



**Solutions**

**Packaging Machinery**

# Packaging Machinery

## Solutions for



### Filling

### Inspection

### Wrapping and sealing

### Labelling

#### ABOUT CARLO GAVAZZI

Carlo Gavazzi Automation is an international group active in designing, manufacturing and marketing electronic equipment targeted at the global markets of industrial and building automation.

Our history is full of firsts and our products are installed in a huge number of applications all over the world. With more than 80 years of successful operation, our experience is unparalleled.

We have our headquarters in Europe and numerous offices around the world.

Our R&D competence centres and production sites are located in Denmark, Italy, Lithuania, Malta and the People's Republic of China.

We operate worldwide through 22 of our own sales companies and also selected representatives in more than 65 countries, from the United States in the West to the Pacific Rim in the East.

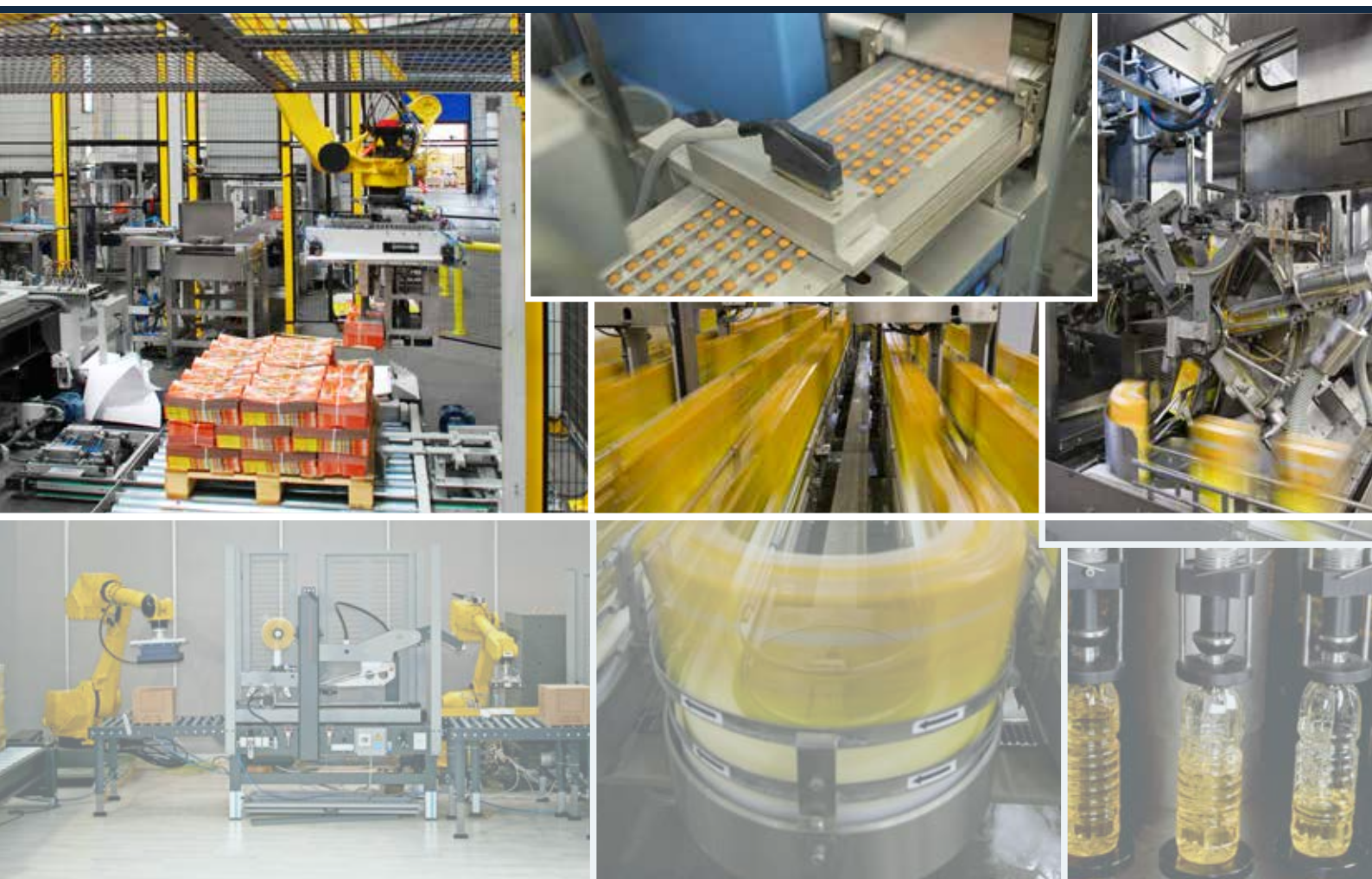
Our core competence in automation spans three product lines: Sensors, Switches and Controls.

Our wide array of products includes sensors, monitoring relays, timers, energy management systems, solid state relays, safety devices and fieldbus systems.

We focus our expertise on offering state-of-the-art product solutions in selected market segments.

Our customers include original equipment manufacturers of packaging machines, plastic injection moulding machines, food and beverage production machines, conveying and materials handling equipment, door and entrance control systems, lifts and escalators, as well as heating, ventilation and air-conditioning devices.





## DESIGNED TO MEET MARKET REQUIREMENTS

The growing markets in consumer goods and packaged pharmaceuticals drive the development of packaging equipment. Filling and sealing machines, also labelling and coding devices, are important to ensure product safety throughout the supply chain.

To meet these needs, the industry has gradually introduced more automation and more sophisticated electronic controls.

In today's packaging production lines, the different stages are completed in minutes rather than in hours, as compared to years past.

In all types of packaging machinery - in all sectors of industry - each component must meet the strict requirements of the individual application.

This is to guarantee the continuity of production and the conformity of the packaged product to quality standards.

For many years, Carlo Gavazzi photoelectric, inductive and capacitive sensors have proven to be the best solution in applications for filling and checking.

In shrink wrapping applications, careful control of heating is essential for good results. Solid state relays are used to switch the heaters on and off in order to maintain the correct temperature.

The packaging industry also needs safety devices to guarantee the safety of the operators engaged in the work area, ensuring safe operation of the machines.

Carlo Gavazzi's comprehensive safety range includes products that detect intrusions within the non-safe zones and shut down the machinery in a controlled manner via standard and/or configurable safety modules.

Carlo Gavazzi products all offer easy installation, high precision and long term reliability.

# Packaging Machinery

## Filling



Photoelectric sensors	Photoelectric sensors	Inductive sensors with IO-Link	Capacitive sensors with IO-Link	Ultrasonic sensors	Capacitive level sensors	Conductive level probes
LD30..IO PD30ET PD30C	PA18 PH18	ICB12..IO ICB18..IO ICB30..IO	CA18..IO CA30..IO	UA18 UA30	CD34CNF	CLH CLD

Carlo Gavazzi offers a complete range of automation components for the packaging industry.

UA ultrasonic sensors are used in a bottling line to verify that the appropriate level of a product is in the container before it is sealed and shipped.

Ultrasonic sensors are also used to measure the level of ingredients – either liquid or solid – in a container. The continual analog output signal allows for better control of the process. The levels of solid material, such as ground coffee, coffee beans or flour, are accurately detected using photoelectric sensors.

The PA18/PH18 sensors come with

a mounting bracket which allows fast mounting and space saving. Axial, radial and square versions are also available. An important benefit is that the conveyor can be cleaned much more easily.

For accurate control of the filling process, PD30 sensors provide an output signal when the product is at the appropriate fill level.

The PD30E and LD30E stainless steel sensors are designed for wet as well as dry areas. The stainless steel housing and high-end plastic materials guarantee maximum resistance against IP69K and Ecolab cleaning processes. The IO-Link sensors allow easy exchanges of process data, remote

configurations and events with simple and inexpensive 4-wire or 3-wire cabling, without the need to change the existing architecture. The IO-Link ICB series, available from M12 to M30, can be completely configured to enable new functionalities such as the divider and speed control functions.





# Inspection



Photoelectric sensors	Photoelectric sensors	Inductive sensors with IO-Link	Capacitive sensors with IO-Link	Ultrasonic sensors	Fiber optic amplifiers	Soft starters
PD30ET PD30C	PH18 PA18	ICB12..IO ICB18..IO ICB30..IO	CA18..IO CA30..IO	UA18 UA30	FA1	RSGD

Carlo Gavazzi products have many applications in the inspection-detection field. For bottling lines that have darker or less transparent bottles, PA18 through beam sensors can be used to detect the presence of the bottles. This family of products is from 40% to 60% smaller than existing housings.

The PD30 stainless steel (background suppression) sensors detect all colours on objects at the same distance from the sensor, and their durable design withstands daily cleaning processes. The specialised optics of the PD30CNG - combined with a reflector - are perfect for detecting clear bottles on a conveyor. In some confectionery applications, it is necessary to detect if a cake decoration is

present or properly positioned. The PD30 diffuse sensor recognises the decoration on top of the cake.

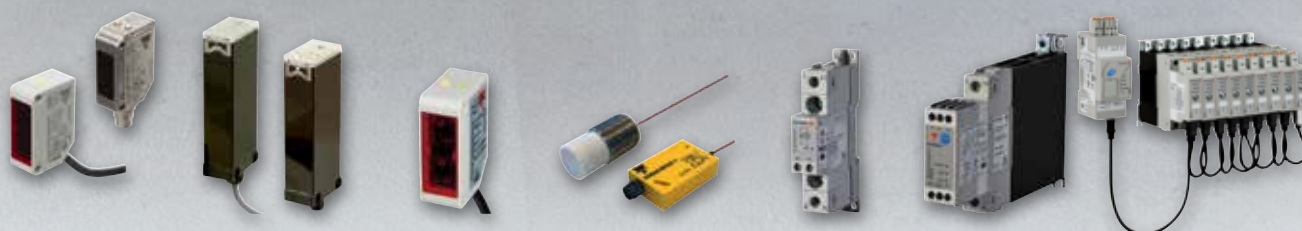
The fiber optic amplifier FA1 and the series of fiber optic cables FUR & FUT offer even more flexibility for sensing. To verify that a bottle cap is present on the bottle a FA1 fiber optic amplifier with a fiber optic cable and lens are positioned above the bottles and programmed to detect the reflection from the bottle cap. Thanks to the IO-Link capacitive sensors advanced settings, it is possible to detect the presence and the content of packages. With two configurable switching signal channels, each IO-Link capacitive sensor works as two different sensors at the same time.

Once connected to the Y-series IO-Link Masters, all process, event, and service data will be accessible to the upper level control system via EtherNet/IP™, PROFINET IO and MODBUS TCP, increasing the visibility of the processes and providing continuous feedback on the machine status. The integrated OPC UA server allows simultaneously access to the data of the smart devices attached from cloud-based applications via OPC UA clients in the direction of IIoT and Internet 4.0 requirements.

The integrated multi-language web-server and IODD interpreter allow easy access to detailed diagnostics and configuration of the module and IO-Link devices from a web browser, even remotely.

# Packaging Machinery

## Wrapping and sealing



**Photoelectric sensors with IO-Link**

**LD30..IO**

**Photoelectric sensors**

**PD112**

**Photoelectric sensors**

**PD30CN**

**Capacitive sensors**

**ECH**

**Solid state switches**

**RGS  
RGC  
RM**

**Solid state switches**

**RGC1S  
RGS1S**

**Digital solid state switches**

**NRG**

Multiple bottles are often bundled together and shrink-wrapped. Carlo Gavazzi's solid state relays allow fast switching of heaters that enable accurate control of the process temperature, thus maintaining an even shrink of the plastic wrap. The RG range offers a wide variety of solutions, starting from solid state switching of heaters to more intelligent solutions that integrate monitoring features that immediately detect load malfunctions (RGC1S). This ensures that the expected quality of the end-product or process is maintained. The NRG series adds a communication interface whereby measurement and diagnostic data can be accessed in real-time. Downtime of machines can be reduced or eliminated by using

this accessible data to predict failures. In order to verify that the shrink-wrap has been added, a PD30CNG clear object sensor is positioned to focus on the level of the bottle necks. If the shrink-wrap is present, the clear object sensor will have a continuous output as the package passes by. Diffuse reflective photoelectric sensors with long detecting distances (PD112) detect goods on a pallet to ensure that wrapping is stopped at the required height. In hot-melt heating systems the high temperature ECH sensors have proven their capability and reliability. Other applications include automatic continuous processes of thermoforming,

filling and sealing. The RG range offers a wide variety of solutions, starting from solid state switching of heaters to more sophisticated solutions that, apart from the switching function, integrate monitoring features that are able to detect load and system malfunctions to guarantee a reliable thermal process.



# Labelling



**Photoelectric  
sensors  
with IO-Link**

**LD30..IO**

**Fiber optic  
amplifiers**

**FA1**

**Photoelectric  
sensors**

**PC50**

**Photoelectric  
fork sensors**

**PF80**

**Timers**

**DAA51  
DMB51**

Once a container is filled, the next step is to apply the appropriate label.

A fiber optic amplifier FA1 is used to detect the presence of a mark on a bottleneck label, which confirms that the bottle is in the correct position for the main label to be applied.

These sensors also detect the presence

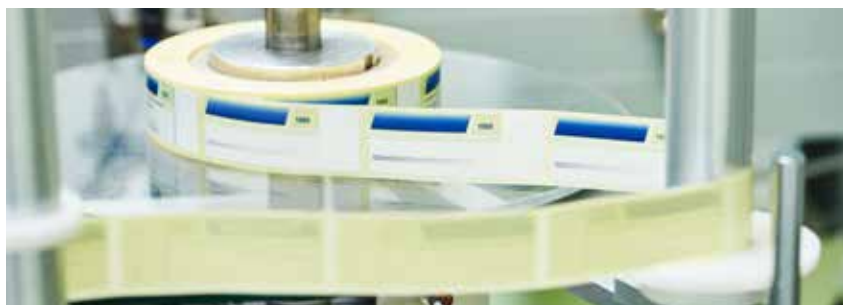
of security bands which are required on many bottles and containers. They recognise the difference between the security band and the bottle cap.

The FA1 is compact and highly intuitive for easy setup. It is equipped with two 4-digit LED displays for clear and concise reading. An adjustable signal

level, selectable response time and different timer functions provide full flexibility. Coupled with the robust and complete range of fiber optic cables FUR & FUT, this amplifier can be used in many applications.

Detection of labels, marks and double sheets, as well as holes and edges, are typical applications for the PF80 fork sensor.

Precise control of all labels is an important part of the packaging process. The surfaces of the labels are often reflective and the photoelectric proximity sensors provide the necessary sensitivity for maximum reliability.





# Packaging Machinery

## Our expertise



**Multifunction  
safety modules**

**SM..  
CM..**

**Safety magnetic  
sensors**

**MC36..  
SMS..  
CLS..**

**Electromagnetic  
safety interlocks**

**ESI**

**Photoelectric  
sensors**

**PD30ET  
PD30C**

**Photoelectric  
sensors**

**PA18  
PH18**

Carlo Gavazzi's safety devices are used to prevent access to dangerous areas, until the machines have completely stopped. For example, the configurable safety module offers up to 128 inputs and 16 pairs of programmable solid state outputs in a compact modular system, managing and monitoring safety sensors and commands such as: safety light curtains, photocells, emergency stops, two-hand controls, mechanical switches, laser scanners and safety mats at the same time. Protection of the operators from dangerous moving parts of the machine is ensured by using our SM or CM series safety module, able to monitor multiple safety functions of machinery.

With the configuration of the right delay time, by means of the hex-switch, and in combination with our electromagnetic safety interlock ESI, we can guarantee the safety of the operator, as the machinery remains operative for only a short time after the stop signal, due to mechanical inertia of the moving parts. Around the packaging machine photoelectric sensors (PD30, PA18 and PH18) are widely used to detect the position of the items to be packed and/or to detect the position of the carton box.

When packaging products into a carton box, the boxes are stacked up unfolded on one side of the machine. Two photoelectric sensors are used:

one to detect that there are enough unfolded carton boxes in the pipeline, the other to detect when an unfolded carton box is ready to be fed into the packaging machine. If this box is not present then the stack of unfolded carton boxes is pushed forward until the sensor detects the first box.





# Safety devices and energy efficiency



## 3-phase power analyzers

**WM20**

## Energy analyzers / transducers

**EM210  
ET112  
ET340**

## Monitoring relays

**DPA01/DPB01  
DIA/DIB/DTA**

## Switching power supplies

**SPD  
SPPC  
SPM**

## DC UPS

**SPUBC  
SPUC**

Our safety magnetic sensors (SMS, CLS) are particularly designed for safety gates that allow entry to machines with dangerous movements. Carlo Gavazzi offers a vast array of products to improve energy efficiency and to ensure the monitoring of entire processes.

Energy management components provide vital information for operators to identify consumption trends and take appropriate action. The WM20 power analyzer, the EM210 energy analyzer or the ET340 energy transducer can monitor all the main parameters of an electric line or load.

DPA01 monitoring relays monitor phase sequence and phase loss of motors: DPB01 also monitors mains over and under voltages. Overloads can be prevented with the DIA and DIB current relays whilst the DTA04 relays stop motors in case of overheating. Carlo Gavazzi timers - available in four different housings (standard DIN-rail, Plug-in, 48x48 and MiniD) - provide correct and reliable solutions for every application. The SPUC and the SPUBC modules guarantee power supply and electrical continuity in case of mains failure.



# Packaging Machinery

## Our product range

### Photoelectric sensors ABS with IO-Link



#### LD30C..

- Background Suppression based on ToF
- Infrared Class 1 Laser
- Selectable: NPN, PNP, Push-Pull, External Input, N.O. and N.C. output
- IO-Link 1.1 with timer, diagnostics and logic functions
- Approvals/Marks: CE - cULus

#### MAIN FEATURES

- Adjustment: back or top potentiometer
- IP67, NEMA type 1
- Diagnostics tools: Quality of Run & Quality of Teach, Alarms and transients

### Photoelectric sensors AISI316L with IO-Link



#### LD30E..

- Background Suppression based on ToF
- Infrared Class 1 Laser
- Selectable: NPN, PNP, Push-Pull, External Input, N.O. and N.C. output
- IO-Link 1.1 with timer, diagnostics and logic functions
- Approvals/Marks: CE - cULus - ECOLAB

#### MAIN FEATURES

- Adjustment: back or top potentiometer
- IP67, IP68, IP69K, NEMA type 1, 2, 4, 4x, 5, 6, 6P
- Diagnostics tools: Quality of Run & Quality of Teach, Alarms and transients

### Inductive sensors with IO-Link



#### ICB12..IO / ICB18..IO / ICB30..IO

- Nickel-plated brass M12, M18 or M30 cylindrical threaded barrel housings
- Sensing distance from 4 mm to 22 mm
- Output functions: programmable NO or NC, NPN, PNP or push-pull
- 2 meter oil resistant PVC cable or M12 plug version
- Approvals/Marks: CE - cULus
- IO-Link V1.1

#### MAIN FEATURES

- Operating temperature: -25°C to +70°C (-13°F to +158°F), and -40°C to +70°C (-40°F to +158°F) for M12-plug version
- Adjustable sensing distance and hysteresis and configurable output
- Up to 2 kHz operating frequency

### Capacitive sensors PBT, AISI316L or PTFE with IO-Link



#### CA18..IO / CA30..IO

- Sensing distance: 0.5 - 12 mm (M18), 2 - 30 mm (M30)
- Selectable: NPN, PNP, Push-Pull, External Input, N.O. and N.C. output
- IO-Link 1.1 with timer, diagnostics and logic functions
- Approvals/Marks: CE - cULus - ECOLAB

#### MAIN FEATURES

- 4<sup>th</sup> Generation TRIPLESIELD™ with superior EMC performance
- IP67, IP68 and IP69K
- Diagnostics tools: Quality of Run & Quality of Teach and Alarms

### IO-Link Masters



#### YN115..IO / YL212..IO

- DIN rail mount enclosure for control cabinet installation [YN] or Fully encapsulated housing for machine mounting [YL]
- 8 ports configurable as standard DI, DO or IO-Link
- Additional digital input on every port
- EtherNet/IP™ or PROFINET IO, Modbus TCP, OPC UA
- Approvals/Marks: CE, cULus, FCC
- IO-Link v1.0 and v1.1; COM1, COM2 and COM3 support

#### MAIN FEATURES

- Integrated multi-language web-server and IODD interpreter for remote configuration and diagnostics
- Simultaneous access to smart devices attached from cloud-based applications via OPC UA clients and from standard industrial machine control systems
- Pluggable push-in and screw terminal connectors for a quick and error-proof start-up [YN]
- Future-proof L-coded M12 power connector for higher current in more compact dimensions [YL]

### Smart configurator for IO-Link sensors



#### SCTL55

- Handheld device for IO-Link sensors
- 5.5" HD touch screen display
- Automatic IODD file download via Wi-Fi
- High capacity rechargeable battery
- M8 3-wire, M8 4-wire and M12 connectors
- Approvals/Marks: CE, FCC
- IO-Link v1.1

#### MAIN FEATURES

- Intuitive GUI with dedicated App for a simplified user experience.
- Access to an advanced diagnostic with the possibility to verify operating hours, number of detections, operating cycles, alarms and quality of run of the sensor connected.
- Easy management of operating parameters such as switchpoint mode, logic and timing functions, sensing distance, output configuration (PNP/NPN/push-pull, NO/NC)

## Our product range

### Photoelectric sensors



#### PA18 / PH18

- Standard M18 cylindrical housing
- Power supply: 10 to 30 VDC
- Separate models available for NPN or PNP outputs
- Range: 1 m (Axial), 0.8 m (Radial)
- Sensitivity adjustment by potentiometer
- Approvals/Marks: CE - cULus - ECOLAB

#### MAIN FEATURES

- Complying with the requirements of ECOLAB, IP67, IP69K
- Approved according to UL508
- Diagnostic LED indication (green and yellow LED)
- Short circuit, reverse polarity and overload protection

### Photoelectric sensors



#### PD30C

- World standard housing style 10.8 x 30 x 20 mm
- Power supply: 10 to 30 VDC
- NPN or PNP transistor output
- Sensitivity adjustment by Teach-in or by potentiometer
- Approvals/Marks: CE - cULus (UL508, CSA C22.2)

#### MAIN FEATURES

- Background suppression version, with accurate detection and PointSpot light
- Long detection distances
- Protection: reverse polarity, short circuit and transients

### Photoelectric sensors



#### PD30ET

- World standard housing style 11 x 31.5 x 21 mm
- Supply voltage: DC 4-wire
- Output: NPN/PNP NO+NC
- Sensor types: D, B, R, P and T
- Connectivity: Cable or M8 connectors
- Approvals/Marks: CE - cULus (UL508, CSA C22.2) - ECOLAB

#### MAIN FEATURES

- Stainless steel housing AISI 316L
- Resistant to high-pressure washdown, and aggressive cleaning agents.
- IP67, IP68, IP69K, NEMA type 1, 2, 4, 4x, 5, 6, 6P
- Protection: reverse polarity, short circuit and transients

### Photoelectric sensors



#### PC50

- Dimensions: 17 x 50 x 50 mm
- Sensing distance up to 20 m
- Modulated infrared light
- Selectable make and break switching function
- Cable and plug version
- Approvals/Marks: CE - UL - CSA

#### MAIN FEATURES

- Adjustable sensitivity
- High EMC immunity
- Protection: reverse polarity, short circuit and transients

### Photoelectric sensors



#### PD112

- Dimensions: 25 x 45 x 112 mm
- Long range background suppression (BGS) sensor
- Power supply receiver: 10 to 30 VDC
- NPN and PNP NO or NC output
- Emitter with Mute Input for testing sensor's functions
- 2.5 m sensing distance

#### MAIN FEATURES

- Light beam approved to Safety Category 2
- UL325, UL508, EN12445, EN12453, EN12978
- Long detection range of black objects

### Fiber optic amplifiers



#### FA1

- 2 x 4 digit LED display for signal and threshold level
- Easy setup 3 way adjustment switch
- Selectable response time and timing delay functions
- 100 mA NPN PNP NO NC Switching

#### MAIN FEATURES

- Varieties of through beam and reflective fiber optic cable
- Ø 0.25, 0.5 or 1.0 mm inner fiber diameter for different applications
- Extra overmoulding on fiber units for better fiber curvature protection



# Packaging Machinery

## Our product range

### Ultrasonic sensors



#### UA18 / UA30

- Dimensions: M18, M30
- Ultrasonic sensors with integrated amplifier providing a digital and/or analog output
- Housing material: plastic and stainless steel
- Sensing distance up to 6 m
- Approvals/Marks: CE - cULus - CSA

#### MAIN FEATURES

- Excellent EMC performance and precision
- Detects clear, transparent and shiny targets, solid objects, liquid or granules.
- Protection: short circuit, transient and reverse polarity

### Capacitive sensors



#### CA18 / CA30

- 4<sup>th</sup> generation TRIPLESIELD™ technology
- Dimensions: M18 / M30
- Plastic housing DC versions
- Sensing distance up to 30 mm
- Approvals/Marks: CE - cULus - ECOLAB

#### MAIN FEATURES

- Highest EMC immunity
- ESD ratings up to 40 KV
- Sensing face temperature up to 120°C
- Best immunity towards Inverters

### Capacitive level sensor



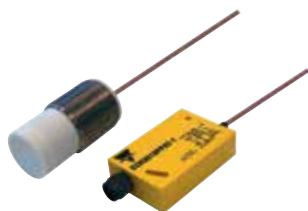
#### CD34CNF

- Dimensions 8 x 16 x 34 mm
- Power supply: 10-30 DC
- Output: NPN / PNP / NO or NC
- Power supply from 208 to 480 VAC (+/- 15%)
- Connectivity: Cable or M8 4-pin Pig-tail
- Approvals/Marks: CE - cULus - ECOLAB

#### MAIN FEATURES

- Detecting water-based liquids (up to 50 mS)
- Automatic adaption to tank wall thickness
- Eliminating influence from build-up or foam
- IP65, 66, 67, 68, 69K NEMA type 1, 2, 4, 4X, 5, 12
- Protection: reverse polarity, short circuit and transients

### Capacitive sensors



#### ECH

- Sensor diameter: M30, teflon and stainless steel
- Adjustable sensing distance: 4 to 15 mm, factory set for 10 mm
- Output: transistor NPN or PNP, make & break switching
- Power supply: 10 to 40 VDC

#### MAIN FEATURES

- Provided with a separate teflon sensor head in M30 for temperatures within the range of -196°C to +180°C
- Protection: reverse polarity, short circuit, transients

### Photoelectric fork sensors



#### PF80

- Dimensions: 12 x 37.5 x 80 mm. Slot width 3 mm
- Teach-In: push button or by wire
- Rated operational voltage 10-30 VDC
- Aluminium housing
- Approvals/Marks: CE

#### MAIN FEATURES

- High speed detection
- Detection of transparent material
- Detection of labels, marks and double sheets

### Conductive level controllers / probes



#### CLD / CLH

- 17.5 mm slim housing, 22.5 mm & 35 mm housing available
- Multiple filling and emptying functions
- 24-240 VAC/DC [CLD2EB1BU24] / 24 VDC, 115 VAC, 230 VAC
- Flexible modular probes up to 5 electrodes [CLH5]
- Extendable probes for longer length

#### MAIN FEATURES

- Wide operational supply voltage range
- Slim compact housing
- Wide sensitivity adjustment 250 Ω to 500 KΩ
- Cascading amplifiers for more levels [CLP2FA]

## Our product range

### Multifunction safety modules



#### CM22D0A / CM40D0A / CM30D1A

- Compact dimension, 1 DIN, W x H x D: 18 x 90 x 63 mm.
- Safety solution for basic machines, equipment and production lines
- 4 LEDs on the front panel indicate the status and any errors during operation
- Up to 4 OSSD safety outputs
- Approvals/Marks: CE - cULus - TÜV

#### MAIN FEATURES

- Selectable delay time
- Can be used in applications with: e-stop, e-gate, limit switch, non contact switch, safety light curtains, safety light beam and safety mat
- Cat.4, PL e (ISO 13849-1), SIL 3 (IEC 62061), SILcl 3 (IEC 61508)
- 2 OSSD auxiliary outputs
- Selectable manual or automatic start

### Multifunction safety modules



#### SMS31

- Dimensions 110,8 x 17,5 x 121,1 mm DIN-rail housing
- Auto, manual or monitored manual start
- 3 NO safety relay outputs
- 1 NC auxiliary relay output
- Detachable screw terminals
- Approvals/Marks: CE - cULus - TÜV

#### MAIN FEATURES

- Dual channels simultaneity infinite
- Safe monitoring of emergency stops, interlocks, safety magnetic and limit switches
- Front LED's for safety channel diagnosis
- PL e as per ISO EN 13849-1

### Expansion safety module



#### SME41

- Dimensions 110,8 x 17,5 x 121,1 mm DIN-rail housing
- Expansion relays module
- 4 NO safety relay outputs
- 1 NC auxiliary relay output
- Detachable screw terminals
- Approvals/Marks: CE - cULus - TÜV

#### MAIN FEATURES

- Extension of safety relay outputs
- Operates as expansion unit for master safety relays or OSSD signals
- Front LED's for safety channel diagnosis
- PL e as per ISO EN 13849-1 in combination with a master safety module

### Configurable safety module



#### CMM

- 4 non-safety test outputs for sensor monitoring
- 2 non-safety programmable digital signal outputs
- 2 non-safety inputs for Start / Restart interlock and EDM
- LOG file with 5 configuration modifications
- Connection with other exp. units via rear bus
- Approvals/Marks: CE - cULus - TÜV

#### MAIN FEATURES

- Also usable as a stand-alone device, able to control any other expansion unit
- 8 safety digital inputs
- 2 safety OSSD pairs (400 mA Output)
- Cat.4, PL e (ISO 13849-1), SIL 3 (IEC 62062), SILcl 3 (IEC 61508),

### Configurable I/O expansion modules



#### C I/O

- Wide range of Input/Output, Input only or Output only (both OSSD and standard relay) expansion units to serve different application requirements
- Models offer a variety of non-safety Inputs/Outputs such as: inputs for Start/Restart interlock and EDM, test outputs
- Approvals/Marks: CE - cULus - TÜV

#### MAIN FEATURES

- The models offer eight combinations:
  - 8 Inputs 2 Outputs; 12 Inputs 8 test Outputs
  - 8 Inputs, 16 Inputs,
  - 2 OSSD, 4 OSSD
  - 2 relay Outputs, 4 relay Outputs

### Data and diagnostic modules + bus transfer



#### DDC + CBT

- DDC: Expansion unit for Diagnostics and Data Comm.:
  - C PFBUS - Profibus DP, - C DNET - DeviceNET
  - C CAN - CANOpen, - C EIP - Ethernet IP
  - C ECAT - EtherCAT, - C PFNET - PROFINET
  - C OMMS - Universal Serial Bus
- Bus Transfer: interface module allowing the connection of remote expansions via bus
- DDC: allows communication with most common industrial fieldbus systems
- Approvals/Marks: CE - cULus - TÜV

#### MAIN FEATURES

- Bus transfer: up to 100 m for each connection. Maximum 5 CBT expansions. Ideal solution for the interconnection of the safety functions of several machines in a production line

# Packaging Machinery

## Our product range

### Electromagnetic Safety Interlock



#### ESI

- Enhancing safety. Ideal for applications that require access to remain closed and locked until potential hazards have stopped or come to a predetermined safe state.
- Protecting machines from production interruptions
- Standards compliance. SIL 3 (EN 62061), PL e in accordance with EN ISO 13849-1, interlock type 2 in accordance with EN ISO 14119.
- Approvals by IMQ - CE - cULus.

#### MAIN FEATURES

- Ensure protection in inertia's machineries
- Prevents entry into a dangerous area until the unlock signal
- With a manual unlock device for emergency
- Block controlled by solenoid

### Safety magnetic sensors and units



#### CLS / SMS

- Rectangular or cylindrical housing
- Connection: PVC cable or pigtail solution
- Housing material: plastic or stainless steel
- Approvals/Marks: CE - cULus

#### MAIN FEATURES

- Multiple flux coding
- Several combinations of safety and auxiliary outputs available
- Operating temperature -25° to +70°C
- Long operating distance up to 20 mm

### Safety magnetic sensors



#### MC36CH / MC36CM

- Rectangular plastic housing: 36 x 26 x 13 mm
- Assured switching distance (Sao) 5 mm
- Output functions: 2 NO or 1 NO + 1 NC
- 2 meter PVC cable or M8 plug version
- Approvals/Marks: CE - cULus

#### MAIN FEATURES

- Up to Cat. 4, PL e in accordance with EN ISO 13849-1, with suitable safety module
- Flexibility: left or right exit connection versions
- LED version available for all variants
- Suitable for applications where greater tolerances are required

### 1-phase solid state relays



#### RM1.. / RAM1..

- Dimensions: 58.2 x 44.8 x 28.8 mm, panel mount
- Rated operational voltage: up to 660 VAC
- Rated operational current: 25, 50, 75, 100, 125 AAC
- Control input ranges: 4-32 VDC, 20-280 VAC
- Approvals/Marks: CE - EAC - cURus - CSA - CCC - VDE [RAM1]

#### MAIN FEATURES

- Zero cross or random switching
- Low noise emission - EN55011 class B conformance [RM1A..L]
- Integrated over-voltage protection [RM1]

### 1-phase solid state switches



#### RGS1A.. / RGC1A..

- Product width: 17.5 mm up to 70 mm, DIN or panel mount
- Ratings: up to 660 VAC, 90 AAC, 18000 A²s
- Integrated output overvoltage protection
- Control input ranges: 4-32 VDC, 20-275 VAC (24-190 VDC)
- Approvals/Marks: CE - EAC - VDE - cULus [RGC] - cURus [RGS] - CSA [RGS] - GL (RGC up to 30 AAC)

#### MAIN FEATURES

- Integrated heatsink [RGC1..], without heatsink [RGS1..]
- 100 kA short circuit current rating
- Optional overtemperature protection

### 1-phase solid state switches with current monitoring



#### RGS1S.. / RGC1S..

- Product width: 22.5 mm up to 70 mm, DIN or panel mount
- Ratings: up to 660 VAC, 90 AAC, 18000 A²s
- Integrated output overvoltage protection
- Control input range: 4-32 VDC
- Approvals/Marks: CE - EAC - cULus [RGC1S] - cURus [RGS1S] - CSA [RGS1S]

#### MAIN FEATURES

- Partial load failure detection (1/6)
- Monitoring for SSR and load circuit malfunction
- TEACH by local push button or remote signal



# Our product range

## 3-phase solid state contactors



### RGC3A.. / RGC2A..

- Product width: up to 70 mm, DIN-rail mounting
- Ratings: up to 660 VAC 75 AAC/pole [RGC2], 65 AAC/pole [RGC3] @ 40°C
- Motor ratings up to 11 kW @ 400 VAC, 25 HP @ 600 VAC
- Control input range: 5-32 VDC, 20-275 VAC (24-190 VDC)
- Approvals/Marks: CE - cULus - EAC - CCC

#### MAIN FEATURES

- 3-phase; 2-pole [RGC2] or 3-pole [RGC3] switching
- Monitoring for SSR and load circuit malfunction [RGC..M]
- 100 kA short circuit current rating

## Digital solid state switches



### NRG

- Modbus RTU or PROFINET for NRG controller
- Up to 32 solid state switches with 1 NRG controller
- Switching through communication interface
- Ratings: 1-phase, max. 660 VAC, up to 90 A
- Approvals/Marks: CE, cULus - UR - CSA - EAC

#### MAIN FEATURES

- ON/OFF, Distributed Full Cycle, Advanced Full Cycle or Burst switching mode
- Real-time measurement: current (A), voltage (V), power (W or VA), energy consumption (kWh) and running hours
- Predictivity of load failures by detection of load resistance changes
- Immediate failure detection of load loss, SSR damage or operation out of set ranges

## 3-phase general purpose soft starters



### RSGD

- Operational voltage range: 187-440 VAC, 187-660 VAC
- Operational current range: 12 AAC up 100 AAC
- Control voltage: 24 VAC/DC, 110-400 VAC
- Serial communication (Modbus 2-wire) (RSGD 75 mm models)
- Approvals/Marks: cULus - CCC - EAC

#### MAIN FEATURES

- Easy to use and set-up
- Self-learning algorithm to adapt to different loads
- Auxiliary relays for top of ramp and alarms

## Variable frequency drives



### RVLF

- Compact dimensions, with ratings up to 11 kW
- Inbuilt V/F and SLV control
- Drive voltage ratings: 100-120 VAC; 200-240 VAC; 380-480 VAC
- Drive kW rating: - 0.4 kW - 11 kW (0.5 HP - 15 HP)
- Approvals/Marks: CE - cULus

#### MAIN FEATURES

- Ease of use with minimal settings
- Precision low speed control with SLV algorithms
- Inbuilt filters on most models to reduce harmonics disturbance

## 3-phase monitoring relays



### DPA01

- 80 x 22.5 x 99.5 mm; DIN-rail housing
- Phase sequence and phase loss, regenerated voltage detection
- 3 phase AC (own power supply)
- Variants from 208 to 690 VAC
- Approvals/Marks: CE - UL - CSA - CCC

#### MAIN FEATURES

- Motors protection from reverse running and phase loss
- 2-relays output available for more flexibility
- No setup needed (plug&play)

## 3-phase monitoring relays



### DPB01

- 80 x 22.5 x 99.5 mm; DIN-rail housing
- Phase sequence and loss; overvoltage and undervoltage detection + time delay
- 3 phase connection; 3 phase + neutral connection
- Power supply 208-480 VAC
- Approvals/Marks: CE - cULus - CCC

#### MAIN FEATURES

- Complete mains monitoring in 3 or 4 wires systems
- Neutral loss protection
- Double-cage terminal for easier daisy-chain connections

# Packaging Machinery

## Our product range

### Motor thermistor relays



#### DTA04

- 80 x 22.5 x 99.5 mm; DIN-rail housing
- 2 SPST 8A Relay Outputs
- For motor protection with built-in PTC sensors
- Power supply 24 V - 240 VAC/DC
- Approvals/Marks: CE - cULus

#### MAIN FEATURES

- Multicolour LED with alarm discrimination
- Auto or manual, local or remote reset, test function

### AC Current relays



#### DIA53

- 81 x 17.5 x 67.2 mm; DIN-rail housing with 12 mm hole for current measurement
- Current monitoring relay with built-in current transformer
- 20 A, 50 A or 100 A AC
- Self powered
- Approvals/Marks: CE - cULus - CSA

#### MAIN FEATURES

- Only 2 wires connection
- Adjustable current tripping setpoint
- Integrated solid state NPN PNP output

### Current monitoring relays



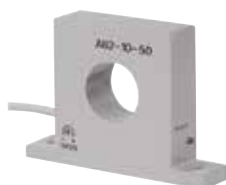
#### DIA /DIB

- 80 x 22.5 x 99.5 mm; DIN-rail housing
- Over or under current relay
- 1 phase AC or DC
- Power supply from 24 to 48 VAC/DC or 115/230 VAC
- Approvals/Marks: CE - UL - CSA

#### MAIN FEATURES

- Detect any variation of the desired current level
- Direct connection, by CT or by external shunt
- Time delay to avoid undesired nuisance tripping [DIB]

### AC Current transformers



#### A82

- 95 x 67.5 x 20 mm; 27 mm hole for current measurement
- 25 A to 500A AC inputs
- Output 4-20 mA, 0-20 mA, 0-10V DC
- Approvals/Marks: CE - UL

#### MAIN FEATURES

- Easy PLC interfacing
- True RMS measurement
- Load status information to the PLC

### 3-phase power analyzers



#### WM20

- 96 x 96 mm panel mounting housing
- Accuracy 0.2% (voltage, current)
- Class 0.5S (kWh)
- Universal power supply
- Front protection degree IP65, NEMA4X, NEMA12
- Approvals/Marks: cULus

#### MAIN FEATURES

- Provides installation data to a SCADA to manage the whole system
- Modular housing to build the instrument according to real application needs
- Modbus, Ethernet, Profibus, BACnet (IP and MS/TP) communication ports

### Energy analyzers



#### EM210

- 3-phase energy meters with CT connection
- Solid or split-core 5 A CT
- Dimensions: 4 DIN modules or 72 x 72 mm housing
- Class 1 (kWh) acc. to EN62053-1
- Class B (kWh) acc. to EN50470-3
- Pulse open collector or serial RS485 output

#### MAIN FEATURES

- Very compact and space saving meter
- Can be installed both on DIN-rail or on the panel
- MID annex D certification available
- Approvals/Marks: CE - cULus

# Our product range

## 1 and 3-phase energy transducers



### ET112 / ET340

- 2 DIN size; DIN-rail mounting [ET112]
- 3 DIN size; DIN-rail mounting [ET340]
- Measurement of voltage, current, power, power factor and frequency
- Bi-directional energy metering, 2 tariffs, cl. 1 (EN62053-1)
- Measuring inputs: 115/230 VAC, 100 A [ET112], single phase
- Measuring inputs: 208 to 400 VLL VAC, 65 A [ET340], 3-phase

#### MAIN FEATURES

- Self-powered
- RS485 Modbus port (screw, 2x RJ45)
- Optical port
- Sealable terminal covers
- Approvals/Marks: CE

## Timers



### DAA51 / DMB51

- 81 x 17,5 x 67,2 mm; DIN-rail housing
- Delay on operate function [DAA], multifunction [DMB]
- Combined AC and DC power supply
- Repeatability: < 0.2%
- CE, UL, CSA, RINA [DMB51]

#### MAIN FEATURES

- Wide range of timing functions [DMB51]
- Timing range 0.1 s to 100 h
- 5 A SPDT relay

## DIN-rail switch mode power supplies



### SPD

- Output power 5 W to 960 W
- Universal input range of 110-240 VAC or up to 370 VDC
- Short Circuit, overload and overvoltage protection
- PFC > 100 W
- Approvals/Marks: CE - cULus - cURus - UL1310 Class 2 (up to 90W) - ISA 12.12.1 Class I Div2 - TÜV - CCC

#### MAIN FEATURES

- Power Factor Correction (PFC)
- Parallel connection
- DC OK output

## Low profile power supplies



### SPM

- Compact DIN-rail housing - 1/3/4/5 Din width, and battery charger versions available
- Universal input from 90-264 VAC
- Integrated short circuit and overload protection with built-in input filters
- High efficiency of up to 89%
- Approvals/Marks: CE - cULus - cURus - UL1310 Class 2 (up to 91.2 W) - ISA 12.12.1 Class I Div2 - TÜV

#### MAIN FEATURES

- Compact design for installation within distribution box with ratings up to 100 W
- Intuitive visual and electrical indications
- Selected models comes with UL 1310 Class 2 classification

## Metal enclosed power supplies



### SPPC

- Output power from 25 W to 800 W
- Input 110/240 VAC single phase
- Short circuit, overload and overvoltage protection
- PFC function available >75 W
- Approvals/Marks: CE - cURus

#### MAIN FEATURES

- Adjustable output +/- 10%
- Compact dimensions
- Wide operating temperature range up to 70°C

## DC UPS



### SPUC / SPUBC

- Power supply, UPS and battery charger "All in one" [SPUBC], UPS controller [SPUC]
- 12 or 24 VDC 5 A output (up to 30 A SPUC)
- Power boost up to 2 times rated output, permanent [SPUBC]
- Built-in battery status, complete diagnosis [SPUBC]
- Approvals/Marks: CE - cURus (all) - cULus (SPUC only) - TÜV (SPUC only)

#### MAIN FEATURES

- Power supply independent from charger [SPUBC], to be used in addition to 12 or 24 V power supply [SPUC]
- Remote indication for battery operation and battery low
- "Start from battery" and "Empty battery charging" features [SPUBC]



## Notes

[illegible]

## OUR SALES NETWORK IN EUROPE

### AUSTRIA

Carlo Gavazzi GmbH  
Ketzerergasse 374,  
A-1230 Wien  
Tel: +43 1 888 4112  
Fax: +43 1 889 10 53  
office@carlogavazzi.at

### BELGIUM

Carlo Gavazzi NV/SA  
Mechelsesteenweg 311,  
B-1800 Vilvoorde  
Tel: +32 2 257 4120  
Fax: +32 2 257 41 25  
sales@carlogavazzi.be

### DENMARK

Carlo Gavazzi Handel A/S  
Over Hadstenvej 40,  
DK-8370 Hadsten  
Tel: +45 89 60 6100  
Fax: +45 86 98 15 30  
handel@gavazzi.dk

### FINLAND

Carlo Gavazzi OY AB  
Ahventie, 4 B  
FI-02170 Espoo  
Tel: +358 9 756 2000  
myynti@gavazzi.fi

### FRANCE

Carlo Gavazzi Sarl  
Zac de Paris Nord II, 69, rue de la Belle Etoile,  
F-95956 Roissy CDG Cedex  
Tel: +33 1 49 38 98 60  
Fax: +33 1 48 63 27 43  
french.team@carlogavazzi.fr

### GERMANY

Carlo Gavazzi GmbH  
Pfnorstr. 10-14  
D-64293 Darmstadt  
Tel: +49 6151 81000  
Fax: +49 6151 81 00 40  
info@gavazzi.de

### GREAT BRITAIN

Carlo Gavazzi UK Ltd  
4.4 Frimley Business Park,  
Frimley, Camberley, Surrey GU16 7SG  
Tel: +44 1 276 854 110  
Fax: +44 1 276 682 140  
sales@carlogavazzi.co.uk

### ITALY

Carlo Gavazzi SpA  
Via Milano 13,  
I-20045 Lainate  
Tel: +39 02 931 761  
Fax: +39 02 931 763 01  
info@gavazziacbu.it

### NETHERLANDS

Carlo Gavazzi BV  
Wijkermeerweg 23,  
NL-1948 NT Beverwijk  
Tel: +31 251 22 9345  
Fax: +31 251 22 60 55  
info@carlogavazzi.nl

### NORWAY

Carlo Gavazzi AS  
Melkeveien 13,  
N-3919 Porsgrunn  
Tel: +47 35 93 0800  
Fax: +47 35 93 08 01  
post@gavazzi.no

### PORTUGAL

Carlo Gavazzi Lda  
Rua dos Jerónimos 38-B,  
P-1400-212 Lisboa  
Tel: +351 21 361 7060  
Fax: +351 21 362 13 73  
carlogavazzi@carlogavazzi.pt

### SPAIN

Carlo Gavazzi SA  
Avda. Iparraguirre, 80-82,  
E-48940 Leioa (Bizkaia)  
Tel: +34 94 480 4037  
Fax: +34 94 431 6081  
gavazzi@gavazzi.es

### SWEDEN

Carlo Gavazzi AB  
V:a Kyrkogatan 1,  
S-652 24 Karlstad  
Tel: +46 54 85 1125  
Fax: +46 54 85 11 77  
info@carlogavazzi.se

### SWITZERLAND

Carlo Gavazzi AG  
Verkauf Schweiz/Vente Suisse  
Sumpfstrasse 3,  
CH-6312 Steinhausen  
Tel: +41 41 747 4535  
Fax: +41 41 740 45 40  
info@carlogavazzi.ch

## OUR SALES NETWORK IN THE AMERICAS

### USA

Carlo Gavazzi Inc.  
750 Hastings Lane,  
Buffalo Grove, IL 60089, USA  
Tel: +1 847 465 6100  
Fax: +1 847 465 7373  
sales@carlogavazzi.com

### CANADA

Carlo Gavazzi Inc.  
2660 Meadowvale Boulevard,  
Mississauga, ON L5N 6M6, Canada  
Tel: +1 905 542 0979  
Fax: +1 905 542 22 48  
gavazzi@carlogavazzi.com

### MEXICO

Carlo Gavazzi Mexico S.A. de C.V.  
Circuito Puercultores 22, Ciudad Satelite  
Naucalpan de Juarez, Edo Mex. CP 53100  
Mexico  
T +52 55 5373 7042  
F +52 55 5373 7042  
mexicosales@carlogavazzi.com

### BRAZIL

Carlo Gavazzi Automação Ltda.Av.  
Francisco Matarazzo, 1752  
Conj 2108 - Barra Funda - São Paulo/SP  
Tel: +55 11 3052 0832  
Fax: +55 11 3057 1753  
info@carlogavazzi.com.br

## OUR SALES NETWORK IN ASIA AND PACIFIC

### SINGAPORE

Carlo Gavazzi Automation Singapore Pte. Ltd.  
61 Tai Seng Avenue #05-06  
Print Media Hub @ Paya Lebar iPark  
Singapore 534167  
Tel: +65 67 466 990  
Fax: +65 67 461 980  
info@carlogavazzi.com.sg

### MALAYSIA

Carlo Gavazzi Automation (M) SDN. BHD.  
D12-06-G, Block D12,  
Pusat Perdagangan Dana 1,  
Jalan PJU 1A/46, 47301 Petaling Jaya,  
Selangor, Malaysia.  
Tel: +60 3 7842 7299  
Fax: +60 3 7842 7399  
sales@gavazzi-asia.com

### CHINA

Carlo Gavazzi Automation  
(China) Co. Ltd.  
Unit 2308, 23/F.,  
News Building, Block 1,1002  
Middle Shennan Zhong Road,  
Shenzhen, China  
Tel: +86 755 83699500  
Fax: +86 755 83699300  
sales@carlogavazzi.cn

### HONG KONG

Carlo Gavazzi Automation  
Hong Kong Ltd.  
Unit No. 16 on 25<sup>th</sup> Floor, One Midtown,  
No. 11 Hoi Shing Road, Tsuen Wan,  
New Territories, Hong Kong  
Tel: +852 26261332 / 26261333  
Fax: +852 26261316

## OUR COMPETENCE CENTRES AND PRODUCTION SITES

### DENMARK

Carlo Gavazzi Industri A/S  
Hadsten

### MALTA

Carlo Gavazzi Ltd  
Zejtun

### ITALY

Carlo Gavazzi Controls SpA  
Belluno

### LITHUANIA

Uab Carlo Gavazzi Industri Kaunas  
Kaunas

### CHINA

Carlo Gavazzi Automation (Kunshan) Co., Ltd.  
Kunshan

## HEADQUARTERS

Carlo Gavazzi Automation SpA  
Via Milano, 13  
I-20045 - Lainate (MI) - ITALY  
Tel: +39 02 931 761  
info@gavazziautomation.com



**CARLO GAVAZZI**  
Automation Components

*Energy to Components!*

[www.gavazziautomation.com](http://www.gavazziautomation.com)

