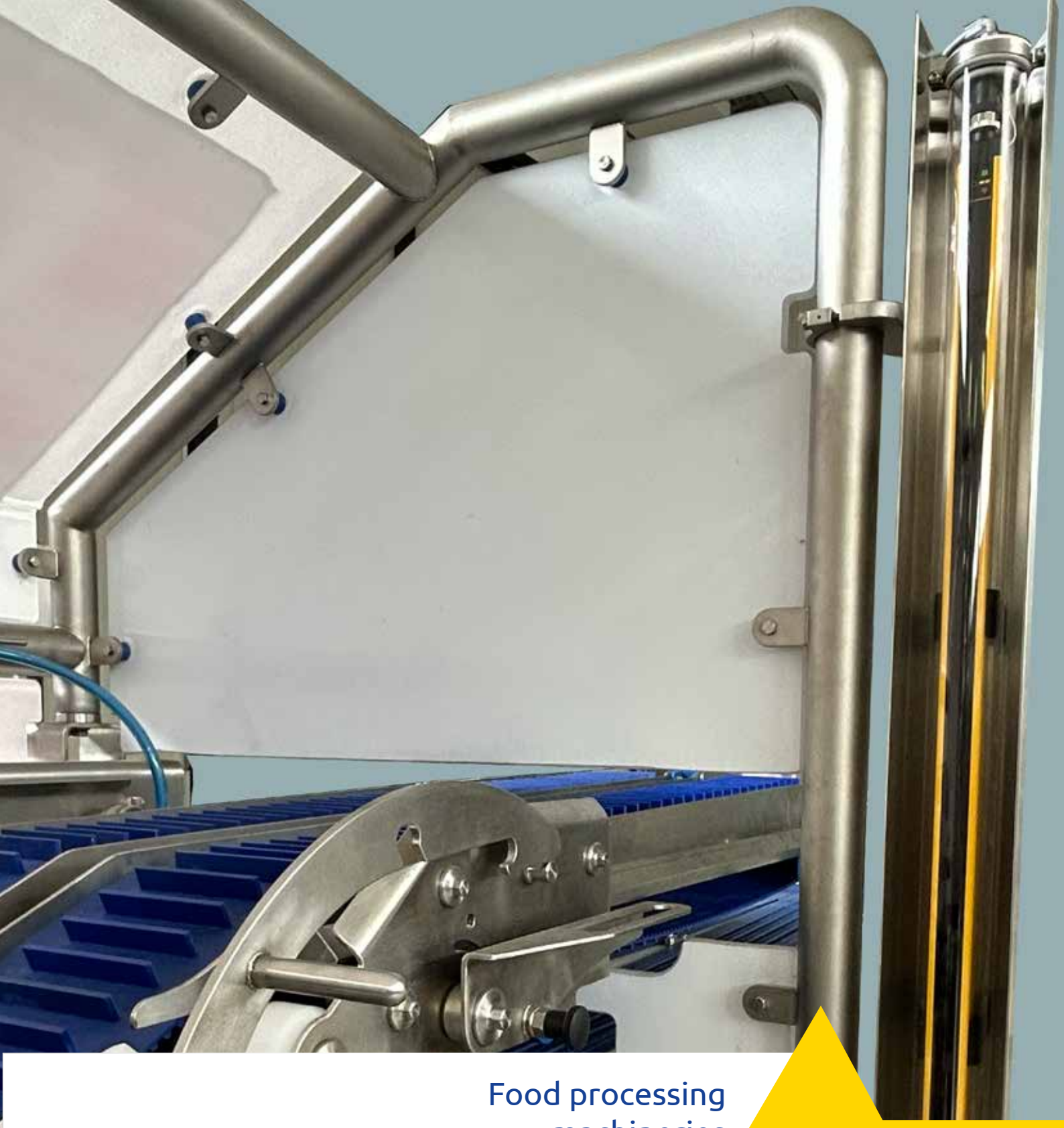


Food processing machineries

Food & beverage industry applications

REER
Your future's safe!

whitepaper

Application

Food packaging machines

Specifically, we will analyze machines for the handling and loading into trays of foods designed and manufactured by the company Elcat, a reality Cuneo-based company with an international scope.

In fact, Elcat's solutions and machinery in 90 percent of cases are exported to international markets.

The company's specialization is the design and assembly of machines for the handling and packaging of food.

Some examples of these machines:

- Tray loading or thermoforming machines - Used for handling, dosing, stacking or rolling food (for example: cheese slices, cold cuts, hams, hamburgers).
- Machines for picking, aligning and placing portions of food (for example: cheese sticks or meat).
- Weight Dosing Machines - For weighing and packaging (for example: cheese cubes, olives, taralli, and other foods).

The machines are mainly made of stainless steel and other materials suitable for use in the food industry.

Elcat machines are composed of several semi-independent modules, each of them performing a dedicated process.

- Loaders in trays or thermoforming machines
- Robotic modules for proportioning and dosing foodstuffs
- Turrets for portion overlapping
- Wrapping modules
- Modules for dosing by weight
- Loaders with centrifugal food.

Request

Find solutions to protect operators in the event that a hazardous condition exists during machine operation under normal operating conditions and during maintenance operations. For example, approaching a limb in the area where there are moving parts considered dangerous.

However, this protection must be implemented with certain factors in mind:

1. An unobstructed view of the production process must always be maintained and rapid intervention guaranteed. This effectively limits the use of physical protective guards such as gates and doors.
2. Areas of accumulation of dust and contaminating particles, which in the food industry are considered a source of risk to food quality and consumer health, must be eliminated as far as possible.
3. Components must be chosen from those suitable for food contact and capable of withstanding the frequent daily washing and cleaning cycles that must be carried out on food machinery.

A second requirement relates to the different operating modules of which the machines are composed. Each operating module provides a specific safety solution (mobile or fixed guards, safety sensors, barriers, devices such as E-STOP).

It is therefore necessary to centralise the safety controls to prevent a problem with one module's safety device from blocking the entire line.

Furthermore, to simplify the installation of the machinery, the requirement is to be able to connect the safety system with as little cable possible to the safety system.

Example of a semi-independent module - Stretch wrapper

The E-STOP safety device is highlighted in the picture.

ReeR solution

Safety solutions were entrusted to ReeR components and technology.

EOS4 WTHF safety barriers are used to provide on-board machine protection, which allow

stop the machine in the event that the operator introduces a limb or leans into the danger zone.

The light curtains occupy very little space compared to a physical guarding system, allowing you to

to maintain an unobstructed view of the production process while guaranteeing extremely rapid intervention.

Also considering the reduced dimensions compared to a door or physical guard, the use of safety light curtains also allows the elimination of several areas of dust and contaminating particle accumulation.

The watertight EOS IP69K safety barrier housing, which protects the barrier itself, makes it suitable for contact with food and able to withstand the frequent daily washing and cleaning cycles that have to be carried out on food machinery.

In the specific application, a barrier with watertight container was used

EOS4 1203 XH WTHF	
Part number:	1110297
Protected heights:	1210 mm
Number of beams:	61
Overall height:	1387 mm
Range:	17 m

Please refer to the website for the ReeR safety barriers.

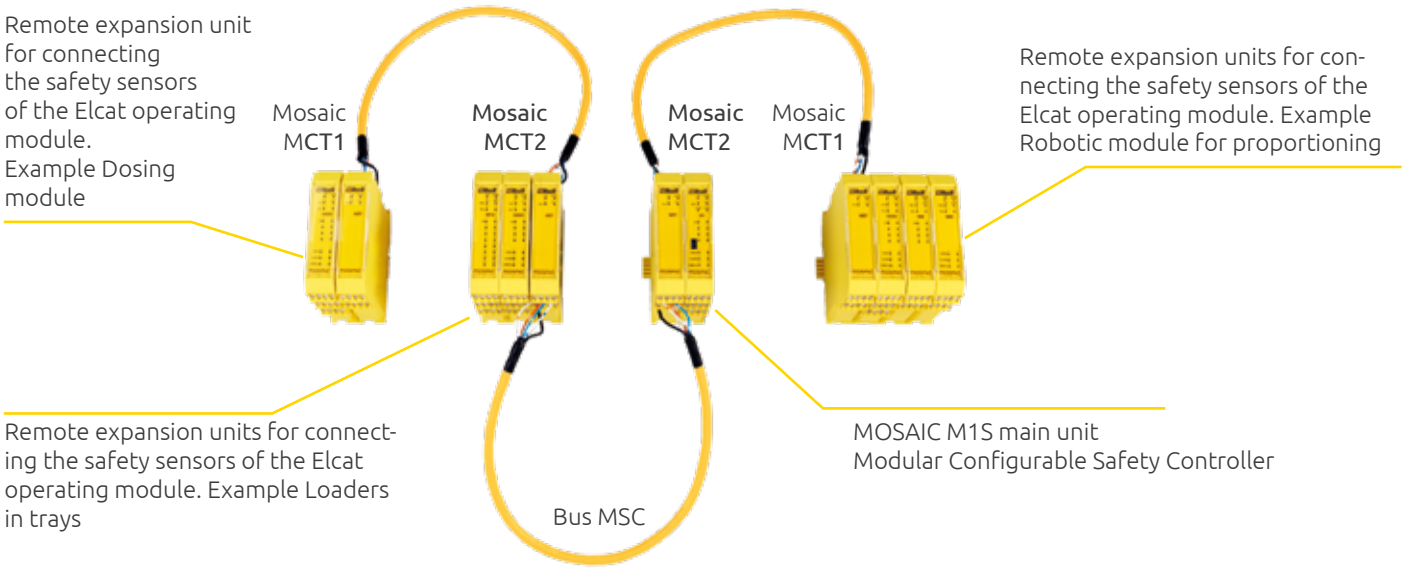
EOS4 X / EOS4 XH
Watertight enclosure, food-graded, IP69K certified

Light curtain model	EOS4 X (14 mm resolution) EOS4 XH (20, 30, 40, 50, 90 mm resolution)
Response time (ms)	2,5 ... 20
Safety outputs	2 PNP - 400 mA at 24 VDC with short-circuit, overload, polarity reversal protection
Power supply (VDC)	24 ± 20%
Status Display	LEDs for light curtain's status and diagnostic
Operating temperature (°C)	WTF: 0 ... +55 WTHF: -25 ... +50 (with heating system)
Max. water pressure jets	80 ... 100 bar at 80° C (± 5° C)
Max. range (m)	Selectable 2 or 5 for 14 mm resolution models Selectable 8 or 17 for H versions
Electrical connections	10-meter cable pre-wired with cable gland
WTHF heated power consumption	2 to 10 W per element depending on barrier height (see technical manual) - 24 VDC power supply
Fastening	Fastening brackets included

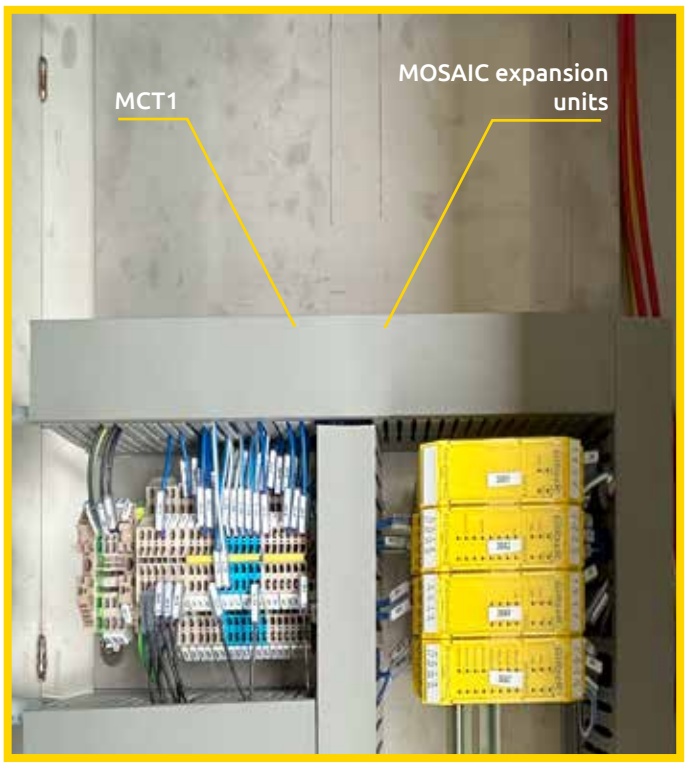
ReeR solution

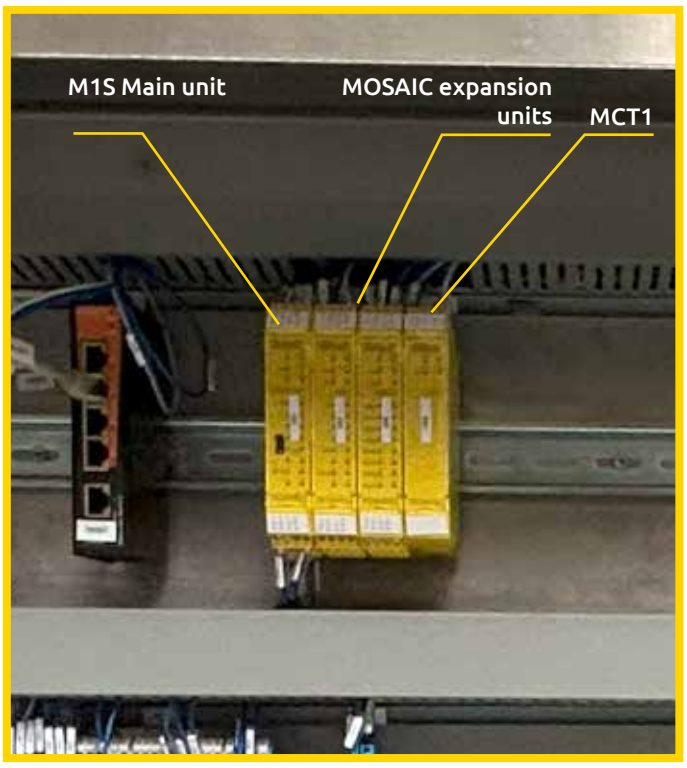
The centralisation of the safety controls simplifies the installation of the different operating modules of the machine considerably. Each module can be separated from the others and, as far as the safety system is concerned, only one cable is needed to connect the entire system. Only one cable is required to connect the entire system.

All Elcat machine operating modules are equipped with many safety sensors (barriers, door opening sensors, emergency controls, safety photocells, etc.). All the sensors of a module are connected to the inputs and outputs of the **MOSAIC Expansion Units**, which in turn are remote-controlled via the **MOSAIC MCT1 and MCT2 Communication Units**. These communication units allow the expansion units to be connected to a single centralised safety control unit (**MOSAIC Main Unit M1S**).



Example of security system de-centralisation realised by MCT communication units





ReeR solution

In addition, the solution of centralising security control allows intelligent evaluation of the signals received from the different sensors and safety devices. For example, interrupting the operation of only the module that has highlighted a problem and not the entire line.

This possibility is realised with a continuous exchange of information between the MOSAIC safety controller and the PLC that manages the machine automation.

Much appreciated by Elcat technicians is the remote control mode that can be achieved with the MOSAIC M1S COM main unit, which can be connected to an Ethernet network and then fully controlled via an internet connection.

This allows ELCAT technicians to remotely intervene on machine settings, reprogramming and/or resolving customer needs quickly and easily regardless of where the machine is physically installed.

MCT1 - MCT2
Remote interface units

Interface module allowing the connection of remote expansions units via the MSC bus.

Connections	MCT1 - 1 connection: 1 input or 1 output to be placed at the beginning or at the end of the network MCT2 - 2 connections: 1 input and 1 output
Cable	Shielded RS 485 serial interface compatible cable (4 wires + shield) via the connector block. We recommend the use of ReeR's MCTx cables for a correct operation of the system
Total distance	Up to 50 m for each connection (total distance up to 250 m). Max. 5 MCT expansions units
LED signalling	Module status and fault diagnostics
Connection to Master Unit	Via MSC connector (included)

Mosaic M1S COM
Enhanced field-bus ready

The enhanced version of the master unit allows to control complex system and machinery that require a greater number of safety outputs, status outputs and logical operators.

The new version **field-bus ready**, with two RJ45 lan connectors, as well as interfacing with the main Ethernet field buses, allows configuration from remote.

Digital inputs	8
Safety outputs	4 single OSSD or 2 pairs
EDM/RESTART	Up to 4 (For each module, the total number of inputs for restart interlock and EDM + status outputs must not exceed 4.)
Test outputs	4
Status outputs	Up tp 4
Logical operators	128
Field bus protocols	Ethernet IP, EtherCAT, PROFINET, Modbus TCP

Soluzione ReeR

Il Mosaic system in its maximum expansion (main unit + 14 expansion units) provides, depending on the main unit used:

Main unit	Mosaic M1	Mosaic M1S	Mosaic M1S COM	Note
Maximum number of expansion units	14	14	14	
USB port	yes	yes	yes	USB 2.0 (High speed)
LAN port	no	no	yes	Ethernet connection (10/100 Mbit)
MCM card slot	yes	yes	yes	
Connection with MSC bus	yes	yes	yes	
MSC connector provided	no	no	no	
Digital inputs	128	128	128	
Start/Restart inputs and External Device Monitoring	16	Up to 32	Up to 32	Inputs for restart interlock and EDM of the Mosaic M1S, Mosaic M1S COM main modules, MO4L and MI8O4 modules can be converted to status outputs. For each module, the total number of inputs for restart interlock and EDM + status outputs must not exceed 4.
Fieldbus input	8	32	32	The Mosaic M1S main unit uses a new "footprint map" for data exchange with the fieldbus units
Analogue inputs	-	16	16	Mosaic M1S and Mosaic M1S COM system only
Safety outputs (OSSD)	16	32	32	The Mosaic M1S and Mosaic M1S COM main units provides 4 single (or 2 pairs) OSSD safety outputs
Programmable status outputs	32	Up to 48	Up to 48	The status outputs of the Mosaic M1S and Mosaic M1S COM main units and MI8O4 and MO4L expansion units can be converted to feedback inputs (up to 4 feedback inputs for the 4 single OSSD safety outputs) The status outputs can reach the safety level: SIL 1 - SILCL 1 - PL c
Maximum number of operators managed by the MSD sosftware	64	128	128	
Maximum number of managed timers	32	48	48	
Maximum number of "Muting" operators	4	8	8	
Maximum number of operators "Safety Guard Lock"	4	8	8	
Maximum number of "Fieldbus Probe" outputs	16	32	32	
Supported fieldbus protocol	With MBx modules	With MBx modules	Integrated	EtherNet/IP - MODBUS/TCP - PROFINET - EtherCAT

Your future's safe!

More than 60 years of quality and innovation

Founded in Turin, Italy in 1959, ReeR prides itself in its strong commitment to innovation and technology.

ReeR's steady growth since its inception is a result of being a leader in the global safety automation industry.

Today, the Safety Division is a world leader in the development and manufacturing of safety optoelectronic sensors and controllers.

ReeR is ISO 9001, ISO 14001 and ISO 45001 certified.

Made in Italy
since 1959

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Date	05-12-2023
Applicaation	Food &beverage industry
INTERNAL USE ONLY	