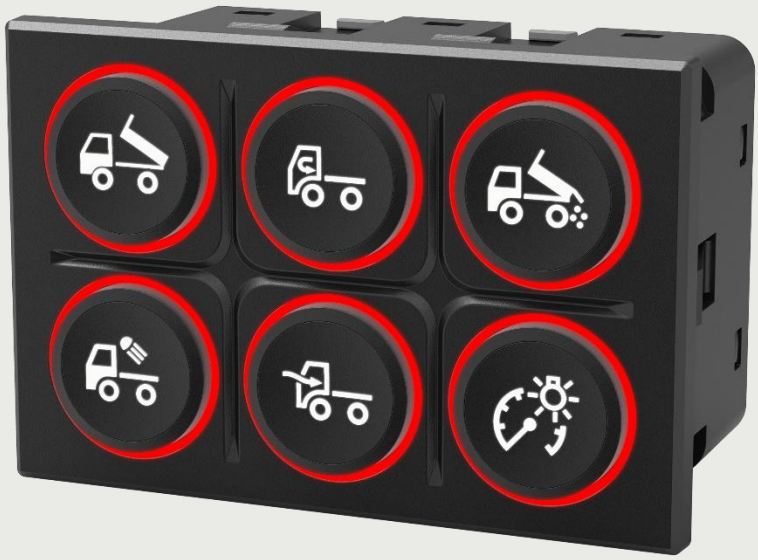


Operating instructions

Series 09 – In-Cabin Keypads
I/O BASIC (2PB and 6PB Version)

Operating instructions and safety instructions

Operating instructions and safety instructions



Project	S09 In-Cabin Keypad
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Related Products	Version
Series 09 In-Cabin Keypad 6PB Hardwired	01S
Series 09 In-Cabin Keypad 2PB Hardwired	02H

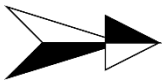
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List of abbreviations and units

DIN	Deutsches Institut für Normung / German institute for standardization
EN	European standard
EU	European Union
HMI	Human-Machine-Interface
IP	International Protection
ISO	International Organization for Standardization
LED	Light emitting diode
MOT	Ministry of Transport
OEM	Original Equipment Manufacturer
VDA	Verband der Automobilindustrie/German Association of the automotive industry

Used symbols

	**Caution!** Indicates a hazardous situation which, if not avoided, may result in a minor or moderate injury
	**Attention** Describes information on installation which, if ignored, can lead to malfunctions
	**Note** Indicates a situation which, if not avoided, may result in property damage
	Indicates an executive activity
	Indicates an application tip

1. Safety warnings

The safe system handling requires knowledge of the operating instructions.



Caution!

Connect the power supply in accordance with the safety regulations for electrical equipment.

– Risk of injury
– Damage to the keypad



Note

Avoid shocks and impacts to the keypad during installation

– Damage to or destruction of the keypad

The supply voltage must not exceed the specified limit.

– Damage to or destruction of the keypad

Protect the connector from damages

– Damage to or destruction of the keypad

Never kink the cable, do not bend the cable in tight radii. Dynamic movement of the cable should be avoided as far as possible, as well as chafing of the cable on system components.

– Damage to the cable or connector

1.1 Intended use

The modules were developed for vehicles that are intended for operation with road traffic approval in the EU and for intelligent control with direct wired connection. The High-quality modular automotive design with a protection degree of up to IP5K4, changeable ISO 7000 or customized symbols and Illumination features are facts that make the devices the best choice for Interior use in heavy-duty and special vehicles.

The keypads may only be operated within the parameters specified in the technical data.

The keypads must be used in such a way that no persons are endangered or machines damaged in the event of failure or malfunction.

Commissioning must be carried out by qualified personnel.

2. Proper environment

See Technical specification.

	**Note** If possible, avoid abrupt changes in the operating temperature of the keypad and connector. – Damage to the keypad, connector

	**Caution!** Do not operate the keypad in: – Potentially explosive atmospheres – Applications where the keypad and connector are completely or partly submerged for short periods of time – Situations in which the keypad and connector are subjected to harsh external shocks and impacts – Do not use for remaining in final customer installations due to validation not completed – Risk of injury – Damage to the keypad, connector

3. General description

Series 09 In-Cabin Keypads offer high reliability. Main features are the high-quality modular automotive design with a protection degree of up to IP5K4, changeable ISO 7000 or customized symbols and Illumination features which makes it possible to configure the Keypad exactly to individual Interior application in heavy-duty, special vehicles, trucks & buses. The modules are as well designed for ECE certification.

Typical applications

Interior Applications in special vehicles such as fire trucks, road sweepers, cleaning vehicles, dustcarts, snow clearing vehicles and snow groomers.

Advantages

- Red Halo Ring Illumination (different colours possible on request)
- High-quality modular automotive design with a protection degree of up to IP5K4 (mounted state front: IP5K4; back: IP20 without plugged connector). Protection degree for assembled situation in responsibility of customer application.
- Interchangeable ISO 7000 symbols or customer-specific symbols

Robust and innovative design

The design of the In-Cabin Keypads is characterised by a robust and modular construction. The control and signalling devices, which are protected up to IP5K4, function reliably at an operating temperature of – 40 °C … + 85 °C. The low panel depth and robust clip-in mounting allow a flexible and easy installation, either vertically or horizontally. The high-quality devices also offer an excellent haptic and, thanks to the bright RGB LED halo and LED symbol illumination, are clearly visible in daylight and at night. An attractive Halo- and 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 In-Cabin Keypads are produced in our competence centre for Automotive and Special vehicles, located in Germany. This allows us to apply our many years of comprehensive experience as an original equipment manufacturer (OEM) in the automotive industry to the heavy duty and special vehicles markets. At the same time, this offers EAO customers high quality, durable products and services. The development and production process is aligned and executed according to automotive standards (IATF 16949), including qualified suppliers. This requirement ensures EAO high quality products and solutions.

4. Technical specification

Validation ongoing and not completed:

Mechanical characteristics

- Actuation force: ca. 6,5 N
- Overload force: 250 N
- lifetime: up to 1 000 000 operating cycles (B10)
- Impact resistance: IEC 62262 IK07

Electrical characteristics

- Operating voltage range: 8-18 VDC (12 V variant)
  18-32 VDC (24 V variant)
- Maximal switching current: 30 mA

Illumination

- LED symbol illumination – colour: white LED
- LED halo ring illumination – colour: red LED

Symbols

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

Connections/interfaces

- Connector: 8-pin TYCO Plug 1745000-3/4
- Interface: hardwired interface with separate lines for each halo Ring and a common symbol illumination; Switching systems are available with resistors in series and parallel to the switching contact (Namur) or without these resistors

Ambient conditions (validation not yet completed)

- Operating temperature: -40 °C … +85 °C
- Storage temperature: -40 °C … +85 °C

Protection degree

IP5K4 protection (front: IP5K4; back: IP20 without plugged connector). Protection degree for assembled situation in responsibility of customer application.



Attention

The protection degree of up to IP5K4 to be achieved depends on the front panel and type of mounting and must be ensured by the customer.

5. Scope of delivery

1 pc In-Cabin Keypad (incl. retaining rings to hold the Symbol Insert)

Additional Mounting material for Screw-in version:

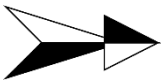
- 1 pc bracket / coupler
- 1 pc lock washer
- 1 pc Screw

	**Attention** Symbol inserts are not part of the scope of delivery and must be ordered separately.

6. Storage

See Technical specification.

	**Note** If possible, avoid abrupt changes in the storage temperature of the keypad cable and connector. – Damage to the keypad, cable or connector Do not expose the open contacts of the unprotected connector to condensing air humidity. – Damage to the keypad, cable or connector



Check the delivery immediately after unpacking regarding completeness and transport damages.

If any damage or incompleteness is found, please contact the supplier immediately.

Optional accessories can be found in the annex Optional accessories.

7. Mechanical installation/mounting

2 mounting versions are available: Installation in a panel by means of retaining clamps (retaining clamp version) or screw (screw-in version).

7.1 Installation in a panel by means of retaining clamps (Clip-in version)

See drawing “1902940001 In-Cabin Keypads”.

The retaining clips are integrated on the housing and part of the Keypad.

The keypad shall be pressed evenly into the panel with the mounted retaining clamps, while tilting should be avoided. Press evenly on the housing and not on the buttons.

It´s possible to dismount the keypads. Push the module from backside out of the mounting panel. To press the retaining clamps together will support the disassembling. Please note that this may result in material abrasion on the retaining clips, which may impair the retaining force.

The keypad is automatically centred to the panel by the 6 retaining clamps, i.e. the exact positioning of the keypad depends on the accuracy of the installation opening.

Although the clamps are suitable for a panel of 1 – 4mm material thickness, it is recommended a material thickness of at least 2mm.



Note

- Damage to the buttons
- Keypad not securely fastened
- Damage of the Retaining Clips

The plug-in connection must be established with a suitable connector. The plug-in connection can alternatively be established before or after mounting the keypad into the panel.

Plug and cable must be mounted draught-free.



Note

- Cable breaks



Caution!

- Risk of Injury

7.2 Installation in a panel with rear-side bracket (screw-in version)

See drawing “1902940001 In-Cabin Keypads”.



Caution!

Exceeding the maximum permissible torque inevitably leads to the destruction of the keypad. The keypad is no longer tight nor leak proof in this case.

Incorrect mounting of the keypad may result in damages to the keypad.

- Risk of injury
- Damage to the keypad
- Electric shock

The specified overload force refers to the switches, not to the mounting situation. For Rotary Cursor Controller it is recommended to use the screw-in variant.

- Risk of Unfastening
- Risk of injury

7.2.1 Mounting sequence

First, the keypad must be installed in the front panel, like descripted in Chapter 7.1.

From the rear side, the holding frame is now fastened centrally in the screw hole.

For screwing, please use the lock washer and screw provided.

The correct tightening torque is defined in document “1902940001 In-Cabin Keypads” and must be observed. The last step is to connect the connector.

Dismantling sequence:

Unplug the electrical connector, remove the fixation nut and lock washer backside of the panel, remove the holding frame. The Keypad can now be taken out of the front panel. Please push the module from backside out of the mounting panel. To press the retaining clamps together will support the disassembling. Please note that this may result in material abrasion on the retaining clips, which may impair the retaining force.



Caution!

The cables must not be bent during installation. Please reflect the minimum bending radius of the cable used.

- Damage to the cable
- Risk of injury

7.3 Installation of the symbol inserts

The symbol inserts must be ordered separately and are available with ISO7000 or customised symbols.

See drawing “1902940001 In-Cabin Keypads”

In the first assembly step, the symbol inserts (flexible silicone) must be pressed into the mounting rings (plastic). This is done with simple pressure and only possible from one side until the silicone part snaps into the plastic ring. No separate tool is required.

The mounting ring is required to create a defined key edge. In addition, the gap between the button and the front cover is minimized in a defined manner. This is to ensure that the keys cannot be levered out during operation.

In the second step the Key (combination of Symbol insert and ring) can be mounted (Evenly Pressing) on the corresponding push button position of the Keypad. No separate tool is required. The Symbol insert and ring needs to be pressed until a “Click” noise is noticed. It has to be considered, that the upper top surface of the silicone will be even to the top of the surface of the upper panel.

To change the Symbol inserts afterwards, it is necessary to remove the front cover of the Keypad.

Each symbol insert can be installed rotated in a 90° grid. When mounting the symbol inserts, make sure that the position of the symbols has the desired orientation towards the keypad. The symbol inserts have a mechanical coding to the housing of the keypad. A slight twisting of the symbol inserts to the keypad is technically possible and does not constitute a defect.



Caution!

When mounting and dismounting the symbol inserts, make sure that the housing is not damaged.

- Damage to the keypad
- Loss of tightness of the keypad

It must be always ensured that the symbol inserts are mounted in the correct position.

- Risk of injury



Note

When changing the symbol inserts, make sure that there are no liquids or impurities between the housing and the symbol insert. These would negatively affect the illumination of the symbols.



Note

Only use original mounting material and optional accessories.

– Damage to the keypad

7.4 Use inside closed vehicles

The In-Cabin Keypads are designed for use in the interior of the vehicle. Use outside of this defined area must be explicitly assessed on corresponding customers application and its operating environment.



Caution!

The environmental conditions must be compared with the specification of the In-Cabin Keypad

– Damage to the Keypad
– Risk of Injury

8. Electrical installation and pinning

Electrical installation shall only be done when the system is under no power.

Connection of the keypad module will be realized with 8-pin TYCO connector 1745000-3/4.

	**Caution!** – Damage to the keypad – Risk of injury

The 6-button-keypad use a Tyco connector 1745000-3 for the button signals and a 1745000-4 for the symbol and halo illumination. The 2-button-keypad combines the button signals and the halo and symbol illumination signals in one Tyco 1745000-3 connector.

For both, 6-button and 2-button keypad, the buttons are galvanically isolated from the symbol and halo illumination and use a common line. Each button has a Namur-circuit (only available in option Namur circuit) consisting of a series and a parallel resistor. With the Namur circuit option, it is possible to diagnose short circuit or interrupted circuit to the switching signal. The keypad can be ordered with or without Namur functionality. With Namur functionality the series and parallel resistor have the following values:

- Rp = 1 kΩ
- Rs = 120 Ω

Without Namur-functionality the values of the resistors are:

- Rp = not placed
- Rs = 0 Ω

Furthermore, it is necessary to debounce the switches. This can be done via software or hardware in the control unit connected to the keypad. The debounce time should be longer than 10ms.

The led’s of halo- and symbol illumination are connected with common cathode.

For the pinning of the connectors, please refer to „1902940001 In-Cabin Keypads”.

9. Cleaning

Cleaning with water and commercially available soft cloths is possible. Do not use aggressive solvents.

	**Caution!** Cleaning with a high-pressure water jet is not permitted. – Damage to the keypad – Electrical shock due to leakage of the keypad

10. Optional accessories

Symbol inserts with customer-specific symbols or alternatively according to ISO 7000 can be ordered. Also blank and colored Symbol Inserts are available.

11. Liability for quality defects

The general function of each keypad has been tested at the factory before delivery. However, if errors occur despite the careful quality control, they must be reported immediately to EAO or the dealer.

The liability for quality defects is 12 months for the delivered products. Within this period, faulty parts, except wear parts, will be repaired or replaced free of charge if the keypad is returned to EAO, free of charge in the event EAO is responsible for the defect.

Damages caused by improper use, installation, dismantling or the use of force are excluded from the liability for quality defects. Damages caused by repairs or modifications to the keypad are also excluded. EAO is exclusively responsible for repairs to the keypad.

Further claims cannot be asserted. Claims arising from the purchase contract remain unaffected.

EAO is not liable for consequential damages. The right to design changes, in the sense of product improvement, is reserved by EAO.

12. Service, repair

Broken symbol inserts need to be replaced immediately to prevent the keypad from further damage.

	**Caution!** Defective symbol inserts can cause the keypad to be damaged by protection or symbol inserts can fall out. – Damage to the keypad

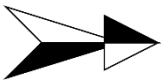
In case of a defective keypad or connector, please contact your dealer. In case of malfunctions, the cause of which you cannot clearly identify, please send the defective keypad to the following address:

EAO Automotive GmbH & Co. KG
Service
Richard-Wagner-Strasse 3
08209 Auerbach/ Vogtl.
Tel: +49 (0)3744/ 8264-0
Email: service.esa@eao.com
www.eao.com

13. Decommissioning, disposal

Disconnect the system from the power supply before the disconnection.

Do not pull at the cable when removing the connector.



Dispose of the device, components and accessories, packaging materials and documentation in accordance with the country-specific waste treatment and disposal regulations in the area of use.

14. Declaration of Conformity

The declaration of conformity certificate is available for download on the EAO-homepage www.eao.com within the download section. The document valid for the product listed in this manual is:

EG/EC/CE – Declaration of Conformity Series S09, 6PB In-Cabin Keypad - hardwired from July 19, 2024

EG/EC/CE – Declaration of Conformity Series S09, 2PB In-Cabin Keypad – hardwired from July 19, 2024

In case of further certificates are required, please ask your dealer.