

Kantech Telephone Entry System Installation Guide



DN1769-1908

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KANTECH WARRANTY TERMS

For KANTECH Products Provided With or Without Components or Software

KANTECH Products purchased with or without Components and Software is copyrighted and is purchased under the following limited warranty terms:

Sensomatic Electronics, LLC ("Kantech") warrants the original purchaser that for a period of 2 years from the date of purchase, the product shall be free of defects in materials and workmanship under normal use. During the warranty period, Kantech shall, at its option, repair or replace any defective product upon return of the product to its factory, at no charge for labour and materials. Any replacement and/or repaired parts are warranted for the remainder of the original warranty period or ninety (90) days, whichever is longer. The original purchaser must promptly notify Kantech in writing that there is defect in material or workmanship, such written notice to be received in all events prior to expiration of the warranty period. There is absolutely no warranty on software, and all software products are sold as a user license under the terms of the software license agreement included with the product. The Customer assumes all responsibility for the proper selection, installation, operation and maintenance of any products purchased from KANTECH. Custom products are only warranted to the extent that they do not function upon delivery. In such cases, KANTECH can replace or credit at its option.

International Warranty

The warranty for international customers is the same as for any customer within Canada and the United States, with the exception that Kantech shall not be responsible for any customs fees, taxes, or VAT that may be due.

Warranty Procedure

To obtain service under this warranty, please return the item(s) in question to the point of purchase. All authorized distributors and dealers have a warranty program. Anyone returning goods to Kantech must first obtain an authorization number. Kantech will not accept any shipment whatsoever for which prior authorization has not been obtained.

Conditions to Void Warranty

This warranty applies only to defects in parts and workmanship relating to normal use. It does not cover any of the following, the occurrence of which will void this warranty:

- damage incurred in shipping or handling;
- damage caused by disaster such as fire, flood, wind, earthquake or lightning;
- damage due to causes beyond the control of Kantech, such as excessive voltage, mechanical shock or water damage;
- damage caused by unauthorized attachment, alterations, modifications or foreign objects;
- damage caused by peripherals (unless such peripherals were supplied by Kantech.);
- defects caused by failure to provide a suitable installation environment for the products;
- damage caused by use of the products for purposes other than those for which it was designed;
- damage from improper maintenance; and
- damage arising out of any other abuse, mishandling or improper application of the products.

Items Not Covered by Warranty

In addition to the items which void the Warranty, the following items shall not be covered by Warranty: (i) freight cost to the repair centre; (ii) products which are not identified with KANTECH's product label and lot number or serial number; (iii) products disassembled or repaired in such a manner as to adversely affect performance or prevent adequate inspection or testing to verify any warranty claim. Access cards or tags returned for replacement under warranty will be credited or replaced at KANTECH's option. Products not covered by this warranty, or otherwise out of warranty due to age, misuse, or damage shall be evaluated, and a repair estimate shall be provided. No repair work will be performed until a valid purchase order is received from the Customer and a Return Merchandise Authorization number (RMA) is issued by KANTECH's Customer Service. Kantech's liability for failure to repair the product under this warranty after a reasonable number of attempts will be limited to a replacement of the product, as the exclusive remedy for breach of warranty. Under no circumstances shall Kantech be liable for any special, incidental, or consequential damages based upon breach of warranty, breach of contract, negligence, strict liability, or any other legal theory. Such damages include, but are not limited to, loss of profits, loss of the product or any associated equipment, cost of capital, cost of substitute or replacement equipment, facilities or services, down time, purchaser's time, the claims of third parties, including customers, and injury to property. The laws of some jurisdictions limit or do not allow the disclaimer of consequential damages. If the laws of such a jurisdiction apply to any claim by or against KANTECH, the limitations and disclaimers contained here shall be applicable to the greatest extent permitted by law. Some states do not allow the exclusion or limitation of incidental or consequential damages, so that the above may not apply to you.

Disclaimer of Warranties

This warranty contains the entire warranty and shall be in lieu of any and all other warranties, whether expressed or implied (including all implied warranties of merchantability or fitness for a particular purpose) and of all other obligations or liabilities on the part of Kantech. Kantech neither assumes responsibility for, nor authorizes any other person purporting to act on its behalf to modify or to change this warranty, nor to assume for it any other warranty or liability concerning this product. This disclaimer of warranties and limited warranty are governed by the laws of the state of New York.

WARNING:

Kantech recommends that the entire system be completely tested on a regular basis. However, despite frequent testing, and due to, but not limited to, criminal tampering or electrical disruption, it is possible for this product to fail to perform as expected.

Out of Warranty Repairs

Kantech will at its option repair or replace out-of-warranty products which are returned to its factory according to the following conditions. Anyone returning goods to Kantech must first obtain an authorization number. Kantech will not accept any shipment whatsoever for which prior authorization has not been obtained. Products which Kantech determines to be repairable will be repaired and returned. A set fee which Kantech has predetermined and which may be revised from time to time will be charged for each unit repaired. Products which Kantech determines not to be repairable will be replaced by the nearest equivalent product available at that time. The current market price of the replacement product will be charged for each replacement unit.

WARNING - PLEASE READ CAREFULLY

Note to Installers

This warning contains vital information. As the only individual in contact with system users, it is your responsibility to bring each item in this warning to the attention of the users of this system.

System Failures

This system has been carefully designed to be as effective as possible. There are circumstances, however, involving fire, burglary, or other types of emergencies where it may not provide protection. Any access control system of any type may be compromised deliberately or may fail to operate as expected for a variety of reasons. Some but not all of these reasons may be:

- **Inadequate Installation**

An access control system must be installed properly in order to provide adequate protection. Every installation should be evaluated by a security professional to ensure that all access points and areas are covered. Locks and latches on windows and doors must be secure and operate as intended. Windows, doors, walls, ceilings and other building materials must be of sufficient strength and construction to provide the level of protection expected. A reevaluation must be done during and after any construction activity.

- **Criminal Knowledge**

This system contains security features which were known to be effective at the time of manufacture. It is possible for persons with criminal intent to develop techniques which reduce the effectiveness of these features. It is important that an access control system be reviewed periodically to ensure that its features remain effective and that it be updated or replaced if it is found that it does not provide the protection expected.

- **Access by Intruders**

Intruders may enter through an unprotected access point, circumvent a sensing device, evade detection by moving through an area of insufficient coverage, disconnect a warning device, or interfere with or prevent the proper operation of the system.

- **Power Failure**

Control units, readers, exit detectors and many other security devices require an adequate power supply for proper operation. If a device operates from batteries, it is possible for the batteries to fail. Even if the batteries have not failed, they must be charged, in good condition and installed correctly. If a device operates only by AC power, any interruption, however brief, will render that device inoperative while it does not have power. Power interruptions of any length are often accompanied by voltage fluctuations which may damage electronic equipment such as an access control system. After a power interruption has occurred, immediately conduct a complete system test to ensure that the system operates as intended.

- **Motion Detectors - Request to Exit**

Motion detectors can only detect motion within the designated areas as shown in their respective installation instructions. Motion detectors do not provide volumetric area protection. They have multiple beams of detection and motion can only be detected in unobstructed areas covered by these beams. They cannot detect motion which occurs behind walls, ceilings, floor, closed doors, glass partitions, glass doors or windows. Any type of tampering whether intentional or unintentional such as masking, painting, or spraying of any material on the lenses, mirrors, windows or any other part of the detection system will impair its proper operation. Passive infrared motion detectors operate by sensing changes in temperature. However their effectiveness can be reduced when the ambient temperature rises near or above body temperature or if there are intentional or unintentional sources of heat in or near the detection area. Some of these heat sources could be heaters, radiators, stoves, barbecues, fireplaces, sunlight, steam vents, lighting and so on.

- **Component Failure**

Although every effort has been made to make this system as reliable as possible, the system may fail to function as intended due to the failure of a component.

- **Inadequate Testing**

Most problems that would prevent a system from operating as intended can be found by regular testing and maintenance. The complete system should be tested weekly and immediately after a break-in, an attempted break-in, a fire, a storm, an earthquake, an accident, or any kind of construction activity inside or outside the premises. The testing should include all sensing devices, keypads, consoles, alarm indicating devices and any other operational devices that are part of the system.

General Description

Pre-Installation Information

To the Installer: If you are familiar with the installation, you can jump to section **4 - Installing the KTES** or use the **Appendix A - Installation Checklist on page 31** of this manual.

Copyright Information

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Safety Instructions

Important: NEVER INSTALL THE EQUIPMENT DURING A LIGHTNING STORM!

This equipment, Kantech Telephone Entry System, shall be installed and used within an environment that provides the pollution degree max 2 and over voltages category II NON HAZARDOUS LOCATIONS, INDOOR and OUTDOOR. 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).
 - Be permanently connected, fail safe, with double or reinforced insulation between primary and secondary circuits.
 - The ground connection must be provided by the TERMINAL BLOCK at the PE (IEC 60417-5019 symbol) marked connection. It is the installer's responsibility to provide protection against a short circuit on the input (bridge rectifier, C2, etc.).
 - The system requires the integrity of the subscribed telephone line to be operational at all times. If the telephone line is cut off, placed out of service, or shared with other interconnect telephone devices other than the KTES, the unit will not be able to perform its function when required.
2. AVOID **setting up** the equipment near heaters, air conditioners, ventilators. DO NOT select a place that exposes the KTES to 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.
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. **CAUTION:** To reduce the risk of fire, use only AWG #26 or larger telecommunication line cord.
10. **CAUTION:** Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.
11. **Sealant application** is required on all mounting holes and removed knockouts. The draining holes must **not** be blocked by any excess of sealant.
12. **DISCONNECT POWER BEFORE SERVICING.**

Technical Support

For technical support, email access-support@jci.com during business hours or go to:
http://www.kantech.com/Support/Contact_Technical_Support_Advanced.aspx

See the following table for the technical support phone numbers and opening hours.

Country/Region	Phone Numbers
North America Toll Free +1 888 222 1560 (GMT -05:00)	
US and Canada	Direct: +1 450 444 2030 8:00 to 20:00
Latin America (GMT -03:00) 8:00 to 20:00	
Argentina, Buenos Aires	Direct: +5411 5199 3104
Brazil, Sao Paulo	Direct +5511 3181 7377
Chile, Santiago	Direct +562 3210 9662
Colombia, Bogota	Direct +571 344 1422
Colombia, Cali	Direct +572 891 2476
Colombia, Medellin	Direct +574 204 0519
Costa Rica, National	Direct +506 4000 1655
Dominican Republic, Santo Domingo	Direct +1829 235 3047
El Salvador, San Salvador	Direct +503 2136 8703
Guatemala, Guatemala City	Direct +502 2268 1206
Mexico, Mexico City	Direct +5255 8526 1801
Panama, Panama City	Direct +507 836 6265
Peru, Lima	Direct +51 1642 9707
Venezuela, Caracas	Direct +58 212 720 2340
Asia Toll free +800 CALL TYCO / +800 2255 8926 (GMT +08:00) 9:00 to 17:00	
Asia	Direct +8621 6023 0650
China	Direct +400 671 1528
India	Direct +1800 1082 008
Australia	Direct +02 9684 3980
EMEA Toll Free +800 CALL TYCO / +800 2255 8926 (GMT +01:00) 8:00 to 18:00	
Bahrain	Direct +800 04127
Belgium	Direct +0800 76 452
Denmark	Direct +45 4494 9001
France	Direct +0800 90 79 72
Germany	Direct +0800 1806 757

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Country/Region	Phone Numbers
Greece	Direct +00 800 3122 9453
Ireland	Direct +1800 94 35 70
Italy	Direct +39 0230 510 112
Nordic countries	Direct +45 4494 9001
Russia	Direct +81 0800 2052 1031
South Africa	Direct +2721 100 3882
Spain	Direct +900 99 31 61
Turkey	Direct +00800 3192 3007
United Arab Emirates	Direct +800 0310 7123
United Kingdom	Direct +44 330 777 1300

Compliance Specifications

FCC & IC Compliance

- This device complies with FCC 2000 Part 15 Class B (Radiated Emissions, Residential, USA). 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 B digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations. The Kantech Telephone Entry System is also compliant with EN55022:1998, amendment 1:1995, Class B and CISPR 22.
- TIA968 (FCC part 68) Direct Connection to the PSTN (Public Switched Telephone Network) USA.
- FCC Registration Number: **ACTA US: V85OT01BKTES125 REN: 01B**
- DOC - CANADA: The Canadian Department of Communications label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational, and safety requirements. The Department does not guarantee the equipment will operate to the users satisfaction.
 - Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable means of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.
 - Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.
 - Users should ensure, for their own protection, that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.
 - CAUTION: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.
 - In addition, the Kantech Telephone Entry System complies with the CS-03 (Direct Connection to the Public Switched Telephone Network, Canada).
 - DOC registration Number: **IC: 5690B-KTES125**

CE & CB Scheme Compliance

- EN50133-1 Alarm Systems – Access control systems for use in security applications, Europe
- EN55022 Radiated Emissions, Europe
- 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
- ETSI ES 203 021 Harmonized basic attachment requirements for Terminals for connection to analog interfaces of the Telephone Networks, Europe

Australia, New Zealand

- Australia: The AS/ACIF 5002 Direct Connection to the Public Switched Telephone Network
- New Zealand: The PTC200 standard which is described as the following: Direct Connection to the Public Switched Telephone Network, New Zealand
- CISPR 22: Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement
- The ferrite installation is mandatory, see **Connecting the Telephone Line with the Ferrite (KTES-AUS Model for Australia and New Zealand only) on page 24.**

Australia, New Zealand (continued)

GENERAL WARNING: The grant of a telepermit for any item of terminal equipment indicates only that Telecom has accepted that the item complies with minimum conditions for connection to its network. It indicates no endorsement of the product by Telecom, nor does it provide any sort of warranty. Above all, it provides no assurance that any item will work correctly in all respects with another item of Telepermitted equipment of a different make or model, nor does it imply that any product is compatible with all of Telecom's network services.

IMPORTANT NOTICE: Under power failure conditions, the KTES may not operate. Please ensure that a separate telephone, not dependent on local power, is available for emergency use.

This equipment shall not be set up to make automatic calls to the Telecom "111" Emergency Service.

UL Compliance for the KTES-US and the KTES-CDN Models only

The Kantech Telephone Entry System (KTES) complies with the UL 294 which is described by the following: UL Standard for Access Control Equipment, USA. The KTES enables users to grant access to the building, to their visitors, via their own telephone line or cellular telephone. The KTES also supports basic schedule operations for the postal lock supervision and automatic relay activation.

- The KTES can be connected to the PC via IP or RS-485 or internal PTSN to the phone line, these are all supplementary. The KTES must be connected to one of the compatible controllers (KT-300 or KT-400).
- Use only a UL listed transformer available through Kantech distributors or dealers, please refer to the Technical Support contact information to obtain the specific transformer, see page 2.
 - **Kantech part number TR1640P/UL** (manufacturer part number Codex model SEP-1640U)
 - **Kantech part number TR1640P/CSA** (manufacturer part number Codex model SEP/G-1640)
- For UL 294:
 - Only models KTES-US (for installation in the USA) and KTES-CDN (for installation in Canada) are UL listed.
 - If the KTES door lock output is used in fail-secure mode, a listed panic hardware device shall be used to allow emergency exit from the protected area.
 - Electrical specifications, refer to **Table 1 on page 18** and **Table 2 on page 19**.
 - For class 1 installation, the optional camera need to be installed.
- Each KTES will be battery backed up with a KT-BATT-12, 12V/7Ah battery.
- The optional accessories allowed in a UL installation are:
 - Heater kit (part number KTES-HEAT)
 - Postal lock (part number KTES-POSTAL)
 - Color camera (part number KTES-CAM-N)
- The KTES is an access control accessory.
- Humidity test conducted at 90%.
- Compatible card readers are: P225, P325, P600 and Polaris.
- The KTES has an on-board capability of monitoring 4 input points. 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.

UL 294 Performance Levels

	Destructive Attack	Line Security	Endurance	Standby Power
KTES-US	Level I	Level I	Level IV	Level IV
KTES-CDN	Level I	Level I	Level IV	Level IV
KTES-OEM	Level I	Level I	Level IV	Level IV

Standby power achieved when 12 VDC, 7 Ah battery is used.

RoHS (Restriction on Hazardous Substances)

This standard restricts the use of the following substances: Lead, cadmium, mercury, chromium IV, polybrominated biphenyl (PBB), and polybrominated diphenyl ether (PBDE) in electrical and electronic equipment by no later than July 1, 2006.

WEEE (Waste Electrical and Electronic Equipment)

This regulation is used for Waste Electrical and Electronic Equipment, and addresses the disposal and the environmental handling of these products.

Overview

The Kantech Telephone Entry System enables users to grant access to the building, to their visitors, via their own telephone line or cellular telephone. This telephone line can also serve, via an integrated modem, as a programming link and/or a monitoring link. Programmed alarms and troubles can be reported to a pager. The KTES also supports basic schedule operations for the postal lock supervision, automatic door unlock, automatic relay activation, pager and dialup reporting.

The KTES is designed to be a stand-alone unit as well as a part of a complete access control system such as EntraPass from Kantech. The KTES can be connected to a PC via IP or RS-485 or internal PSTN to the phone line. It can communicate with EntraPass through a Corporate gateway for programming and monitoring. The KTES installation can also include Kantech controllers (KT-100, KT-300 and KT-400) as well as any controller that supports a Wiegand interface port.

This manual will describe the installation procedures required to install and power up the KTES. For the configuration of the KTES, refer to the *KTES Programming Manual*, DN1770.

Figure 1: Front Panel Description



Features

Compatible with any Access Controller Supporting a Wiegand Interface Port

- Any access controller with Wiegand reader port(s)
- Kantech KT-100, KT-300 and KT-400 controllers

Note: When the KTES is connected to a controller using the Wiegand interface, the control of the attached lock is managed by the controller. This means the door locking device will be connected to the access controller and not the KTES.

Compatible with all EntraPass Special, Corporate and Global Editions

The Kantech Telephone Entry System is compatible with all EntraPass Editions v4.02 and higher:

- EntraPass Special Edition
- EntraPass Corporate Edition with a Corporate Gateway
- EntraPass Global Edition with a Corporate Gateway

Multiple Configuration Options

- **Visual User Interface (VUI):** The KTES can be configured locally with the VUI, refer to the *Programming Manual*, DN1770 for details concerning the VUI.
- **EntraPass:** The KTES can be configured and monitored through the EntraPass system, refer to the corresponding *EntraPass Reference Manual*, for additional details.

Communication Ports

- 1 10/100Base-T Ethernet for network connection with the EntraPass Gateway
- 1 (TIP and RING) terminal block for phone line connections and for multiple KTES sharing the same telephone line
- 1 RS-485 (COM1) for RS-485 communication with the EntraPass Gateway

Inputs

There are four (4) onboard inputs on the KTES. They are configurable with EOL (End-of-Line) resistor, without EOL resistor, or with double EOL resistors. Respective alarm response timers are also programmable. By default, Input 1 is assigned to the door contact and Input 2 is assigned to the postal lock. Each input can be individually configured for one of the following applications:

- Door Contact
- Postal Lock
- Rex (Request to Exit) Device
- General Supervised Input

DC Powered Lock Output

There is one (1) onboard DC powered lock output and it is supervised.

Relay Outputs

There are three (3) onboard relay controlled outputs. The locking function can also be performed by any onboard relay configured for lock output functionality.

Reader Interfaces

There are two (2) onboard reader interfaces. They can be programmed for one (1) Wiegand input port and one (1) Wiegand output port.

Automatic Port Detection

The KTES can automatically detect the site communication RS-485 speed set by EntraPass as well as the communication port which can be IP (ETHERNET #1), RS-485 (COM1) or Dialup modem.

Upgradable Firmware

The firmware program can be downloaded from any EntraPass workstation to the KTES. The firmware program, stored in the KTES flash memory, is upgraded without having to change any parts.

Trouble and Reporting

The KTES constantly supervises ac power and battery condition and reports “AC Lost”, “Normal Battery”, “Low Battery”, or “No Battery”, status to the EntraPass system. Power outputs are supervised and electronically protected against circuits surges. The locking device is also supervised for short to common and open circuit.

Event Buffer

The event buffer can hold up to 4000 events.

Visual Status Indicators (LEDs)

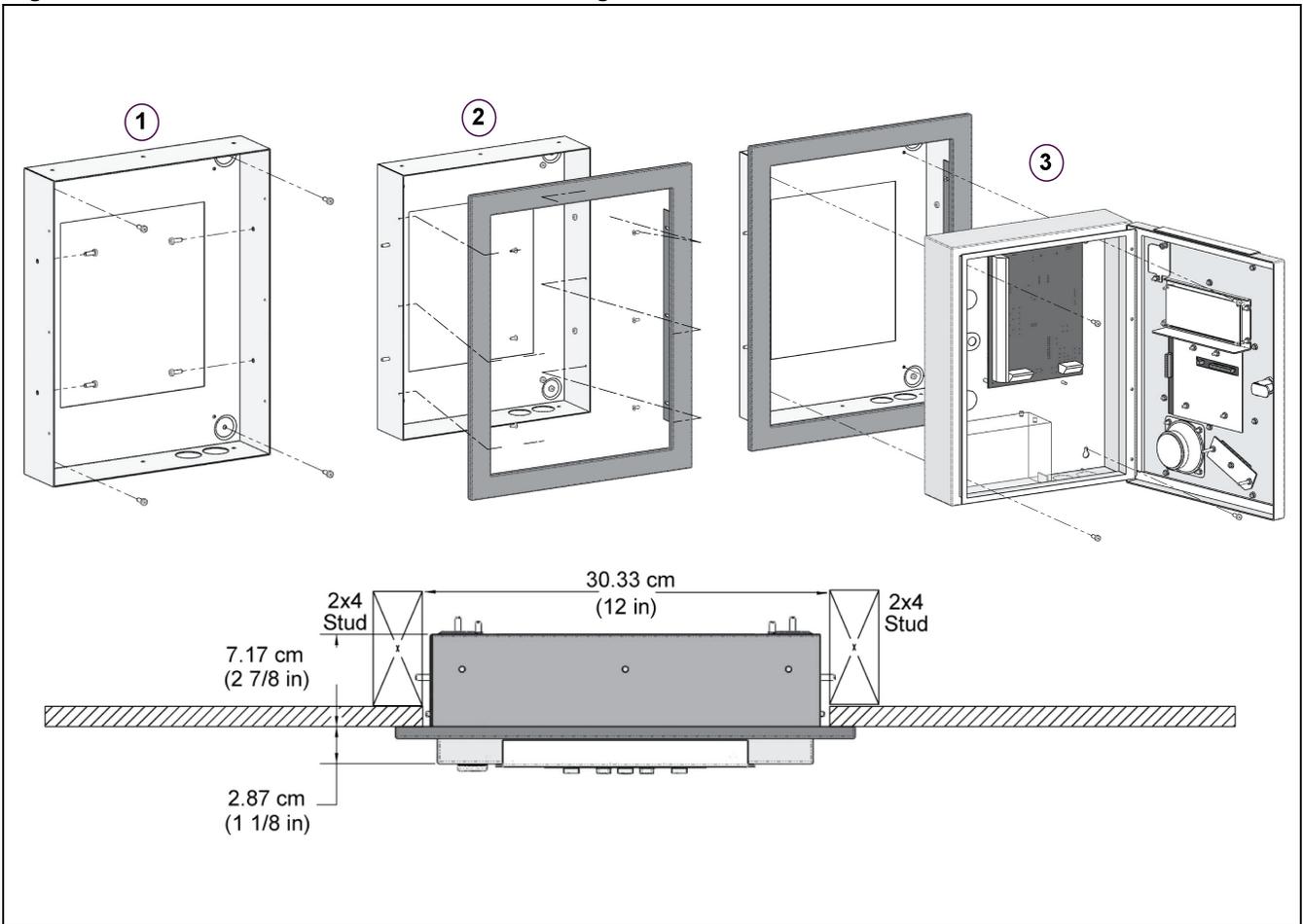
The KTES has multiple status indicators such as for troubleshooting, network activity, power status and outputs activity. See **Figure 8:** for their locations.

- **HEARTBEAT (BLUE):** This LED indicates the working status of the KTES. Refer to **Table 6** for a description of the heartbeat patterns.
- **COM1 RX, COM1 TX (YELLOW):** The RS-485 port LEDs are transmit/receive activity indicators.
- **COM2 RX and COM2 TX (YELLOW):** For future use.
- **OFF-HOOK (RED):** This LED turns ON when the KTES is either dialing or answering a call.
- **LOCK (RED):** This LED turns ON when the lock output is activated.
- **RELAY1, RELAY2 and RELAY3 (RED):** Each relay output has an indicator which turns ON each time the corresponding relay is activated.
- **AC POWER and DC POWER (GREEN):** These LEDs are on when AC and DC power are present.
- **TXRX (YELLOW):** This LED is OFF when there is no Ethernet network or the cable is disconnected; FLASHING when there is an Ethernet cable and network activity; and ON when the network is present.
- **100 (GREEN):** This LED is ON when the KTES is connected to a 100 Base-T Ethernet network.

Optional Accessories

The KTES can be mounted indoor or outdoor directly on the wall (surface mount) or recessed (flush mount). The surface mount is described **4 - Installing the KTES**. The following figures describes the options available with the KTES. Each option has its own install sheet included.

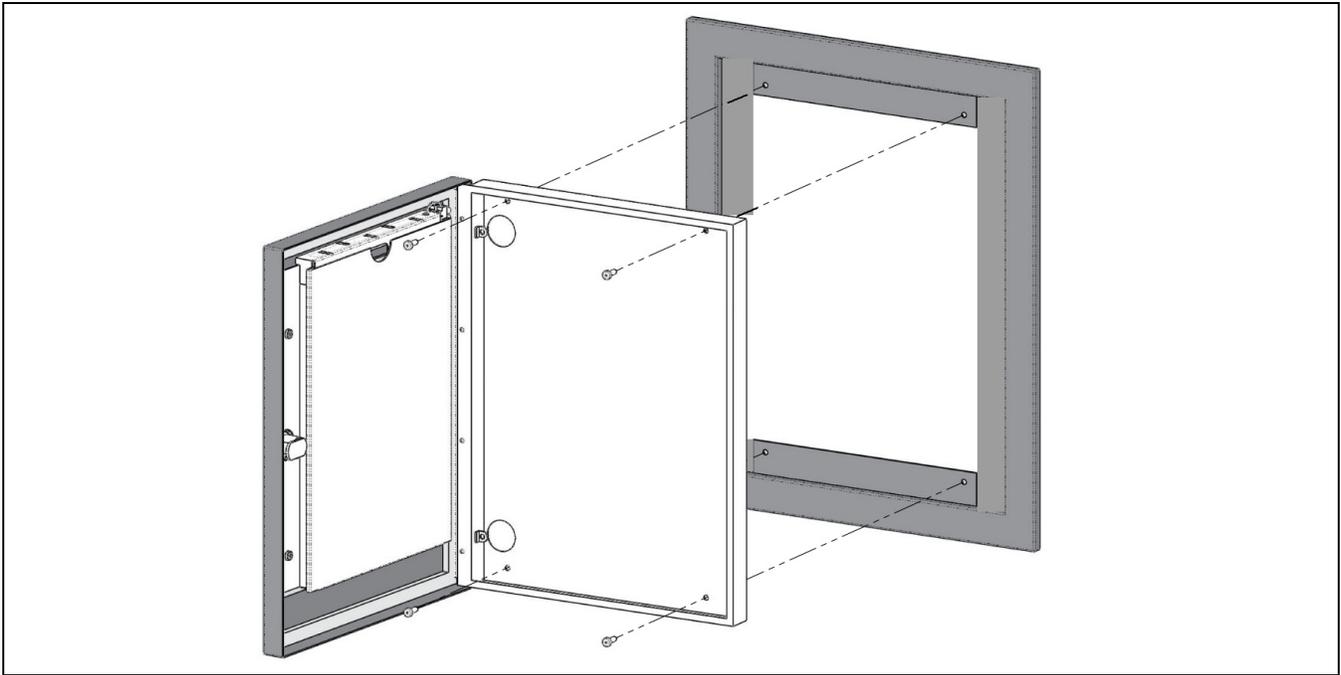
Figure 2: KTES Flush Mounted with Box and Trim Ring



Matching Paper Directory

The KTES itself does not support a paper directory but has an optional matching enclosure designed just for that purpose. This illuminated enclosure supports the letter format 216 x 279 mm (8.5 x 11 in) and A4 format 210 x 297 mm (8.3 x 11.7 in).

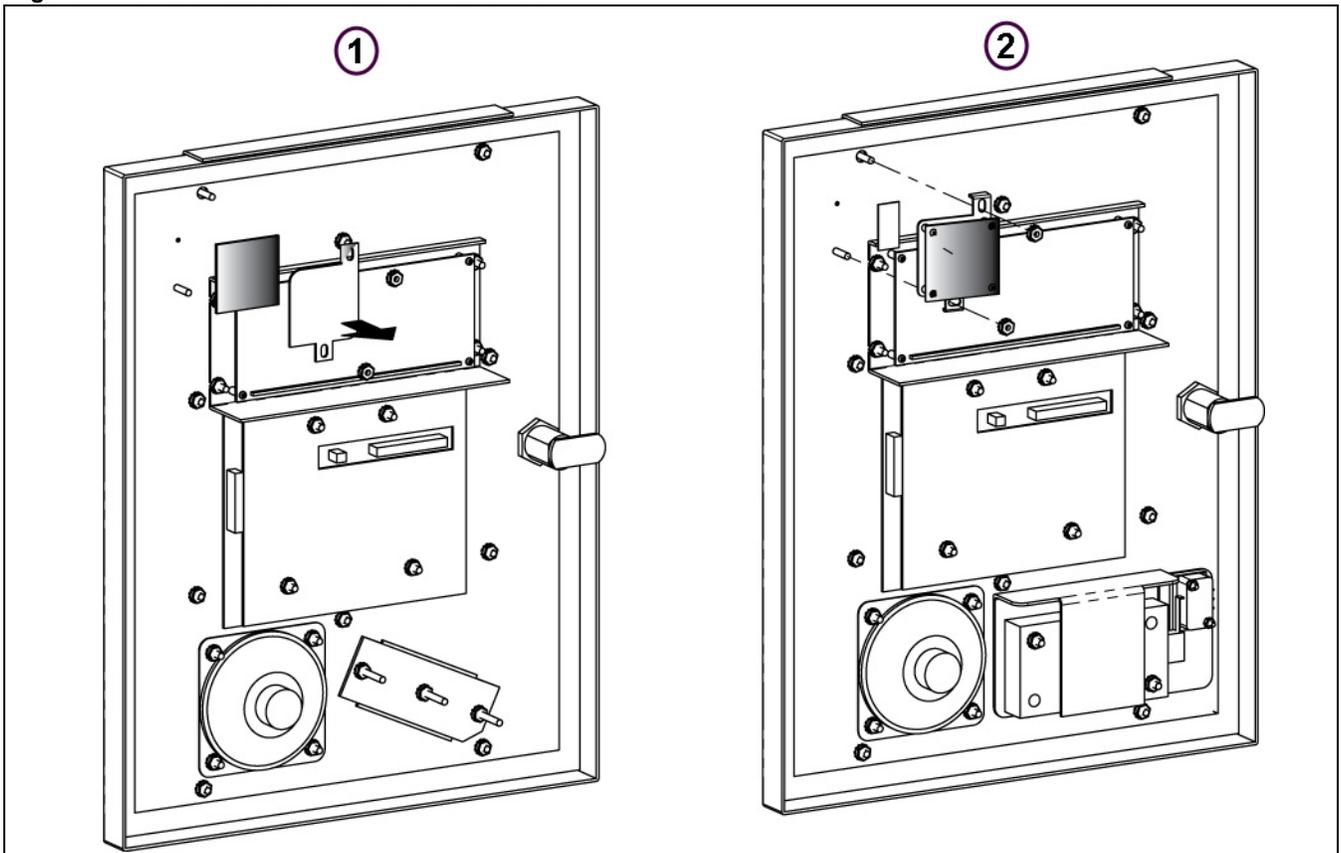
Figure 3: Paper Index Flush Mounted



Camera

The KTES offers the possibility to install a color camera in the back of the front door.

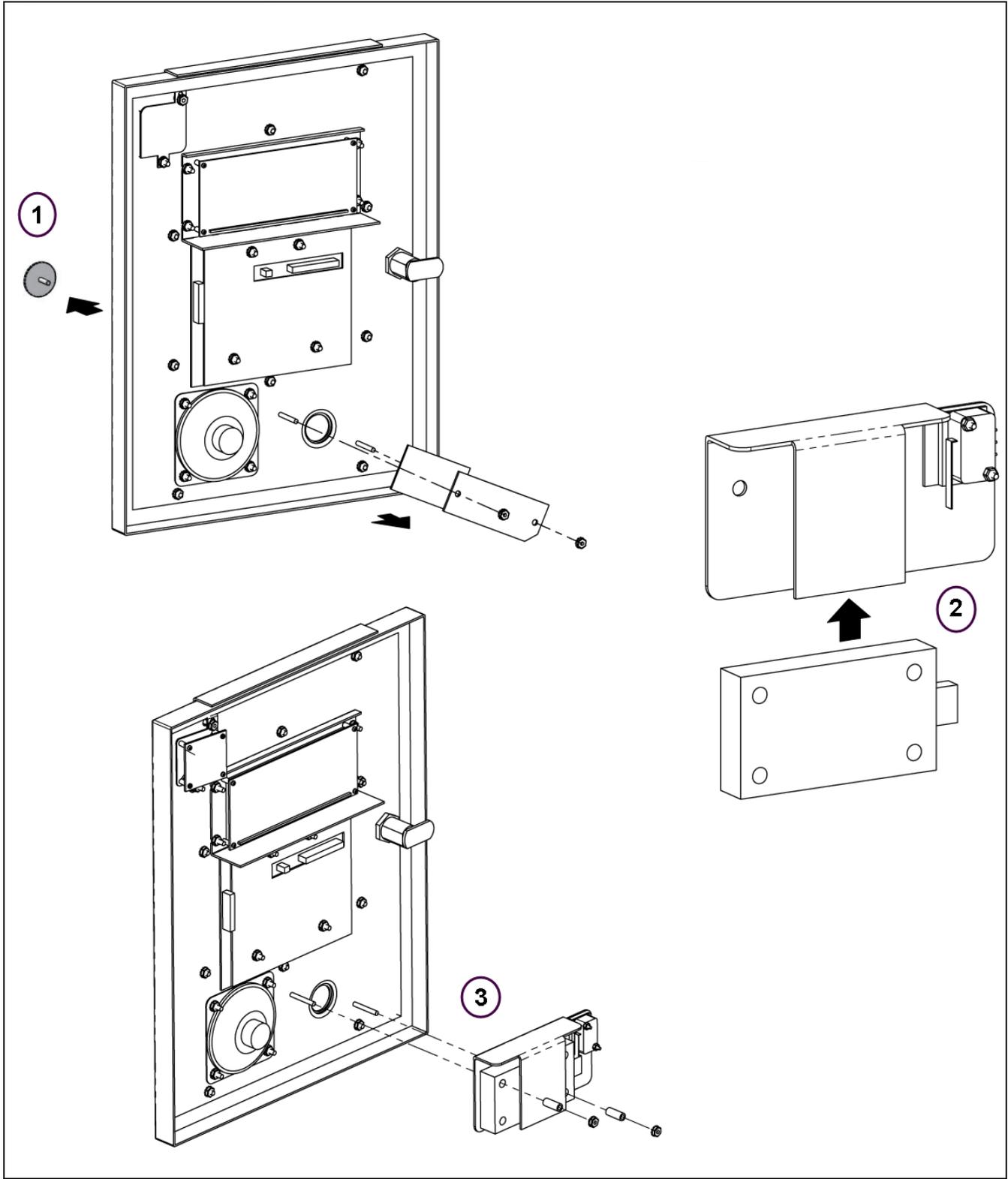
Figure 4: Camera Position in Back of Front Door



Postal Lock

This option fits in the product enclosure. Its role is to allow postal service personnel access to the building. For added security purpose its usage may be limited by a schedule.

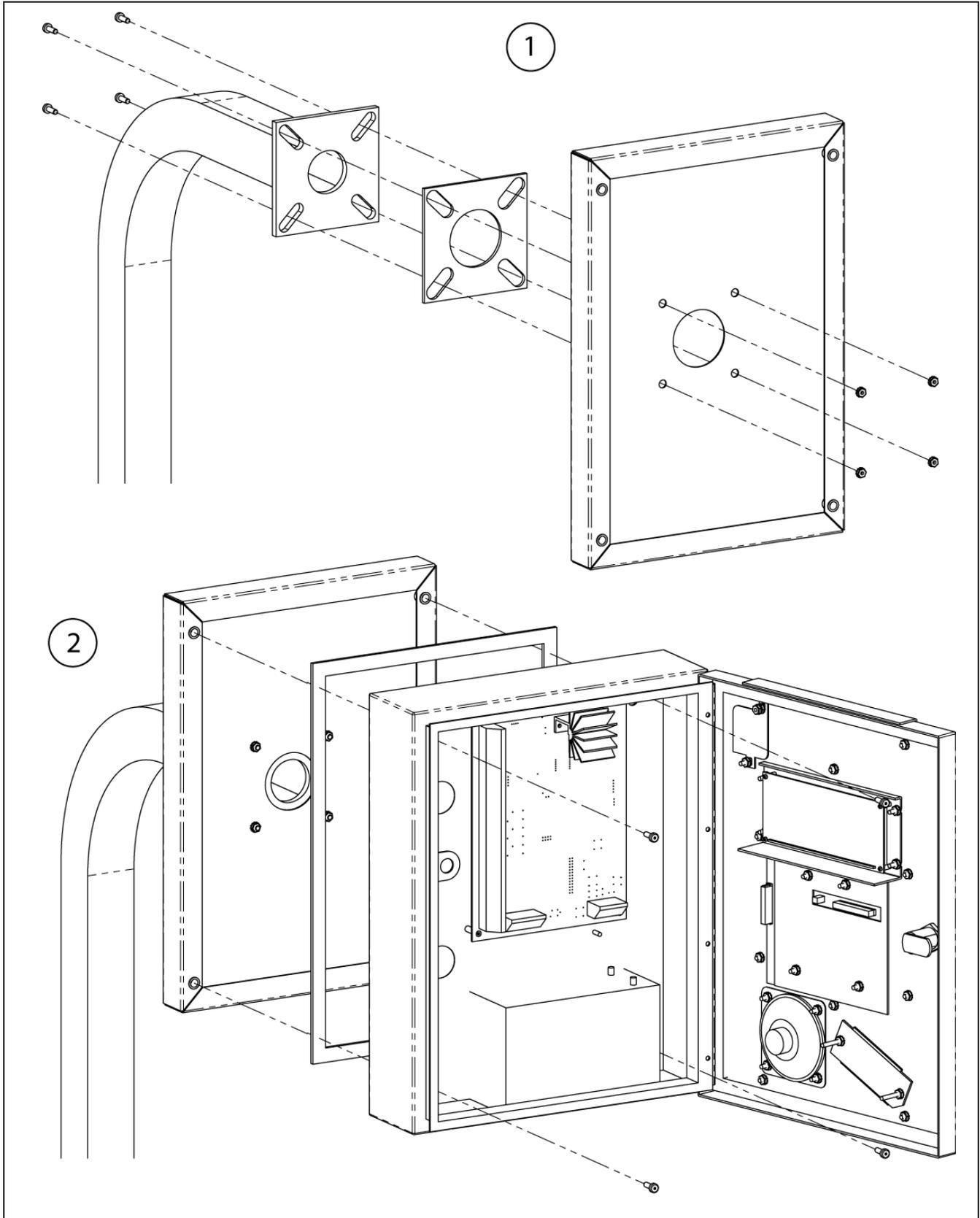
Figure 5: Postal Lock Mounting Location



Goose Neck

The KTES can be mounted on a goose neck stand.

Figure 6: Goose Neck Mounting Plate with Gaskets (Goose Neck not Included)

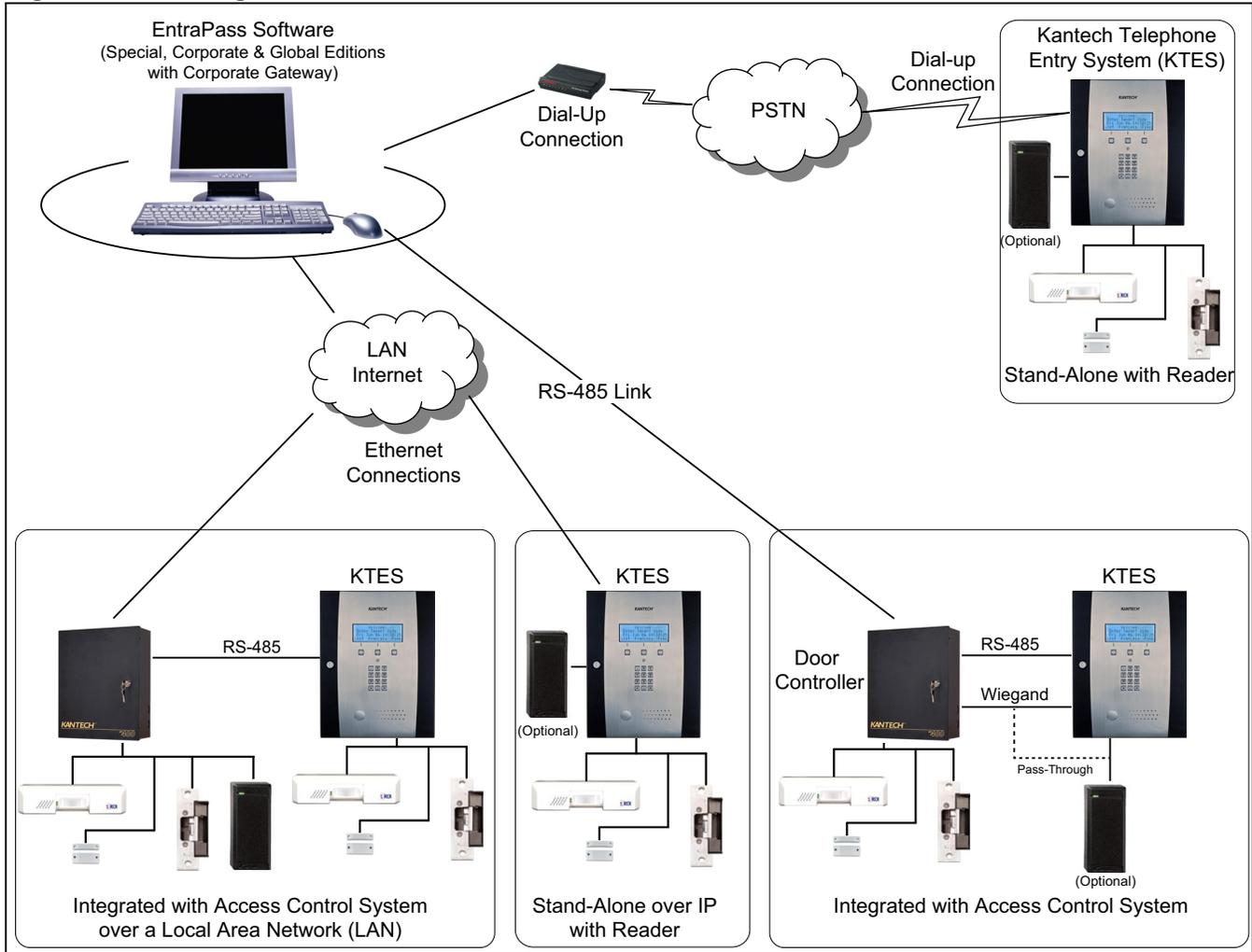


1 - System Architecture

The KTES can be configured and monitored through various means:

- Locally with the Visual User Interface (VUI).
- Remotely with EntraPass over an Ethernet network.
- Remotely with EntraPass over RS-485.
- Remotely with EntraPass over the telephone line with a dialup modem. The KTES is compatible with the US Robotics V.92 external modem.

Figure 7: KTES Configurations with EntraPass



Note: For the UL 294 Compliance, the KTES-US and KTES-CDN models must be integrated with an access control system over a Wiegand connection.

Figure 8: PCB view of main board

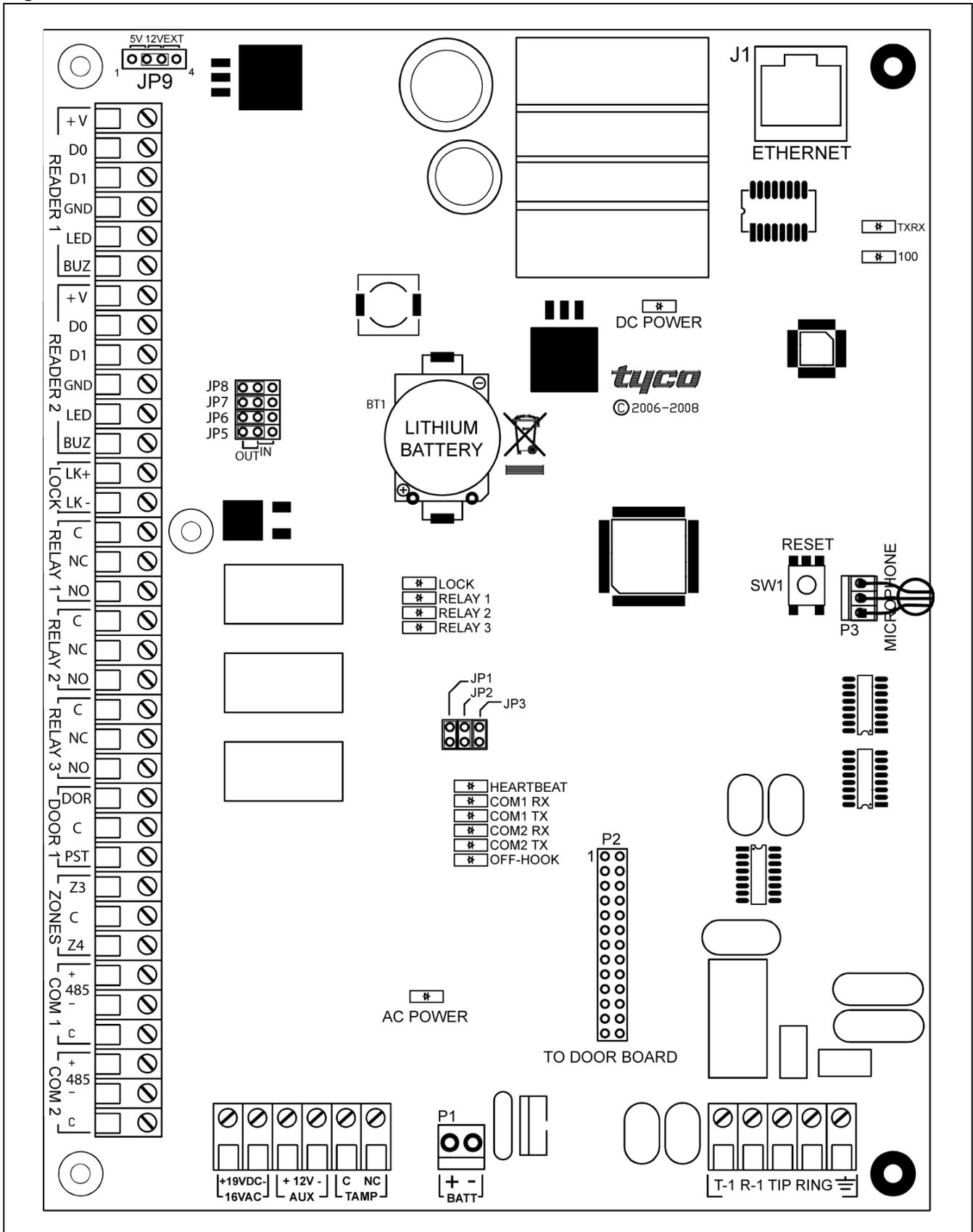
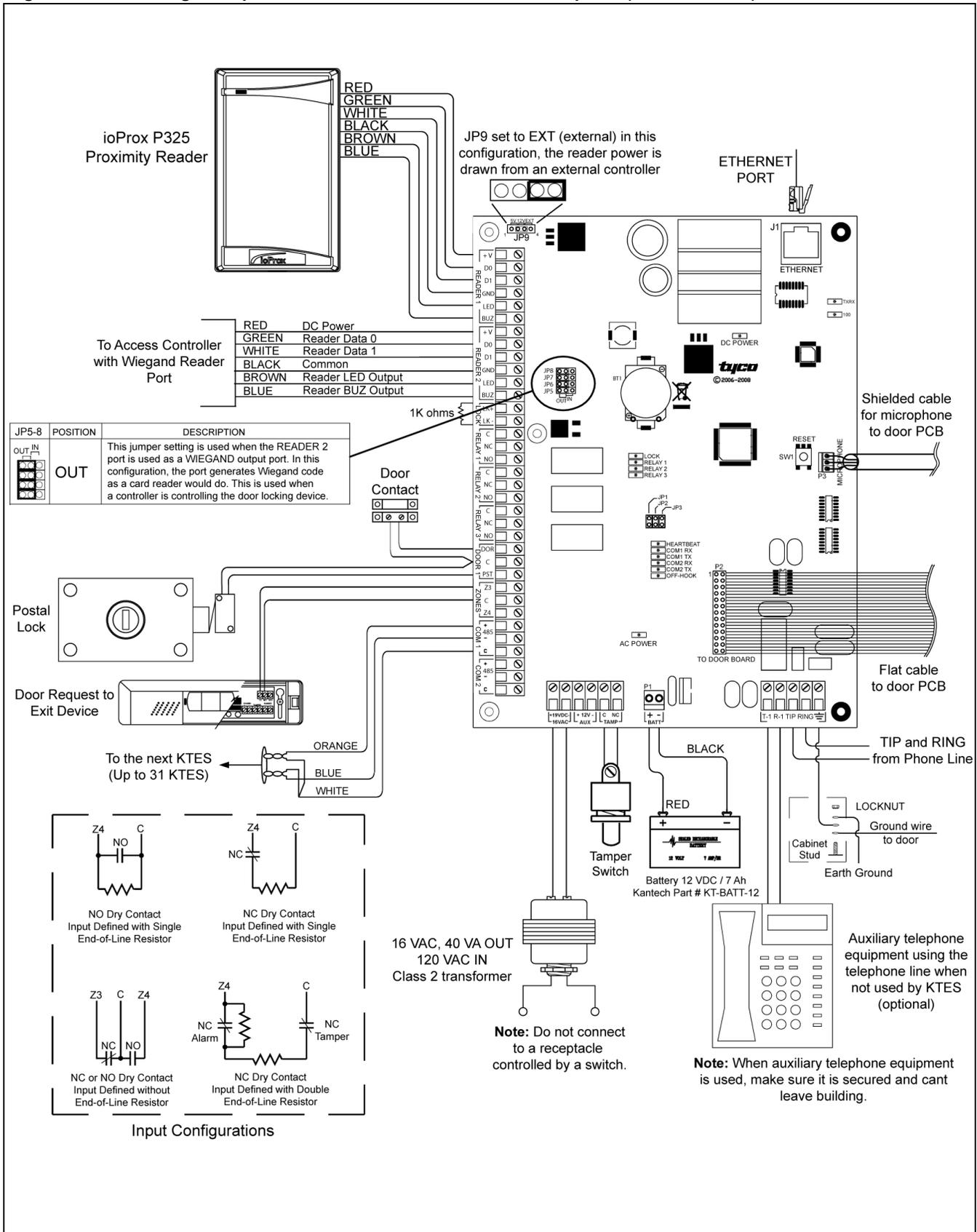
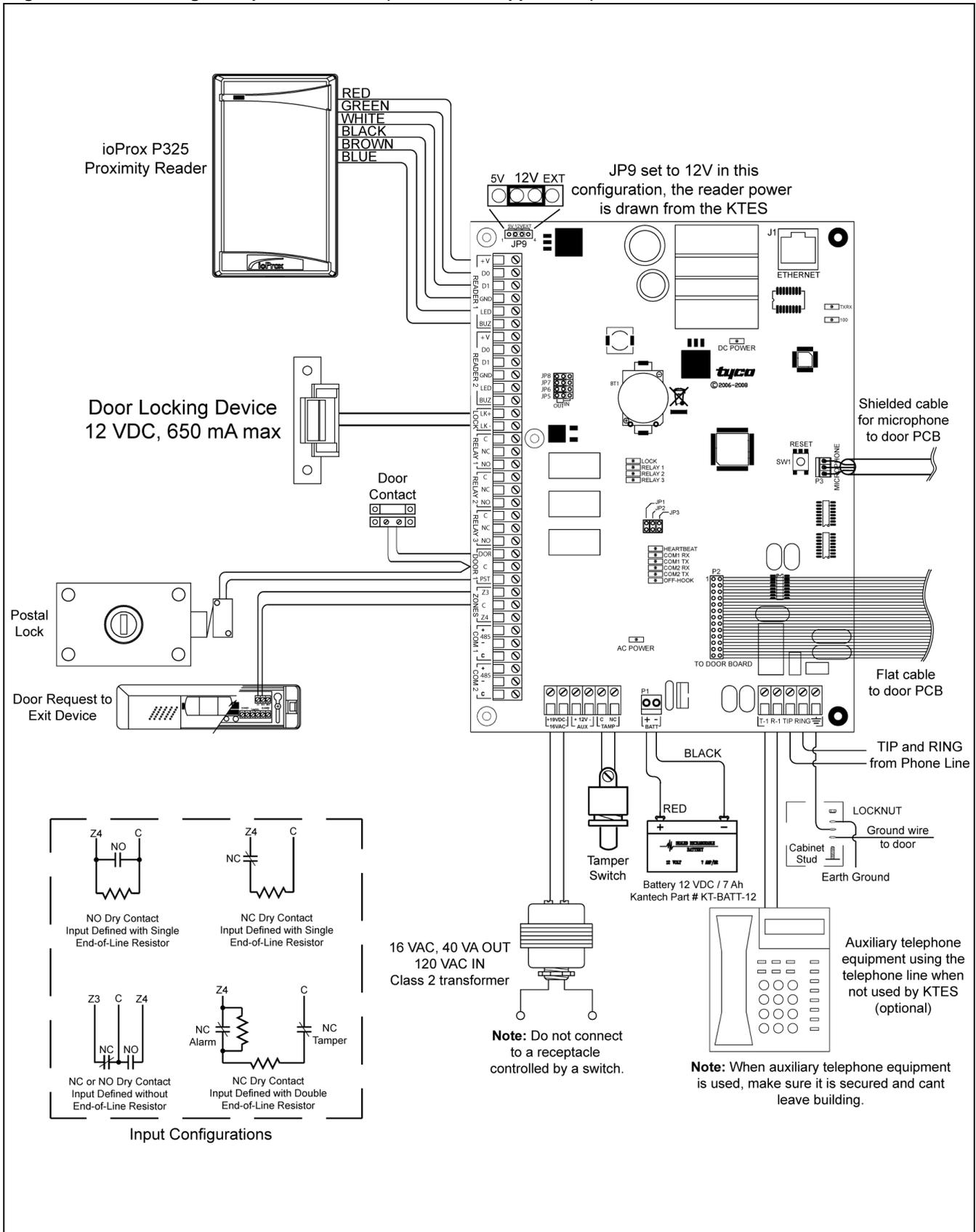


Figure 9: KTES Wiring Example with an External Controller - UL Compliant (North America)



Note: For more information, see 8.1 How to reset the Kantech Telephone Entry System for Factory Default.

Figure 10: KTES Wiring Example with Reader (Stand Alone Application) - North America



2 - Technical Specifications

Table 1: Technical Specifications

Specification	Description
AC Power Input (UL)	16.5 VAC, 40 VA, 1.9 Amps class 2 transformer, see Table 3 on page 28 for the part numbers
DC Power Input (CE)	19 VDC, 3.15 Amps, see Table 3 on page 28 for the part numbers
DC Auxiliary Output	11.2 to 13.75 VDC, 450 mA
Lock Output	11.2 to 13.75 VDC, 650 mA
Relay Controlled Outputs	<ul style="list-style-type: none"> • 3 Form C Relay controlled outputs • 30 VDC, 3 Amps max each, or • 24 VAC, 3 Amps max each
Reader Power Outputs (JP9)	3 options with jumpers (JP9): <ul style="list-style-type: none"> • 5 VDC, 175 mA, or • 12 VDC, 175 mA, or • from external controller
Auxiliary Reader Outputs	2 outputs per reader (LED and BUZ), 25 mA max. each, open collector outputs
Reader types	Wiegand interface
Monitored Points (Zone Inputs)	<ul style="list-style-type: none"> • 4 monitored points (Z1 to Z4), NO/NC, with or without EOL resistor • 1 fixed-function tamper switch input
Points maximum wiring	AWG #22 - 600 m (2,000 ft.)
Weight (UL Listed)	7.0 kg (15.4 lb)
Weight (CE Compliant)	7.0 kg (15.4 lb)
Visual User Interface (VUI) Characteristics	4 lines x 20 Characters LCD module with controllable LED backlighting. The text on the 4th line cant be edited, but can be changed with the navigation buttons.
Operating Temperatures	Without heater kit: -10°C to 55°C (14°F to 131°F) With heater kit: -40°C to 55°C (-40°F to 131°F)
Humidity Level	Indoor and outdoor: 0 to 90%
Storage Conditions	Temperature: -40°C to 70°C (-40°F to 158°F)
Multiple KTES Cabling	Telephone Line: 305 m (1,000 ft.) maximum RS-485 Bus: 1219 m (4,000 ft.) maximum Ethernet network: 91 m (300 ft.) maximum
KTES Dimensions (Surface Mount)	29.21 cm (11 1/2 in.) Wide x 37.46 cm (14 3/4 in.) High x 9.91 cm (3.9 in.) Deep
Communication ports	10/100 Base-T Ethernet Port (RJ-45 connector) 1 x RS-485 (COM1) Global Data Access Arrangement (DAA) interface for the telephone line
Communication speed	<ul style="list-style-type: none"> • Ethernet: 10/100 Base-T • RS-485: from 1200 to 115,200 Baud (automatic detection) • Dialup Modem: Up to 2400 Baud
Flush Mount Box	30.33 cm (12 in.) Wide, 38.42 cm (15 1/8 in.) High, 7.15 cm (2 7/8 in.) Deep
Paper Index Flush Mount	29.21 cm (11 1/2 in.) Wide, 37.46 cm (14 3/4 in.) High, 2.82 cm (1 1/8 in.) Deep

Table 1: Technical Specifications

Specification	Description
Paper Index Surface Mount	29.21 cm (11 1/2 in.) Wide, 37.46 cm (14 3/4 in.) High, 9.93 cm (4 in.) Deep
Paper Index Black Trim Ring	35.72 cm (14 in.) Wide, 44.13 cm (17 3/8 in.) High, 0.92 cm (3/8 in.) Deep
Goose Neck Mounting Plate	25.30 cm (10 in.) Wide, 36.50 cm (14 3/8 in.) High, 3.30cm (1 1/4 in.) Deep

3 - Electrical Specifications

Table 2: Electrical Specifications

AUXILIARY OUTPUTS	MAXIMUM CURRENT	COMBINED MAXIMUM CURRENT
LED for each door reader	25 mA (each)	1.1 Amps
Buzzer (BUZ) for each door reader	25 mA (each)	
OUTPUTS	MAXIMUM CURRENT	
1 for Auxiliary Power (11.2 to 13.75 VDC)	450 mA	
2 for Controlled Readers (11.2 to 13.75 VDC)	175 mA	
2 for Controlled Readers (5 VDC)	175 mA	
1 for Lock Output (11.2 to 13.75 VDC)	650 mA	

4 - Installing the KTES

Important: Make sure that the local telephone company has been notified that you will be installing communication equipment.

4.1 Preparing to Install the KTES

A visual inspection should be made when unpacking the KTES. Any missing item/part or damaged component should be reported immediately.

Stay away from electrical or communication devices

The KTES has been designed to be mounted indoor or outdoor. The cabinet is large enough to accommodate the backup battery and the necessary wiring connections for most applications. Four (4) EMT (Electrical Metallic Tubing) conduit knockouts (1.9 cm (0.75 in)) are provided. The location should be easily accessible for servicing the equipment. The KTES 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 and at a minimum of 8 m (25 ft) from any transmitting equipment.

4.2 Installation

STEP 1: Unpacking the KTES

Check that the following parts are in your KTES package when you unpack it:

- Kantech Telephone Entry System (KTES)
- EntraPass software CD-ROM, version 4.02 or higher
- Installation Manual, English and French version
- Programming Manual, English and French version

Any missing item/part or damaged component should be reported immediately.

Note 1: The 12 VDC backup battery and the ground clamp are not included.

Note 2: Make sure you have adequate sealant (not included).

STEP 2: Applying Sealant on the Back of the KTES

Sealant must be applied on each of the four mounting holes when the KTES is installed **outside** in order to avoid water infiltration. Also, apply sealant around any knockout that will be removed.

Important: Be careful not to apply sealant on the four (4) draining holes at the bottom of the KTES.

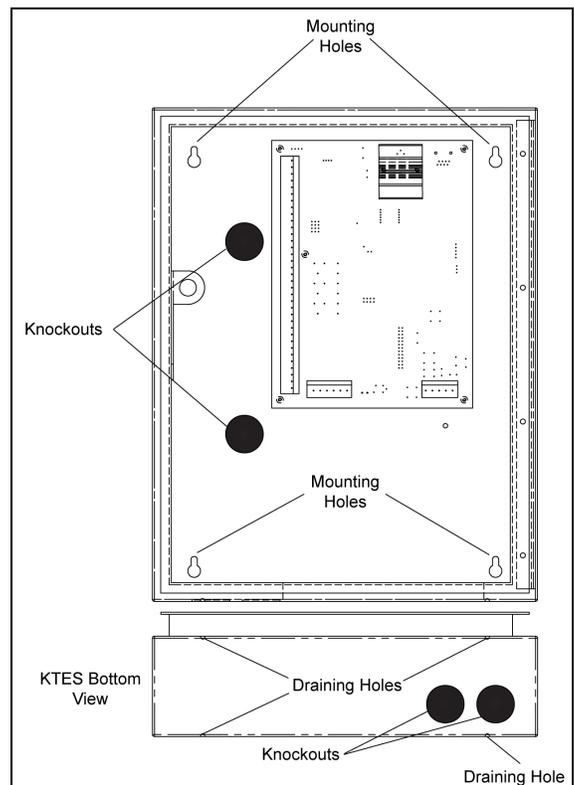
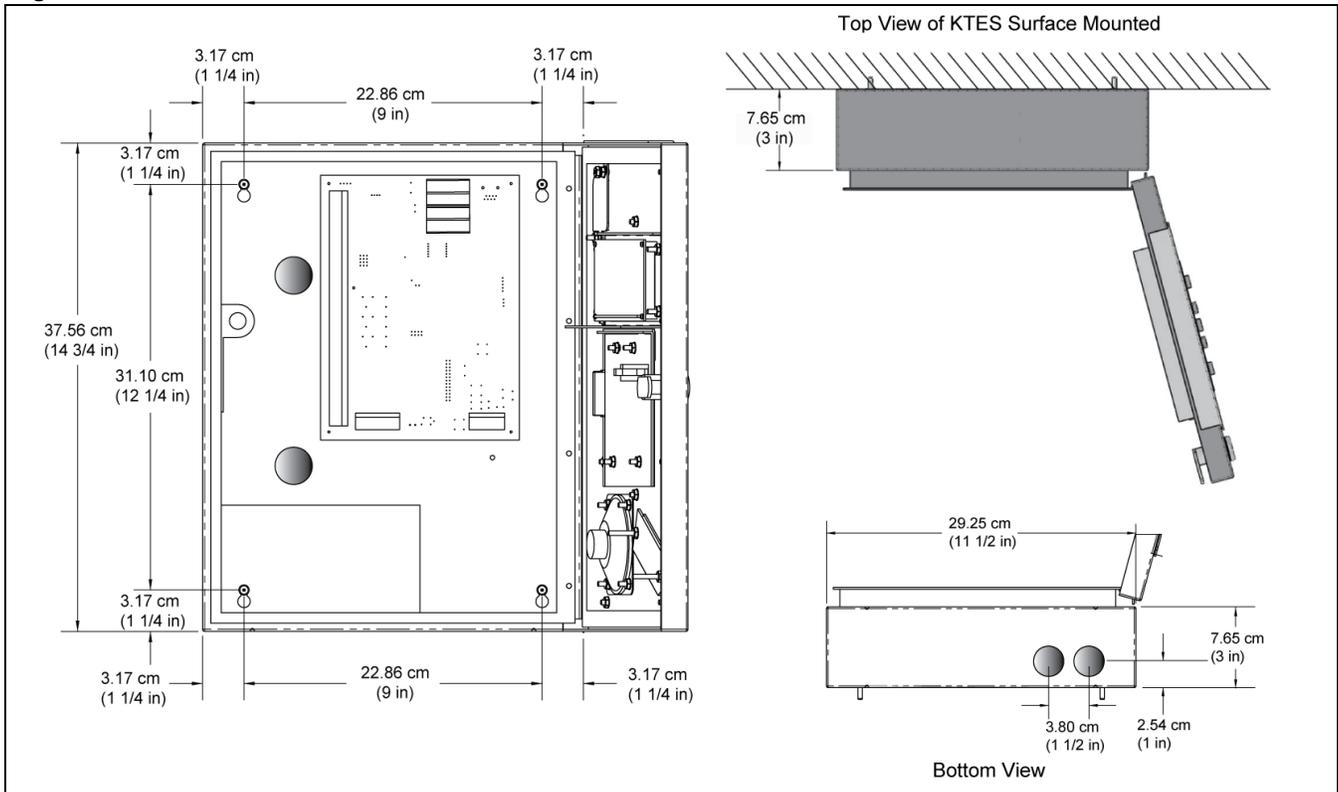


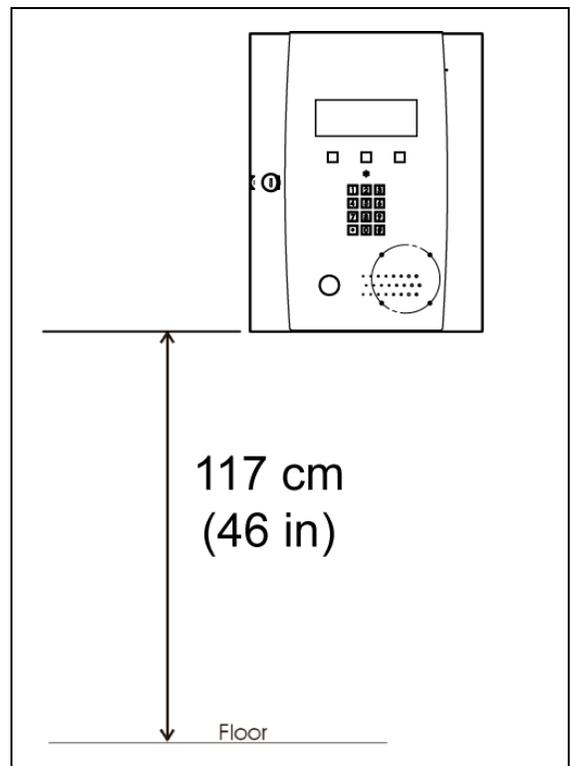
Figure 11: Surface Mount Installation



STEP 3: Mounting

It is recommended that you mount the KTES so that the bottom of the enclosure is not higher than 117 cm (46 in.) from the floor. If you install it in a location where there are extremely low temperatures, the outdoor installation might require an optional heater kit in order to meet the environmental conditions.

Caution: Make sure the area stays clear of any objects below the KTES that could interfere with its daily use.

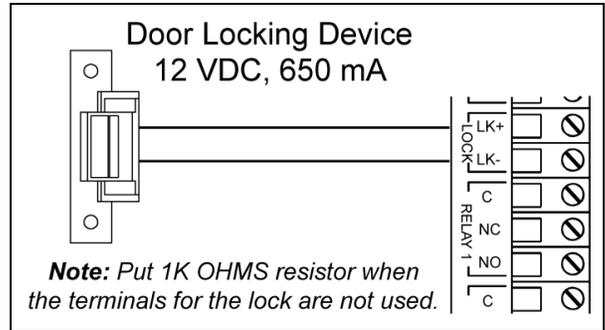


STEP 4: Connecting the Door Locking Device (DC Powered)

Connecting the Door Lock Device to LK+ and LK-

Check for Local “magnetic lock” Regulations

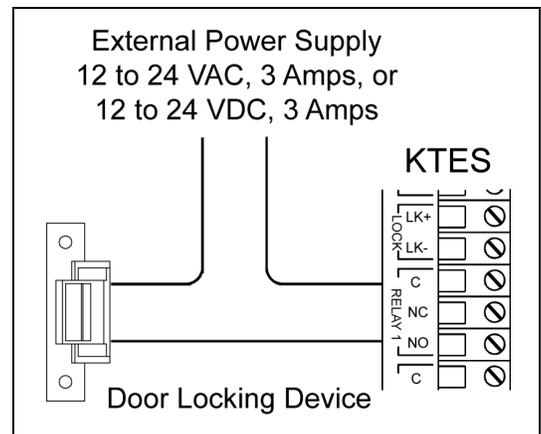
The door locking device output is controlled according to the end-user programmed parameters for allowing access to or unlocking doors according to schedules and access levels. The door locking device output can operate DC powered locking devices such as an electromechanical strike and can be configured to operate fail-safe or fail-secure (normal or reverse action).



Note: Use 1 K ohm EOL (End-of-Line resistor) between LK+ and LK- terminals if not used.

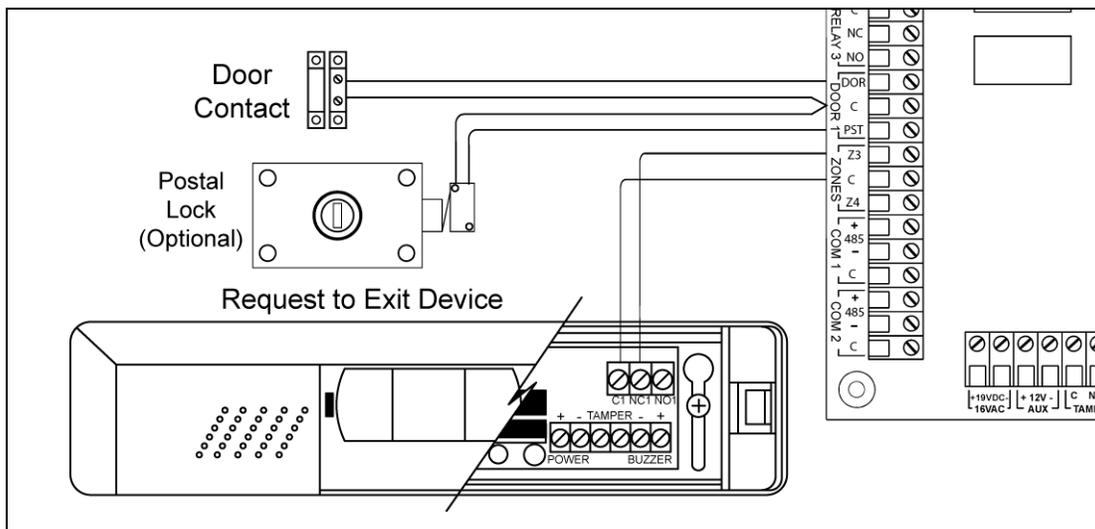
STEP 5: Connecting the Door Lock Device with an External Power Supply

Use one of the three relay terminals available to connect the door locking device and the external power supply.



STEP 6: Hooking Up Inputs

Connect Devices to Inputs 1 to 4



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

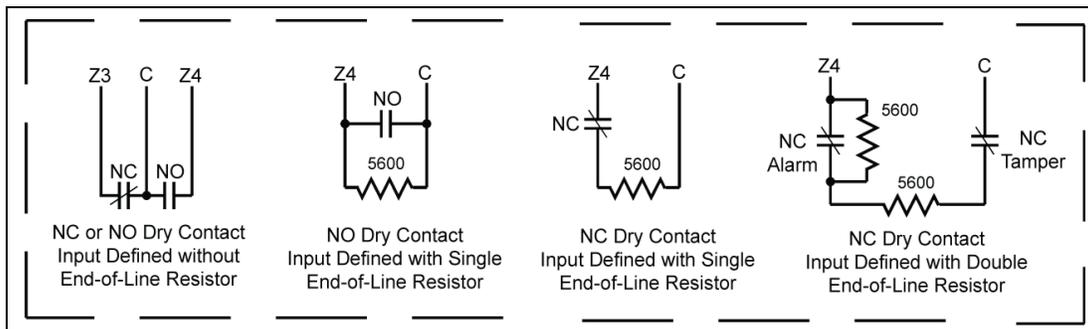
Resistors for all Inputs 5.6K Ohms (EOL or DEOL) (Optional)

The KTES has an on-board capability of monitoring 4 input points. 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. Inputs 1-2 are automatically assigned. The **door contact** is assigned to input 1 and the **postal lock** is assigned for input 2. There is no obligation to follow these rules but this standard convention facilitates servicing.

DRY (without EOL resistor): In a simple NC dry contact configuration, the **secure** state is given when a short is detected. The **alarm** state is given when the input is open. If the alarm switch is programmed as NO device, the **alarm** state will be given when the input is shorted.

EOL (with EOL resistor): The **secure** state is given when a single resistor is detected. The **alarm** state is given when the input is open or short.

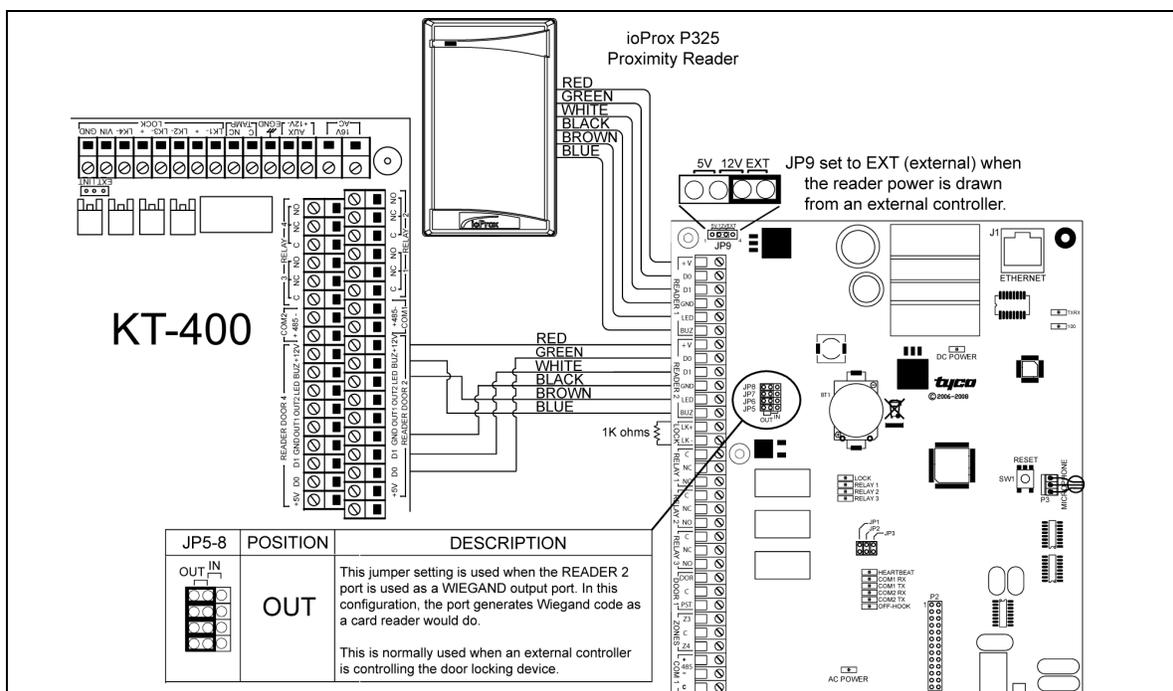
DEOL (Double EOL Resistor): For NC device only, in a DEOL configuration, the **secure** state is given when a single resistor is detected. The **alarm** state is given when two resistors in series are detected. The **trouble** state is given when the input is shorted. The **tamper** state is given when the input is left open.



STEP 7: Connecting an External Controller

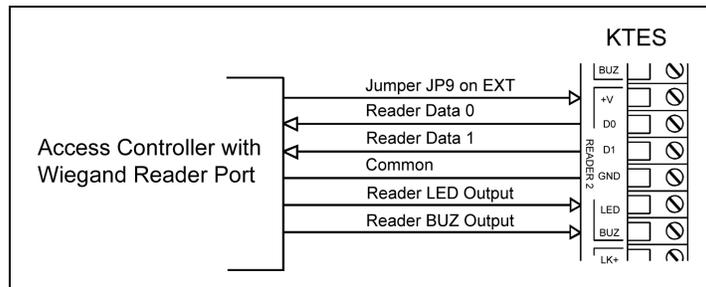
The distance between the reader and the KTES varies by reader type. Consult the installation manual for details.

Important: When you want the external controller to power the reader, the jumper JP9 must be put on external (EXT) since the external controller will supply the +12 VDC to the reader connected on the **READER 1** terminals.



STEP 8: Connecting a 3rd Party Controller

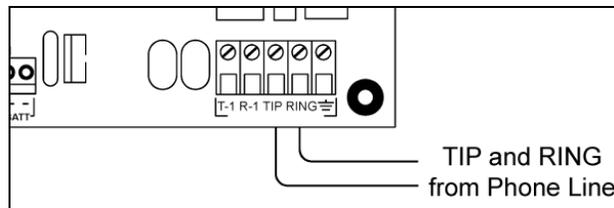
The +V terminal voltage level is set by jumper JP9 (5V, 12V or EXT).



STEP 9: Connecting the Telephone Line

Connect the TIP (green) and RING (red) from the Phone Line to the TIP and RING terminals.

Note: The (T-1 and R-1) terminals can be connected to the local telephone.



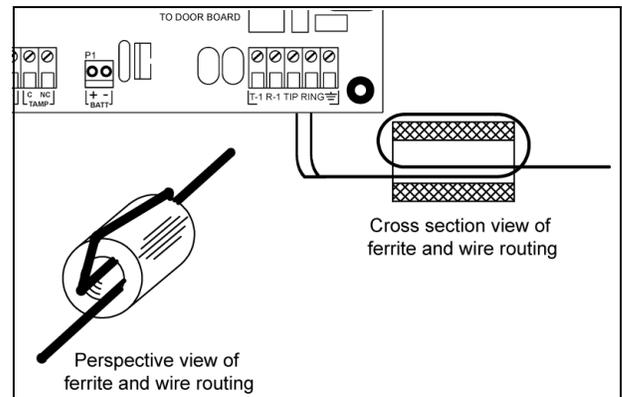
STEP 10: Connecting the Telephone Line with the Ferrite (KTES-AUS Model for Australia and New Zealand only)

Attach the ferrite as close as possible to the TIP and RING terminals.

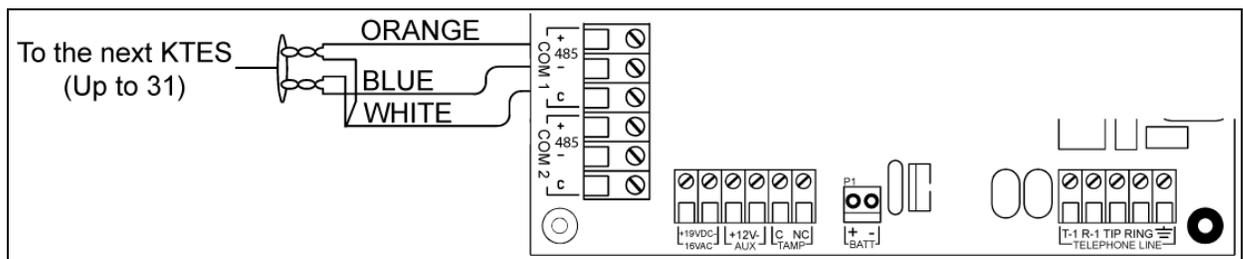
Connect the TIP and RING from the Phone Line to the TIP and RING terminals.

Tie wrap the cable **directly behind** the ferrite.

Note: The (T-1 and R-1) terminals can be connected to the local telephone.

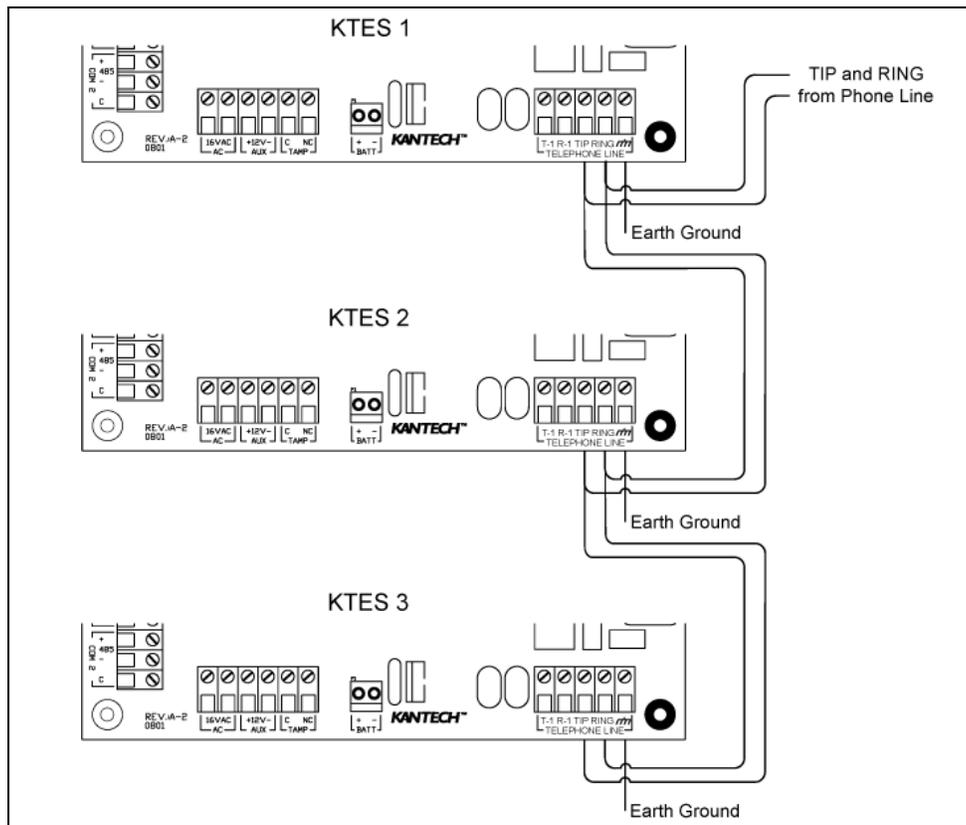


STEP 11: Connecting the RS-485 (optional)



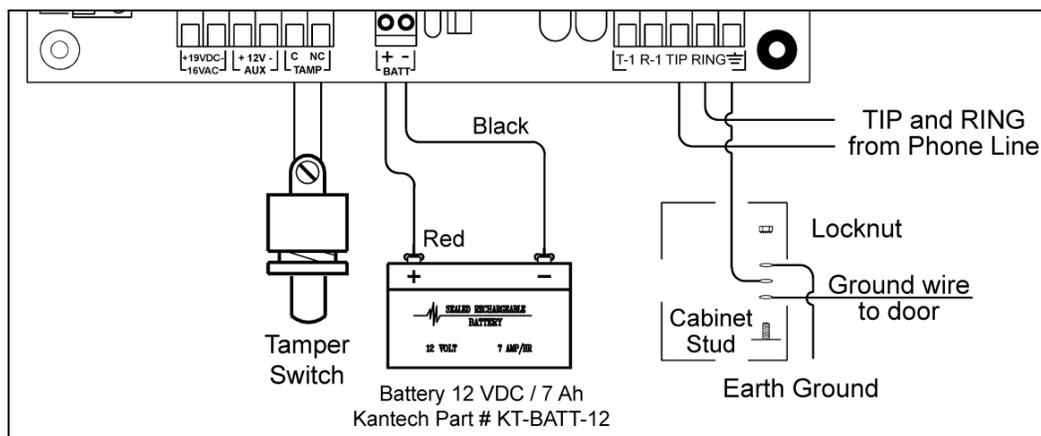
STEP 12: Connecting Multiple KTES on the Same Telephone Line (optional)

It is very important to take into consideration that a maximum of 305 m (1000 ft) should be used between the first KTES and the last KTES, or in total.



STEP 13: Connect the KTES to Earth Ground

Since the KTES uses high performance communication and the telephone line, proper grounding is required to insure safety and proper operation. An AWG #18 single conductor copper wire must be used to ground each KTES 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.



STEP 14: Connect AC Power (North America only)

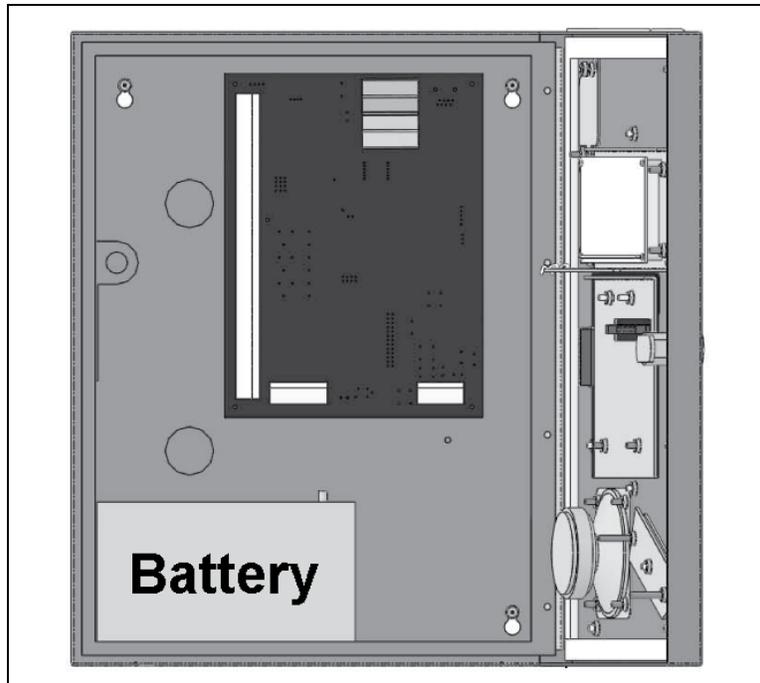
Power should only be applied to the unit when all connections are completed. Connect the **16VAC** terminals to the secondary of the class 2 transformer 120 VAC 60 Hz IN / 16.5 VAC, 40 VA OUT.

STEP 15: Connect DC Power (EMEA only)

Power should only be applied to the unit when all connections are completed. Connect the **+19VDC-** terminals to the power supply 19 VDC, 3.15 Amps.

STEP 16: Connecting the Backup Battery

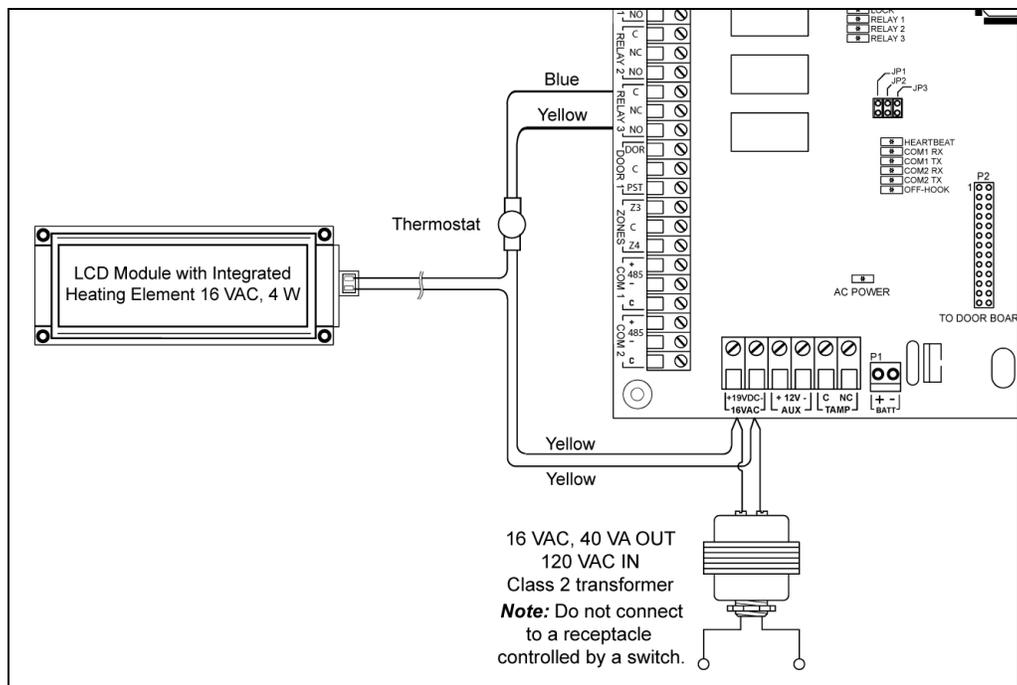
The 12 VDC, 7 A/h backup battery provides operation of up to 12 hours.



Note: The battery must be kept indoor if the outdoor temperature drops below -25°C (-13°F).

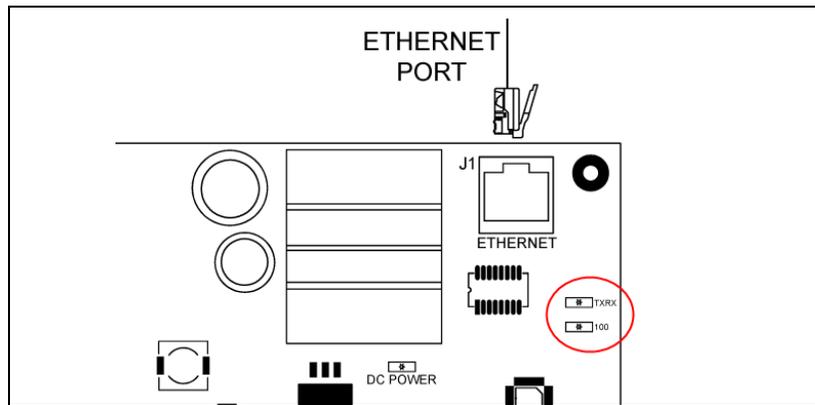
STEP 17: Connecting the Heater Kit for Outdoor Operation (Optional)

Refer to the Heater Kit Install Sheet, DN1856.



STEP 18: Connecting the Ethernet Cable (Optional)

Connect the Ethernet cable to the RJ-45 port.



- The TXRX (YELLOW) LED is OFF when there is no Ethernet network or the cable is disconnected; FLASHING when there is network activity; and ON when the network is present
- The 100 (GREEN) LED is ON only when the KTES is connected to a 100 Mb/s (100 Base-T) network.

STEP 19: Powering Up the KTES

Once powered, check the blue heartbeat LED status indicator to determine the status of communication and other vital parameters. Refer to the troubleshooting section for the patterns. If the main supply is removed, the 12 VDC, 7 A/h backup battery will support normal operation.

Important: The KTES will not start on backup battery alone.

STEP 20: Programming the KTES

If you intend to program the KTES remotely with an access control software like EntraPass, there are some options that must be done with the VUI before leaving the customer premises.

Enter the KTES programming mode by pressing and holding ***** during 5 seconds, until you hear a beep. Type in the **Installer PIN (8888)**.

Important: For security reasons, keep in mind to change the default installer PIN (8888) after the **installation and configuration are completed** and give it to the owner or the maintenance dept of the building. Refer to the Tenant Menu in the *KTES Programming Manual*, DN1770.

Options only Programmable with the VUI

Option Name	Keypad Shortcut
Audio Visual > Speaker Volume	8-1-2-2-1
Audio Visual > Microphone Sensitivity	8-1-2-2-2
Audio Visual > Telephone Sensitivity	8-1-2-2-3
Audio Visual > LCD Contrast	8-1-2-2-4
Audio Visual > Live Adjustment	8-1-2-2-5

Note: For more information on how to configure the KTES with the VUI, refer to the *KTES Programming Manual*, DN1770.

5 - KTES Models, Options, Related Documentation and Miscellaneous Items

Table 3: KTES Models

Part number	Description
Models	
KTES-CDN	Kantech Telephone Entry System, plug-in AC transformer 16 VAC, 40 VA (TR1640P/CSA), KTES EntraPass software (E-KTES-CD1) and accessory kit (KTES-ACC-KIT)
KTES-US	Kantech Telephone Entry System, plug-in AC transformer 16 VAC, 40 VA (TR1640P/UL), KTES EntraPass software (E-KTES-CD1) and accessory kit (KTES-ACC-KIT)
KTES-EU	Kantech Telephone Entry System, switching power supply, AC cord for Europe and UK, KTES EntraPass software (E-KTES-CD1) and accessory kit (KTES-ACC-KIT)
KTES-AUS	Kantech Telephone Entry System, switching power supply, AC cord for Australia, KTES EntraPass software (E-KTES-CD1) and accessory kit (KTES-ACC-KIT-AUS)
Dimensions Drawing	
DN1878	KTES Dimensions Drawing
Miscellaneous Items	
USB-485	USB-485 interface, USB cable 0.9 m (3 ft) and USB drivers on CD-ROM
VC-485	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
Optional Accessories	
KTES-FBOX	Flush mount box with black trim ring
KTES-HEAT	Heater pad for temperature below -10°C (14°F)
KTES-INDEX-F	Flush mount paper index, black. KTES-INDEX-R trim ring not included
KTES-INDEX-R	Black trim ring for KTES-INDEX-F flush mount paper index
KTES-INDEX-S	Surface mount paper index, black
KTES-MPLATE	Goose neck mounting plate with seal, black
KTES-CAM-N	NTSC color camera with bracket
KTES-CAM-P	PAL color camera with bracket
KTES-POSTAL	Postal lock with bracket
E-KTES-3000	Option for a maximum of 3000 tenants in total (EntraPass 4.02 required; 1 option per unit)
KTES-ACC-KIT	Accessory kit, includes eight (8) 5.6K resistors and one (1) 1K resistor
KTES-ACC-KIT-AUS	Accessory kit, includes eight (8) 5.6K resistors, one (1) 1K resistor and one (1) ferrite
KTES-PS-NA	Power Supply 100V - 240VAC IN / 19 VDC, 3.15 Amps OUT and AC power cord, 3-pin model, for KTES-CDN and KTES-US only
KTES-PS-UK	Power Supply 100V - 240VAC IN / 19 VDC, 3.15 Amps OUT and AC power cord, for UK only with KTES-EU
KTES-PS-EU	Power Supply 100V - 240VAC IN / 19 VDC, 3.15 Amps OUT and AC power cord, for Europe only with KTES-EU

Kantech Telephone Entry System Installation Manual

Part number	Description
KTES-PS-AUS	Power Supply 100V - 240VAC IN / 19 VDC, 3.15 Amps OUT and AC power cord, for KTES-AUS only
TR1640P/UL	16.5 VAC, 40 VA, class 2 transformer for installation in the USA (manufacturer part number Codex model SEP-1640U)
TR1640P/CSA	16.5 VAC, 40 VA, class 2 transformer for installation in Canada (manufacturer part number Codex model SEP/G-1640)
Spare Parts	
E-KTES-CD1	EntraPass Special Edition with only KTES-enabled features. Can be upgraded to a full EntraPass Special Edition
KT-TAMPER	Tamper switch for cabinet
KTES-LOCK	Keylock for cabinet with 2 keys
KTES-SPEAK	Speaker assembly
KTES-LCD	LCD module assembly
KTES-MPCA	Main PCB assembly
KTES-DCPA	Door PCB assembly with keypad and microphone
KTES-LENS	LCD clear lens

6 - Troubleshooting

Table 4: Reset Types and Descriptions

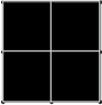
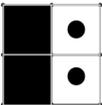
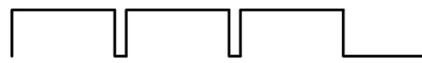
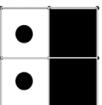
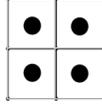
Jumpers	Heartbeat Patterns	Resets
<p>ON ON JP1 JP2</p> 	 <p>Continuous Short Pulses</p>	<p>Soft Reset: When JP1 and JP2 are ON, the KTES will reset on a) power up, b) pushbutton, or c) EntraPass software 'Manual operator soft reset':</p> <ul style="list-style-type: none"> All KTES memory definitions and parameters are verified and kept intact if still valid. The internal event buffer is maintained if still valid. IP address is kept if valid. The KTES generates the appropriate message: a) 'Power ON Soft Reset' b) 'Manual Pushbutton Soft Reset' c) 'Operator Soft Reset'.
<p>ON OFF JP1 JP2</p> 	 <p>3 Long Pulses</p>	<p>Forced Default Static: When JP1 is ON and JP2 is OFF:</p> <ul style="list-style-type: none"> Same as 'Soft Reset' condition, except IP address is forced to the default static IP: 192.168.1.2.
<p>OFF ON JP1 JP2</p> 	 <p>4 Short Pulses</p>	<p>Hard Reset: When JP1 is OFF and JP2 is ON:</p> <ul style="list-style-type: none"> The default installer PIN (8888) is restored. All KTES memory is settled to default values. Internal event buffer is cleared. IP address is kept if valid. KTES generates the message, 'KTES Hard Reset'. Internal RTC (Real Time Clock) and clock are settled to the default time and date values January 1st 2009, 00:00:00.
<p>OFF OFF JP1 JP2</p> 	 <p>Continuous Long Pulses</p>	<p>Factory Default: When JP1 and JP2 are OFF:</p> <ul style="list-style-type: none"> The default installer PIN (8888) is restored. All KTES memory is settled to default values. Internal event buffer is cleared. KTES generates the message 'KTES Factory Default Reset'. Internal RTC and clock are settled to the default time and date values January 1st 2009, 00:00:00.

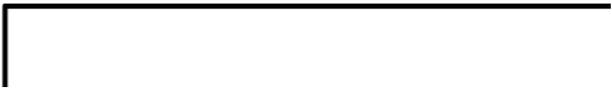
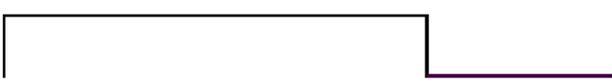
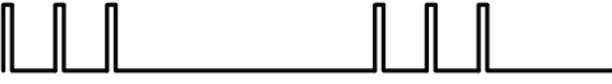
Table 5: AC and DC Power LED Status Indicators

AC Power LED	DC Power LED	Status Indicators
ON	ON	<ul style="list-style-type: none"> The AC power or external AC source is present. The DC power level is sufficient for all DC operations such as the readers, outputs and the 12V AUX.
OFF	ON	<ul style="list-style-type: none"> The KTES is running on the 12V rechargeable backup battery only. The DC power supply has been connected with reverse polarity, for CE compliant models only.

7 - Heartbeat Patterns

The KTES status can be obtained from the **HEARTBEAT** blue LED patterns. It is located near the ribbon cable connected to the door PCB, see **Figure 8: PCB view of main board**. This information is particularly useful when connecting the KTES to the EntraPass system. The following table lists all conditions along with a brief description. Refer to **Table 4 on page 30**, if you must reset or change the communication mode with the KTES.

Table 6: Heartbeat Patterns

Booting Up		Steady
Factory Default		Continuous LONG pulses
Forced Default Static		3 Long Pulses
Modem Initialization		Single 2.5 Sec. Burst
Dialup Communication with EntraPass		2 Short Pulses
Corporate Gateway Communication with EntraPass		3 Short Pulses
Hard Reset		4 Short Pulses
Fail Soft		Continuous Short Pulses
Firmware Update		Quick Pulses 5 pulses per sec. @ 50% duty cycle
Rebooting		Very Quick Pulses 10 pulses per sec. @ 50% duty cycle

8 - Hardware Default initialization

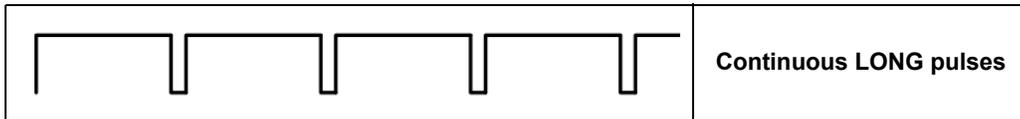
Note: The Soft Reset and the Hard Reset can be performed directly from the VUI, without having to open the KTES, refer to the *KTES Programming Manual*, DN1770.

8.1 How to reset the Kantech Telephone Entry System for Factory Default

Before you start, you must be able to:

- Open the KTES with the key.
- Locate the reset button (SW1) and the two jumpers JP1 - JP2.
- See the flashing blue **Heartbeat** LED.

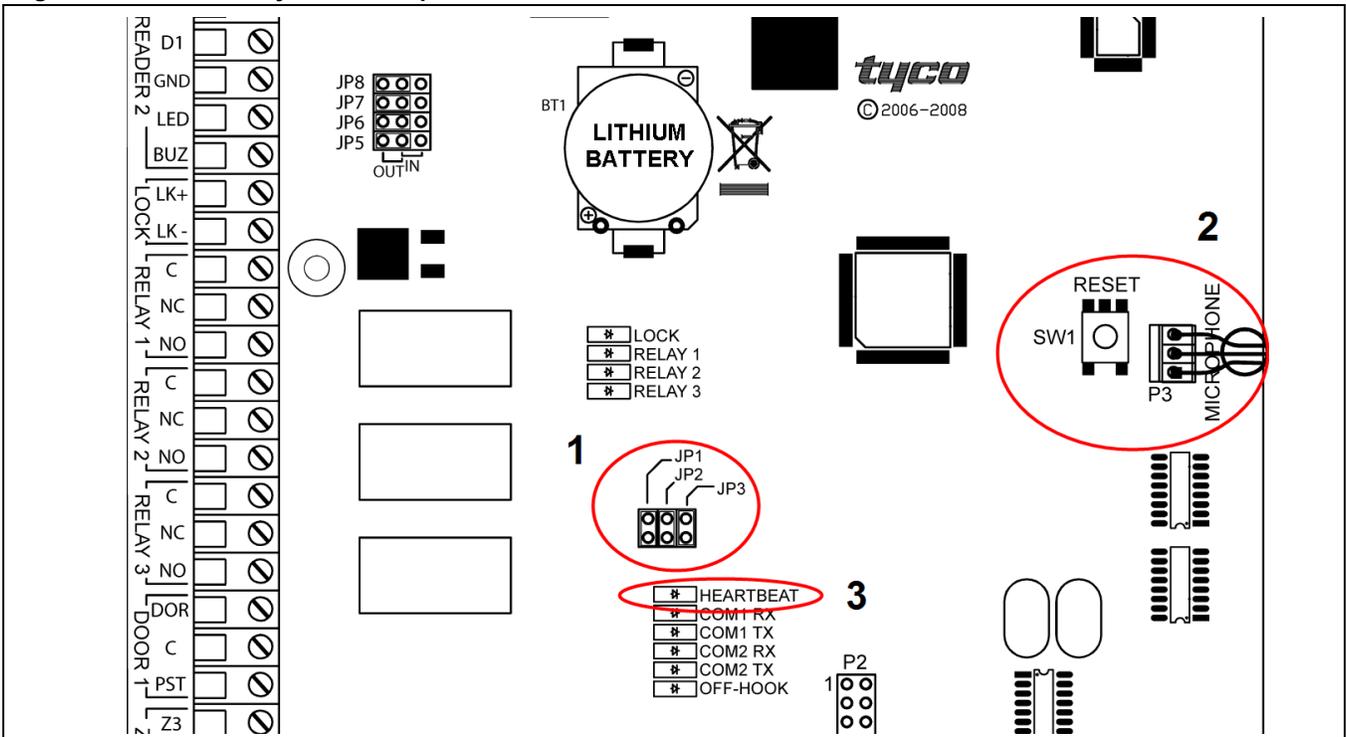
1. Remove JP1 and JP2 jumpers as described in **Table 4** for Factory Default.
2. Press the reset button.
3. Check the blue **Heartbeat** LED pattern, wait until the heartbeat pattern corresponds to this:



4. Put back JP1 and JP2 jumpers, close and lock the KTES.
5. Configure the KTES with the VUI, refer to the *KTES Programming Manual*, DN1770.

Note: In pass-through mode, the KTES loses all ability to unlock the doors, or activate relays on access events. Lock outputs on the KTES no longer activate access granted by card, PIN, tenant, or any relay. In pass-through mode, the access controller entirely manages the door.

Figure 12: KTES Factory Default Steps



9 - Maintenance Recommendations

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

The KTES includes a lithium battery (see Figure 8 Kantech Telephone Entry System PCB View on page 15). This battery **cannot** be replaced in the field. If the lithium battery stops working, return the circuit board 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 circuit board, wrap it in non-conductive tape.

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**.

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 circuit board 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.

It is highly recommended to test the KTES by performing the following tests:

1. Bi-annual test for backup battery:

Remove AC power (UL Listed) or DC power (CE Compliant) from the KTES and let it work on backup battery power for one hour. This test will ensure that in the event of a power failure, the backup battery will be able to support normal operations. This test should be performed twice a year. Once the test has been performed successfully, reconnect power to the KTES.

2. Annual test for lithium battery:

Measure voltage when power is totally removed from the KTES (AC or DC and backup battery power). To ensure maximum operation and to prevent loss of the database, contact your distributor to return the KTES for maintenance, if the lithium battery voltage measures below 2.5 VDC.

Appendix A - Installation Checklist

The following checklist enumerates the steps to install the system.

Installation Steps	Pages
STEP 1: Unpacking the KTES	see page 20
STEP 2: Applying Sealant on the Back of the KTES	see page 20
STEP 3: Mounting	see page 21
STEP 4: Connecting the Door Locking Device (DC Powered)	see page 22
STEP 5: Connecting the Door Lock Device with an External Power Supply	see page 22
STEP 6: Hooking Up Inputs	see page 22
STEP 7: Connecting an External Controller	see page 23
STEP 8: Connecting a 3rd Party Controller	see page 24
STEP 9: Connecting the Telephone Line	see page 24
STEP 10: Connecting the Telephone Line with the Ferrite (KTES-AUS Model for Australia and New Zealand only)	see page 24
STEP 11: Connecting the RS-485 (optional)	see page 24
STEP 12: Connecting Multiple KTES on the Same Telephone Line (optional)	see page 25
STEP 13: Connect the KTES to Earth Ground	see page 25
STEP 14: Connect AC Power (North America only)	see page 25
STEP 15: Connect DC Power (EMEA only)	see page 26
STEP 16: Connecting the Backup Battery	see page 26
STEP 17: Connecting the Heater Kit for Outdoor Operation (Optional)	see page 26
STEP 18: Connecting the Ethernet Cable (Optional)	see page 27
STEP 19: Powering Up the KTES	see page 27
STEP 20: Programming the KTES	see page 27



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