT-CAB3000LDR and KT-CAB4000LDR have been evaluated by UL as alternate enclosures.

Note: All circuits are power limited.

UL 294 Compliance Notice
• IP Connectivity: Only for supplementary use when planning to install the KT-400 Ethernet Four-Door Controller with a UL 294 access control system.
• Use only UL 294 or UL 1076 listed power supply
• Connect Kantech part number KT-ACPW-LED status indicator to the 16 VAC black terminals of the KT-400
• Use Kantech part number KT-BATT-12 battery, see Note.

Note: Backup battery provides operation of up to 12 hours but has been tested for 4 hours per Section 33 of UL 294, fifth edition.

UL 1076 Compliance Notice
• The KT-400 is UL 1076 Listed as a Commercial Proprietary Control Unit Accessory and Proprietary Burglar Alarm Unit (Section 83.2), with EntraPass and Redundant Server, alarm system features, KT-300 Controllers, ioProx Proximity readers, and TRex request to exit devices – other sensor devices (temperature, water level, etc.) may be used as long as they are also UL 1076 Listed.
• The EntraPass and Redundant Server shall be running at all time, and manned 24 hours a day, 365 days a year – The EntraPass and Redundant Server will each have their own operator workstation.
• Data processing equipment and office appliance and business equipment used as central supervisory equipment station shall be listed to Information Technology Equipment - UL 60950.
• Should the EntraPass and/or Redundant Server be replaced, a UL 60950 listed computer must be used.
• The following recommended system requirements apply to the EntraPass Server, Redundant Server, Video Vault, Card Gateway, SmartLink, and Workstation:
  • Processor: Pentium IV at 1.8 GHz
1 GB RAM
• Minimum free hard disk space: 20 GB
• Color depth: 24-bit (16 million colors), required for Video Integration only
• Screen resolution: 1024 x 768
• Graphic adapter card: 32 MB
• 48X CD-ROM drive
• Network Interface card: 10/100 Base-T network adaptor

Note: Actual requirements may vary based on your operating system and configuration.

• The Central Supervisory Equipment shall employ supply line transient protection complying with the Standard for Transient Voltage Surge Suppressors, UL 1449, with a maximum marked rating of 330 V.
• The Central Supervisory Equipment shall employ signal line Transient protection complying with the Standard for Protectors for Data Communications and Fire Alarm Circuits, UL 497B, with a maximum marked rating of 50 V.
• The Central Supervisory Equipment shall employ that communication circuits and network components connected to the telecommunications network shall be protected by secondary protectors for communication circuits. These protectors shall comply with the Standard for Secondary Protectors for Communications Circuits, UL 497A. These protectors shall be used only in the protected site of the telecommunications network.
• The Central Supervisory Equipment shall be installed in a temperature controlled environment. A temperature controlled environment is defined as one that can be maintained between 13° - 35°C (55° - 95°F) by HVAC system. Twenty-four hours on standby power shall be provided for the HVAC system. The standby power system for the HVAC system may be supplied by an engine driven generator alone. A standby battery is not required to be used.
• A marking to identify the application and signaling function of the product is located on the inside of the unit (inner door sticker).
• For certified commercial proprietary control unit accessory applications, the requirements of UL 1076, Commercial Proprietary Control Unit Accessory also apply.
• Use Kantech part number KT-3LED-PLATE 3-color LED indicators mounted on single plate when the KT-400 is configured with the (APOU/ALVY) KT-NCC in an EntraPass Global Edition system for remote alarm monitoring. Refer to the KT-NCC Installation Manual, DN1611 for additional details.
• The reader(s), that is(are) designated to arm or disarm the alarm system, must be within the secured side of the customer premises.
• The following Kantech readers have been validated by UL for the UL 1076 Standard: P225W26, P225KPW26, P225XSFXF, P225KPXSFXF, P325W26, P325KPW26, P325XSFXF, P325KPXSFXF and P600.

Note: All readers can be ordered with or without the following suffixes: BEI, BEI-SE, GRY or GRY-SE.

• The KT-400 Ethernet Four-Door Controller is UL 1076 listed when used with the (APOU/ALVY) KT-NCC (Network Communications Controller).
• All alarms shall be reported and acknowledged in the following priority:

Note: To set these priorities, please adjust the Event Parameters, found in EntraPass System

1. Fire alarm and industrial supervision where a risk of injury to persons, or damage or destruction of property may be involved
2. Hold-up or panic alarm
3. Burglar alarm
4. Watchman tour (Guard tour)
5. Fire-alarm supervision
6. Burglar-alarm supervision
7. Industrial supervision where a risk of injury to persons, or damage or destruction of property will not be involved.

CE & C-Tick Compliance

• EN50133-1: Alarm systems - Access control systems for use in security applications: system requirements.
• EN55022: Information technology equipment, radio disturbance characteristics.
• EN60950: Information technology equipment, safety.
• EN61000-6-1: Electromagnetic Compatibility (EMC) - Generic Standards - Immunity for residential, commercial and light-industrial environments.
• EN61000-6-2: Electromagnetic Compatibility (EMC) - Generic Standards - Immunity for industrial environments.
Overview

The KT-400 Ethernet Four-Door Controller is designed to meet the highest standards of access control and point monitoring applications. Here are the features of the KT-400 Ethernet Four-Door Controller.

Compatible with all EntraPass Special, Corporate and Global Editions

The KT-400 Ethernet Four-Door Controller is compatible with all EntraPass Editions v4.01 and higher:
- EntraPass Special Edition
- EntraPass Corporate Edition with a Corporate Gateway
- EntraPass Global Edition with a Corporate Gateway
- EntraPass Global Edition with a Global Gateway
- EntraPass Global Edition with a KT-NCC Network Communications Controller

Multiple Configuration Options
- **EntraPass**: The KT-400 Ethernet Four-Door Controller can be configured with all EntraPass Editions v4.01 and higher.
- **Web Configuration Page**: The Web Configuration Page is accessible through any browser. It can be used to verify and configure the IP settings of the following Kantech devices: the KT-400 Ethernet Four-Door Controller, the KT-NCC and the Kantech IP Link. Refer to the procedure “Configuring the KT-400 Ethernet Four-Door Controller with the Web Configuration Page” on page 32 for further details.
- **KT-Finder**: The KT-Finder is a stand-alone application that can be used to verify and configure the IP settings of the following Kantech devices: the KT-400 Ethernet Four-Door Controller, the KT-NCC and the Kantech IP Link. Refer to the procedure “Configuring the KT-400 Ethernet Four-Door Controller with the KT-Finder” on page 33 for further details.

Four Onboard doors

The KT-400 Ethernet Four-Door Controller is a full 4 onboard doors access controller. See Figure 1 for a description of the PCB and Figure 2 for all the connection possibilities offered by the KT-400 Ethernet Four-Door Controller.

Communication Ports

- 1 10/100Base-T Ethernet for network connection with the EntraPass Gateway
- 1 RS-232 (COM3) for direct connection to the EntraPass Gateway and RS-485 communication with KT-100, KT-200, KT-300 and KT-400
- 1 RS-485 (COM1) for RS-485 communication between the EntraPass Gateway and the KT-100, KT-200, KT-300 and KT-400
- 1 SPI (Serial Peripheral Interface) port for expansion modules such as the KT-MOD-REL8 (8-Relay Outputs), the KT-MOD-INP16 (16-Input) and the KT-MOD-OUT16 (16-Output)

**Note**: You can connect a loop of KT-200 controllers on the RS-485 of the KT-400 if not mixed with other controllers (Kantech KT-100, KT-300 and KT-400).

IP Connectivity

The KT-400 Ethernet Four-Door Controller, when used with EntraPass Special Edition or a Corporate Gateway, can report events, gather its configuration through an IP connection over the LAN (Local Area Network) and over the Internet for a WAN (Wide Area Network). In this mode, the 1st or local controller becomes a “Master Controller” and can poll up to 31 Kantech controller(s). The KT-400 Ethernet Four-Door Controller is compatible with all the controllers. Unlike the other controllers, the KT-400 Ethernet Four-Door Controller asynchronously polls the controllers (KT-100, KT-200, KT-300) and communicates with the EntraPass Gateway only when necessary. This significantly reduces the amount of bandwidth required to operate your security system on the network.

- **AES Encryption 128-Bit**: The KT-400 Ethernet Four-Door Controller is extremely secure. It uses 128-bit AES encryption to communicate with the Gateway which prevents any hacking from the internet and ensures secure communications when used over the internet on a wide area network (WAN).
Inputs

There are 16 onboard inputs on the KT-400 Ethernet Four-Door Controller. Up to 240 more can be added through the addition of expansion modules, such as the KT-MOD-INP16, for a total of 256 inputs. Each input can be individually configured for one of the following application:

- Door contact (4 onboard)
- T.Rex (Request to Exit Detector) (4 onboard)
- Interlock (4 onboard)
- Floor Selection for Elevator Application
- Elevator Action
- External Alarm System Status (Armed / Disarmed)
- External Alarm System Alarm (Alarm / Secure)
- External Alarm System Zones
- Relays to trigger on each input in alarm event
- Zone shunt: Single or group of zones can be permanently or temporarily 'shunted' to a secure state on the same controller. Shunt method includes:
  - Zone Shunt by another Zone - When a zone in alarm is programmed to shunt another zone / group of zones.
  - Zone Shunt on Unlock - When a zone is temporarily frozen to its actual state (alarm or secured) after an access granted.
  - Manual Shunt - Operator can manually 'Shunt' a zone to a secure state.
  - Disarmed Door Shunt - When alarm system is disarmed, some zones may be 'Shunted' to a secure state.
  - Entry / Exit Delay Shunt - When a user is in the process of disarming / arming the alarm system and entry / exit delay prevails, some zones may be 'Shunted' to a secure state.
- Arming / Disarming Request
- Postpone Arming Request
- Tamper switch input: The tamper switch is a non-programmable 'Fixed-Function' input. It is used to identify tampering of the KT-400 cabinet.

Lock Outputs

There are 4 onboard lock outputs and they are supervised. The locking function can also be performed by any onboard relay configured for this functionality.

Relay Outputs

There are 4 onboard relay outputs. Up to 256 relay outputs can be supported through the addition of expansion modules such as the KT-MOD-REL8.

Reader Outputs

There are 4 different possible outputs for each of the 4 onboard reader interfaces for a total of 16 programmable outputs. Reader outputs are used to give user visual and/or audible feedback on the ongoing access events.

Reader Interfaces

There are 4 onboard reader interfaces. They can be programmed for Wiegand or ABA (Clock and Data) readers.

Elevator Interface

The KT-400 Ethernet Four-Door Controller supports elevator interfacing with the addition of expansion modules such as the KT-MOD-REL8, KT-MOD-INP16 and KT-MOD-OUT16.

Alarm Panel Interface

The KT-400 Ethernet Four-Door Controller supports alarm panel interfacing with the appropriate connections made between zone inputs, relay outputs and the alarm system panel.

Automatic Port Detection

The KT-400 Ethernet Four-Door Controller automatically detects the site communication speed set by EntraPass as well as the communication port which can be IP (ETHERNET #1), RS-485 (COM1) or RS-232 (COM3).

Downloadable Firmware

The firmware program can be downloaded from any EntraPass workstation to the KT-400 Ethernet Four-Door Controller. The firmware program, stored in the controller’s flash memory, is upgraded without having to change any parts.
Trouble and Reporting

The KT-400 Ethernet Four-Door Controller constantly supervises ac power and battery condition and reports “AC Lost”, “Normal Battery”, “Low Battery”, “Battery Critical” or “No Battery”, status to the EntraPass system. Power outputs are supervised and electronically protected against short-circuits and surges. Locking devices are also supervised for short and open circuits.

Visual Status Indicators (LEDs)

The KT-400 Ethernet Four-Door Controller has multiple status indicators such as for troubleshooting, network activity, power status and outputs activity. See Figure 1 for their locations.

- **Heartbeat**: The Heartbeat blue LED indicates the communication status with EntraPass or the IP mode of the controller. Refer to Table 1 for a description of the heartbeat patterns.
- **SPI Active (YELLOW)**: This LED signals activity on the SPI expansion port as well as communication between the main CPU and the input/output CPU.
- **COM1-RX, COM1-TX, COM2-RX, COM2-TX, RS232-RX and RS232-TX (YELLOW)**: The six serial port LEDs are transmit/receive activity indicators. The COM2-RX and COM2-TX LEDs are for future use.
- **LOCK1, LOCK2, LOCK3 and LOCK4 (RED)**: Each lock output (Open Drain) has an indicator which turns on each time the corresponding output is activated.
- **RELAY1, RELAY2, RELAY3 and RELAY4 (RED)**: Each relay output has an indicator which turns on each time the corresponding relay is activated.
- **AC PWR and DC PWR (GREEN)**: The AC PWR LED is ON when AC power is present. The DC PWR is ON when the DC level is sufficient for all DC terminals such as the 12V AUX. For further details, see Troubleshooting on page 29 section.
- **ETH1 LINK (GREEN)**: The LED is OFF when there is no Ethernet network or the cable is disconnected, and ON when there is an Ethernet cable and network connection.
- **ETH1 TXRX (YELLOW)**: The LED indicates network activity.

Built-in SPI Expansion

The KT-400 Ethernet Four-Door Controller allows connection of expansion modules in order to add outputs, like relays and open drain outputs, and inputs. See Figure 10 and Figure 11 for an example with expansion modules.

- **KT-MOD-REL8**: The KT-MOD-REL8 is an 8-relay expansion module. Each relay is 3 Amps, 30 VDC Form C. The module supports daisy-chaining which can add up to 32 KT-MOD-REL8 modules for a total of 256 relay outputs per KT-400 Ethernet Four-Door Controller.
- **KT-MOD-INP16**: The KT-MOD-INP16 is a 16-zone input expansion module. The module supports daisy-chaining which can add up to 15 KT-MOD-INP16 for a total of 240 external inputs per KT-400 Ethernet Four-Door Controller. The KT-400 Ethernet Four-Door Controller has 16 onboard inputs which gives a total of 256 inputs per controller.
- **KT-MOD-OUT16**: The KT-MOD-OUT16 is a 16-output expansion module. Each output is capable of 750 mA. It gives the opportunity to address the need for external LED, lock, relay, piezo and buzzer control. The module supports daisy-chaining which can add up to 16 KT-MOD-OUT16 modules for a total of 256 external open drain outputs per KT-400 Ethernet Four-Door Controller.

**Note**: The expansion modules support daisy chaining which can add up to 32 KT-MOD-REL8 modules for a total of 256 external relays per KT-400 Ethernet Four-Door Controller. Combining input and output expansion modules gives the flexibility to connect up to 256 inputs and 256 outputs.
Figure 1: KT-400 Ethernet Four-Door Controller PCB View
Figure 2: KT-400 Ethernet Four-Door Controller Inputs and Outputs View
Figure 3: KT-400 Cabinet Models for North America and European Union
System Architecture


• Over the internet. See Figure 4.
• Over RS-232 with a USB-485. See Figure 5.

• Over RS-232 with a VC-485. See Figure 6.

Application with EntraPass Global Edition and a KT-NCC.
• Over the internet with a KT-NCC. See Figure 7.

• Over RS-232 straight from EntraPass RS-232 COM port. See Figure 8.

Figure 4: Over the Internet with EntraPass Special Edition and Corporate Edition with Corporate Gateway
Figure 5: USB-485 with EntraPass Special Edition and Corporate Edition with Corporate Gateway

Figure 6: VC-485 with EntraPass Global Edition and Global or Corporate Gateway

"*Use the DB9F to RJ-12 adaptor (740-1022) included in the VC-485 kit."
Figure 7: Over the internet with a KT-NCC and EntraPass Global Edition

Figure 8: Over RS-232 straight from the EntraPass RS-232 COM port

*Use the DB9F to RJ-12 adaptor (740-1023) included in the CBLK-10 kit. The maximum length for the RS-232 cable is 30 m (100 ft).*
Heartbeat LED Patterns

Communication status and other vital controller parameters can be obtained from heartbeat LED patterns. It is located near the RS-232 port (COM3), see Figure 1. This information is particularly useful when connecting the controller to the rest of the EntraPass system. The following table lists all conditions along with a brief description. Refer to Table 3, if you must reset or change the communication mode of the KT-400 Ethernet Four-Door Controller.

Table 1: Heartbeat LED Patterns

<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
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<tr>
<td>Booting Up</td>
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<tr>
<td>Factory Default DHCP</td>
<td>Continuous LONG Pulses</td>
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<tr>
<td>Unable to Resolve DNS</td>
<td>2 LONG Pulses</td>
</tr>
<tr>
<td>Forced Default Static</td>
<td>3 LONG Pulses</td>
</tr>
<tr>
<td>DHCP Server Failed</td>
<td>4 LONG Pulses</td>
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<tr>
<td>Receive Broadcast</td>
<td>Single 2.5 Sec. Burst</td>
</tr>
<tr>
<td>Card Read or Swipe</td>
<td>Single 0.5 sec burst, resume previous flash</td>
</tr>
<tr>
<td>Hard Reset</td>
<td>4 SHORT Pulses</td>
</tr>
<tr>
<td>Corporate Gateway</td>
<td>3 SHORT Pulses</td>
</tr>
<tr>
<td>Global Gateway</td>
<td>1 SHORT Pulse</td>
</tr>
<tr>
<td>Fail Soft</td>
<td>Continuous SHORT Pulses</td>
</tr>
<tr>
<td>Firmware Update</td>
<td>5 pulses / sec @ 50% duty cycle</td>
</tr>
<tr>
<td>Rebooting</td>
<td>10 pulses / sec @ 50% duty cycle</td>
</tr>
</tbody>
</table>
## Technical Specifications

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power input (<strong>KT-400</strong></td>
<td>Transformer class 2, 120 VAC 75VA IN; 16 VAC OUT</td>
</tr>
<tr>
<td>Power input (<strong>KT-400-EU</strong></td>
<td>Transformer 240 VAC 50 Hz 100 VA IN, 16.5 VAC OUT</td>
</tr>
<tr>
<td>Battery back-up (<strong>KT-BATT-12</strong>)</td>
<td>12 VDC, 7 Ah battery supervised, provides up to 12 hours of operation</td>
</tr>
<tr>
<td>Operating Temperatures</td>
<td>From 2°C to 49°C (35°F to 120°F) indoor use only</td>
</tr>
<tr>
<td>Humidity Level</td>
<td>0 to 85% (relative humidity non-condensing)</td>
</tr>
<tr>
<td>Cabinet Dimensions (High-Wide-Deep)</td>
<td>37.59 cm (14.8 in) x 30.48 cm (12.0 in) x 12.57 cm (4.95 in)</td>
</tr>
<tr>
<td>Cabinet Weight (<strong>KT-400</strong>)</td>
<td>4.0 kg (8.82 lb)</td>
</tr>
<tr>
<td>Cabinet Weight (<strong>KT-400-EU</strong>)</td>
<td>7.0 kg (15.43 lb)</td>
</tr>
<tr>
<td>PCB dimension</td>
<td>22.86 cm (9 in) X 13.97 cm (5.5 in) X 5.20 cm (2.04 in)</td>
</tr>
<tr>
<td>Reader types</td>
<td>Wiegand, proximity, ABA Clock and Data, bar code, magnetic, integrated keypad, smartcard and others</td>
</tr>
<tr>
<td>Reader power output</td>
<td>12 VDC and 5 VDC @ 400 mA max each, protected and supervised</td>
</tr>
<tr>
<td>Monitored points (zone inputs)</td>
<td>16 monitored points (Z1 to Z16), NO/NC, without EOL (DRY), single EOL, double EOL and 1 fixed-function tamper switch input</td>
</tr>
<tr>
<td>Points maximum wiring</td>
<td>AWG #22 - 600 m (2,000 ft)</td>
</tr>
<tr>
<td>Door strike power supervised</td>
<td>• 250 mA each or 1.0 Amp total for the <strong>KT-400</strong> model (JP4 on INT)</td>
</tr>
<tr>
<td></td>
<td>• 750 mA each or 3.0 Amps total for the <strong>KT-400</strong> model (JP4 on EXT)</td>
</tr>
<tr>
<td></td>
<td>• 625 mA each or 2.5 Amps total for the <strong>KT-400-EU</strong> model (JP4 on EXT)</td>
</tr>
<tr>
<td>Auxiliary reader outputs</td>
<td>LEDs (LED, OUT1 and OUT2) and buzzer (BUZ) for each individual door, 25mA max each, open collector outputs</td>
</tr>
<tr>
<td>Relay controlled output</td>
<td>4 onboard Form C Relay controlled outputs, 30 VDC, 3 Amps max each</td>
</tr>
<tr>
<td>Communication ports</td>
<td>1 x RS-232 with RJ-12, 1 x RS-485, 1 x Ethernet 10/100Base-T with RJ-45</td>
</tr>
<tr>
<td>Expansion port</td>
<td>1 x SPI 6-pin connector, bidirectional data exchange supported. Supplies 12 VDC, 500 mA max shared with 12 VDC Auxiliary port</td>
</tr>
<tr>
<td>Auxiliary port</td>
<td>1 x Auxiliary 12 VDC, 500 mA maximum shared with SPI expansion port</td>
</tr>
<tr>
<td>Communication speed</td>
<td>- Up to 115200 Bauds (automatic detection) over RS-232 and RS-485</td>
</tr>
<tr>
<td></td>
<td>- 10/100 Mb/s BaseT over Ethernet</td>
</tr>
<tr>
<td>Flash memory</td>
<td>16 MB for application storage</td>
</tr>
<tr>
<td>RAM memory</td>
<td>64 MB for application loading and running, protected by a Lithium-Ion battery for a minimum of 75 hours</td>
</tr>
<tr>
<td>Network autonomy</td>
<td>Distributed data and processing</td>
</tr>
<tr>
<td>Certifications / Listing</td>
<td>EN50133-1, EN55022, EN60950, EN61000-6-1, EN61000-6-2</td>
</tr>
<tr>
<td></td>
<td>FCC: Class A</td>
</tr>
<tr>
<td></td>
<td>UL 294, UL 1076</td>
</tr>
<tr>
<td></td>
<td>C-Tick</td>
</tr>
</tbody>
</table>
Electrical Specifications

<table>
<thead>
<tr>
<th>AUXILIARY READER OUTPUTS</th>
<th>MAXIMUM CURRENT (Typical)</th>
<th>COMBINED MAXIMUM CURRENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEDs (LED, OUT1 and OUT2) for each door reader</td>
<td>25 mA (each)</td>
<td></td>
</tr>
<tr>
<td>Buzzer (BUZ) for each door reader</td>
<td>25 mA (each)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OUTPUTS</th>
<th>MAXIMUM CURRENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 for 12 VDC Auxiliary Power (11.2 to 13.75 VDC) polyswitch protected, shared with SPI expansion port</td>
<td>500 mA</td>
</tr>
<tr>
<td>4 for Controlled Readers (11.2 to 13.75 VDC)</td>
<td>500 mA</td>
</tr>
<tr>
<td>4 for Controlled Readers 5 VDC</td>
<td>400 mA</td>
</tr>
<tr>
<td>4 for Locks (11.2 to 13.75 VDC) when jumper JP4 is on INT (internal)</td>
<td>1 Amp</td>
</tr>
<tr>
<td>4 for Locks (11.2 to 28 VDC) when jumper JP4 is on EXT</td>
<td>2.5 Amps for KT-400-EU model</td>
</tr>
</tbody>
</table>

KT-400 Ethernet Four-Door Controller Models, Expansion Modules Models, Related Documentation and Miscellaneous Items

<table>
<thead>
<tr>
<th>Part number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>KT-400</td>
<td>KT-400 Ethernet Four-Door Controller, IP Ready with Accessory Kit in Metal Cabinet, see Table 2</td>
</tr>
<tr>
<td>KT-400-EU</td>
<td>KT-400 Ethernet Four-Door Controller, IP Ready with Accessory Kit in Metal Cabinet, European Union Model, see Table 2</td>
</tr>
<tr>
<td>KT-400-PCB</td>
<td>KT-400 Ethernet Four-Door Controller PCB only, IP Ready with Accessory Kit, see Table 2</td>
</tr>
<tr>
<td>KT-400-CAB</td>
<td>KT-400 Black Metal Cabinet with Lock and Keys, see Table 2</td>
</tr>
<tr>
<td>KT-400-CABEU</td>
<td>KT-400 Black Metal Cabinet with Lock and Keys, European Union Model, see Table 2</td>
</tr>
<tr>
<td>KT-MOD-INP16</td>
<td>KT-400 Expansion Module 16-Zone Inputs with SPI Cable 41 cm (16 in)</td>
</tr>
<tr>
<td>KT-MOD-REL8</td>
<td>KT-400 Expansion Module 8-Relay with SPI Cable 41 cm (16 in)</td>
</tr>
<tr>
<td>KT-MOD-OUT16</td>
<td>KT-400 Expansion Module 16-Output with SPI Cable 41 cm (16 in)</td>
</tr>
<tr>
<td>KT-MOD-CAB</td>
<td>KT-400 Expansion Module Cabinet, Black, with SPI Cable 91 cm (36 in), Lock and Two Keys</td>
</tr>
<tr>
<td>KT-MOD-CABEU</td>
<td>KT-400 Expansion Module Cabinet, Black, with Electrical Parts, SPI Cable 91 cm (36 in), Lock and Two Keys, European Union Model</td>
</tr>
<tr>
<td>KT-MOD-SPI-16</td>
<td>KT-400 SPI Cable 41 cm (16 in) for SPI Interconnection within the Cabinet</td>
</tr>
<tr>
<td>KT-MOD-SPI-36</td>
<td>KT-400 SPI Cable 91 cm (36 in) for SPI Interconnection between Cabinets</td>
</tr>
</tbody>
</table>

Related Documentation

<table>
<thead>
<tr>
<th>Part number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DN1796</td>
<td>Networking Basics, <em>Application Note</em>, English version</td>
</tr>
</tbody>
</table>

**Related Documentation (continued)**

<table>
<thead>
<tr>
<th>Part number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DN1791</td>
<td>KT-CAB3000LDR 71 cm (28 in) Cabinet Dimensions Drawing</td>
</tr>
<tr>
<td>DN1793</td>
<td>KT-CAB4000LDR 107 cm (42 in) Cabinet Dimensions Drawing</td>
</tr>
<tr>
<td>DN1846</td>
<td>KT-400-PCB Dimensions Drawing</td>
</tr>
<tr>
<td>DN1848</td>
<td>KT-400-CAB Dimensions Drawing (UL Listed)</td>
</tr>
<tr>
<td>DN1850</td>
<td>KT-400-CABEU Dimensions Drawing (CE Compliant)</td>
</tr>
<tr>
<td>DN1851</td>
<td>KT-MP400 Mounting Plate Dimensions Drawing</td>
</tr>
<tr>
<td>DN1852</td>
<td>KT-MP500 Mounting Plate Dimensions Drawing</td>
</tr>
</tbody>
</table>

**Dimensions Drawings**

<table>
<thead>
<tr>
<th>Part number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBLK-10</td>
<td>Cable kit, RS-232 cable 30 m (100 ft) with RJ-12 connectors for PC to master KT-400, 740-1023 (DB9F to RJ-12) adaptor and 740-1041 (DB9M to DB25F) adaptor</td>
</tr>
<tr>
<td>USB-485</td>
<td>USB-485 interface, USB cable 0.9 m (3 ft) and USB drivers on CD-ROM</td>
</tr>
<tr>
<td>VC-485</td>
<td>VC-485 interface, RS-232 cable 3 m (10 ft) with RJ-12 connectors, 740-1012 (DB25F to RJ-12) adaptor, 740-1022 (DB9F to RJ-12) adaptor and 740-1033 (DB25M to RJ-12) adaptor</td>
</tr>
<tr>
<td>KT-3LED-PLATE</td>
<td>Three-color LED alarm indicator mounted on single plate</td>
</tr>
<tr>
<td>KT-ACPW-LED</td>
<td>AC power LED indicator</td>
</tr>
<tr>
<td>KT-LOCK</td>
<td>Keylock for cabinet with 2 keys</td>
</tr>
<tr>
<td>KT-SW1224</td>
<td>Internal Power Supply 12 VDC, 2 Amps, 24 Watts for KT-MOD Expansion Modules only</td>
</tr>
<tr>
<td>KT-SMP3</td>
<td>Internal Power Supply 12 VDC, 2.5 Amps, 30 Watts for KT-400-EU model only</td>
</tr>
<tr>
<td>KT-TAMPER</td>
<td>Tamper switch for cabinet</td>
</tr>
<tr>
<td>KT-400-CON</td>
<td>KT-400 removable terminal block spare kit</td>
</tr>
<tr>
<td>TR1675</td>
<td>Transformer Class 2 wire-in, 120 VAC 60 Hz IN; 16.5 VAC, 75 VA OUT, UL Listed</td>
</tr>
<tr>
<td>TR16100-240V</td>
<td>Transformer, 240 VAC 50 Hz 100 VA IN; 16.5 VAC OUT, CE Compliant</td>
</tr>
</tbody>
</table>
### Models Information

- **KT-400**: Cabinet with one KT-400 for North America, up to two expansion modules can be installed in the cabinet.
- **KT-400-PCB**: KT-400 with parts,
- **KT-400-ACC**: Accessory kit,
- **KT-400-CAB**: Cabinet only for North America,
- **KT-400-EU**: Cabinet with KT-400, transformer, power supply and fuse terminal block for European Union,
- **KT-400-CABEU**: Cabinet only for European Union.

### Table 2: Models Bills of Material

<table>
<thead>
<tr>
<th>Item Description</th>
<th>KT-400 (Notes 1, 2 &amp; 5)</th>
<th>KT-400-PCB (Note 2)</th>
<th>KT-400-ACC (Notes 1 &amp; 5)</th>
<th>KT-400-CAB (Notes 1, 2, 3 &amp; 5)</th>
<th>KT-400-EU (Notes 1, 2, 3 &amp; 5)</th>
<th>KT-400-CABEU (Notes 1 &amp; 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>KT-400 PCB</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cabinet</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>KT-400-ACC Accessory Kit</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ground wire (PCB to cabinet)</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ground wire (door to cabinet)</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Tamper switch</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Battery cable</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>1 (Note 4)</td>
<td>1</td>
</tr>
<tr>
<td>Resistor 5.6K, 0.5W</td>
<td>-</td>
<td>-</td>
<td>32</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Resistor 1K, 0.5W</td>
<td>-</td>
<td>-</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fuse terminal block</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>240 VAC 100 VA IN, 16.5 VAC OUT, Transformer</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 VDC, 2.5 Amps, 30 W SMP3 Power Supply</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Inner door sticker for North America, DN1762, Figure 14</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inner door sticker for European Union, DN1763, Figure 15</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>1</td>
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<tr>
<td>Installation Manual DN1725 - French</td>
<td>1</td>
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<tr>
<td>Installation Manual DN1726 - English</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
</tbody>
</table>

**Note 1**: The KT-400, KT-400-CAB, KT-400-EU and KT-400-CABEU models also include the KT-LOCK.

**Note 2**: The KT-400, KT-400-PCB and KT-400-EU models also include screws and locknuts.

**Note 3**: The KT-400-EU model also includes additional screws and cables.

**Note 4**: The battery cable is different for the KT-400 and KT-400-EU.

**Note 5**: The recommended four (4) stainless steel tapping screws #8, 32 mm (1.25 in) to mount the cabinet are not included.
Installing the KT-400 Ethernet Four-Door Controller

Preparing to Install the KT-400 Ethernet Four-Door Controller

- **Required to install KT-400 Ethernet Four-Door Controller**
  - For North America: AC transformer 120 VAC 60 Hz IN; 16.5 VAC, 75 VA OUT; class 2 (not included)
  - For EMEA (Europe, Middle East and Asia): AC transformer 240 VAC 50 Hz 100 VA IN; 16.5 VAC OUT; (included in KT-400-EU)
  - One battery 12 VDC, 7 Ah (not included)
  - Ground clamp (not included)

A visual inspection should be made when unpacking the KT-400 Ethernet Four-Door Controller. Any missing item/part or damaged component should be reported immediately.

Physical Installation

- **Check for ideal indoor location**
- **Stay away from electrical or communication devices**

The KT-400 cabinet has been designed to be mounted on a wall without any additional enclosures. The cabinet is large enough to accommodate the battery backup supply and the necessary wiring connections for most applications. EMT (Electrical Metallic Tubing) conduit knockouts are provided in 1.9 cm (0.75 in) on all sides of the cabinet.

The cabinet should be mounted indoors, in a secure location providing normal temperature and humidity, leaving 23 cm (8 in) clear space around all sides and a minimum of 33 cm (13 in) clear space in front of the cabinet. The location should be easily accessible for servicing the equipment and it is recommended that controllers be located close to the controlled doors.

Controllers must be located at a minimum distance of 2 m (6 ft) from any high voltage equipment or wiring and from electrical equipment susceptible of generating electrical interference, at a minimum distance of 1 m (3 ft) from telephone equipment or lines, and at a minimum of 8 m (25 ft) from any transmitting equipment. Physical access, using keys, on controlled doors must be provided so that the KT-400 Ethernet Four-Door Controller can easily be accessed for servicing in case of malfunction.

Earth Grounding

- **AWG #18 grounding wire to EGND**

Since the KT-400 Ethernet Four-Door Controller uses high performance communication, proper grounding must be provided to ensure proper operation.

An AWG #18 single conductor copper wire must be used to ground each controller to good earth ground as per the local electrical code (be careful with ground loops). The ground clamp should be located below any other ground.

Door Locking Devices

- **Connect the door lock device to + and LK1-, (+ and LK2-), (+ and LK3-) or (+ and LK4-)**

  **Note:** If you need additional power for ALL the external locks, you can use an external power supply. Connect the power supply to the VIN and GND terminals and put jumper JP4 on EXT.

- **When jumper JP4 is on INT, the total maximum current draw is 1 Amp at 11.2 to 13.75 VDC, or**

- **When jumper JP4 is on EXT, the total maximum current draw is 2.5 Amps for the KT-400-EU, or 3.0 Amps at 11.2 to 28 VDC for the KT-400.**

- **Check for local “magnetic lock” regulations**

  LK1-, LK2-, LK3- and LK4- and + terminals are located near the battery (BATT) terminals. The locking device outputs are controlled according to the end-user programmed parameters for allowing access to or unlocking doors according to schedules and access levels. These doors locking device outputs can operate DC powered locking devices such as electromechanical strikes and can be configured to operate fail-safe or fail-secure (normal or reverse action).

  **Note:** Use 1 K ohm EOL (End-of-Line resistor) between + and LK- terminals if not used.
Warning: Controlled door locks may be governed by regulatory bodies and should always be installed according to local regulations. In most instances, there are strict limitations to installing fail-secure devices and fail-safe locking devices such as magnetic locks or other similar locking devices on doors used as emergency exits.

**Hooking Up Inputs**

- **Connect devices to inputs 1 to 16**
- **Resistors for all inputs 5.6K ohm (if selected)**
  The KT-400 has an on-board capability of monitoring 16 input points (expandable to 256 with expansion modules). Each onboard input is supervised with or without end-of-line resistors (5.6K ohm). The maximum distance of one line is 600 m (2,000 ft) with AWG #22 in a single or double EOL configuration.

**Note:** Onboard Inputs can be defined with: none, single or double EOL (End-of-Line) resistor(s) according to your EntraPass software settings.

Inputs 1-2 are automatically reserved for the first controlled door. The contact is assigned input 1 and the associated request-to-exit detector as input 2. Inputs 5 and 6 are automatically reserved for the second controlled door. The contact is assigned input 5 and the associated request-to-exit detector as input 6. Inputs 9 and 10 are automatically reserved for the third controlled door. Inputs 13 and 14 are automatically reserved for the fourth controlled door. There is no obligation to follow these rules but this standard convention facilitates servicing.

![Diagram of KT-400 panel connections](image)

- **Connect readers and keypads**
  
  **READER CONNECTION TERMINAL WARNING**
  Connecting the red wire lead (or power lead) of a 5 VDC reader to the 12 VDC terminal may damage the reader. See your reader installation procedure for proper power connection. Up to 4 readers can be connected to a KT-400. They can be installed on one door to control both entry and exit or on four separate doors operating independently to control one-way access. The distance between the readers and the KT-400 varies by reader type (please consult the installation manual for details). Auxiliary outputs provide visual and/or audible access operation feedback at the controlled door. Outputs “READER DOOR 1 - OUT1 OUT2 LED & BUZ” are used for the first door, “READER DOOR 2 - OUT1 OUT2 LED & BUZ” are used for the second door, “READER DOOR 3 - OUT1 OUT2 LED & BUZ” are used for the third door and “READER DOOR 4 - OUT1 OUT2 LED & BUZ” are used for the fourth door.
Relay Controlled Outputs
The KT-400 provides four relay outputs RELAY1 to RELAY4 (3 Amps, 30 VAC/VDC). The KT-400 can be expanded up to 256 controlled outputs when using expansion modules.

- The KT-MOD-OUT16 module provides 16 outputs at a maximum of 750 mA per output.
- The KT-MOD-REL8 module provides 8 relay outputs at a maximum of 3 Amps per relay.

*Note:* Since the KT-400 maximum output current draw on the SPI expansion port is 500 mA when the 12V AUX terminals are not used, an external power supply of 12 VDC, 2 Amps is required when adding expansion modules to the same KT-400. See “SPI Expansion Port” on page 24 for additional details concerning the external power supply requirement for expansion modules.

Auxiliary Outputs
- **Connect auxiliary outputs to readers and local warning devices**
  Auxiliary outputs are used for visual and audible signal. They can be activated according to input conditions or events and local alarms. Auxiliary outputs “READER DOOR 1 to 4 - LED” provide visual feedback of access operation, and auxiliary outputs “READER DOOR 1 to 4 - BUZ” can activate audible warning devices, such as T-REX or reader buzzer, to signal door alarms.

Tamper Protection
- **Install tamper switch on cabinet**
  A tamper switch must be installed on the unit to detect unauthorized cabinet opening.
  The normally closed tamper switch must be connected to the dedicated tamper input, next to the EGND.

*Note:* The tamper switch is required for a UL listed installation.
Connecting the KT-400 Ethernet Four-Door Controller

Connecting the VC-485 or the USB-485 to the RS-485 Bus

☐ Connect the RS-485 cable to (COM1) + 485 - and the RS-485 signal ground to the 12 VDC AUX - (negative)

Controllers are linked together through their RS-485 terminals. The maximum communication loop length is 1.2 km (4,000 ft) using appropriate cabling. The RS-485 communication loop should be wired with Ethernet Category 3 double twisted pair network cable or better. The RS-485 loop can operate from 1200 to 115200 Bauds under normal conditions. Intermittent communication problems or erratic operation may require network speed drops to 9600 or 19200 Bauds. Varying the network speed does not perceptibly change the operation speed of the system.

Note 1: Most installations should be set to 38400 Bauds.

Note 2: Connecting several KT-400 at a single point is not recommended neither are splitters or spider web (star) networks.

Note 3: If the 12 VDC - is already used, the RS-485 signal ground can be connected to the other GND terminals on the KT-400. The EGND (earth ground) terminal cannot be used for signal ground, only use the GND and 12 VDC - (negative) terminals for signal ground.

Note 4: There is no end-of-line resistor to install on the RS-485 COM1 terminals on the last KT-400 controller of a loop.

Note 5: If you must make up your own RS-232 cable with a RJ-12 connector, refer to the following diagram for the RJ-12 pin-out.
Connecting the Master Controller to the Host PC via RS-232

- **Connect RS-232 cable from KT-400 to the PC (maximum length 30 m (100 ft))**
  
  If the local master controller is located more than 30 m (100 ft) from the host computer, you must use a VC-485 or USB-485 interface.

**Note 1:** The CBLK-10 kit includes 30 m (100 ft) of RS-232 cable with RJ-12 connectors and the 740-1023 (DB9F to RJ-12) adaptor

**Note 2:** If you must make up your own RS-232 cable with RJ-12 connectors, refer to the following diagram for the RJ-12 pin-out.

---

### Connecting over Corporate Network (LAN)

If the master controller is used in a LAN-enabled corporate setting, use the RJ-45 Ethernet port to connect the controller to the corporate network. This method uses existing wiring for data exchange between EntraPass and the controllers.

### Powering the KT-400 Ethernet Four-Door Controller

- **Install transformer, if applicable**
- **Place battery in cabinet**
- **Power up the KT-400 Ethernet Four-Door Controller**

  The KT-400 must be powered by a wire-in or plug-in transformer. After you have completed all the necessary steps, you can power up the KT-400. Connect AC power and connect the battery. Once powered, check the Heartbeat LED status indicator to determine the communication status and other vital parameters. Consult Table 1 for Heartbeat LED behavior identifications.

  If the AC supply is removed, the 12 VDC, 7 Ah backup battery will support normal operation for up to 12 hours, if fully charged. Internal battery verification will cutoff battery power if the battery voltage level falls below 9.5 Volts.

**Note:** The KT-400 will not start on battery power alone.

**Power should only be applied to the unit when all connections are completed and tested.**
SPI Expansion Port

The SPI (Serial Peripheral Interface) expansion port on the KT-400 is used to connect expansion modules, in order to add more inputs and outputs such as relays. The maximum current draw for the SPI expansion port is 500 mA when the 12V AUX terminals are not used. The 6-pin SPI cable must be connected to the SPI IN of the first module. See Figure 9 and Figure 11 for examples of interconnection between the KT-400 and expansion modules.

Figure 9: KT-400 Interconnection Examples with Expansion Modules

The number of expansion modules that can be connected to the KT-400 SPI expansion port, without an additional external power supply, can vary depending how much current is drawn from all the modules in the SPI chain.

Check the following table to calculate the SPI chain current draw:

<table>
<thead>
<tr>
<th>Expansion Module</th>
<th>Qty of modules x Maximum current draw</th>
<th>Total Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>KT-MOD-REL8</td>
<td>_______ x 330 mA</td>
<td>______ mA</td>
</tr>
<tr>
<td>KT-MOD-INP16</td>
<td>_______ x 40 mA</td>
<td>______ mA</td>
</tr>
<tr>
<td>KT-MOD-OUT16</td>
<td>_______ x 750 mA</td>
<td>______ mA</td>
</tr>
</tbody>
</table>

Maximum current draw from KT-400 SPI expansion port when the 12 VDC AUX terminals are not used. - 500 mA

If the total current is between 0 mA and 1850 mA (1.85 Amps), 1 external power supply is required. If the total current is between 1851 mA and 3700 mA (3.70 Amps), 2 external power supply are required.

Example of current draw calculation:
1. 15 modules (KT-MOD-OUT16) x 750 mA = 11250 mA
2. 11250 mA - 500 mA (or 0 mA if the 12 VDC AUX of the KT-400 is used) = 10750 mA
3. 10750 mA divided by 1850 mA = 5.8 which means in fact 6 external power supplies 12 VDC, 2 Amps are required.  
4. Connect an external power supply at every expansion module where the current draw has reached 1.85 Amps. 
5. Make sure the power jumper on the modules is in the correct position when using external power supply(ies).
Important Installation Rules about Expansion Modules

**Note 1:** The maximum current draw must be calculated each time there is a new module added to the SPI chain.

**Rule 2:** The SPI cable, between the KT-400 and the 1st module or between each module, cannot exceed 1 m (3 ft). Shielded wire should only be used in areas with excessive RF noise of electromagnetic interference. Keep in mind that the expansion modules must be defined in the EntraPass system when they are installed.

**Rule 3:** There is already 4 relays available on the KT-400 Ethernet Four-Door Controller. Don't forget to check the relays number assignments to prevent redundancy unless it has been planned on purpose.

For more details concerning the expansion modules, refer to the following documents:

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DN1775</td>
<td>KT-MOD-INP16 Install Sheet - French version</td>
</tr>
<tr>
<td>DN1776</td>
<td>KT-MOD-INP16 Install Sheet - English version</td>
</tr>
<tr>
<td>DN1780</td>
<td>KT-MOD-OUT16 Install Sheet - French version</td>
</tr>
<tr>
<td>DN1781</td>
<td>KT-MOD-OUT16 Install Sheet - English version</td>
</tr>
<tr>
<td>DN1785</td>
<td>KT-MOD-REL8 Install Sheet - French version</td>
</tr>
<tr>
<td>DN1786</td>
<td>KT-MOD-REL8 Install Sheet - English version</td>
</tr>
<tr>
<td>DN1805</td>
<td>KT-MOD-CAB Install Sheet - French version</td>
</tr>
<tr>
<td>DN1806</td>
<td>KT-MOD-CAB Install Sheet - English version</td>
</tr>
<tr>
<td>DN1833</td>
<td>KT-MOD-CABEU Install Sheet - French version</td>
</tr>
<tr>
<td>DN1834</td>
<td>KT-MOD-CABEU Install Sheet - English version</td>
</tr>
<tr>
<td>DN1790</td>
<td>KT-MOD-INP16, -OUT16 and -REL8 Expansion Modules Dimensions Drawing</td>
</tr>
<tr>
<td>DN1792</td>
<td>KT-MOD-CAB Dimensions Drawing</td>
</tr>
<tr>
<td>DN1794</td>
<td>KT-MOD-CABEU Dimensions Drawing</td>
</tr>
<tr>
<td>DN1795</td>
<td>KT-MP200 Mounting Plate for KT-MOD-INP16, -OUT16 and -REL8 Expansion Modules Dimensions Drawing</td>
</tr>
</tbody>
</table>
Figure 10: PCB View of Expansion Modules

KT-MOD-INP16 KT-400 Expansion Module 16-Zone Input with SPI Cable

SPI CONNECTION TO INPUT MODULES ONLY (KT-MOD-INP16)

KT-MOD-REL8 KT-400 Expansion Module 8-Relay with SPI Cable

SPI CONNECTION TO OUTPUT MODULES ONLY (KT-MOD-REL8 and KT-MOD-OUT16)

KT-MOD-OUT16 KT-400 Expansion Module 16-Output with SPI Cable

SPI CONNECTION TO OUTPUT MODULES ONLY (KT-MOD-REL8 and KT-MOD-OUT16)
Figure 11: Example of KT-400 Ethernet Four-Door Controller Interconnection with Expansion Modules
Figure 12: Expansion Modules Cabinets for North America and European Union

KT-MOD-CAB for North America with Optional Expansion Modules (6 max)

KT-MOD-CABEU for European Union with Optional Expansion Modules (4 max) and Optional Power Equipment
# Troubleshooting

## Table 3: Reset Types and Descriptions

<table>
<thead>
<tr>
<th>Jumpers</th>
<th>Heartbeats</th>
<th>Patterns</th>
<th>Resets</th>
</tr>
</thead>
</table>
| JP2 & JP3 | Continuous quick flashing | ![Continuous Pattern](image) | **Soft Reset:**  
When JP2 and JP3 are ON, the controller will reset on a) power up, b) pushbutton, or c) EntraPass software 'Manual operator soft reset':  
- All controller’s memory definitions and parameters are verified and kept intact if still valid.  
- With a corporate gateway, the internal event buffer is maintained if still valid.  
- With a global gateway, the internal event buffer is cleared.  
- IP address is kept if valid.  
- Controller generates the appropriate message: a) 'Power ON Soft Reset' b) 'Manual Pushbutton Soft Reset' c) 'Operator Soft Reset'. |
| JP2 & JP3 | 4 short pulses | ![4 Short Pulses Pattern](image) | **Hard Reset:**  
When JP2 is OFF and JP3 is ON:  
- All controller’s memory is settled to default values.  
- Internal event buffer is cleared.  
- IP address is kept if valid.  
- Controller generates the message, 'Controller Hard Reset'.  
- Internal RTC (Real Time Clock) and clock are settled to the default time and date values January 1st 2005, 00:00:00, Saturday. |
| JP2 & JP3 | 3 long pulses | ![3 Long Pulses Pattern](image) | **Forced Default Static:**  
When JP2 is ON and JP3 is OFF:  
- Same as 'Soft Reset' condition, except IP address is forced to the default static IP: 192.168.1.2. |
| JP2 & JP3 | Continuous long pulses | ![Continuous Long Pulses Pattern](image) | **Factory Default DHCP:**  
When JP2 and JP3 are OFF:  
- All controller’s memory is settled to default values.  
- Internal event buffer is cleared.  
- Controller generates the message 'Controller Factory Default Reset'.  
- The Ethernet port reverts to DHCP configuration and waits for an IP address from the local DHCP server.  
- Internal RTC and clock are settled to the default time and date values January 1st 2005, 00:00:00, Saturday. |
Table 4: AC and DC Power LED Status Indicators

<table>
<thead>
<tr>
<th>AC Power LED</th>
<th>DC Power LED</th>
<th>Status Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>ON</td>
<td>ON</td>
<td>• The AC power is present. • The DC power level is sufficient for all DC operations such as the readers, outputs and the 12V AUX.</td>
</tr>
<tr>
<td>ON</td>
<td>OFF</td>
<td>• The AC power is below minimum requirements, and • the 12V rechargable backup battery is either not connected, or • its voltage is below minimum requirements.</td>
</tr>
<tr>
<td>OFF</td>
<td>ON</td>
<td>• The KT-400 is running on the 12V rechargable backup battery only.</td>
</tr>
</tbody>
</table>

Default initialization

The KT-400 default initialization or Factory Default DHCP is done at Kantech. The following steps should only be followed if:

a) You want to configure the KT-400 with the KT-Finder, see page 33.

b) The KT-400 was communicating via the RS-232 port and you have installed a VC-485 or USB-485 to communicate via the RS-485 port.

c) The KT-400 was communicating via a VC-485 or a USB-485 interface and you want to communicate directly with the serial (RS-232) port.

d) You are using a KT-400 from another site and there is no communication.

How to reset the KT-400 Ethernet Four-Door Controller for Factory Default DHCP mode

Before you start:

• Locate the reset button, the two jumpers JP2 - JP3 and the blue Heartbeat LED.

• The Ethernet cable must be connected to the corporate network. The green LINK LED should lit and the yellow TXRX LED should be flashing.

• The blue Heartbeat LED should be flashing.

1. Remove JP2 and JP3 jumpers as described in Table 3 for Factory Default DHCP mode.

2. Press the reset button.

3. Check the blue Heartbeat LED heartbeat pattern.

4. Verify the IP address with the KT-Finder, see page 33.


6. Configure the KT-400 with the KT-Finder, see page 33.

Figure 13: KT-400 Factory Default Steps
KT-400 Ethernet Four-Door Controller Maintenance Recommendations

Important: Only a technician should perform the following maintenance recommendations.

The KT-400 includes a lithium-ion rechargeable battery (see the KT-400 Ethernet Four-Door Controller PCB View on page 8). This battery must be replaced by a Technician ONLY to avoid any risk of explosion. If the lithium-ion battery stops working, return the PCB to Kantech. Do not crush, puncture, open, disassemble or otherwise mechanically interfere with the battery. Do not try to recharge the battery. If you need to dispose of the PCB and/or the lithium-ion battery, wrap the KT-400 in non-conductive tape. Check with your local authorities for battery disposal regulations.

Warning: Do not store the batteries in such a way that they come into contact with each other or with any piece of metal. Explosion or fire may occur. Should fire occur, use only dry chemical fire extinguishers. Do not use water to put out the fire. Do not heat the batteries. Do not dispose of the batteries or PCB in a fire. Do not disassemble the batteries. Do not apply pressure to or deform the batteries. Ensure that the above precautions are strictly observed by related departments, including, but not limited to, production, sales and outside contractors.

Regarding the recommended backup battery 12 VDC / 7 Ah: It is the technician’s responsibility to assure that the disposal of used batteries is made according to the waste recovery and recycling regulations applicable to the intended market. Use the recommended battery type ONLY.

It is highly recommended to test the KT-400 by performing the following tests:

1) Biannual test for battery:
   Remove AC power from the controller and let it work on battery backup power for one hour. This test will ensure that in the event of a power failure, the battery will be able to support normal operations. This test should be performed twice a year. Once the test has been performed successfully, reconnect AC power to the controller.

2) Annual test for emergency lithium-ion battery:
   Measure voltage of lithium-ion battery when power is totally removed from the controller (AC, DC and backup battery power). To ensure maximum operation and to prevent loss of the database, contact your distributor to return the KT-400 for maintenance if the lithium-ion battery voltage measures below 2.5 VDC.
Configuring the KT-400 Ethernet Four-Door Controller with the Web Configuration Page

This procedure is practical if you want to configure the KT-400 in advance before going on site.

Optional Documentation
Application Note, Networking Basics, DN1796.

Before you start
• The detachable Network Configuration Information Sheet is fully completed.
• Determine your connection to the KT-400 and choose the appropriate network cable that you need.

1. Make sure the KT-400 is in Forced Default Static mode before starting the configuration. Verify the heartbeat patterns to determine the status. See Table 3 on page 29 for details.
2. Start your web browser and enter the following IP: 192.168.1.2 and press Enter.

Note: Event though the KT-400 is in Forced Default Static mode, the DHCP status displays Enable. Make sure to change it accordingly when entering the parameters from the Network Configuration Information Sheet.

4. Enter the IP addresses as per the Network Configuration Information Sheet.
5. Select a Protocol (TCP or UDP)
6. Enter a Port (UDP only)
7. Click on Save configuration to KT-400.
8. When you will go to the site with the configured KT-400, you will have to enter the same details into the EntraPass workstation.
Configuring the KT-400 Ethernet Four-Door Controller with the KT-Finder

The KT-Finder is an application used to configure the KT-400 over the local area network (LAN) or the wide area network (WAN). It doesn’t require any installation.

Important: The KT-Finder application is:

- located in C:\Program Files\Kantech\Server_xE\Bin,
- on the EntraPass CD-ROM,
- available as a free download from http://www.kantech.com

1. Quit all EntraPass applications.
2. Make sure the KT-400 is in Factory Default DHCP mode. See Table 3 on page 29.
3. Start the KT-Finder.

   Note: If you try to run the KT-Finder while running EntraPass, you will get an error message similar to this.

4. Select KT-400 from the Device menu.
5. Enter the MAC address of the KT-400 then click on Connect.

6. When the KT-400 is found, the configuration page displays.
8. Verify your Network Configuration Information Sheet:
   - Enter the EntraPass IP address or the Domain name of the EntraPass Gateway. This information must be the same as entered in EntraPass workstation for Devices > Site.
   - Select Obtain an IP address automatically or Use the following IP address. This information must be the same as entered in EntraPass workstation for Devices > Site.
9. Select a Protocol (UDP or TCP).
10. Change the Port number, if required (not applicable in TCP).
    
    **Note:** The port number should only be changed when you have more than one KT-400 at the same remote site.
11. Click OK.
12. Repeat the procedure for each KT-400 at this site.
KT-400 Ethernet Four-Door Controller
Network Configuration Information Sheet

Please complete one sheet per KT-400 Ethernet Four-Door Controller

Company Name:
Site Name:

☐ LAN or ☐ WAN (see other side)

Configuration in a Local Area Network (LAN)


MAC Address: 00:50:F9:______:______:______
Protocol: __________
Port (18810 by Default) or __________ (UDP only)

IP Address Type:

☐ DHCP

or

☐ Static

IP Address: ______.______.______.______
Subnet Mask: ______.______.______.______
Default Gateway (Router): ______.______.______.______

EntraPass Special Edition / Corporate Gateway

☐ IP Address: ______.______.______.______
Configuration in a Wide Area Network (WAN)

EntraPass Site

EntraPass Special Edition / Corporate Gateway
IP Address: ______.______.______.______

Router
☐ Public IP Address: ______.______.______.______
or
☐ Domain name: ____________________________

Port Forwarding Checklist

EntraPass Gateway Ports: ☐ 18001 (UDP) and ☐ 18801 (UDP) or 18802 (TCP)

KT-400 Ethernet Four-Door Controller Site
MAC Address: 00:50:F9: ______:______:______
IP Address Type: ☐ Static or ☐ Reserved DHCP
IP Address: ______.______.______.______
Subnet Mask: ______.______.______.______
Default Gateway (Router): ______.______.______.______
DNS Server IP Address: ______.______.______.______

Router
☐ Public IP Address: ______.______.______.______
or
☐ Domain name: ____________________________

Port Forwarding Checklist
Note: If you are using more than one KT-400 at the same remote site, you must use a unique port number for each KT-400.

KT-400 Ports: ☐ 18803 (UDP) and ☐ 18810 (UDP) or ______
Note: No port forwarded to the KT-400 if used in TCP.
Installation Checklist

To the Installer: If you are familiar with the installation, you can use the checklist with the □ symbol.

Installing the KT-400 Ethernet Four-Door Controller

Preparing to install the KT-400 Ethernet Four-Door Controller

☐ Required to install KT-400 Ethernet Four-Door Controller

Physical Installation

☐ Check for ideal indoor location
☐ Stay away from electrical or communication devices

Earth Grounding

☐ AWG#18 grounding wire to EGND

Door Locking Devices

☐ Connect the door locked device to + and LK1-, (+ and LK2-), (+ and LK3-), or (+ and LK4-)

☐ When jumper JP4 is on INT (internal), the maximum current draw is 1 Amp at 11.2 to 13.75 VDC, or
☐ When jumper JP4 is on EXT (external), the maximum current draw is 2.5 Amps for the KT-400-EU, or
3.0 Amps at 11.2 to 28 VDC for the KT-400.

☐ Check for local “magnetic lock” regulations

Hooking Up Inputs

☐ Connect devices to inputs 1 to 16
☐ Resistors for all inputs 5.6K ohm (if necessary)
☐ Connect readers and keypads

Auxiliary Outputs

☐ Connect auxiliary outputs to readers and local warning devices

Tamper Protection

☐ Install tamper switch on cabinet

Connecting the KT-400 Ethernet Four-Door Controller

Connecting the VC-485 or the USB-485 to the RS-485 Bus

☐ Connect the RS-485 cable to (COM1) +485- and the RS-485 signal ground to the 12 VDC AUX - (negative)

Connecting the Master Controller to the Host PC

☐ Connect the RS-232 flat cable from the KT-400 to the PC

Connecting Expansion Modules to the KT-400 SPI Expansion Port

☐ Make sure input and output expansion modules are not in the same SPI group
☐ Calculate maximum current draw and connect external power supply(ies) to expansion module(s), if required
☐ Make sure the power jumper on the modules is in the correct position when using external power supply(ies)

Powering the KT-400 Ethernet Four-Door Controller

☐ Install the transformer, if applicable
☐ Place battery in cabinet
☐ Power up the KT-400 Ethernet Four-Door Controller
# Inputs and Outputs Assignments Sheet

<table>
<thead>
<tr>
<th>Doors</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DOOR 1</td>
<td>CONTACT</td>
<td>REX</td>
</tr>
<tr>
<td>DOOR 2</td>
<td>CONTACT</td>
<td>REX</td>
</tr>
<tr>
<td>DOOR 3</td>
<td>CONTACT</td>
<td>REX</td>
</tr>
<tr>
<td>DOOR 4</td>
<td>CONTACT</td>
<td>REX</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inputs</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DOOR Z1</td>
<td>NO or NC</td>
<td>EOL, DRY or DEOL</td>
<td></td>
</tr>
<tr>
<td>REX Z2</td>
<td>NO or NC</td>
<td>EOL, DRY or DEOL</td>
<td></td>
</tr>
<tr>
<td>INPUT Z3</td>
<td>NO or NC</td>
<td>EOL, DRY or DEOL</td>
<td></td>
</tr>
<tr>
<td>INPUT Z4</td>
<td>NO or NC</td>
<td>EOL, DRY or DEOL</td>
<td></td>
</tr>
<tr>
<td>DOOR Z5</td>
<td>NO or NC</td>
<td>EOL, DRY or DEOL</td>
<td></td>
</tr>
<tr>
<td>REX Z6</td>
<td>NO or NC</td>
<td>EOL, DRY or DEOL</td>
<td></td>
</tr>
<tr>
<td>INPUT Z7</td>
<td>NO or NC</td>
<td>EOL, DRY or DEOL</td>
<td></td>
</tr>
<tr>
<td>INPUT Z8</td>
<td>NO or NC</td>
<td>EOL, DRY or DEOL</td>
<td></td>
</tr>
<tr>
<td>DOOR Z9</td>
<td>NO or NC</td>
<td>EOL, DRY or DEOL</td>
<td></td>
</tr>
<tr>
<td>REX Z10</td>
<td>NO or NC</td>
<td>EOL, DRY or DEOL</td>
<td></td>
</tr>
<tr>
<td>INPUT Z11</td>
<td>NO or NC</td>
<td>EOL, DRY or DEOL</td>
<td></td>
</tr>
<tr>
<td>INPUT Z12</td>
<td>NO or NC</td>
<td>EOL, DRY or DEOL</td>
<td></td>
</tr>
<tr>
<td>DOOR Z13</td>
<td>NO or NC</td>
<td>EOL, DRY or DEOL</td>
<td></td>
</tr>
<tr>
<td>REX Z14</td>
<td>NO or NC</td>
<td>EOL, DRY or DEOL</td>
<td></td>
</tr>
<tr>
<td>INPUT Z15</td>
<td>NO or NC</td>
<td>EOL, DRY or DEOL</td>
<td></td>
</tr>
<tr>
<td>INPUT Z16</td>
<td>NO or NC</td>
<td>EOL, DRY or DEOL</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Relay Outputs</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>RELAY 1</td>
<td>NO</td>
<td>NC</td>
</tr>
<tr>
<td>RELAY 2</td>
<td>NO</td>
<td>NC</td>
</tr>
<tr>
<td>RELAY 3</td>
<td>NO</td>
<td>NC</td>
</tr>
<tr>
<td>RELAY 4</td>
<td>NO</td>
<td>NC</td>
</tr>
</tbody>
</table>
Figure 14: KT-400 Cabinet Inner Door Sticker Diagram (North America)

Note concerning output voltage ratings:
- Auxiliary power: 11.2 to 13.75 VDC
- 12 VDC readers: 11.2 to 13.75 VDC
- 5 VDC readers: 5 VDC
- Locks with internal power (JP4 on INT): 11.2 to 13.75 VDC
- Locks with external power (JP4 on EXT): 11.2 to 28 VDC

**KT-ACPW-LED**

**NOTE**: DO NOT CONNECT TO RECEPTACLE CONTROLLED BY A SWITCH

16 VAC, 75 VA OUT
CLASS 2, WIRE IN
120 VAC, 60 Hz IN

**SYSTEM GROUND**

**EARTH GROUND**

**LOCK**

**PEM CABINET**

**12 VDC, 250 mA MAX**

**IF INTERNAL POWER USED**

**SEE NOTE**

(CONNECT TO 1K OHM RESISTOR IF NOT USED)
Figure 15: KT-400-EU Inner Door Sticker Diagram (European Union)

Note concerning output voltage ratings:
Auxiliary power: 11.2 to 13.75 VDC
12 VDC readers: 11.2 to 13.75 VDC
5 VDC readers: 5 VDC