



# Small but highly beneficial

Transponder-coded safety switch  
**CTM** with guard locking

**EUCHNER**  
More than safety.

# The safety switch CTM

Smart, compact and safe – the new safety switch CTM fits into any machine. The integrated transponder technology achieves the highest safety level, category 4 / PLe (EN ISO 13849-1). Featuring a locking force of 1,000 N and an innovative ball actuator, it is ideally suited for small doors and flaps with pivoting radii from 150 mm. Two different versions for standard and hygienic applications cover a wide range of uses.

## ■ Compact design

The small dimensions (120 mm x 36 mm x 25 mm) permit simple integration into any machine design.

Door pivoting radii as small as 150 mm are possible thanks to the innovative ball actuator. The integral adhesive force (25 / 50 N) effectively prevents doors from being opened unintentionally when they are not locked.

## ■ “No chance of getting locked in”

The bistable guard locking function of the new safety switch CTM ensures that guard locking remains in its momentary state in case of a power failure or if the installation is switched off. In other words: a locked door will stay locked if it was locked before, or it can be opened and closed as needed if guard locking was not previously activated. People can therefore no longer be locked in unintentionally if the machine is switched off or if the power should fail.

## ■ Maximum safety

Transponder coding ensures maximum safety despite the small switch size. The requirements in all relevant standards can already be met with a single CTM. Irrespective of whether category 4 / PLe according to EN ISO 13849-1 must be achieved or whether the requirements in EN ISO 14119 must be met – you're always on the safe side with the CTM.

## ■ Simple series connection

The CTM's communication capabilities future-proof it for Industry 4.0. The integrated interface additionally permits connection to the new EUCHNER evaluation unit ESM-CB, which then forwards the relevant process and diagnostic data via IO-Link to the higher-level control system. Data communication functions in a series connection with additional EUCHNER devices as well.

## ■ Hygienic design

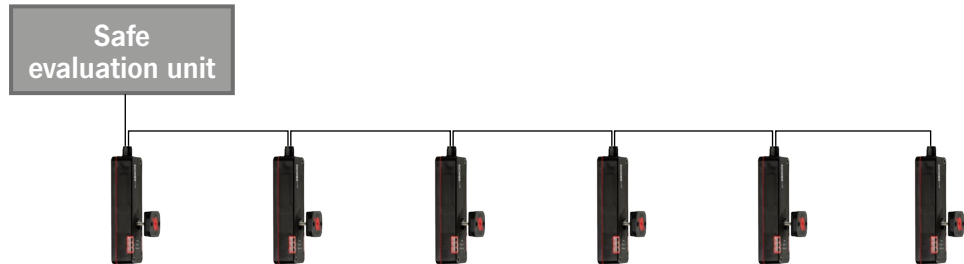
The black-and-blue hygienic version consists exclusively of food-safe materials; all plastics are approved according to EU Regulation (EC) No. 10/2011, for example. This version features smooth surfaces, rounded edges, and materials resistant to cleaning agents, making it particularly suitable for use in the food and packaging industries.



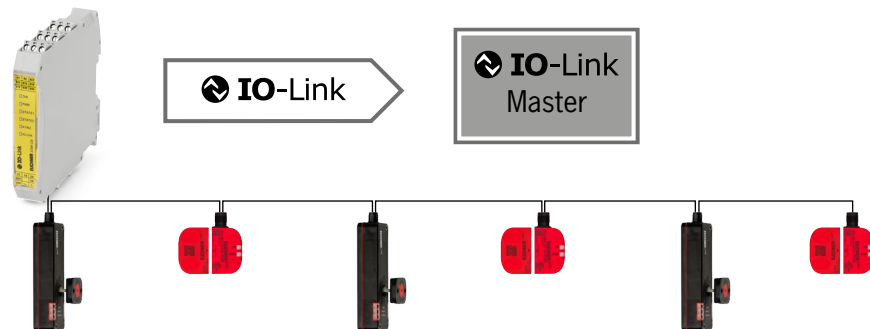
# Intelligent communication

## Examples for series connection in the field

Connection to safe PLCs or safety relays



Connection to safety module ESM-CB



## CTM IO-Link communication data

The devices transmit both process data, which the system continuously supplies to the IO-Link master, and acyclical data\*, which can be polled specifically as needed.

### Process data

Daten		Meaning
Guard position	O <sub>D</sub>	This signal indicates whether the guard is open or closed.
Status of guard locking	O <sub>L</sub>	This signal indicates whether guard locking is active or inactive.
Safety outputs switched	O <sub>M</sub>	This signal indicates whether the safety outputs are switched on. The guard must be closed and all other conditions must be met for this purpose. The safety outputs of all preceding devices in the series connection are switched on, for example.
Message pending	O <sub>I</sub>	This signal indicates a pending message. You can retrieve it via the acyclical data.
Locking element stuck	O <sub>LS</sub>	This signal indicates whether the locking arm is stuck and guard locking therefore cannot be deactivated or activated.

\*Refer to the "Industry 4.0" flyer for information about the acyclical data

## Technical data for safety switch CTM

Parameter	Value			Unit
	min.	typ.	max.	
Material seals / switch housing	Fluorinated rubber (FMK) / reinforced thermoplastic			
Degree of protection (screwed tight with the related mating connector)	IP65 / IP67 / IP69 / IP69K			
Safety class acc. to EN IEC 61140	III			
Installation orientation	any			
Mechanical life	1 x 10 <sup>6</sup> operating cycles			
Ambient temperature at U <sub>B</sub> =24 V DC	-20 ... +60			°C
Approach speed of the actuator	20			m/min
Locking force F <sub>max</sub> /F <sub>Zh</sub> (dependent on the actuator used)	1,300 / 1,000			N
Weight	approx. 0.16			kg
Connection (depending on version)	1 plug connector M12, 8-pin			
Actuating/extraction force - CTM-...161639, ...161640 - CTM-...161638, ...161496	26/18 44/32			N
Degree of contamination (external, acc. to EN 60947-1)	3 (industrial)			
Operating voltage U <sub>B</sub> (reverse polarity protected, regulated, residual ripple < 5 %)	24 ± 15 % (PELV)			
Current consumption I <sub>UB</sub> at U <sub>B</sub> = 24 V	-	-	500	mA
Ready delay	-	5.5	-	s
<b>Solenoid IMP (control input of guard locking solenoid)</b>				
Solenoid current consumption I <sub>IMP</sub> guard locking not active (open)	20	-	50	mA
Input voltage guard locking active (closed)	0	-	5	V DC
Input voltage guard locking not active (open)	20.4	-	26.4	
Power consumption at max. switching frequency	3			W
Duty cycle	100			%
<b>Safety outputs (F01A, F01B)</b>	<b>Semiconductor outputs, p-switching, short circuit-proof</b>			
Output voltage HIGH U <sub>F01A</sub> /U <sub>F01B</sub>	UB - 1.5	-	UB	V DC
Output voltage LOW U <sub>F01A</sub> /U <sub>F01B</sub>	0	-	1	
Switching current per safety output	1		150	mA
Utilization category acc. to EN 60947-5-2	DC-13 24 V 150 mA Caution: outputs must be protected with a free-wheeling diode in case of inductive loads			
Risk time single device	-	-	200	ms
Risk time delay per device	10			ms
Turn-on time	-	-	400	ms
Discrepancy time between both safety outputs acc. to EN 60947-5-3	-	-	10	ms
Test pulse duration (applies to a load with C ≤ 30 nF and R ≤ 20kΩ)	-	-	0.3	ms
Test pulse interval	-	-	100	ms
<b>Monitoring output</b>	<b>p-switching, short circuit-proof</b>			
Output voltage	0.8 x UB	-	UB	V DC
Max. load	1	-	50	mA
<b>Reliability values acc. to EN ISO 13849-1</b>	<b>Guard lock monitoring / control of guard locking</b>			
Mission time	20			years
Category	4 / 3			
Performance Level (PL)	PL e / PL d			
PFH <sub>D</sub>	4.52 x 10 <sup>-9</sup> / 1.03 x 10 <sup>-7</sup>			

## Technical data for actuator

Parameter	Value	Unit
Material housing / ball holder / elastomer	Ultradur black / stainless steel / fluorinated rubber (FMK)	
Resistance	Chemical and oil resistant	
Food safe	DIN EN 1672-2, DIN EN ISO 14159, PAH category 3	
Installation orientation	any	
Degree of protection	IP67 / IP69 / IP69K	
Mechanical life	1 x 10 <sup>6</sup>	operating cycles
Ambient temperature	-20 ... +60	°C
Weight	0.0194	kg
Locking force F <sub>max</sub> /F <sub>Zh</sub>	1,300 / 1,000	N
Overtravel	2	mm

# CTM

## in detail

Industry 4.0 ready  
through intelligent  
communication

Easy mounting

Auxiliary release  
(optional)

Bistable  
guard locking

Compact housing

Hygienic version  
additionally available

LEDs visible from  
three sides

Innovative guard locking  
principle

Flexible ball actuator for  
very small door radii

Versatile integration into  
the machine design



Shown in original size

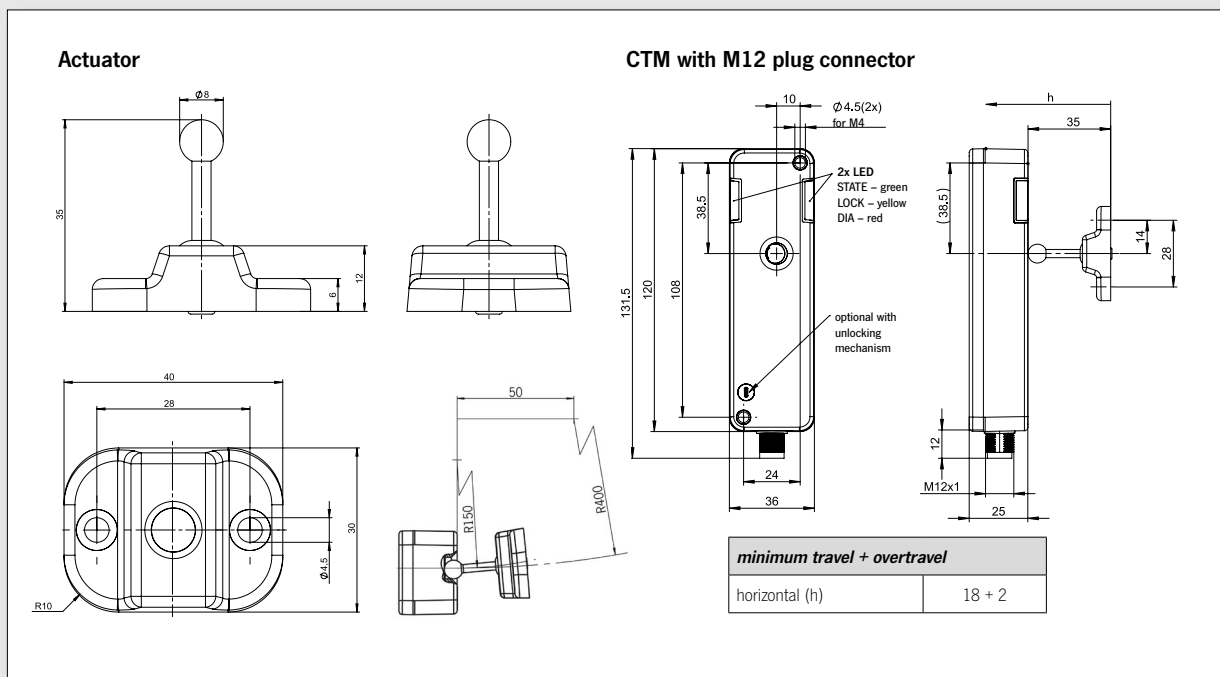
## Advantages of the CTM at a glance

- Compact size
- Guard locking with guard lock monitoring
- Locking force 1,000 N
- Simple wiring and series connection
- Suitable for small door radii thanks to ball actuator
- Bistable guard locking principle
- Comprehensive, detailed diagnostics
- Hygiene requirements are met
- Maximum safety level:  
Category 4/ PLe according to EN ISO 13849-1

Series	Guard locking principle	System family	Coding	Connection	Actuating/ extraction force	Optional release	Particularity	Order number/ type designation
CTM	LBI	BR	Unicode	M12, 8-pin	25 N	Auxiliary release		161639 / CTM-LBI-BR-U-AZ-SA-161639
							EU Regulation (EC) No. 10/2011	161640 / CTM-LBI-BR-U-ZZ-SA-P-161640
					50 N	Auxiliary release		161638 / CTM-LBI-BR-U-AZ-SA-161638
							EU Regulation (EC) No. 10/2011	161496 / CTM-LBI-BR-U-ZZ-SA-P-161496

Series	Design	Particularity	Order number/ type designation
CTM actuator	Ball actuator		161642/ A-B-A1-A1-161642
		EU Regulation (EC) No. 10/2011	161643/ A-B-A1-A1-P-161643

## Dimensions



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