



Engineering



# SM-SYSTEM

## General Features

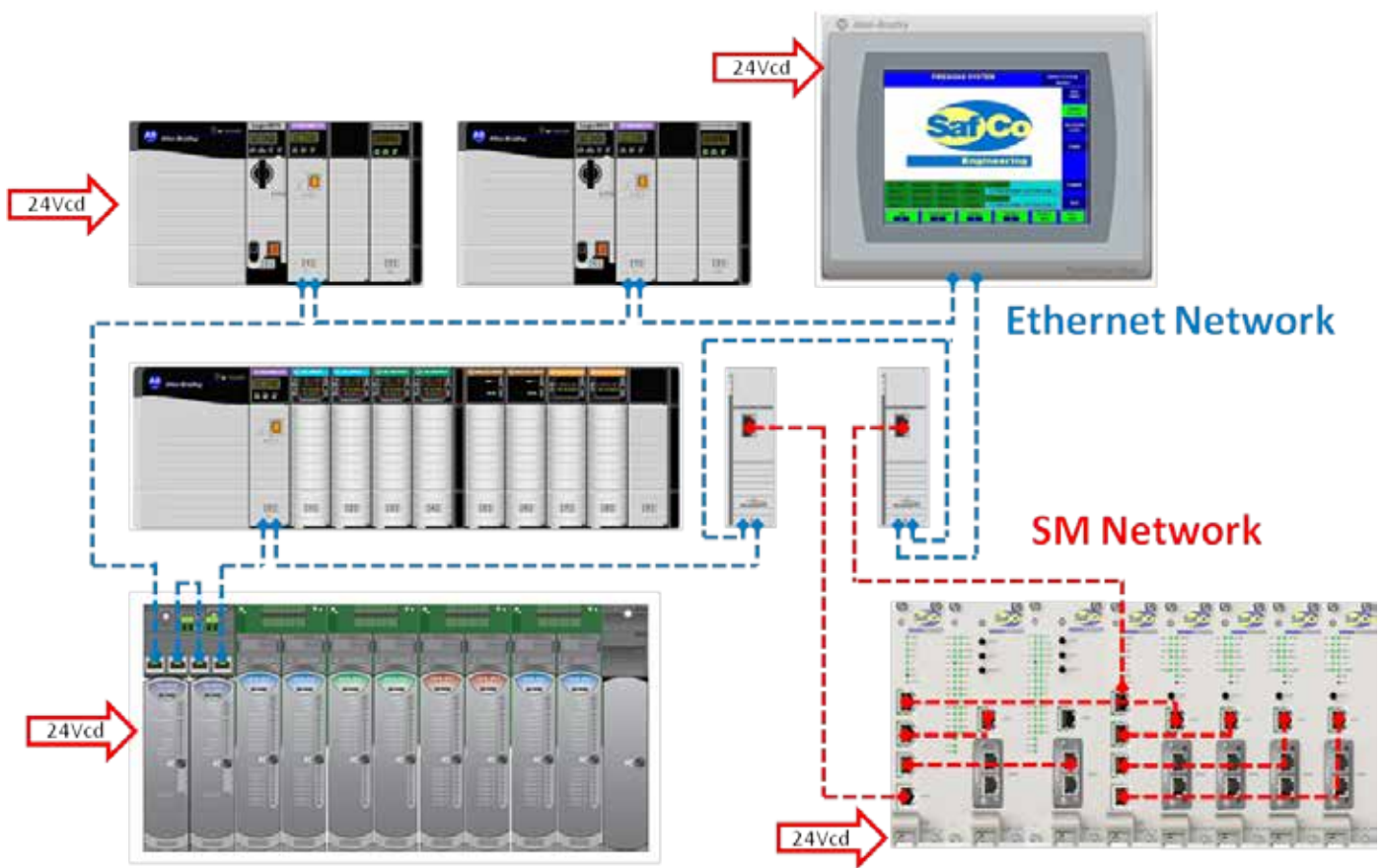
- Addressable fire detection and gas extinguishing control system designed to be fully integrated into a PLC platform solution
- Managed and controlled by a Programmable Logic Controller PLC technology
- Certified according to:
  - EN54-2: Fire detection and fire detection systems
  - EN54-4: Fire detection power supply unit
  - EN12094-1: Components of gas extinguishing systems
- Configured in single or hot backup redundant configuration in terms of IO and network connectivity
- Designed to meet SIL2 safety level according to IEC61508
- Addressable fire detection devices and multiple extinguishing systems control

# System Architecture

Thanks to the Ethernet connectivity the SM System can be configured in different ways according to the project requirements.

The SM System along with Rockwell Control Logix PLC is certified according to European standard EN54.

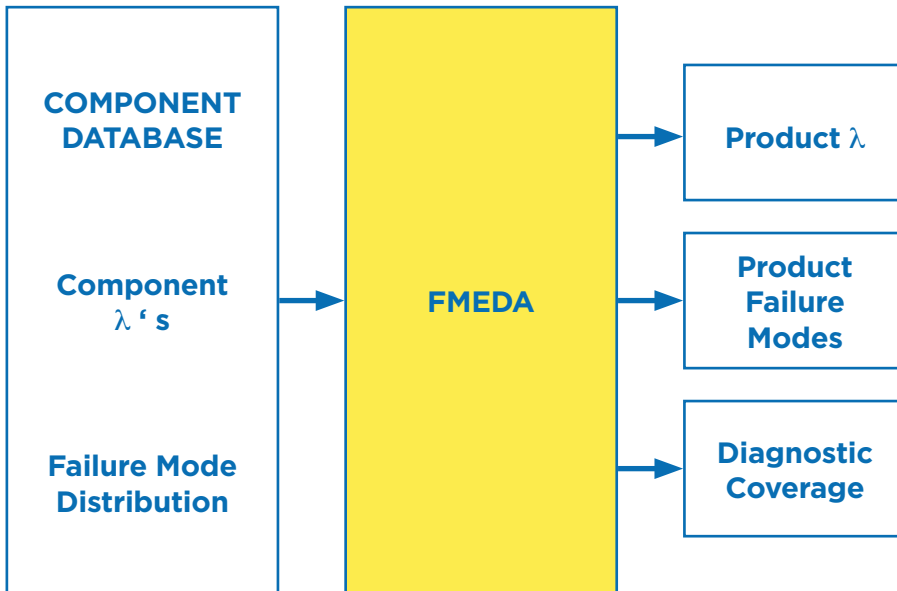
The block diagram represents a sample of configuration of a system including building addressable fire detection system, gas extinguishing control system and process single and redundant IO cards. Through card's local LAN port or optional M40 RJ45 ports (used for safety communication or customized protocol) the SM system can be integrated into the PLC architecture and can be fully incorporated into the plant network system.



**The SM series is the perfect solution to meet the high demands of safety instrument equipment in the Industry**

Designed & Certified to meet:

- SIL2 according to IEC61508-2 for the hardware
- IEC61508-3 for the firmware application of every single card



**FMEA Failure Modes, Effects and Diagnostic Analysis**

**SM-GEC**

$\lambda$ DD	3,9751E-06	SFF	9,1923E-01	91,92%	<b>SIL 2</b>
$\lambda$ DU	5,5467E-07				
$\lambda$ S	2,3377E-06				
MTTR [hours]				8	
Time Inspection Frequency (TI) [months]				48	
PFDAVG = $(\lambda DU + \lambda DD) * tCE = (\lambda DU * (TI/2 + MRT)) + (\lambda DD * MTTR)$				9,754E-03	

**SM-ALM**

$\lambda$ DD	2,0553E-06	SFF	9,9273E-01	99,27%	<b>SIL 2</b>
$\lambda$ DU	1,6548E-08				
$\lambda$ S	2,0320E-07				
MTTR [hours]				8	
Time Inspection Frequency (TI) [months]				48	
PFDAVG = $\lambda DU * (TI/2 + MTTR)$				2,900E-04	



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# System Components

Components included in the integrated EN54 system tested IMQ are:

- SM-GEC - Gas Extinguishing Cards
- SM-ALM - Addressable Fire detection Loop Card
- SM-SWITCH - 4 Port Ethernet switch cards
- SM-RACK 19" Card Rack - 4 unit
- Logic Solver Rockwell Contrologix 5000 (\*)
- Local HMI operator interface
- CBI2420A Power Supply and battery charger

## Panel view



**Rockwell  
Automation**

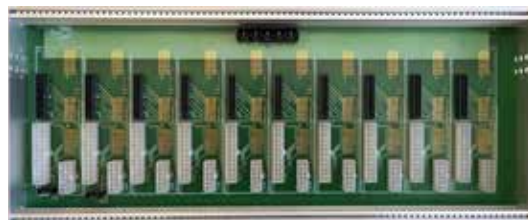
## ControlLogix PLC



## Power supply



**ADELSYSTEM**  
INTEGRATED ELECTRONIC SOLUTIONS



## SM-RACK 19" Card Rack (10 Slots)

### \* Rockwell ControlLogix PLC components included in the integrated EN54 system tested IMQ

Model	Description	Model	Description
1756-PB75	DC Power Supply	1756-OW16I	16 Point Relay Module
1756-A7	7 Slots Chassis	1756-OB32	32 Point DO Module
1756-A13	13 Slots Chassis	1783-ETAP	3 Port EtherNet/IP Tap
1756-L7x	CPU Controller	1783-MS10T	10 Port EtherNet/IP
1756-RM2	Redundancy Module	1715-A2A	Slot Adaptor Base Unit
1756-EN2TR	Ethernet Module	1715-A3IO	3 Slot Input/Output Base Unit
1756-IB16D	16 Point DI Module Monitored	1715-AENTR	Ethernet Module
1756-IB32	32 Point DI Module	1715-IB16D	16 Point DO Module Monitored
1756-IF16	16 Point AI Module	1715-IF16	16 Point AI Module
1756-IF8H	8 Point AI Module HART	1715-OB8DE	8 Point DO Module Monitored
1756-OB16D	16 Point DO Module Monitored	2711P-T7C4D9	Operator Interface Terminal

# System Components in detail



## SM-ALM

- Two isolated addressable loops - ring connection
- Apollo XP, Discovery and System Sensor (Notifier) protocols
- Single or redundant Hot back up configuration
- Hot swap card replacement
- EN54-2 Certified
- SIL-2 Certified according to IEC61508-2 and IEC61508-3
- OnLine configuration via Web Browser
- Modbus TCP/IP communication protocol
- CIP Safety (Rockwell) communication protocol for SIL application
- Customizable third party protocol
- 1 Slot space into 19" rack



## SM-GEC

- 12 Digital inputs monitored
- 9 Digital outputs monitored
- 6 Relay contacts
- Single or redundant Hot back up configuration
- Hot swap card replacement
- EN12094-1 Certified
- SIL-2 Certified according to IEC61508-2 and IEC61508-3
- OnLine configuration via Web Browser
- Modbus TCP/IP communication protocol
- CIP Safety (Rockwell) communication protocol for SIL application
- Customizable third party protocol
- 2 Slot space into 19" rack

For further details consider SM-ALM and SM-GEC datasheets

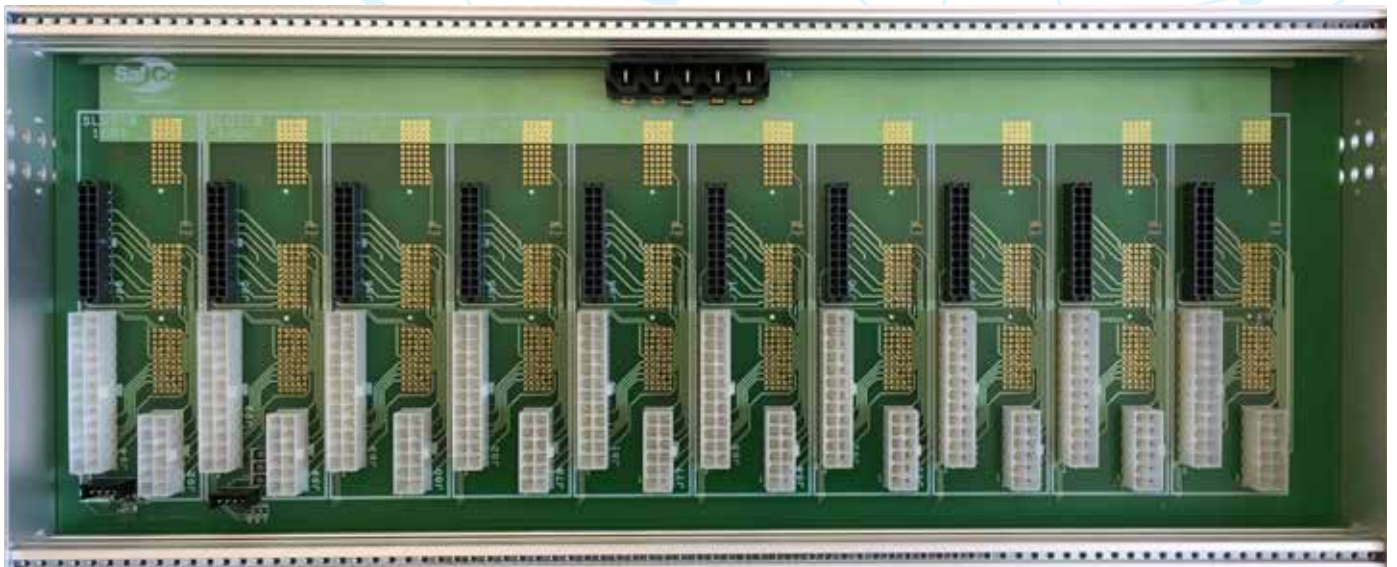
# SM-SWITCH

- 4 ethernet port 10/100mb
- led indication of internal status
- led indication of communication status
- Hot swap card replacement
- 1 Slot space into 19" rack



# SM-RACK

- 19" metal chassis
- 4 unit high
- 10 slots available space for SM cards
- 24VDC power on dedicated connector



# Local HMI operator interface

- 7" touch screen display
- Dual Ethernet connection
- Display indication as per EN54.2
- Historic event log
- Fire, Trouble, Supervisory and Disable single indication and counts
- Acknowledge, Reset and Silence touch screen button
- 24VDC power on dedicated connector

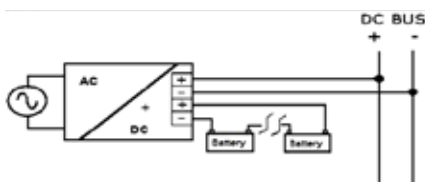


# CBI2420A Power supply and battery charger

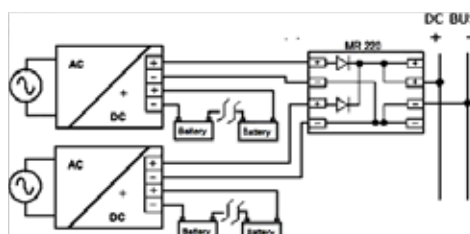
- Power Input 100-277Vac
- Maximum Power 20 A
- Range output voltage 22 ÷ 28.8 VDC
- Single, Multiple and/or Redundant Configuration
- Battery Type: Lead Acid or Ni Cd
- Battery Charger capacity up to 262Ah (tested)
- Internal diagnostic and battery control features



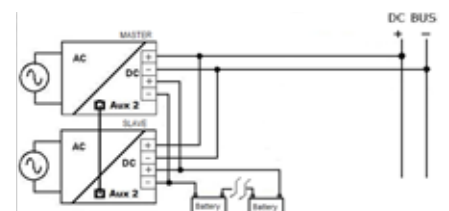
Single Configuration

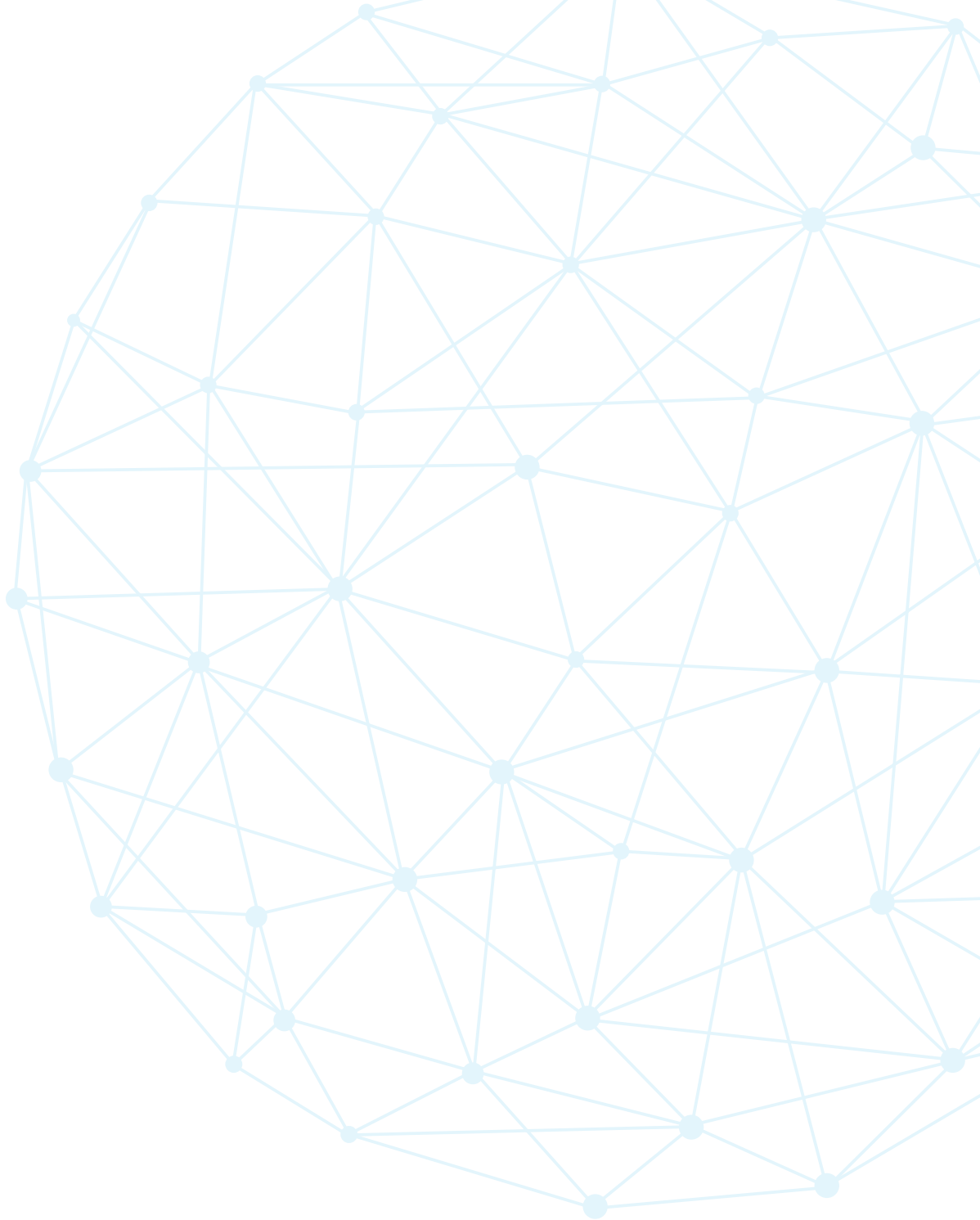


Redundant Configuration



Multiple Configuration





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