

KEYCAN

Technical datasheet



MAIN FEATURES

- Reconfigurable icon plate
- RGB LED backlight button
- RGB LED status
- Suitable both for 12 and 24V system
- CANBUS communication
- Safety application
- Rugged application
- Customizable color of plate
- Vertical or horizontal mount
- Ergonomic design

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DESCRIPTION

KEYCAN is a new concept of modular keyboard that allows customization of dashboard and driver control panels in accordance with the customer needs. Equipped with CANBUS line for the connection with ECU and stack J1939, KEYCAN is the best solution to reduce the volume of wire harness under the dashboard and increase the space for others devices. KEYCAN module is composed of 4 membrane push buttons fully programmables with 3 RGB LED able to change brightness of its 7 colors. Icons in the middle of each push button is removable and customizable by a laser printing process, this allows also that KEYCAN can be installed horizontally or vertically.



TECHNICAL DATA

ELECTRICAL

Nominal voltage	Vehicle electrical battery system	12Vdc and 24Vdc
	Operating range	6 Vdc to 32Vdc
Current consumption		100mA max @ 12Vdc
		70mA max @ 24Vdc
Interfaces	CAN 2.0B (ISO11898)	1
LED indicator	RGB button status	12
	RGB button backlight	4
Microcontroller	Main MCU: Cypress 16 bit	1
	Safety MCU: Microchip 8 bit	1
Memory	FLASH	256,5KB+32KB
	RAM	16KB

MECHANICAL

Material	Front and back cover	PBT-30GF
	Plate	ABS painted
	Keypad	Silicon rubber

RELIABILITY

MTTFd	14 years
B10d	99349

TECHNICAL DATA

Environmental Compatibility

Operating Temperature	min	-30°C (-40°C for 24h)
	max	+85°C (for 96h)
Storage Temperature	min	-55°C
	max	+105°C
Sund and dust		ISO16750-4 5.10 TBP (to be performed)
Solar radiation		ISO4892-2 Method B 1000 hours TBP (to be performed)
Ingress protection		IP65 (following EN60529)

Electromagnetic compatibility

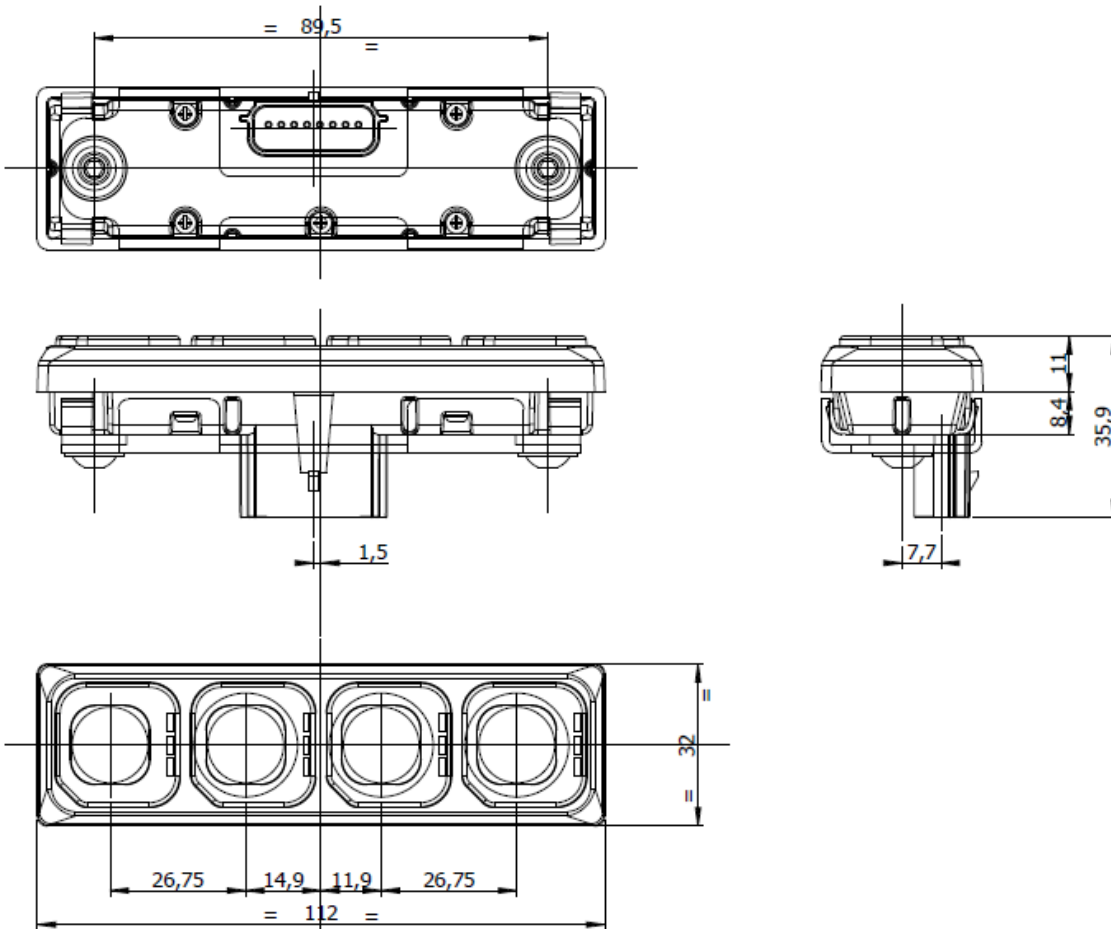
Radiated Immunity		ISO14982:1998 6.6 (200-1000MHz @30V/m)
		Bulk current injection 20-400MHz dist. 150mm level 60mA
Broadband Radiated Emission		ISO 14982:1998 6.4 and 6.5 (30-1000MHz)
Electrostatic discharge		ISO 10605-8-9
Electrical performance	LOAD DUMP	ISO 7637 and ISO16750-2 sec 4.6.4.2.2 Test A
	Reverse polarity protection	ISO 16750-2 4.7.2.3
	Switching spike	ISO 7637-2 Pulse 3a Pulse 3a: Us = -300V Pulse 3b: Us = +300V

TECHNICAL DATA

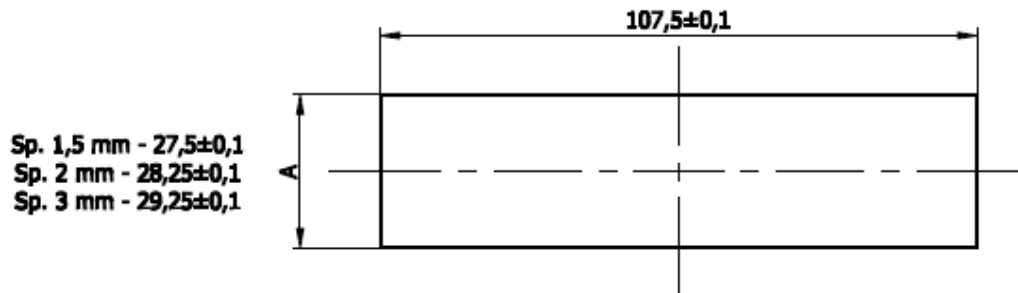
Physical Compatibility

Vibration	Random	ISO16750-3
	Sinusoidal	TBP (to be performed)
Shock/Crash Safety		ISO 16750-3 4.2.2 TBP (to be performed)
Mechanical life		1M actuations per key (internal testing)

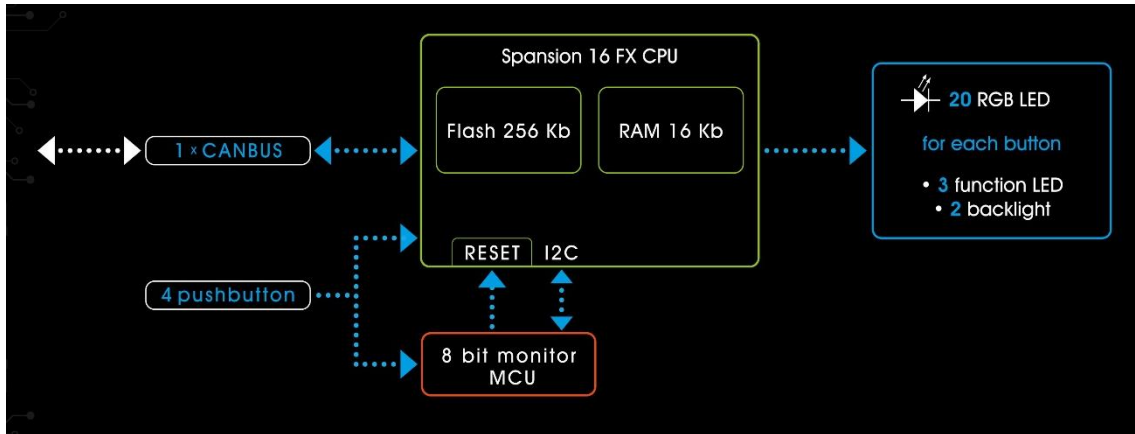
DIMENSIONS (in mm)



PANEL CUT OUT DIMENSIONS

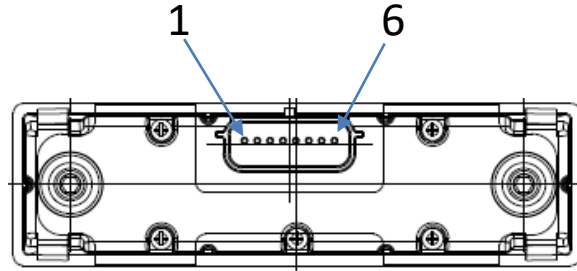


Block diagram

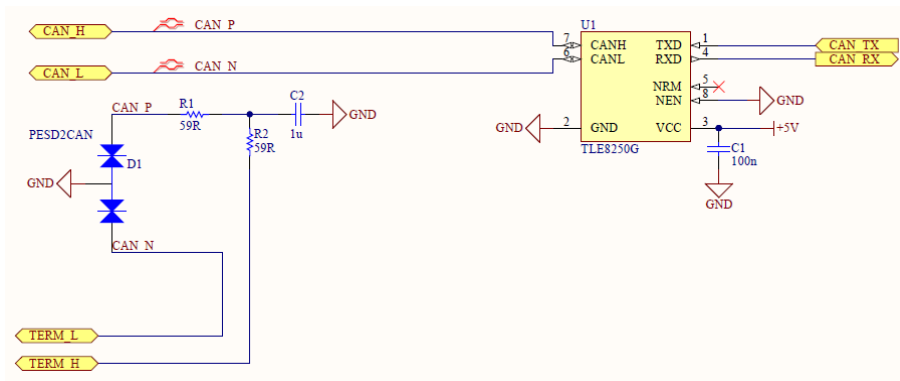


PINOUT CONNECTION

PIN	Function
1	120 OHM TERM_L
2	120 OHM TERM_H
3	CAN_H
4	CAN_L
5	GND
6	+Vcc



INTERNAL CANBUS CIRCUIT



CONNECTOR FOR HARNESS CABLE

	<p>Manufacturer: MOLEX Model: MX64 314036110</p>
	<p>Manufacturer: MOLEX Model: MX64 334680003 Conductor AWG 18-20</p>

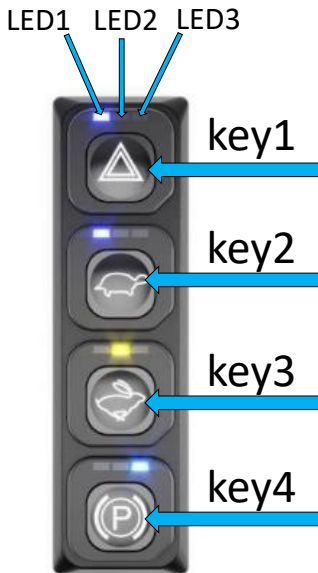
ACCESSORIES

AMA Code: IMEL.151 Complete harness cable to help for develop and prototype phase.
50cm of cable pre-crimped on contact



CANBUS PROTOCOL

AMA will provide a standard version of J1939 protocol. It is possible to modify this protocol under specific request



KEY PRESS DATA PGN

PGN – 65282 (FF02h), Proprietary B

Direction - Transmit

PDU2 format (PF = 255)

Keypad default Source Address (Node-ID) 18 (12h)

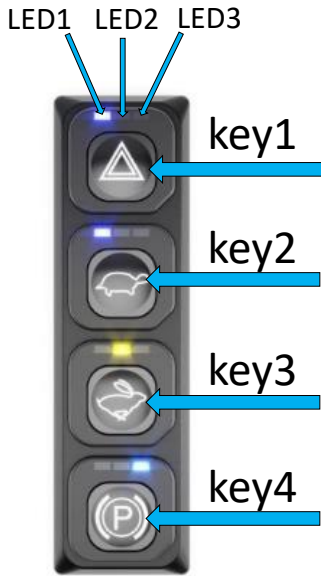
Priority – 6 (18h)

Data Length - 8

Transmission Rate – 100ms

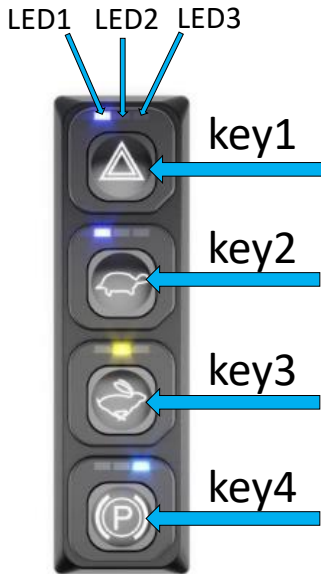
Start	Length	Key	Values (bin)
1,1	2 bits	Key 1	Key status 00 - Key Not Pressed 01 - Key Pressed 10 – not used 11 – not used
1,3	2 bits	Key 2	Key status 00 - Key Not Pressed 01 - Key Pressed 10 – not used 11 – not used
1,5	2 bits	Key 3	Key status 00 - Key Not Pressed 01 - Key Pressed 10 – not used 11 – not used
1,7	2 bits	Key 4	Key status 00 - Key Not Pressed 01 - Key Pressed 10 – not used 11 – not used
2,1	8 bits	Key 1	Counter time Key1 pressed (0-250, 1 bit = 100ms)
3,1	8 bits	Key 2	Counter time Key2 pressed (0-250, 1 bit = 100ms)
4,1	8 bits	Key 3	Counter time Key3 pressed (0-250, 1 bit = 100ms)
5,1	8 bits	Key 4	Counter time Key4 pressed (0-250, 1 bit = 100ms)

Start	Length	Other informations
6,1	16 bits	0xFF
8,1	8 bits	SPN 4206 Message Counter SPN 4207 Message Checksum



LED INDICATOR					
PGN – 42752 (A700h), Auxiliary I/O #2,					
Direction - Receive					
PDU1 format (PF = 167)					
Data Length - 8					
Priority – 6 (18h)					
Transmission Rate – 100ms (timeout 1 sec)					
Controller Source address (Node-ID) 03 (03h)					
Start	Length	Key	Led position	Bit Position	Led color
1,1	16 bits	Key 1	LEFT	RED	BIT0
			LEFT	GREEN	BIT1
			LEFT	BLUE	BIT2
			Not used	-	BIT3
			CENTER	RED	BIT4
			CENTER	GREEN	BIT5
			CENTER	BLUE	BIT6
			Not used	-	BIT7
			RIGHT	RED	BIT8
			RIGHT	GREEN	BIT9
			RIGHT	BLUE	BIT10
			Not used	-	BIT11
			BACKLIGHT	RED	BIT12
			BACKLIGHT	GREEN	BIT13
			BACKLIGHT	BLUE	BIT14
Not used	-	BIT15			
2,1	16 bits	Key 2	LEFT	RED	BIT0
			LEFT	GREEN	BIT1
			LEFT	BLUE	BIT2
			Not used	-	BIT3
			CENTER	RED	BIT4
			CENTER	GREEN	BIT5
			CENTER	BLUE	BIT6
			Not used	-	BIT7
			RIGHT	RED	BIT8
			RIGHT	GREEN	BIT9
			RIGHT	BLUE	BIT10
			Not used	-	BIT11
			BACKLIGHT	RED	BIT12
			BACKLIGHT	GREEN	BIT13
			BACKLIGHT	BLUE	BIT14
Not used	-	BIT15			
3,1	16 bits	Key 3	LEFT	RED	BIT0
			LEFT	GREEN	BIT1
			LEFT	BLUE	BIT2
			Not used	-	BIT3
			CENTER	RED	BIT4
			CENTER	GREEN	BIT5
			CENTER	BLUE	BIT6
			Not used	-	BIT7
			RIGHT	RED	BIT8
			RIGHT	GREEN	BIT9
RIGHT	BLUE	BIT10			

Start	Length	Key	Led position	Bit Position	Led color
3,1	16 bits	Key 3	Not used	-	BIT11
			BACKLIGHT	RED	BIT12
			BACKLIGHT	GREEN	BIT13
			BACKLIGHT	BLUE	BIT14
			Not used	-	BIT15
4,1	16 bits	Key 4	LEFT	RED	BIT0
			LEFT	GREEN	BIT1
			LEFT	BLUE	BIT2
			Not used	-	BIT3
			CENTER	RED	BIT4
			CENTER	GREEN	BIT5
			CENTER	BLUE	BIT6
			Not used	-	BIT7
			RIGHT	RED	BIT8
			RIGHT	GREEN	BIT9
			RIGHT	BLUE	BIT10
			Not used	-	BIT11
			BACKLIGHT	RED	BIT12
			BACKLIGHT	GREEN	BIT13
			BACKLIGHT	BLUE	BIT14
Not used	-	BIT15			



INTENSITY			
PGN – 61184 (EF00h)			
Direction - Receive			
PDU1 format (PF = 239)			
Data Length - 8			
Priority – 6 (18h)			
Transmission Rate – 100ms (timeout 1 sec)			
Controller Source address (Node-ID) 03 (03h)			
Start	Length	Desc.	Value
1,1	8 bits	Starting frame	0x00
2,1	8 bits	Intensity indicator	0 Dimmest 254 Brightest 255 Not Available
3,1	8 bits	Intensity backlight	0 Dimmest 254 Brightest 255 Not Available
4,1	32 bits	Dont'care	0xFF

KEYCAN AMA PROGRAMMING PROTOCOL

AMA will provide the possibility to program ID, BAUDRATE or TRANSMISSION RATE for each KeyCan . If KeyCan device receives a correct **CONFIGURAZION MESSAGE** all leds and all backlights lamp with frequency of 1Hz and save the new configuration pressing KEY1 for 4 seconds.

CONFIGURATION MESSAGE

PGN – 65534 (FFEEh), Proprietary B

Direction - Receive

PDU2 format (PF = 255)

Priority – 12 (0Ch)

Data Length - 8

Transmission Rate – 100ms

COMMAND WORD FOR LOADING DEFAULT PARAMETERS							DEFAULT Address Source
BYTE1	BYTE2	BYTE3	BYTE4	BYTE5	BYTE6	BYTE7	BYTE8
'C'	'O'(4Fh)	'N'(4Eh)	'F'(46h)	'I'(49h)	'G'(47h)	'I'(21h)	0xFF

COMMAND WORD FOR PROGRAMMING ID							Address Source Configurable
BYTE1	BYTE2	BYTE3	BYTE4	BYTE5	BYTE6	BYTE7	BYTE8
'C'(43h)	'O'(4Fh)	'N'(4Eh)	'F'(46h)	'I'(49h)	'G'(47h)	'I'(21h)	ID SET

COMMAND WORD FOR PROGRAMMING BAUDRATE							Transmission rate Configurable (*)
BYTE1	BYTE2	BYTE3	BYTE4	BYTE5	BYTE6	BYTE7	BYTE8
'T'(54h)	'R'(52h)	'A'(41h)	'N'(4Eh)	'R'(52h)	'T'(54h)	'I'(21h)	TR SET

COMMAND WORD FOR PROGRAMMING BAUDRATE							Baud rate Configurable
BYTE1	BYTE2	BYTE3	BYTE4	BYTE5	BYTE6	BYTE7	BYTE8
'B'(42h)	'A'(41h)	'U'(55h)	'D'(44h)	'R'(52h)	T'(54h)	'I'(21h)	BR SET

(*) The Transmission Rate (byte 8) can be set from 5 to 250 (1 bit = 1ms)

Value of BR SET (Byte 8)	Baud Rate
1	10 kbit /s
2	20 Kbit /s
3	50 Kbit /s
4	100 Kbit /s
5	125 Kbit /s
6	250 Kbit /s
7	500 Kbit /s
8	800 Kbit/s
9	1000 Mbit/s



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