Joysticks

Powerful. Robust and individual.

www.eao.com
**EAO joysticks** offer a wide range of possibilities for interfacing and control of HMI Systems in vehicles, machinery, medical equipment and remote control systems. Standard and individual configurable joysticks allow intuitive operation, robust construction and reliability. These are important basic characteristics for the joysticks. EAO joystick controllers also offer the potential for applications in construction and agricultural machinery and vehicles as well as police, fire-fighting and cleaning vehicles.

These requirements are also needed for the control of complex additional functions such as hydraulic lifting equipment, powered safety equipment and for other auxiliary functions.

The modern design, low back panel depth and numerous customising options make EAO products particularly attractive and versatile. Joysticks are compatible with established interfaces such as CAN, CANopen, J1939, SPI and USB.

Each joystick can be configured for its individual application. EAO has chosen the following products to represent the whole product range.

<table>
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<tr>
<th>Typical applications</th>
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<td>Commercial vehicles</td>
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<td>Special vehicles</td>
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<td>Marine, rail and electric vehicles</td>
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<td>Machinery</td>
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<tr>
<td>Medical technology</td>
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<tr>
<td>Numerous other applications</td>
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**EMV qualification**

The products are certified according to the relevant EN standards.

**Materials**

The materials used comply with the high EAO standards relating to quality, functional safety, service life and design.

**Mechanical characteristics**

- **Mounting**
  - Front or rear panel mounted
  - Screw fixing (depending on joystick type)
  - Various fixing rings as design element or as additional sealing available
- **Number of axes**
  - 1, 2 or 3
- **Cross guidance**
  - Soft, rigid or none
- **Gate shape**
  - Standard: square
  - Other gates available on request
- **Handle**
  - Several standard handle options with configurable functions
- **Resetting in centre position**
  - Self-resetting
  - With friction brake
  - With centre position locking
  - With mechanical interlocking
  - Momentary or maintained action
- **Terminals / connections**
  - Solder, screw or spring-load terminals
  - Plug, cable (customising possible)

**Joysticks**

**Powerful. Robust and individual.**

EAO, the expert partner for innovative, intuitive and reliable Human Machine Interfaces (HMIs), offers a range of standard and customised joysticks for rough usage in a variety of applications.
Advantages.

- Mechanical and electrical customisation is possible
- Front protection to IP65 or IP67
- Standard joysticks available from stock
- Low back panel depth for hall effect and conductive plastic sensors
- Competent and productive project management

Electrical characteristics
- Technology/sensor
  - Hall effect sensors
  - Conductive plastic (with and without series resistor)
  - Digital steps (up to 4 per semi-axis)
  - Redundancy
  - Exact interlinear
  - Neutral position switch
  - Directional switch
  - Snap-action switching element
- Output signal
  - Proportional
  - With/without centre tab
  - Digital
  - Redundant
  - AC/DC 5V/0.07A up to 500V/10A
  - Customised
- Interfaces
  - CAN, CANopen, J1939, SPI, USB

Ambient conditions
- Temperature
  - Operating temperature – 30 °C to + 80 °C
  - Storage temperature – 40 °C to +85 °C

Degree of protection
- Depending on mounting, handle type and function (up to IP65, IP67, IP69K)

Customised joysticks – EAO is here to advise
Each joystick can be individually configured for your specific application. The EAO team will help you select and specify the optimum products to meet your individual application requirements, also for customised versions.
Joystick, 1 axis with square flange.

Part No.
09-01.18214.0107

Mechanical characteristics
• Mounting
  from front of panel, 4 screws
  (Ø 3.5 mm)
• 1 axis
• No cross guidance
• No gate shape
• 20° deflection angle
• Handle “Winter”
• Resetting
  self-resetting (medium resetting force)
• Breakout torque
  Y-axis 0.18 Nm
• Operating torque
  Y-axis 0.42 Nm
• Max. allowable torque
  Y-axis 18 Nm

Electrical characteristics
• Operating voltage
  5 V DC
• Output signal
  proportional (\(-y = 0.5 V / \text{Mid} = 2.5 V / +y = 4.5 V\))
• Redundancy
  yes

Connections
• Minitek plug (8-pole)

Ambient conditions
• Operating temperature
  \(-30^\circ C \text{ to } +80^\circ C\)
• Storage temperature
  \(-40^\circ C \text{ to } +85^\circ C\)

Degree of protection
• IP65 front protection
• IP40 rear protection
**Joystick, 3 axes with square flange.**

**Part No.**
09-01.32294.0109

**Mechanical characteristics**
- Mounting
  - from front of panel, four screws (Ø 3.5 mm)
- 3 axes
- Soft cross guidance
- Gate shape square
- Deflection angle XY: ± 20° / Z: ± 30°
- Handle “Winter twist”
- Resetting
  - self-resetting (medium resetting force)
- Breakout torque
  - X/Y-axis 0.18 Nm / Z-axis 0.075 Nm
- Operating torque
  - X/Y-axis 0.42 Nm / Z-axis 0.18 Nm
- Max. allowable torque
  - X/Y-axis 18 Nm /
  - Z-axis 10 Nm

**Electrical characteristics**
- Operating voltage
  - 5 VDC
- Output signal proportional
  - (–x/y/z = 0.5 V /
  - Mid = 2.5 V / +x/y/z = 4.5 V)
- Redundancy
  - all axes

**Technology**
- Hall effect sensors

**Connections**
- Minitek plug (8-pole)

**Ambient conditions**
- Operating temperature
  - –30 °C to + 80 °C
- Storage temperature
  - –40 °C to + 85 °C

**Degree of protection**
- IP65 front protection
- IP40 rear protection
Joystick, small and beautiful.

Part No.
09-01.22224.0128

Mechanical characteristics
- Mounting
  from above, four screws (Ø 3.5 mm)
- 2 axes
- Light cross guidance
- Gate shape square
- 20° deflection angle
- Handle “Nupsi”
- Resetting
  self-resetting (medium resetting force)
- Breakout torque
  X/Y-axis 0.18 Nm
- Operating torque
  X/Y-axis 0.42 Nm
- Max. allowable torque
  X/Y-axis 10 Nm

Electrical characteristics
- Operating voltage
  5 VDC
- Output signal
  proportional (–x1/y1 = 0.5 V/average = 2.5 V/+x1/y1 = 4.5 V) (–x2/y2 = 4.5 V/
  average = 2.5 V/+x2/y2 = 0.5 V)
- Redundancy
  all axes

Technology
- Hall effect sensors

Connections
- Minitek plug (8-pole)

Ambient conditions
- Operating temperature
  –30 °C to +80 °C
- Storage temperature
  –40 °C to +85 °C

Degree of protection
- IP67 front protection
- IP40 rear protection
Joystick, standard with round flange.

Part No.
09-02.22244.1052

Mechanical characteristics
- Mounting
  from rear of panel, 4 x M3 screws
- 2 axes
- Rigid cross guidance
- Gate shape square
- 20° deflection angle
- Handle “Standard”
- Resetting
  self-resetting (medium resetting force)
- Breakout torque
  X / Y-axis 0.16 Nm
- Operating torque
  X / Y-axis 0.5 Nm
- Max. allowable torque
  X / Y-axis 18 Nm

Electrical characteristics
- Operating voltage
  max. 30 VDC
- Output signal
  proportional with centre tab at ±1.75°,
  switch point at ±2.3° (see diagram
  X-, Y-axis)

Technology
- Conductive plastic with digital steps/
  control segment 1-0-1

Connections
- Dubox plug (6- and 8-pole)

Ambient conditions
- Operating temperature
  –30 °C to + 80 °C
- Storage temperature
  –40 °C to + 85 °C

Degree of protection
- IP67 front protection
- IP40 rear protection
Joystick, CAN with round flange.

Part No.
09-03.23362.1051 (CANopen)
09-03.23363.1051 (J1939)

Mechanical characteristics
- Mounting
  from rear of panel, 4 x M3 screws
- 2 axes
- Soft cross guidance
- Gate shape square
- 20° deflection angle
- Handle “Sleek”
  with two integrated buttons (red)
-Resetting
  self-resetting (strong resetting force)
- Breakout torque
  X/Y-axis 0.19 Nm
- Operating torque
  X/Y-axis 0.7 Nm
- Max. allowable torque
  X/Y-axis 18 Nm

Electrical characteristics
- Operating voltage
  8 to 36 VDC
- Hall effect sensors

Connections
- Dubox plug (4-pole)

Interfaces
- CANopen/J1939 interface

Ambient conditions
- Operating temperature
  –30°C to + 80°C
- Storage temperature
  –40°C to + 85°C

Degree of protection
- IP65 front protection
- IP40 rear protection
**Joystick, CAN with 3 buttons and 1 cable.**

**Applications**
Especially well-suited to heavy duty and special vehicles.

**Part No.**
09-03.223A2.1114 (CANopen)
09-03.223A3.1114 (J1939)

**Mechanical characteristics**
- Mounting: from below, 4 x M3 screws
- 2 axes
- Light cross guidance
- Gate shape square
- 15° deflection angle
- Handle "Kermit" with 3 integrated buttons (black)
- Resetting: self-resetting (strong resetting force)
- Breakout torque: X/Y-axis 0.63 Nm
- Operating torque: X/Y-axis 1.16 Nm
- Max. allowable torque: X/Y-axis 18 Nm

**Electrical characteristics**
- Operating voltage: 8 to 36 VDC

**Technology**
- Hall effect sensors

**Connections**
- PVC cable, 4 x 0.34 mm²
- Molex Micro-Fit (4-pole)

**Interfaces**
- CANopen/J1939 interface

**Ambient conditions**
- Operating temperature: –30 °C to +80 °C
- Storage temperature: –40 °C to +85 °C

**Degree of protection**
- IP65 front protection
- IP40 rear protection
Joystick, 2 axes with 6 momentary positions each.

Applications
Especially well-suited to wireless remote control systems.

Part No.
09-04.223E4.1112

Mechanical characteristics
- Mounting from below, 4 x M3 screws
- 2 axes
- Soft cross guidance
- Gate shape square
- 20° deflection angle
- 6 momentary positions per axis
- Handle “Goblet Top” with button
- Resetting self-resetting (strong resetting force)
- Breakout torque X/Y-axis 0.19 Nm
- Operating torque X/Y-axis 0.7 Nm
- Max. allowable torque X/Y-axis 18 Nm

Electrical characteristics
- Operating voltage max. 5 VDC / 5 mA
- Output signal switching point at ±3.33°

Technology
- Digital grid / switching segment 3-1-3

Connections
- Dubox plug (2 and 8-pole)

Ambient conditions
- Operating temperature –30 °C to +80 °C
- Storage temperature –40 °C to +85 °C

Degree of protection
- IP65 front protection
- IP40 rear protection
**Joystick, drive lever with mechanical interlocking.**

**Part No.**
09-02.174C4.1113

**Mechanical characteristics**
- Mounting: from below, 4 x M3 screws
- 1 axis
- No cross guidance
- No gate shape
- 20° deflection angle
- Handle “Central Lock”
- Resetting friction brake
- Unlocking force: 22 N
- Breakout torque: 0.456 Nm
- Operating torque: 0.456 Nm
- Max. allowable torque: 18 Nm

**Electrical characteristics**
- Operating voltage: max. 30 VDC
- Output signal: proportional without centre tab

**Technology**
- Conductive plastic

**Connection**
- Dubox plug (3-pole)

**Ambient conditions**
- Operating temperature: –30°C to +80°C
- Storage temperature: –40°C to +85°C

**Degree of protection**
- IP65 front protection
- IP40 rear protection

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**Dimensions**

**Diagram Y-axis**

**Bottom view**
Toggle stick, 4 directions with momentary position.

Applications
The toggle stick from Series 45 (4 directions with momentary position, lockable) is suitable for various applications.

Part No.

Mechanical characteristics
• Mounting Ø 22.3 mm, raised
• 2 axes
• Rigid cross guidance
• 35° deflection angle
• Mechanical service life up to 250 000 switching cycles
• Connection screw terminal

Electrical characteristics
• Operating voltage 5 to 500 V
• Output signal AC1S: 6A / 24 V to 1.4A / 500 V
• Contact material silver

Ambient conditions
• Operating temperature −25 °C to +70 °C
• Storage temperature −40 °C to +85 °C

Degree of protection
• IP65, IP67 front protection
• IP20 or IP40 rear protection

Configure your product in a few steps at eao.com/products.
Lever switch, 8 positions.

Applications
The lever switch from Series 44 (8 positions) is suitable for various applications.

Part No.
44-800.8

Mechanical characteristics
• Mounting
  Ø 22.3 mm, raised
• 2 axes
• Soft cross guidance, pulse
• 12° deflection angle
• Mechanical service life
  up to 1.2 million switching cycles
• Connection
  soldering terminal

Electrical characteristics
• Operating voltage
  250 VAC
• Output signal
  5 A / 4 NC + 4 NO
• Contact material
  gold-plated silver alloy

Ambient conditions
• Operating temperature
  –30 °C to +80 °C
• Storage temperature
  –40 °C to +85 °C

Degree of protection
• IP65 front protection
• IP20, IP40 rear protection

A choice of three lever switches can be found at eao.com/products.
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Being close to customers and able to offer a comprehensive range of services are fundamental to our success and at the core of our corporate policy.

EAO AG, a Swiss, family-owned company founded in 1947, has developed into one of the world’s leading manufacturers of high-quality industrial switches, complete custom HMI panels and interface systems, and specialised automotive switch systems.

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