CKP-Series

SAE J1939 CAN KEYPAD

Compliant with SAE J1939 CAN standards, the CKP-Series is a customizable keypad featuring laser etched legends and up to three dimmable LED function lights per button, which also offer diagnostic feedback by blinking if there is a fault.

With above and below sealing protection, the CKP-Series can be installed inside or outside the cab making it ideal for any on/off-highway application. Its low profile design affords a seamless dashboard look and can be mounted either vertically or horizontally.

The CKP-Series offers significant advantages over traditional electromechanical switches such as 1,000,000 actuation cycles, reduced wire harnessing, and easy installation.

Product Highlights:

- SAE J1939 CAN 2.0b Protocol
- IP6k9k Above-Panel Sealing Protection
- IP6k8 Below-Panel Sealing Protection
- Up to 3 LED Function Lights Per Button
- Diagnostic Feedback
- Standard or Custom Laser Etched Legends
- 1,000,000+ Button Actuation Cycles
- Low Current Switching
- 8 to 32V Operating Voltage
- Tactile and Audible Feedback

Typical Applications:

- Military
- On/Off-Highway
  - Trucks & Buses
  - Construction
  - Mining
  - Agriculture
  - Among Others

Carling Technologies®
Innovative Designs. Powerful Solutions.

CKP-Series
DESIGN FEATURES

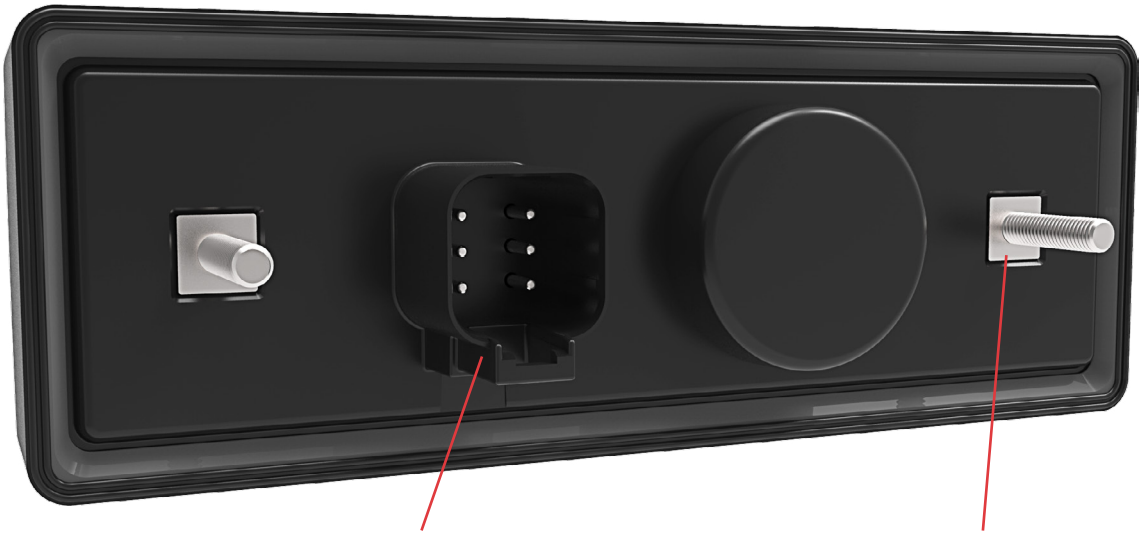
LOW PROFILE DESIGN
0.57 inch [14.48 mm] thickness (see dimensional specifications for more detail)

Front View

SEALING PROTECTION
Fully sealed IP6k9k above-panel

LED FUNCTION LIGHTS
One, two, or three LED Function Lights per button. Colors include Amber, Green, Red or Blue.

CUSTOMIZABLE ICONS
Choose from our standard library of icons or use custom icons.



Back View

SEALING PROTECTION
Fully sealed IP6k8 below-panel when connected

CONNECTOR
Mates to the Deutsch DT-Series Connector

10-32 MOUNTING STUDS (2x)
Max tightening torque 30 inch lbs.

General

Illumination	LED backlit icons and function lights Up to 3 function lights per button Dimmable illumination, controlled by CAN messages
Connection / Wiring	Duetsch DT series connector (See Dimensional Specifications)

Electrical

Operating Voltage	Designed for 12/24 Volt systems Minimum 8 VDC Maximum 32VDC
Sleep Mode	Low current sleep mode draws less than 1.5 mA throughout the supply voltage range wakes on keypress or CAN message
Supply Voltage ratings	The keypad passes SAE J1455 section 4.13.1 for power up, operating voltage, over voltage, reverse polarity, and short circuit
EMC	Transient immunity: ISO 11452-2, 100 V/m, 20 MHz to 2,000 MHz, Class A per ISO 11451-1 Conducted Transient immunity: ISO 7637-2:2004, Annex A Table A2 (for 24V systems), Class A ESD immunity: ISO 10605:2001, Test level IV (8 kV direct dis charge, 15 kV air discharge) Transient Emission: ISO 13766, Broadband: Annex D, Narrow band: Annex E, 30-1000 MHz

Mechanical

Overall Dimensions	See Dimensional Specifications
Panel cutout	See Dimensional Specifications
Endurance	Each button functions for at least 1,000,000 total actuations (100,000 actuations at -40°C, 100,000 actuations at +85°C, and 800,000 actuations at +25°C ± 10°C)

Software

CAN Protocol	CAN 2.0b type interface as defined by SAE J1939

Environmental

Thermal	-40°C to +85°C The following codes were passed: Cold Soak (IEC 60068-2-1) Heat Soak (IEC 60068-2-2) Cycling/Shock (IEC 60068-2-14)
Solar Radiation:	IEC 60068-2-5, procedure B, 10 cycles, Total irradiation per cycle = 22.4 kWh/m2
Low pressure	IEC 60068-2-13
Humidity	Soak: IEC 60068-2-78, 93% RH (±3%), 10 days
Cyclic	IEC 60068-2-30, test Db: Damp Heat Cyclic (12hr + 12hr cycle), variant 1, 6 cycles
Ingress Protection	IP6k9k, for above-panel components of actual switch only. IP6k8, for below-panel components of actual switch only when connected.
Shock and Bump	IEC 60068-2-27, Shock 500 m/s^2 11 milliseconds, Bump 400 m/s^2 6 milliseconds 600 cycles
Drop test	IEC 60068-2-31, Free fall, Procedure 1, 1000 mm height, drop in all 3 axes in both directions
Vibration	IEC 60068-2-6, Swept sine wave section 8.2, 5 - 500 Hz 20 cycles 5g acceleration IEC 60068-2-6, Vibration sinusoidal, section 8.1, 10 - 2000 Hz, 5g acceleration IEC 60068-2-64, Method 1, random excitation, 10 - 350 Hz, 5 hours in each axis
Chemical Resistance	IEC 60068-2-74, Class B, Engine oil, Diesel, Hydraulic oil, Ethylene Glycol, Urea Nitrogen, Liquid Lime, NPK Fertilizer, Ammonia, Calcium Chloride, Brake fluid
Corrosion Resistance	IEC 60068-2-52, Test Kb, Severity level 4
Weathering/Cracking Resistance	ASTM D1171-99, method A, 72 hours
Abrasion/Wear Resistance:	40 cycles of ASTM F2357 testing with 0.25” paper at 175 grams of force

Software Interface Integration

Click below for details on integrating the CKP-Series into J1939 CAN network:
www.carlingtech.com/sites/default/files/documents/ckp-series_interface.pdf

*Manufacturer reserves the right to change product specification without prior notice.
GPS-0007 Rev: A

Ordering Scheme: Part 1 (Keypad)

CKP	1	-	1	A	1	-	A	B	-	A	-	J	000	/
1 Series	2 Styling		3 Button Layout	4 Orientation	5 Keypad Color		6 Backlight	7 Function Light Color		8 Un-illuminated Image Code		9 Network Type	10 Source Address	

1 SERIES
CKP Carling Keypad

2 KEYPAD STYLING
1 Standard

3 BUTTON LAYOUT
1 Two by Six

4 ORIENTATION
A Landscape
B Portrait
C Reverse Landscape
D Reverse Portrait
See "icon artwork button layout" section for details.

5 KEYPAD COLOR
1 Black

6 BACKLIGHT
A White

7 FUNCTION LIGHT COLOR
B Amber **C** Green **D** Red **E** Blue

8 NON-ILLUMINATED IMAGE CODE
A White

9 NETWORK TYPE
J J1939

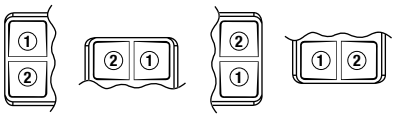
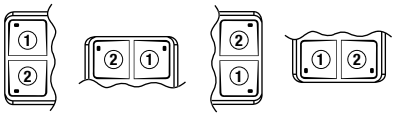
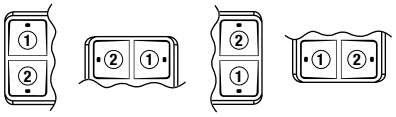
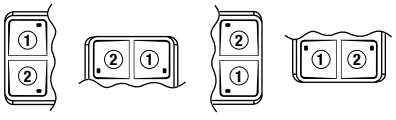
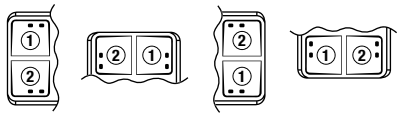
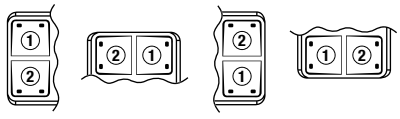
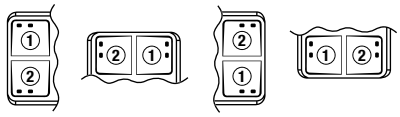
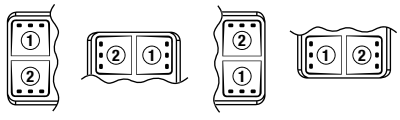
10 SOURCE ADDRESS
The Source Address is a unique number (000-248) assigned to each node on a CAN network, and is determined based on the specific CAN architecture of each customer application.

Ordering Scheme: Part 2 (Icon Artwork)

Button 1		Button 2		Button 3		Button 4		Button 5		Button 6	
2	RS	2	RA	3	UV	3	UW	6	MT	8	UB
11 Function	12 Icon Code	13 Function	14 Icon Code	15 Function	16 Icon Code	17 Function	18 Icon Code	19 Function	20 Icon Code	21 Function	22 Icon Code

Button 7		Button 8		Button 9		Button 10		Button 11		Button 12	
8	NN	8	PU	5	PR	5	PP	4	RH	4	NU
23 Function	24 Icon Code	25 Function	26 Icon Code	27 Function	28 Icon Code	29 Function	30 Icon Code	31 Function	32 Icon Code	33 Function	34 Icon Code

FUNCTION LIGHT CODE (Select for positions 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33)

		Landscape	Portrait	Reverse Landscape	Reverse Portrait
1	No Function Light				
2	Open-Closed-Closed				
3	Closed-Open-Closed				
4	Closed Closed-Open				
5	Closed-Open-Open				
6	Open-Closed-Open				
7	Open-Open-Closed				
8	Open-Open-Open				

Additional function light colors available, please consult factory.

ICON CODE
00 For standard icons, see next page. For additional icons, please consult factory.

COS-0094 Rev: D

Continue to next page for layout and icons.

Orientation - Icon Artwork Button Number Layout

(see dimensional specifications for more detail)

A: Landscape

C: Reverse Landscape

B: Portrait

D: Reverse Portrait

Standard Icon Codes:

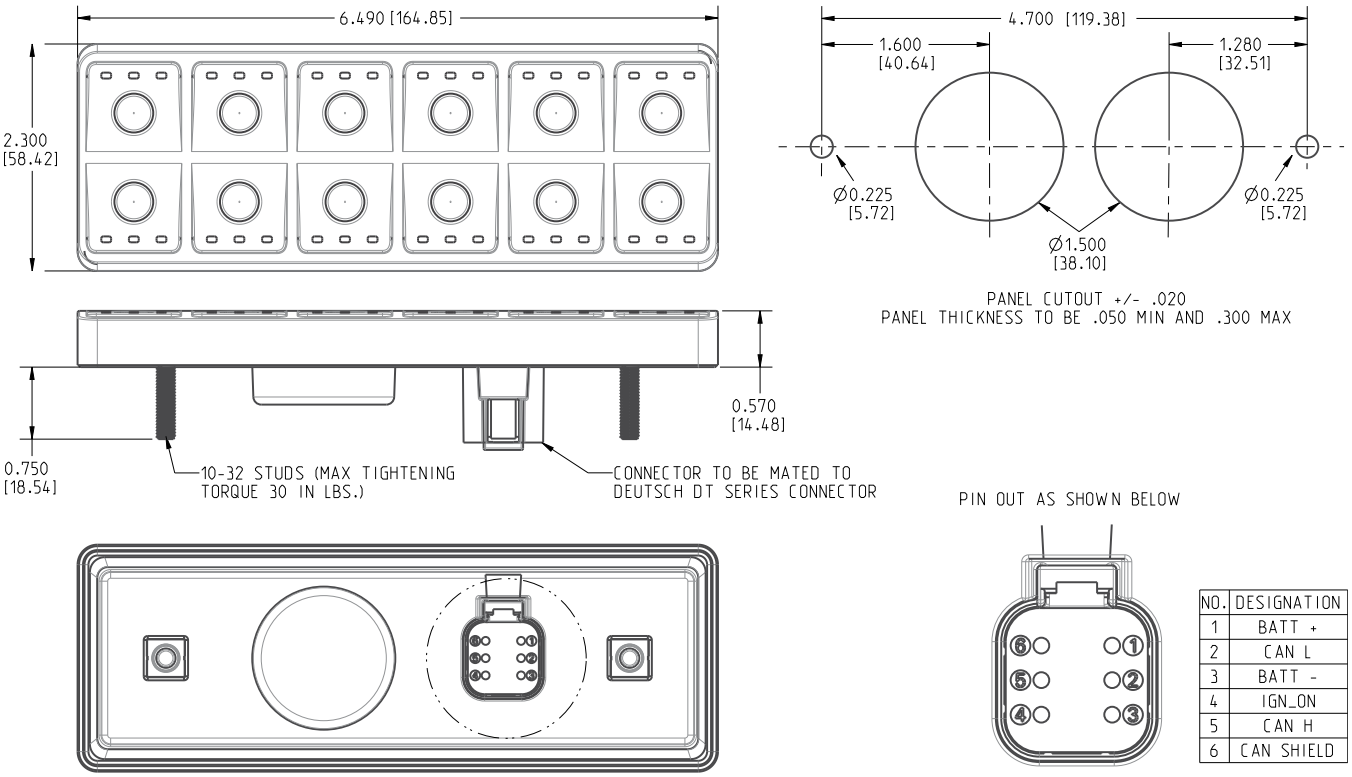
UB	UV	UW	UX	UY	MP	MR	PX	MS	MR	MT	VU	MW
NZ	NX	NY	YM	VW	PW	PZ	WG	RN	RP	YG	TX	HEAD LIGHTS SH
DASH LIGHTS SN	BEACON SR	LIGHT SY	DIM WY	BRIGHT WZ	UF	UG	MU	TN	NS	PB	WIPER SE	VZ
YE	NN	RW	PU	WA	YN	UE	NM	RJ	NR	YD	TL	VR
ENG FAN SL	UC	VN	PK	VY	HORN UZ	RH	NU	NV	RB	RC	RK	RL
MZ	RG	UP WS	DOWN WT	PM	VV	WB	TB	TC	TD	TE	MY	PV
TA	TZ	WC	PT	PN	PH	RA	TU	TT	ENG HATCH YL	ENG BRAKE SK	VS	UL
UM	WK	TS	VT	TCS WL	VP	YJ	PJ	RY	UP	NW	NP	RE
RF	PP	PR	TV	PC	YT	YU	PL	WJ	MV	RR	TK	RT

Standard Icon Codes continued on next page.

Standard Icon Codes:

SEAT					CRUISE							
SZ	VX	WF	WH	PG	SJ	YA	YB	RM	TM	RD	RS	TP
TR	NT	MX	YC	TW	TJ	YF	TH	TF	TG	YS	YH	SX
ON OFF	OFF ON	I O	O I	OFF ON	ON	OFF	I	O	II	RAISE	LOWER	HIGH
RZ	YP	WN	WP	WW	WX	SA	SB	SC	SD	ST	SU	WU
LOW	FWD	REV	ACC	REAR	PARK	AUTO						
WV	SV	SW	VK	SF	SG	SS	RU	RV	RX			

Dimensional Specifications: in. [mm]



NO.	DESIGNATION
1	BATT +
2	CAN L
3	BATT -
4	IGN_ON
5	CAN H
6	CAN SHIELD

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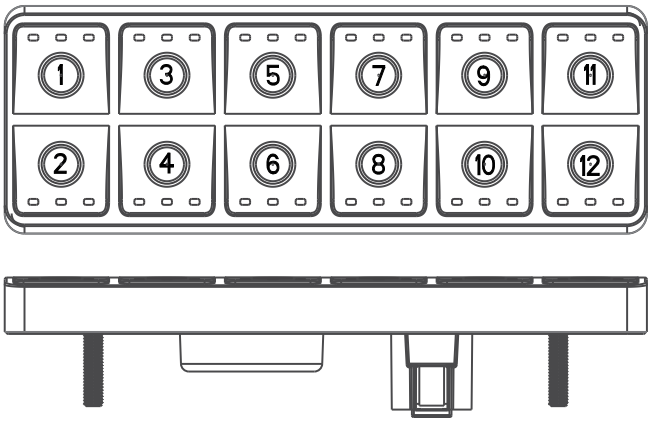
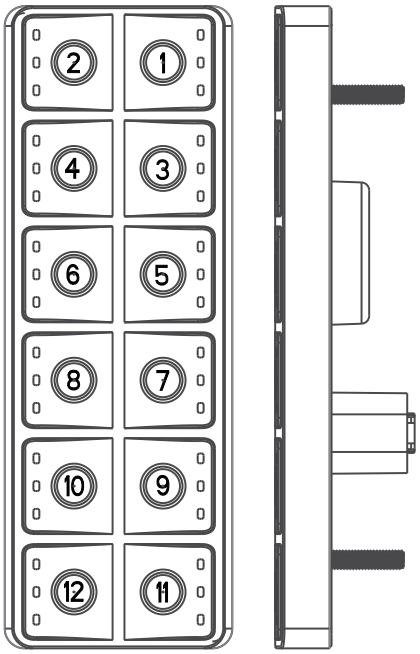
Dimensional Specifications: in. [mm]

ORIENTATION - ICON ARTWORK BUTTON NUMBER LAYOUT

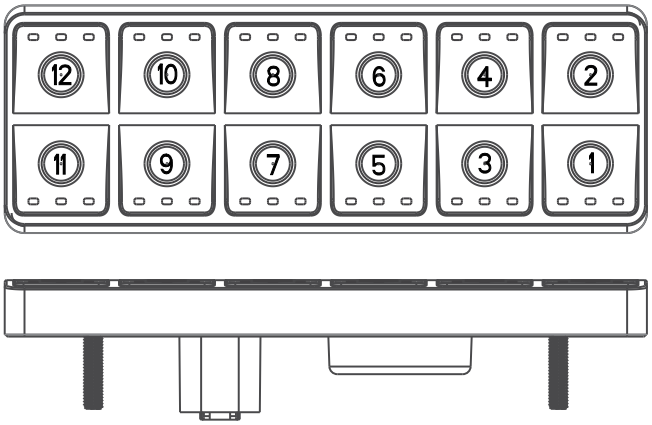
LANDSCAPE



PORTRAIT



REVERSE LANDSCAPE



REVERSE PORTRAIT