CTI ELECTRONICS
when reliability is critical™

KP4000
OEM USB KEYPAD

• Pictured with F13 – F16 Legend, F17-F20, F18-24 Legend also Available

KP4000 STANDARD FEATURES

• 4-Button OEM Keypad
• Supports USB 1.1, 2.0, 3.1 Specification Standards
• SynProof™ Coating resists most hazardous chemicals and oils
• Molded rubber elastomer keys rated for 10 million cycles
• Hard carbon pills molded into rubber elastomer
  guarantees durability
• Keys: 2mm travel provides excellent tactile feedback
• Legends are laser etched and translucent which
  eliminates wear issues
• Conformal Coating of PCB protects against condensation
  or humidity
• Optional Backlighting: Red or Green LED
• Optional USB Cable with standard "A" Plug.
• Optional Parylene coating offers the toughest molecular
  barrier protection
• Optional customized legends or elastomer color
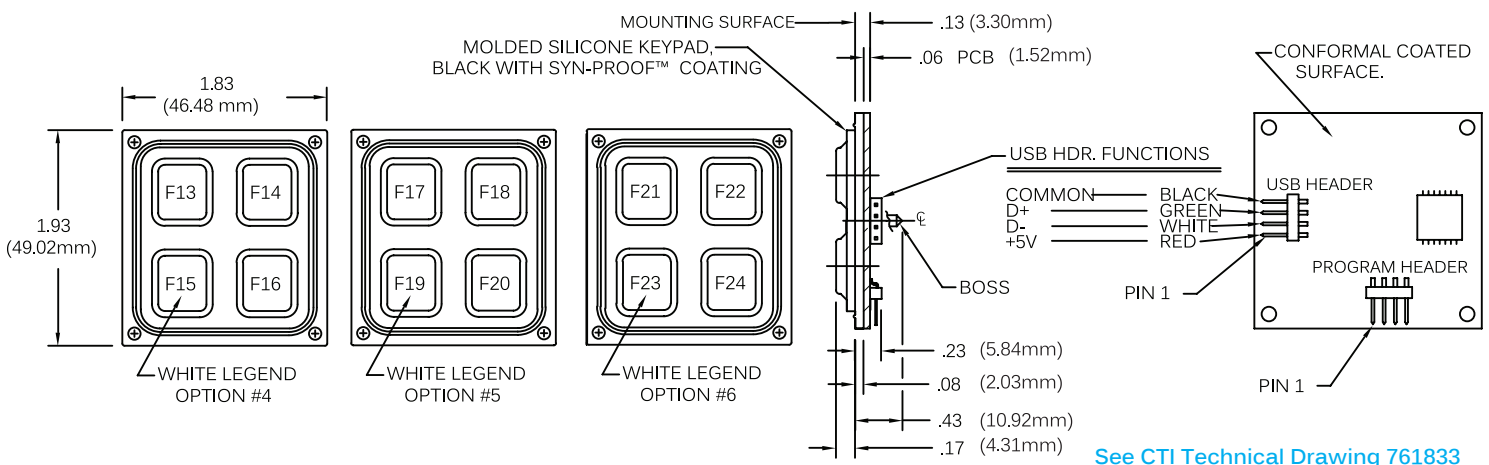• Made in the USA

KP4000 SERIES INDUSTRIAL USB KEYPAD

The KP4000 Series industrial USB keypad assembly offers four momentary pushbuttons with predefined function codes, as specified within the USB Specification Standard. A single key press or keystroke provides a unique code to the computer operating system via the USB HID Compliant Keyboard Device Driver. This unique code is accessible via the application programming Interface libraries (a set of routines) for the Software Application Developer to use for extending the capability or functionality of a software application. Computer operating systems (Windows OS®, Mac OS X®, Linux OS, SunOS®, etc.) or the System Software Applications (programs) typically use the Function 1 (F1) through Function 12 (F12) keys but most have not taken advantage of the Function 13 (F13) through Function 24 (F24) keys.

These miniature USB keypads are comprised of molded silicone rubber with an o-ring to provide a NEMA 4 (IP66) watertight sealing protection. The silicone rubber elastomer is SYN-Proof™ coated with specially formulated polyurethane for protection against harsh oils and solvents, ensuring 10,000,000+cycles. Key travel is a 2mm stroke which provides excellent tactile response. The use of hard carbon pill contacts molded into the silicone rubber contacting a thick layer of hard gold plated onto the printed circuit board ensures a durability rating over 10,000,000 actuations at 5VDC, 50mA. The electronics components are conformal coated to protect against moisture due to condensation or humidity.

This design ensures years of reliable service and durability across a broad operating temperature range of -40°C to +80°C (-40°F to +176°F). These miniature USB keypads measure 1.8 inches by 1.9 inches and require less than 0.5 inches of below panel depth. Optional backlighting or custom laser etched legends are available to Original Equipment Manufacturers (OEMs).

KP4000 SERIES MANUFACTURING OPTIONS

4	Keypad Legend F13 – F16 (HEX Codes 68, 69, 6A, 6B)
5	Keypad Legend F17 – F20 (HEX Codes 6C, 6D, 6E, 6F)
6	Keypad Legend F21 – F24 (HEX Codes 70, 71, 72, 73)
BR	Red LED Backlight
BG	Green LED Backlight
X.X	Optional Hardwired USB Cable, Minimum 1.0 ft, Maximum 9.5 ft, in 0.5 ft Increments
	*For complete ordering information please refer to Technical Drawing 761833

KP4000 SERIES USB CABLE OPTIONS

P4S003X Hardwired USB Cable for USB Keypad **P4S005** Removable USB Cable for USB Keypad

KP4000 TECHNICAL DRAWING

1.83 (46.48 mm)
1.93 (49.02mm)

F13 F14
F15 F16
WHITE LEGEND OPTION #4

F17 F18
F19 F20
WHITE LEGEND OPTION #5

F21 F22
F23 F24
WHITE LEGEND OPTION #6

MOUNTING SURFACE
MOLDED SILICONE KEYPAD, BLACK WITH SYN-PROOF™ COATING
.13 (3.30mm)
.06 PCB (1.52mm)
USB HDR. FUNCTIONS
COMMON — BLACK
D+ — GREEN
D- — WHITE
+5V — RED
BOSS
PIN 1
.23 (5.84mm)
.08 (2.03mm)
.43 (10.92mm)
.17 (4.31mm)

CONFORMAL COATED SURFACE.
USB HEADER
PROGRAM HEADER
PIN 1

See CTI Technical Drawing 761833

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OPERATING SYSTEM SPECIFICATION

Operating System	all Windows OS® with USB HID Compliant Ports
	All others are Indeterminate

ELECTRICAL SPECIFICATION

Power Consumption	Non-Backlit	@ 5VDC, < 10mA
	Backlit	@ 5VDC, < 50mA

MECHANICAL SPECIFICATION

KP4000 Dimensions	Width: 1,83" (46.48mm)		Height: 1.93" (49.02mm)		Below Panel: 0.43" (10.92mm)	
	Key Travel	0.08" (2mm)	Key Cap Size	Width: 0.44" (11.18 mm)	Height: 0.51" (12.95mm)	
Keys	4 Silicone Rubber Keys with carbon pills			Actuation Force: 100g +/- 20g		
MTBF	Greater than 100,000 hours (Hard gold plating)					
Life Expectancy	5VDC @ 50mA is 10,000,000+ activations					
	SynProof ™ Coated Elastomer is 10,000,000+ cycles			Parylene Coated Elastomer is 10,000,000+ cycles (Option)		
Shock	Peak Value	30-50g	Peak Duration	11ms	Waveform	Half Sine
Vibration	Frequency / Displacement		5-25 Hz / 0.1"		25-55 Hz / 0.03"	

ENVIRONMENTAL SPECIFICATION

	Standard	Optional
Operating Temperature	-40º to 80º C / -40º to 176º F	
Storage Temperature	-40º to 80º C / -40º to 176º F	
Relative Humidity	100% (properly installed)	
Sealing Rating	NEMA 4 (IP66) Watertight (properly installed)	
Elastomer Coating	SynProof™ Coating	Parylene Coating
PCB Coating	Conformal Coating	

CONFORMANCE / CERTIFICATIONS / COMPLIANCE
subject to manufacturing options applied

U.S.A. Standards	U.S. FCC 47 CFR 15 Class A & B	RF Emissions Compliant 8Kv (Contact), 15Kv (Air)
	MIL-STD-461F	Radiated Emissions and Susceptibility Conformance
	MIL-STD-810G	Protection against humidity, fungus, and salt spray Conformance
	MIL-STD-901D	Protection against shock Conformance
	MIL-STD-167-1	Protection against vibration Conformance
	MIL-STD-1472G	Human Factors Conformance
	MIL-I-45208	Quality System Conformance
	IPC-A-610	Acceptability of Electronics Assemblies Certification
European Standards	"CE" Compliant	
	Restriction of Hazardous Substance (RoHS) Directive Compliant	
	Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) Directive Compliant	
International Standards	IEC 61000-4-2 and EN61000-4-2	ESD 8Kv contact and 15Kv air Conformance
	IEC 61000-4-3 and EN61000-4-3	Radiated Emissions and Susceptibility Conformance
	IEC 61000-6-3 and EN61000-6-3	Electromagnetic Compatibility Conformance
	IEC 60601-1 and EN60601-1	Medical Device Design and Manufacture Conformance
	IEC 62353 and BS EN62353	Medical Device Recurrent Testing Conformance

KP4000 STANDARDS

CTIs USB keypads are ruggedized to meet aerospace, marine, medical, and military standards. When properly installed these USB keypads can meet MIL-STD-167-1 (protection against vibration), MIL-STD-901D (protection against shock), MIL-STD-461F (protection against high EMI/RFI levels), MIL-STD-810G (protection against humidity, fungus, and salt spray), and MIL-HDBK-217F (MTBF is greater than 100,000 hours) as well as other international standards.

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