

# Redundancy and motion safety minimize downtime



Redundancy keeps the machine running during disconnection

**FROM**

**Case 1 : Disconnection of a part of the network stops the machine until the disconnection is fixed.**

Disconnection	Downtime	Recovery	Operation
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**Case 2 : Disconnection of a part of the network lowers synchronization, leading to low manufacturing quality.**

Disconnection	Operation (high jitter)	Recovery	Operation
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**TO**

**Omron : Even when a part of the network is disconnected, the machine continues to run while synchronization is maintained. \***

Disconnection	Operation (jitter < 1 μs)
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Redundancy keeps the machine running even if an unexpected network disconnection occurs due to machine vibration.  
Applicable models : 1S Series/1S Series with Safety Functionality

\* Although the machine keeps running, fix the disconnection soon.

Motion safety ensures safe continuous operation

**FROM**

**Case 1 : Since safety is ensured by physically removing power in case of hazards, it takes time to restart.**

Approach of operator	Downtime	Recovery	Operation
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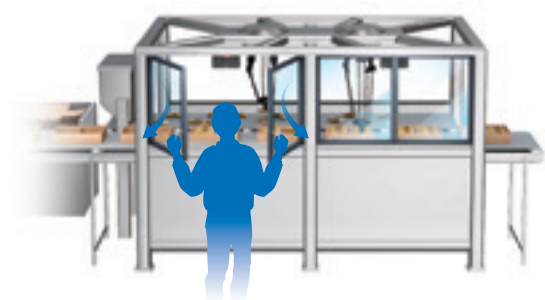
**Case 2 : Since safety is ensured by Safe Torque Off (STO) that maintains power in case of hazards, recovery time is shorter than Case 1.**

Approach of operator	Downtime (STO)	Recovery	Operation
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**TO**

**Omron : Eight motion safety functions ensure safe continuous operation in case of hazards.**

Approach of operator	Operation (SLP is enabled to ensure safety)
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Safely-Limited Position (SLP) of the drive allows the machine to keep running.  
 • When the operator approaches, the machine keeps running within the safe area.  
 • When the operator leaves, the machine keeps running within the normal area.  
 Applicable models: 1S Series with Safety Functionality

## Cable redundancy

Even if a part of the EtherCAT network is disconnected, Cable Redundancy provides continuous connectivity. This function allows you to fix disconnection without stopping the machines and production line where one controller provides both machine control and safety control.\*

\* Although the machine keeps running, fix the disconnection soon.



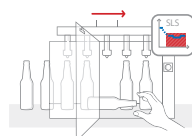
## Motion safety reduces downtime

### ISSUE

In a machine operation intervention such as removing a crashed product, the machine is stopped, so there is no production.

### SOLUTION

You can pick up the product safely with Safely-Limited Speed function. The production line is running at limited speed but it is not stopped. Machine restarts smoothly from speed limit to normal speed.

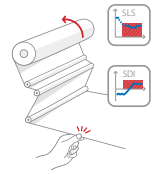


### ISSUE

In a coil change, the machine operator has to set the material in each roll with inching or jog function. It makes the change over complex and time consuming.

### SOLUTION

Machine operator can set the material in the roll with Safely-Limited Speed and introduce the film smoothly with Safe Direction function. It helps the operator to reduce the change over time and complexity.

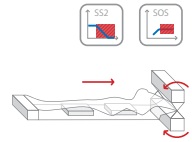


### ISSUE

Disposal of product waste occurs. If the power to a motor is stopped following an emergency stop, film may be caught in the machine.

### SOLUTION

Even in the event of machine stoppage due to an emergency stop, disposal of product waste will not occur. Power is continuously supplied to a motor even during the emergency stop, therefore preventing film from getting caught in the machine.

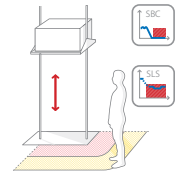


### ISSUE

In a machine operation intervention, the stacker is stopped, so there is no production.

### SOLUTION

When the operator is close, the stacker run slowly with Safely-Limited Speed without stopping. If the operator gets too close, then the Safe Brake Control function is activated to hold the stacker in a safer mode.



## Applicable models

### 1S Servo System - General purpose servo

- Up to 15 kW
- Battery-free absolute multi-turn encoder
- Safety function: STO (Cat. No. I821)



### 1S Servo System - Motion Safety servo

- Up to 3 kW
- Battery-free absolute multi-turn encoder
- Advanced safety functions: STO/SS1/SS2/SOS/SLS/SLP/SDI/SBC
- Servo drive for rotary motors with one cable connection (Cat. No. I838)



For details of controllers and slaves, refer to the Applicable Models of Cable Redundancy Function (Cat. No. R200).

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