



The new flexible Safety configuration with Hot Swap from SIGMATEK is software-based.

At a glance

The essentials in 20 seconds

- Hot Swap without machine stop saves time in the production process
- Firmware update of the Safety control enables flexible aggregate exchange
- Hot Swap Safety is completely software based
- Flexible production needs a flexible solution
- Substations with emergency stop function can be integrated, logged off and on at different locations
- Central Safety control manages up to 70 substations

Safe Slot games for Machine Builders

Safety Hot Swap enables machine networks to be changed during active operation

The modularization of production machines and lines provide flexibility in the production process. Safety technology in the machine network is also affected. Designed for modular Safety applications, the thin S-DIAS Safety system from SIGMATEK offers an interesting feature: Hot-Swap capability. With this function, a change in the machine network is also possible during active operation – without a hardware switch.

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Anyone in highly automated production systems, who can easily reconfigure their machines and lines, as well as integrate or remove functional units such as handling and extraction robots as needed, has a clear advantage when it comes to flexibility and output. However, such modular machine and system concepts have very special requirements for Safety technology: It must be just as flexibly changeable and easy to handle – of course, without compromising the Safety level.

The S-DIAS Safety system now equips the user with much more freedom in designing the Safety concept: Hot-plugging optional units was already possible in the Safety solution from SIGMATEK, to date however, the module order on the line had to be known and hard coded into the control program. With a firmware expansion in the Safety controller of the S-DIAS system, the developers were able to significantly increase the flexibility.

The general Safety application 'Flex Con with Hot Swap' is configured with all conceivable units of a machine network one-time. The only requirement is that the maximum number of Safety slave CPUs that can be used in the production process must be known. An exact position specification is, however, no longer necessary. The substations can therefore be configured in any combination desired – without changes to the Safety application.

Hot Plug – Requirements

For a Safety Hot Swap, the modular machine units must have their own Safety controller. The controllers communicate with the higher-level Safety control via the industrial Ethernet system VARAN. For dynamic Safety applications,

the central Safety control can manage up to 70 optional substations with an emergency stop function with a bus cycle time of 5 ms.

In such a flexible Safety configuration, system modules equipped with an integrated emergency stop function can then be added to machines and systems, logged off and as needed, then logged in at a different location in the machine network during active operation without having to restart.

The connection is dynamically created using a simple function-oriented login mechanism – completely without a hardware switch. The Hot-Swap concept ensures that

the machines operator must actively acknowledge the log-in of a substation to prevent it from unintentionally logging in.

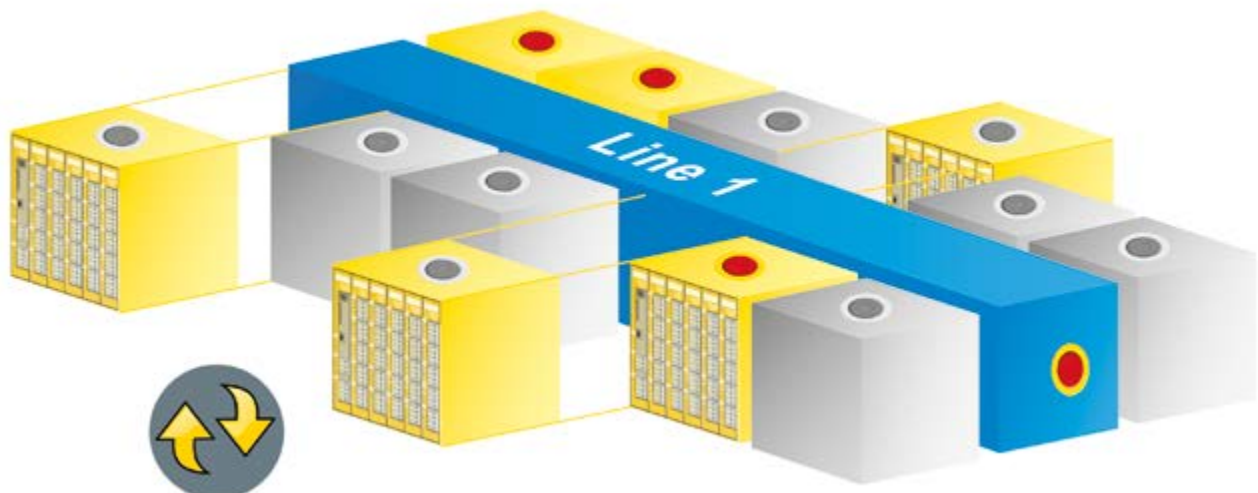
The end of the connection is triggered with a safe input. If a unit is separated from the central Safety control without first logging out, an emergency stop is triggered in all connected machine modules after the configurable Watchdog time has elapsed.

Hot Swap also Operates Wirelessly

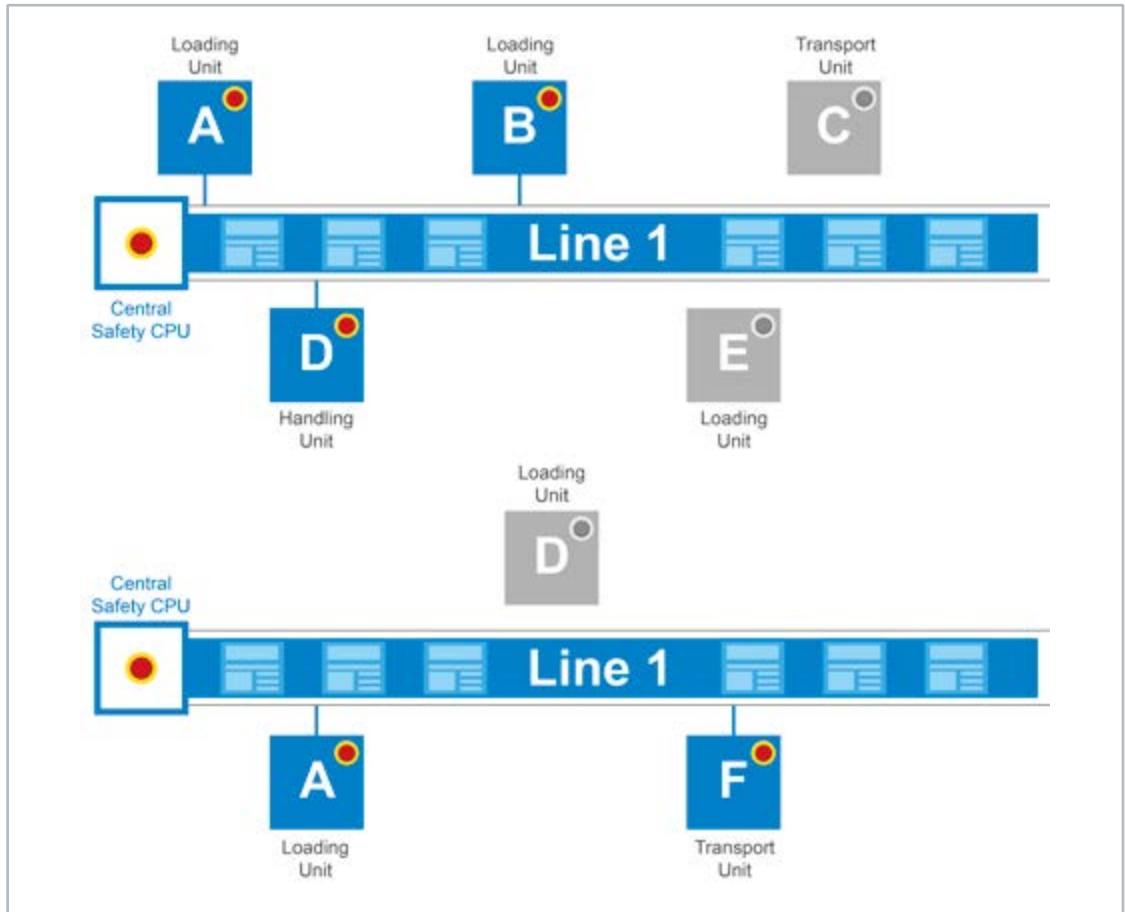
In addition to the Safety controller, the modular Safety system includes various Safety I/Os and drives with Safety functions. The Safety solution can therefore be perfectly tuned to the Safety-relevant application. The Safety technology is designed to send Safety-relevant signals via Black Channel over any communication media. With cable-connected solutions, a single line

Substations with emergency stop function can be integrated, logged off and on at different locations as desired.

With the Hot-Swap feature for the S-DIAS Safety system, modular machines and system units with emergency stop function can be flexibly reconfigured.



Typical example application from the plastic and paper packaging line: The modular loading and unloading units, as well as handling and transport systems with emergency stop function, can be integrated into or separated from the line as required via S-DIAS Safety's Hot-Swap feature – during operation and without a hardware switch.



is sufficient for Safety and standard communication. Data are transmitted over the industrial Ethernet VARAN but can also be sent wirelessly via WLAN. For this reason, the vibration-proof S-DIAS Safety system is also optimally suited for mobile applications such as automated guided vehicles (AGV).

Same Effort, More Flexibility – Engineering

Thanks to the extensive library in the LASAL Safety Designer, S-DIAS Safety applications can be comfortably configured. The certified Safety function blocks are based on the PLCopen standard and can, exactly like the safe in- or output, be placed via Drag & Drop. The integrated debugger enables the graphic representation of all values and clearly shows status and signal flow of the Safety functions. When using the S-DIAS Safety system, neither the machine manufacturer nor the user has to know at the time of delivery, which modules or subunits will be added during the lifespan



The thin S-DIAS Safety system supports flexible machine and system concepts. Safety-relevant data can be sent with standard data over a cable or wirelessly – following the Black Channel principle.

of the machine. During the active production process, machine operators save valuable time and simultaneously increase output with the Plug&Play function. S-DIAS Safety can be fully integrated into the S-DIAS control system or used as a stand-alone solution and it complies with all requirements up to SIL 3 (in accordance with IEC 62061) and PL e Cat. 4 (according to EN ISO 13849-1/-2). (sk)

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