

# PALM GRIP JOYSTICKS



**CALDARO**



THE LINK BETWEEN MAN AND MACHINE

# THE UNBREAKABLE JOYSTICK



We tackled the challenge of constructing an unbreakable joystick for one of the harshest environments on earth – the mining industry.

When we designed the C15, the original idea was to make it simple and ergonomic, with no room for customisation. However, it wasn't long before we were asked to add features and the joystick with its grip has today evolved into a system with a whole range of different configurations. Contrary to the original intention, the C15 turned out to be incredibly customisable. This joystick is the base within our Palm Grip segment.

Caldaro is a modern company with a decentralised organisation where people enjoy working and take responsibility. Exciting problems make our brains tick.

I love my job because it's rewarding to be part of developing the future operator environment. I also think it's an honour to work with the leading manufacturers of machines in the world; they trust us and rely on our expertise.

Thanks to working with prominent customers, we quickly realised the importance of sustainability issues, which are close to our hearts.

We always want to deliver the very best product to our customers. Best as in "solving the customer's challenges and fulfilling their needs". We started as a trading company, but since 2003, we have been designing our own products.

To customise a product will sometimes mean just configuring or modifying one of the products we have already developed. In other cases, it means creating a whole new product.

Don't hesitate to ask us even if you want just a small batch; it's a matter of adapting the manufacturing methods. Our speciality is to think outside the box. Please go ahead and challenge us!

**Claudio Talamo, CEO Caldaro**

# ERGONOMIC WITH PRECISION

Our palm grip joysticks are designed with particular emphasis on operator comfort and precision control. After decades of experience working with joysticks, our technical advisers are well placed to supply customers with the ideal solution for their individual needs, and always with a variety of CAN bus options.

It is used across a spectrum of applications, from the toughest working environments to exquisitely high precision, fine-tuned medical equipment.

The joystick can be fitted with numerous grips, functions and withstand the harshest conditions for your application, as it is available with high protection class and is customisable to the fullest.

Caldaro defines a joystick as a two-part module: the joystick base and the joystick grip attached to the base. The C14 joystick is best combined with our Viper grips.



# C15: A WORK OF JOY

**Protected electronics.** Circuit board and electronics are potted with a silicone compound that protects them from threats such as salt, mist, water, lubricants and virtually all chemicals.

**A strong shaft.** Manufactured in one single piece and with extended dimensions. This makes it practically impossible to bend.

**The best material** have been chosen for each component. The rubber mixture endures the toughest conditions.

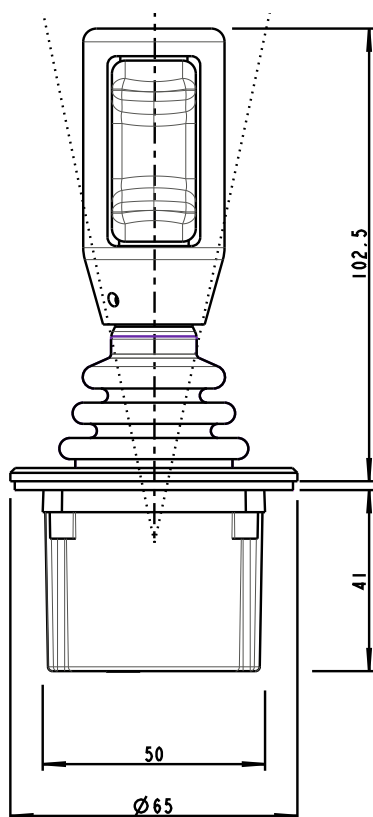
**Full redundancy** with direction switches, using double or double independent output signals. The C15 is also available with CAN interface.

**Adding operator feeling.** Fully customisable feeling with Guide feeling, optional spring force and Over-press feature.

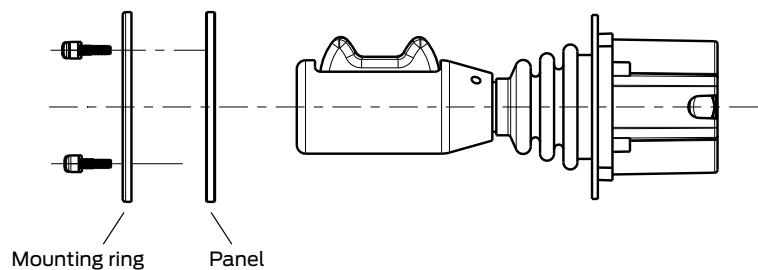
**Proportional axis.** Choose between 1, 2 or 3 axis to be operated in  $\pm 9$ , 12, 17 and 20.



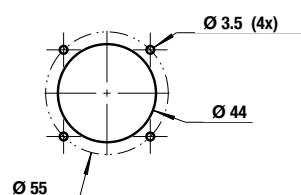
Standard dimensions



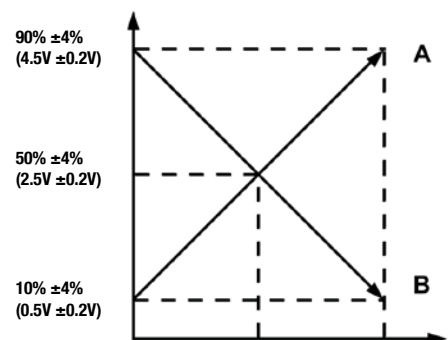
Mounting arrangement



Panel cutout



Example of output signal



## MECHANICAL SPECIFICATIONS

Life expectancy: 10 000 000 operations

Mechanical angle two axis:  $\pm 9^\circ$ ,  $\pm 12^\circ$ ,  $\pm 17^\circ$  or  $\pm 20^\circ$

Mechanical angle one axis:  $\pm 12^\circ$  or  $\pm 20^\circ$  (X or Y)

Lever strength: max 500N Static load

Break out force: 1N or 1,7N or 2,5N or 3,8N  
(Depending on spring force)

## ENVIRONMENTAL SPECIFICATIONS

Storage temperature:  $-40^\circ\text{C}$  to  $+85^\circ\text{C}$  ( $-40^\circ\text{F}$  to  $185^\circ\text{F}$ )

Operating temperature:  $-40^\circ\text{C}$  to  $+85^\circ\text{C}$  ( $-40^\circ\text{F}$  to  $185^\circ\text{F}$ )

Sealing: IP67 (above panel subject to handle and final specification)

EMC: 100V/M

ESD:  $\pm 8\text{kV}$  (contact discharge)  $\pm 15\text{kV}$  (air discharge)

## ELECTRICAL SPECIFICATIONS: ANALOG

Effective output standard 10%–90%  $V_{in}$

Total current consumption: 17–22mA

Power supply: 5VDC  $\pm 10\%$  (regulated)

Recommended load resistance 4,7k $\Omega$ –100k $\Omega$  pull down

## ELECTRICAL SPECIFICATIONS: CAN

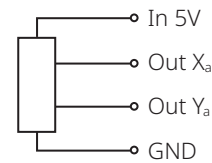
Power supply: 9–32VDC

Baud rate: 125, 250, 500 Kbit/s

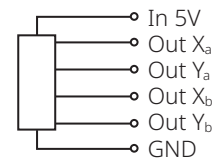
Transmission rate: 10, 20, 50ms

## OUTPUT OPTIONS

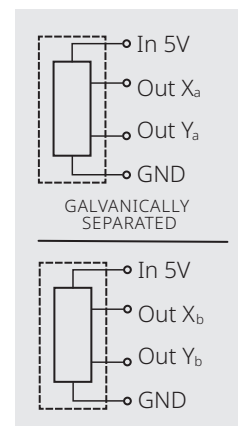
### SINGLE OUTPUT



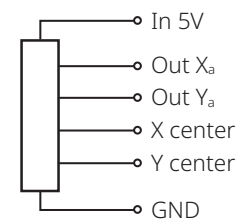
### DUAL OUTPUT



### DUAL INDEPENDENT OUTPUT



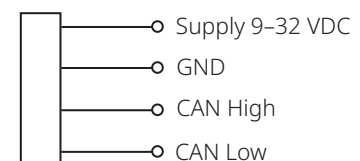
### SINGLE + DIGITAL OUTPUT\*



\*Centre validation signal 1 per axis (please consult Caldaro)

### CAN INTERFACE

CANopen, CANopen Safety or J1939 protocol



Available with direction or centre Switch function (please consult Caldaro)

# COMBINE THE C15 WITH VIPER, LION OR A VARIETY OF GECKO GRIPS

## THE VIPER SLIM GRIP

Viper Slim is a professional multifunction joystick that provides all necessary functions easily accessible to the operator's hand. It has a highly appreciated design that provides a natural grip for the operator's ergonomics and is used in many types of applications and special vehicles.

Configuration on image: 5 buttons, one sensor • A capacitive sensor for "operator presence" • 2-4-axis • Height 128 mm



## THE LION GRIP

The Lion grip is a multi-functional grip made for professional usage. First developed solely for mining applications. Made to endure the test of time and harsh conditions. It is available with two sliders on the front side, allowing the intuitive operation of a belt-driven machine. It can be found in mining applications, snow removal machines, cranes, and other special vehicles.

Configuration on image: 6 buttons + 2 sensors for 3rd and 4th axis • Sensors; a capacitive sensor for "operator presence" • Proportional sensors • 2-4-axis • Height 128 mm

# THE GECKO GRIPS SERIES

Our Grip series consists of a great variety of grips made to fit a great variety of machines. The grips in the Gecko series are commonly used with the C15 joystick and will give your machine perfect control. By machining the shape from a solid part, split lines can be avoided, providing a more comfortable and higher-quality appearance.



## GECKO A0

Configuration on image: Plain robust grip • Does not include any additional functionality • Height 97,4 mm



## GECKO A1

Configuration on image: 1 momentary push button • Button specifics are customized with NO/NC • Height 103 mm



## GECKO A2

Configuration on image: 2 momentary push buttons • Buttons specifics are customized with NO/NC • Height 110 mm



## GECKO A3

Configuration on image: 3 push momentary buttons • Buttons specifics are customized with NO/NC • Height 110 mm



## GECKO R0

Configuration on image: 1 Proportional Hall effect thumb rocker • Height 97,5 mm

## THE GECKO GRIPS SERIES CONTINUES



### GECKO R1

Configuration on image: 1 Proportional Hall effect thumb rocker • 1 momentary push button • Button specifics are customized with NO/NC • Height 117 mm



### GECKO R1 LED

Configuration on image: 1 latching LED push button (Optional push button specifics: Icon etc) • 1 Proportional Hall effect thumb rocker • Height 128 mm



### GECKO R4+1

Configuration on image: 1 Proportional Hall effect thumb rocker • 4 momentary push buttons on front • 1 momentary push button on top (Optional push button specifics: NO/NC) • Height 126 mm



### GECKO R5

Configuration on image: 1 Proportional Hall effect thumb rocker • 5 momentary push buttons on front • Height 116 mm



### GECKO R7

Configuration on image: 1 Proportional Hall effect thumb rocker • 5 momentary push buttons on front • 2 momentary push buttons on rocker side • Height 116 mm



### GECKO R9

Configuration on image: 1 Proportional Hall effect thumb rocker • 5 momentary push buttons on front • 4 momentary push buttons on rocker side • Height 116 mm





## GECKO R12

Configuration on image: 1 Proportional Hall effect thumb rocker • 10 momentary push buttons on front • 2 momentary push buttons on rocker side • Height 116 mm



## GECKO W0

Configuration on image: 1 Rubber covered rocker button • Optional push button specifics: NO/NC • Height 114 mm



## GECKO W1

Configuration on image: 1 Rubber covered rocker button • 1 Rubber covered momentary push button • Optional push button specifics: NO/NC • Height 114 mm



## GECKO W1B

Configuration on image: 1 momentary rocker button • 1 momentary trigger button • Buttons specifics are customized with NO/NC • Height 114 mm



## GECKO W2

Configuration on image: 1 Rubber covered rocker button • 2 Rubber covered momentary push button • Optional push button specifics: NO/NC • Height 114 mm



## GECKO WR

Configuration on image: 1 Rubber covered rocker button (Optional push button specifics: NO/NC) • 1 Proportional Hall effect thumb rocker • Height 114 mm

# CUSTOMER-ADAPTED PRODUCTS MADE IN SWEDEN

Caldaro is an international company based in Sweden that develops premium HMI products like joysticks, pedals and sensors for customers with high-quality expectations and special requirements. Our products are typically used in harsh conditions or operating environments where ergonomics and design are important.

We develop our products according to each customer's distinctive needs while pushing the boundaries of design and technology. Our extensive know-how from several demanding applications allows us to design each product according to each customer's quality and function needs.

We are dedicated to providing modern, safe controls that lead the industry in durability, precision, and dependability through constant innovation. Ergonomics and simplified design go hand in hand. We are the link between man and machine; our task is to optimise that interaction.

## WE DELIVER HIGH-END SOLUTIONS

We have become the go-to supplier for customers with high performance, accuracy, and functionality demands in various industries worldwide.

With solid growth, we have established ourselves as the leading player in our niche. A modern organisation with cutting-edge expertise at our head office means we can deliver on short lead times with a proven track record of reliability.

Outsourced production allows us to increase or decrease capacity as necessary while we get the best help and solutions. We see this as a winning model.

We operate in an exciting technical environment where, in close cooperation with our customers, we are designing the operator environments of the future.



# SUSTAINABILITY IS NECESSARY



We are committed to building a sustainable society with our customers, partners and stakeholders. Our focus areas are the environment, ethics, social responsibilities, and economy.

In everything we do, we follow Caldaro's values, ethical principles, and appropriate laws and regulations. In line with our values and Code of Conduct, we aim to provide excellent customer experiences professionally in all our projects. We deliver on our customers' promises and are committed to increasing customer satisfaction.

Our fundamental principle is to offer the best working conditions. With happy, skilled and motivated employees, we can design the best possible products and thereby get satisfied customers.

We increase environmental awareness by communicating our sustainable goals and results internally and externally to ensure that quality and environmental policies are embedded and adhered to at all levels of the organisation.

In 2019, we committed to the UN Global Compact's sustainability goals. In 2022, we received our first. Ecovadis sustainability rating: their Platinum medal for the top 1% of companies.

## CALDARO QUALITY

- Joysticks and pedals built to last "forever". We always perform extensive life and other tests to ensure we can exceed our specified requirements.
- Long life expectancy is also a matter of sustainability.
- We use the most durable materials.
- Ergonomic design.
- Excellent precision.
- Simplified design to reduce the number of parts.
- Custom-made to fit the customer's needs.
- Constantly working to get more sustainable: environment, ethics, social, and economy.
- The ID number on each manufactured item allows for full traceability and test data from end-of-line testing if needed.

# PREMIUM PRODUCTS

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## INDUSTRIAL JOYSTICKS

Our full grip-sized industrial joysticks are designed to suit the most demanding heavy-duty applications in terms of mechanical strength and environmental requirements. Designed with the operator in focus, these joysticks are ergonomic and user-friendly, built for operating every productive hour.

Our palm grip joysticks are designed with particular emphasis on operator comfort and precision control. After decades of experience working with joysticks, our technical advisers are well placed to supply customers with the ideal solution for their individual needs, and always with various CAN bus options.

Our fingertip joysticks are designed for smooth operator control with high precision. These mini joysticks are often used in precision machines, forklifts and remote controls but can also be found in agricultural applications.

We can offer a wide range of joysticks with up to 5 analog axis and contactless redundant sensors.



## INDUSTRIAL PEDALS

Our specially designed foot pedals for heavy-duty throttle, brake and retardation control are as robust as they are precise. All our industrial pedals are designed and manufactured for the most demanding applications in harsh environments. The pedals withstand the toughest conditions in all surroundings for dependability and your safety.



## POSITION SENSORS

Caldaro has been supplying sensors since the early 80's. Initially, it was only potentiometers with wire-wound or conductive plastic in both rotating and linear versions. Currently, contactless technology (Hall effect and inductive) has evolved and is now used effectively in many different sensor types, both rotating and linear.

## MARINE CONTROLS

Real craftsmanship levers made by our specialist team. Every control lever has a smooth, elegant feeling resulting from decades of refinement and engineering experience. Since we started in 1985, we have developed about 200 different variations for a wide variety of marine and offshore applications.

