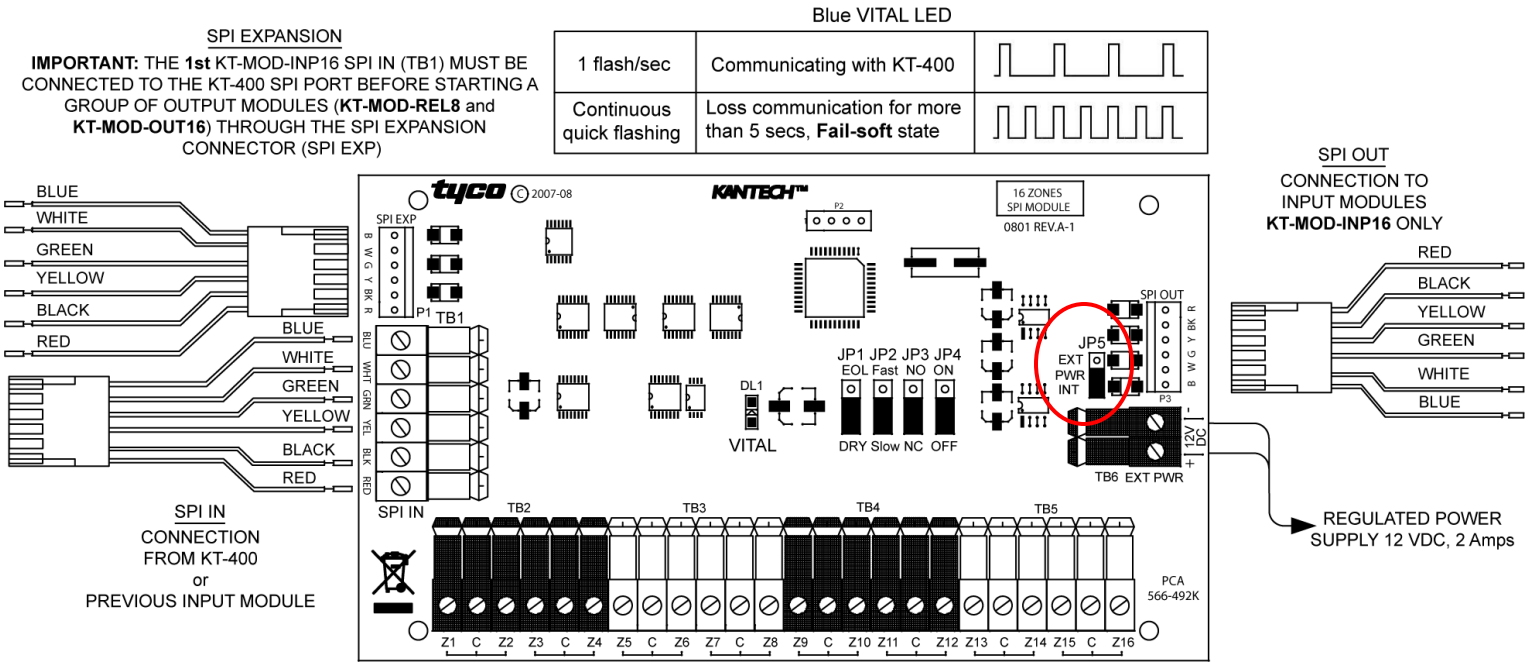


1. Introduction

The **KT-MOD-INP16** is an input module that adds up to 16 zones to the **KT-400** controller. The module supports daisy chaining; you can interconnect up to 15 KT-MOD-INP16 modules for a total of 240 external inputs per KT-400. Adding the 16 onboard inputs of the KT-400 gives a total of 256 inputs per KT-400. Combining input and output expansion modules gives the flexibility to connect up to 256 inputs and 256 outputs.

Note 1: The KT-400 SPI port maximum current draw, when the 12V AUX terminals are not used, is 500 mA.

Note 2: External power supply (12 VDC, 2 Amps) is required when the total current draw exceeds 500mA on the SPI Port.

2. Specifications

- Maximum Current Draw: up to 40 mA per module
- Supports single end-of-line (5.6 KΩ) resistor, double end-of-line resistor and no end-of-line (DRY) zone loops
- Supports Normally Closed (NC) and Normally Open (NO) contacts
- The C (Common) terminal is GND
- Input change with a debouncing of 500 ms (Slow) or 150 ms (Fast)
- Report conditions per input: **SECURE** or **ALARM** in single end-of-line and no end-of-line zone loops, and 2 additional conditions **TAMPER** and **TROUBLE** in double end-of-line zone loops
- Can be used for contact or elevator input
- Cannot be connected to output modules KT-MOD-REL8 and KT-MOD-OUT16 through SPI OUT, only through its SPI EXP expansion port
- Operating Temperature: -10C to +55C, 0C to 49C for UL Listed product
- Maximum Humidity: 93% (non condensing), 0 to 85% (non condensing) for UL Listed product
- IP Class 3X, IK Rating 04 (when mounted in a Kantech cabinet). IP and IK rating not evaluated by Underwriters Laboratories.

3. Installing the KT-MOD-INP16 Module

3.1. Unpacking

The **KT-MOD-INP16** package includes the following parts:

- One (1) KT-MOD-INP16 module, 14 cm x 8 cm (5.7 in x 3.25 in)
- One (1) SPI cable with 1 SPI connector, 41 cm (16 in)
- 16x 5.6K Ohms ½ Watt Resistor
- Four (4) plastic standoffs
- Two (2) installation sheets, English and French

3.2. Mounting

The **KT-MOD-INP16** can be installed inside a compatible cabinet (KT-MOD-CAB or KT-400) or mounted in a dry and secure location at less than 1 m (3 ft) from the KT-400.

1. Press the four (4) plastic standoffs through the mounting holes of the cabinet,
2. Secure the cabinet to the wall in the desired location. Use appropriate wall anchors when securing the cabinet to drywall, plaster, concrete, brick or other surfaces.
3. Press the module into the plastic standoffs to secure the module to the cabinet.

3.3. SPI Wiring

Perform the following steps to complete wiring:

Note 1: Before beginning to wire the unit, ensure that all power (AC transformer and battery) is disconnected from the KT-400.

Note 2: If you are combining input and output modules through the SPI EXP expansion port of the KT-MOD-INP16, the input module must be the 1st module connected to the KT-400 SPI Port.

1. Connect the 6-pin SPI connector to the KT-400 SPI port or to the SPI OUT of the previous KT-MOD-INP16 module.
2. Connect the six SPI wires (blue (BLU), white (WHT), green (GRN), yellow (YEL), black (BLK) and red (RED)) to the SPI IN (TB1) terminals.
3. You can use the SPI EXP of the 1st KT-MOD-INP16 to start a group of output modules (**KT-MOD-REL8** and **KT-MOD-OUT16 only**).
4. Connect the 6-pin SPI connector from the SPI OUT to the next KT-MOD-INP16 module.
5. Complete all zone wiring to the zone input terminals (Z1-Z16).

Configurations for 16-Zone Inputs with Jumpers (***Note***)

JP1	JP2	JP3	JP4	DESCRIPTION
-	-	-	ON	Normally Close contact with double End-of-Line resistor
EOL	-	NC	OFF	Normally Close contact with single End-of-Line resistor
EOL	-	NC	OFF	Normally Close contact with single End-of-Line resistor
DRY	-	NO	OFF	Normally Open contact without End-of-Line resistor
DRY	-	NC	OFF	Normally Close contact without End-of-Line resistor
x	FAST	x	x	150 ms input debounce time
x	SLOW	x	x	500 ms input debounce time

*3.4. Check the power jumper **JP5** position. Put it on **EXT** if you need external power or **INT** if no external power is required.*

Note: In double end-of-line resistor configuration (JP4 ON position), only 8 zone inputs (Z1 through Z8) are operational. Z9 through Z16 are operational only in single and no end-of-line configurations (JP4 OFF position). This configuration is available from firmware version 1.03 and later.

Interconnection is still limited to 15 KT-MOD-INP16 modules for a total of 120 external double end-of-line inputs per KT-400.

4. Configurations with Jumpers

There are 4 jumpers available to configure the KT-MOD-INP16. The jumper settings apply to **ALL** inputs at the same time.

DRY (no end-of-line resistor): In a simple NC dry contact configuration, the **secure** state is given when a short is detected. The voltage becomes lower than the **Level 1** threshold value (1.1V).

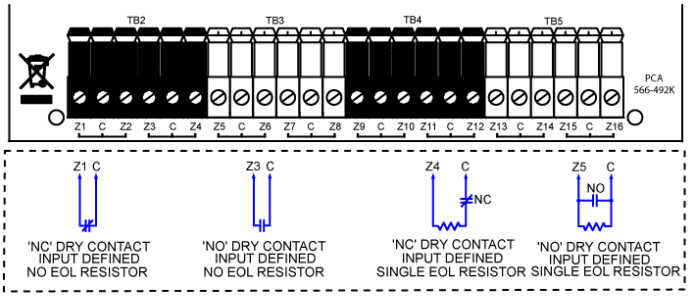
The **alarm** state is given when the input is open. The voltage becomes higher than the **Level 2** threshold value (3.75V). If the alarm switch is programmed as NO device, the **alarm** state will be given when the input is shorted.

EOL (single end-of-line resistor): For NC device, the **secure** state is given when a single resistor is detected. The voltage becomes lower than the **Level 3** threshold value (2.9V) and higher than the **Level 2** threshold value (2.25V).

The **alarm** state is given when the input is open or short. The voltage becomes higher than the **Level 4** threshold value (3.75V) or lowers than the **Level 1** threshold value (1.1V). If the alarm switch is programmed as NO device, the **alarm** state will be given when a single resistor is detected.

DEOL (double end-of-line resistor): Both Alarm and Tamper switches always operate as NC devices. The **secure** state is given when a single resistor is detected. Corresponding digital reading is lower than the **Level 3** threshold value (2.9V) and higher than the **Level 2** threshold value (2.25V). The **alarm** state is given when double resistors in series are detected. Corresponding digital reading is lower than the **Level 4** threshold value (3.75V) and higher than the **Level 3** threshold value (2.9V). The **trouble** state is given when the input is shorted. Corresponding digital reading is lower than the **Level 1** threshold value (1.1V). The **tamper** state is given when the input is left open. Corresponding digital reading is higher than the **Level 4** threshold value (3.75V).

Double End-of-Line resistor functionality not evaluated by Underwriters Laboratories.



DRY (No EOL Resistor)

Input	State NC	State NO	Level
Open	Alarm	Secure	High
			2
			1
Short	Secure	Alarm	Low

Fixed values for:
Level 1 = 1.1 V
Level 2 = 3.75 V

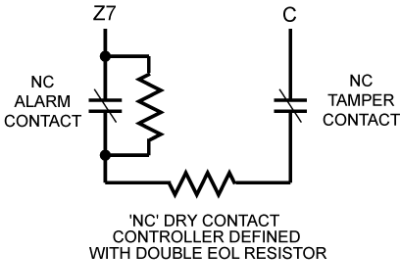
EOL (Single EOL Resistor)

Input	State NC	State NO	Level
Open	Alarm	Secure	High
			4
			3
Resistor	Secure	Alarm	
			2
			1
Short	Alarm	Secure	Low

Fixed values for:
Level 1 = 1.1 V
Level 2 = 2.25 V
Level 3 = 2.9 V
Level 4 = 3.75 V

DEOL (Double EOL Resistor)

Input	State	Level
Open	Tamper	High
		4
2R	Alarm	
		3
1R	Secure	
		2
		1
Short	Trouble	Low



Fixed values for Level 1 to 4 are the same as for single EOL.

5. Applying Power

After all wiring is completed, connect the 16 VAC to the KT-400. Connect the battery leads to the battery, and then apply power to the AC transformer.

Note: Do not connect power until all wiring is complete.

This module provides access point control (5) as per EN50133-1.

Certified by Telefication under the requirements of EN50133-1 and EN50130-5 Class II.

Terminal Connections

Module no.: _____

Date of installation: _____

KT-400 Name: _____

KT-400 SITE NAME: _____

KT-400 Serial Number: _____

AUX: _____

SPI BUS (FROM): _____

SPI BUS (TO): _____

☐ **Z1:** _____	☐ **Z9:** _____
☐ **Z2:** _____	☐ **Z10:** _____
☐ **Z3:** _____	☐ **Z11:** _____
☐ **Z4:** _____	☐ **Z12:** _____
☐ **Z5:** _____	☐ **Z13:** _____
☐ **Z6:** _____	☐ **Z14:** _____
☐ **Z7:** _____	☐ **Z15:** _____
☐ **Z8:** _____	☐ **Z16:** _____

FCC COMPLIANCE STATEMENT

CAUTION: Changes or modifications not expressly approved by Kantech could void your authority to use this equipment.
This equipment generates and uses radio frequency energy and if not installed and used properly, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for Class B device in accordance with the specifications in Subpart "B" of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in any residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to television or radio reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient the receiving antenna
- Relocate the alarm control with respect to the receiver
- Move the alarm control away from the receiver
- Connect the alarm control into a different outlet so that alarm control and receiver are on different circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the FCC helpful: "How to Identify and Resolve Radio/Television Interference Problems". This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402, Stock # 004-000-00345-4.

This device complies with Part 15 of the FCC rules. 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 complies with Canadian ICES-003.

The KT-MOD-INP16 is also compliant with EN55022: Class B.

UL 294 Performance Levels

Destructive Attack: I Line Security: I

Endurance: IV Standby Power: I*

*Standby Power Level IV when powered by KT-400.

Johnson Controls

TYCO INTERNATIONAL LTD

END-USER LICENSE AGREEMENT

FOR KANTECH Software Provided with or without products or components

IMPORTANT - READ CAREFULLY

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

- This End-User License Agreement ("EULA") is a legal agreement between You (the company, individual or entity who acquired the Software and any related Hardware) and KANTECH, the manufacturer of the integrated security systems and the developer of the software and any related products or components ("HARDWARE") which You acquired.
- If the KANTECH software product ("SOFTWARE PRODUCT" or "SOFTWARE") is intended to be accompanied by HARDWARE, and is NOT accompanied by new HARDWARE, You may not use, copy or install the SOFTWARE PRODUCT. The SOFTWARE PRODUCT includes computer software, and may include associated media, printed materials, and "online" or electronic documentation.
- Any software provided along with the SOFTWARE PRODUCT that is associated with a separate end-user license agreement is licensed to You under the terms of that license agreement.
- By installing, copying, downloading, storing, accessing or otherwise using the SOFTWARE PRODUCT, You agree unconditionally to be bound by the terms of this EULA, even if this EULA is deemed to be a modification of any previous arrangement or contract. If You do not agree to the terms of this EULA, KANTECH is unwilling to license the SOFTWARE PRODUCT to You, and You have no right to use it.

SOFTWARE PRODUCT LICENSE

a The SOFTWARE PRODUCT is protected by copyright laws and international copyright treaties, as well as other intellectual property laws and treaties. The SOFTWARE PRODUCT is licensed, not sold.

1 GRANT OF LICENSE - This EULA grants You the following rights:

a Software Installation and Use - For each license You acquire, You may have only one copy of the SOFTWARE PRODUCT installed.

b Storage/Network Use - The SOFTWARE PRODUCT may not be installed, accessed, displayed, run, shared or used concurrently on or from different computers, including a workstation, terminal or other digital electronic device ("Device"). In other words, if You have several workstations, You will have to acquire a license for each workstation where the SOFTWARE will be used.

c Backup Copy - You may make back-up copies of the SOFTWARE PRODUCT, but You may only have one copy per license installed at any given time. You may use the back-up copy solely for archival purposes. Except as expressly provided in this EULA, You may not otherwise make copies of the SOFTWARE PRODUCT, including the printed materials accompanying the SOFTWARE.

2 DESCRIPTION OF OTHER RIGHTS AND LIMITATIONS

a Limitations on Reverse Engineering, Decompilation and Disassembly - You may not reverse engineer, decompile, or disassemble the SOFTWARE PRODUCT, except and only to the extent that such activity is expressly permitted by applicable law notwithstanding this limitation. You may not make any changes or modifications to the Software, without the written permission of an officer of KANTECH. You may not remove any proprietary notices, marks or labels from the Software Product. You shall institute reasonable measures to ensure compliance with the terms and conditions of this EULA.

b Separation of Components - The SOFTWARE PRODUCT is licensed as a single product. Its component parts may not be separated for use on more than one HARDWARE unit.

c Single INTEGRATED PRODUCT - If You acquired this SOFTWARE with HARDWARE, then the SOFTWARE PRODUCT is licensed with the HARDWARE as a single integrated product. In this case, the SOFTWARE PRODUCT may only be used with the HARDWARE as set forth in this EULA.

d Rental - You may not rent, lease or lend the SOFTWARE PRODUCT. You may not make it available to others or post it on a server or web site.

e Software Product Transfer - You may transfer all of Your rights under this EULA only as part of a permanent sale or transfer of the HARDWARE, provided You retain no copies, You transfer all of the SOFTWARE PRODUCT (including all component parts, the media and printed materials, any upgrades and this EULA), and provided the recipient agrees to the terms of this EULA. If the SOFTWARE PRODUCT is an upgrade, any transfer must also include all prior versions of the SOFTWARE PRODUCT.

f Termination - Without prejudice to any other rights, KANTECH may terminate this EULA if You fail to comply with the terms and conditions of this EULA. In such event, You must destroy all copies of the SOFTWARE PRODUCT and all of its component parts.

g Trademarks - This EULA does not grant You any rights in connection with any trademarks or service marks of KANTECH or its suppliers.

3 COPYRIGHT

All title and intellectual property rights in and to the SOFTWARE PRODUCT (including but not limited to any images, photographs, and text incorporated into the SOFTWARE PRODUCT), the accompanying printed materials, and any copies of the SOFTWARE PRODUCT, are owned by KANTECH or its suppliers. You may not copy the printed materials accompanying the SOFTWARE PRODUCT. All title and intellectual property rights in and to the content, which may be accessed through use of the SOFTWARE PRODUCT, are the property of the respective content owner and may be protected by applicable copyright or other intellectual property laws and treaties. This EULA grants You no rights to use such content. All rights not expressly granted under this EULA are reserved by KANTECH and its suppliers.

4 EXPORT RESTRICTIONS

You agree that You will not export or re-export the SOFTWARE PRODUCT to any country, person, or entity subject to US export restrictions.

5 CHOICE OF LAW

This Software License Agreement is governed by the laws of the State of New York.

6 LIMITED WARRANTY

a NO WARRANTY
KANTECH PROVIDES THE SOFTWARE "AS IS" WITHOUT WARRANTY. KANTECH DOES NOT WARRANT THAT THE SOFTWARE WILL MEET YOUR REQUIREMENTS OR THAT OPERATION OF THE SOFTWARE WILL BE UNINTERRUPTED OR ERROR-FREE.

b CHANGES IN OPERATING ENVIRONMENT
KANTECH shall not be responsible for problems caused by changes in the operating characteristics of the HARDWARE, or for problems in the interaction of the SOFTWARE PRODUCT with non-KANTECH SOFTWARE or HARDWARE PRODUCTS.

c LIMITATION OF LIABILITY; WARRANTY REFLECTS ALLOCATION OF RISK
IN ANY EVENT, IF ANY STATUTE IMPLIES WARRANTIES OR CONDITIONS NOT D IN THIS LICENSE AGREEMENT, KANTECH'S ENTIRE LIABILITY UNDER ANY PROVISION OF THIS LICENSE AGREEMENT SHALL BE LIMITED TO THE GREATER OF THE AMOUNT ACTUALLY PAID BY YOU TO LICENSE THE SOFTWARE PRODUCT AND FIVE US DOLLARS (USD$5.00). BECAUSE SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES, THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

d 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 MAKES NO OTHER WARRANTIES. KANTECH NEITHER ASSUMES 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 SOFTWARE PRODUCT.

e EXCLUSIVE REMEDY AND LIMITATION OF WARRANTY
UNDER NO CIRCUMSTANCES SHALL KANTECH BE LIABLE FOR ANY SPECIAL, INCIDENTAL, CONSEQUENTIAL OR INDIRECT 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 SOFTWARE PRODUCT OR ANY ASSOCIATED EQUIPMENT, COST OF CAPITAL, COST OF SUBSTITUTE OR REPLACEMENT EQUIPMENT, FACILITIES OR SERVICES, DOWN TIME, PURCHASERS TIME, THE CLAIMS OF THIRD PARTIES, INCLUDING CUSTOMERS, AND INJURY TO PROPERTY.

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 SOFTWARE PRODUCT to fail to perform as expected.