



Class 1

ISO 9001 CERTIFIED

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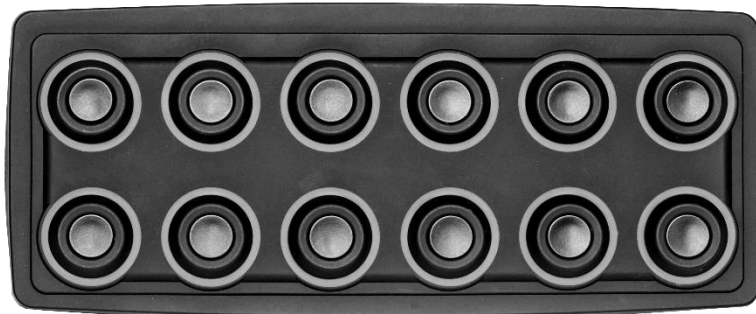
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TECHNICAL DATASHEET

SmartTOUCH


Switch Panel

610-00061-004 (4 position 2x2)
610-00061-005 (5 position 5x1)
610-00061-008 (8 position 4x2)
610-00061-012 (12 position 6x2)
610-00061-016 (16 position 8x2)
610-00061-080 (10 position 2x5 for UV800)



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1. Revision Log

Rev	Date	Changes
3.0	3/16/2018	Initial port from 1-touch to SmartTouch platform
3.1	5/15/2018	Add 16 button capability
3.2	8/9/2018	Add Vmux mode and Extended EsKey for red support
3.3	9/7/2018	Add 10 and 5 button panels
3.4	11/28/2018	Reset when new configuration is received
3.5	3/26/2019	Soft-Start gets stuck in loop in Vmux mode if CAN is changing brightness right from initialization.
3.6	12/11/2019	EsKey config wasn't getting updated in 16 button panel
3.7	1/30/2020	Must hold down button #2 while entering passwords. Tx state on change.
3.8	2/24/2020	Add out-of-EsKey band control over brightness and backlighting.
3.9	4/14/2020	Add out-of-EsKey band control over individual backlights.



Product specifications in this manual are subject to change without notice.

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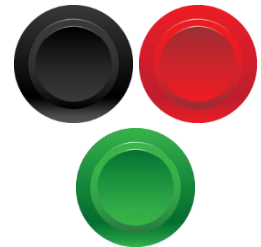
2. Part Numbers

2.1. SmartTOUCH switch part numbers

SmartTOUCH Switch, 4 position	(2x2)	610-00061-004
SmartTOUCH Switch, 8 position	(4x2)	610-00061-008
SmartTOUCH Switch, 12 position	(6x2)	610-00061-012
SmartTOUCH Switch, 16 position	(8x2)	610-00061-016
SmartTOUCH Switch, 5 position	(5x1)	610-00061-005
SmartTOUCH Switch, 10 position	(5x2 LCD surround)	610-00061-080

These part numbers include the SmartTOUCH switch panel, blank black switch inserts (loose), and quick reference guide. The blank switch inserts can be laser-etched by your local preferred company. Refer to section 8.1 for details regarding the switch label size.

SmartTOUCH switch insert, black (standard)	101-00296-016
SmartTOUCH switch insert, red	101-00296-017
SmartTOUCH switch insert, green	101-00296-018




2.2. Miscellaneous part numbers

SmartTOUCH Switch connector items

Deutsch 6-position mating plug	DT06-6S
Deutsch 6-position mating plug wedge lock	W6S
Deutsch DT series socket (16 GA)	0462-201-16141
Deutsch DT series socket (16 GA) - GOLD	0462-201-1631

CAN connector items

Deutsch 3-position mating plug - GRAYDT06-3S	
Deutsch 3-position mating plug wedge lock - BLUE	W3S-1939
Deutsch 3-position mating plug wedge lock - ORANGE	W3S
Deutsch DT series socket (16 GA) - GOLD	0462-201-1631
Deutsch DT series 3-way "Y" receptacle	DT04-3P-P007
Deutsch 3-position mating plug with terminating resistor	DT06-3S-P006

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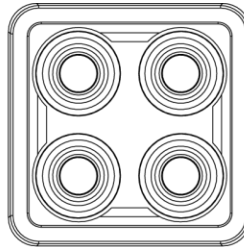
3. Overview

3.1. Product description

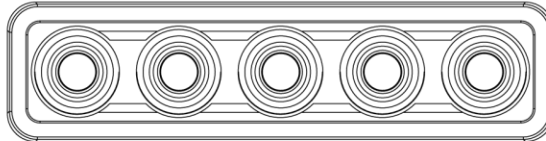
The SmartTOUCH switch panel is a fully customizable switch solution for utilization within a Class 1 Electronics distributed multiplex network (or peer-to-peer networks). The SmartTOUCH switch allows control and indication of outputs configured within the network database.

The SmartTOUCH switch panel is available in three layouts: 4 switches (610-00061-004), 8 switches (610-00061-008), and 12 switches (610-00061-012).

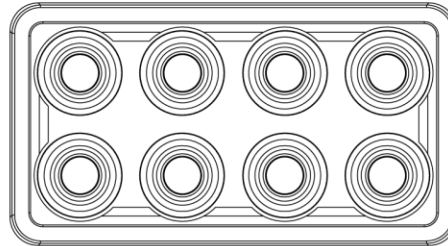
4 position (610-00061-004)



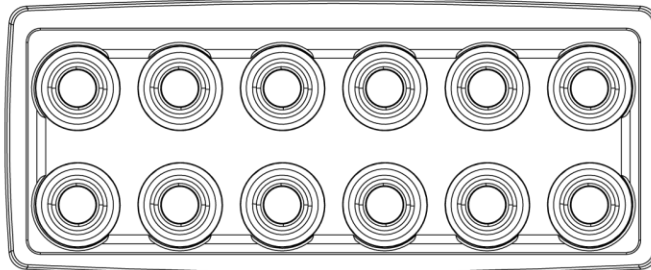
5 position (610-00061-005)



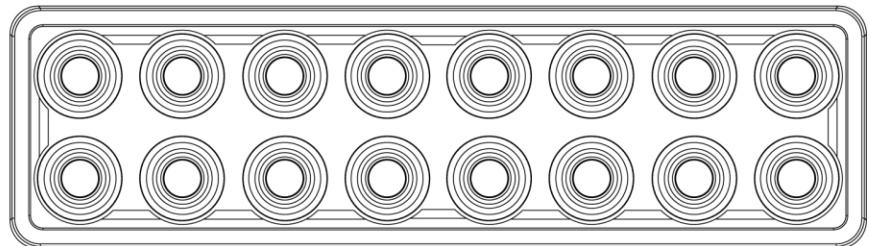
8 position (610-00061-008)



12 position (610-00061-012)



16 position (610-00061-016)




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Figure 1. Available SmartTOUCH switch panel layouts

3.2. Features

- Backlit switches with laser-etchable switch inserts (black, red, green)
- Dimmable backlighting
- Configurable switches with 6 switch functions (momentary, bi-stable, dimmer, and 3 toggle switch types)
- Switch state indicator LEDs (green and blue)
- ES-Key network and peer-to-peer compatible
- 12 and 24 volt operation
- Sealed to IP68

3.3. Indicators and switches

The SmartTOUCH switch is comprised of paired switches (upper and lower) and each switch has its own LED ring which is used for backlighting (white) and indications (green and blue). The left-most four (4) switch LED rings also serve a dual purpose as a diagnostic indicator (see section 3.3.1).

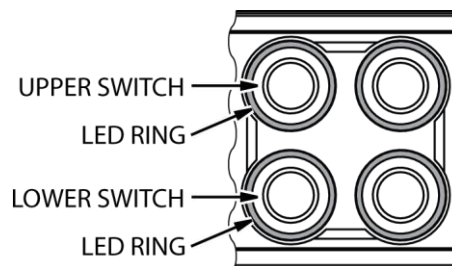



Figure 2. Indicators and switches.

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3.3.1. Diagnostic indicator

The SmartTOUCH switch uses the four (4) left-most switch LED rings (red) as a diagnostic indicator to display error conditions.

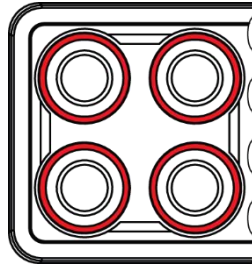


Figure 3. Diagnostic indicator (left-most LED rings).

Diagnostic indications

LED state	Description
<i>Cycling red slowly</i>	<i>CAN bus okay, but no communication with the ES-Key USM. Verify CAN bus connection to the USM.</i>
<i>Cycling red quickly</i>	<i>CAN bus error (passive). Verify terminating resistors are correctly installed on CAN bus. Evaluate CAN bus wiring for shorts, improper wiring, etc.</i>
<i>Upper 2 and lower 2 alternate flashing</i>	<i>CAN bus error (active). Verify terminating resistors are correctly installed on CAN bus. Evaluate CAN bus wiring for shorts, improper wiring, etc.</i>
<i>All flashing</i>	<i>Address conflict with another SmartTOUCH Switch. Verify that another SmartTOUCH Switch with the same address is not connected to the bus.</i>

Table 1. Diagnostic indications (left-most LED rings).


3.3.2. Memory error indication

The SmartTOUCH checks all of the configuration data during initialization and after configuration saves. The SmartTOUCH will flash the switch backlighting if a memory error is detected. The SmartTOUCH uses the default settings (see section 7.2) and sets the switch types to momentary during a memory error.

3.4. Device type and address

The SmartTOUCH is recognized by the ES-Key Professional software as an **SPS Module** (default), but may be configured via password as an Input/Output Module (see section 7.4).

The SmartTOUCH's **address is 0** (default), but may be configured to any valid ES-Key address by entering a password (see section 7.3).

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4. ES-Key Network Detail

4.1. Input/output memory space

The SmartTOUCH Switch uses ES-Key defined input and output memory space.

- The state of the switches is mapped into the input memory space.
- The control of the green and blue indicator LEDs (and/or the white backlighting LEDs) is mapped into the output memory space (*NOTE: The control of these LEDs is only allowed if the SmartTOUCH Switch has been set to ES-Key LED control – see section 7.6). Control of backlighting and the red indicators is available using secondary addressing. – see section 6.1.1.*


4.1.1. I/O memory space map

INPUT MEMORY SPACE		OUTPUT MEMORY SPACE		OPTIONAL SECONDARY OUTPUT SPACE
INPUT	DESCRIPTION	OUTPUT	LOCATION	LOCATION
0	Switch state – 0	0	Green LED switch 0 *	Backlight switch 0
1	Switch state – 1	1	Green LED switch 1 *	Backlight switch 1
2	Switch state – 2	2	Green LED switch 2 *	Backlight switch 2
3	Switch state – 3	3	Green LED switch 3 *	Backlight switch 3
4	Switch state – 4	4	Green LED switch 4 *	Backlight switch 4
5	Switch state – 5	5	Green LED switch 5 *	Backlight switch 5
6	Switch state – 6	6	Green LED switch 6 *	Backlight switch 6
7	Switch state – 7	7	Green LED switch 7 *	Backlight switch 7
8	Switch state – 8	8	Green LED switch 8 *	Backlight switch 8
9	Switch state – 9	9	Green LED switch 9 *	Backlight switch 9
10	Switch state – 10	10	Green LED switch 10 *	Backlight switch 10
11	Switch state – 11	11	Green LED switch 11 *	Backlight switch 11
12	Switch state – 12	12	Green LED switch 12 *	Backlight switch 12
13	Switch state – 13	13	Green LED switch 13 *	Backlight switch 13
14	Switch state – 14	14	Green LED switch 14 *	Backlight switch 14
15	Switch state – 15	15	Green LED switch 15 *	Backlight switch 15
16	reserved	16	Blue LED switch 0 **	Red LED switch 0
17	reserved	17	Blue LED switch 1 **	Red LED switch 1
18	reserved	18	Blue LED switch 2 **	Red LED switch 2
19	reserved	19	Blue LED switch 3 **	Red LED switch 3
20	reserved	20	Blue LED switch 4 **	Red LED switch 4
21	reserved	21	Blue LED switch 5 **	Red LED switch 5
22	reserved	22	Blue LED switch 6 **	Red LED switch 6
23	reserved	23	Blue LED switch 7 **	Red LED switch 7
24	reserved	24	Blue LED switch 8 **	Red LED switch 8
25	reserved	25	Blue LED switch 9 **	Red LED switch 9
26	reserved	26	Blue LED switch 10 **	Red LED switch 10
27	reserved	27	Blue LED switch 11 **	Red LED switch 11
28	reserved	28	Blue LED switch 12 **	Red LED switch 12
29	reserved	29	Blue LED switch 13 **	Red LED switch 13
30	reserved	30	Blue LED switch 14 **	Red LED switch 14
31	reserved	31	Blue LED switch 15 **	Red LED switch 15

* These outputs can control the white backlighting LEDs instead of the green LEDs if desired.

** These outputs can control the white backlighting LEDs instead of the Blue LEDs if desired.

Table 2. I/O memory space map.

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5. Operation

5.1. Initialization cycle

The SmartTOUCH switch turns ON all of its white lighting for the first second after a power cycle and then begins normal operation (section 5.2).

5.2. Normal operation

The SmartTOUCH switch begins normal operation after the initialization cycle (section 5.1). The switches will operate as the switch type for which they were configured (bi-stable switches by default) shows the position of the switches and their associated indicator LEDs. The switches are mapped into input memory space (section 4.1). The state of each switch is transmitted via the input memory space CAN message for use within the ES-Key database. The indicator LEDs are (by default) mapped for **internal control** but may be mapped for **ES-Key control** in the output memory space.

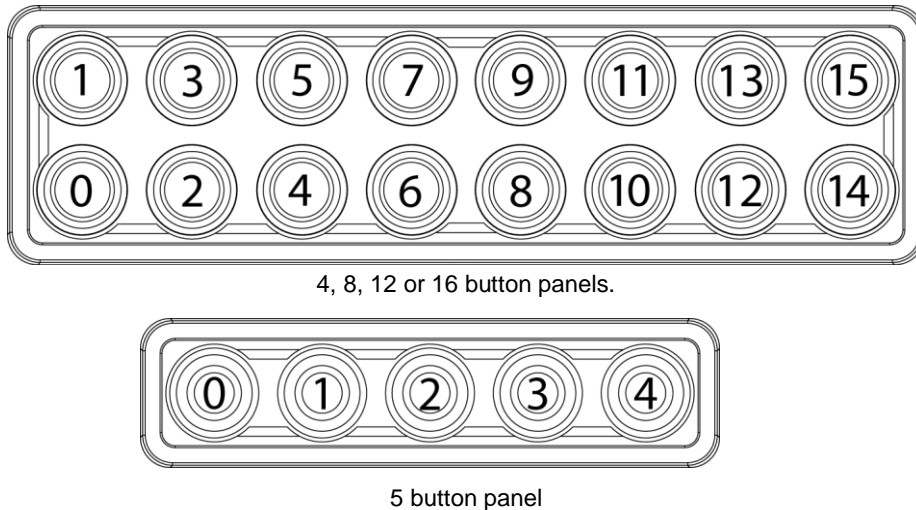


Figure 4. Switch and indicator LED identification.

Internal control of the indicators (default)

The output memory space (section 4.1) is not used for internal indicator control. A switch's associated green indicator LED is ON when the switch position is ON. The Blue indicator LEDs are not used and are always OFF.


ES-Key control of the indicators

The switch state does not control the state of the associated green or blue LEDs. The output memory space (section 4.1) is must be used to control the state of the green, blue and red indicator LEDs through the ES-Key database.

The SmartTOUCH switches can be configured for **individual switch types** and **paired switch types**.

- Individual switch types are those that can be configured to an individual switch where its operation does not affect the operation of its complementary switch. Complementary switches are a lower and upper pair. For example, switches 0 and 1 are complementary; switches 2 and 3 are complementary, etc.
- Paired switch types are those whose switch operation affects its complementary switch.

Individual switch types. The upper and lower switches in a complementary pair are not associated.

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1. No function
Pressing the switch has no effect on the input memory space associated with the switch position.
2. Momentary
The input memory space associated with the switch position is only ON while the switch is pressed.
3. Bi-stable (default switch type)
The input memory space associated with the switch position toggles with every press of the switch.

Paired switch types. The upper and lower switches work together as a pair.

4. Toggle (upper switch = ON)
The switch pair acts a single toggle switch with the upper switch turning ON its associated input memory space and the lower switch turning OFF the upper switch's input memory space.
5. Toggle (lower switch = ON)
The switch pair acts a single toggle switch with the lower switch turning ON its associated input memory space and the upper switch turning OFF the lower switch's input memory space.
6. Toggle (exclusive)
The switch pair acts as an exclusive toggle switch.
Each upper switch press toggles the state of its associated input memory space while turning OFF the input memory space of the lower switch.
Each lower switch press toggles the state of its associated input memory space while turning OFF the input memory space of the upper switch.
7. Dimmer
The upper switch increases the brightness of the SmartTOUCH panel lighting.
The lower switch decreases the brightness of the SmartTOUCH panel lighting.
Only one dimmer switch is allowed. The dimmer switch type option will not be available if another switch pair has previously been configured as a dimmer.

5.3. Master switch operation

The SmartTOUCH allows a switch pair to be configured as a master switch. The master switch controls the state of all the other switches and will only allow the other switches to operate when the master switch is ON. The master switch is always initialized OFF during a power cycle (regardless of the initial switch state configuration). Only one master switch may be configured for the SmartTOUCH switch (see section 7.8).

Permitted master switch types


A master switch can be configured as a toggle (upper switch = ON) or a toggle (lower switch = ON).

5.3.1. Master switch OFF

When the master switch is turned OFF the input memory space is completely cleared and the backlighting of all of the other switches will be OFF. Any indicator LEDs which were ON before the master switch was turned OFF begin pulsating. The pulsating indicator LEDs show the switches which will be ON when the master switch is turned back ON.

5.3.2. Master switch ON

When the master switch is turned ON the input memory space returns to the state it held before the master switch was turned OFF. All other switches resume their normal operation.

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6. Configuration Entry Methods

6.1. Entering passwords

The SmartTOUCH Switch utilizes passwords to modify its operational parameters. All operational parameters are stored in memory and will not be lost when power is disconnected.

Use the left-most UPPER and LOWER switches to enter passwords. Note that on the 5 button panel, buttons 0 and 1 are side by side. The switches and indicator LEDs will operate as configured during password entry (there is no special indication that a password is being entered). Each password button press must occur within 2 seconds of the last button press otherwise the attempted password is cleared. **To prevent the unintentional entry of a password, switch 2 must be held down while entering passwords.**

The SmartTOUCH Switch only allows passwords to be entered for the first sixty (60) seconds after a power cycle. However, the SmartTOUCH switch will allow one password after this time period has elapsed – **1101 1011** resets the time-since reset timer allowing another 60 seconds for passwords to be entered.

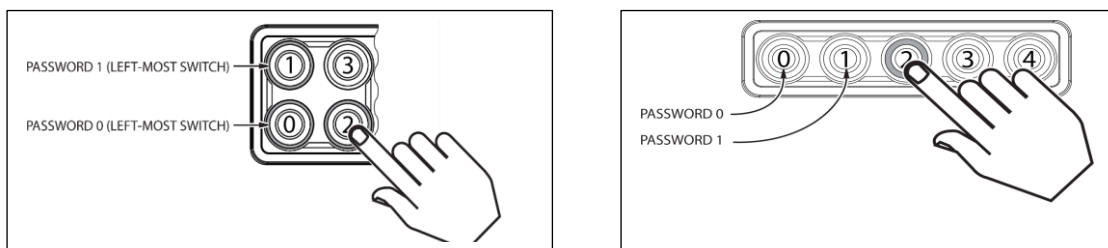



Figure 5. Password switches.

6.1.1. Table 3. List of passwords (while holding button #2)

Function	Root password	Section
Reset "configuration allow" timer and enable press-and-hold configuration.	1101 1011	---
Configure switch types for pair 0 (switches 0 and 1)	1000 0000	7.1
Configure switch types for pair 1 (switches 2 and 3)	1000 0001	7.1
Configure switch types for pair 2 (switches 4 and 5)	1000 0010	7.1
Configure switch types for pair 3 (switches 6 and 7)	1000 0011	7.1
Configure switch types for pair 4 (switches 8 and 9)	1000 0100	7.1
Configure switch types for pair 5 (switches 10 and 11)	1000 0101	7.1
Configure switch types for pair 6 (switches 12 and 13)	1000 0110	7.1
Configure switch types for pair 7 (switches 14 and 15)	1000 0111	7.1
Load defaults	1001 1001	7.2
Configure the address	1001 0010	7.3
Set device type to SPS (device type 5)	0111 0101	7.4
Set device type to IOM (device type 4)	0111 0100	7.4
Configure the initial states of the switches at power cycle	1001 0000	7.5
Configure the indicator LEDs control source (Internal or ES-Key)	1001 0011	7.6
Configure white backlight control to disabled (default)	0110 1111	7.7
Configure white backlight control to use green LEDs output memory space	0110 1100	7.7
Configure white backlight control to use blue LEDs output memory space	0110 1101	7.7
Configure white backlight control to use secondary address memory space Also adds control of RED LEDs	0110 1110	7.11
Configure a master switch	1001 0001	7.8
Set network mode to ES-Key	0101 0000	7.10
Set network mode to Peer-to-Peer	0101 0001	7.13
Set Vmux mode	0101 0010	7.12
Set peer-to-peer simple mapping	0101 1000	7.13
Clear all peer-to-peer mapping	0101 1001	7.13
Set panel brightness. Where xxxx = 0000->1111. Sets the LED brightness	0011-xxxx	

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6.2. “Press and Hold” switch type configuration method

The SmartTOUCH Switch allows a “press and hold” method for configuring the switch types.

1. **Press and hold configuration will only work if enabled by entering password 1101-1011 while holding button #2. This enable only persists for the current power cycle.**
2. Within the first sixty (60) seconds after a power cycle “press and hold” the switch pair to configure until all backlighting except for the held switches turns OFF (five seconds). The password to reset the 60 second timer may be used (**1101 1011**).
3. Follow the switch type configuration detailed in section 7.1.

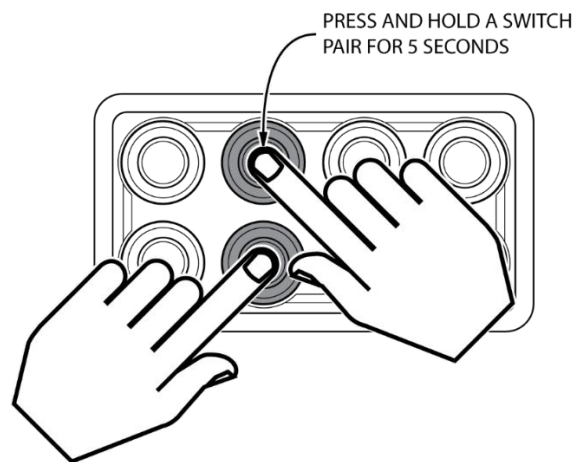


Figure 6. Press and hold configuration method.

7. Configuration Procedures

7.1. Switch type configuration


The SmartTOUCH's switches can be configured to one of the seven different types: no function, momentary, bi-stable, toggle (upper switch = ON), toggle (lower switch = ON), toggle (exclusive), and dimmer.

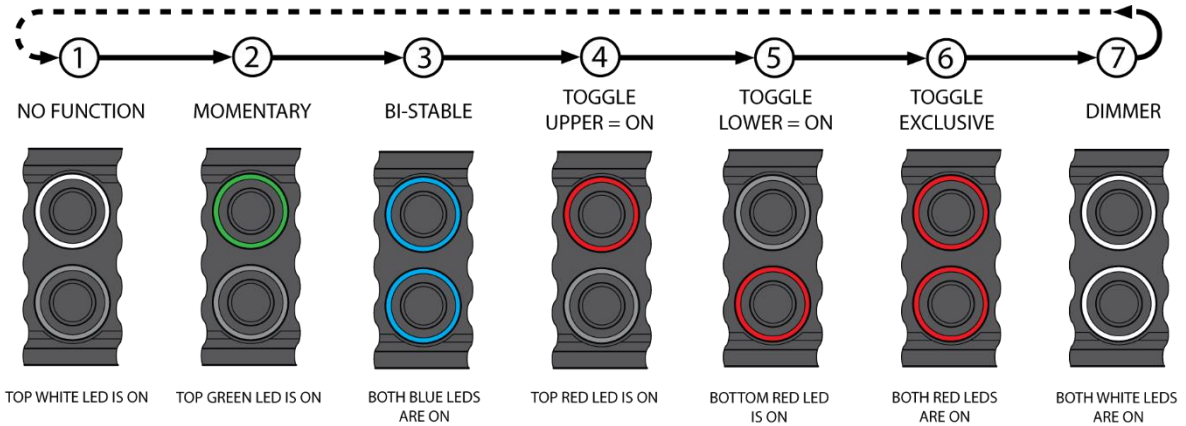
Configuring a switch type

Enter the switch type configuration using the “press and hold” method (section 6.2) or the password method (section 6.1). The switch pair's backlighting is now lit and all other lighting is OFF. Press the desired switch (upper or lower) of the switch pair to configure. The switch pair's backlighting and indicator LEDs (green and blue) show the selected switch's current switch type (see Figure 7).

Each time the switch is toggled it increments to the next switch type (see Figure 7). When the last switch type (dimmer) is reached it wraps back to the first switch type (no function).

The other switch of the switch pair may also be toggled to set its switch type. Press any other switch in any other switch pair to save the switch types configuration and exit.

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7.2. Load defaults


The SmartTOUCH's default configuration may be reloaded by entering the password – **1001 1001**. The backlighting of each switch is individually cycled to indicate that the defaults have been loaded and saved.

The SmartTOUCH's default configurations are:

All switch types:	Bi-stable
Device type:	SPS Module (device type 5)
Device address:	0
Dim level:	7 (mid-brightness)
Dim input type:	Digital (positive polarity)
Network mode:	ES-Key
Switch indicator control source:	Internal
Master switch configuration:	No master switch enabled
Initial state of switches at power cycle:	All OFF

7.3. Address configuration

The SmartTOUCH's ES-Key address can be set from 0 to 15 by entering the password – **1001 0010**. Switches 0, 1, 2, and 3 (left most four switches) are now lit and all other switches are OFF. The LED color of these four switches indicates the current address. Use the left-most switches to change the address (upper switch decreases, lower switch increases). Press any other switch in any other switch pair to save the address configuration and exit.

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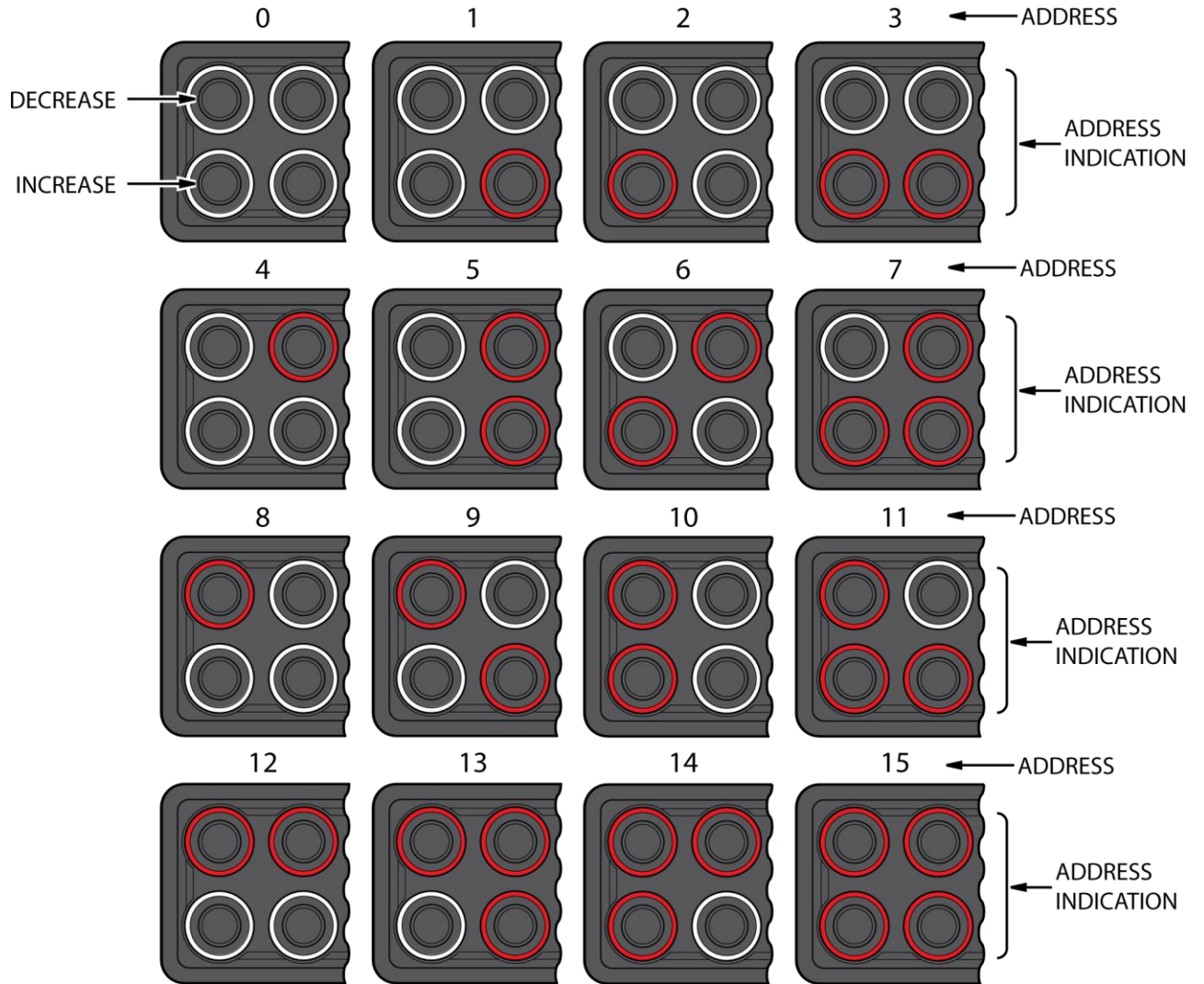



Figure 8. Address configuration indication for 4, 8, 12 and 16 button panels

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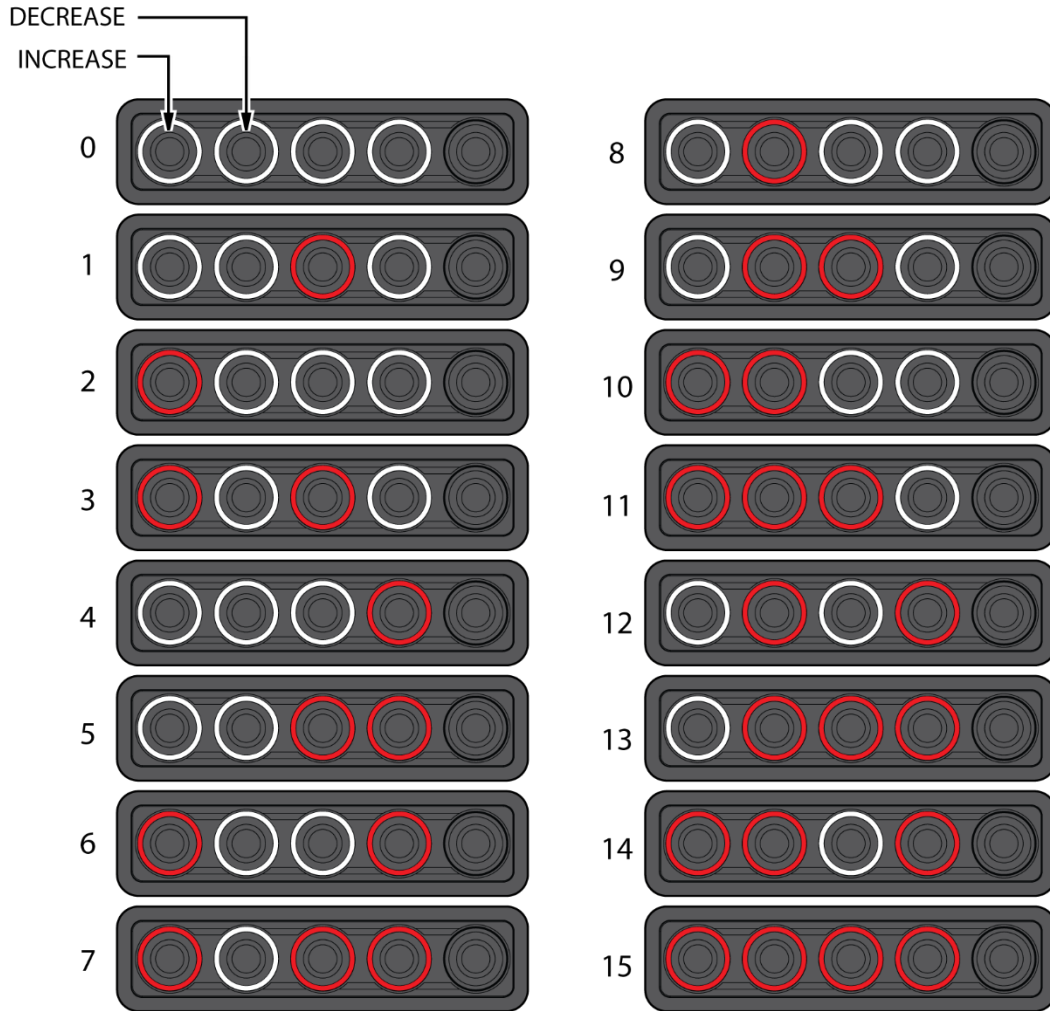


Figure 9a. Address configuration indication for 5 button panels

7.4. Device Type configuration

The SmartTOUCH’s device type can be set as a SPS Module (device type 5, default) or as an Input Output Module (IOM, device type 4).

SPS Module (device type 5)


Set the device type to SPS Module (device type 5) by entering the password – **0111 0101**.

I/O Module (Device type 4)

Set the device type to I/O Module (Device type 4) by entering the password – **0111 0100**.

7.5. Initial switch states configuration

The initial state (ON or OFF) of each switch during a power cycle may be configured. “No function” and “dimmer” type switches cannot have an “ON” initial state associated.

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Set the initial switch states by entering the password – **1001 0000**. Set the desired initial state of each switch. The switches operate as the types for which they have been configured. Allow the countdown timer to time-out (fifteen seconds - each switch press resets the countdown timer) once the switches have been set to the desired initial state. The SmartTOUCH will resume normal operation with the new initial states.

7.6. LED indicator control source configuration

The SmartTOUCH's indicator LEDs (green/blue) can be configured for internal control (default) or ES-Key control.

Internal control

The green indicator LED will be ON when its associated switch is active. The blue LED is not used and remains OFF.

ES-Key control

The green and blue indicator LEDs are controlled by the ES-Key database through the output memory space (see section 4.1.1).

Enter the password – **1001 0011**. Switch 0's backlighting is ON and all of the indicator LEDs show the current control source:

- Green LEDs only – internal control
- Green and blue LEDs – ES-Key control

Press switch 0 (the only switch with the backlight ON) to toggle the indicator control source. Press any other switch in any other switch pair to save the indicator control source and exit.

7.7. White backlighting LED control source configuration

The SmartTOUCH's white backlighting is by default not controllable and will always be ON. If desired, the white backlighting LEDs can be configured for ES-Key control. This is accomplished by using the output memory space originally intended for the green or blue indicator LEDs or by using a secondary address.

Backlighting controlled using green indicator output memory space

Enter the password – **0110 1100**. The green indicator LEDs are now not controllable and the white backlighting LEDs are controlled using the output memory space intended for the green indicators.

Backlighting controlled using blue indicator output memory space


Enter the password – **0110 1101**. The blue indicator LEDs are now not controllable and the white backlighting LEDs are controlled using the output memory space intended for the blue indicators.

Backlighting controlled using secondary output memory space

Enter the password – **0110 1110**. The white backlighting LEDs are now controlled by using output memory spaces 0 to 15 of a secondary address (the SmartTOUCH address + 1). For example, if this SmartTOUCH panel is address 2 then the white backlighting is controlled using the output memory space of SmartTOUCH panel address 3. This means that the ES-Key Pro database must include this "phantom" SmartTOUCH device.

Backlighting is not controllable (default)

Enter the password – **0110 1111**. The white backlighting is now always ON and not controllable (default).

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7.8. Master switch configuration

The SmartTOUCH allows one switch pair to be configured as a master switch.

Add or remove a master switch by entering the password – **1001 0001**.

To remove a master switch

Do not press any switches. Allow the countdown timer to time-out (fifteen seconds - each switch press resets the countdown timer) to remove a master switch. The SmartTOUCH will remove the master switch, save the configuration, and resume normal operation.

To add a master switch

Press one of the switches in a switch pair to select it as the master switch. The backlighting stops flashing and only the backlighting of the selected switch pair remains ON. The countdown timer is turned OFF.

Toggle one of the switches in the switch pair to select the type of switch to use as a master switch. Only the “toggle, upper=ON” and “toggle, lower=ON” are allowed. Press any other switch in any other switch pair to save the indicator control source and exit.

7.9. Network mode configuration

The SmartTOUCH's network mode can be configured for ES-Key (default) or Peer-to-Peer.

7.10. ES-Key network mode

The ES-Key network mode is the default mode and allows normal ES-Key multiplex system database control. Set the network mode to **ES-Key** by entering the password – **0101 0000**.

Standard EsKey mode is limited to controlling green and blue LEDs.


CAN address 0x18EFtn1E t=5 or 4 & n=0 to F	CAN payload bytes							
	1	2	3	4	5	6	7	8
Bitmapped button #	Green	Blue	Backlights	brightness	backlight			
	7 - 0	15 - 8	7 - 0	15 - 8	7-0	15-8	MSB = enable 4 LSBs = intensity 0x00 = ignore 0x80 = minimum 0x88 = medium 0x8F = maximum	MSB = enable 0x00 = ignore 0x80 = all backlights off 0x81 = all backlights on 0x82 = use bytes 5 and 6 to control individual backlights.
	Normal EsKey control				Out-of-band EsKey control. (Perhaps an Ultraview)			

The 2 colors can be combined to form a 3rd color.

If brightness or backlight bytes are enabled (MSB set) then the Green and Blue LED data is ignored.

If brightness or backlight bytes are disabled (MSB =0) then the brightness or on/off information is ignored.

The enable bits on the backlight and brightness bytes exist so that those settings in the message can be ignored until such time as they need to be changed. In other words, the enable bit must be on for the brightness or backlight state to be acted on.

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Conversely, if brightness or backlighting is enabled in EsKey mode, then the green and blue LED information is ignored for that message. This is so brightness and backlighting can be controlled from a different source than the SuperNode which may be unaware of the LED color.

7.11. Extended EsKey (dual address) mode

Extended EsKey mode uses the CAN ID+1 to permit control of red and white (back) lighting. Set the network mode to EsKey mode by entering the password – **0110 1110**.

CAN address 0x18EFtn1E where t=5 or 4 and n = 0 to F	CAN payload bytes							
	1	2	3	4	5	6	7	8
	White		Red		Not used			
Bitmapped button #	7 - 0	15 - 8	7 - 0	15 - 8				

The 3 colors can be combined to form 7 colors. This switch panel does not have a separate white backlight LED. To create a quasi-white color all three LEDs are turned on. If the WHITE color is selected in the message above, all 3 LEDs will be turned on but only if green, red and blue are all off. If red, green or blue are on, then that color combination will be shown.

7.12. Vmux mode

Vmux mode suppresses the CAN status message and sets all buttons to momentary.

Vmux mode is similar to ES-Key mode in that the LEDs are controlled via CAN messaging. However the CAN payload is expanded passed the ES-Key 32 bit limitation to include control over the RED LEDs. In other words, you have control of Green and Blue as shown in section 4.1.1 as well as Red in the 5th and 6th byte of the message for a total of 8 colors including off. In addition the 7th payload byte is used to adjust LED intensity and the 8th byte can be used to control backlighting.

Set the network mode to **Vmux** by entering the password – **0101 0010**.

CAN address 0x18EF5n1E where n = 0-F	CAN payload bytes							
	1	2	3	4	5	6	7	8
	Green		Blue		Red		brightness	backlight
Bitmapped button #	7 - 0	15 - 8	7 - 0	15 - 8	7 - 0	15 - 8	MSB = enable 4 LSBs = intensity	MSB = enable LSB = backlight on/off
							If enable=0 the byte is ignored	


7.13. Peer-to-Peer network mode

The Peer-to-Peer network mode allows the SmartTOUCH to work within a very basic multiplex system which does not require a USM or database. Each switch can be mapped to a Class 1 Power Distribution Module (PDM) output for peer-to-peer control. The “switch to PDM output” mapping is accomplished with the ES-Key Professional software or by setting a basic one-for-one mapping by entering a password (see section 7.13).

Set the network mode to **Peer-to-Peer** by entering the password – **0101 0001**

Peer-to-Peer mapping

A SmartTOUCH set for Peer-to-Peer network mode (see section 7.9) requires “SmartTOUCH switch to PDM output” mapping. This is normally accomplished with the ES-Key Professional software, but a very simple one-for-one mapping can be set with a password.

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One-for-one mapping details:


The SmartTOUCH is mapped to a PDM with same address (e.g. SmartTOUCH address 0 to PDM address 0). Each SmartTOUCH switch is mapped to control the state of the associated PDM's output (e.g. switch 0 controls output 0, switch 1 controls output 1, etc).

Set simple Peer-to-Peer mapping

Enter the password – **0101 1000**.

Clear all Peer-to-Peer mapping (default)

Enter the password – **0101 1001**.

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8. Mounting and Installation

8.1. Switch insert installation

The plastic switch inserts are easily installed with no special tools required. Black switch inserts are provided with the SmartTOUCH, but red and green colors are available (see section 2.1).

The switch inserts may be custom laser-etched with text or icons within the “etchable area” dimension listed below.

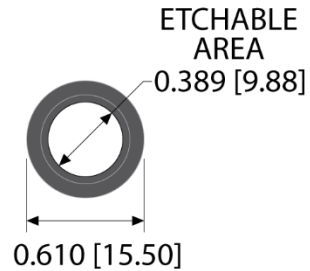


Figure 9. Switch insert dimensions in inches [millimeters].

1. Notice the orientation tab on the back of the switch insert and the orientation grooves in the switch insert pocket. The switch insert pocket’s “+” groove allows the insert to be positioned horizontally or vertically.
2. Place one edge of the switch insert under the lip of the switch insert pocket.
3. Push the switch insert firmly under the lip of the switch insert pocket.
4. Pull the other side’s lip of the switch pocket out slightly so that it will cover the switch insert.

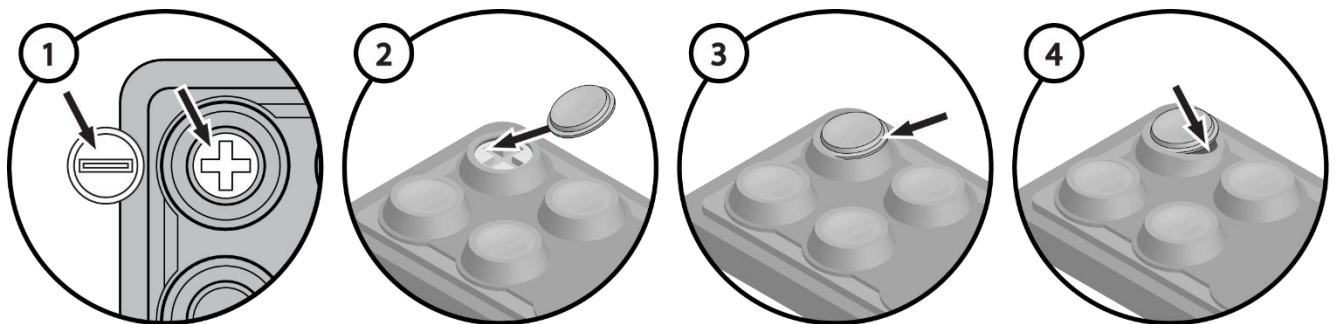



Figure 10. Switch insert installation.

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8.2. Switch insert removal

The plastic switch caps may be easily removed using your finger or a small flat-bladed tool. Use caution when removing switch caps to reduce the danger of damaging the SmartTOUCH.

1. Pull one edge of the switch away from the switch insert's lip.
2. Gently pull the switch insert out of the switch insert pocket.

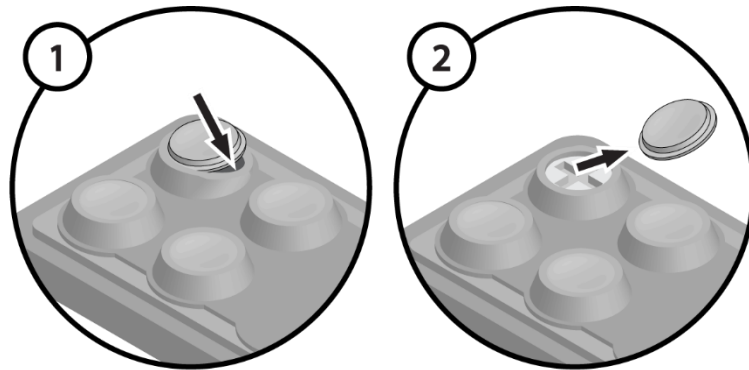


Figure 11. Switch insert removal.

8.3. Side view dimensions (all models)

The SmartTOUCH uses 6-32 studs (0.650 in / 16.51 mm long) for mounting.

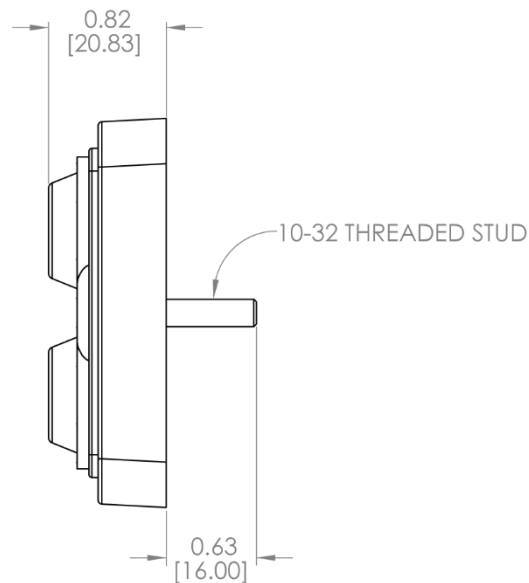



Figure 12. Overall dimensions in inches [millimeters].

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				BY	AMS/WJB

8.4. Mounting dimensions (4 position, 610-00061-004)

Mount the 4 position SmartTOUCH and secure with two 10-32 nuts.

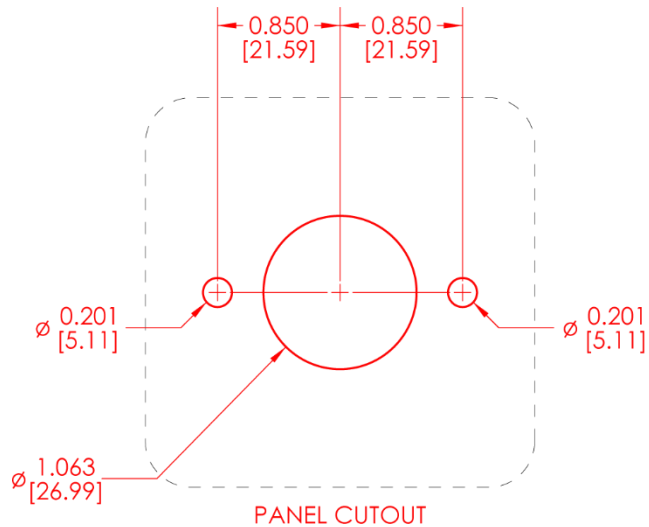


Figure 13. SmartTOUCH, 4 position installation dimensions in inches [millimeters].

8.5. Mounting dimensions (5 position, 610-00061-005)

Mount the 5 position SmartTOUCH and secure with two 10-32 nuts.

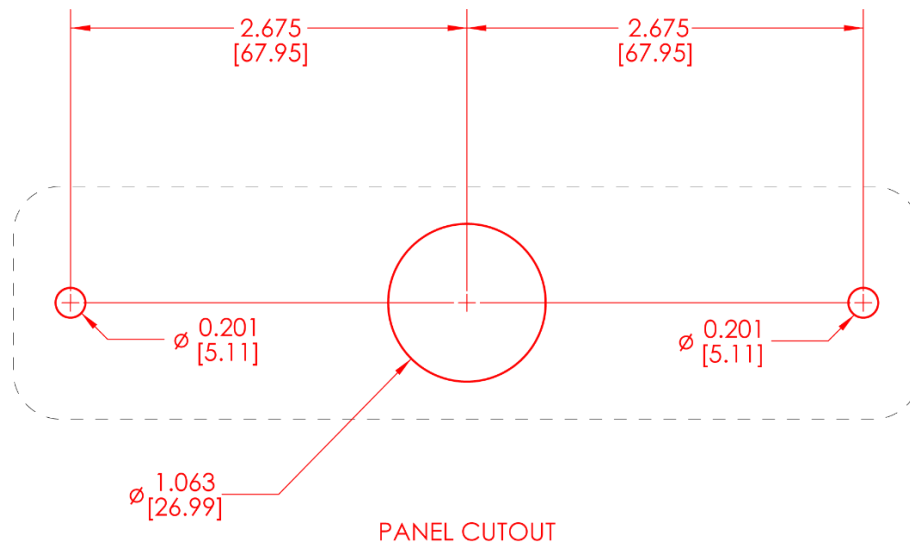



Figure 14. SmartTOUCH, 5 position installation dimensions in inches [millimeters].

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				BY	AMS/WJB

8.6. Mounting dimensions (8 position, 610-00061-008)

Mount the 8 position SmartTOUCH and secure with two 10-32 nuts.

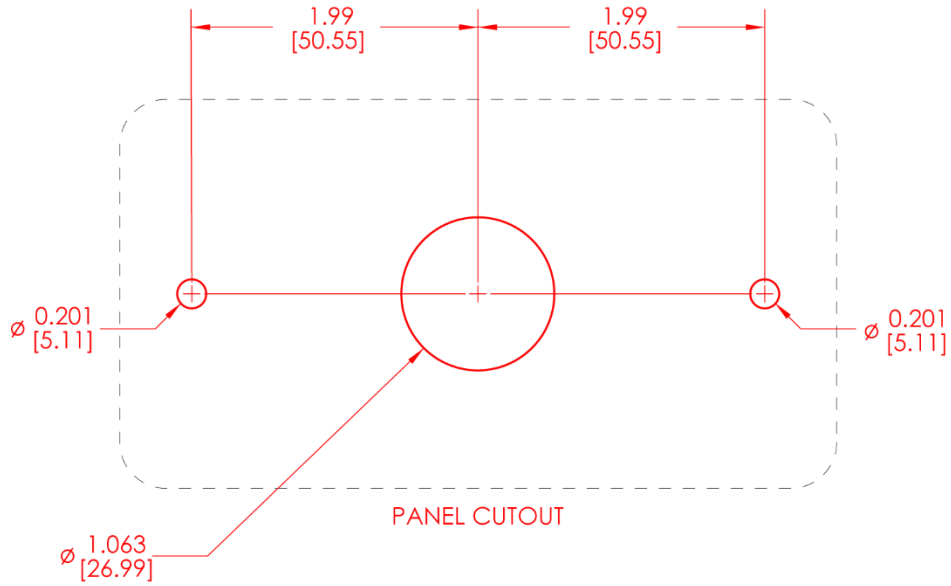


Figure 15. SmartTOUCH, 8 position installation dimensions in inches [millimeters].

8.7. Mounting dimensions (12 position, 610-00061-012)

Mount the 12 position SmartTOUCH and secure with two 10-32 nuts.

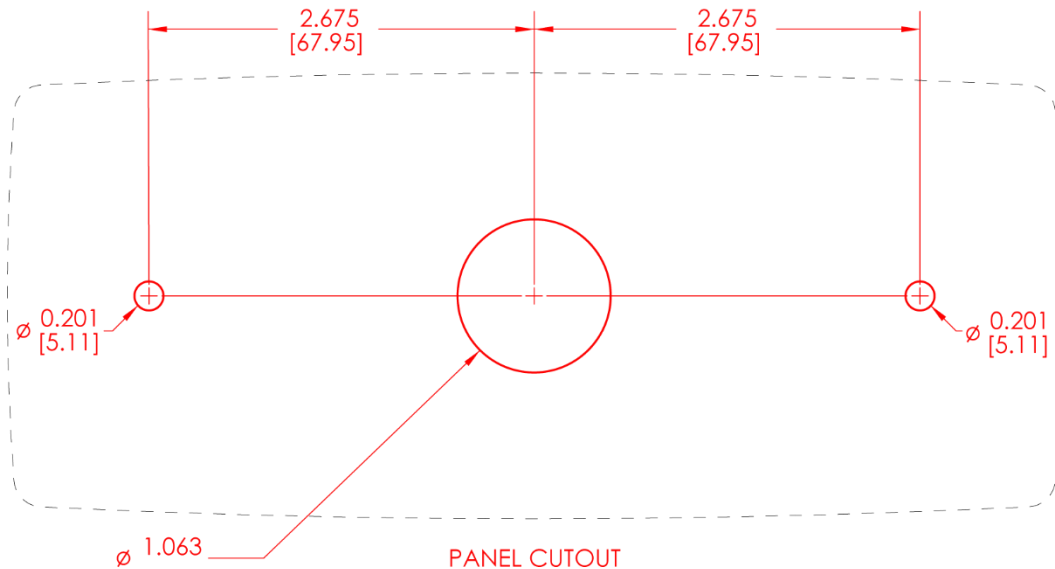



Figure 14. SmartTOUCH, 12 position installation dimensions in inches [millimeters].

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					BY	AMS/WJB

8.8. Mounting dimensions (16 position, 610-00061-012)

Mount the 16 position SmartTOUCH and secure with two 10-32 nuts.

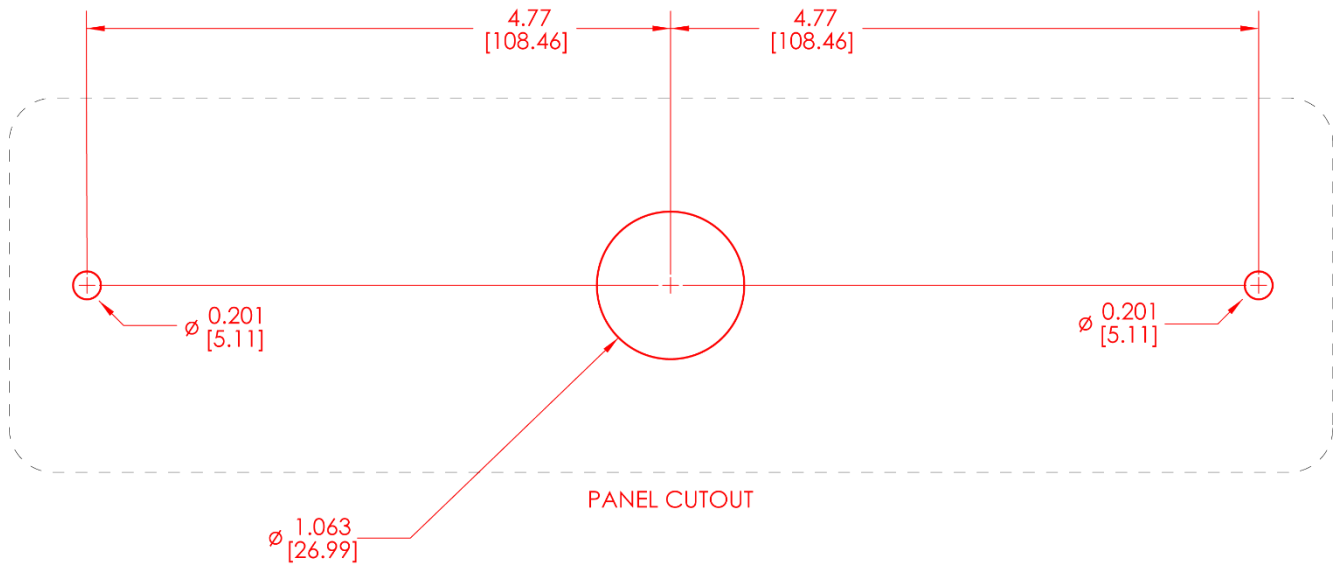



Figure 6. SmartTOUCH, 16 position installation dimensions in inches [millimeters].

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9. Connector Description

Mating connector: Deutsch DT06-6S
Mating sockets: Deutsch 0462-201-16141
Gold mating sockets: Deutsch 0462-201-1631
Recommended wire gage: 16-20 AWG
Wedge lock: W6S

PIN	CIRCUIT	DESCRIPTION
1	SYS POWER	(INPUT) – battery voltage (+9VDC...+32VDC)
2	SYS GROUND	(INPUT) – battery ground
3	----	Not used
4	CAN HIGH	(DATA) – SAE J1939 CAN 2.0B, 250Kbits/s *
5	CAN LOW	(DATA) – SAE J1939 CAN 2.0B, 250Kbits/s *
6	CAN SHIELD	(DATA) – SAE J1939 CAN 2.0B, 250Kbits/s *

* Gold sockets recommended for CAN connections.


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11. Technical Details and Compliances

Product category	Multiplexing	
Voltage range	+9VDC...+32VDC	
Maximum current draw @13.8VDC @27.6VDC	Logic supply+ input (pin 1 of 6-pin connector) 65 mA 45 mA	
Temperature range	-40°F...+185°F (-40°C...+85°C)	
Environmental range	IP 68 (front and rear)	
CAN specification	SAE J1939, 250 Kbits/second	
LED	2 RGB LEDs per switch to indicate status	
Electrical protection	Reverse voltage protection (pins 1 and 2 of 6-pin connector) CAN bus protected for heavy duty trucks (24V) ESD voltage protected to SAE J1113 specification for heavy duty trucks (24V) Transient voltage protected to SAE J1113 specification for heavy duty trucks (24V) Load dump voltage protected to SAE J1113 specification for heavy duty trucks (24V)	
Electrical performance	Immunity to Radiated Electromagnetic Fields– Bulk Current Injection (BCI) method, Class C device	SAE J1113-4
	Reverse voltage protection on power leads (pins 1 and 2 of 12-pin gray connector), Class C device	ISO 16750-2
	Overvoltage due to failing generator, Class A device	ISO 16750-2
	Immunity to conducted transients on power leads, L4 requirements (24V)	SAE J1113-11
	Immunity to Electrostatic Discharge – powered and unpowered modes	SAE J1113-13
	Immunity to radiated electromagnetic fields, Class C device	SAE J1113-21
	Conducted emission on power leads (Class 3 average and Class 5 peak limits)	CISPR 25
	Radiated emissions, absorber-lined shielded enclosure (Class 1 average and Class 3 peak limits)	CISPR 25
Reset behavior on voltage drop 24V, Class C device	ISO 16750-2	
Environmental performance	Thermal shock	SAE J1455 (sec 4.1.3.2)
	Exposure to humidity	MIL-STD-810F (method 507.4)
	Thermal shock due to splash	Class 1 (STD-0001)
	Pressure cleaning	Class 1
	Exposure to salt spray atmosphere/fog	SAE J1455 (sec 4.3)
	Exposure to outdoor UV	ISO 4892-2 (method A)
	Exposure to chemicals	Class 1
Mechanical performance	Resonance dwell	SAE J1455 (sec 4.9.4.1)
	Random vibration	SAE J1455 (sec 4.9.4.2)
	Mechanical shock	SAE J1455 (sec 4.10.3.4)
Dimensions (W x H x D) in inches [millimeters]	2.70 [65.58] x 2.70 [65.58] (4 position, 610-00061-004)	
	4.98 [126.49] x 2.70 [65.58] (8 position, 610-00061-008)	
	7.32 [185.93.60] x 3.10 [78.74] (12 position, 610-00061-012)	
	x 0.82 [20.83]	