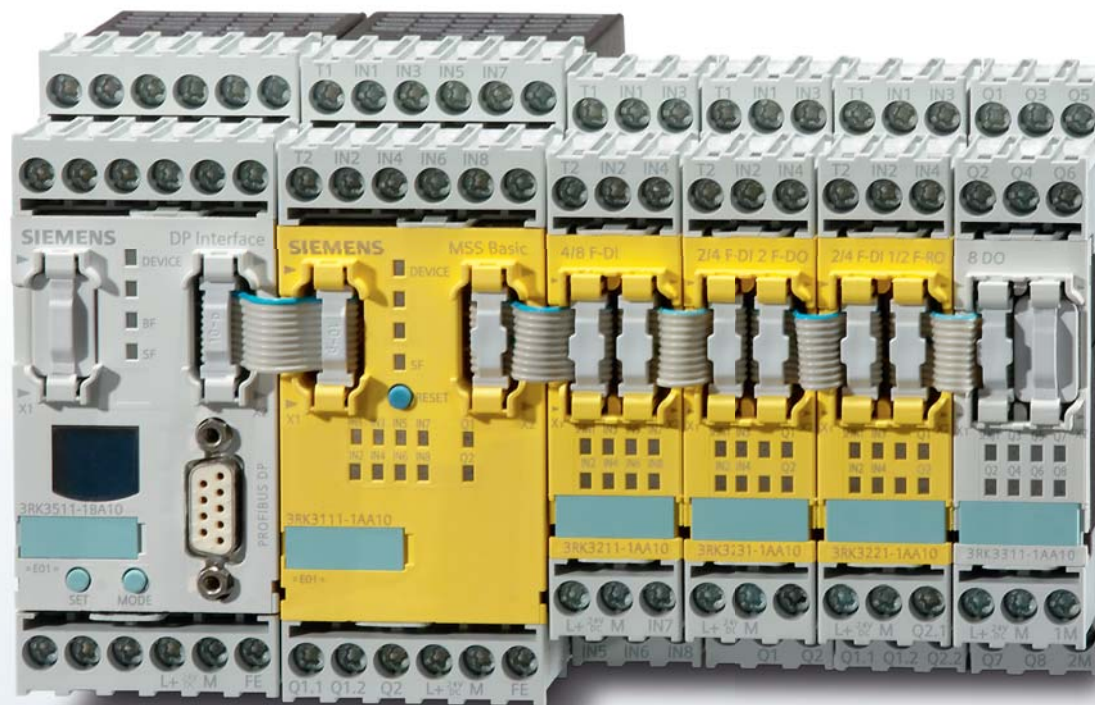# Easy parameterization of safety functions instead of complex wiring

SIRIUS 3RK3 Modular Safety System

www.siemens.com/sirius-mss

SIEMENS

Flexible and functional …

Increased Flexibility, Enhanced Functionality, Improved Safety

SIRIUS 3RK3 Modular Safety System

With Safety Integrated, we offer a consistent safety concept which facilitates seamless integration in your standard automation. SIRIUS MSS, our modular and software-parameterizable safety system rounds off our comprehensive safety technology portfolio. From individual tasks down to complex safety applications: Benefit from an integrated and safe platform for your machines' and systems' efficient utilization – whether for the implementation of new concepts or retrofits.

... for integrated safety

Our flexible and multi-functional SIRIUS MSS system features a modular design. A central module forms the safety system's core. The number of inputs and outputs can be adjusted anytime via expansion modules, thanks to which the system's quantity structure can be flexibly adjusted to the respective applications. Using a bus module, SIRIUS MSS can be connected to superior systems via PROFIBUS. The safety functions' rapid and easy parameterization is realized via the MSS ES software.

The MSS can be employed in safety applications up to Category 4 in accordance with EN 954-1 or SIL 3 in accordance with IEC 61508/62061 and Performance Level e in accordance with EN 13849-1.
The 3RK3 Modular Safety System enhances your applications' flexibility and saves costs as only the actually required modules have to be installed. Furthermore, the fast and easy parameterization via the MSS ES software produces time savings.

One System, Many Options: the Modules

3RK3 Basic central module:

All assemblies with SIRIUS MSS are based on the 3RK3 Basic central module. This module reads inputs, controls outputs and communicates with superior controls via a bus module. The complete safety program of an application is processed within the central module.

To allow for larger quantity structures, up to 7 expansion modules can be connected to the central module's right side.

Yet, already the 3RK3 Basic central module's minimum configuration offers great functionality.

Features:
– 8 safety-oriented sensor inputs
– 1 safety-oriented relay output
– 1 safety-oriented electronic output

The quantity structure of the Modular Safety System can be flexibly adjusted to the application's requirements via expansion modules. The module types can be combined as required. The following expansion modules are available.

Expansion module 4/8F-DI
– 8 safety-oriented sensor inputs

Your advantages:

■ **Tailored quantity structures:**
Whatever your requirements – the expansion modules allow for the Modular Safety System's optimum adjustability to your application.

Expansion module 2/4F-DI 1/2F-RO:
– 4 safety-oriented sensor inputs
– 2 safety-oriented relay outputs

Expansion module 2/4F-DI 2F-DO:
– 4 safety-oriented sensor inputs
– 2 safety-oriented electronic outputs

Expansion module 4/8F-RO
– 8 safety-oriented relay outputs

Expansion module 4F-DO
– 4 safety-oriented electronic outputs

Expansion module 8DI
– 8 standard inputs

Expansion module 8DO:
– 8 electronic standard outputs
– e. g. for signaling functions

The DP-Interface module serves the transmission of diagnostics and device state data to a superior PROFIBUS network. This way, up to 32 bit can be cyclically exchanged with the control. Diagnostics data can be called up acyclically.

Diagnostics display:

The diagnostics display serves the indication of diagnostics and device state data to facilitate fast detection of the cause for system standstill in case of faults or after tripping of a safety sensor.
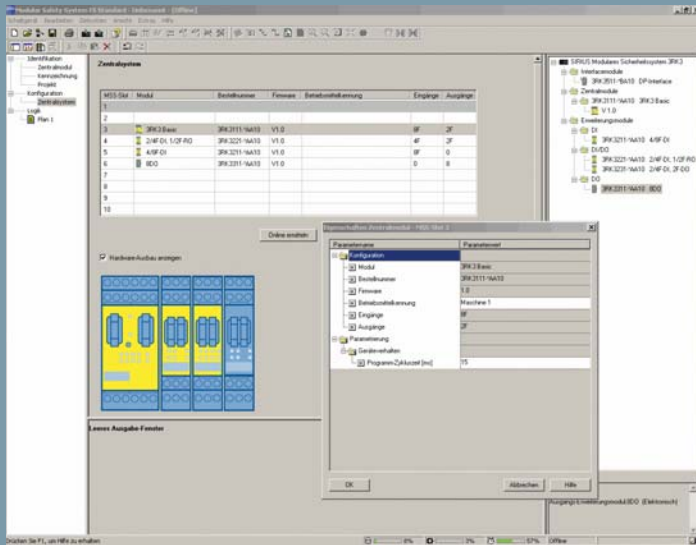
■ **Cost and space savings:**
The system's modular design facilitates rapid and easy mounting. The small design saves space in the control cabinet.

■ **Future-proof flexibility:**
SIRIUS MSS supports easy, fast and flexible responding to application changes in your system.

One Program, Ample Comfort: the Parameterization Software ...
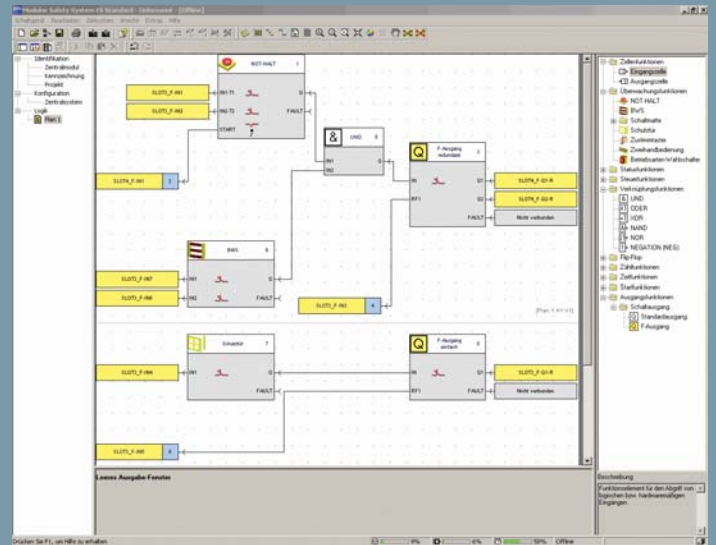
MSS ES parameterization software

The parameterization software forms part of the Modular Safety System and replaces laborious wiring of the individual functions by fast and easy parameterization.

All function elements can be placed via drag & drop. All functions – whether safety or logic functions – are provided as blocks and can also be interlinked.

Highlight: testing through forcing
The software facilitates the safety application's testing through forcing. The targeted setting of outputs allows for an advance monitoring the downstream safety function's reaction. This eases and accelerates the safety application's commissioning.

The MSS ES software furthermore serves as reliable "diagnostics tool" as it supports online monitoring of every element's state and the entire interconnection. In addition, a comprehensive documentation of the safety function is prepared.

Your advantages:

■ **Fast parameterization:**
Your software contains all elements and tools required for your application's configuration, diagnostics and commissioning.

■ **Easy interlinking:**
Blocks are provided for all functions, which can be easily interlinked via a mouse click.

■ **Comfortable operation:**
The user-friendly and clearly structured interface facilitates your safety application's comfortable parameterization, operation, monitoring and testing.

.... and its Function Elements

Monitoring functions							
	EMERGENCY STOP		ESPE monitoring (electrosensitive electronic equipment)		Safety shutdown mat		Protective door monitoring
	Enabling button		Two-hand operation		Mode selector		

Logic functions							
&	AND	≥1	OR	=1	XOR	&	NAND
≥1	NOR	1	Negation (NEG)	SR	Flip-Flop		

Counter functions						
2 1	Counter 0 –> 1	2 1	Counter 1 –> 0	2 1	Counter 0 –> 1/ 1 –> 0	

Time functions							
	ON delay		Passing make contact		OFF delay		Clock-pulse generation

Start-up functions				Output functions			
	Monitored start-up		Manual start-up	Q	Standard output	Q	F-output

Whatever your safety requirements – all conventional safety functions can be parameterized and operated with the 3RK3 Modular Safety System and the parameterization software. The monitoring functions can be logically interlinked via the logic functions.

Technical Data
Selection and Ordering Data

	3RK3 Basic central module	EM 4/8F-DI expansion module	EM 2/4F-DI 1/2F-RO expansion module	EM 2/4F-DI 2F-DO expansion module	EM 4 F-DO expansion module
Device data					
Number of sensor inputs (1-channel)	8	8	4	4	
Outputs	1 double-channel relay output 1 double-channel electronic output		2 single-channel relay outputs	2 double-channel electronic outputs	4 double-channel electronic outputs
Supply voltage / rated control supply voltage U_s (in acc. with DIN EN 61131-2)	24 V DC	24 V DC	24 V DC	24 V DC	24 V DC
Utilization category in acc. with EN 60947-5-1 (relay outputs) – AC-15 with 230 V – DC 13 with 24 V (semiconductor outputs) – DC 13 with 24 V	AC-15 2 A, 230 V DC-13 1 A, 24 V DC-13 1.5 A, 24 V		AC-15 2 A, 230 V DC-13 1 A, 24 V	DC-13 1 A, 24 V	DC-13 2 A, 24 V
Mechanical service life with rated operation, switching cycles	10 10^6 (relay)		10 10^6 (relay)		
Switching frequency z with rated operating current 1/h	1000		1000	1000	1000
Dimensions					
Height – Screw-type terminals – Spring-loaded terminals	111 mm 113 mm	102 mm 105 mm	102 mm 105 mm	102 mm 105 mm	102 mm 105 mm
Width	45 mm	22.5 mm	22.5 mm	22.5 mm	22.5 mm
Depth	124 mm	124 mm	124 mm	124 mm	124 mm
Order data					
with screw-type terminal	3RK3111-1AA10	3RK3211-1AA10	3RK3221-1AA10	3RK3231-1AA10	3RK3242-1AA10
with spring-loaded terminal	3RK3111-2AA10	3RK3211-2AA10	3RK3221-2AA10	3RK3231-2AA10	3RK3242-2AA10

EM 4/8 F-RO expansion module	EM 8 DI expansion module	EM 8DO expansion module	3RK35 interface module	Diagnostics display
	8			
8 single-channel relay outputs		8 electronic standard outputs	**DP-Interface** PROFIBUS-DP Interface, 12 Mbit/sec RJ485	
24 V DC	24 V DC	24 V DC	24 V DC	24 V DC
AC-15 2 A, 230 V DC-13 1 A, 24 V				
		DC-13 0.5 A, 24 V		
10 10^6 (relay)				
1000		1000		
111 mm 113 mm	102 mm 105 mm	102 mm 105 mm	111 mm 113 mm	60 mm
45 mm	22.5 mm	22.5 mm	45 mm	96 mm
124 mm	124 mm	124 mm	124 mm	35.6 mm
3RK3251-1AA10	3RK3321-1AA10	3RK3311-1AA10	3RK3511-1BA10	3RK3611-3AA00
3RK3251-2AA10	3RK3321-2AA10	3RK3311-2AA10	3RK3511-2BA10	

Software	Order data
MSS ES 2008 Parameterization and diagnostics software for the 3RK3 Modular Safety System – executable on PC / programming device under Windows 2000/XP/VISTA	
Basic Floating Licence:	3ZS1314-4CC10-0YA5
Standard Floating Licence:	3ZS1314-5CC10-0YA5

Accessories	Order data
Connection cable	3UF7930-0AA00-0
PC cable	3UF7940-0AA00-0
Memory module	3RK3931-0AA00
System manual	

The software and further technical data, e. g. the system manual, can be downloaded from the Internet via

www.siemens.com/sirius-mss

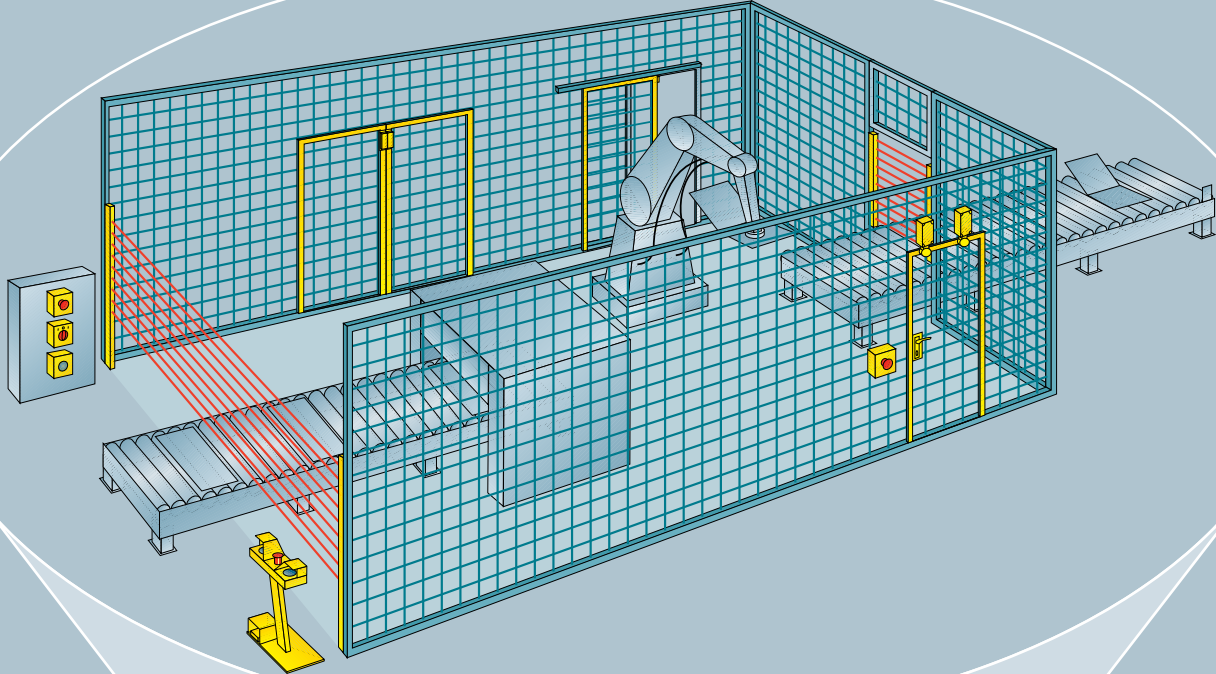# Flexible Safety
for Efficient Workflows

SIRIUS MSS offers benefits for your production all along the line. The 3RK3 Modular Safety System already pays off with smaller applications. Furthermore, the MSS can be employed sector-neutrally and globally for various applications up to Category 4 in accordance with EN 954-1, Performance Level e in accordance with EN 13849-1 and SIL 3 in accordance with IEC 61508/62061. The system facilitates your safety functions' flexible realization, reduces wiring expenditures and supports fast and easy parameterization – to save space, time and costs.

MSS application advantages at a glance

■ **High flexibility and planning reliability** through modular design

■ **More space in the control cabinet and reduced costs** through finely modular quantity structure

■ **Enhanced functionality and time savings** through software-parameterizable system

■ **Comprehensive on-site diagnostics** via the MSS ES software

■ **Improved system diagnostics, increased system availability** through data exchange via PROFIBUS

**The 3RK3 Modular Safety System –
the ideal solution for your safety application**