CARLO GAVAZZI
Automation Components

CARLO GAVAZZI

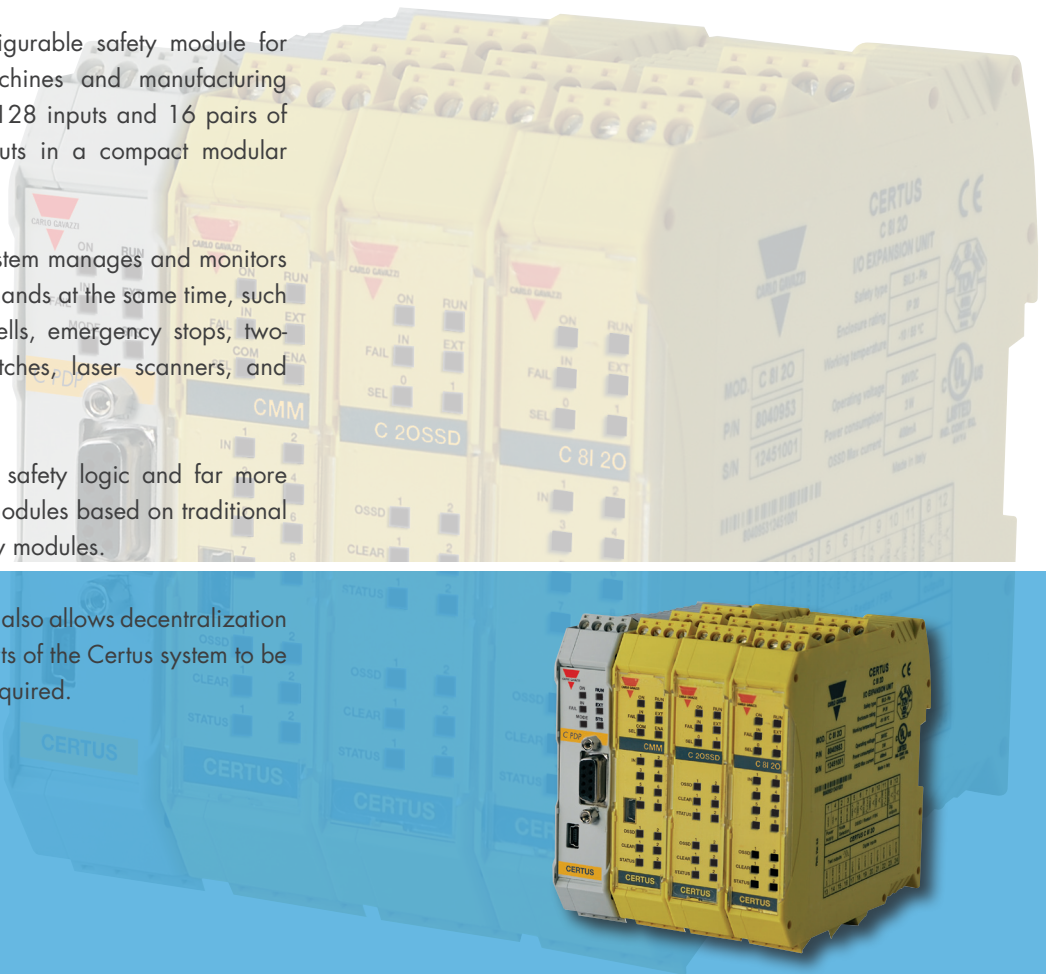**Certus Configurable Safety Module**

Sensors

CERTUS

Certus Configurable Modular Safety Module

Certus is a new modular configurable safety module for the protection of people, machines and manufacturing plants, offering a maximum of 128 inputs and 16 pairs of programmable solid state outputs in a compact modular system.

The new Certus configurable system manages and monitors several safety sensors and commands at the same time, such as safety light curtains, photocells, emergency stops, two-hand controls, mechanical switches, laser scanners, and safety mats.

Certus offers a robust versatile safety logic and far more flexibility than standard safety modules based on traditional components, such as relay safety modules.

The flexible Certus safety module also allows decentralization via its CBT module, allowing parts of the Certus system to be mounted in remote cabinets if required.

Versatile and flexible configurable modules

The Certus modular system is comprised of:

- A Configurable Master Module (CMM), which can be used in stand-alone mode, featuring 8 safety inputs and 2 separate programmable dual channel solid state outputs.

- A maximum of 14 expansion modules connectable to the Master Module via the Safety Communication Connector (SCC) proprietary bus to deliver up to 128 inputs and 16 OSSD pairs.

The Certus system is configurable via the Certus Configuration Software (CSS) graphic interface, which is provided with each Master Module at no extra cost. The Master Module and the expansion modules communicate via the 5 way Safety Communication Connector (SCC) proprietary bus, located in the back of each module. Through the Certus Bus Transfer (CBT) it is possible to remote the I/O expansion modules.

The Certus Configuration Software (CCS), installable in a standard PC, can be used to create complex logical conditions using logical operators and safety functions, such as: muting, timer, counters, memories, etc. via an intuitive graphic interface. Configuration data is transferred to the Master Module via a USB link.
A specific configuration held on the Master Module can be saved to the optional Configuration Memory Card (CMC), allowing its transference to another Master Module in a few easy steps. Welcome to simplified plant installation and machine maintenance!

Key features, advantages and benefits.
• Reduces the number of components (less footprint and wiring).
• Faster electrical cabinet construction.
• Flexible, intuitive and quick logical configuration software.
• Ideal for machine designers.
• Easy to set up tamper-proof safety systems.
• Simplifies machine maintenance through the Configuration
• Memory Card, which can be used to transfer the configuration program to a new Certus in just a few simple steps.
• Certified to the highest safety levels: SIL +, SILCL 3, PL e, Cat.4.

Sensors   CARLO GAVAZZI Automation Components. Specifications are subject to change without notice. Illustrations are for example only.

Safety management of a machining centre with alternated load / unload

The operator is required to position the workpiece with the forklift.

The area is protected by two horizontal safety light curtains. In this case, each light curtain must be equipped with the muting function to allow personnel access to the hazardous area when there is no danger. One of the two light curtains (the one facing the tool working area) is active, while the other is muted to allow load/unload by the operator. The muting condition of the two safety light curtains will be inverted when the tool is required to operate on the opposite side of the machine. The machine is completely protected by a fence with an acces gate equipped with a safety switch.

When the gate is opened, the system stops. The related manual restart control is located close to each safety light curtain. The system is equipped with three emergency push buttons which, if activated, stop the machine.
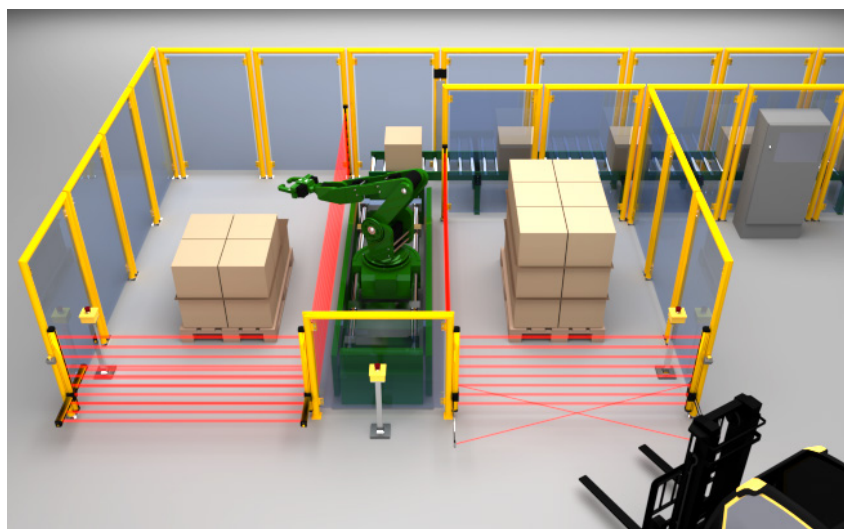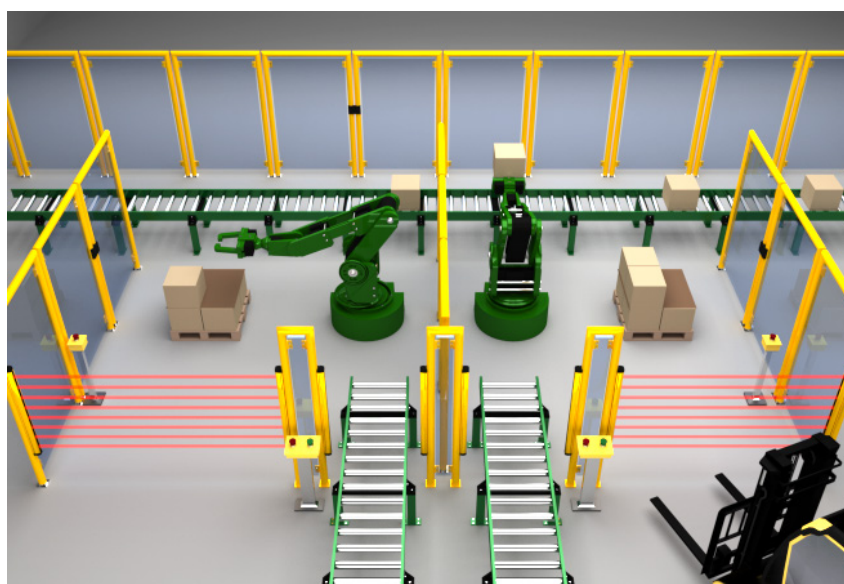
Total safety devices:
- 2 Safety light curtains
- 2 Restart buttons for the safety light curtains
- 1 Safe gate switches
- 1 Emergency push buttons

Our Solution:
- One CERTUS Master Module (CMM)
- One input expansion unit with eight digital inputs (C 8I)

Safety management of a palletising system with two robotic cells

The system is formed by a conveyor that transports boxes to two robotic palletisation cells.

The area is protected by a fence with three access gates (one for each robotic cell and one for the conveyor area) equipped with a safety switch. When the c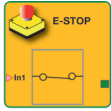onveyor area gate is opened the entire area stops. The muting condition of the two safety light curtains will be inverted when the tool is required to operate on the opposite side of the machine. The machine is completely protected by a fence with an acces gate equipped with a safety switch.

When the gate is opened, the system stops. The related manual restart control is located close to each safety light curtain. The system is equipped with three emergency push buttons which, if activated, stop the machine.

Total safety devices:
- 2 Safety light curtains
- 2 Restart buttons for the safety light curtains
- 3 Safe gate switches
- 4 Emergency push buttons

Our Solution:
- One CERTUS Master Module (CMM)
- One input expansion unit with eight digital inputs (C 8I)

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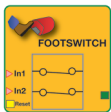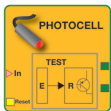**Sensors**

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E-STOP checks the status of the inputs connected to an emergency stop device.
Test outputs may be used.
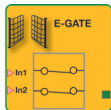Configurable inputs for contacts: 1 NC or 2 NC.
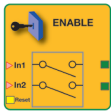
ENABLE checks the status of the inputs connected to a key type manual control device.
Test outputs may be used.
Configurable inputs for contacts: 1 NO or 2 NO.

FOOTSWITCH checks the status of the inputs connected to a safety footswitch.
Test output may be used.
Configurable inputs for contacts: 1 NC or 1 NO or 2NC or1 NO + 1NC

SAFETY PHOTOCELL checks the status of the inputs connected to one or to a series of two non selfmonitored safety photocells.
Test outputs may be used.

E-GATE - DEVICE FOR MOVABLE GUARDS checks the status of the inputs connected to a device for movable guards, such as doors and gates.
Test outputs may be used.
Configurable inputs for contacts: 2 NC or 1NC + 1 NO.

ESPE - OPTO ELECTRONIC SAFETY BARRIER OR SAFETY LASER SCANNER checks the status of the inputs of a safety light courtain or a safety laser scanner with two self-monitored static outputs.
Any device with OSSD is accepted.
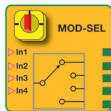
MOD-SEL - SAFETY SELECTOR checks the status of the inputs connected to a functioning mode selector (up to 4 inputs). Configurable inputs for two, three or four position selectors.
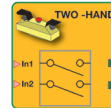
CERTUS C 8I 2O

- I/O expansion unit
- 8 digital inputs
- 2 OSSD pairs with 400mA output current
- 4 test outputs for sensor monitoring
- 2 Programmable digital signal outputs
- 2 Inputs for Start/Restart interlock and external device monitoring (EDM)
- 24 terminal points in 22.5mm
- Connectable to CMM via SCC proprietary bus

CERTUS C 8I - C 16I

- Input expansion unit:
  - C 8I: 8 digital inputs
  - C 16I: 16 digital inputs
- 4 test outputs for sensor monitoring
- 16/24 terminal points in 22.5 mm
- Connectable to CMM via SCC proprietary bus

CERTUS C 12I 8TO

- Input expansion unit: 12 digital inputs
- 8 test outputs for sensor monitoring: can control up to four 4-wire safety mats
- 24 terminal points in 22.5mm
- Connectable to CMM via SSC proprietary bus

Sensors   CARLO GAVAZZI Automation Components. Specifications are subject to change without notice. Illustrations are for example only.

TWO-HANDS - SAFETY CONTROL checks the status of the inputs connected to a two-hand safety control device. Configurable inputs for contacts: 2 NC or 2NO + 2 NC.
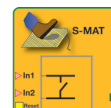
S -MAT checks the status of the inputs connected to a safety mat or safety edge.
Test outputs must be used. Cannot be used with 2-wire safety mats with terminal resistance.
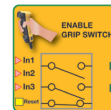
ENABLING GRIP SWITCH checks the status of the inputs connected to an enabling (aka deadman) switch.
Test outputs may be used.
Configurable inputs for contacts: 2 NO+ 1NC.
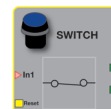
SWITCH checks the status of the input connected to a nonsafety button or switch.
A test may be used.
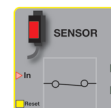
SENSOR checks the status of the input connected to a non safety sensor.
A test may be used.

Through the **STATUS** programmable non safety output, it is possible to monitor any point of the logical scheme of the application.

OSSD is a pair of solid state PNP safety outputs. For each OSSD output, it is possible, via dedicated input, to obtain manual or automatic reset and EDM control of external relays.

CERTUS C 2OSSD - C 4OSSD

- Output expansion units:
  - C 2OSSD: 2 OSSD pairs
  - C 4OSSD: 4 OSSD pairs
- Output current - 400mA
- 2/4 programmable digital signal outputs
- 2/4 inputs for Start/Restart interlock and external device monitoring (EDM)
- 16/24 terminal points in 22.5mm
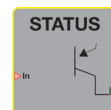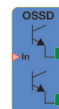- Connectable to CMM via SSC proprietary bus

CERTUS C 2R - C 4R

- Safety relay modules:
  - C 2R: 2 relays - 2 NO + 1 NC connectable to 1 OSSD pair
  - C 4R: 4 relays - 4 NO + 2 NC connectable to 2 independent OSSD pairs
- 2/4 safety relays with 6A 250VAC guided contacts
- 1/2 NC contacts for External Device Monitoring (EDM)
- 16/24 terminal points in 22.5mm

CERTUS C DDC

Expansion unit for the connection to the most common industrial Fieldbus systems for diagnostics and data communication:

- C PDP - **Profibus DP**
- C DNET - **DeviceNET**
- C CAN - **CANOpen**
- C EIP - **Ethernet IP**
- C ECAT - **EtherCAT**
- C PFNET - **PROFINET**
- C OMMS - **Universal Serial Bus**

CARLO GAVAZZI Automation Components. Specifications are subject to change without notice. Illustrations are for example only.

Sensors

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CERTUS
Certus Configurable Safety Module

Description of the Certus Master Module (CMM)

- Main unit, also usable as a stand-alone device, able to control any other expansion unit
- Configurable from PC via USB interface using CCS software
- 8 digital inputs
- 2 OSSD pairs with 400mA output current
- 4 test outputs for sensor monitoring
- 2 programmable digital signal outputs
- 2 inputs for Start/Restart interlock and external device monitoring (EDM)
- CMC configuration memory card slot
- LOG file containing the last 5 configuration modifications in chronological order, with date of modification
- 24 connectors in 22.5mm
- Possible connection with Carlo Gavazzi SCC rear bus for connection with other expansion units

The Certus master module is equipped with a USB 2.0 serial Bus for configuration connection to a PC with installed CSS (Certus Configuration Software).
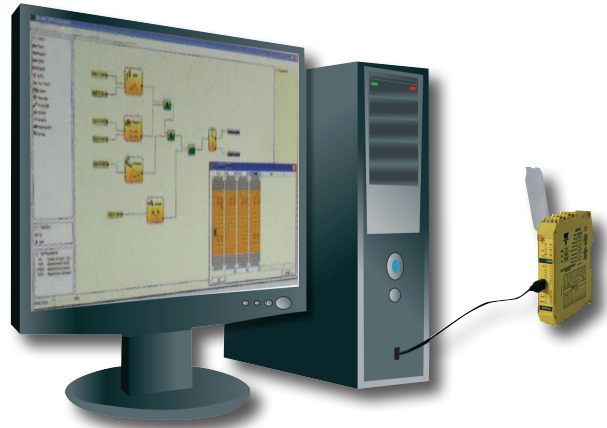
Configuration Memory Card - CMC

The Configuration Memory Card (CMC) is a proprietary removable card (optional) that can be used to save Certus configuration data for subsequent transfer to a new device/machine without using a PC.

The configuration in the CMC overwrites any other configuration present the Certus Master Module (CMM), replacing it with the configuration contained in the CMC. This configuration replacement function can be disabled on the CMM via the CCS (Certus Configuration Software).

Overwrite operations are recorded in chronological order in the CMM LOG file.

Certus CBT Bus transfer (CBT)

Certus CBT is an expansion module which allows the connection of CMM with other slave modules placed at great distances (up to 100m).

Through the use of a shielded cable (compatible with RS485 standard) two CBT modules placed at the desired distance can be linked together.
Each CBT has two independent connection channels; the connection of two CBTs can be performed by wiring a channel of your choice.

CBT has only one channel and must be connected as the first or last module.

CBT

CBT

CBT

CMM

RS 485 compatible cable

Sensors CARLO GAVAZZI Automation Components. Specifications are subject to change without notice. Illustrations are for example only.
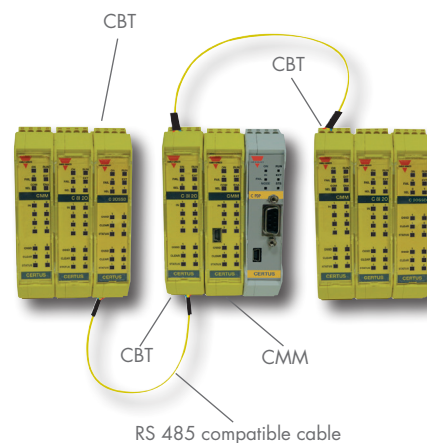
Technical Features

Module	CMM	C 8I 2O	C 8I -C 16I	C 12I 8TO	C 2OOSD - C 4OOSD	C 2R - C 4R	CBT	C DDC
Description	Programmable Master unit	I/O Expansion Units	Input Expansion Units	Input Expansion Units	Output Expansion Units	Guided contact relay output Expansion units	Bus transfer Expansion units	Expansion units for Bus*
USB	Yes	-	-	-	-	-	-	Yes
Housing for CMC	Yes	-	-	-	-	-	-	-
Connection with SCC bus	Yes	Yes	Yes	Yes	Yes	-	Yes	Yes
SCC connector provided	No	Yes	Yes	Yes	Yes	-	Yes	Yes
Safety level	SIL 3 - SILCL 3 according to IEC 61508 - IEC 62061 PLe - Cat. 4 according to ISO 13849-1					-	-	-
Safety inputs	8	8	8 - 16	12		-	-	-
Safety outputs (OSSD)	2 PNP . 400mA	2 PNP . 400mA	-	-	2 PNP . 400mA	-	-	-
Programmable signal output	2 PNP . 400mA	2 PNP . 400mA	-	-	2 PNP . 400mA	-	-	-
Test output	4	4	4	8	-	-	-	-
Safety relay outputs	-	-	-	-	-	2 NO + 1 NC 6A 250 VAC 4 NO + 2 NC 6A 250 VAC	-	-
Start/Restart input and external device monitoring (EMD)	2	2	-	-	2 - 4	-	-	-
LED signalling	Input / Output status and fault diagnostic					Output status	Output status	Diagnostic
Power supply (VDC)	24 ± 20%							
Electrical connection	Removable terminal blocks, screw contact							
Operating temperature (°C)	-10° to 55°C							
Protection rating	-20° to 85°C							
Fastening	Rail fastening according to EN 50022-35 standard							
Dimensions h x w x d (mm)	99 x 22.5 x 114							

* Non-safety I/Os are provided using the Bus Unit.

CARLO GAVAZZI Automation Components. Specifications are subject to change without notice. Illustrations are for example only.

Sensors

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