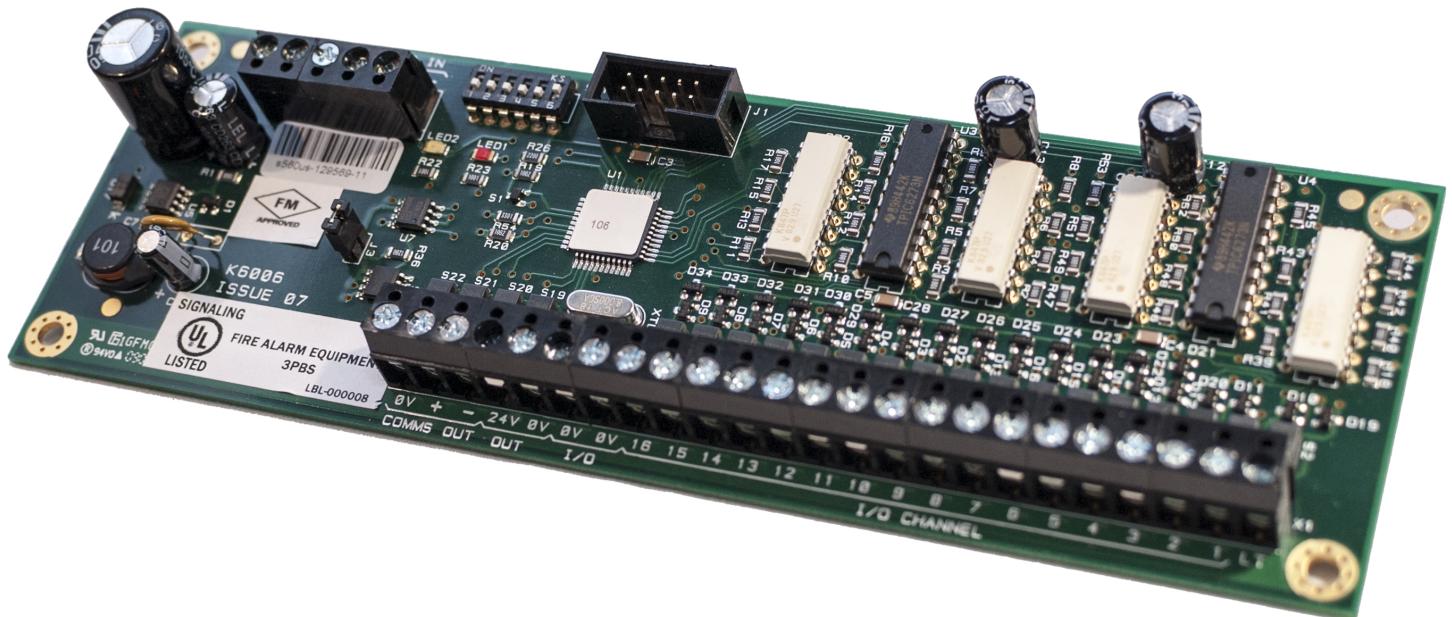




16 Channel I/O Interface Information Guide



CONTENTS

Contents	2
Compliance	4
Underwriters Laboratories (UL)	4
FCC	4
Installation	4
Introduction	5
Technical Support	5
Return Material Authorization (RMA)	5
Warranty Service	6
Advanced Replacements	6
Overview	7
Use Case Examples	7
Restrictions	8
Installation	9
Before You Begin	10
Setting the Address	11
Mounting the Card	12
Connecting the Termination Jumper	13
Connecting Power and Communications	14
Inputs and Outputs	16
Connecting Inputs	17
Connecting Outputs	17
Troubleshooting	19

Configuration	20
For channels set as Outputs	20
For channels set as Inputs	20
UL Compliance Limitations	21
Specifications	22
Electrical	22
Cabling	22
Operating Environment	22
Physical Specifications	22
Index	23
Glossary	24

COMPLIANCE

Underwriters Laboratories (UL)

Fire Alarm Subassembly
Kentec Electronics Ltd

FCC

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the Installation Manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Any changes or modifications not expressly approved by Kentec Electronics Ltd could void the user's authority to operate this equipment under the rules and regulations of the FCC.

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.

Installation

Install this product in accordance with NFPA 13, NFPA 72, NFPA 70, and NEC 70 and all local codes.

All field wiring should be installed using fire rated cables according to the NFPA 72. Riser conductors shall be installed in accordance with the survivability from attack by fire requirements in National Fire Alarm Code, NFPA 72, Section 12.3. Riser conductors shall employ either a 2 hour rated cable system, or meet requirements approved by the AHJ.

INTRODUCTION

Technical Support

For technical support, contact Kentec Electronics, Ltd at +44 (0)1322 222121 or techsupport@kentec.co.uk.

Prior to contacting technical support, have the following information available:

- Product part number
- Purchase order or order number
- Product serial number
- Current function of the product
- Expected function of the product
- Installation of the product

Return Material Authorization (RMA)

Contact Technical Support to obtain an RMA for any product to be returned. Returns will not be accepted without an accompanying RMA number. An RMA number is assigned when:

- Tech Support acknowledges a possible product failure.
- A product was damaged during shipping
- An incorrect product was shipped
- An order was placed using an incorrect part number *
- An order was placed using an incorrect part quantity *
- An order is no longer required *

* Restocking fees may apply.

All returned products are tested to confirm operating failures experienced in the field. If the product is found to be functional, contractors must absorb expenses for return shipping, as well as the cost and shipping of the advanced replacement product.

Prominently display the RMA number on all packages sent for return. Ship all return products to:

Attention: RMA # _____

Kentec Electronics, Ltd

Units 25-27 Fawkes Avenue

Questor, Dartford
Kent. DA1 1JQ
United Kingdom

Warranty Service

Technical Support can replace or repair a defective product when the original purchase is within the warranty period defined in the sales contract. Check your contract for more information, or contact your sales representative about your specific warranty period.

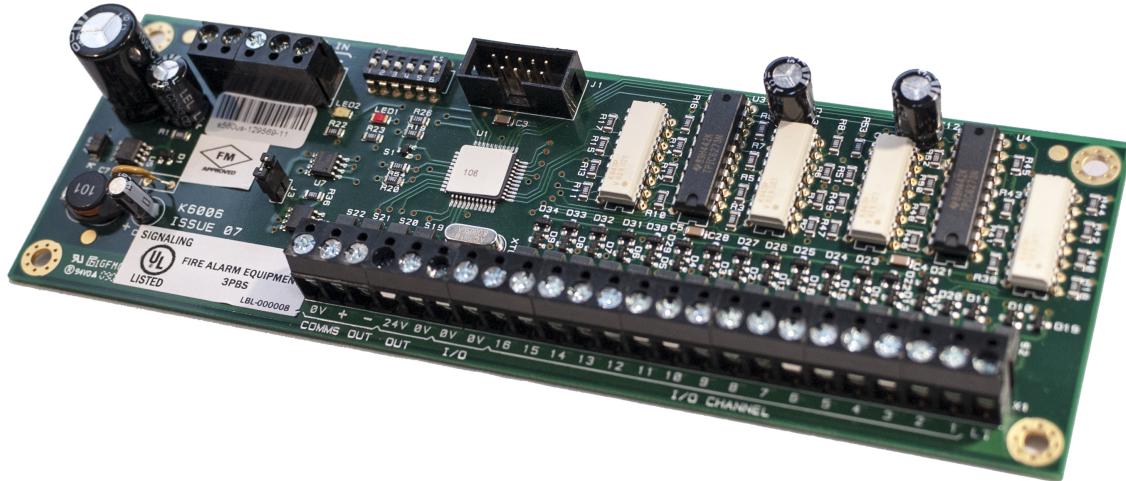
Advanced Replacements

Products that fail to operate in the field can be replaced quickly using the advanced replacement process. The advanced replacement process is available to all contractors who maintain an acceptable line of credit.

Initiate the advanced replacement process by requesting an RMA number from a Tech Support representative. Advanced replacements can be shipped to your location when the product is covered under warranty and when a replacement product is in stock.

- Advanced replacements can be expedited at the request of the contractor. Shipping costs associated with this process are the responsibility of the contractor.
- Products returned using the advanced replacement process must be received within 30 days of the RMA issue date.

OVERVIEW



16 Channel I/O Interface Card (K1171)

The 16 Channel I/O Interface enhances the versatility of the alarm system by providing additional input and output capabilities to the Taktis Fire Alarm Control Panel. Inputs and outputs can be selected for up to 16 individual channels. All inputs and outputs are configured in the same way as devices connected to addressable loops of the panel. The 16 Channel I/O Interface can be configured to contribute or act upon cause and effect logic.

This module must be housed in a separately-listed enclosure connected to the panel by metal conduit located within the same room. Power must be provided by a power supply listed for fire alarm service.

Use Case Examples

The 16 Channel I/O Interface can be used to interface the Taktis panel to a NAC extender or Voice Evacuation system, by providing

- inputs to the Taktis panel for dry contact closures such as General Trouble, AC Power Trouble, or Battery Trouble from these devices.
- outputs from the panel to control various NAC or Voice Evacuation outputs.

The 16 Channel I/O Interface can be used to interface the Taktis panel to a secondary panel or releasing panel, by providing

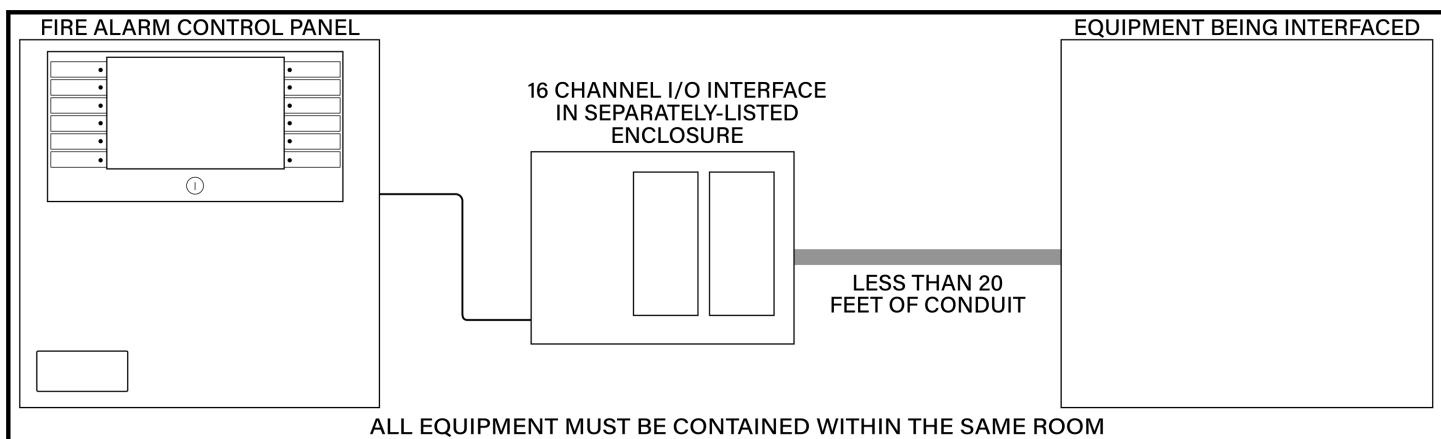
- inputs to the Taktis panel for dry contact closures such as Fire, Supervisory, and Trouble from these panels, and various stages of release from the releasing panel.
- outputs from the panel to activate NAC outputs on these panels.

Restrictions

Inputs are intended for use as control signals from other life safety equipment. Inputs of this device are not supervised, and therefore cannot be used directly as initiating circuits for life safety applications within a UL listed system. Outputs are intended for use as control signals to other life safety equipment. Outputs of this device are not supervised, and cannot be directly connected to notification or releasing-type appliances in a UL listed system.

In a UL listed system, the 16 Channel I/O Interface:

- must be housed in a separately-listed enclosure.
- must be located in the same room as the Taktis panel.
- must be located in the same room as the equipment being interfaced.
- must be wired in conduit (or equivalently protected against mechanical injury) and within 20 feet of equipment being interfaced.
- must not be used to control the release of extinguishants.



INSTALLATION

This section provides instructions for connecting cables, mounting, and testing the 16 Channel I/O Interface Card for installation.

- Notify the monitoring center and location security that the Taktis Fire Alarm Control Panel will be temporarily out of service.
- Remove the card from its packaging and check its contents.
- Set the address of the card.
- Mount the card(s) in a supplementary cabinet near the panel using the supplied hardware.
- On all boards except the last in the bus, remove the pre-installed termination jumper as shown in [Connecting the Termination Jumper](#).
- Connect multiple cards together using the inputs and outputs as shown in [Connecting Power and Communications](#).
- Remove AC and battery power from the panel.
- Connect field wiring as shown in [Connecting Power and Communications](#) below.
- Restore AC and battery power.
- [Configure](#) the module(s) using Loop Explorer 2 or the panel GUI.
- Test communication from the panel via the [LED Status Indicators](#).

Install this product in accordance with NFPA 72, the National Electrical Code, and all local codes.

IMPORTANT! The card must be installed by personnel familiar with electronic components. Electronic components are vulnerable to damage from electrostatic discharge. Ground straps must be worn by installers before handling 16 Channel I/O Interface to prevent electrostatic discharge damage.

Before You Begin

Before you begin the installation, take a few minutes to review the installation information, gather the required items, and complete the tasks listed below to make the installation as quick and easy as possible:

1. A small ancillary cabinet (see below to determine model number) is required for mounting the 16 Channel I/O Interface Board. The ancillary cabinet should be mounted near the Taktis Fire Alarm Control Panel. Provide a metal enclosed wiring pathway (such as conduit) between the panel and the cabinet.

Cabinet w/ Lid and Mounting Plate: **K0770 - <A>**, where

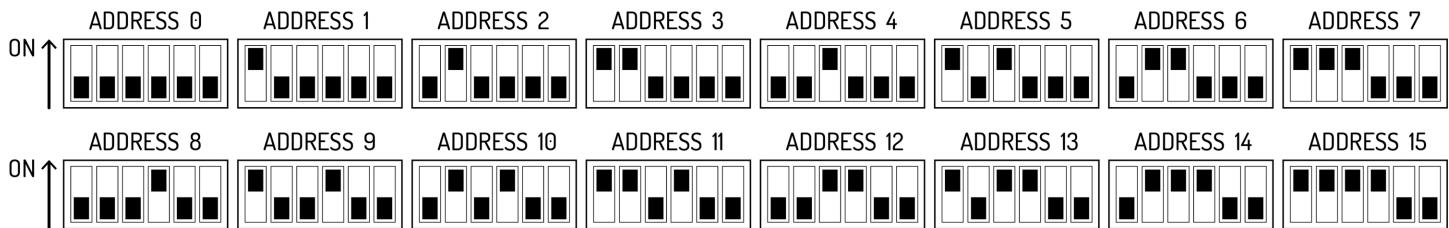
- A designates color (1 = red, 4 = gray)
- B designates the number of cards (up to 3) to be installed

2. Verify that you received the [termination jumper](#). The 16 Channel I/O Interface Card ships from the factory with the termination jumper installed.
3. Acquire the following items that are not included with the 16 Channel I/O Interface Card, but may be required for installation:
 - **Communication Cabling** - Specify required lengths of 14 through 22 AWG.
 - **Power Cabling** - Specify required lengths of 14 through 22 AWG.
 - **Ground Strap** - A ground strap is required for handling circuit boards. The ground strap is not provided in the packaging of the 16 Channel I/O Interface.

Setting the Address

Each panel module of the Taktis Fire Alarm Control Panel must contain a unique setting before being connected to the Main Back Board. The binary setting of the DIP switch sets the specific address for the panel module. The numeric order of the address setting between modules does not impact operation, but each panel module must be assigned a separate / unique address.

The black portion of the DIP switch identifies the switch actuator.



Address 0 is shown above for illustrative purposes only. Address 0 should never be used.

For addresses above 15, switches 5 and 6 will need to be used.

- For address 16-31, switch 5 should be in the ON position. Switch 5 ALONE adds 16 to the address number. For example, for address 20, set the switch position to address 4 shown above and switch 5 in the ON position.
- For address 32-47, switch 6 should be in the ON position. Switch 6 ALONE adds 32 to the address number.
- For address 48-63, switches 5 AND 6 should be in the ON position. Switches 5 and 6 TOGETHER adds 48 to the address number.

Mounting the Card

To install the 16 Channel I/O Interface Card:

1. Switch off AC power and disconnect the battery .
2. Use the standoffs and screws (included with the board) to mount the card to the device plate inside the supplemental enclosure. Up to 3 cards can be installed in the supplementary cabinet.
3. Reconnect the battery and restore AC power.

Connecting the Termination Jumper

A termination jumper is provided with the 16 Channel I/O Interface Card, and comes installed. The jumper provides RS-485 communication on the 16 Channel I/O Interface card. When multiple cards are installed, only the last card on the bus should have the jumper installed.



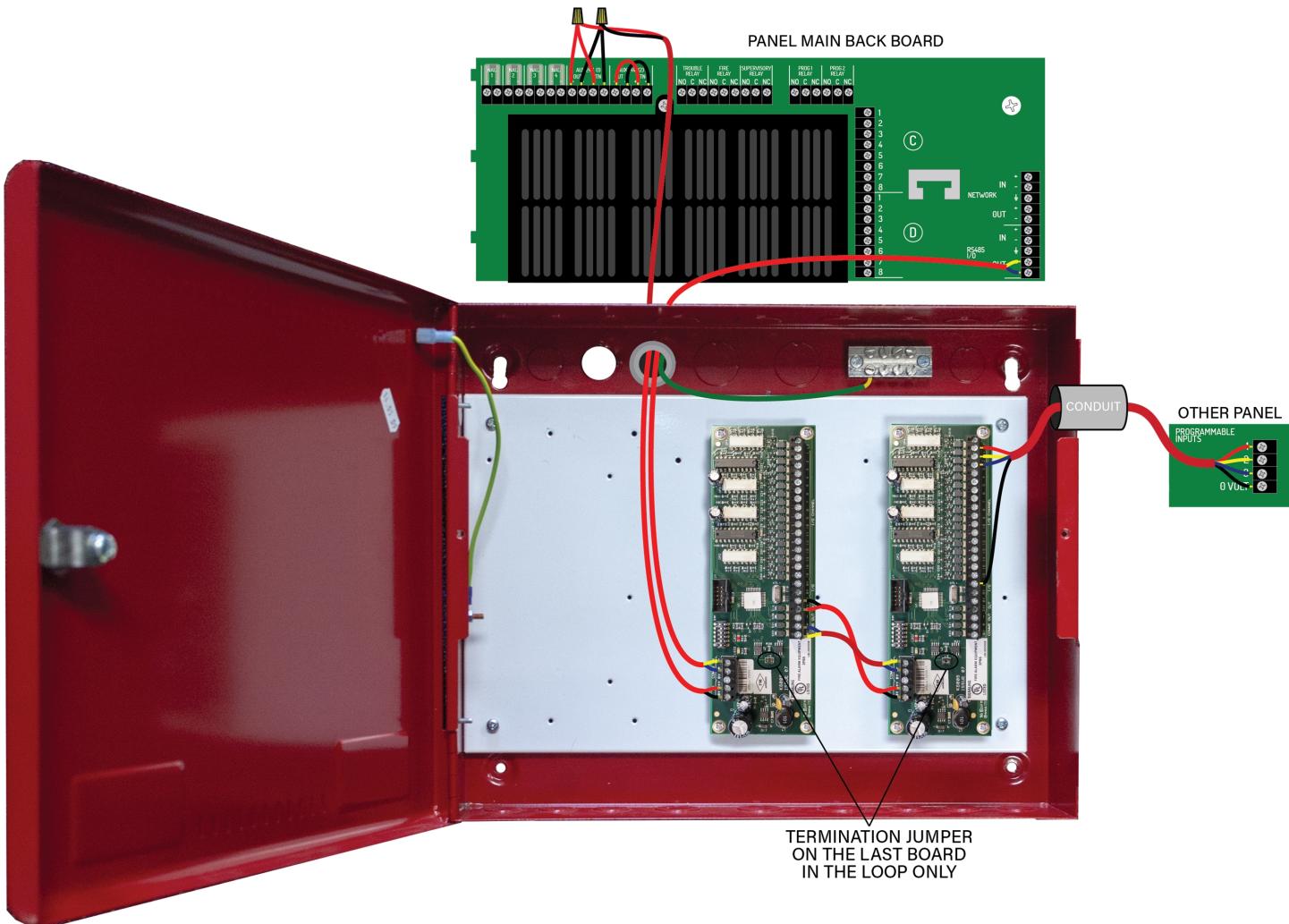
Connecting Power and Communications

The AUX 24V available in the Taktis Fire Alarm Control Panel is fused at 900 mA and is suitable for powering the 16 Channel I/O Interface Card. The total load current drawn by all outputs should be considered when using this supply. If an alternate power supply is used, it must provide regulated 24V DC and be listed for fire alarm service.

Do not insert more than one conductor per terminal. Use wire nuts or other suitable splice connectors to connect the 24V DC cables to both the AUX 24V OUT and RTN terminals.

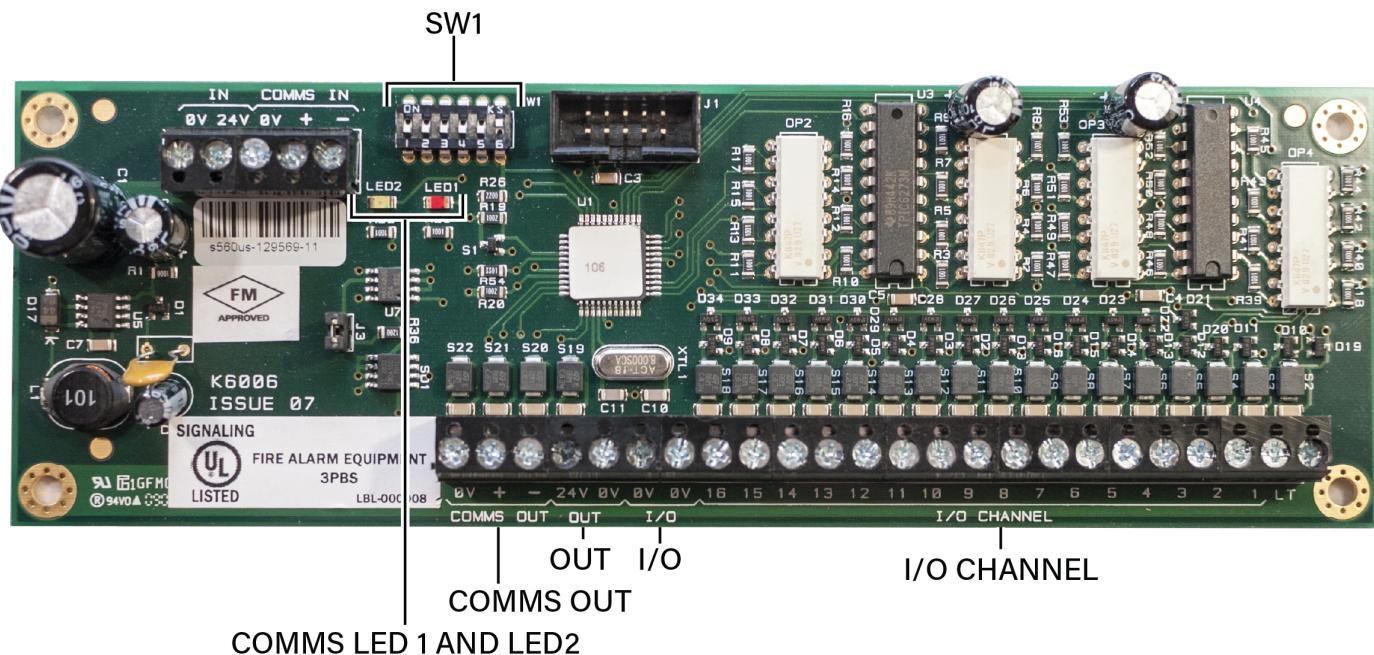
The Taktis Fire Alarm Control Panel communicates with the 16 Channel I/O Interface using a 2-wire RS-485 data bus. Wire the RS-485 data bus using a suitable RS-485 data communications cable.

The following figure illustrates power and communication connections between the panel and the 16 Channel I/O Interface Card.



Example of 16 I/O Wiring

Inputs and Outputs

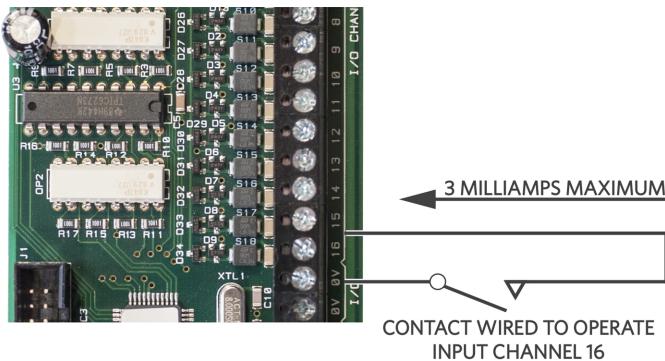


Do not insert more than one conductor into any terminal on this board. If your application requires multiple conductors to be connected to the same terminal, use a wire nut or other suitable splice connector to join the conductors together, along with a short 14-18 AWG jumper wire, and then connect the jumper wire to the terminal.

Name	Description
I/O Channel	16 channels available for operating circuit inputs or outputs.
I/O Terminals	0V and 0V are the return connections for each channel.
OUT Terminals	24V and 0V are the 24 VDC output connections.
COMMS OUT	Terminals 0V, + and - are available output connections for the RS485 serial bus.
COMMS LED1 and LED 2	LED1 flashes when the 16 Channel I/O Interface receives message traffic from the panel. LED2 flashes when the 16 Channel I/O Interface transmits message traffic to the fire control panel.
IN Terminals	24V and 0V are the 24 VDC input connections.
COMMS IN	Terminals 0V, + and - are input connections for the RS485 serial bus.
SW1	DIP switch capable of setting 32 unique addresses.

Connecting Inputs

Inputs on the 16 Channel I/O Interface are optically isolated and are activated when connecting one of the 0V terminals to one of the 16 channel inputs. The 16 Channel I/O Interface inputs are activated when resistances of the circuit-path are less than 500 ohms. The switch-current caused by contact closure is limited to a maximum of 3 mA.

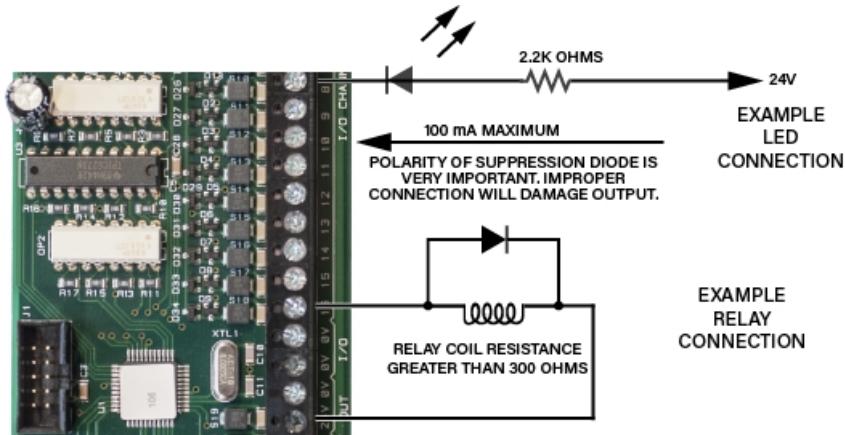


CAUTION! These inputs are intended for use as control signals from other life safety equipment. Inputs of this device are not supervised, and cannot be used as initiating circuits for life safety applications within a UL listed system.

Refer to the [example wiring diagram](#) above for how to properly route and wire device and terminal connections.

Connecting Outputs

Channels of the 16 Channel I/O Interface provide a negative voltage with respect to the 24V supply when outputs are configured. Care should be taken when connecting outputs to ensure that suppression diodes of relay coils are correctly polarized. Incorrectly connected diodes will damage 16 Channel I/O Interface outputs. Installers must connect the cathode-band of suppression diodes to the positive 24VDC terminals to provide polarization. Individual channels can provide current up to 100 mA but each bank of eight channels (channels 1-8 or 9-16) must be limited to 500 mA combined. The power supply operating the 16 Channel I/O Interface should also be evaluated to ensure that its rating is not exceeded when multiple channels function simultaneously. The following figure illustrates an example relay and LED connection on the 16 Channel I/O Interface.



CAUTION! These outputs are intended for use as control signals to other life safety equipment. Outputs of this device are not supervised, and cannot be connected to notification and/or releasing type appliances in a UL listed system.

Refer to the [example wiring diagram](#) above for how to properly route and wire device and terminal connections.

Troubleshooting

LED indicators on the 16 Channel I/O Interface provide diagnostic information to identify communication.

LED Indicator	Color	Description
LED1	Red	LED1 flashes when the 16 Channel I/O Interface receives message traffic from the panel. When it does not light, the 16 Channel I/O Interface is not receiving message traffic from the panel. Check the integrity of the comms communication path. When LED1 lights continuously, corrupt data is being received on the comms communication path. Confirm that interference is not being induced on the comms communication path by checking the power or other noise-generating sources.
LED2	Yellow	LED2 flashes when the 16 Channel I/O Interface transmits message traffic to the fire control panel. The LED does not flash when the 16 Channel I/O Interface is not transmitting message traffic to the fire control panel. Check the integrity of the comms communication path.

CONFIGURATION

The 16 Channel I/O Interface can be configured via LE2 or the Panel GUI. Set each channel to be an input or output.

For channels set as Outputs

1. Select the desired **Output** options. This selection will activate the circuit when the selected event(s) occur.
2. Set whether or not the output will be **Silenceable**. Each channel is configurable in reaction to the Alarm Silence button on the front panel. Select the box for **Silencing** if the channel should return to normal standby when the panel is silenced.
3. Each output circuit is normally On, but Off upon activation. Selecting **Output Invert** will set the circuit to be normally Off, but On upon activation.
4. **Ignore Global Delays**. This setting will delay the activation of the output. If nothing is set, it will activate immediately (when triggered) and remain on until the system is reset. For UL compliance, this field must be set to 0.
5. Enter a **Duration** to select how long an output will be active. If nothing is configured, it will remain active until the system is reset. For UL compliance, this field should not be configured.
6. Set the **Location Text**, up to 80 characters. This text is displayed when the circuit is activated.
7. Set the desired **Zone** number for the circuit. Allowable values are 0-2000.

For channels set as Inputs

1. Choose an **Input Action**. If desired, a custom input message can be entered.
2. Check the **Output Delay Bypass** box if activation of this circuit should immediately activate its associated outputs, even if those outputs have configured delays.
3. Set the **Input Delay** in seconds, up to 180 seconds. For UL compliance, this field must be set to 0.
4. Set the circuit to latching or non-latching. For UL compliance, this field must be set to latching.
5. Each input circuit is Normally Closed, but Open upon activation. Selecting **Input Invert** will set the circuit to be Normally Open, but Closed upon activation.
6. Set the **Location Text**, up to 80 characters. This text is displayed when the circuit is activated.
7. Set the desired **Zone** number for the circuit. Allowable values are 0-2000.

UL Compliance Limitations

In order for the product to comply with the requirements in the **Standard for Control Units and Accessories for Fire Alarm Systems, UL 864 10th Edition**, certain programming features or options must be limited to specific values or not used at all as indicated below.

Field	Configurable Range	UL Permitted Value / Range
First Global Delay	0-10 minutes	0 minutes
Second Global Delay	0-10 minutes	0 minutes
Duration	0 seconds - 23 hours, 59 minutes, 50 seconds	0 seconds
Input Delay	0-180 seconds	0 seconds
Input Latch	Latching or Non-Latching	Latching

SPECIFICATIONS

This appendix provides electrical and environmental specifications for the 16 Channel I/O Interface.

Electrical

Supply Voltage	24 V DC
Quiescent Current	20 mA
Current Per Input	3 mA maximum, power-limited
Current Per Output	100 mA or 500 mA across bank of 8 outputs Source must be power-limited.

Cabling

Communications	RS-485 two-wire. Maximum distance from fire control panel: 3900 feet (1200 meters). Specify Belden 9271, 9860, or any 18 - 22 AWG insulated copper-wire.
Terminal Blocks	Each terminal accepts two 14 - 22 AWG.

Operating Environment

Dry indoor use only.

Temperature Range	32° F to 120° F (0° C to 49° C)
Relative Humidity	Up to 93%, non-condensing

Physical Specifications

Dimensions	190mm x 61 mm or 7.5" x 2.5"
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INDEX

0

0V 16

1

18 AWG 16

2

24V 14

A

AUX 24V 14

C

Cabling 10, 22

Class A 4

D

DIP Switch 11

G

General Trouble 7

L

Load Current 14

Loop Explorer 2 9

M

Main Back Board 11

N

NAC 7

R

RS485 16

T

Terminals 14

Trouble 7

GLOSSARY

A

AHJ

Authority Having Jurisdiction. The government body, organization, office, or individual having the power to enforce and/or interpret laws, codes, and rules.

Ancillary Device

A device connected to a fire alarm system not required by the fire alarm standard, but may be required by other standards, e.g. door holders, smoke control fans, remote LED indicators, remote alarm, or trouble units.

AWG

American Wire Gauge. The standard American designation of wire sizes. Wire size is an inverse relation to gauge numbers that range from 0000 to 40 AWG. Also called Brown and Sharpe or B&S gauge.

C

Class A

A wiring classification of circuits capable of transmitting an alarm signal during a single open or non-simultaneous ground fault on a conductor.

Class B

A wiring classification of circuits NOT capable of transmitting an alarm signal beyond a single open or during a short between conductors.

Class X

A wiring classification capable of transmitting an alarm signal during a single open, short, or non-simultaneous ground fault on a conductor.

D

DIP Switch

A group of two-position electrical contacts mounted in a Dual Inline Package (DIP), typically used to set address or function information.

E**End-Of-Line Device (EOL)**

An electronic component physically installed as the furthest device from the control panel; whose presence on the circuit is used to monitor the integrity of the circuit.

L**Loop Explorer 2**

Windows-based configuration software for the Fire Alarm Control Panel

N**NAC**

Notification Appliance Circuit. A supervised output circuit that connects horns, strobes, speakers, etc. to the control panel.

S**SLC**

Signaling Line Circuit. A Signaling Line Circuit (SLC) carries data to and from the field devices for the fire alarm system, and also carries power from the control panel to the devices.

Supervision

Monitoring the integrity of a circuit or device to detect a fault condition that would prevent normal operation.