



# CKP-Series

## Interface Specification

# Revision History

Revision	Description
1.0	Initial Release

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## CKP-Series: J1939 Interface Specification

This document contains the message format details required for communication between the ECU and the CKP-Series under the J1939 protocol.

### 1.0 Quick Start Guide

1. Connect the CKP harness to a power supply and a PC-based CAN tool (such as CANalyzer) with the proper terminating resistor (120 ohm) across CAN-L and CAN-H.
2. Make sure that the ignition pin on the CKP harness is also connected to the input power - this will cause the unit to run at full power and prevent it from entering low-power sleep mode.
3. Once input power has been applied, observe the live CAN traffic on the PC - a J1939 Address Claim (ACL) message should be immediately visible, followed by sequential transmission of the J1939 Aux I/O and DMI messages.
4. It is critical to understand that the backlight and function LEDs will not illuminate on their own, as the CKP is a passive device that requires interaction with other ECUs to fully integrate into a CAN-based network.
5. Use a PC-based CAN tool (such as CANalyzer or PCAN etc) to transmit the Cab Illumination (CL) message onto the CAN network.
6. To illuminate the backlights, the CKP needs to receive the J1939 standard CL message (PGN 53248 = 0xD000 in hex notation). The ID and message payload should look like this:

ID = 0x18D0FFxx, DLC = 8, Payload = FA FA FF FF FF FF FF FF

0xFF denotes that the message is being received globally by all nodes on the network. You could also set this field specifically to the source address of the CKP if you only wanted that device to receive the message

After setting non-zero brightness values, the backlights should turn on automatically. To turn the indicator LEDs on, you'll need to generate the Aux I/O messages as follows:

Aux I/O 2: ID = 0x18A7xxYY, DLC = 8, Payload = 55 55 55 55 55 55 55 55

Aux I/O 3: ID = 0x18A6xxYY, DLC = 8, Payload = 55 00 00 00 00 00 00 00 (0x00 are unused channels in the message)

Note that this will turn on all CKP indicator LEDs at full brightness

# 2x6 Configuration

## 2. J1939 CAN Messages

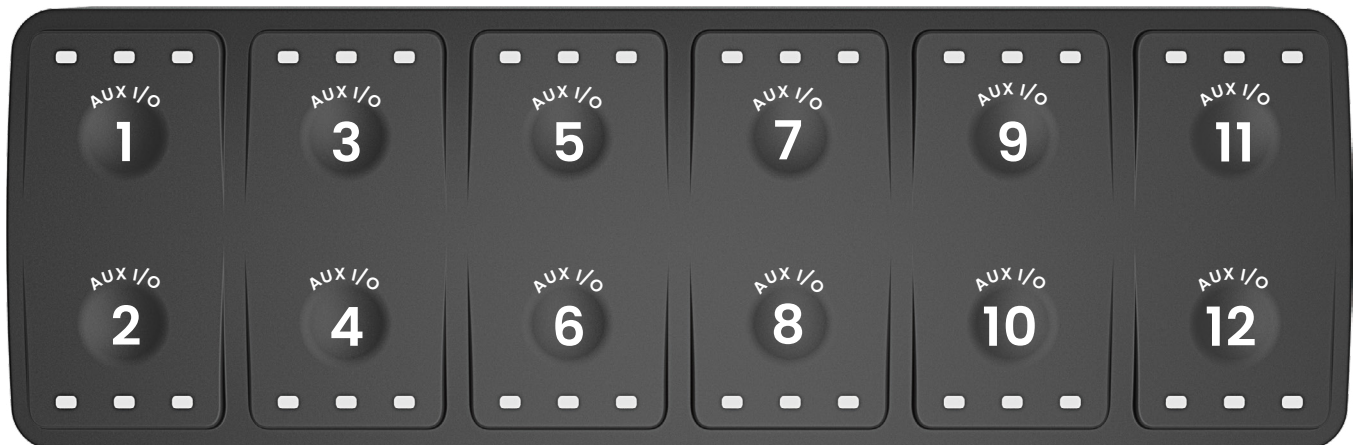
### 2.1 Switch Status (transmitted)

The J1939 Aux I/O 1 message contains the current status of each button on the keypad. This message is broadcast at a periodic rate of 250ms, as well as any time the keypad button(s) are pressed.

Auxiliary Input / Output Status 1				
Description	This message shall be broadcast periodically or upon change of state to the rest of the CAN network to indicate the state of the switches			
PGN	0x00FED9			
Default Priority	3			
Source Address	Source Address configurable			
DLC	8			
Update Rate	250 mS periodically and upon change of state (no faster than 20 mS)			
Direction	Keypad -> CAN Network			
Start	Bits	Name	SPN	Notes
1.1	2	Auxiliary I/O #04	704	00 <sub>2</sub> - Auxiliary Channel is OFF 01 <sub>2</sub> - Auxiliary Channel is ON 010 <sub>2</sub> - Error 11 <sub>2</sub> - Not Available
1.3	2	Auxiliary I/O #03	703	
1.5	2	Auxiliary I/O #02	702	
1.7	2	Auxiliary I/O #01	701	
2.1	2	Auxiliary I/O #08	708	
2.3	2	Auxiliary I/O #07	707	
2.5	2	Auxiliary I/O #06	706	
2.7	2	Auxiliary I/O #05	705	
3.1	2	Auxiliary I/O #12	712	
3.3	2	Auxiliary I/O #11	711	
3.5	2	Auxiliary I/O #10	710	
3.7	2	Auxiliary I/O #09	709	
4.1	2	Not Used	N/A	
4.3	2	Not Used	N/A	
4.5	2	Not Used	N/A	
4.7	2	Not Used	N/A	
5.1	32	Not Used	N/A	

Below shows how the above J1939 Aux I/O 1 channels map to the physical 12-key keypad.

Note: The orientation of each unit may vary according to the product configuration - Landscape orientation shown



## 2.2 LED Function Indicators Status (received)

LED Function Lights are controlled independently from the switch status(s). The 36 function lights are controlled through messages AUX I/O 2 & AUX I/O 3 as detailed in the below tables and figure.

Default Priority	6
Source Address	Source Address configurable
DLC	8
Update Rate	Variable
Direction	Control Node → CAN Network

Auxiliary Input / Output Status 2				Auxiliary Input / Output Status 3			
Description	Message will control indicator state of first 32 indicators. SPN 3840 will control 1 <sup>st</sup> indicator, SPN 3871 will control 32 <sup>nd</sup> indicator			Description	Message will control indicator state of last 4 indicators. SPN 3872 will control 33 <sup>rd</sup> Indicator, SPN 3875 will control 36 <sup>th</sup> Indicator. Remaining SPN's in message are unused		
PGN	42752 (0x00A7xx) xx=keypad source address)			PGN	42496 (0x00A6xx) xx=keypad source address)		
Start	Bits	Name	SPN	Start	Bits	Name	SPN
1.1	2	Auxiliary I/O #20	3843	1.1	2	Auxiliary I/O #52	3875
1.3	2	Auxiliary I/O #19	3842	1.3	2	Auxiliary I/O #51	3874
1.5	2	Auxiliary I/O #18	3841	1.5	2	Auxiliary I/O #50	3873
1.7	2	Auxiliary I/O #17	3840	1.7	2	Auxiliary I/O #49	3872
2.1	2	Auxiliary I/O #24	3847	2.1	2	Auxiliary I/O #56	3879
2.3	2	Auxiliary I/O #23	3843	2.3	2	Auxiliary I/O #55	3878
2.5	2	Auxiliary I/O #22	3845	2.5	2	Auxiliary I/O #54	3877
2.7	2	Auxiliary I/O #21	3844	2.7	2	Auxiliary I/O #53	3876
3.1	2	Auxiliary I/O #28	3851	3.1	2	Auxiliary I/O #60	3883
3.3	2	Auxiliary I/O #27	3850	3.3	2	Auxiliary I/O #59	3882
3.5	2	Auxiliary I/O #26	3849	3.5	2	Auxiliary I/O #58	3881
3.7	2	Auxiliary I/O #25	3848	3.7	2	Auxiliary I/O #57	3880
4.1	2	Auxiliary I/O #32	3855	4.1	2	Auxiliary I/O #64	3887
4.3	2	Auxiliary I/O #31	3854	4.3	2	Auxiliary I/O #63	3886
4.5	2	Auxiliary I/O #30	3853	4.5	2	Auxiliary I/O #62	3885
4.7	2	Auxiliary I/O #29	3852	4.7	2	Auxiliary I/O #61	3884
5.1	2	Auxiliary I/O #36	3859	5.1	2	Auxiliary I/O #68	3891
5.3	2	Auxiliary I/O #35	3858	5.3	2	Auxiliary I/O #67	3890
5.5	2	Auxiliary I/O #34	3857	5.5	2	Auxiliary I/O #66	3889
5.7	2	Auxiliary I/O #33	3856	5.7	2	Auxiliary I/O #65	3888
6.1	2	Auxiliary I/O #40	3863	6.1	2	Auxiliary I/O #72	3895
6.3	2	Auxiliary I/O #39	3862	6.3	2	Auxiliary I/O #71	3894
6.5	2	Auxiliary I/O #38	3861	6.5	2	Auxiliary I/O #70	3893
6.7	2	Auxiliary I/O #37	3860	6.7	2	Auxiliary I/O #69	3892
7.1	2	Auxiliary I/O #44	3867	7.1	2	Auxiliary I/O #76	3899
7.3	2	Auxiliary I/O #43	3866	7.3	2	Auxiliary I/O #75	3898
7.5	2	Auxiliary I/O #42	3865	7.5	2	Auxiliary I/O #74	3897
7.7	2	Auxiliary I/O #41	3864	7.7	2	Auxiliary I/O #73	3896
8.1	2	Auxiliary I/O #48	3871	8.1	2	Auxiliary I/O #80	3903
8.3	2	Auxiliary I/O #47	3870	8.3	2	Auxiliary I/O #79	3902
8.5	2	Auxiliary I/O #46	3869	8.5	2	Auxiliary I/O #78	3901
8.7	2	Auxiliary I/O #45	3868	8.7	2	Auxiliary I/O #77	3900

Notes: 00<sub>2</sub> - Auxiliary Channel is OFF; 01<sub>2</sub> - Auxiliary Channel is ON; 10<sub>2</sub> - Error; 11<sub>2</sub> - Not Available



### 2.3 Diagnostic Reporting – DMI (transmitted)

Active Diagnostic Trouble Codes				
Description	Message is broadcast from the keypad and contains details of any problems within the unit. If more than one problem exists it will be transmitted using the multi-packet protocol. SPN 1215, through 1706 are repeated for each problem.			
PGN	65226 (0x00FECA)			
Default Priority	3			
Source Address	Variable			
DLC	8			
Update Rate	1 Hz			
Direction	Keypad → Network			
Start	Bits	Name	SPN	Notes
1.1	2	Protect Lamp	987	00 <sub>2</sub> - Auxiliary Channel is OFF 01 <sub>2</sub> - Auxiliary Channel is ON 10 <sub>2</sub> - Error 11 <sub>2</sub> - Not Available
1.3	2	Amber Warning Lamp	624	
1.5	2	Red Stop Lamp	623	
1.7	2	Malfunction Indicator Lamp	1213	
2.1	2	Flash Protect Lamp	3041	
2.3	2	Flash Amber Warning Lamp	3040	
2.5	2	Flash Red Stop Lamp	3039	
2.7	2	Flash Malfunction Indicator Lamp	3038	
3 - 4, 5,6	19	Suspect Parameter Number (SPN)	1214	
5.1	5	Failure Mode Identifier (FMI)	3883	
6.1	7	Occurrence Count	1216	
6.8	2	SPN Conversion Method	1706	

Diagnostic Trouble Code Name	SPN	FMI	Lamp
Shift Register Fault	516984	31 <sup>1</sup>	–
Button 1 Stuck	516252	7 <sup>4</sup>	Amber
Button 2 Stuck	516253	7	Amber
Button 3 Stuck	516254	7	Amber
Button 4 Stuck	516255	7	Amber
Button 5 Stuck	516256	7	Amber
Button 6 Stuck	516257	7	Amber
Button 7 Stuck	516258	7	Amber
Button 8 Stuck	516259	7	Amber
Button 9 Stuck	516260	7	Amber
Button 10 Stuck	516261	7	Amber
Button 11 Stuck	516262	7	Amber
Button 12 Stuck	516263	7	Amber
VREF Voltage Low	520794	4	–
VREF Voltage High	520794	3	–
EEPROM Corruption	516982	31	Amber
Microcontroller Reset	516980	31	–
LED Error	516983	31	–

Notes:

FMI 31 = Condition Exists

FMI 4 = Voltage Below Normal or Shorted to Low Source

FMI 3 = Voltage Above Normal or Shorted to High Source

FMI 7 = Mechanical System Not Responding

## 2.4 Common CAN Messages

This document contains the J1939 interface for the keypad, including all transmitted messages and which messages it must receive from a master ECU to operate properly.

Cab Illumination Message				
Description	The keypad shall adjust the indicator and backlight brightness based on the standard J1939 Cab Illumination Message.			
PGN	53248 (0x00D0xx where xx=keypad source address)			
Default Priority	6			
Source Address	Source Address of control node			
DLC	8			
Update Rate	5 seconds periodically or upon change (no faster than 100 ms).			
Direction	Control Node → Keypad			
Start	Bits	Name	SPN	Notes
1.1	8	Illumination Brightness Percent	1487	Range: 0% to 100% Resolution: 0.4% per bit Offset: 0
2.1	8	Switch Backlight Illumination Brightness Percent	5532	Range: 0% to 100% Resolution: 0.4% per bit Offset: 0

Address Claim				
Description	The keypad shall transmit an address claim at start-up.			
PGN	60928 (0x00EE00)			
Default Priority	6			
Source Address	Source Address of control node			
DLC	8			
Update Rate	Variable			
Direction	Keypad → Network			
Start	Bits	Name	Notes	
1.1 – 3.5	21	Unique Number	Varies	
3.6 – 4.8	11	Manufacturer Code	J1939: 741	
5.1	3	Device Instance Lower – ECU Instance	As configured	
5.4	5	Device Instance Upper – Function Instance	As configured	
6.1	8	Device Function	135	
7.1	1	Dominant bit	0	
7.2	7	Device Class	0	
8.1	4	Generic Instance	0	
8.5	3	Industry Group	J1939: Global (0)	
8.8	1	Self-configurable	Always 1	

## 2.5 Low-Power Sleep Mode

All three of the following need to be in place for the keypad to sleep:

- Ignition signal OFF
- No CAN communication on the vehicle
- No keys pressed

Any one of the above three conditions will wake the keypad.

# 2x2, 2x3, 2x4 & 2x5 Configuration

## Reference Documents

The following documents are referenced within this document.  
SAE-J1939, SAE-J1939/11, SAE-J1939/21, SAE-J1939/71, SAE-J1939/73, SAE-J1939/81

## 3. Functionality

The CKP have several buttons; each button has 3 function LEDs. The status combination of two physical channels of each button can represent the position of each button, press-down position and press-up position. When the button status change, the CKP will send out the CAN message right away. When the CKP has no button status change, the CKP-Series will send the CAN message periodically.

### 3.1 Power Up Sequence

Upon first power up, the CKP sends out an Address Claimed message. If there is a conflicting address and the CKP loses arbitration, it will send out the "Cannot Claim Address" message. It will not transmit or act upon any messages, but still can send the "Cannot Claim Address" message upon the request for Address Claimed.

### 3.2 Normal Mode

#### Button Pressing Data - Transmit

The CKP button's status message is sent every 500ms or upon a change in status with a minimum period of 25ms.

#### Backlights and Function Lights Brightness - Received

The CKP monitors the backlights and function lights brightness message sent by CAB illumination control unit and adjusts the brightness accordingly.

#### Function Lights Status - Received

The CKP monitors the function lights message sent by CAB illumination control unit and adjusts the brightness accordingly. The function lights can be activated or deactivated by related control unit.

#### Button mode Setting - Received

Set the button as normal, long press or double press mode.

Normal mode: The button status becomes ON immediately after being pressed.

Long press: The button status becomes ON after keeping pressed for a given time.

Double press mode: The button status becomes ON after being double pressed.

No matter what mode, the button status becomes OFF immediately after being released.

#### Diagnostic Reporting - Transmit

Diagnostic message is broadcast from the CKP and contains details of any problems within the unit. If more than one problem exists, it will be transmitted using the multi-packet protocol.

### 3.3 Sleep Mode

In normal mode, if the CAN bus is quiet, ignition signal is OFF, and no button is pressed during 15 seconds, it will enter sleep mode, and all LEDs will be turned off to conserve energy. In sleep mode, CKP-Series will not send any message, but once it receives any CAN message, or any button is pressed, it will exit sleep mode and enter normal mode.

## 4. Communications

The default communication baud rate is 250kbps. However, it can be customized when customer places order.

### 4.1 Standard Message

Transmission of CKP Button Status			
PF	254		
PS	8		
PGN	65241 (0xFED9)		
Default Priority	6		
DLC	8		
Update Rate	500ms or upon button status change		
Direction	CKP → CA		
Start	Bits	Description	Notes
1.1	2	Auxiliary I/O 4 Status	00 - Off 01 - On 10 - Error (Stuck) 11 - Not available
1.3	2	Auxiliary I/O 3 Status	
1.5	2	Auxiliary I/O 2 Status	
1.7	2	Auxiliary I/O 1 Status	
2.1	2	Auxiliary I/O 8 Status	
2.3	2	Auxiliary I/O 7 Status	
2.5	2	Auxiliary I/O 6 Status	
2.7	2	Auxiliary I/O 5 Status	
3.1	4	Unused	All bits set to 1
3.5	2	Auxiliary I/O 10 Status	00 - Off 01 - On 10 - Error (Stuck) 11 - Not available
3.7	2	Auxiliary I/O 9 Status	
4.1	5	Unused	All bytes set to 255

Note: Some buttons are unavailable according to the type. For instance, Aux I/O 9 is unavailable for 2x4 CKP

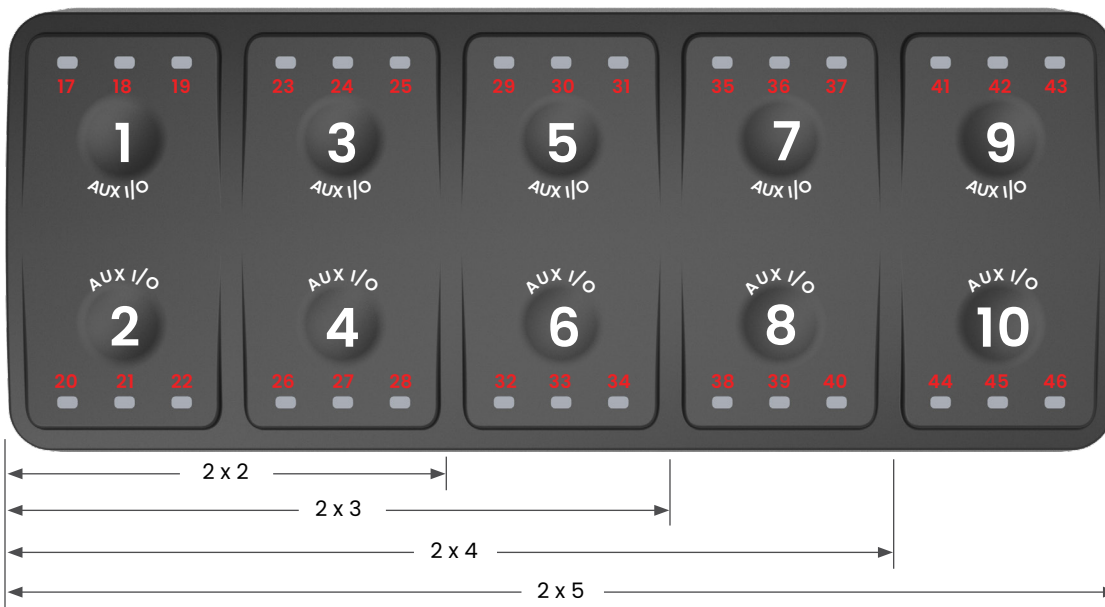


Figure 1: Buttons and LEDs mapping for 2x2 2x3 2x4 2x5 CKPs

LED Lights Brightness Setting			
Description	Adjust the indicator and backlight brightness based on the standard J1939 Cab Illumination Message.		
PF	208		
PS	DA, The address of CKP		
PGN	53248 (0xD000)		
Default Priority	6		
DLC	8		
Update Rate	Upon commanded		
Direction	CA → CKP		
Start	Bits	Description	Notes
1.1	1	Function lights brightness percentage	0.4%/bit 0-250: normal >250: invalid value
2.1	1	Back lights brightness percentage	
3.1	1	LED Blinking period Effective when LED status is Blink	10ms/bit 5-250: normal others: invalid value
4.1	5	Unused	All bytes set to 255

LED Function Lights Status			
Description	Control the state of indicators.		
PF	167		
PS	DA, The address of CKP		
PGN	42752 (0xA700)		
Default Priority	6		
DLC	8		
Update Rate	Upon commanded		
Direction	CA → CKP		
Start	Bits	Description	Notes
1.1	2	Auxiliary I/O 20 Status	00 - Off 01 - On 10 - Blink 11 - invalid value
1.3	2	Auxiliary I/O 19 Status	
1.5	2	Auxiliary I/O 18 Status	
1.7	2	Auxiliary I/O 17 Status	
2.1	2	Auxiliary I/O 24 Status	
2.3	2	Auxiliary I/O 23 Status	
2.5	2	Auxiliary I/O 22 Status	
2.7	2	Auxiliary I/O 21 Status	
3.1	2	Auxiliary I/O 28 Status	
3.3	2	Auxiliary I/O 27 Status	
3.5	2	Auxiliary I/O 26 Status	
3.7	2	Auxiliary I/O 25 Status	
4.1	2	Auxiliary I/O 32 Status	
4.3	2	Auxiliary I/O 31 Status	
4.5	2	Auxiliary I/O 30 Status	
4.7	2	Auxiliary I/O 29 Status	
5.1	2	Auxiliary I/O 36 Status	
5.3	2	Auxiliary I/O 35 Status	
5.5	2	Auxiliary I/O 34 Status	
5.7	2	Auxiliary I/O 33 Status	
6.1	2	Auxiliary I/O 40 Status	
6.3	2	Auxiliary I/O 39 Status	
6.5	2	Auxiliary I/O 38 Status	
6.7	2	Auxiliary I/O 37 Status	
7.1	2	Auxiliary I/O 44 Status	
7.3	2	Auxiliary I/O 43 Status	
7.5	2	Auxiliary I/O 42 Status	
7.7	2	Auxiliary I/O 41 Status	
8.1	4	Unused	All bits set to 1
8.5	2	Auxiliary I/O 46 Status	00 - Off 01 - On 10 - Blink 11 - invalid value
8.7	2	Auxiliary I/O 45 Status	

8. Note: Some LEDs are unavailable according to the type. For instance, Aux I/O 4 4 is unavailable for 2x4 CKP.

Diagnostic Reporting – DMI			
Description	Transmission of CKP Diagnostic Information		
PF	245		
PS	202		
PGN	65226 (0xFECA)		
Default Priority	6		
DLC	8		
Update Rate	1000ms periodically		
Direction	CKP → CA		
Start	Bits	Description	Notes
1.1	2	Protect Lamp	00 - Off 01 - On 10 - Error 11 - Not available
1.3	2	Amber Warning Lamp	
1.5	2	Red Stop Lamp	
1.7	2	Malfunction Indicator Lamp	
2.1	1	For future use	255
3.1	24	SPN and FMI	
6.1	7	Occurrence Count	
6.8	1	SPN Conversion Method	
7.1	2	unused	All bytes set to 255

Trouble Code List:			
Diagnostic Trouble Code Name	SPN	FMI	Lamp
Button 1 Stuck	516252	7	Amber
Button 2 Stuck	516253		
Button 3 Stuck	516254		
Button 4 Stuck	516255		
Button 5 Stuck	516256		
Button 6 Stuck	516257		
Button 7 Stuck	516258		
Button 8 Stuck	516259		
Button 9 Stuck	516260		
Button 10 Stuck	516261		

Address Claimed			
Description	Address Claimed, J1939-81		
PF	238		
PS	DA, global address, 255		
PGN	60928(0xEE00)		
Default Priority	6		
DLC	8		
Update Rate	Upon initialization or requested		
Direction	CKP → CA		
Start	Bits	Description	Notes
1.1	16	Identity Number	2018 (Default)
3.1	5	Identity Number	12 (Default)
3.6	11	Manufacturer Code	2005 (Default)
5.1	3	ECU Instance	0 (Default)
5.4	5	Function Instance	0 (Default)
6.1	8	Function	37 (Default)
7.1	1	Reserved	0 (Default by SAE)
7.2	7	Vehicle System	0 (Default)
8.1	4	Vehicle System Instance	0 (Default)
8.5	3	Industry Group	0 - Global 1 - On-Highway Equipment 2 - Agricultural and Forestry Equipment 3 - Construction Equipment (Default) 4 - Marine 5 - Industrial-Process Control-Stationary 6 & 7 - Reserved
8.8	1	Arbitrary Address Capable	0 - Not Capable 1 - Capable (Default)

PGN Request				
Description	PGN request, J1939-81			
PF	234			
PS	DA, global address, 255			
PGN	59904(0xEA00)			
Default Priority	6			
DLC	3			
Update Rate	Upon initialization or requested			
Direction	CA → CKP			
Start	Bits	Description	SPN	Value
1.1	1	Byte 1 of PGN being requested (LSB)		0-255
2.1	1	Byte 2 of PGN being requested		
8.8	1	Byte 3 of PGN being requested (MSB)		

This is a standard request message, and the following are the supported PGNs that can be requested from the CKP module.

- CKP Status PGN 65241
- Address Claimed PGN 60928)
- ECU Identification Information PGN 64965)
- Software Identification Information PGN 65242)

If the requested PGN is unsupported, the CKP module shall respond with a NACK.

Acknowledgment Message				
Description	Acknowledgment Message, J1939-81			
PF	238			
PS	DA, global address, 255			
PGN	59392(0xE800)			
Default Priority	6			
DLC	8			
Update Rate	Upon reception of a PGN that requires this form of acknowledgment			
Direction	CKP → CA			
Start	Bits	Description	Notes	
1.1	1	Control Byte	0 - Positive Acknowledgment 1 - Negative Acknowledgment 2 - Access Denied 3 - Cannot Respond	
2.1	1	Group Function	Refer to SAE-J1939-21. 0(Default)	
3.1	1	Reserved by SAE	255 (Default)	
4.1	1	Reserved by SAE	255 (Default)	
5.1	1	Reserved by SAE	255 (Default)	
6.1	1	Byte 1 of PGN being requested (LSB)		
7.1	1	Byte 2 of PGN being requested		
8.1	1	Byte 3 of PGN being requested (MSB)		

ECU Identification Information				
Description	ECU Identification Information, J1939-71			
PF	253			
PS	197			
PGN	64965(0xFDC5)			
Default Priority	6			
DLC	variable			
Update Rate	Upon request			
Direction	CKP → CA			
Start	Length	Description	SPN	Notes
A	<=110 characters	ECU Part Number	2901	
B		ECU Serial Number	2902	
C		ECU Location	2903	
D		ECU Type	2904	

The length of the whole ECU ID should be not more than 110 bytes.

Software Identification Information				
Description	Software Identification Information, J1939-71			
PF	254			
PS	218			
PGN	65242(0xFEDA)			
Default Priority	6			
DLC	variable			
Update Rate	Upon request			
Direction	CKP → CA			
Start	Bits	Description	SPN	Notes
1	1	Number of Software Identification Fields	965	0-125
2-N	Variable	ECU Serial Number	234	ASCII characters. Each field delimited with an "*" and up to 200 characters.

Transport Protocol Connection Management BAM				
Description	Transport Protocol Connection Management BAM, J1939-21			
PF	236			
PS	DA, global address, 255			
PGN	60416 (0xEC00)			
Default Priority	7			
DLC	8			
Update Rate	Upon requested			
Direction	CKP → CA			
Start	Bits	Description	Notes	
1.1	1	Control Byte	32-Broadcast Announce Message	
2.1	2	Message length	9-1785	
4.1	1	Total number of packets	2-255	
5.1	1	Reserved by SAE	255	
6.1	3	Parameter Group Number of the packeted message	LSB at sixth byte, MSB at eighth byte.	

Transport Protocol Data Transfer				
Description	Transport Protocol Data Transfer, J1939-21			
PF	235			
PS	DA, global address, 255			
PGN	60160 (0xEB00)			
Default Priority	7			
DLC	8			
Update Rate	Upon requested			
Direction	CKP → CA			
Start	Bits	Description	Notes	
1.1	1	Sequence Number	1-255	
2.1	7	Related PGN data	Packetized Data	

## 5. Configuration

Configurations remains in the flash memory after setting. They will still be effective after power up again . When a configuration is successful , CKP will reply an ACK message, otherwise CKP will reply a NACK message.

Set New Source Address				
PF	239			
PS	DA, The source address of CKP			
PGN	61184(0xEF00)			
Default Priority	6			
DLC	8			
Update Rate	Upon commanded			
Direction	CA → CKP			
Start	Bits	Description	SPN	Value
1.1	1	Control Byte		0xE1-Set CKP source address
2.1	1	New Source Address		
3.1	6	Not Used		0xFFFFFFFF

Set New Priority				
PF	239			
PS	DA, The source address of CKP			
PGN	61184(0xEF00)			
Default Priority	6			
DLC	8			
Update Rate	Upon commanded			
Direction	CA → CKP			
Start	Bits	Description	SPN	Value
1.1	1	Control Byte		0xE4-Set CKP new priority
2.1	1	New Priority		0-7, otherwise the CKP will send the NACK message
3.1	6	Not Used		0xFFFFFFFF

Set New Field Name				
PF	239			
PS	DA, The source address of CKP			
PGN	61184(0xEF00)			
Default Priority	6			
DLC	8			
Update Rate	Upon commanded			
Direction	CA → CKP			
Start	Bits	Description	SPN	Value
1.1	1	Control Byte		0xE2 - Set CKP New Name Field Part 1
2.1	4	New Name Field Part 1 (Byte1 Byte4)		
6.1	3	Not Used		0xFFFFFFFF

Set New Field Name				
PF	239			
PS	DA, The source address of CKP			
PGN	61184(0xEF00)			
Default Priority	6			
DLC	8			
Update Rate	Upon commanded			
Direction	CA → CKP			
Start	Bits	Description	SPN	Value
1.1	1	Control Byte		0xE3 - Set CKP New Name Field Part 2
2.1	4	New Name Field Part 2 (Byte5 Byte8)		
6.1	3	Not Used		0xFFFFFFFF

Set Button Mode				
Description	Set the button as normal long press or double press mode			
PF	239			
PS	DA, The address of CKP			
PGN	61184(0xEF00)			
Default Priority	6			
DLC	8			
Update Rate	Upon commanded			
Direction	CA → CKP			
Start	Bits	Description	Notes	
1.1	8	Control byte	0x81	
2.1	2	Auxiliary I/O 4 Status	00 - Normal Mode (default) 01 - Long Press Mode 10 - Double Press Mode 11 - Invalid Value	
2.3	2	Auxiliary I/O 3 Status		
2.5	2	Auxiliary I/O 2 Status		
2.7	2	Auxiliary I/O 1 Status		
3.1	2	Auxiliary I/O 8 Status		
3.3	2	Auxiliary I/O 7 Status		
3.5	2	Auxiliary I/O 6 Status		
3.7	2	Auxiliary I/O 5 Status		
4.1	4	Unused	All bits set to 1	
4.5	2	Auxiliary I/O 10 Status	00 - Normal Mode (default) 01 - Long Press Mode 10 - Double Press Mode 11 - Invalid Value	
4.7	2	Auxiliary I/O 9 Status		
5.1	3	Unused	All bits set to 255	
8.1	1	Button long push time. Effective only for Long press mode	100ms/bit 5-250: Normal Others: Invalid Value	

Note: Some buttons are unavailable according to the type. For instance, Aux I/O 10 is unavailable for 2x4 CKP.

Set Sleep Time				
Description	Set CKP Sleep Time			
PF	239			
PS	DA, The address of CKP			
PGN	61184(0xEF00)			
Default Priority	6			
DLC	8			
Update Rate	Upon commanded			
Direction	CA → CKP			
Start	Bits	Description	Notes	
1.1	1	Control byte	0x82	
2.1	2	Auxiliary I/O 4 Status	0 - Never Sleep 1-250 : 1s/bit others: unused	
3.1	6	Not used		
			0xFFFFFFFF	

Set PGN of Button Status			
Description	Set CKP PGN of Button Status		
PF	239		
PS	DA, The address of CKP		
PGN	61184(0x EF00)		
Default Priority	6		
DLC	8		
Update Rate	Upon commanded		
Direction	CA → CKP		
Start	Bits	Description	Notes
1.1	1	Control byte	0x85
2.1	1	Byte 1 of PGN being requested (LSB)	0~255
3.1	1	Byte 2 of PGN being requested	240~255
4.1	1	Byte 3 of PGN being requested (MSB)	Must be 0
5.1	4	Not Used	0xFFFFFFFF

Set Button Status Transmission Rate			
Description	Set CKP Button Status Transmission Rate		
PF	239		
PS	DA, The address of CKP		
PGN	61184(0x EF00)		
Default Priority	6		
DLC	8		
Update Rate	Upon commanded		
Direction	CA → CKP		
Start	Bits	Description	Notes
1.1	1	Control byte	0x86
2.1	1	Transmission Rate	10ms/bit 5-250: normal others: unused
3.1	6	Not Used	0xFFFFFFFFFFFF

## 6. Manually Change the Baud Rate and Source Address

This document contains the steps needed to manually change the baud rate and source address of the keypad. 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.

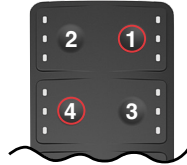
### 6.1 2x6 Configuration

portrait orientation



#### Step 1 – Entering into Configuration Mode

- Make sure power is initially disconnected from the keypad.
- Hold the keypad in a portrait orientation (as shown on left).
- Start by pressing and holding buttons 1 and 4 while the power is off.
- Apply power to the keypad while continuing to hold buttons 1 and 4.



- Once the status LEDs on buttons 1 and 2 start flashing, configuration mode has been entered – this should take approximately 10-15 seconds.



- At this time, buttons 1 and 4 can be released.



#### Step 2 – Setting Baud Rate

- To set the baud rate, select one of the following:  
Button 2 = 250 kilobaud (kBd)  
Button 1 = 500 kBd
- Once selected, press button 4 (now flashing) to save the new baud rate to flash memory.



#### Step 3 – Setting Source Address

Button 2 controls the hundreds digit. (  $\overset{x}{-}$   $\overset{-}{-}$   $\overset{-}{-}$  )  
Button 1 controls the tens digit. (  $\overset{-}{-}$   $\overset{x}{-}$   $\overset{-}{-}$  )  
Button 4 controls the ones digit. (  $\overset{-}{-}$   $\overset{-}{-}$   $\overset{x}{-}$  )  
Button 3 is the enter key.

- To set the Source Address, press and release button 2 to the number you want, then press and release button 1 to the number you want, then press and release button 4 to the number you want.
- Press button 3 to save the new address to flash memory.  
For example, to set the Source Address to 198:  
Press Button 2 – one time,  
Press Button 1 – nine times,  
Press Button 4 – eight times,
- Then press button 3 to save the new address to flash memory. Upon pressing button 3 (enter), the keypad sends out an Address Claim message and begins normal operation.

Note: To enter a zero, simply skip that key.

For example, to set the Source Address to 020:

Skip button 2, press button 1 – two times, skip button 4, press button 3 to save the new address to flash memory.

## 6.2 2x2, 2x3, 2x4 & 2x5 Configurations

Set New Source Address				
PF	239			
PS	DA, The source address of CKP			
PGN	61184(0xEF00)			
Default Priority	6			
DLC	8			
Update Rate	Upon commanded			
Direction	CA → CKP			
Start	Bits	Description	SPN	Value
1.1	1	Control Byte		0xE1-Set CKP source address
2.1	1	New Source Address		
3.1	6	Not Used		0xFFFFFFFF

Set New Priority				
PF	239			
PS	DA, The source address of CKP			
PGN	61184(0xEF00)			
Default Priority	6			
DLC	8			
Update Rate	Upon commanded			
Direction	CA → CKP			
Start	Bits	Description	SPN	Value
1.1	1	Control Byte		0xE4-Set CKP new priority
2.1	1	New Priority		0-7, otherwise the CKP will send the NACK message
3.1	6	Not Used		0xFFFFFFFF

Set New Field Name				
PF	239			
PS	DA, The source address of CKP			
PGN	61184(0xEF00)			
Default Priority	6			
DLC	8			
Update Rate	Upon commanded			
Direction	CA → CKP			
Start	Bits	Description	SPN	Value
1.1	1	Control Byte		0xE2 - Set CKP New Name Field Part 1
2.1	4	New Name Field Part 1 (Byte1 Byte4)		
3.1	3	Not Used		0xFFFFFFFF

Set New Field Name				
PF	239			
PS	DA, The source address of CKP			
PGN	61184(0xEF00)			
Default Priority	6			
DLC	8			
Update Rate	Upon commanded			
Direction	CA → CKP			
Start	Bits	Description	SPN	Value
1.1	1	Control Byte		0xE3 - Set CKP New Name Field Part 2
2.1	4	New Name Field Part 2 (Byte5 Byte8)		
3.1	3	Not Used		0xFFFFFFFF

Set CAN baud rate type. Effective after reboot.				
PF	239			
PS	DA, The source address of CKP			
PGN	61184(0xEF00)			
Default Priority	6			
DLC	8			
Direction	CA -> CKP			
Start	Bits	Description	SPN	Value
1.1	1	Control Byte		0xF2
2.1	1	Baud Rate Type		0:250kbps 1:500kbps 2:125kbps others: don't care
3.1	1	Safe Code		0x2E
4.1	1			0x3D
5.1	1			0x4C
6.1	1			0x5B
7.1	2	Not Used		0xFFFF