

Series 09

Rugged CAN Keypads

Rugged. Modular. Reliable.

www.eao.com



Series 09 Rugged CAN Keypads

CAN Modules – Rugged. Modular. Reliable.

Designed for E1 applications with functional safety and CAN bus integration – *The robust control units with flexible illumination are ideally suited for use in heavy duty and special vehicle applications.*

Series 09 Rugged CAN Keypads offer high reliability: The modules are designed for E1 applications and functional safety in accordance with ISO 26262 ASIL B and EN ISO 13849 PLD as well as an intelligent control with CAN bus integration. The robust, modular design with sealing levels of up to IP67 and the ability to customise and interchange the keypad legends make these high-quality devices ideally suited for harsh use in heavy duty and special vehicles.

High reliability and functional safety are crucial to controlling safety-related applications in vehicles and machines – whether in construction machinery, construction vehicles, agricultural machinery or in special and commercial vehicles of various types. Harsh environments and low back panel depth require a robust and compact product design. The actuators and indicators must also be precisely configured, both mechanically and electronically, to suit the respective application. The high-quality Rugged CAN Keypad and Rugged CAN Rotary Cursor Controller meet these requirements with cutting-edge system integration.

Robust, innovative design

Robust and innovative construction is a feature of the Rugged CAN Keypads design. The actuators and indicators are protected up to IP67 and work reliably at operating temperatures from –40 °C to +85 °C. The low back panel depth and

robust clip-in or screw-in mounting allow easy, flexible installation, either vertically or horizontally. These high-quality devices also offer excellent tactile feedback, and are clearly visible in daylight and at night thanks to the powerful RGB LED halo and LED symbol illumination. Attractive and configurable 4-segment halo button illumination is integrated as standard. The customisable illumination provides the operator with excellent visual feedback, and is combined with a unique, contemporary design.

Durability

The Series 09 CAN Modules are produced in our automotive competence centre located in Germany. This allows us to apply years of comprehensive experience as an original equipment manufacturer (OEM) in the automotive industry to the heavy duty and special vehicle markets. At the same time, this offers EAO customers high quality, durable, and intuitive products and services. The development and production process is aligned and executed according to automotive standards that include qualified suppliers and functional safety.

Functional safety and CAN bus integration

The Rugged CAN Keypads feature a high reliability and are designed for functional safety in accordance with the EN ISO 13849 PLD and ISO 26262 ASIL B standards. Put simply, functional safety means that the system monitors whether the safety-related function is working properly. If a function error occurs, the system promptly informs the operator. Thanks to the CAN bus integration, the devices are intelligently and easily integrated into a bus system – the devices are fitted with a Deutsch DT Series connector.

More than an expert – A partner of the automotive industry

As a global partner to major automotive manufacturers and suppliers, we provide our customers with high-quality, products and services. Through many decades of commitment and consultation with the automotive industry, EAO is an established global supplier of operator control panels, sub-assemblies, switches, buttons and indicators.

Please note

Fully validated and certified product according to ASIL B ISO 26262 and PLD ISO 13849 with CANopen Safety available from 2022.

Advantages.

- Individual 4-segment and RGB halo ring illumination
- Designed for functional safety: ISO 26262 and ISO 13849
- Intelligent HMIs with CAN bus integration
- Robust, innovative, ergonomic design sealed up to IP67 protection
- Interchangeable ISO 7000 range of symbols or customised symbols

Typical applications

- Special vehicles including fire-fighting vehicles, road sweepers, cleaning vehicles, refuse trucks, snow removers and groomers
- Heavy duty vehicles including construction and agricultural equipment

HMI functions

- Rugged CAN Keypad
- Rugged CAN Rotary Cursor Controller

Mechanical characteristics

- Actuating force: 5-13N
- Overload: 250N
- Mechanical lifetime
 - Rugged CAN Pushbutton Keypad: up to 1 million cycles of operation
 - Rugged CAN Rotary Cursor Controller Keypad: up to 10 million detents (rotation and joystick functions rotary cursor controller) up to 1 million switching cycles (push of joystick rotary cursor controller and push of pushbuttons)

Electrical characteristics

- Operating voltage range: 8-32VDC

Illumination

- LED symbol illumination
 - Colour: white LED
 - Luminance: 20cd/m²
- LED halo ring illumination with 4 segments
 - Colour: RGB
 - Luminance: 1500cd/m²
- Halo ring and symbol illumination can be configured independently

Symbols

- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

* Functional safety with CANopen Safety protocol available as of 2022.

Connections/interfaces

- CAN interface (ISO 11898)
- CAN protocols: CANopen (CiA 401), CANopen Safety* (EN 50325-5), CAN J1939
- Baud rate 250kBd & 500kBd (software configurable)

Ambient conditions

- Operating temperature: –40°C ... +85°C
- Storage temperature: –40°C ... +85°C

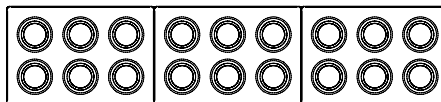
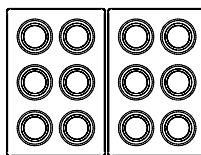
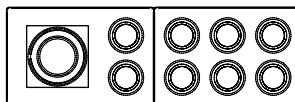
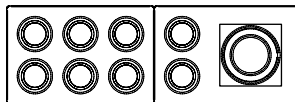
Protection degree

- IP67 protection (front and rear side)
- IP67 protection (panel/screw-in)
- IP54 protection (panel/clip-in)

Approvals and conformities

- IATF 16949 QMS
- E1
- EG/EC/CE

Examples of unit combinations



Further information is available under www.eao.com/09



Features and benefits.



Sealing protection

Robust, resistant to weather and harsh environments, IP67 seals out dust, water, mud, salt, sand, oil.

Symbols

Interchangeable legends with laser etch LED backlit ISO 7000 range of symbols or customised symbols.

Mounting option

Flexible vertical and horizontal installation as well as user-friendly clip-in and screw-in mounting.

Illumination

Modern, trendy, innovative RGB 4-segment halo ring illumination in nearly unlimited variety of colours and visual effects. Symbol illumination and halo ring illumination working independently.

* Fully validated and certified product according to ASIL B ISO 26262 and PLD ISO 13849 with CANopen Safety available from 2022.



Modularity

Control units can be combined into array of modules.

Safety level

Designed for functional safety*: ISO 26262 ASIL B and ISO 13849 PLD.

Communication protocols

Intelligent HMI with J1939, CANopen and CANopen Safety* integration.

Design

Smart, optimally ergonomic design with low panel depth mounting.

Feedback

Tactile and audible product feedback with haptic design.

Approvals and conformities.*

Test	Standard	Load
Mechanical specifications	(acc. ISO16750-3: mounting location codes D, E, F, G, K, L, R, S)	
Vibration	ISO 16750-3 4.1	Test IV and Test VII
Tests for devices on doors or flaps	ISO 16750-3 4.2.1	half-sinusoidal, 300 m/s ² , 6 ms, 100.00 shocks
Tests for devices on rigid points on the body and on the frame	ISO 16750-3 4.2.2	half-sinusoidal, 500 m/s ² , 6 ms, 10 shocks per direction
Drop test	ISO 16750-3 4.3	height: 1 m, 6 directions (±x, ±y, ±z), 2 falls per DUT (±direction)
Surface strength/scratch and abrasion resistance	ISO 16750-3 4.4	ASTM F2357-10
Impact resistance	IEC 62262	IK07, 2 Joules, free-fall hammer
Environmental specifications	(acc. ISO16750-4: temperature code G, climatic load code H)	
Low-temperature storage test	ISO 16750-4 5.1.1.1	-40 °C, 24 h
High-temperature storage test	ISO 16750-4 5.1.2.1	+95 °C, 48 h
Low-temperature operation test	ISO 16750-4 5.1.1.2	-40 °C, 24 h
High-temperature operation test	ISO 16750-4 5.1.2.2	+85 °C, 96 h
Temperature step test	ISO 16750-4 5.2	Tmin = -40 °C, Tmax = +85 °C
Temperature cycle with specified change rate	ISO 16750-4 5.3.1	Tmin = -40 °C, Tmax = +85 °C, Profile Tab. 2, 30 cycles (each 480 min)
Rapid change of temperature with specified transition duration	ISO 16750-4 5.3.2	Tmin = -40 °C, Tmax = +85 °C, 100 cycles
Ice water shock test - Splash water test	ISO 16750-4 5.4.2	Tmax = +85 °C, 100 cycles
Ice water shock test - Submersion test	ISO 16750-4 5.4.3	Tmax = +85 °C, 10 cycles
Salt spray test - Corrosion test	ISO 16750-4 5.5.1	T = 40 °C, 5 % sodium chloride solution, pH-Value 6.5–7.2, severity 4, 2 cycles (each 10 days)
Salt spray test - Leakage and function test	ISO 16750-4 5.5.2	T = 35 °C, 5 % sodium chloride solution, pH-Value 6.5–7.2, 6 cycles (each 24 h)
Composite temperature/humidity cyclic test	ISO 16750-4 5.6.2.3	Tmin = -10 °C, Tmax = 65 °C, 95 % RH, 10 cycles (each 24 h)
Dewing test	ISO 16750-4 5.6.2.4	Tmax = 80 °C, 95 % RH, 5 cycles (300 min)
Damp heat, steady-state test	ISO 16750-4 5.7	(40 ±2) °C, (80 ±3) % RH, 21 days
Corrosion test with flow of mixed gas	ISO 16750-4 5.8	IEC 60068-2-60, test Ke, method 4, 21 days
Solar radiation	ISO 16750-4 5.9	ISO 4892-2, method A, cycle no. 1
Protection against dust and water	ISO 16750-4 7	IP67 according ISO 20653
Electromagnetic specification		
Chemical resistance	ISO 16750-5	Chemical load codes: AD, CA, CD, CE, CF, CG, DA, DB, DC, DD, DE, DF, DG, DJ, DK, EA, EB, EC, ED, EE, EF

Test	Standard	Load
Electromagnetic compatibility tests	(acc. ISO16750-2: supply voltage code min. B, max. F)	
Electrostatic discharge (ESD)	ISO 10605	8 powered-up, up to ± 15 kV, 10 pulses
Electrostatic discharge (ESD)	ISO 10605	9 unpowered, up to ± 15 kV, 10 pulses
Electromagnetic disturbances (conducted)	DIN EN 55025	6.3
Electromagnetic disturbances (radiated emissions)	DIN EN 55025	6.4
	ISO 11452-2	200 MHz to 3.2 GHz, 100 V/m, 66.7 mA to 200 mA, severity level IV
	ISO 11452-4	1 MHz to 400 MHz, 66.7 mA to 200 mA, severity level IV
	ISO 11452-5	10 kHz to 400 MHz, 200 V/m, severity level IV
	ISO 11452-8	15 Hz to 30 kHz, 10 A/m to 600 A/m
	ISO 11452-9	26 MHz to 5.85 GHz, 1 W to 10 W
Electrical specifications	(acc. ISO16750-2: supply voltage code min. B, max. F)	
Direct current supply voltage	ISO 16750-2	4.2 8V ... 32V
Overvoltage	ISO 16750-2	4.3 36V, 60 min
Superimposed alternating voltage	ISO 16750-2	4.4 $U_{max} = 36V$, $U_{PP} = 4V$, 50 Hz - 20 kHz
Slow decrease and increase of supply voltage	ISO 16750-2	4.5 $U_{max} = 32V$, $U_{min} = 0V$, 1 V/min
Momentary drop in supply voltage	ISO 16750-2	4.6.1 $U_{Smin} = 8V$, $U_{min} = 4,5V$, $t = 100ms$
Reset behaviour at voltage drop	ISO 16750-2	4.6.2 $U_{Smin} = 8V$, $U_{min} = 0V$, thold_drop = 5 s
Starting profile	ISO 16750-2	4.6.3 $U_N = 12V$ severity level II, $U_N = 24V$ severity level II,
Load dump (Test A)	ISO 16750-2	4.6.4.2.2 12V: $U_s = 101V$; $R_i = 4\ \Omega$, $t_d = 400ms$ 24V: $U_s = 202V$; $R_i = 8\ \Omega$, $t_d = 350ms$
Load dump (Test B)	ISO 16750-2	4.6.4.2.3 12V: $U_s = 101V$; $R_i = 4\ \Omega$, $t_d = 400ms$ 24V: $U_s = 202V$; $R_i = 8\ \Omega$, $t_d = 350ms$
Reverse voltage	ISO 16750-2	4.7 -28V, 60s
Ground reference and supply offset	ISO 16750-2	4.8 28V, offset 1 V
Single line interruption	ISO 16750-2	4.9.1 28V, interruption 10s
Multiple line interruption	ISO 16750-2	4.9.2 28V, interruption 10s
Short circuit protection	ISO 16750-2	4.10 32V, $R_{i_PSU} < 100m\Omega$, 60s
Electrical transient conduction along supply lines	ISO 7637-2	Test pulses 1, 2a, 2b, 3a, 3b with severity level III
Electrical transient transmission by capacitive and inductive coupling via lines other than supply	ISO 7637-3	CCC test severity level IV ICC test severity Level III





* Available as of 2021.

Optimal for your application.




Series 09 variants

The Series 09 Keypads and Rotary Cursor Controllers are available in a range of different variants. They all have the flexibility of interchangeable legends, but come with a choice of different halo illumination features, communication protocols and connector types for example.

This wide choice allows designers to specify only the HMI features they actually need for their vehicle application, therefore minimising hardware costs and optimising the scope of their software development – optimal for your application.

Variants	Symbol backlight	Halo ring illumination	Communica- tion protocol	Switching element	IP protection	Connector	Switching function/s	Functional safety standard
PREMIUM 	White LED	4-Segment RGB	CANopen Safety	Electro- mechanical switching element	IP67 frontside and rear- side	Deutsch DT04-6P	Pushbutton	Functional safety ISO 26262 ASIL B and ISO 13849 PLD certi- fied
SUPER 	White LED	4-Segment RGB	CANopen, J1939	Electro- mechanical switching element	IP67 frontside and rear- side	Deutsch DT04-6P	Pushbutton	Design for functional safety: ISO 26262 ASIL B and ISO 13849 PLD
PLUS 	White LED	Red LED (other colours on request)	CANopen, J1939	Electro- mechanical switching element	IP67 frontside and rear- side	Deutsch DT04-6P	Pushbutton	Fulfils ASIL QM (B) according to ISO 26262
BASIC 	White LED	Red LED (other colours on request)	N.A. (hardwired)	Electro- mechanical switching element	IP67 frontside	Würth Elektronik WR- MPC3, 16 pins	Pushbutton	Fulfils ASIL QM (B) according to ISO 26262



Variants	Symbol backlight	Halo ring illumination	Communication protocol	Switching element	IP protection	Connector	Switching function/s	Functional safety standard
PREMIUM 	White LED	4-Segment RGB (push-buttons)	CANopen Safety	Electro-mechanical switching element	IP67 frontside and rear-side	Deutsch DT04-6P	Pushbuttons: push RCC*: push, rotate, proportional input	Functional safety ISO 26262 ASIL B and ISO 13849 PLD certified*
SUPER 	White LED	4-Segment RGB (push-buttons)	CANopen, J1939	Electro-mechanical switching element	IP67 frontside and rear-side	Deutsch DT04-6P	Pushbuttons: push RCC*: push, rotate, proportional input	Design for functional safety: ISO 26262 ASIL B and ISO 13849 PLD
PLUS 	White LED	Red LED (push-buttons)	CANopen, J1939	Electro-mechanical switching element	IP67 frontside and rear-side	Deutsch DT04-6P	Pushbuttons: push RCC*: push, rotate, proportional input	Fulfills ASIL QM (B) according to ISO 26262

* Functional safety certification applies to the switching signal of the two keypad pushbuttons.

Keypad PREMIUM.*



Mechanical characteristics

- Actuation force: 5–13 N
- Overload: 250 N
- Mechanical lifetime up to 1 million cycles of operation

Electrical characteristics

- Operating voltage range: 8–32 VDC

Illumination

- Halo ring and symbol illumination can be configured independently
- LED symbol illumination
 - Colour: white
 - Luminance: max. 20 cd/m², dimmable
- LED halo ring illumination with four segments
 - Multi-colour: RGB
 - Luminance: 1500 cd/m²

Symbols

- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

Connections/interfaces

- CAN interface (ISO 11898)
- CANopen Safety* (EN 50325-5),
- Baud rate 250 kBd and 500 kBd (software configurable)
- Connector Deutsch DT04-6P

* Fully validated and certified product according to ASIL B ISO 26262 and PLD ISO 13849 available from 2022.

Ambient conditions

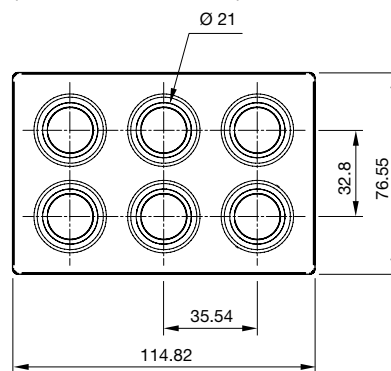
- Operating temperature: –40 °C ... +85 °C
- Storage temperature: –40 °C ... +85 °C

Protection degree

- IP67 (front and rear side)
- IP67 (panel/screw-in)
- IP54 (panel/clip-in)

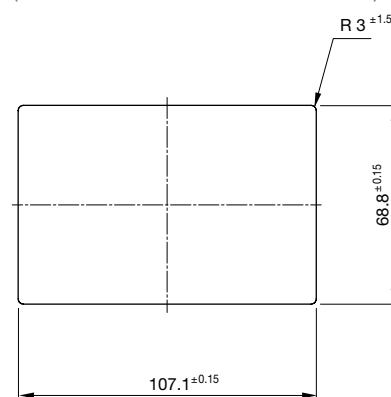
Dimensions

(All dimensions in mm)



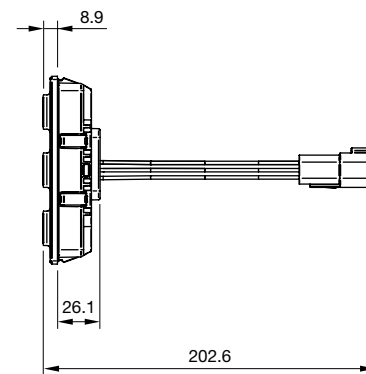
Mounting cut-out

(Panel thickness 1.0 mm ... 4.0 mm)

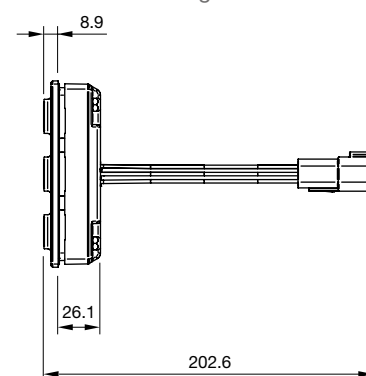


Mounting

Clip-in mounting



Screw-in mounting



Keypad SUPER.



Mechanical characteristics

- Actuation force: 5–13 N
- Overload: 250 N
- Mechanical lifetime up to 1 million cycles of operation

Electrical characteristics

- Operating voltage range: 8–32 VDC

Illumination

- Halo ring and symbol illumination can be configured independently
- LED symbol illumination
 - Colour: white
 - Luminance: max. 20 cd/m², dimmable
- LED halo ring illumination with four segments
 - Multi-colour: RGB
 - Luminance: 1500 cd/m²

Symbols

- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

Connections/interfaces

- CAN interface (ISO 11898)
- CAN protocols: CANopen (CiA 401), CAN J1939
- Baud rate 250 kBd and 500 kBd (software configurable)
- Connector Deutsch DT04-6P

Ambient conditions

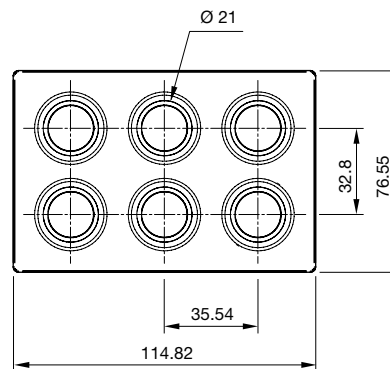
- Operating temperature: –40 °C ... +85 °C
- Storage temperature: –40 °C ... +85 °C

Protection degree

- IP67 (front and rear side)
- IP67 (panel/screw-in)
- IP54 (panel/clip-in)

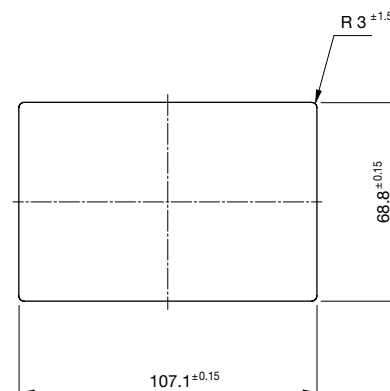
Dimensions

(All dimensions in mm)



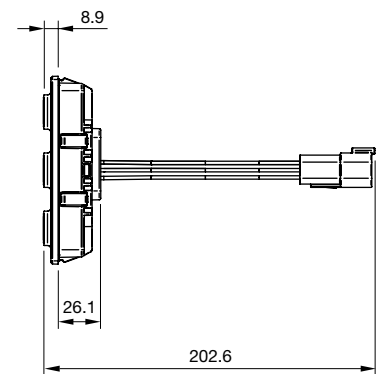
Mounting cut-out

(Panel thickness 1.0 mm ... 4.0 mm)

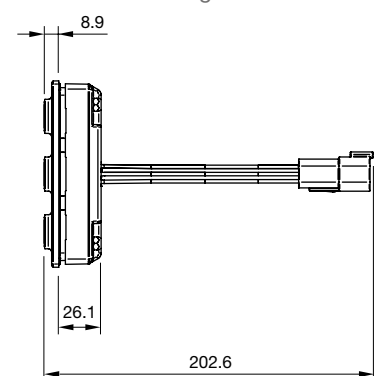


Mounting

Clip-in mounting



Screw-in mounting



Keypad PLUS.*



Mechanical characteristics

- Actuation force: 5–13 N
- Overload: 250 N
- Mechanical lifetime up to 1 million cycles of operation

Electrical characteristics

- Operating voltage range: 8–32 VDC

Illumination

- Halo ring and symbol illumination can be configured independently
- LED symbol illumination
 - Colour: white
 - Luminance: max. 20 cd/m², dimmable
- LED halo ring illumination
 - Colour: red (other colours on request)
 - Luminance: 1500 cd/m²

Symbols

- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

Connections/interfaces

- CAN interface (ISO 11898)
- CAN protocols: CANopen (CiA 401), CAN J1939
- Baud rate 250 kBd and 500 kBd (software configurable)
- Connector Deutsch DT04-6P

* Partially validated product available from end of 2020. Fully validated and certified product available from beginning of 2021.

Ambient conditions

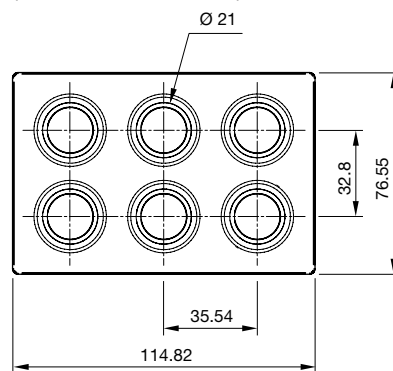
- Operating temperature: –40°C ... +85°C
- Storage temperature: –40°C ... +85°C

Protection degree

- IP67 (front and rear side)
- IP67 (panel/screw-in)
- IP54 (panel/clip-in)

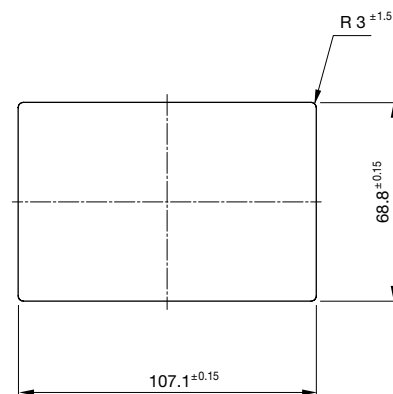
Dimensions

(All dimensions in mm)



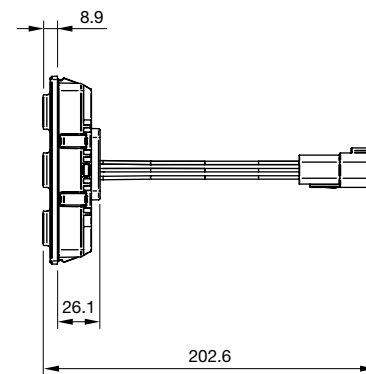
Mounting cut-out

(Panel thickness 1.0 mm ... 4.0 mm)

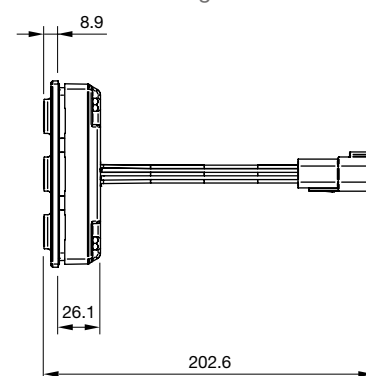


Mounting

Clip-in mounting



Screw-in mounting



Keypad BASIC.*



Mechanical characteristics

- Actuation force: 5–13 N
- Overload: 250 N
- Mechanical lifetime up to 1 million cycles of operation

Electrical characteristics

- Operating voltage range: 8–32 VDC

Illumination

- Halo ring and symbol illumination can be configured independently
- LED symbol illumination
 - Colour: white
 - Luminance: max. 20 cd/m², dimmable
- LED halo ring illumination
 - Colour: red
 - (other colours on request)
 - Luminance: 1500 cd/m²

Symbols

- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

Connections/interfaces

- Connector: Würth Elektronik WR-MPC3, 16 Pins

* Validated product available from end of 2020. Fully validated and certified product available from beginning of 2021.

Ambient conditions

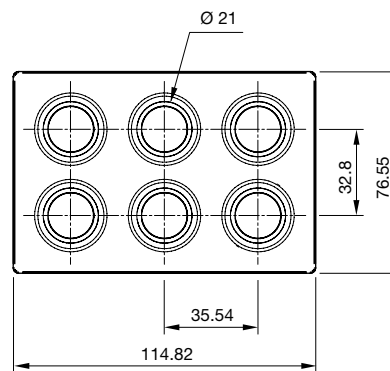
- Operating temperature: –40 °C ... +85 °C
- Storage temperature: –40 °C ... +85 °C

Protection degree

- IP67 (front side)
- IP67 (panel/screw-in)

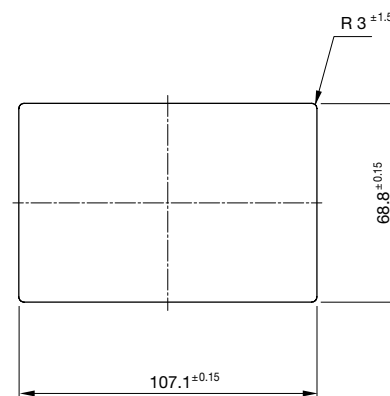
Dimensions

(All dimensions in mm)



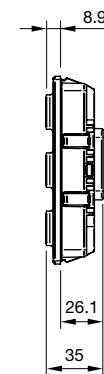
Mounting cut-out

(Panel thickness 1.0 mm ... 4.0 mm)

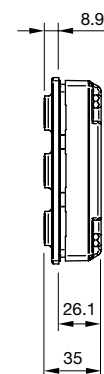


Mounting

Clip-in mounting



Screw-in mounting



Rotary Cursor Controller PREMIUM.*



Rotary Cursor Controller Functions

- Joystick functions
 - With proportional input
 - Digital input can be configured via CAN interface
- Rotary function
 - 20 maintained positions
 - Continuous rotation with no stop position
- Push function
 - Momentary action with click-dome

Mechanical characteristics

- Overload: 250N
- Mechanical lifetime
 - up to 10 million detents (rotation and Joystick functions Rotary Cursor Controller)
 - up to 1 million switching cycles (push of joystick rotary cursor controller and push of pushbuttons)
- Momentary action
 - Actuation force: 5-13N
- Rotary function
 - Haptic with precise detent
- Joystick function
 - Actuation angle: $\sim 5^\circ$

Electrical characteristics

- Operating voltage range: 8–32VDC

* Validated product available from middle of 2021. Fully validated and certified according to ASIL B ISO 26262 and PLD ISO 13849 product available from 2022. Functional safety certification applies to the switching signal of the two keypad pushbuttons.

Illumination

- Halo ring and symbol illumination can be configured independently
- LED symbol illumination (on pushbuttons)
 - Colour: white
 - Luminance: max. 20cd/m², dimmable
- LED halo illumination
 - Multi-colour: RGB (buttons and RCC)
 - Luminance: 1500 cd/m² (buttons)
 - Four segments on buttons

Symbols (on pushbuttons, RCC without symbol)

- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

Connectivity

- CAN interface (ISO 11898)
- CANopen Safety* (EN 50325-5),
- Baud rate 250kBd and 500kBd (software configurable)
- Connector Deutsch DT04-6P

Ambient conditions

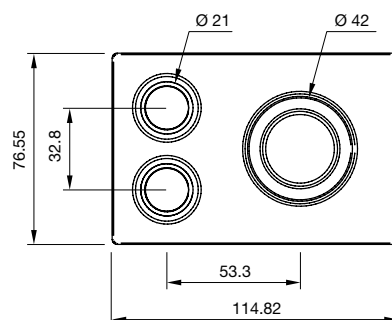
- Operating temperature: $-40^\circ\text{C} \dots +85^\circ\text{C}$
- Storage temperature: $-40^\circ\text{C} \dots +85^\circ\text{C}$

Protection degree

- IP67 (front and rear side)
- IP67 (panel/screw-in)
- IP54 (panel/clip-in)

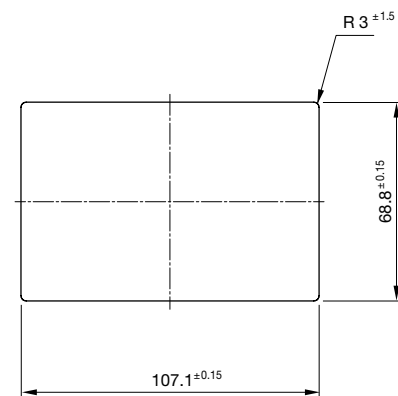
Dimensions

(All dimensions in mm)



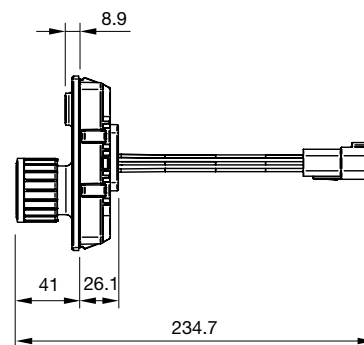
Mounting cut-out

(Panel thickness 1.0 mm ... 4.0 mm)

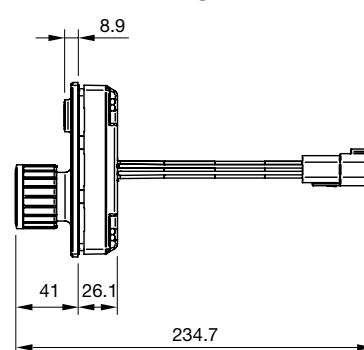


Mounting

Clip-in mounting



Screw-in mounting



Rotary Cursor Controller SUPER.*



Rotary Cursor Controller Functions

- Joystick function
 - With proportional input
 - Digital input can be configured via CAN interface
- Rotary function
 - 20 maintained positions
 - Continuous rotation with no stop position
- Push function
 - Momentary action with click-dome

Mechanical characteristics

- Overload: 250 N
- Mechanical lifetime
 - up to 10 million detents (rotation and Joystick functions Rotary Cursor Controller)
 - up to 1 million switching cycles (push of joystick rotary cursor controller and push of pushbuttons)
- Momentary action
 - Actuation force: 5-13 N
- Rotary function
 - Haptic with precise detent
- Joystick function
 - Actuation angle: $\sim 5^\circ$

Electrical characteristics

- Operating voltage range: 8–32 VDC

* Validated product available from beginning of 2021. Fully validated and certified product available from middle of 2021.

Illumination

- Halo ring and symbol illumination can be configured independently
- LED symbol illumination (on pushbuttons)
 - Colour: white
 - Luminance: max. 20 cd/m², dimmable
- LED halo illumination
 - Multi-colour: RGB (buttons and RCC)
 - Luminance: 1 500 cd/m² (buttons)
 - Four segments on buttons

Symbols (on pushbuttons, RCC without symbol)

- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

Connectivity

- CAN interface (ISO 11898)
- CAN protocols: CANopen (CiA 401), CAN J1939
- Baud rate 250 kBd and 500 kBd (software configurable)
- Connector Deutsch DT04-6P

Ambient conditions

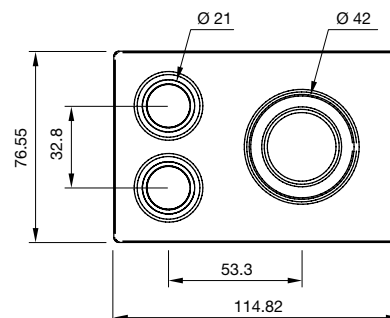
- Operating temperature: $-40^\circ\text{C} \dots +85^\circ\text{C}$
- Storage temperature: $-40^\circ\text{C} \dots +85^\circ\text{C}$

Protection degree

- IP67 (front and rear side)
- IP67 (panel/screw-in)
- IP54 (panel/clip-in)

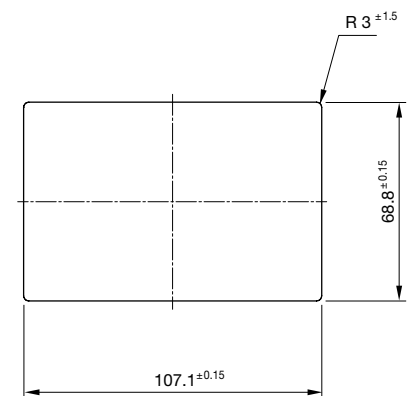
Dimensions

(All dimensions in mm)



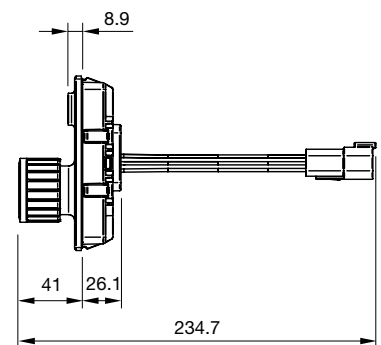
Mounting cut-out

(Panel thickness 1.0 mm ... 4.0 mm)

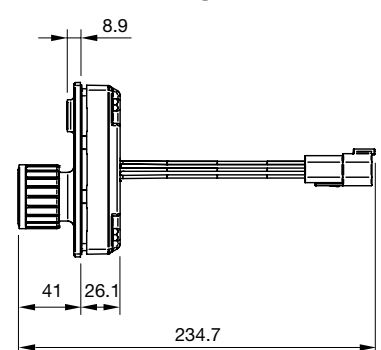


Mounting

Clip-in mounting



Screw-in mounting



Rotary Cursor Controller PLUS.*



Rotary Cursor Controller Functions

- Joystick function
 - With proportional input
 - Digital input can be configured via CAN interface
- Rotary function
 - 20 maintained positions
 - Continuous rotation with no stop position
- Push function
 - Momentary action with click-dome

Mechanical characteristics

- Overload: 250N
- Mechanical lifetime
 - up to 10 million detents (rotation and Joystick functions Rotary Cursor Controller)
 - up to 1 million switching cycles (push of joystick rotary cursor controller and push of pushbuttons)
- Momentary action
 - Actuation force: 5-13N
- Rotary function
 - Haptic with precise detent
- Joystick function
 - Actuation angle: $\sim 5^\circ$

Electrical characteristics

- Operating voltage range: 8–32VDC

* Validated product available from beginning of 2021. Fully validated and certified product available from middle of 2021.

Illumination

- Halo ring and symbol illumination can be configured independently
- LED symbol illumination (on pushbuttons)
 - Colour: white
 - Luminance: max. 20cd/m², dimmable
- Halo ring illumination
 - Colour: red
 - luminance: 1500cd/m² (buttons)
 - Four segments on buttons

Symbols (on pushbuttons, RCC without symbol)

- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

Connectivity

- CAN interface (ISO 11898)
- CAN protocols: CANopen (CiA 401), CAN J1939
- Baud rate 250kBd and 500 kBd (software configurable)
- Connector Deutsch DT04-6P

Ambient conditions

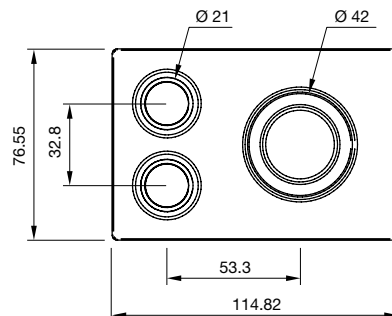
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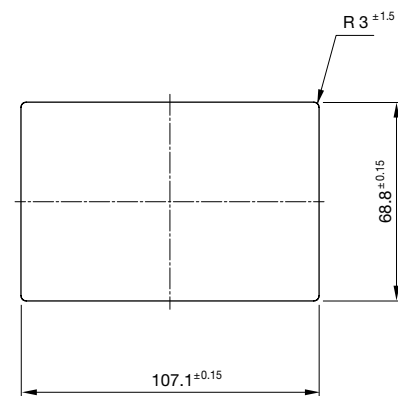
Dimensions

(All dimensions in mm)



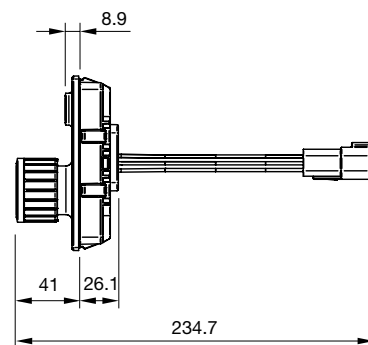
Mounting cut-out

(Panel thickness 1.0 mm ... 4.0 mm)

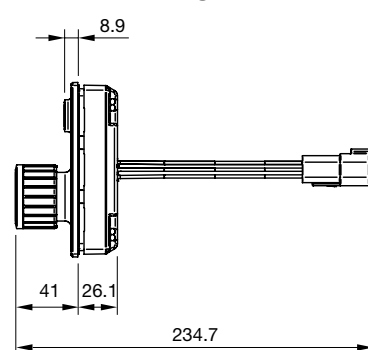


Mounting

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New application possibilities.

Incremental status indication

The individual 4-segment and RGB Halo ring illumination of the Series 09 CAN Module is ideal for status indication. Both the keypad and the rotary cursor controller thus open up many new application possibilities that require step-by-step control with incremental illumination in differing colours – for intuitive operation. Four halo segments offer constant, flashing and rotating illumination.

Application examples

- Air conditioning
- Heating/ventilation
- Seat heating
- Volume regulation
- Working temperature
- Speed of mixer/blender
- Speed of performance modes
- Windscreen wiper
- Lifting and lowering



Level 0



Level 1



Level 2



Level 3

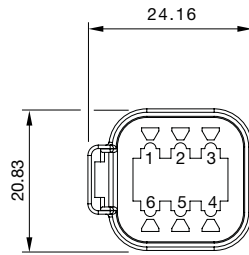
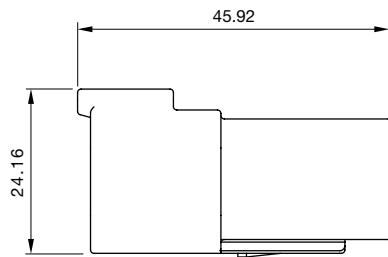
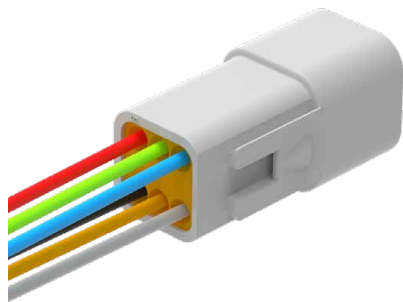


Level 4



Connector, symbol inserts, tool for legends.

Deutsch DT Series connector (DT04-6P)



Pin	Signal
1	GND
2	CAN High
3	WakeUp_Out
4	WakeUp_In
5	CAN low
6	Vcc

Mates with Deutsch DT06-6S-connectors.

All dimensions in mm.

Symbol inserts



Tool for legends



The new symbol insert tool with trendy design enables user-friendly fitting and removal of symbol inserts from the keypad. The round tip layout without edges prevents from damage of the keypad and symbol inserts. The ergonomically adjusted surface with balance point in the middle offers optimal grip.

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