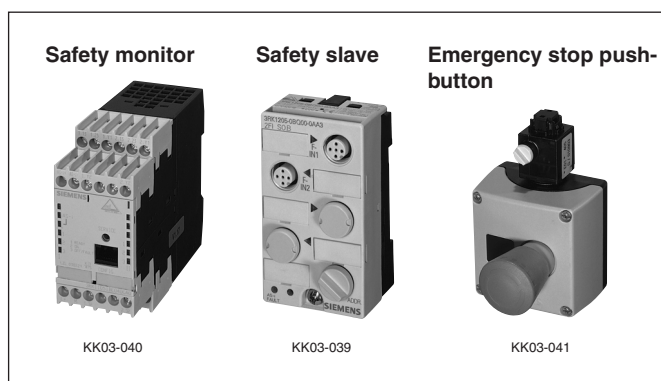


AS-Interface

Safety at Work

We import and market Siemens' Safety at Work, which transfers safety-related signals and I/O signals over a single bus.

Safety at Work (AS-i Safety) is an open network that can be added to existing AS-i systems to support EN954-1 category 4 (the highest safety class). With the globalization of both enterprises and standards (e.g., JIS), there is an increasing worldwide tendency to attach greater importance to safety in order to prevent labor accidents caused by machines. Against this background, FUJI has decided to import and market Siemens' AS-i Safety products.



■ Features

- AS-i Safety makes it possible to unify the safety components that handle all binary signals.
Examples: Emergency pushbutton switches, safety door switches, safety limit switches, safety area sensors, and output circuit configurations.
- The simultaneous operation of a number of safety components is possible over standard AS-i cable.
- No safety PLC or special master is required for AS-i Safety.
- Quickly and easily expands existing systems.
- Safety signals can be grouped.
- System diagnosis is possible through a standard AS-i master and standard PLC.

- Supports up to EN954-1 category 4 (ISO 13849-1/JIS B9705-1).
- High speed with a maximum response time of 40ms.
- Approved by TÜV and BIA (Institution for Statutory Accident Insurance and Prevention in Germany).
- Compatible with all AS-i components (IEC 62026-2 and EN 50295).
- The standard AS-i protocol is used to transfer safety signals.
- Connects to up to 30 safety slaves. (The number of safety slaves varies with the programming in the safety monitor.)
- Allows setting of stop categories 0 and 1 (EN 60204-1).

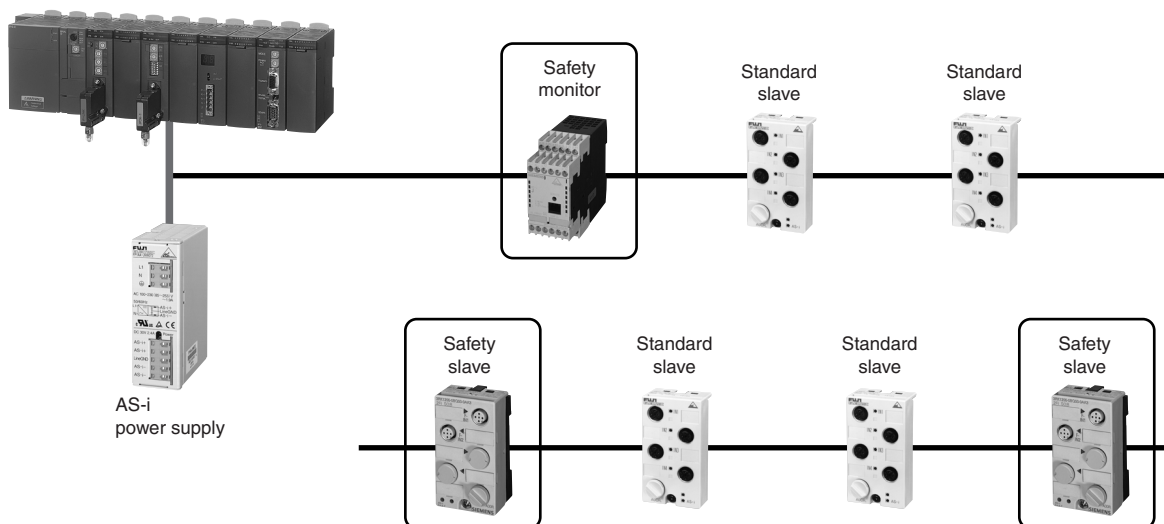
■ Types

Description		Type
Safety monitor	One enabling circuit	3RK1105-1AE04-0CA0
	Two enabling circuits	3RK1105-1BE04-0CA0
Safety monitor with extended functionality	One enabling circuit	3RK1105-1AE04-2CA0
	Two enabling circuits	3RK1105-1BE04-2CA0
Sealable cap		3RP1902
K45F safe compact module		3RK1205-0BQ00-0AA3
K45F mounting plate	Standard rail mounting	3RK1901-2DA00
	Wall mounting	3RK1901-2EA00
Input bridge for K45F		3RK1901-1AA00
Configuration software		3RK1802-2FB06-0GA0
Cable set (Safety monitor to personal computer)		3RK1901-5AA00
AS-Interface EMERGENCY STOP pushbutton	Yellow cover	3SF5 801-3AA08
	Yellow cover with protective collar	3SF5 801-3AB08

■ Description

AS-i Safety added to the standard AS-i system allows the transmission of safety signals.

Standard PLC, standard AS-i master



Constructed with only safety monitor and safety slaves added

Safety devices

■ Safety monitor

The safety monitor is the core device of AS-i Safety (Safety at Work).

The configuration of safety-related devices connected to the safety monitor is defined by the PC.

A unique control mode according to the combination is selectable with the definition on the PC.

For example, emergency stop, electromagnetic lock safety door switch, both-hand operation, and category 0 or category 1 stop can be selected.

The monitor can be controlled using the AS-i address in order to make full use of the AS-i diagnostic function.

The following two types of monitor control are possible.

- A safety monitor with a single two-channel operating circuit.
- A safety monitor with two two-channel operating circuits.

■ Safety slave

The safety slave is a compact module with two safety input terminals.

Two inputs can be used for applications extending up to category 3 safety class.

For category 4, one input point can be used.

■ AS-Interface EMERGENCY STOP pushbutton

Safety communications technology makes it possible to connect emergency stop devices directly to the standard AS-i. The emergency pushbutton box can be mounted inside or on the surface of the panel.

User advantages

- Safety-related signals and I/O signals are transmitted over a single bus cable.
- No fail-safe PLC or special master is required.
- Safety-related signals can be grouped.
- A simple system structure making use of standardized AS-i technology.
- Existing systems can be quickly expanded.
- Safety-related signals can be built into plant diagnostic functions.
- Supports EN954-1 up to category 4 (the highest safety class)
- AS-i Safety (Safety at Work) is approved by TÜV (the German Association for Technical Inspection) and BIA (a German Institution for Statutory Accident Insurance and Prevention).

AS-Interface Safety at Work Specifications

■ Specifications

Safety monitor

• General specifications

Item	Specification
Rated voltage	24V DC
Supply voltage range	20.4 to 27.6V DC
Power consumption	One enabling circuit type: 3.6W max. Two enabling circuit type: 4.8W max.
Power-off retentive time	20ms
Response time	40ms max.
Start delay time	10ms max.
Operating temperature	0 to +60°C (No icing or no condensation)
Storage temperature	-40 to +85°C (No icing or no condensation)
Degree of protection	Panel mounted type IP20
Mass	One enabling circuit type: Approx. 350g Two enabling circuit type: Approx. 450g

• AS-i specifications

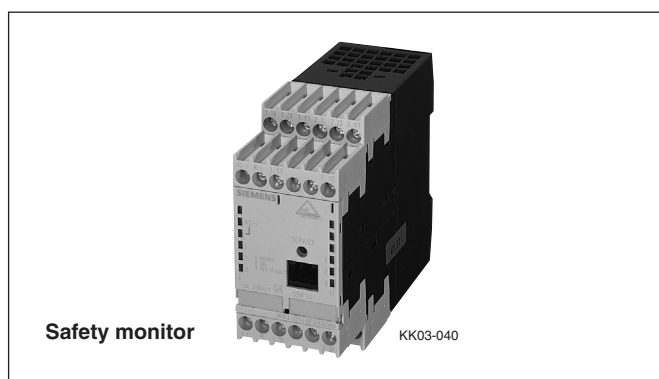
Item	Specification
Profile	Monitor 7F
ID code	7
IO code	F
Voltage range	18.5 to 31.6V
Current consumption	45mA max.

• Input specifications

Item	Specification
Start input	Photocoupler input (high active) Approx. 10mA (at 24V DC)
Protective control (EDM) input	Photocoupler input (high active) Approx. 10mA (at 24V DC)

• Output specifications

Item	Specification
Message output (Safety on)	PNP transistor output: 200mA Short-circuit protection and polarity changeover protection
Safety output rated control current	Nonpotential NO contact I _e /AC-12: 2A at 250V AC I _e /AC-15: 2A at 115V AC 2A at 230V AC I _e /DC-12: 2A at 24V DC max. I _e /DC-13: 1A at 24V DC 0.1A 115V DC 0.05A at 230V DC
Fuse	Constant-speed breaking type (MT) with a maximum breaking current of 4A used externally.
Overvoltage category	3: Conforming to VDE0110 part 1 at a rated operating voltage of 300V AC.



• Setting interface specifications

Item	Specification
Interface	RS-232C
Communications specifications	9600bps with no parity Start bit: 1, End bit: 1, Data bit: 8

• LED indication

LED	State	Description
AS-i 1	OFF	No power
	Green LED ON	AS-i power supply
AS-i 2	OFF	Normal
	Red LED ON	Communication error
1READY (each channel)	OFF	—
	Yellow LED ON	Start/Restart lock ON
	Yellow LED flashing	External test required
2ON (each channel)	OFF	Safety output connection open
	Green LED ON	Safety output connection closed
	Green LED flashing	Delay time operating in stop category 1
3OFF/FAULT (each channel)	OFF	—
	Red LED ON	Safety output connection open
	Red LED flashing	Error

K45F safe compact module

• General specifications

Item	Specification
Operating temperature	-20 to +85°C (No icing or no condensation)
Storage temperature	-40 to +85°C (No icing or no condensation)
Degree of protection	IP67
Mass	Approx. 100g
Approval	UL, CSA

• AS-i specifications

Item	Specification
ID code	B
IO configuration	0
Operating voltage	26.5 to 31.6V
Total current consumption	45mA max.



KK03-039

K45F safe compact module

• Input specifications

Item	Specification
Input type	PNP
Sensor	Mechanical contact
Low signal range	Contact open
High signal range	Contact closed Input current $I_{peak} \geq 5mA$
Pin assignment of socket 1	Pin 1 and pin 2: acts on bits D0 and D1 = channel 1 Pin 3 and pin 4: acts on bits D2 and D3 = channel 2 Pin 5: not used
Pin assignment of socket 2	Pin 1 and pin 2: acts on bits D2 and D3 = channel 2 Pin 3 and pin 4: not used Pin 5: not used
Socket 3	Not used
Socket 4	Not used

• LED indication

LED	State	Description
AS-i/FAULT	Green LED ON	Normal
	OFF	No power
	Red LED ON	Communication error
	(Red/Yellow) ON alternately	Address set to 0
F-IN1	OFF	No input
	Yellow LED ON	With input
F-IN2	OFF	No input
	Yellow LED ON	With input

05

AS-Interface EMERGENCY STOP pushbutton

• General specifications

Item	Specification
Operating temperature	-25 to +70°C (No icing or no condensation)
Storage temperature	-40 to +85°C (No icing or no condensation)
Degree of protection	IP65
Mass	Approx. 130g
Approval	UL, CSA

• AS-i specifications

Item	Specification
ID code	B
IO configuration	0
Operating voltage	26.5 to 31.6V
Total current consumption	45mA max.

• Input specifications

Item	Specification
Low signal range	Contact open (Emergency stop button OFF)
High signal range	Contact close (Emergency stop button ON) Input current: $I_{peak} \geq 5mA$



KK03-041

AS-Interface EMERGENCY STOP pushbutton

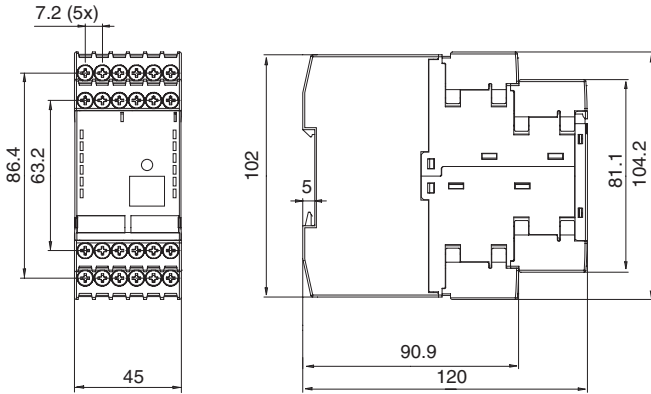
• LED indication

LED	State	Description
AS-i/FAULT	Green LED ON	Normal
	OFF	No power
	Red LED ON	Communication error
	(Red/Yellow) ON alternately	Address set to 0
F-IN1	OFF	Emergency stop button OFF
	Yellow LED ON	Emergency stop button ON
F-IN2	OFF	Emergency stop button OFF
	Yellow LED ON	Emergency stop button ON

AS-Interface Safety at Work

■ Dimensions, mm

• Safety monitor

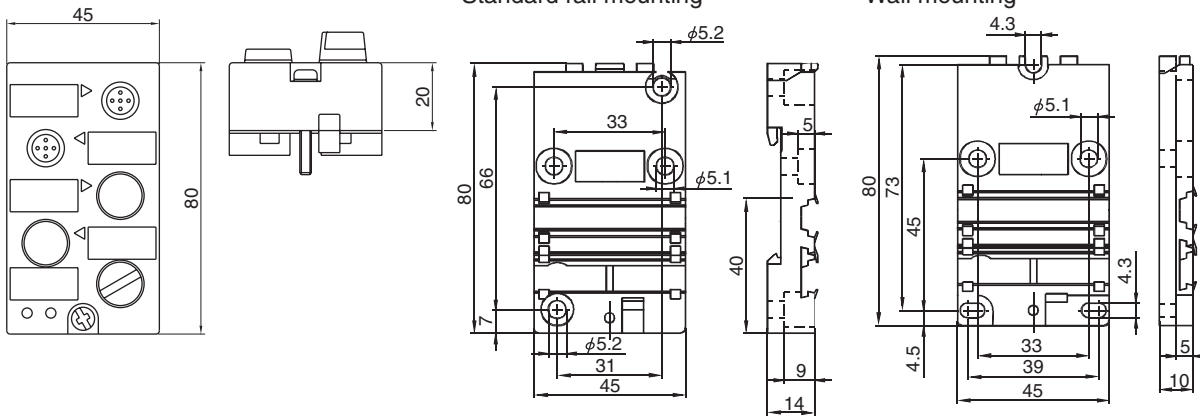


• Safety slave

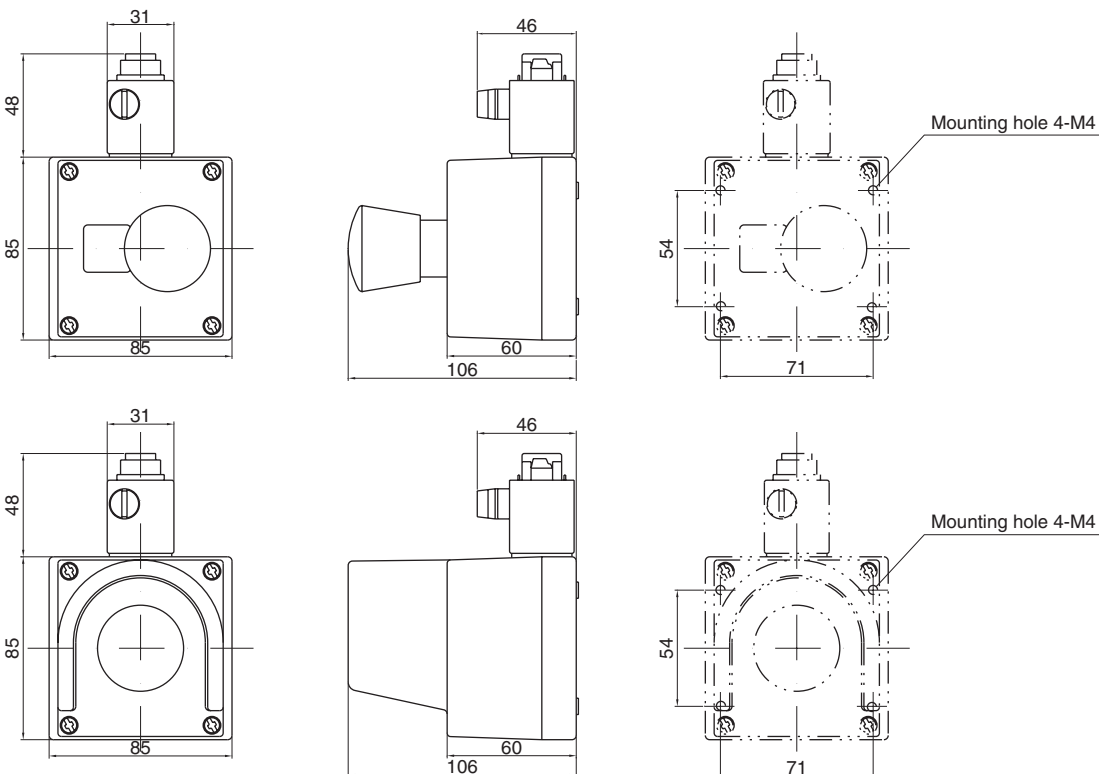
K45 safe compact module

Mounting plate
Standard rail mounting

Wall mounting

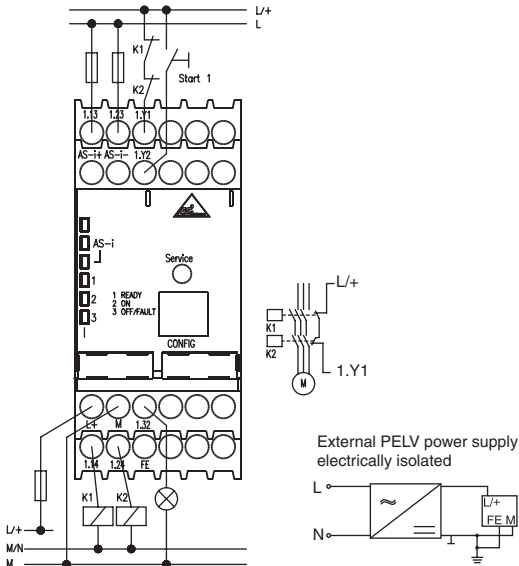


• AS-Interface EMERGENCY STOP pushbutton

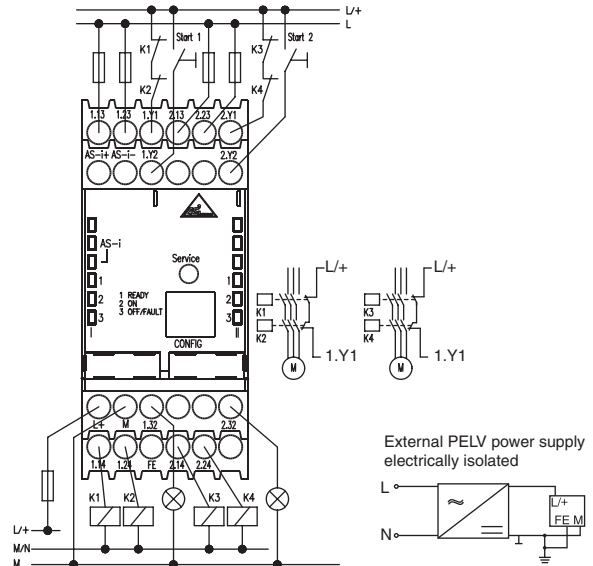


■ Wiring diagrams

• Safety monitor with one release circuit



• Safety monitor with two release circuits



■ Product overview

Item	Description
Configuration software	This software is used to configure and set up the safety monitor on the PC (IBM PC/AT or compatible). A separately sold connection cable (3RK1901-5AA00) is required to make settings. (PC requirements) <ul style="list-style-type: none"> • A Pentium® or newer Intel® processor or a compatible AMD® or Cyrix® processor • CD-ROM drive • Mouse (recommended) • RS-232C serial interface (9-pin D-sub plug) • OS: Microsoft® Windows 95/98/ME/2000/XP®
Cable set	This cable connects the safety monitor and PC (IBM PC/AT or compatible). The PC connects with the RS-232C serial interface (9-pin D-sub plug).
Input bridge for K45F	If only one single-channel switch will be connected to the module, this must be connected to Channel 1. The second channel must be bridged. This can be performed with the M12 connector 3RK1901-1AA00 on Socket 2.
Sealable cap	The front cover is an auxiliary protective cover for the configuration interface of the safety monitor. Each bag contains five front covers. The safety monitor is provided with a single front cover.

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