

Safety Controller



FS1A Series



No programming required. Configuration complete by turning on a logic switch.



• See website for details on approvals and standards.

| | Model | Features | Page |
|---|-----------|-------------------|-------|
|  | FS1A-C11S | 24 logic patterns | E-153 |
|  | FS1A-C21S | 11 logic patterns | E-153 |

Complies with key safety standards!

ISO13849-1 PLe

Complies with key safety standards!

The SafetyOne satisfies:

| | |
|------------|-----------------------------------|
| IEC61508 | SIL3 |
| ISO13849-1 | Performance level e Category 4 |

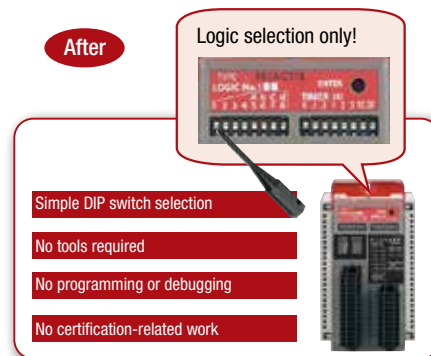
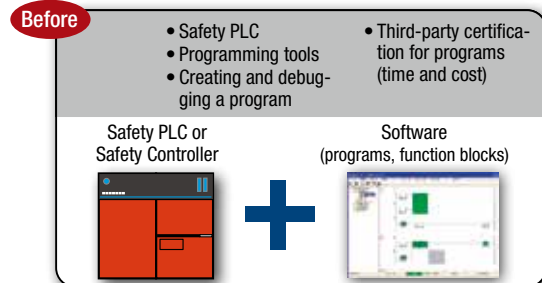
| Applicable standards | |
|----------------------|---|
| ISO | 13849-1, 13851 |
| IEC | 61508, 62061, 61496-1, 61131-2, 61000-6-2, 61000-6-4, 61326-3-1 |
| EN | 13849-1, 62061, 61496-1, 61131-2, 61000-6-2, 61000-6-4, 61326-3-1 |
| UL | UL508, CSA22.2No.142 |

• The SafetyOne satisfies the requirements of SIL3 (IEC61508), performance level e (ISO 13849-1), and safety category 3 or 4 (EN 954-1)

With 11 (FS1A-C21S) or 24 (FS1A-C11S) pre-programmed safety circuit logics in a compact housing, the FS1A SafetyOne safety controller allows you to build a safety circuit by just sliding a DIP switch. Because the programs are tested and approved for compliance with key safety standards, labor, cost, and time for safety system certification can be reduced greatly.

Selecting a logic—that's all you need!

SafetyOne lets you configure a system without any programming. Just select one logic from 11 (FS1A-C21S) or 24 (FS1A-C11S) to configure a safety system.



Reduces overall cost. Simple wiring!

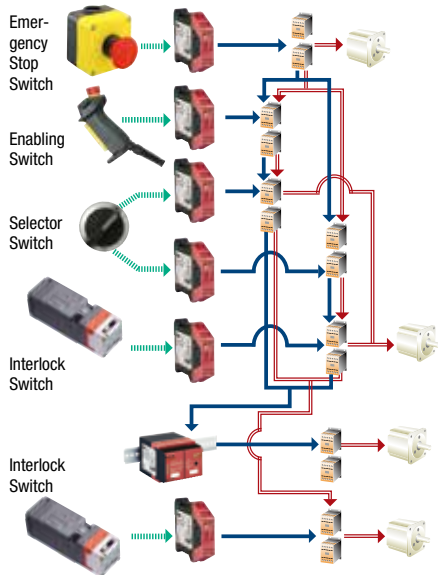
One SafetyOne can replace more than seven safety relay modules.

When using safety modules

- 7 safety relay modules
- 14 safety contactors

Before

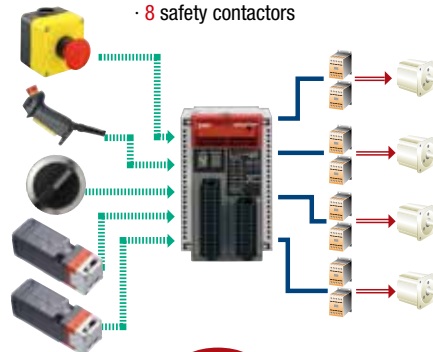
The system is complicated, and the interlocking of mode selector switch cannot be determined. Results in a risk of not satisfying the required safety performance.



When using SafetyOne

(FS1A-C11S, logic 104)

- One FS1A
- 8 safety contactors



After

The system and wiring are much simpler, and the required safety level is satisfied.

Large functionality in a compact housing!

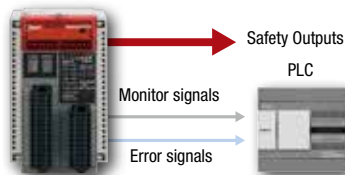
Small & Compact

ALL-IN-ONE

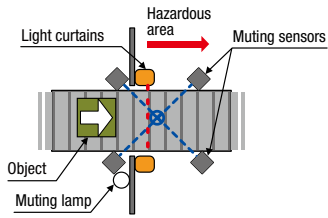
Replaces more than five safety relay modules



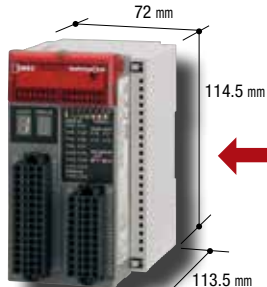
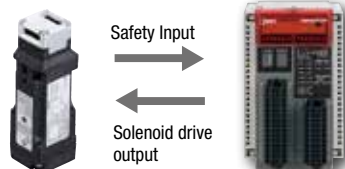
Monitor Output



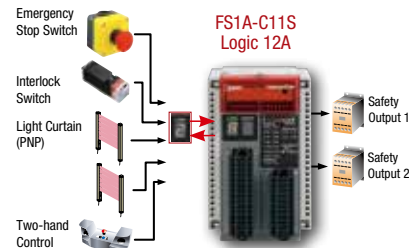
Muting function of light curtains



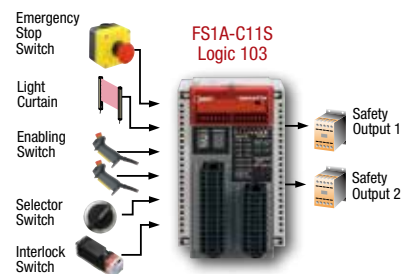
Solenoid drive output



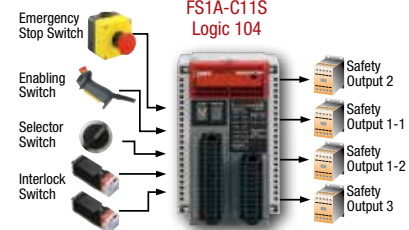
Two-hand Control



Mode selection



Four safety output lines



APEM

Switches & Pilot Lights

Control Boxes

Emergency Stop Switches

Enabling Switches

Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets

Circuit Protectors

Power Supplies

LED Illumination

Controllers

Operator Interfaces

Sensors

AUTO-ID

Interlock Switches

Non-contact Interlock Switches

Safety Laser Scanners

Safety Light Curtains

Safety Modules

FS1A

RF1V

RF2


HR2S

HR1S

FS1A Safety Controller

Safety Controller

FS1A






| Product | No. of Logic | Ordering Part No. |
|---|--------------|-------------------|
|  | 11 | FS1A-C21S |
| | 24 | FS1A-C11S |

Minimum order quantity: 1

Standard Accessories

| | |
|------------------------------|-------|
| Input connector (FS9Z-CN01) | 1 pc |
| Output connector (FS9Z-CN02) | 1 pc |
| Marked cable tie (FS9Z-MT01) | 3 pcs |
| Setting tool | 1 pc |
| English instruction sheet | 1 pc |
| Japanese instruction sheet | 1 pc |

Optional Parts (sold separately)

| Product | Ordering Part No. | Package Quantity | Note |
|---|-------------------|------------------|--|
|  | FS9Z-CN01 | 1 | |
|  | FS9Z-CN02 | 1 | |
|  | FS9Z-SD01 | 1 | |
|  | FS9Z-MT01PN10 | 10 | Used to lock the protective cover of the FS1A. |
|  | BAA1000PN10 | 10 | Aluminum, 1m 35mm wide |
|  | BNL6PN10 | 10 | |

- For details, see the user's manual.
- See **H-071** for DIN rail products.

TÜV approval:

IEC61508 Part1-4, ISO13849-1, IEC/EN62061, IEC/EN61131-2
IEC61326-3-1

UL:

UL508, CSA C22.2 No.142

Applicable standards:

IEC/EN61496-1, IEC/EN61000-6-2, IEC/EN61000-6-4, ISO13851

Specifications

Operating Environment

| Part No. | FS1A-C11S | FS1A-C21S |
|--|---|-----------|
| Safety Circuit | Logic selection | |
| Version | — | Ver. 2 |
| Operating Temperature | -10 to +55°C (no freezing) | |
| Operating Humidity | 10 to 95% RH (no condensation) | |
| Storage Temperature | -40 to +70°C (no freezing) | |
| Storage Humidity | 10 to 95% RH (no condensation) | |
| Pollution Degree | 2 (IEC/EN60664-1) | |
| Degree of Protection | IP20 (IEC/EN60529) | |
| Corrosion Immunity | Free from corrosive gases | |
| Altitude | Operation: 0 to 2000m, Transport: 0 to 3000m | |
| Vibration Resistance | Vibration: 5 to 8.4 Hz, amplitude 3.5 mm 8.4 to 150 Hz Acceleration: 9.8 m/s ² (2 hours each on three mutually perpendicular axes) (IEC/EN60028-2-6) Bump: Acceleration 98 m/s ² , 16 ms (1000 times each on three mutually perpendicular axes) (IEC/EN60028-2-29) | |
| Shock Resistance | 147 m/s ² , 11 ms (3 shocks each on three mutually perpendicular axes) (IEC/EN 60028-2-27) | |
| Connector Insertion/Removal Durability | 50 times maximum | |
| Configuration Switch Durability | 100 operations maximum per pole | |
| Enter Button Durability | 1000 operations maximum | |
| Housing Material | Modified-polyphenyleneether (m-PPE) | |
| Weight (approx.) | 330g | |

Electric Characteristics

| | |
|--|--|
| Rated Voltage | 24V DC |
| Allowable Voltage Range | 20.4 to 28.8V DC |
| Maximum Power Consumption | 48W (at the rated power voltage, when all I/Os are ON) (incl. output load) |
| Allowable Momentary Power Interruption | 10 ms minimum (at the rated power voltage) |
| Response Time | ON-OFF: 40 ms maximum (Note 1) 50 ms maximum (Note 1) 100 ms maximum (Note 2) OFF-ON: 100 ms maximum (Note 3) |
| Start-up Time (Note 4) | 6 sec maximum |
| Dielectric Strength | Between live part and FE terminal: 500V AC, 1 minute Between housing and FE terminal: 500V AC, 1 minute |
| Insulation Resistance | Between live part and FE terminal: 10 MΩ minimum (500V DC megger) Between housing and FE terminal: 10 MΩ minimum (500V DC megger) |
| Impulse Noise Immunity (noise simulator) | Power terminal: ±1 kV 50 ns, 1μs (direct connection) I/O terminal: ±2kV 50 ns, 1μs (coupling adapter) |
| Inrush Current | 25A maximum |
| Effect of Incorrect Wiring | Reverse polarity: No operation, no damage Improper voltage: Permanent damage may occur |

Note 1: The time to shut off safety outputs after inputs are turned off or input monitor error is detected (when off-delay timer is set to 0s).
FS1A-C21S logic 22b, 22C: 50ms maximum

Note 2: Time to shut off safety outputs after an error (except input monitor error) or a configuration change of logic or timer is detected (not depending on the off-delay timer value)

Note 3: Auto start—Time to turn on safety outputs after safe inputs are turned on

Manual start—Time to turn on safety outputs after start inputs are turned on

Control start—Time to turn on safety outputs after the start inputs are turned off-on-off (maintain ON for 0.1 to 5s)

Note 4: Time to change to Run state after power supply is turned on.

Safety Input Specifications

Drive Terminals

(T0, T1, T2, T3, T4, T5, T6, T7, T10, T11, T12, T13, T14, T15)

| | |
|---------------------------|--------------------------------------|
| Rated Drive Voltage | Power supply voltage |
| Minimum Drive Voltage | Power supply voltage – 2.0V |
| Number of Drive Terminals | 14 |
| Maximum Drive Current | 20 mA per terminal (28.8V DC) (Note) |

Note: Drive terminals of safety inputs send safety confirmation signals (pulse signals) for the diagnosis of safety components and input circuits.
Wiring and diagnosis function change depending on the selected logic. See user's manual "Chapter 5 Logic." Basic specifications remain the same.

Receive Terminals

(X0, X1, X2, X3, X4, X5, X6, X7, X10, X11, X12, X13, X14, X15)

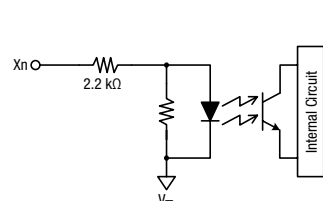
| | |
|---------------------|--|
| Rated Input Voltage | 24V DC |
| Input ON Voltage | 15.0 to 28.8V DC |
| Input OFF Voltage | Open or 0 to 5.0V DC |
| Number of Inputs | 14 |
| Input Current | 10 mA per terminal (at the rated power voltage) |
| Input Signal | Sink input (for PNP output), Type 1 (IEC61131-2) |

Wire

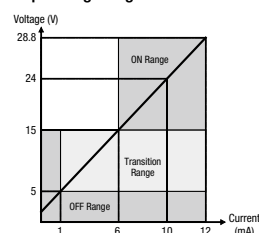
| | |
|---------------------------|--|
| Cable Length (Note) | 100m maximum (total wire length per input) |
| Allowable Wire Resistance | 300Ω maximum |

Note: When wiring between the SafetyOne and a component is 30m or more, use shielded cable to ensure electromagnetic immunity.

• Receive Terminal Internal Circuit



• Receive Terminal Operating Range

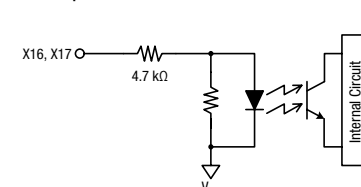


Start Input Specifications

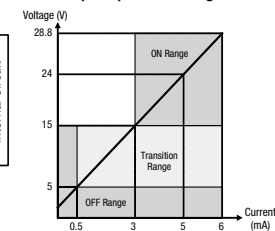
| | |
|---------------------------|--|
| Rated Input Voltage | 24V DC |
| Input ON Voltage | 15.0 to 28.8V DC |
| Input OFF Voltage | Open or 0V to 5.0V DC |
| Number of Start Inputs | 2 (X16, X17) |
| Input Current | 5 mA per terminal (at the rated power voltage) |
| Input Signal | Sink input (PNP output), Type 1 (IEC61131-2) |
| Cable Length (Note) | 100m maximum (total wire length per input) |
| Allowable Wire Resistance | 300Ω maximum |

Note: When wiring between the SafetyOne and a component is 30m or more, use shielded cable to ensure electromagnetic immunity.

• Start Input Internal Circuit



• Start Input Operation Range



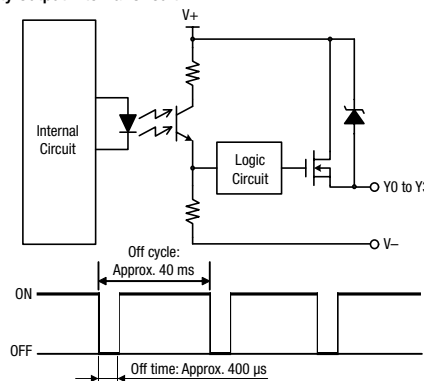
Safety Output Specifications

| | |
|-----------------------------------|---|
| Output Type | Source output (N channel MOSFET) |
| Rated Output Voltage | Power supply voltage |
| Minimum Output Voltage | Power supply voltage – 2.0V |
| Number of Safety Outputs | 4 (Y0, Y1, Y2, Y3) |
| Maximum Output Current | 1 output: 500 mA maximum Total: 1A maximum |
| Leakage Current | 0.1 mA maximum |
| Allowable Inductive Load (Note 1) | L/R = 25 ms |
| Allowable Capacitive Load | 1 μF maximum |
| Cable Length (Note 2) | 100m maximum (total length per output) |

Note 1: When connecting an inductive load, connect a protection element such as a diode.

Note 2: When wiring between the SafetyOne and a component is 30m or more, use shielded cable to ensure electromagnetic immunity.

• Safety Output Internal Circuit



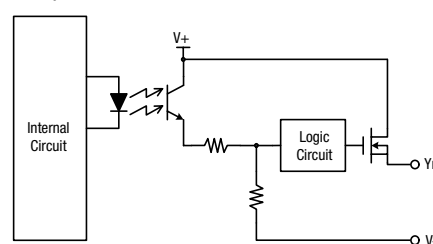
The safety outputs of the SafetyOne are solid state outputs. When the output is on, off-check signals are generated at regular intervals. The operating characteristics of the safety output change depending on the selected logic. For details, see user's manual "Chapter 5 Logic." The basic specifications remain the same. Note that off-check signals may cause reaction of some safety components depending on their response speed. Monitor output and solenoid/lamp output do not generate outputs of off-check signals.

Monitor Output Specifications

| | |
|---------------------------|--|
| Output Type | Source output (N channel MOSFET) |
| Rated Output Voltage | Power supply voltage |
| Minimum Output Voltage | Power supply voltage – 2.0V |
| Number of Monitor Outputs | 11 (Y4, Y5, Y6, Y7, Y10, Y11, Y12, Y13, Y14, Y15, Y16) |
| Maximum Output Current | 1 output: 20 mA maximum Total: 220 mA maximum |
| Leakage Current | 0.1 mA maximum |
| Cable Length (Note) | 100m maximum (total length per output) |

Note: When wiring between the SafetyOne and a component is 30m or more, use shielded cable to ensure electromagnetic immunity.

• Monitor Output Internal Circuit



The operating characteristics of the monitor output change depending on the selected logic. For details, see user's manual "Chapter 5 Logic." The basic specifications remain the same. Do not use monitor output as a safety output, otherwise the system's safety cannot be assured when the SafetyOne or safety components fail.

APEM

Switches & Pilot Lights

Control Boxes

Emergency Stop Switches

Enabling Switches

Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets

Circuit Protectors

Power Supplies

LED Illumination

Controllers

Operator Interfaces

Sensors

AUTO-ID

Interlock Switches

Non-contact Interlock Switches

Safety Laser Scanners

Safety Light Curtains

Safety Modules

FS1A

RF1V

RF2

HR2S

HR1S

FS1A Safety Controller

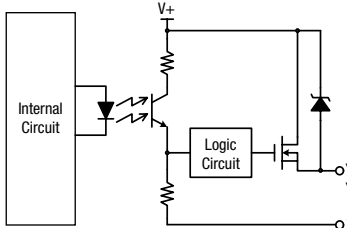
Solenoid/Lamp Output Specifications

| | | |
|-----------------------------------|--|----------------|
| Output Type | Source output (N channel MOSFET) | |
| Rated Output Voltage | Power supply voltage | |
| Minimum Output Voltage | Power supply voltage – 2.0V | |
| No. of Solenoid/Lamp Outputs | 2 (Y17, Y20) | |
| Maximum Output Current | 1 output | 500 mA maximum |
| | Total | 500 mA maximum |
| Leakage Current | 0.1 mA maximum | |
| Allowable Inductive Load (Note 1) | L/R = 25 ms | |
| Cable Length (Note 2) | 100m maximum (total length per output) | |

Note 1: When connecting an inductive load, connect a protection element such as a diode.

Note 2: When wiring between the SafetyOne and a component is 30m or more, use shielded cable to ensure electromagnetic immunity.

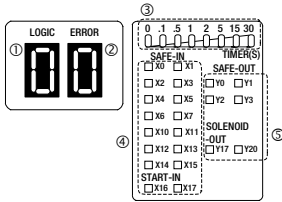
Solenoid/Lamp Output Internal Circuit



The selected operating characteristics of solenoid/lamp output change depending on the selected logic. For details, see user's manual "Chapter 5 Logic." The basic specifications remain the same. Do not use solenoid/lamp output as a safety output, otherwise the system's safety cannot be assured when the SafetyOne or safety components fail.

LEDs

- ① Logic LED (green)
- ② Error LED (red)
- ③ Timer LED (green)
- ④ Input LED (orange)
- ⑤ Output LED (orange)



Logic LED ①

| LED | Status | Description |
|------------------------------------|----------|---|
| 1, 2, 3, 4, 5, 6, 7, 8, A, b, C, d | ON | The selected logic is in Run or Protection state (Ex. Logic 14A: 4 → A → 4 → A → 4 → ...) |
| | Blink | The selected logic is in Configuration state (Ex. Logic 14A: 4 → A → OFF → 4 → A → OFF → 4 → ...) |
| E | Blink | The selected logic has Configuration error (logic not selected, or multiple logics are selected) |
| Random | ON/Blink | Initializing (Initial state) |
| OFF | OFF | Error (Stop state) |

- Correct: Selecting one from 1 to 8
 Selecting one from 1 to 4, and one from A, b, C, or d (from 5 to 8).
- Wrong: Selecting three or more logics from 1 to 8
 Selecting two or more logics from 1 to 4
 Selecting two or more logics from A, b, C, or d (from 5 to 8)

Error LED ②

| LED | Status | Description |
|--------|----------|---|
| 1 | ON | Input monitor error (Protection state) |
| 2 | ON | Wiring error at safety input or an error in safety input circuits (Stop state) |
| 3 | ON | Wiring error at start input or an error in start input circuit (Stop state) |
| 4 | ON | Wiring error at safety output or an error in safety output circuit (Stop state) |
| 5 | ON | Muting lamp error (disconnection) (FS1A-C11S: logic 11d only) |
| 6 | ON | Power supply error or internal power supply circuit error (Stop state) |
| 7 | ON | Internal error, power supply error, or internal power supply circuit error (Stop state) |
| 9 | ON | EMC disturbance (Stop state) |
| C | ON | Configuration procedure is in progress (Configuration state) |
| | Blink | Configuration is valid (Note) (Configuration state) |
| Random | ON/Blink | Initializing (Initial state) |
| OFF | OFF | Normal operation (Run state) |

Note: Blinks for 1 to 5 seconds after the enter button is pressed. Releasing the button during blinking activates the setting. The blinking LED becomes ON if the button is pressed for more than 5 seconds, and the setting becomes invalid even after the button is released.

Input LED ④

SAFE-IN (X0 ... X15), START-IN (X16, X17)

| LED | Status | Description |
|-----------|--------|---|
| X0 to X15 | ON | Input ON |
| | OFF | Input OFF, or SafetyOne is in the Stop or Configuration state |
| | Blink | Input monitor error (Blink input number the error occurred, error number is displayed at Error LED) |
| X16, X17 | ON | Input ON |
| | OFF | Input OFF, or SafetyOne is in the Stop or Configuration state |
| | Blink | Input monitor error (Blink input number the error occurred, error number is displayed at Error LED) |

Output LED ⑤

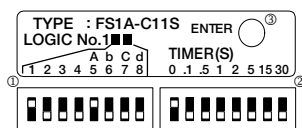
SAFE-OUT (Y0 ... Y3), SOLENOID-OUT (Y17, Y20)

| LED | Status | Description |
|----------|--------|--|
| Y0 to Y3 | ON | Output ON |
| | OFF | Output OFF, or SafetyOne is in the Stop or Configuration state |
| | Blink | During OFF-delay timer operation, or output monitor error (Blink output number the error occurred, error number is displayed in Error LED display) |
| Y17, Y20 | ON | Output ON |
| | OFF | Output OFF, or SafetyOne is in the Stop or Configuration state |
| | Blink | Output monitor error (Blink output number the error occurred, error number is displayed at Error LED display) |

Configuration Switches

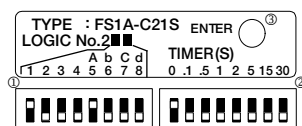
Logic Switch ①

FS1A-C11S



- ① Logic Switch
- ② Timer Switch
- ③ Enter button

FS1A-C21S



- ① Logic Switch
- ② Timer Switch
- ③ Enter button

For details, see user's manual "Chapter 2 Logic Number".

Timer Switch ②

Eight DIP switches are provided for selecting an off-delay timer value, by moving a switch upward. Only one timer switch can be selected.

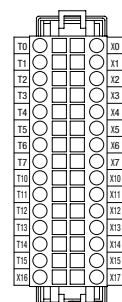
| Switch No. | Timer Value | Description |
|------------|-------------|---|
| 1 | 0 | No off-delay (safety outputs shut down immediately) |
| 2 | .1 | Off-delay timer 0.1s |
| 3 | .5 | Off-delay timer 0.5s |
| 4 | 1 | Off-delay timer 1s |
| 5 | 2 | Off-delay timer 2s |
| 6 | 5 | Off-delay timer 5s |
| 7 | 15 | Off-delay timer 15s |
| 8 | 30 | Off-delay timer 30s |

Enter Button ③

The enter button is used to activate the configuration of logic and timer switches. Error LED will blink for 1 to 5 seconds after pressing the enter button. Releasing the button during blinking activates the setting. The blinking LED becomes ON if the button is pressed for more than 5 seconds, and the setting becomes invalid even after the button is released. For setting the switches and enter button, use the setting tool supplied with the SafetyOne.

Connector Specifications

Input Connector

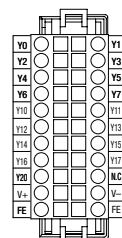


Applicable connector

- Spring clamp (30-pin)
FS9Z-CN01 (IDEC)
2-1871940-5
(Tyco Electronics)
- Crimp (30-pin)
2-1871946-5
(Tyco Electronics)

| Terminal | No. | Description |
|----------|-----|----------------------------------|
| T0 | A1 | Safety input drive terminal 0 |
| T1 | A2 | Safety input drive terminal 1 |
| T2 | A3 | Safety input drive terminal 2 |
| T3 | A4 | Safety input drive terminal 3 |
| T4 | A5 | Safety input drive terminal 4 |
| T5 | A6 | Safety input drive terminal 5 |
| T6 | A7 | Safety input drive terminal 6 |
| T7 | A8 | Safety input drive terminal 7 |
| T10 | A9 | Safety input drive terminal 10 |
| T11 | A10 | Safety input drive terminal 11 |
| T12 | A11 | Safety input drive terminal 12 |
| T13 | A12 | Safety input drive terminal 13 |
| T14 | A13 | Safety input drive terminal 14 |
| T15 | A14 | Safety input drive terminal 15 |
| X16 | A15 | Start input terminal 16 |
| X0 | B1 | Safety input receive terminal 0 |
| X1 | B2 | Safety input receive terminal 1 |
| X2 | B3 | Safety input receive terminal 2 |
| X3 | B4 | Safety input receive terminal 3 |
| X4 | B5 | Safety input receive terminal 4 |
| X5 | B6 | Safety input receive terminal 5 |
| X6 | B7 | Safety input receive terminal 6 |
| X7 | B8 | Safety input receive terminal 7 |
| X10 | B9 | Safety input receive terminal 10 |
| X11 | B10 | Safety input receive terminal 11 |
| X12 | B11 | Safety input receive terminal 12 |
| X13 | B12 | Safety input receive terminal 13 |
| X14 | B13 | Safety input receive terminal 14 |
| X15 | B14 | Safety input receive terminal 15 |
| X17 | B15 | Start input terminal 17 |

Output Connector



Applicable connector

- Spring clamp (22-pin)
FS9Z-CN02 (IDEC)
2-1871940-1
(Tyco Electronics)
- Crimp (22-pin)
2-1871946-1
(Tyco Electronics)

| Terminal | No. | Description |
|----------|-----|----------------------------------|
| Y0 | A1 | Safety output terminal 0 |
| Y2 | A2 | Safety output terminal 2 |
| Y4 | A3 | Monitor output terminal 4 |
| Y6 | A4 | Monitor output terminal 6 |
| Y10 | A5 | Monitor output terminal 10 |
| Y12 | A6 | Monitor output terminal 12 |
| Y14 | A7 | Monitor output terminal 14 |
| Y16 | A8 | Monitor output terminal 16 |
| Y20 | A9 | Solenoid/lamp output terminal 20 |
| V+ | A10 | 24V DC power terminal |
| FE | A11 | Functional ground terminal |
| Y1 | B1 | Safety output terminal 1 |
| Y3 | B2 | Safety output terminal 3 |
| Y5 | B3 | Monitor output terminal 5 |
| Y7 | B4 | Monitor output terminal 7 |
| Y11 | B5 | Monitor output terminal 11 |
| Y13 | B6 | Monitor output terminal 13 |
| Y15 | B7 | Monitor output terminal 15 |
| Y17 | B8 | Solenoid/lamp output terminal 17 |
| NC | B9 | Blank terminal |
| V- | B10 | 0V DC power terminal |
| FE | B11 | Functional ground terminal |

Note: For the specifications of crimp connector, contact Tyco Electronics.

APEM

Switches & Pilot Lights

Control Boxes

Emergency Stop Switches

Enabling Switches

Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets

Circuit Protectors

Power Supplies

LED Illumination

Controllers

Operator Interfaces

Sensors

AUTO-ID

Interlock Switches

Non-contact Interlock Switches

Safety Laser Scanners

Safety Light Curtains

Safety Modules

FS1A

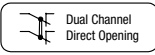
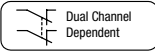
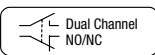
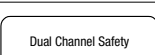
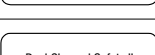
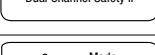
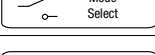
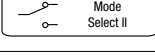
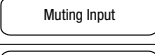
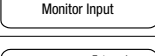
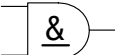
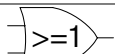
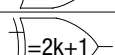
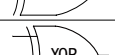

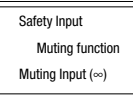
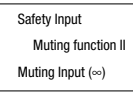
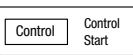
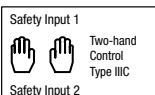


RF1V

RF2

HR2S

HR1S

Logic Functions

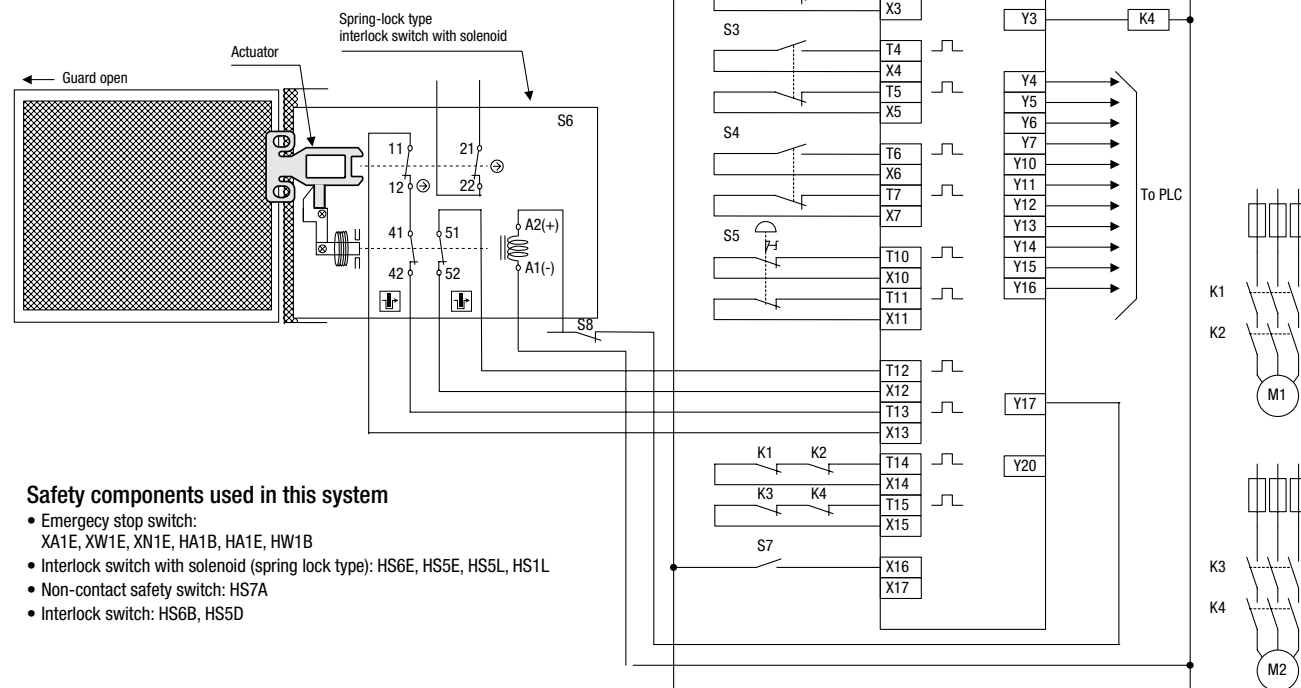
| Type | Function | Symbol | Description |
|--------------------------|---|---|--|
| Input Function | Dual channel direct opening input |  | For connecting safety components with dual channel direct opening action mechanism, such as emergency stop switches and interlock switches. |
| | Dual channel dependent input |  | For connecting safety components with dual channel dependent action mechanism, such as enabling switches. |
| | Dual channel NO/NC Input |  | For connecting safety components with dual channel NO/NC mechanism, such as non-contact interlock switches. |
| | Dual channel safety input |  | For connecting safety components with dual channel solid state output (PNP output), such as light curtains or safety laser scanners, or emergency stop switches or safety switches. |
| | Dual channel safety input II |  | For connecting safety components with dual channel solid state output (PNP output), such as light curtains or safety laser scanners, or safety components with dual channel dependent functions such as enable switches. |
| | Mode select input |  | For connecting components with mode select function, such as mode selector switches. |
| | Mode select input II |  | For connecting components with mode select function, such as mode selector switches. When the switching of input is within 3 seconds, the function's output remains unchanged. |
| | Muting input |  | For connecting components such as muting sensors and limit switches. |
| | Monitor input |  | For connecting switches or sensors for start input. |
| | External device monitor input |  | For monitoring external devices controlled by the SafetyOne. External devices are diagnosed for errors by connecting a NC contact, such as contactor or safety relay. |
| Logic Operation Function | AND |  | Logical multiplication (AND) of multiple inputs. |
| | OR |  | Logical addition (OR) of multiple inputs. |
| | XOR |  | Exclusive logical addition (XOR) of multiple inputs. Error is detected with 2 or more inputs. |
| | XOR II |  | Exclusive logical addition (XOR) of multiple inputs. |
| | Self-hold |  | Self-holding of input. |
| | Muting |  | Adds muting function to the connected safety components. |
| | Muting II |  | Adds muting function to the connected safety components. ∞ shows that muting time is infinite. |
| | Control start |  | Adds operation confirmation function to the connected start input devices. |
| Two-hand control |  | Adds two-hand control input function. Type III C. | |
| Output Function | Safety output |  | For controlling the safety output. |
| | Safety output with timer |  | For controlling the safety output with an off-delay timer. |

• For details, see the user's manual.

Wiring Example (Logic 11b)

When connecting four non-contact interlock switches, an emergency stop switch, and a spring-lock type interlock switch with solenoid

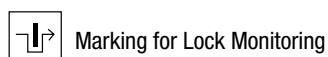
- S1 to S4: Non-contact interlock switch
- S5: Emergency stop switch
- S6: Interlock switch with solenoid (spring lock type)
- S7: Start switch
- K1 to K4: Safety contactor
- M1, M2: Motor
- S8: Solenoid control switch
(Pressing the solenoid control switch after closing the guard door, contacts 41-42 and 51-52 of S6 turn on, allowing the SafetyOne to restart.)



Safety components used in this system

- Emergency stop switch: XA1E, XW1E, XN1E, HA1B, HA1E, HW1B
- Interlock switch with solenoid (spring lock type): HS6E, HS5E, HS5L, HS1L
- Non-contact safety switch: HS7A
- Interlock switch: HS6B, HS5D

- Wiring may differ according to input functions. See manual for details.
- The safety category may differ according to the connection method of input/output. See manual for details.



Marking for Lock Monitoring

By satisfying the requirements shown in EN ISO/ISO14119:2013, the number of contacts needed to construct safety circuits can be reduced/

- APEM
- Switches & Pilot Lights
- Control Boxes
- Emergency Stop Switches
- Enabling Switches
- Safety Products**
- Explosion Proof
- Terminal Blocks
- Relays & Sockets
- Circuit Protectors
- Power Supplies
- LED Illumination
- Controllers
- Operator Interfaces
- Sensors
- AUTO-ID
- Interlock Switches
- Non-contact Interlock Switches
- Safety Laser Scanners
- Safety Light Curtains
- Safety Modules

FS1A

RF1V

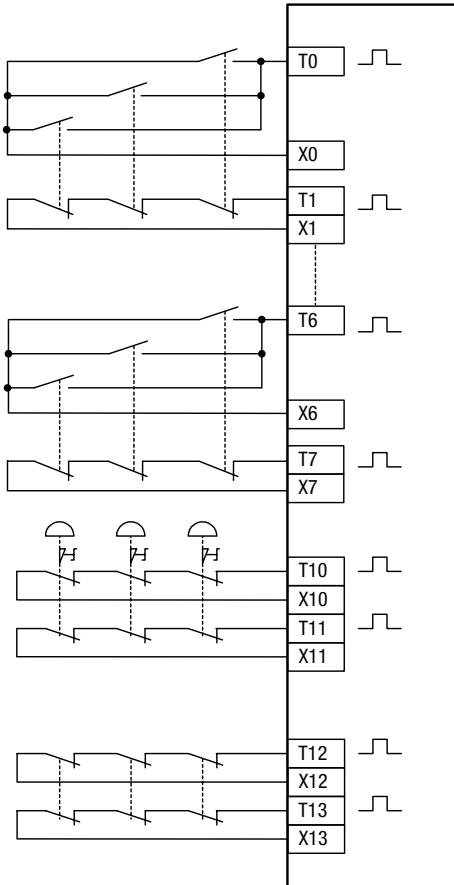
RF2

HR2S

HR1S

FS1A Safety Controller

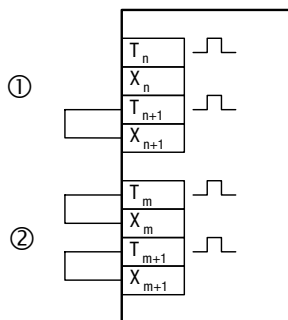
When connecting multiple devices in series



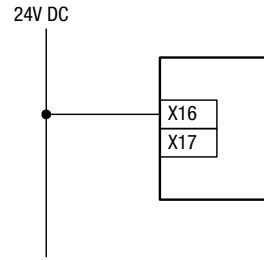
Note: Safety characteristics may differ according to the connection method of the device.

When some safety inputs are not used

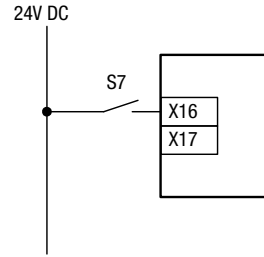
- When there is an unused safety input from S1 to S4, open the receive terminal (T_n) and drive terminal (X_n) suitable for the unused safety input, and provide a short circuit connection between the receive terminal (T_{n+1}) and drive terminal (X_{n+1}). ($n=0,2,4,6$) (See ①)
- When there is an unused safety input for S5 or S6, provide a short-circuit connection between the receive terminal and drive terminal suitable for the unused safety input. (See ②)



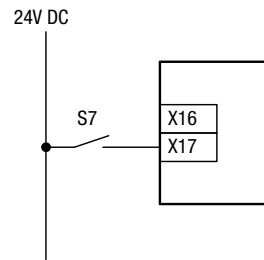
When not using the start switch (auto start)



When not detecting the welding of the start switch (manual start)



When detecting the welding of the start switch (control start)



FS1A

RF1V

RF2

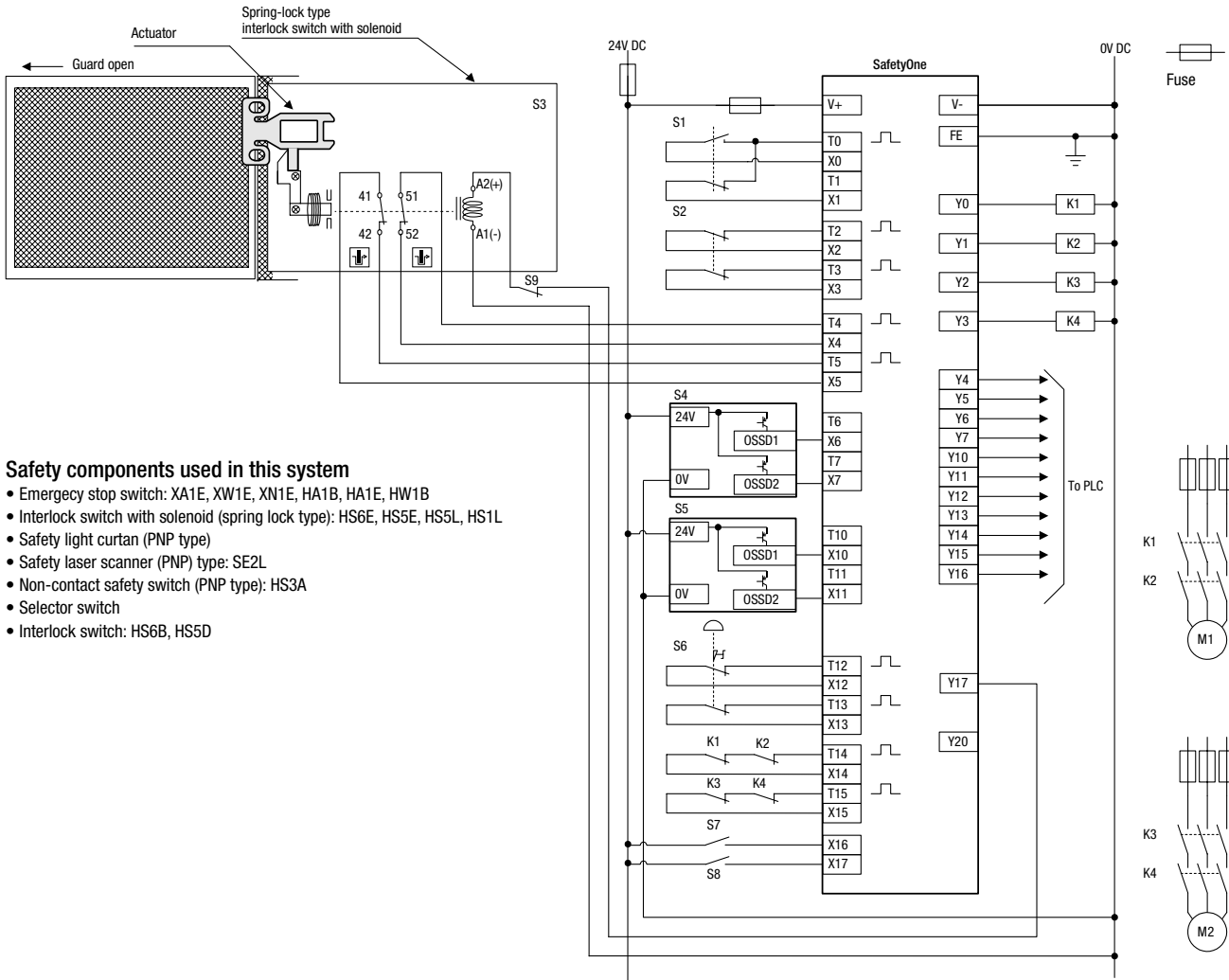
HR2S

HR1S

Wiring Example (Logic 13b)

When connecting a selector switch, an enabling switch, an interlock switch with solenoid with spring lock type, two safety light curtains, and an emergency stop switch.

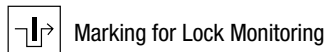
- S1: Selector switch
- S2: Enabling switch
- S3: Interlock switch with solenoid (spring lock type)
- S4, S5: Safety light curtain
- S6: Emergency stop switch
- S7, S8: Start switch
- S9, S10: Solenoid control switch
(Pressing the solenoid control switch after closing the guard door, contacts 41-42 and 51-52 of S3 turns on, allowing the SafetyOne to restart.)
- K1 to K4: Safety contactor
- M1, M2: Motor



Safety components used in this system

- Emergency stop switch: XA1E, XW1E, XN1E, HA1B, HA1E, HW1B
- Interlock switch with solenoid (spring lock type): HS6E, HS5E, HS5L, HS1L
- Safety light curtain (PNP type)
- Safety laser scanner (PNP type): SE2L
- Non-contact safety switch (PNP type): HS3A
- Selector switch
- Interlock switch: HS6B, HS5D

- Wiring may differ according to input functions. See manual for details.
- The safety category may differ according to the connection method of input/output. See manual for details.



Marking for Lock Monitoring

By satisfying the requirements shown in EN ISO/ISO14119:2013, the number of contacts needed to construct safety circuits can be reduced/

APEM

Switches & Pilot Lights

Control Boxes

Emergency Stop Switches

Enabling Switches

Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets

Circuit Protectors

Power Supplies

LED Illumination

Controllers

Operator Interfaces

Sensors

AUTO-ID

Interlock Switches

Non-contact Interlock Switches

Safety Laser Scanners

Safety Light Curtains

Safety Modules

FS1A

RF1V

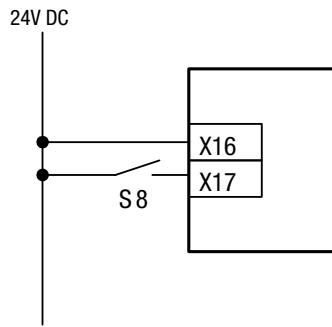
RF2

HR2S

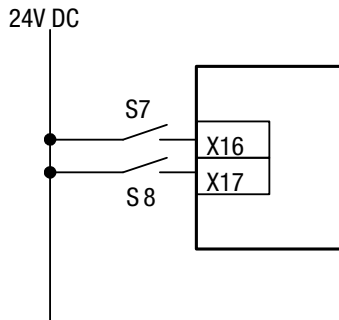
HR1S

FS1A Safety Controller

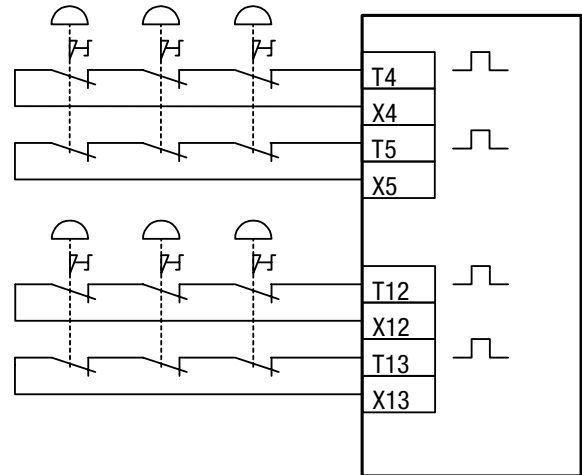
When not using the S7 start switch (auto start)



When using the S7 start switch (manual start)



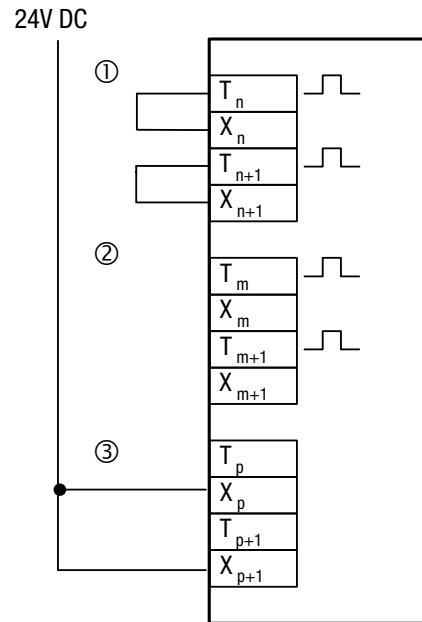
When connecting multiple emergency stop switches in series



Note: Safety characteristics may differ according to the connection method of the device.

When some safety inputs are not used

- When there is an unused safety input for S5 or S6, provide a short-circuit connection between the receive terminal and drive terminal suitable for the unused safety input. (See ①)
- When only one safety input is used for S4 or S5, open the receive terminal suitable for the the other unused safety input. (See ②)
- When both safety inputs are used for S4 or S5, provide 24V DC (V+) and short-circuit connection between the receive terminals to at least either one of the safety inputs. (See ③)



- APEM
- Switches & Pilot Lights
- Control Boxes
- Emergency Stop Switches
- Enabling Switches
- Safety Products
- Explosion Proof
- Terminal Blocks
- Relays & Sockets
- Circuit Protectors
- Power Supplies
- LED Illumination
- Controllers
- Operator Interfaces
- Sensors
- AUTO-ID

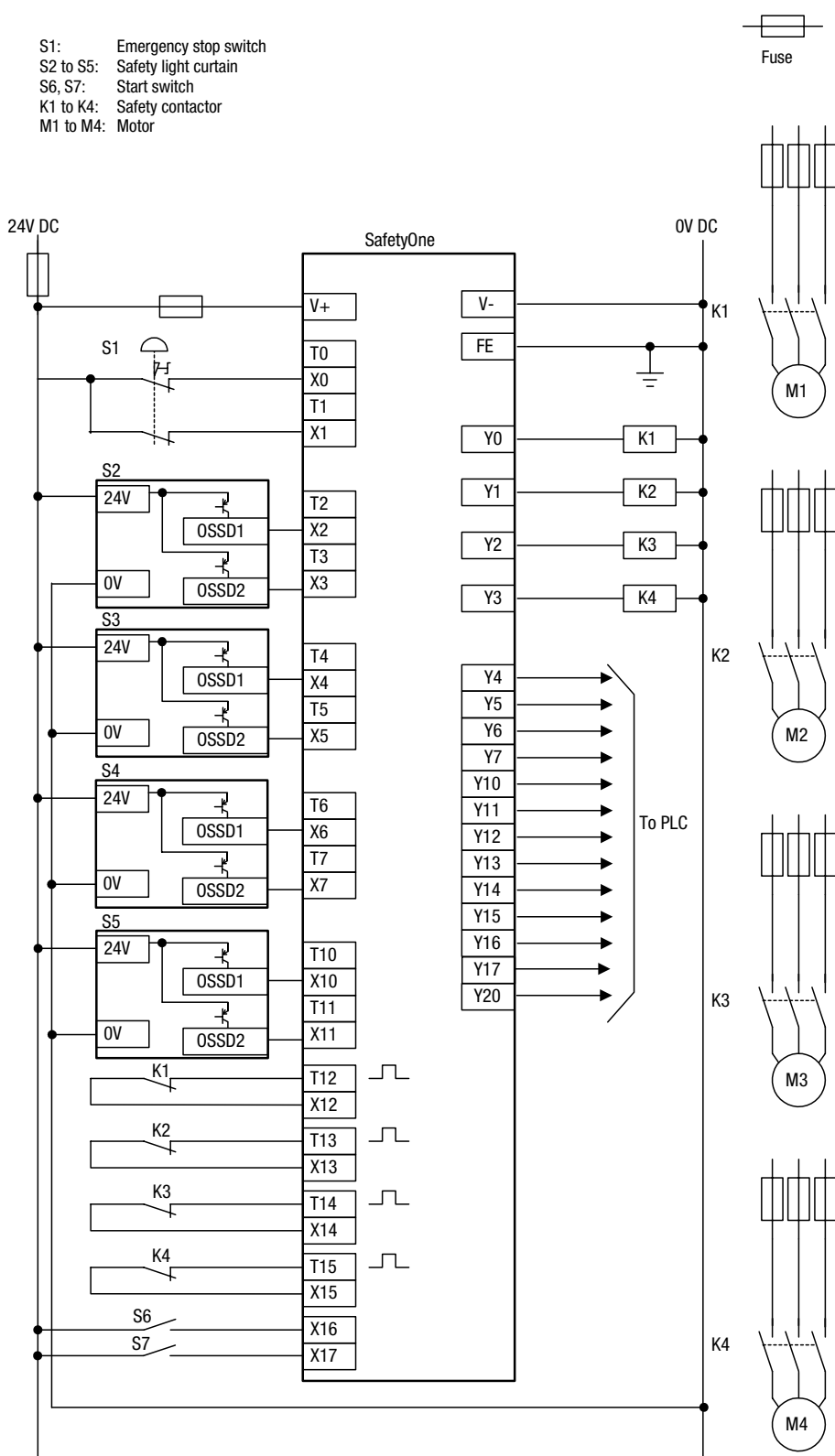
- Interlock Switches
- Non-contact Interlock Switches
- Safety Laser Scanners
- Safety Light Curtains
- Safety Modules

- FS1A
- RF1V
- RF2
- HR2S
- HR1S

Wiring Example (Logic 105)

When connecting an emergency stop switch and four safety light curtains.

- S1: Emergency stop switch
- S2 to S5: Safety light curtain
- S6, S7: Start switch
- K1 to K4: Safety contactor
- M1 to M4: Motor



Safety components used in this system

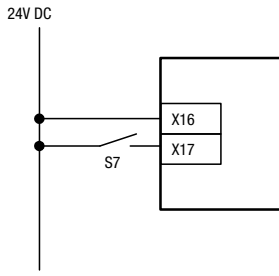
- Emergency stop switch: XA1E, XW1E, XN1E, HA1B, HA1E, HW1B
- Interlock switch with solenoid (spring lock type): HS6E, HS5E, HS5L, HS1L
- Safety light curtain (PNP type)
- Safety laser scanner (PNP type): SE1L
- Non-contact safety switch (PNP type): HS3A
- Interlock switch: HS6B, HS5D

- Wiring may differ according to input functions. See manual for details.
- The safety category may differ according to the connection method of input/output. See manual for details.

- APEM
- Switches & Pilot Lights
- Control Boxes
- Emergency Stop Switches
- Enabling Switches
- Safety Products
- Explosion Proof
- Terminal Blocks
- Relays & Sockets
- Circuit Protectors
- Power Supplies
- LED Illumination
- Controllers
- Operator Interfaces
- Sensors
- AUTO-ID
- Interlock Switches
- Non-contact Interlock Switches
- Safety Laser Scanners
- Safety Light Curtains
- Safety Modules
- FS1A
- RF1V
- RF2
- HR2S
- HR1S

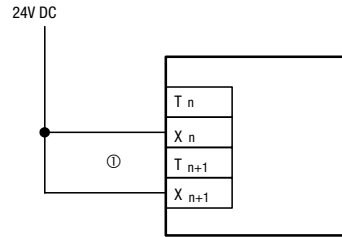
FS1A Safety Controller

When not using the S6 start switch (auto start)

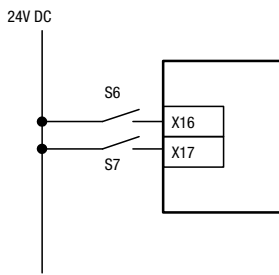


When some safety inputs are not used

- When there is an unused safety input for S1 to S5, provide 24V DC (V+) and short-circuit connection to the receive terminal suitable for the unused safety input. (See ①)

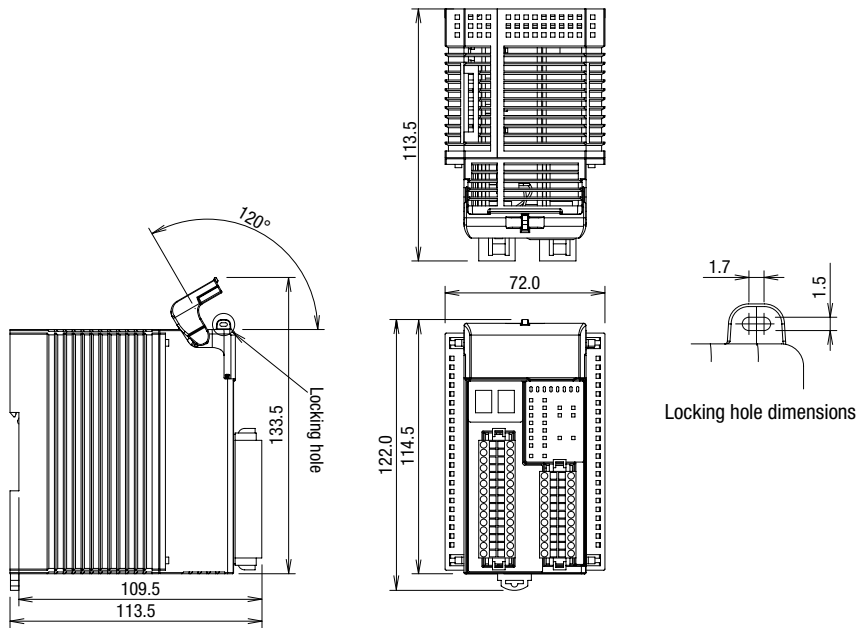


When using the S6 start switch (manual start)



Dimensions

Dimensions in mm.



Specification difference between FS1A-C21S (Ver. 2.0 or above) and earlier series

- When an error is detected, the monitor output of safety input/output turns off but does not flicker such as the FS1A-C11S.
- LED lights can be used for the muting lamp output of FS1A-C21S (ver 2.0 or above) but does not have a disconnect detect function such as FS1A-C21S, FS1A-C11S and FS1A-C01S (discontinued).

FS1A Series

| Part no. | Version | When error is detected for safety input/output monitor | Muting lamp output | |
|--------------------------|---------|--|--------------------------------|------------------------|
| | | | Connectable lamp specification | Disconnection function |
| FS1A-C01S (discontinued) | — | Flicker | Incandescent | Available |
| FS1A-C11S | — | Flicker | Incandescent | Available |
| FS1A-C21S | Ver. 1 | Flicker | Incandescent | Available |
| FS1A-C21S | Ver. 2 | Off | Incandescent/LED | Not available |

Note: The version can be checked from the part no. "FS1A-C21S (*)" on the nameplate of the product.
 (*): (1) Ver.1, (2) Ver. 2.0

FS1A-C11S logic selection chart 1

| Part No. | | Interlock/Emergency Stop Switch | Enabling/Grip Switch | Mode Selection | Light Curtain | Muting | NO/NC Contact Inputs | Two-hand Control | Output 1 Line | Output 2 Lines | Output 4 Lines |
|--|-----------|---------------------------------|----------------------|----------------|---------------|--------|----------------------|------------------|---------------|----------------|----------------|
| FS1A-C11S | | | | | | | | | | | |
| Logic Type | Logic No. | | | | | | | | | | |
| The logic for various apparatus | 101 | ● | ● | | | | | | | ● | |
| The logic for apparatus with openings | 11A | ● | | | ● | | | | | ● | |
| The logic for apparatus with NO/NC contact inputs | 11b | ● | | | | | ● | | | ● | |
| The logic for apparatus with openings | 11C | ● | | | ● | | | | | ● | |
| Muting function logic for apparatus with openings | 11d | ● | | | ● | ● | | | | ● | |
| Partial stop logic for apparatus with openings | 102 | ● | | | ● | | | | | ● | |
| The logic for apparatus with a two-hand control device | 12A | ● | | | ● | | | ● | | ● | |
| The logic constructing an OR circuit for various apparatus | 12b | ● | ● | | | | | | | ● | |
| The logic constructing an OR circuit for apparatus with openings | 12C | ● | | | ● | | | | | ● | |
| Partial control logic for apparatus with openings | 12d | ● | ● | | ● | | | | | ● | |
| Partial stop logic applicable for selection of active safety input devices | 103 | ● | ● | ● | ● | | | | | ● | |
| The logic applicable for selection of active safety input devices | 13A | ● | ● | ● | | | | | | ● | |
| The logic constructing an OR circuit applicable for selection of active safety input devices | 13b | ● | ● | ● | ● | | | | | ● | |
| Partial stop logic applicable for selection of active safety input devices | 13C | ● | ● | ● | ● | | | | | ● | |
| The logic applicable for selection of active safety input devices | 13d | ● | ● | ● | ● | | | | | ● | |
| Partial stop logic applicable for selection of active safety input devices | 104 | ● | ● | ● | | | | | | | ● |
| Partial stop logic applicable for selection of active safety input devices | 14A | ● | ● | ● | | | | | | | ● |
| Partial stop logic applicable for selection of active safety input devices | 14b | ● | ● | ● | | | | | | | ● |
| Partial stop logic applicable for selection of active safety input devices | 14C | ● | ● | ● | | | | | | | ● |
| Partial stop logic applicable for selection of active safety input devices for apparatus with openings | 14d | ● | ● | ● | ● | | | | | | ● |
| Partial stop logic for apparatus with openings | 105 | ● | | | ● | | | | | | ● |
| Partial stop logic for apparatus with openings | 106 | ● | | | ● | | | | | | ● |
| Partial stop logic for various apparatus | 107 | ● | | | | | | | | | ● |
| Partial stop logic applicable for selection of active safety input devices in apparatus with openings | 108 | ● | ● | ● | ● | | | | | | ● |

APEM

Switches & Pilot Lights

Control Boxes

Emergency Stop Switches

Enabling Switches

Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets

Circuit Protectors

Power Supplies

LED Illumination

Controllers

Operator Interfaces

Sensors

AUTO-ID

Interlock Switches

Non-contact Interlock Switches

Safety Laser Scanners

Safety Light Curtains

Safety Modules

FS1A

RF1V

RF2

HR2S

HR1S

FS1A-C11S Logic 101

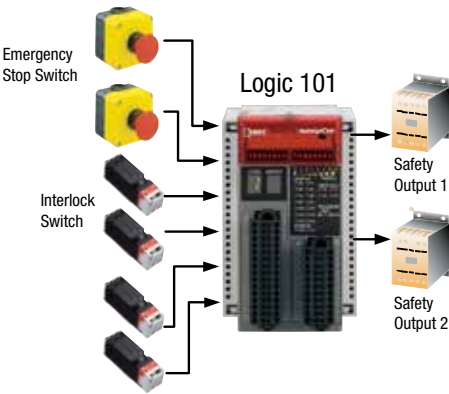
The logic for various apparatus

Output Line: 2
2 dual safety outputs of different operations

Maximum Category
4

Logic 101 is used for safeguarding measures of machine tools and robots. Safety outputs are dual channel outputs. It can be used with two dual direct-opening components and for dual channel dependent inputs. Safety output 2 has an off-delay timer.

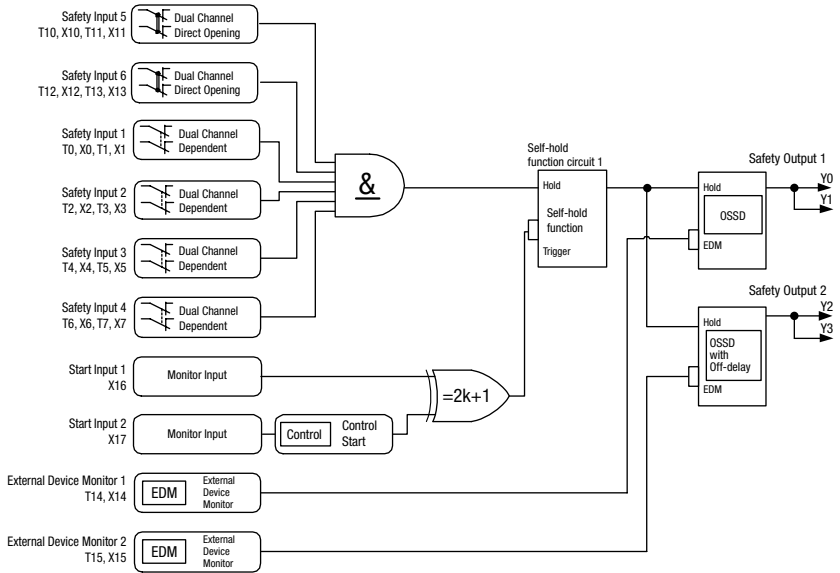
• Wiring Example



• DIP Switch and LED Display



• Logic Chart



• Be sure to check the standards of the equipment before use.

FS1A-C11S Logic 11A

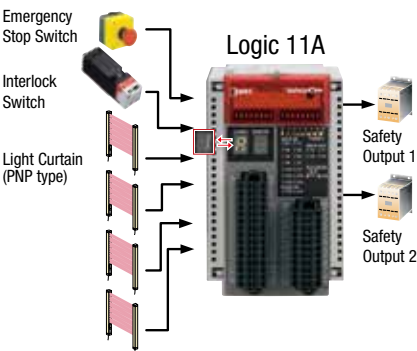
The logic for apparatus with openings

Output Line: 2
2 dual safety outputs of different operations

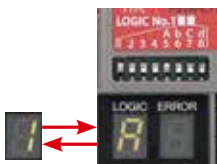
Maximum Category
4

Logic 11A is used for safeguarding measures of machine tools and robots, which use safety equipment such as light curtains with dual solid state outputs. Safety outputs are dual channel outputs. Two dual channel direct opening inputs and four dual channel safety inputs can be connected. Safety output 2 has an off-delay timer.

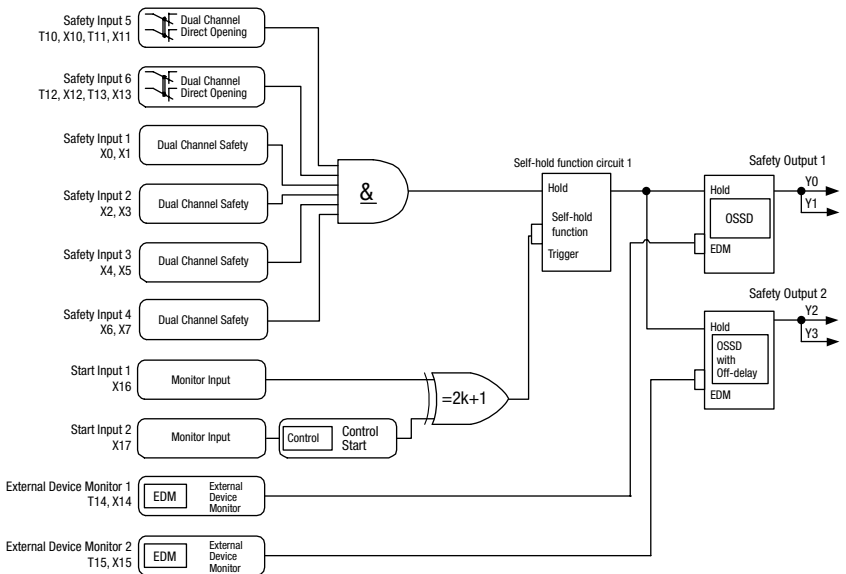
• Wiring Example



• DIP Switch and LED Display



• Logic Chart



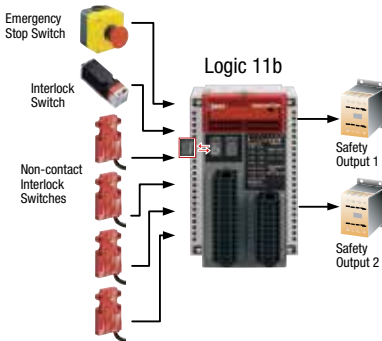
• Be sure to check the standards of the equipment before use.

- APEM
- Switches & Pilot Lights
- Control Boxes
- Emergency Stop Switches
- Enabling Switches
- Safety Products**
- Explosion Proof
- Terminal Blocks
- Relays & Sockets
- Circuit Protectors
- Power Supplies
- LED Illumination
- Controllers
- Operator Interfaces
- Sensors
- AUTO-ID

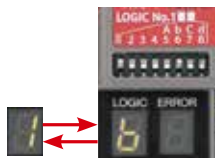
FS1A-C11S Logic 11b The logic for apparatus with NO/NC contact inputs Output Line: 2
2 dual safety outputs of different operations Maximum Category
4

Logic 11b is used for safeguarding measures of semiconductor manufacturing equipment and food packing machine which use dual channel NO/NC contact equipment. Safety outputs are dual channel outputs. Two dual channel direct opening inputs and four dual channel NO/NC inputs can be connected. Safety output 2 has an off-delay timer.

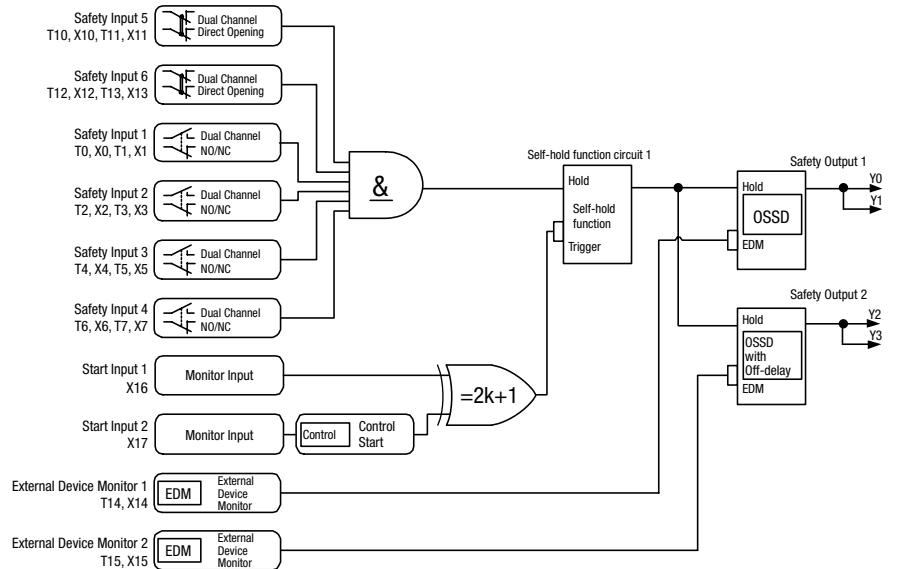
• Wiring Example



• DIP Switch and LED Display



• Logic Chart

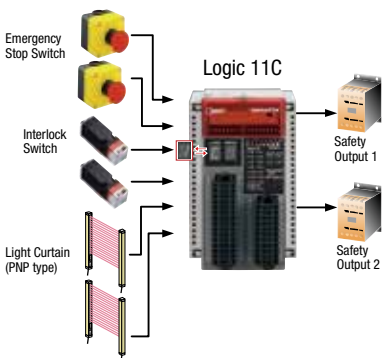


• Be sure to check the standards of the equipment before use.

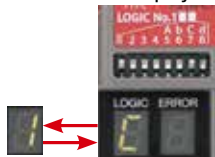
FS1A-C11S Logic 11C The logic for apparatus with openings Output Line: 2
2 dual safety outputs of different operations Maximum Category
4

Logic 11C is used for safeguarding measures of machine tools and robots, which use safety equipment such as light curtains with dual solid state outputs. Safety outputs are dual channel outputs. Four dual channel direct opening inputs, and two dual channel safety inputs can be connected. Safety output 2 has an off-delay timer.

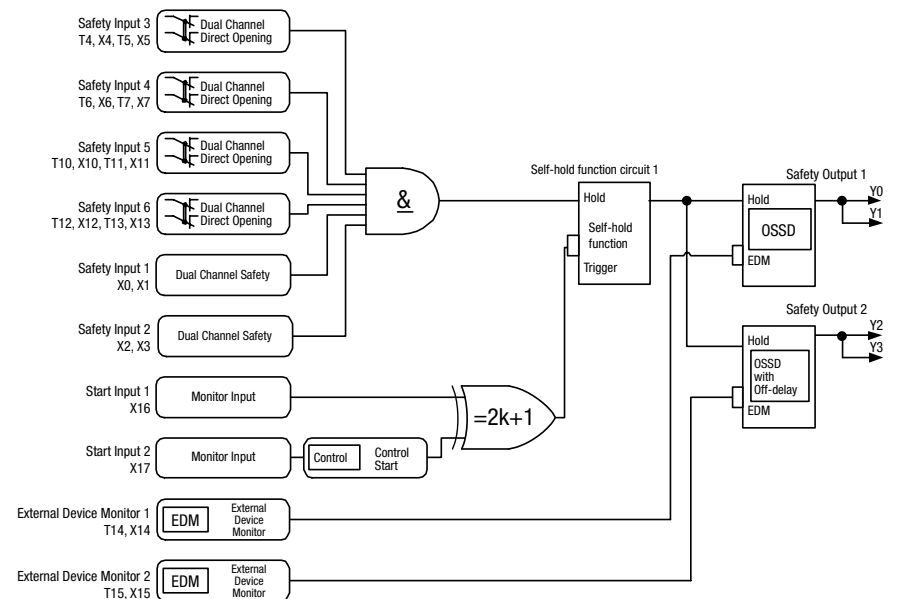
• Wiring Example



• DIP Switch and LED Display



• Logic Chart



• Be sure to check the standards of the equipment before use.

- Interlock Switches
- Non-contact Interlock Switches
- Safety Laser Scanners
- Safety Light Curtains
- Safety Modules**

- FS1A
- RF1V
- RF2
- HR2S
- HR1S

**FS1A-C11S
Logic 11d**

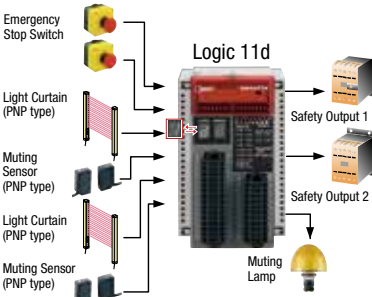
Muting function logic for apparatus with openings

Output Line: 2
2 dual safety outputs of
different operations

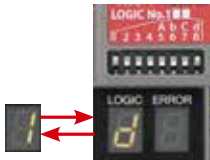
Maximum Category
4

Logic 11d is used for safeguarding measures of robots and conveyor lines, which uses safety equipment such as light curtains with dual solid state outputs, and also equipment that outputs muting signals for safety equipment. Safety outputs are dual channel outputs. Two dual channel direct opening inputs, two dual channel safety inputs, two muting signals (muting sensor or limit switch) (two signals = one muting point) can be connected. Safety output 2 has an off-delay timer.

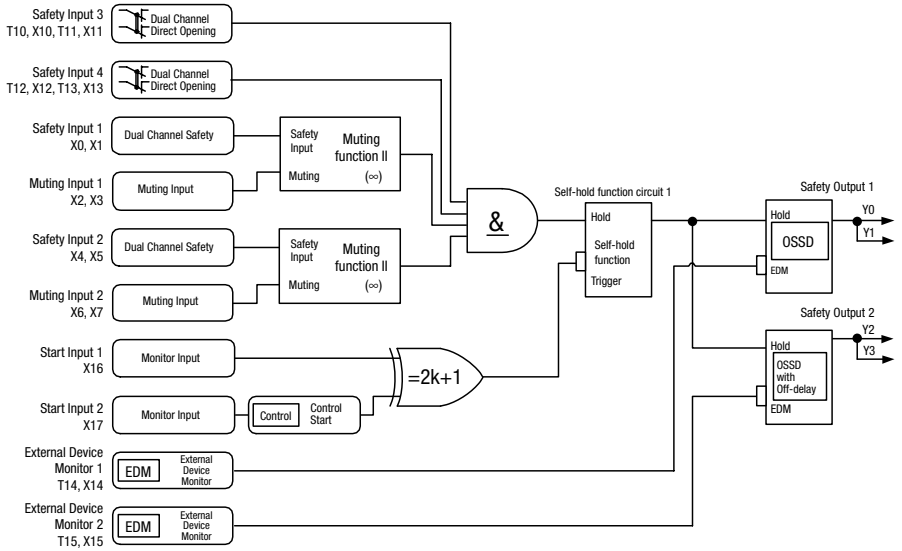
• Wiring Example



• DIP Switch and LED Display



• Logic Chart



• Be sure to check the standards of the equipment before use.

**FS1A-C11S
Logic 102**

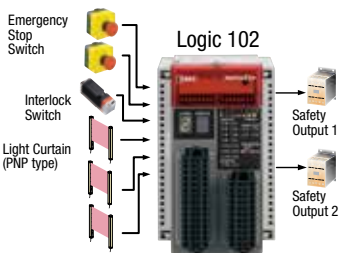
Partial stop logic for apparatus with openings

Output Line: 2
2 dual safety outputs of
different operations

Maximum Category
4

Logic 102 is used for safeguarding measures of machine tools and robots, which use safety equipment such as light curtains with dual solid state outputs. Safety outputs are dual channel outputs. Three dual channel direct opening inputs and three dual safety inputs can be connected.

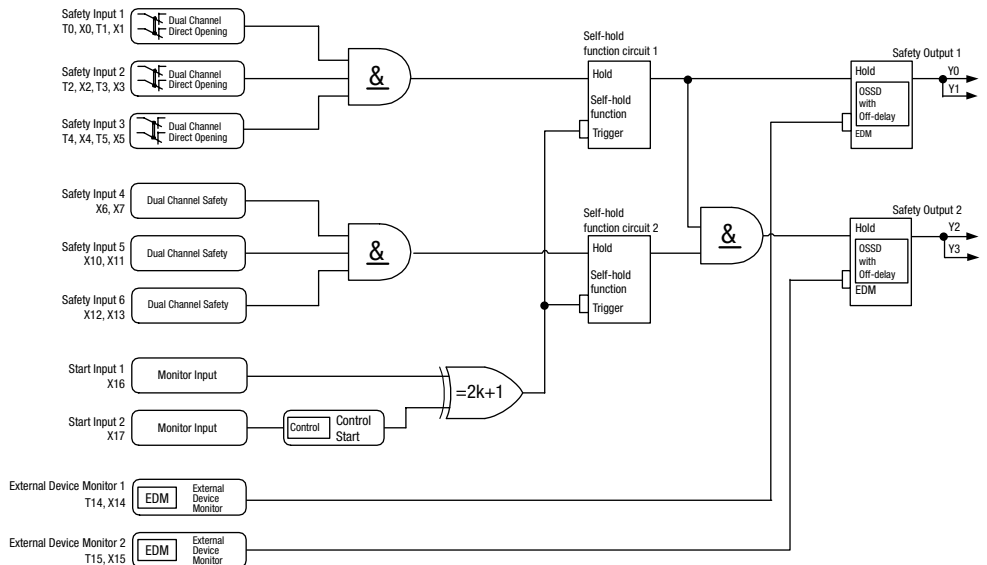
• Wiring Example



• DIP Switch and LED Display



• Logic Chart



• Be sure to check the standards of the equipment before use.

APEM

Switches & Pilot Lights

Control Boxes

Emergency Stop Switches

Enabling Switches

Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets

Circuit Protectors

Power Supplies

LED Illumination

Controllers

Operator Interfaces

Sensors

AUTO-ID

Interlock Switches

Non-contact Interlock Switches

Safety Laser Scanners

Safety Light Curtains

Safety Modules

FS1A

RF1V

RF2

HR2S

HR1S

FS1A-C11S
Logic 12b

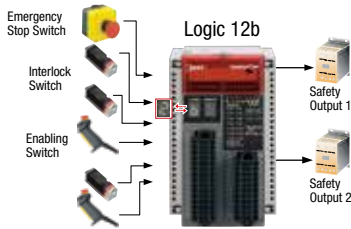
The logic constructing an OR circuit for various apparatus

Output Line: 2
2 dual safety outputs of different operations

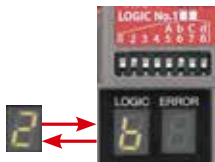
Maximum Category
4

Logic 12b is used for safeguarding measures of machine tools and robots, when an OR circuit is configured. Safety outputs are dual channel outputs. Four dual channel direct opening inputs and two dual channel dependent inputs can be connected. Safety output 2 has an off-delay timer.

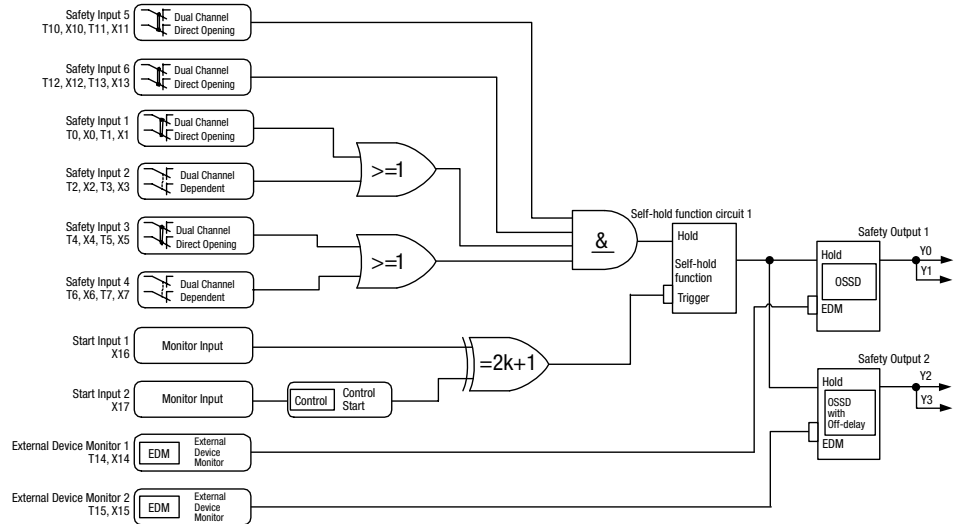
• Wiring Example



• DIP Switch and LED Display



• Logic Chart



• Be sure to check the standards of the equipment before use.

FS1A-C11S
Logic 12C

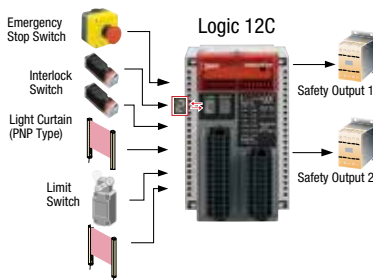
The logic constructing an OR circuit for apparatus with openings

Output Line: 2
2 dual safety outputs of different operations

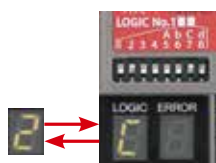
Maximum Category
4

Logic 12C is used for safeguarding measures of machine tools and robots which use safety equipment with dual channel solid state outputs, when configuring OR circuit. Safety outputs are dual channel outputs. Four dual channel direct opening inputs and two dual channel safety inputs can be connected. Safety output 2 has an off-delay timer.

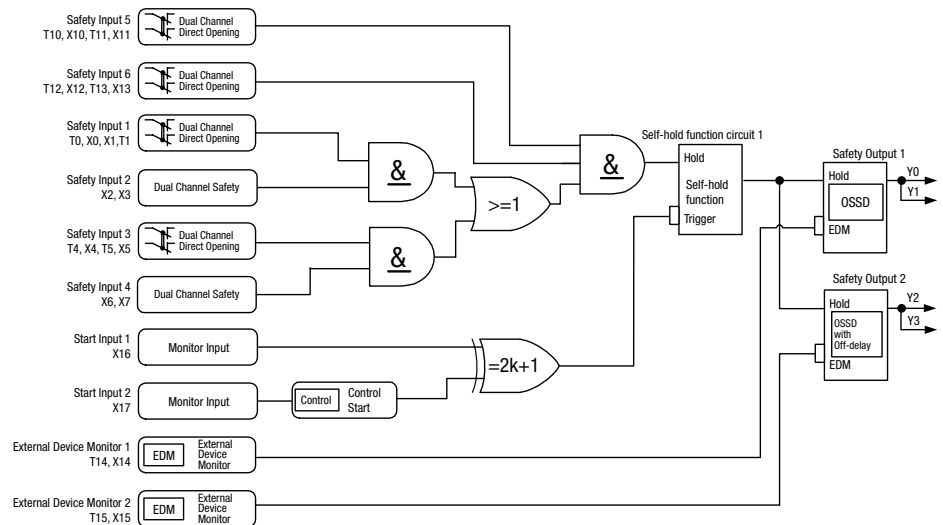
• Wiring Example



• DIP Switch and LED Display



• Logic Chart



• Be sure to check the standards of the equipment before use.

FS1A-C11S Logic 12d

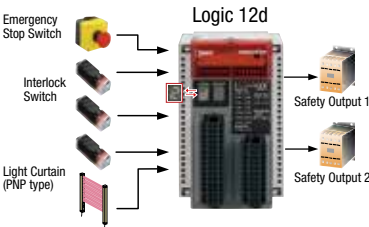
Partial control logic for apparatus with openings

Output Line: 2
2 dual safety outputs of different operations

Maximum Category
4

Logic 12d is used for safeguarding measures of machine tools and robots which use safety equipment with dual channel solid state outputs, when configuring partial control. Safety outputs are dual channel outputs. One dual channel direct opening input, one dual channel safety input, and three dual channel dependent inputs can be connected. Safety output 2 has an off-delay timer.

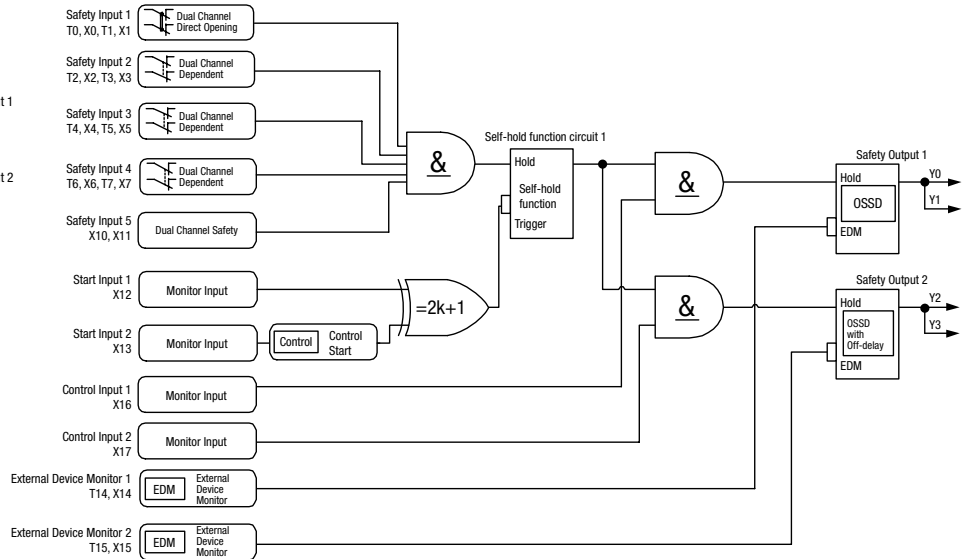
• Wiring Example



• DIP Switch and LED Display



• Logic Chart



• Be sure to check the standards of the equipment before use.

FS1A-C11S Logic 103

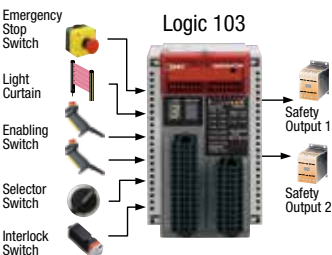
Partial stop logic applicable for selection of active safety input devices

Output Line: 2
2 dual safety outputs of different operations

Maximum Category
4

In machine tools and robots, a hazard source is isolated by a guard in automatic operation. In human-attended operation such as teaching and maintenance, the operator has to work inside a hazardous area. Logic 103 is used to configure a system in which teach or auto mode can be selected using a selector switch. Safety outputs are dual channel outputs. One dual channel direct opening input, one mode select input, three dual channel dependent inputs, and one dual channel safety input can be connected.

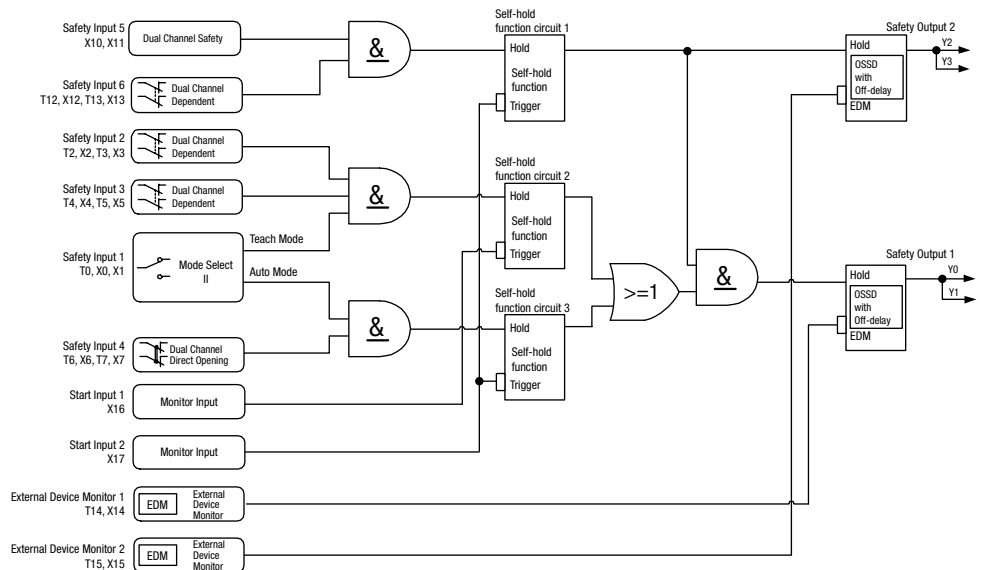
• Wiring Example



• DIP Switch and LED Display



• Logic Chart



• Be sure to check the standards of the equipment before use.

APEM

Switches & Pilot Lights

Control Boxes

Emergency Stop Switches

Enabling Switches

Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets

Circuit Protectors

Power Supplies

LED Illumination

Controllers

Operator Interfaces

Sensors

AUTO-ID

Interlock Switches

Non-contact Interlock Switches

Safety Laser Scanners

Safety Light Curtains

Safety Modules

FS1A

RF1V

RF2

HR2S

HR1S

**FS1A-C11S
Logic 13A**

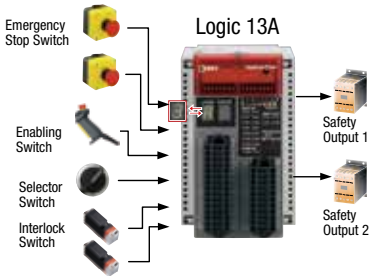
The logic applicable for selection of active safety input devices

Output Line: 2
2 dual safety outputs of different operations

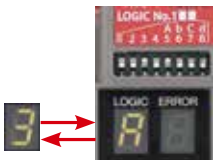
Maximum Category
4

In machine tools and robots, a hazard source is isolated by a guard in automatic operation. In human-attended operation such as teaching and maintenance, the operator has to work inside a hazardous area. Logic 13A is used to configure a system in which teach or auto mode can be selected using a selector switch. Safety outputs are dual channel outputs. Two dual channel direct opening input, one mode select input, and three dual channel dependent inputs can be connected. Safety output 2 has an off-delay timer.

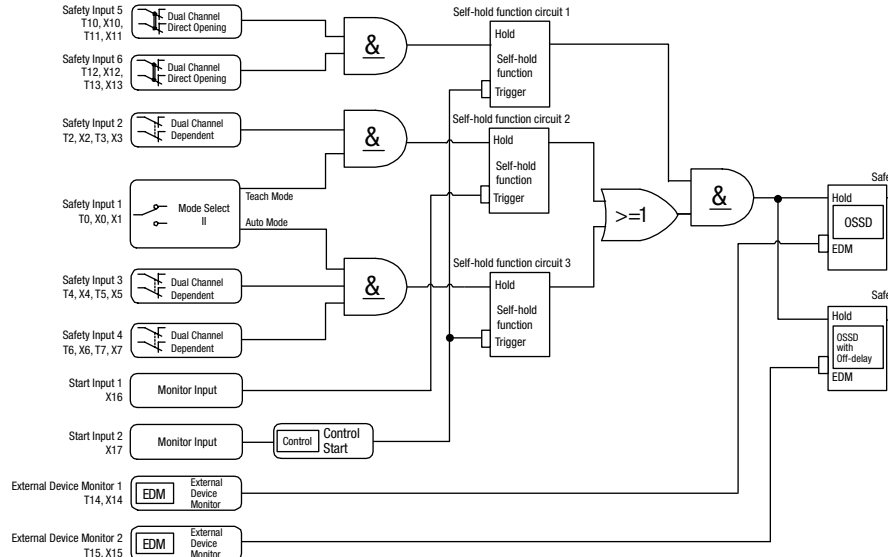
• Wiring Example



• DIP Switch and LED Display



• Logic Chart



• Be sure to check the standards of the equipment before use.

**FS1A-C11S
Logic 13b**

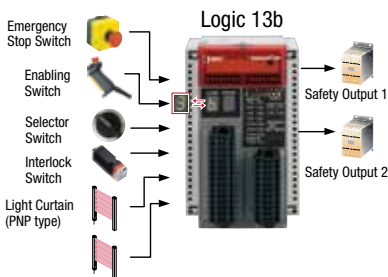
The logic constructing an OR circuit applicable for selection of active safety input devices

Output Line: 2
2 dual safety outputs of different operations

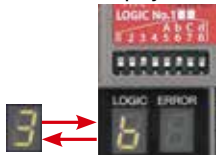
Maximum Category
4

In machine tools and robots, a hazard source is isolated by a guard in automatic operation. In human-attended operation such as teaching and maintenance, the operator has to work inside a hazardous area. Logic 13b is used to configure a system in which teach or auto mode can be selected using a selector switch. Safety outputs are dual channel outputs. OR circuit can be configured in auto mode. Two dual channel direct opening input, one mode select input, one dual channel dependent input, and two dual channel safety inputs can be connected. Safety output 2 has an off-delay timer.

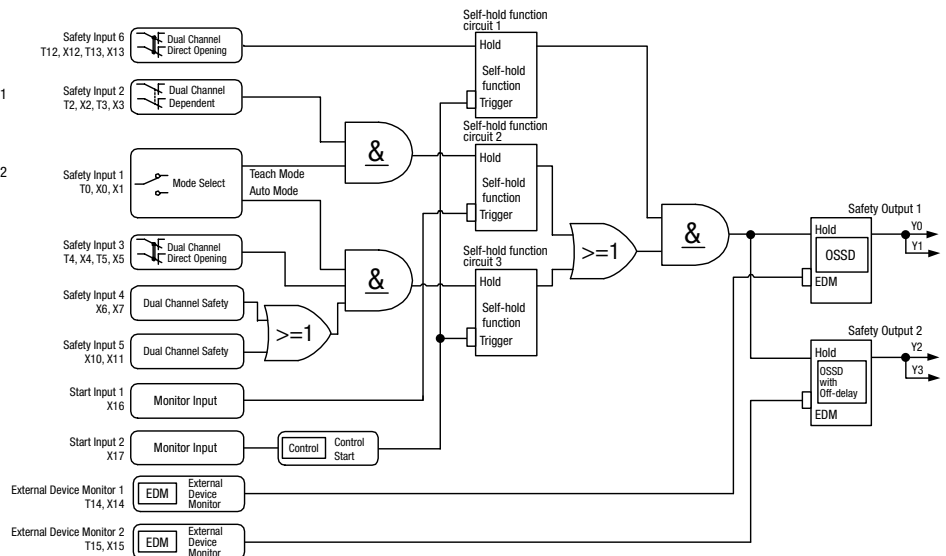
• Wiring Example



• DIP Switch and LED Display



• Logic Chart



• Be sure to check the standards of the equipment before use.

FS1A-C11S Logic 13C

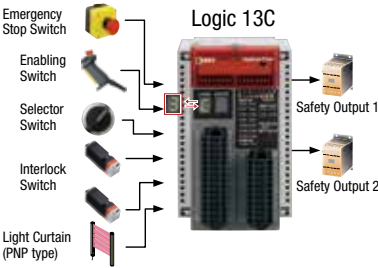
Partial stop logic applicable for selection of active safety input devices

Output Line: 2
2 dual safety outputs of different operations

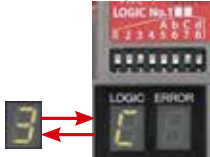
Maximum Category
4

In machine tools and robots, a hazard source is isolated by a guard in automatic operation. In human-attended operation such as teaching and maintenance, the operator has to work inside a hazardous area. Logic 13C is used to configure a system in which teach or auto mode can be selected using a selector switch. Safety outputs are dual channel outputs. Three dual channel direct opening inputs, one mode select input, one dual channel dependent input, one dual channel safety input can be connected. Safety output 2 has an off-delay timer.

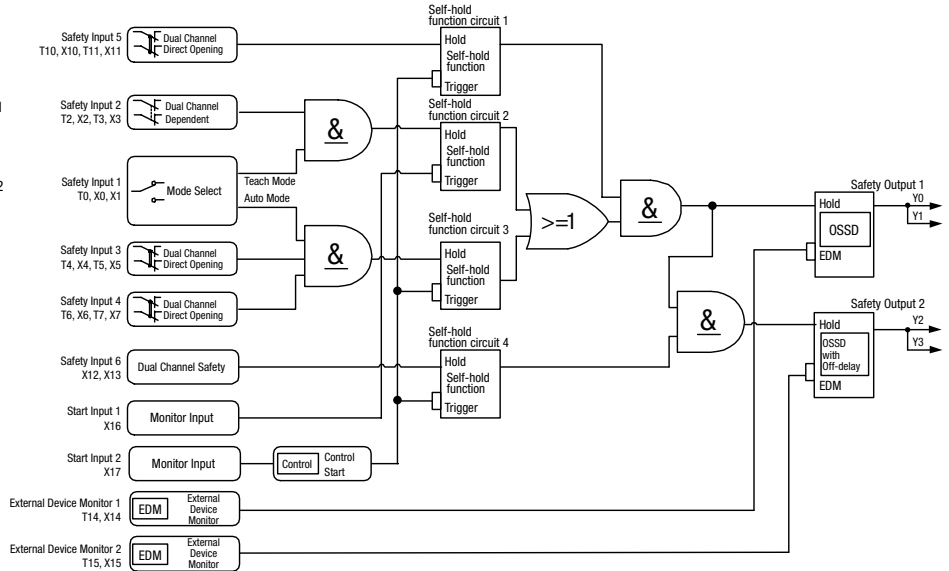
• Wiring Example



• DIP Switch and LED Display



• Logic Chart



• Be sure to check the standards of the equipment before use.

FS1A-C11S Logic 13d

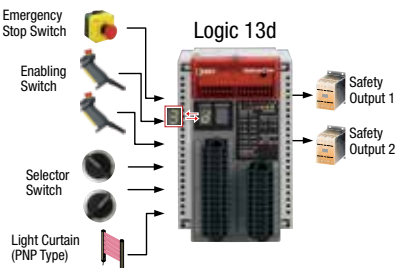
The logic applicable for selection of active safety input devices

Output Line: 2
2 dual safety outputs of different operations

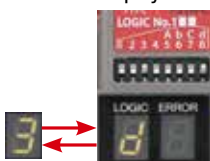
Maximum Category
4

In machine tools and robots, a hazard source is isolated by a guard in automatic operation. In human-attended operation such as teaching and maintenance, the operator has to work inside a hazardous area. Logic 13d is used to configure a system in which teach or auto mode can be selected using a selector switch, and to select teach 1 or teach 2 within teach mode. Safety outputs are dual channel outputs. One dual channel direct opening input, one mode select input, two dual channel dependent inputs, and one dual channel safety input can be connected. Safety output 2 has an off-delay timer.

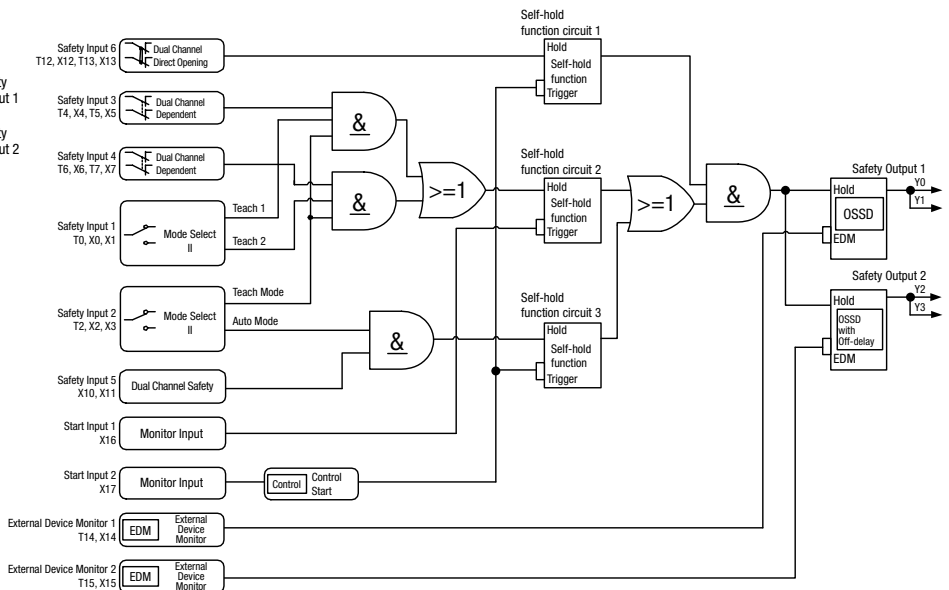
• Wiring Example



• DIP Switch and LED Display



• Logic Chart

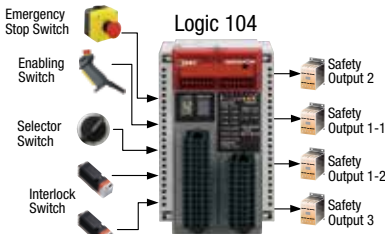


• Be sure to check the standards of the equipment before use.

| | | | |
|--------------------------------|--|---|------------------------------|
| FS1A-C11S Logic 104 | Partial stop logic applicable for selection of active safety input devices | Output Line: 4 4 single safety outputs of different operations | Maximum Category 3 |
|--------------------------------|--|---|------------------------------|

In machine tools and robots, a hazard source is isolated by a guard in automatic operation. In human-attended operation such as teaching and maintenance, the operator has to work inside a hazardous area. Logic 104 is used to configure a system in which teach or auto mode can be selected using a selector switch. Safety outputs are single output. Three dual channel direct opening inputs, one mode select input, and one dual channel dependent input can be connected. Safety output 1-2 has an off-delay timer.

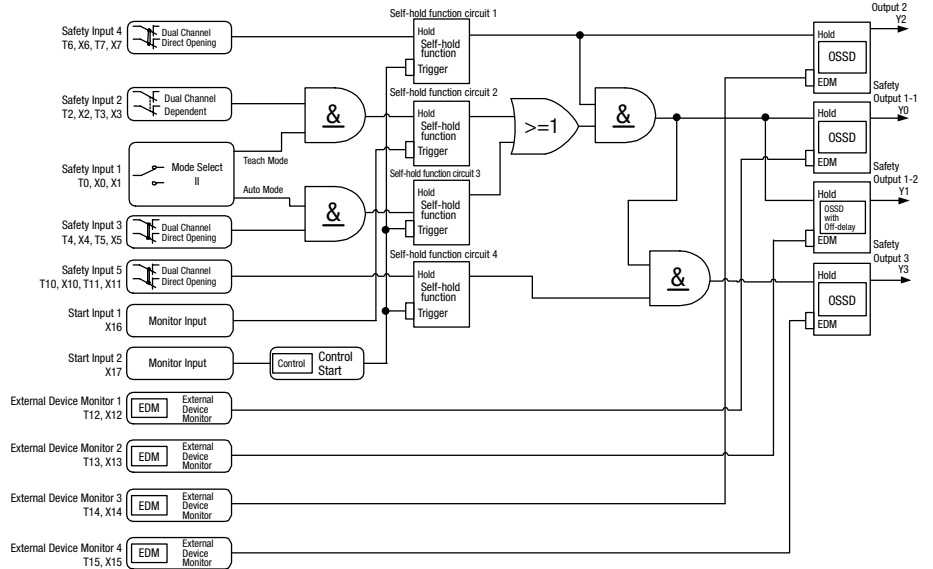
• Wiring Example



• DIP Switch and LED Display



• Logic Chart



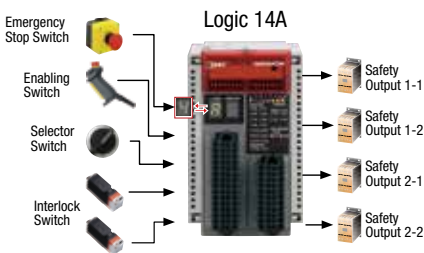
• Be sure to check the standards of the equipment before use.

- APEM
- Switches & Pilot Lights
- Control Boxes
- Emergency Stop Switches
- Enabling Switches
- Safety Products
- Explosion Proof
- Terminal Blocks
- Relays & Sockets
- Circuit Protectors
- Power Supplies
- LED Illumination
- Controllers
- Operator Interfaces
- Sensors
- AUTO-ID

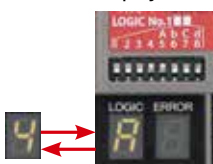
| | | | |
|--------------------------------|--|---|------------------------------|
| FS1A-C11S Logic 14A | Partial stop logic applicable for selection of active safety input devices | Output Line: 4 4 single safety outputs of different operations | Maximum Category 3 |
|--------------------------------|--|---|------------------------------|

In machine tools and robots, a hazard source is isolated by a guard in automatic operation. In human-attended operation such as teaching and maintenance, the operator has to work inside a hazardous area. Logic 14A is used to configure a system in which teach or auto mode can be selected using a selector switch. Safety outputs are single output. Three dual channel direct opening inputs, one mode select input, and one dual channel dependent input can be connected. Safety outputs 1-2 and 2-2 have off-delay timers.

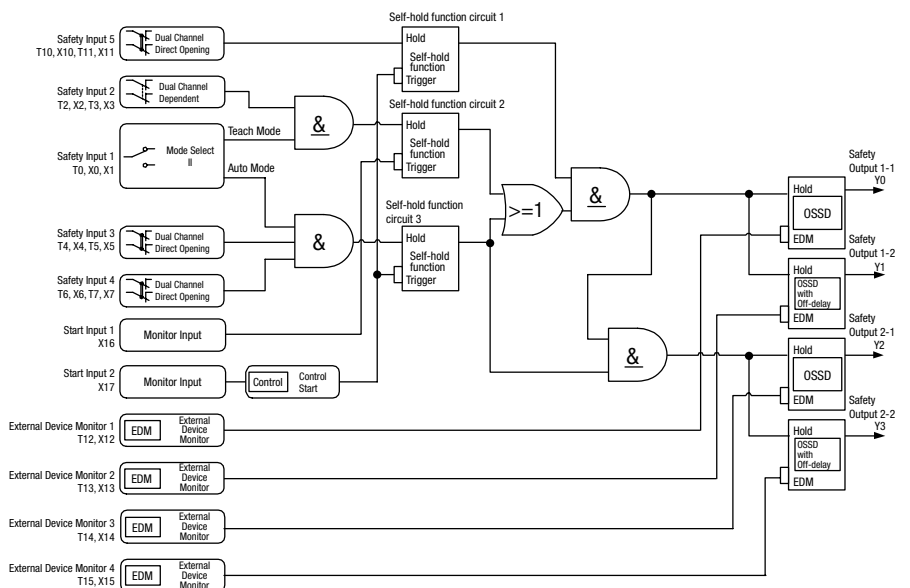
• Wiring Example



• DIP Switch and LED Display



• Logic Chart



• Be sure to check the standards of the equipment before use.

- Interlock Switches
- Non-contact Interlock Switches
- Safety Laser Scanners
- Safety Light Curtains
- Safety Modules

- FS1A
- RF1V
- RF2
- HR2S
- HR1S

FS1A-C11S Logic 14b

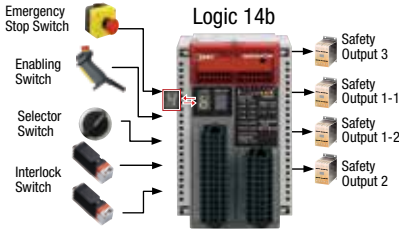
Partial stop logic applicable for selection of active safety input devices

Output Line: 4
4 single safety outputs of different operations

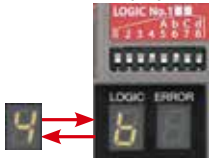
Maximum Category
3

In machine tools and robots, a hazard source is isolated by a guard in automatic operation. In human-attended operation such as teaching and maintenance, the operator has to work inside a hazardous area. Logic 14b is used to configure a system in which teach or auto mode can be selected using a selector switch. Safety outputs are single output. Three dual channel direct opening inputs, one mode select input, and one dual channel dependent input can be connected. Safety output 1-2 has an off-delay timer.

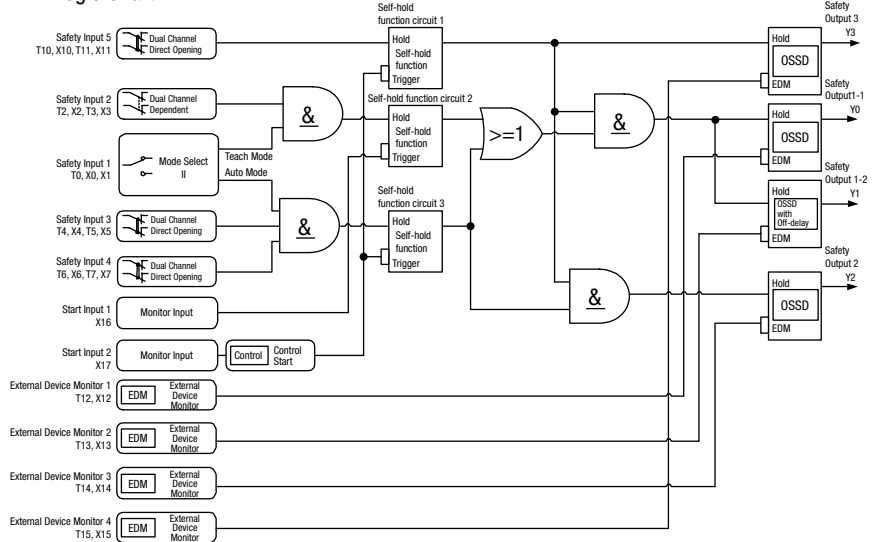
• Wiring Example



• DIP Switch and LED Display



• Logic Chart



• Be sure to check the standards of the equipment before use.

FS1A-C11S Logic 14C

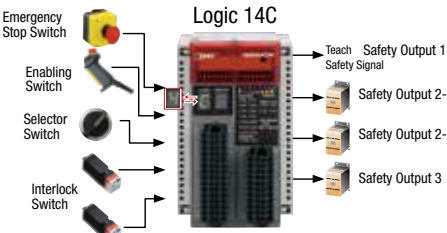
Partial stop logic applicable for selection of active safety input devices

Output Line: 4
4 single safety outputs of different operations

Maximum Category
3

In machine tools and robots, a hazard source is isolated by a guard in automatic operation. In human-attended operation such as teaching and maintenance, the operator has to work inside a hazardous area. Logic 14C is used to configure a system in which teach or auto mode can be selected using a selector switch. Safety outputs are single output. Three dual channel direct opening inputs, one mode select input, and one dual channel dependent input can be connected. Safety output 2-2 has an off-delay timer.

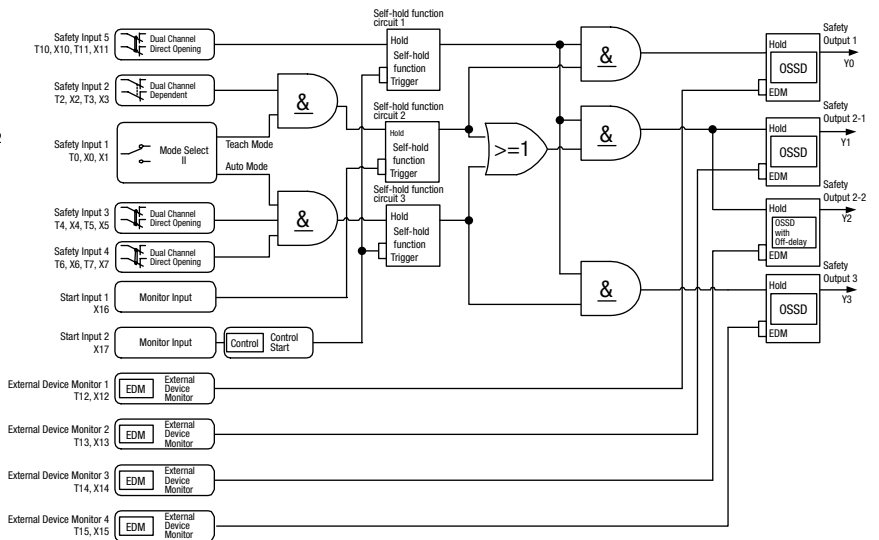
• Wiring Example



• DIP Switch and LED Display



• Logic Chart

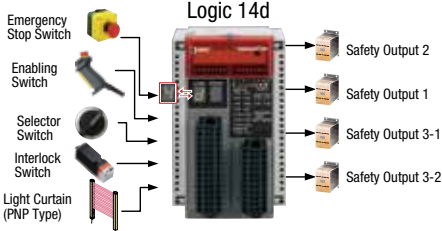


• Be sure to check the standards of the equipment before use.

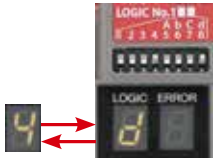
| | | | |
|--------------------------------|--|---|------------------------------|
| FS1A-C11S Logic 14d | Partial stop logic applicable for selection of active safety input devices for apparatus with openings | Output Line: 4 4 single safety outputs of different operations | Maximum Category 3 |
|--------------------------------|--|---|------------------------------|

In machine tools and robots, a hazard source is isolated by a guard in automatic operation. In human-attended operation such as teaching and maintenance, the operator has to work inside a hazardous area. Logic 14d is used to configure a system in which teach or auto mode can be selected using a selector switch. Safety outputs are single output. Two dual channel direct opening input, one mode select input, one dual channel dependent input and one dual channel safety input can be connected. Safety output 2 and 3-2 have off-delay timer.

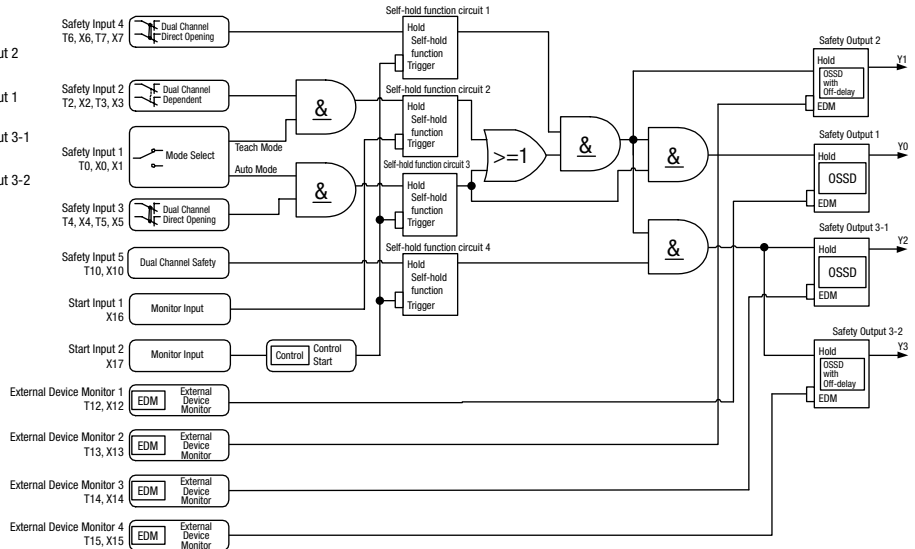
• Wiring Example



• DIP Switch and LED Display



• Logic Chart



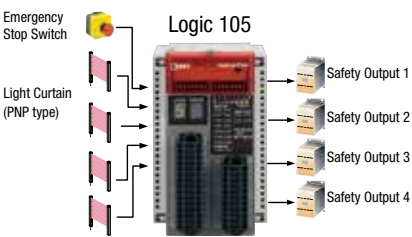
• Be sure to check the standards of the equipment before use.

- APEM
- Switches & Pilot Lights
- Control Boxes
- Emergency Stop Switches
- Enabling Switches
- Safety Products
- Explosion Proof
- Terminal Blocks
- Relays & Sockets
- Circuit Protectors
- Power Supplies
- LED Illumination
- Controllers
- Operator Interfaces
- Sensors
- AUTO-ID

| | | | |
|--------------------------------|--|---|------------------------------|
| FS1A-C11S Logic 105 | Partial stop logic for apparatus with openings | Output Line: 4 4 single safety outputs of different operations | Maximum Category 3 |
|--------------------------------|--|---|------------------------------|

Logic 105 is used for safeguarding measures of machine tools and robots, which use safety equipment such as light curtains with dual solid state outputs. Safety outputs are single output. Five dual channel safety inputs can be connected. Safety output 4 has an off-delay timer.

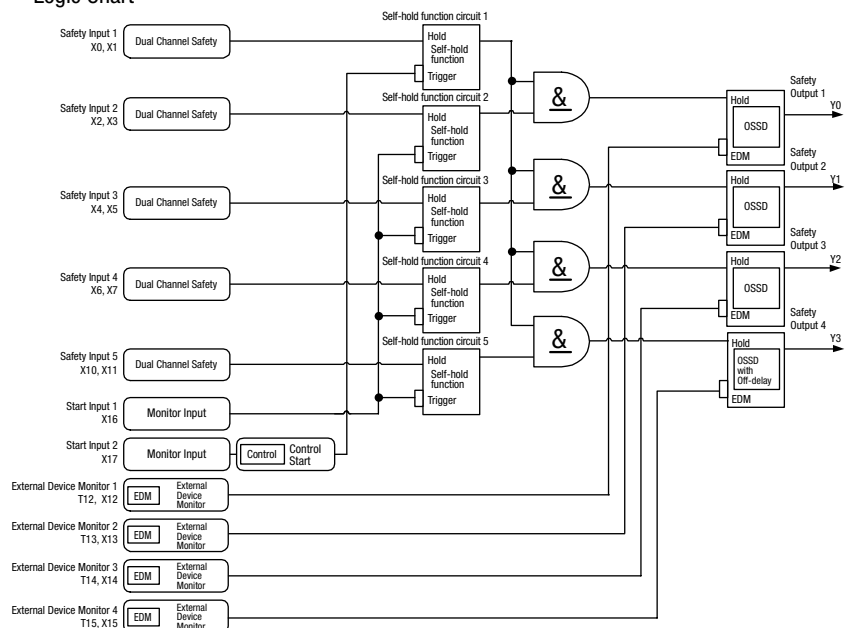
• Wiring Example



• DIP Switch and LED Display



• Logic Chart



• Be sure to check the standards of the equipment before use.

- Interlock Switches
- Non-contact Interlock Switches
- Safety Laser Scanners
- Safety Light Curtains
- Safety Modules

- FS1A
- RF1V
- RF2
- HR2S
- HR1S

FS1A-C11S Logic 106

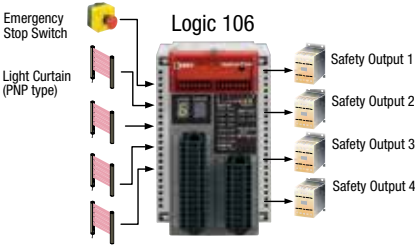
Partial stop logic for apparatus with openings

Output Line: 4
4 single safety outputs of different operations

Maximum Category
3

Logic 106 is used for safeguarding measures of machine tools and robots, which use safety equipment such as light curtains with dual solid state outputs. Safety outputs are single output. Five dual channel safety inputs can be connected. Safety output 4 has an off-delay timer.

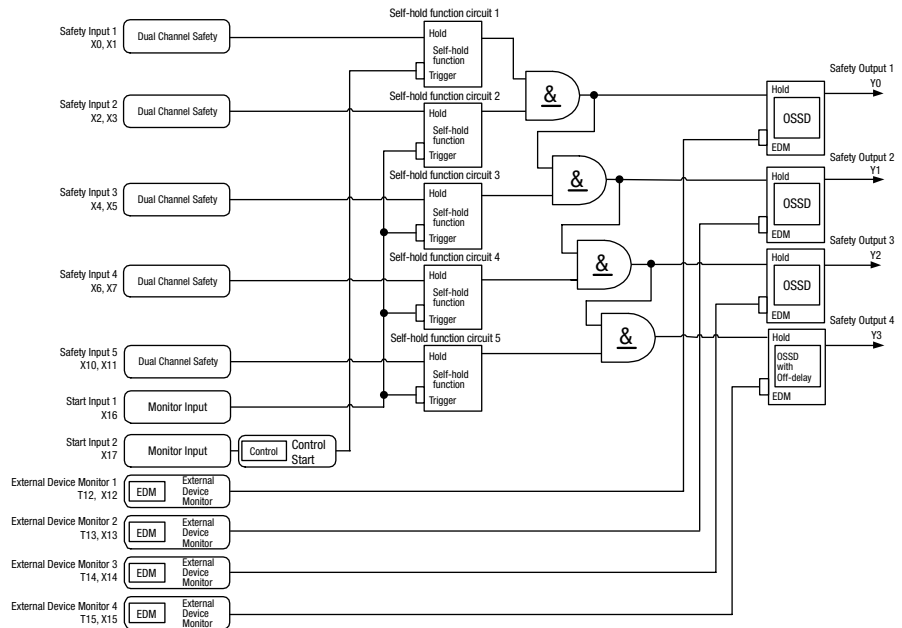
• Wiring Example



• DIP Switch and LED Display



• Logic Chart



• Be sure to check the standards of the equipment before use.

FS1A-C11S Logic 107

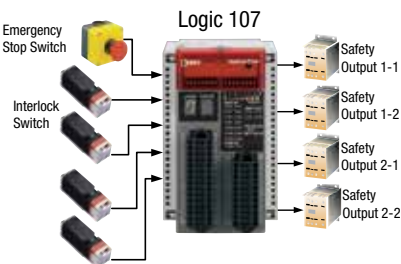
Partial stop logic for various apparatus

Output Line: 4
4 single safety outputs of different operations

Maximum Category
3

Logic 107 is used for safeguarding measures of machine tools and robots. Safety outputs are single output. Five dual channel direct opening inputs can be connected. Safety outputs 1-2 and 2-2 have off-delay timers.

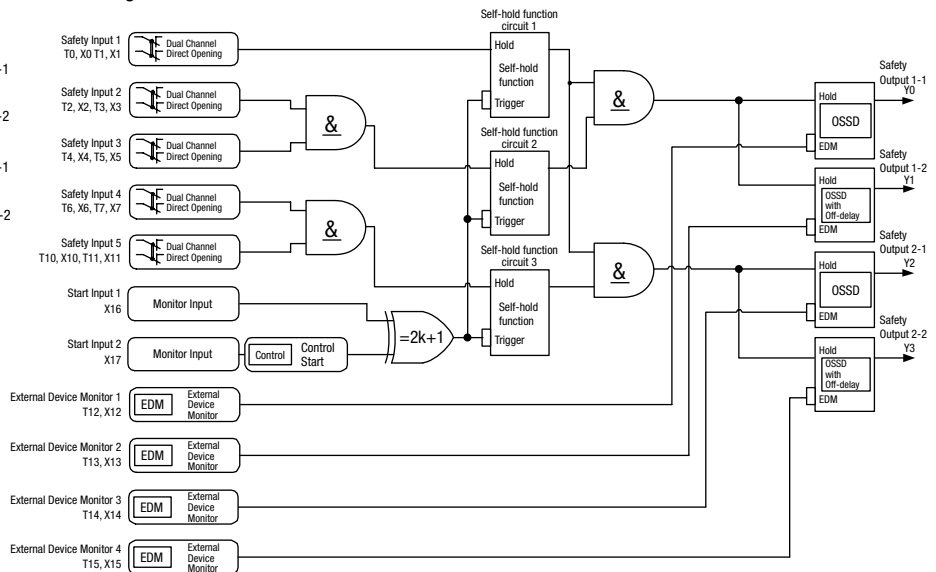
• Wiring Example



• DIP Switch and LED Display



• Logic Chart

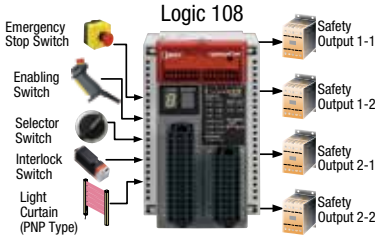


• Be sure to check the standards of the equipment before use.

| | | | |
|--------------------------------|---|---|------------------------------|
| FS1A-C11S Logic 108 | Partial stop logic applicable for selection of active safety input devices in apparatus with openings | Output Line: 4 4 single safety outputs of different operations | Maximum Category 3 |
|--------------------------------|---|---|------------------------------|

In machine tools and robots, a hazard source is isolated by a guard in automatic operation. In human-attended operation such as teaching and maintenance, the operator has to work inside a hazardous area. Logic 108 is used to configure a system in which teach or auto mode can be selected using a selector switch. Safety output is single output. Two dual channel direct opening input, one mode select input, one dual channel dependent input, and one dual channel safety input can be connected. Safety outputs 1-2 and 2-2 have off-delay timers.

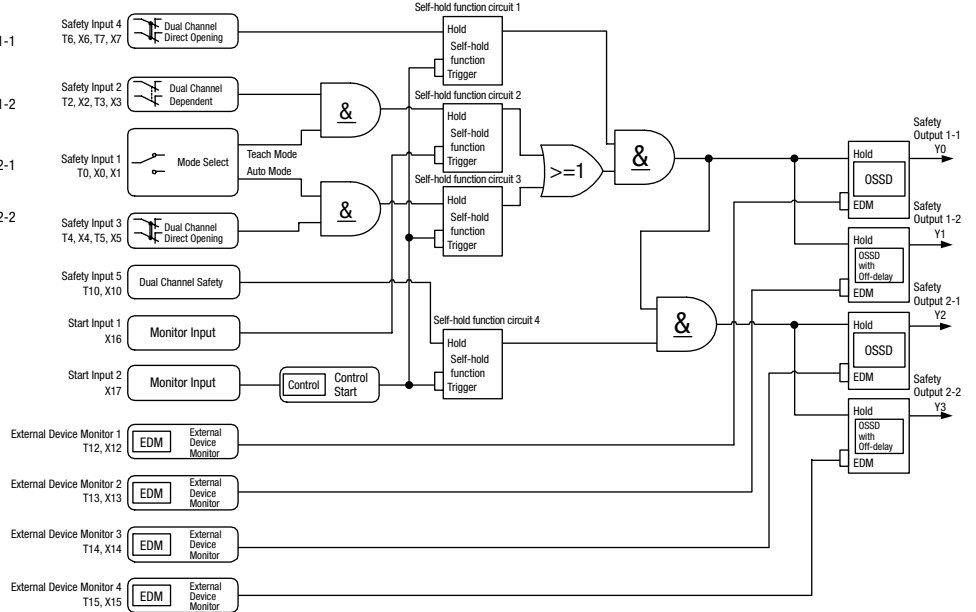
• Wiring Example



• DIP Switch and LED Display



• Logic Chart



• Be sure to check the standards of the equipment before use.

- APEM
- Switches & Pilot Lights
- Control Boxes
- Emergency Stop Switches
- Enabling Switches
- Safety Products
- Explosion Proof
- Terminal Blocks
- Relays & Sockets
- Circuit Protectors
- Power Supplies
- LED Illumination
- Controllers
- Operator Interfaces
- Sensors
- AUTO-ID

FS1A-C21S logic selection chart 2

| Part No. | | Interlock/Emergency Stop Switch | Enabling/Grip Switch | Mode Selection | Light Curtain Safety Laser Scanner | Muting | NO/NC Contact Inputs | Two-hand Control | Output 1 Line | Output 2 Lines | Output 4 Lines |
|--|-----------|---------------------------------|----------------------|----------------|------------------------------------|--------|----------------------|------------------|---------------|----------------|----------------|
| FS1A-C11S | | | | | | | | | | | |
| Logic Type | Logic No. | | | | | | | | | | |
| The logic for various apparatus | 201 | ● | | | | | | | ● | | |
| The logic for apparatus with a two-hand control device | 22A | ● | ● | | ● | ● | | ● | | ● | |
| The logic for apparatus with openings | 22b | ● | ● | | ● | | | | | ● | |
| The logic for apparatus with openings | 22C | ● | ● | | ● | | | | | ● | |
| Partial control logic for apparatus with openings | 22d | ● | ● | | ● | | | | | ● | |
| Partial stop logic for apparatus with openings | 23C | ● | ● | ● | | | | | | ● | |
| Muting function logic for apparatus with openings | 24A | ● | ● | | ● | ● | | | | | ● |
| Muting function logic for apparatus with openings | 24b | ● | ● | | ● | ● | | | | | ● |
| The logic constructing an OR circuit for apparatus with openings | 24C | ● | ● | ● | ● | | | | | | ● |
| The logic constructing an OR circuit applicable for selection of active safety input devices | 24d | ● | ● | | ● | | | | | | ● |
| Partial stop logic for various apparatus | 208 | ● | | | | | ● | | | ● | |

• Logic No. 21A, 21b, 21C, 21d, 202, 203, 23A, 23b, 23d, 204, 205, 206, 207 are optional logics. For software version 1.00, Logic No. 21A, 21b, 21C, 21d, 202, 203, 23A, 23b, 23C, 23d, 204, 24C, 24d, 205, 206, 207, 208 are optional logics.

- Interlock Switches
- Non-contact Interlock Switches
- Safety Laser Scanners
- Safety Light Curtains
- Safety Modules

- FS1A
- RF1V
- RF2
- HR2S
- HR1S

FS1A-C21S Logic 201

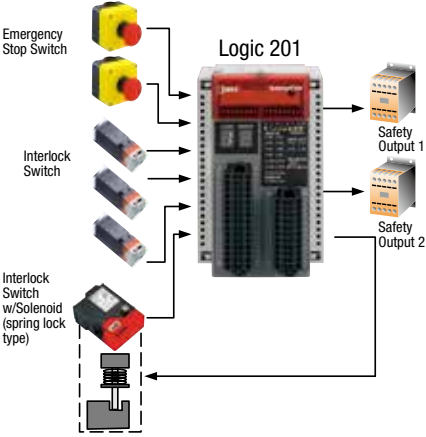
General-purpose logic for various apparatus

Output Line: 1
2 dual safety outputs of the same operation

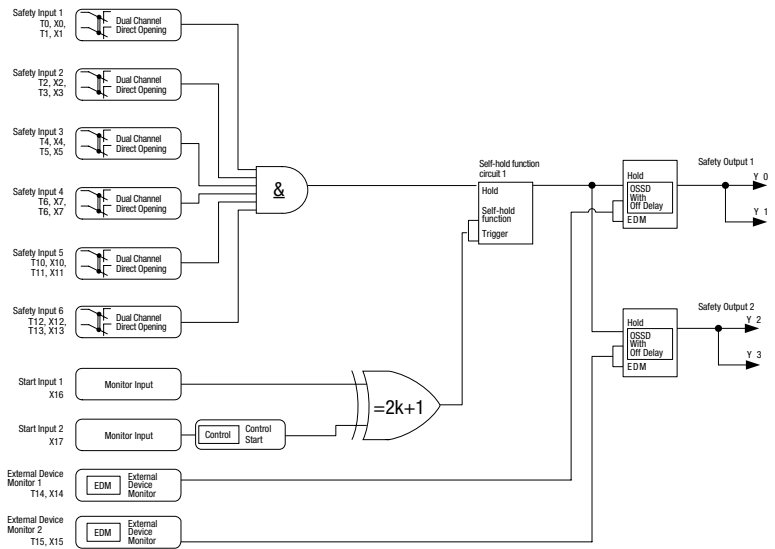
Maximum Category
4

Logic 201 is used for safeguarding measures of machine tools and robots. It can be used with dual direct-opening components such as emergency stop switches and interlock switches.

• Wiring Example



• Logic Chart



• LED Display



• Be sure to check the standards of the equipment before use.

FS1A-C21S Logic 22A

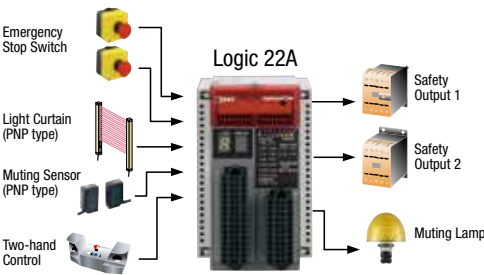
The logic for apparatus with a two-hand control device

Output Line: 2
2 dual safety outputs of different operations

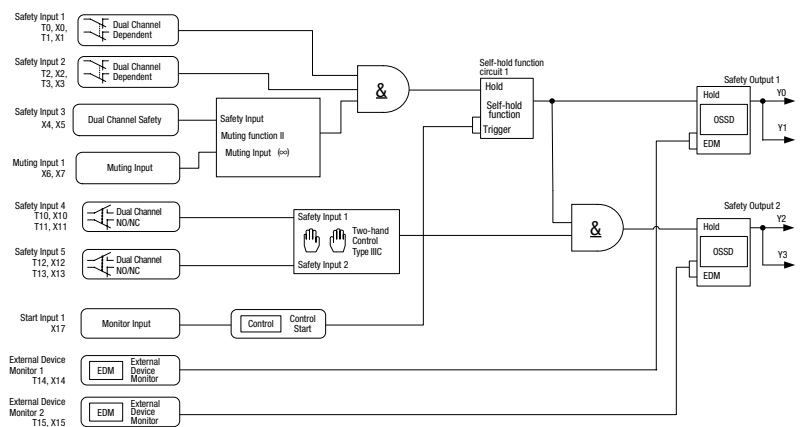
Maximum Category
4

Logic 22A is used for safeguarding measures of machine tools that use two-hand control (two safety inputs = one point). Safety outputs are dual channel outputs. Safety light curtain can be used and muting is available. Two dual channel dependent inputs can be connected.

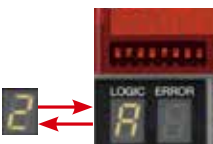
• Wiring Example



• Logic Chart



• LED Display



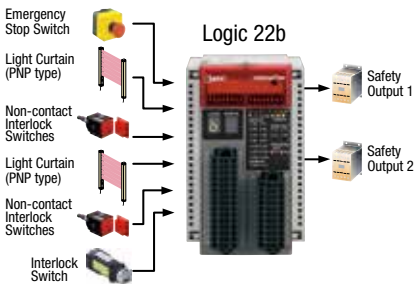
• Be sure to check the standards of the equipment before use.

- APEM
- Switches & Pilot Lights
- Control Boxes
- Emergency Stop Switches
- Enabling Switches
- Safety Products
- Explosion Proof
- Terminal Blocks
- Relays & Sockets
- Circuit Protectors
- Power Supplies
- LED Illumination
- Controllers
- Operator Interfaces
- Sensors
- AUTO-ID

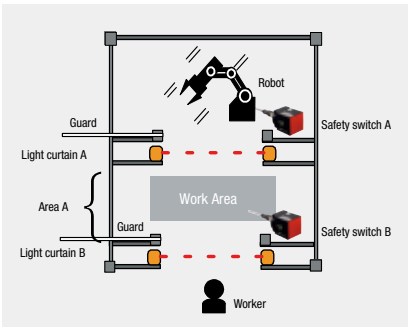
FS1A-C21S Logic 22b The logic for apparatus with openings Output Line: 2
2 dual safety outputs of different operations Maximum Category 4

Logic 22b is used for two sets of dual channel interlock. It can be used with dual direct-opening components such as emergency stop switches and interlock switches.

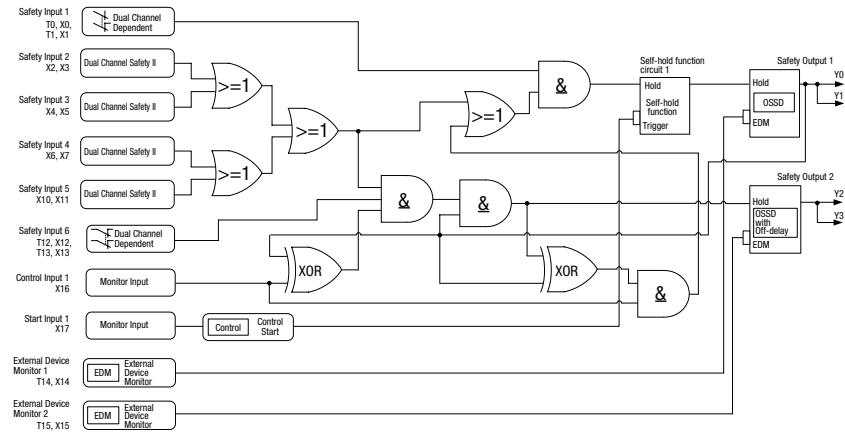
• Wiring Example



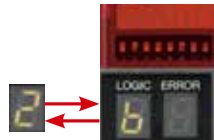
• Application Example



• Logic Chart (Software version 2.00 or above)



• LED Display

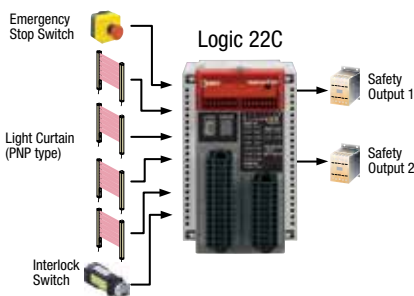


• Be sure to check the standards of the equipment before use.

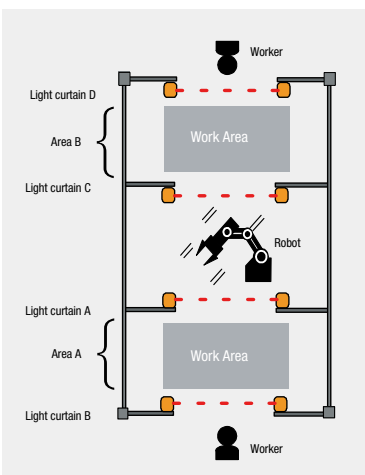
FS1A-C21S Logic 22C The logic for apparatus with openings Output Line: 2
2 dual safety outputs of different operations Maximum Category 4

Logic 22C is used for applications with up to four openings. It can be used with dual direct-opening components such as emergency stop switches and interlock switches.

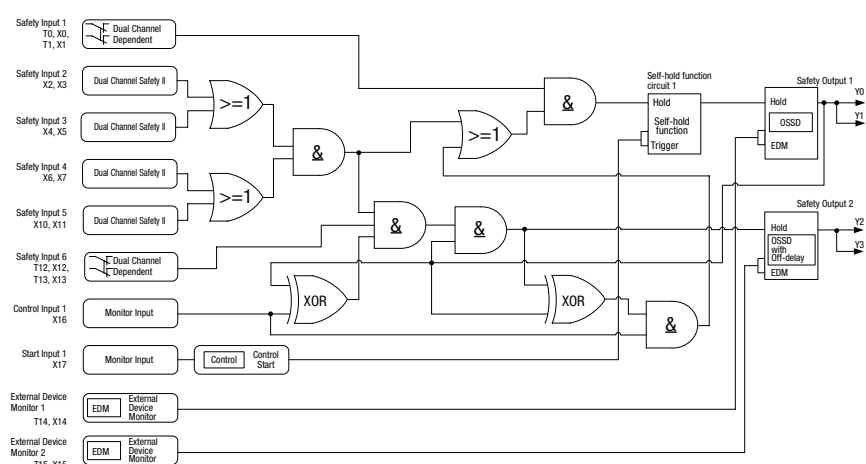
• Wiring Example



• Application Example



• Logic Chart (Software version 2.00 or above)



• LED Display



• Be sure to check the standards of the equipment before use.

- Interlock Switches
- Non-contact Interlock Switches
- Safety Laser Scanners
- Safety Light Curtains
- Safety Modules
- FS1A
- RF1V
- RF2
- HR2S
- HR1S

FS1A-C21S Logic 22d

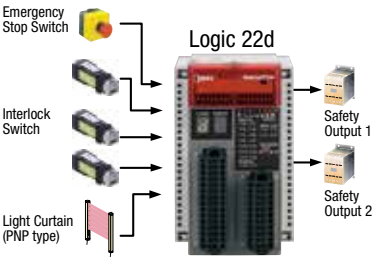
Partial stop logic for apparatus with openings

Output Line: 2
2 dual safety outputs of different operations

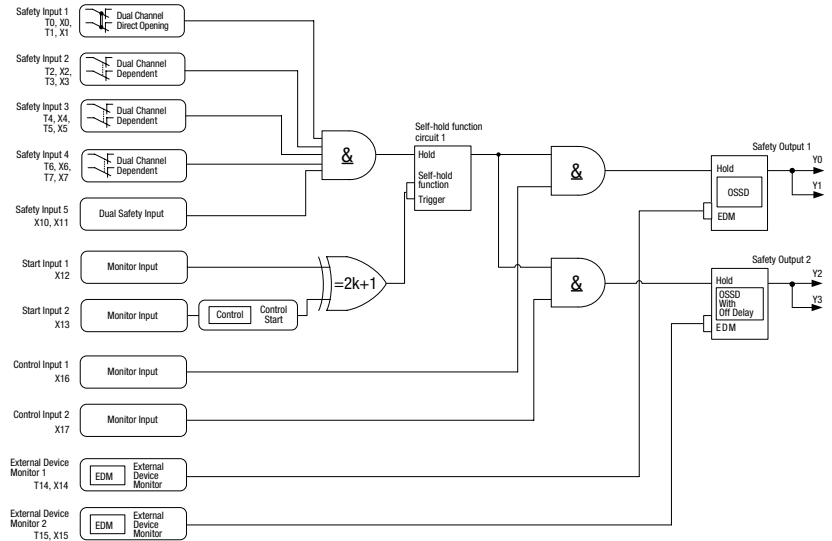
Maximum Category
4

Logic 22d is used for safeguarding measures of machine tools and robots which use one emergency stop switch, three interlock switches, and one safety light curtain when configuring partial control. Safety outputs are dual channel outputs. Safety output 2 has an off-delay timer.

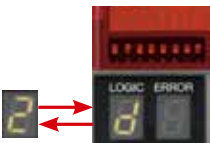
• Wiring Example



• Logic Chart



• LED Display



• Be sure to check the standards of the equipment before use.

FS1A-C21S Logic 23C

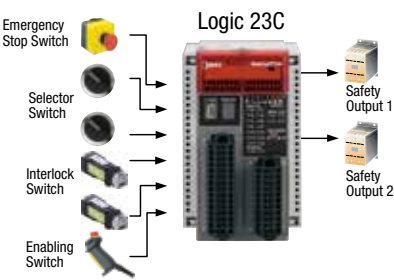
The logic applicable for selection of active safety input devices

Output Line: 2
2 dual safety outputs of different operations

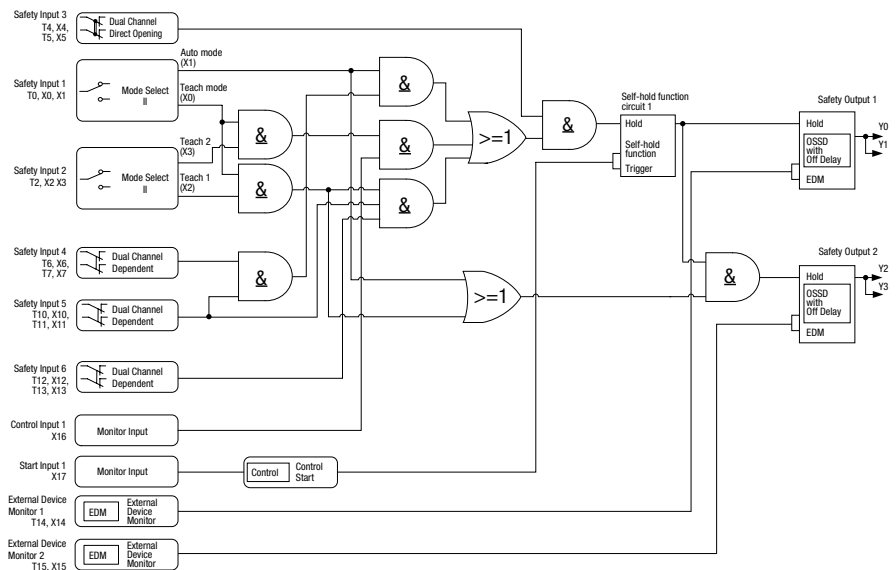
Maximum Category
4

Logic 23C is used in machine tools which have auto mode and two different maintenance modes. Safety outputs are dual channel outputs.

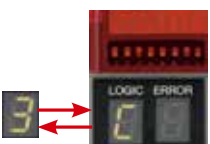
• Wiring Example



• Logic Chart



• LED Display

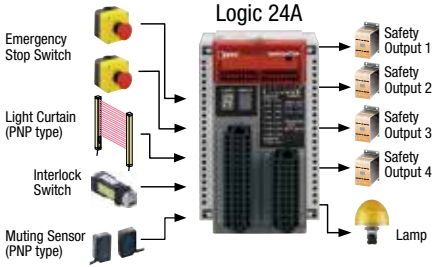


• Be sure to check the standards of the equipment before use.

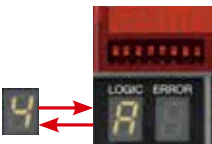
| | | | |
|--------------------------------|---|---|------------------------------|
| FS1A-C21S Logic 24A | Muting function logic for apparatus with openings | Output Line: 4 4 single safety outputs of different operations | Maximum Category 3 |
|--------------------------------|---|---|------------------------------|

Logic 24A is used to shut down devices step by step depending on the safety conditions of the door and openings. Safety output has four single safety outputs.

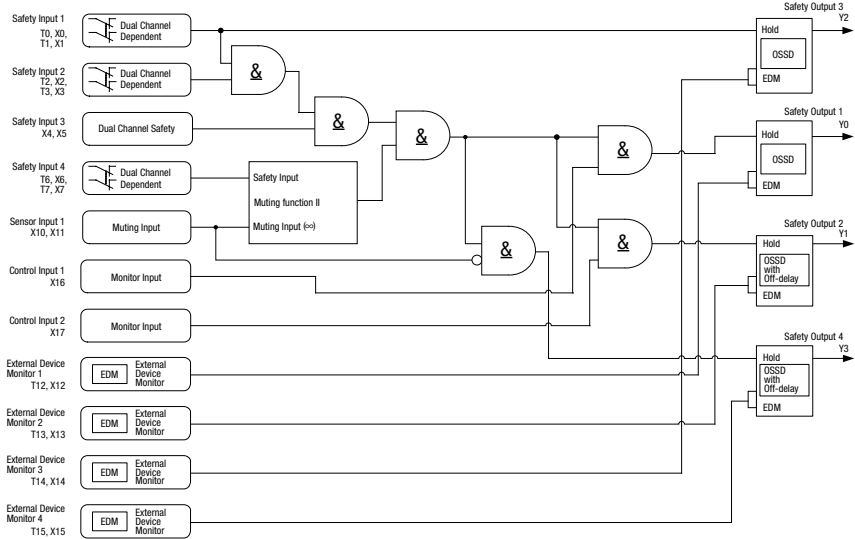
• Wiring Example



• LED Display



• Logic Chart



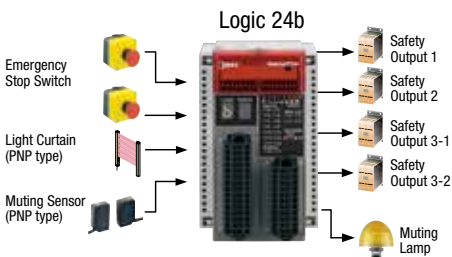
• Be sure to check the standards of the equipment before use.

- APEM
- Switches & Pilot Lights
- Control Boxes
- Emergency Stop Switches
- Enabling Switches
- Safety Products
- Explosion Proof
- Terminal Blocks
- Relays & Sockets
- Circuit Protectors
- Power Supplies
- LED Illumination
- Controllers
- Operator Interfaces
- Sensors
- AUTO-ID

| | | | |
|--------------------------------|---|---|------------------------------|
| FS1A-C21S Logic 24b | Muting function logic for apparatus with openings | Output Line: 4 4 single safety outputs of different operations | Maximum Category 3 |
|--------------------------------|---|---|------------------------------|

Logic 24b is used to shut down devices step by step depending on the safety conditions of the door and openings. Muting function logic on safety light curtains. Safety output has four single safety outputs.

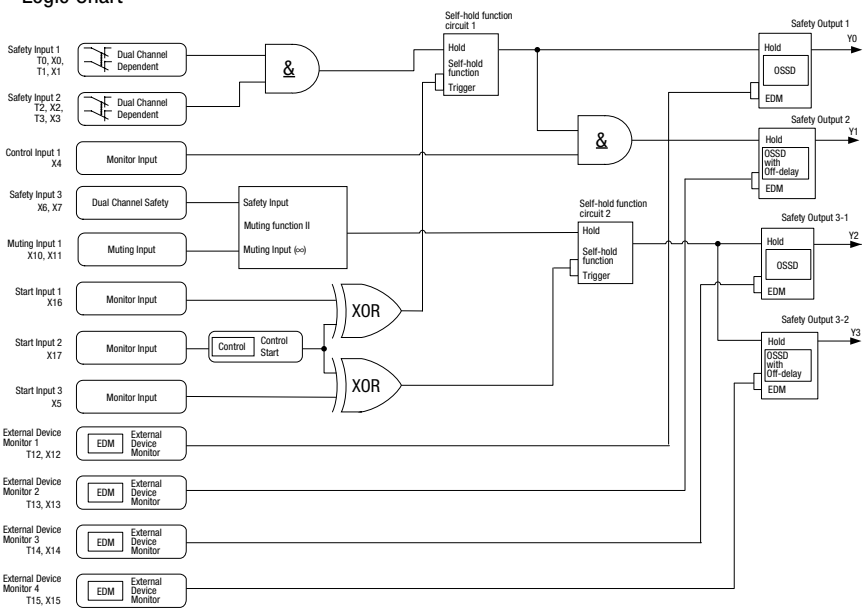
• Wiring Example



• LED Display



• Logic Chart



• Be sure to check the standards of the equipment before use.

- Interlock Switches
- Non-contact Interlock Switches
- Safety Laser Scanners
- Safety Light Curtains
- Safety Modules

- FS1A
- RF1V
- RF2
- HR2S
- HR1S

FS1A-C21S Logic 24C

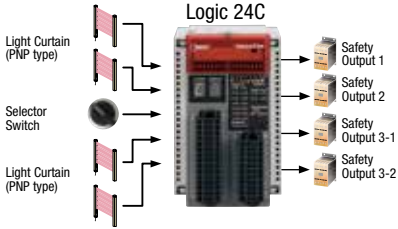
The logic applicable for selection of active safety input devices

Output Line: 4
4 single safety outputs of different operations

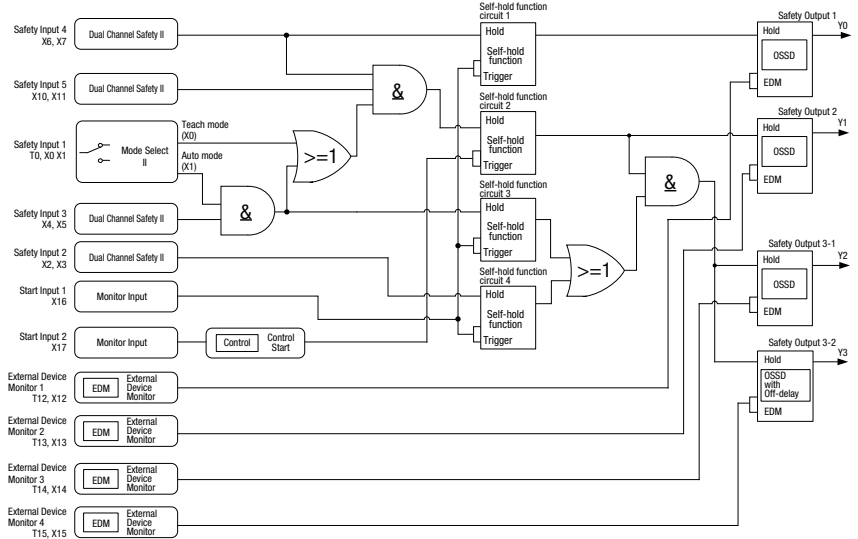
Maximum Category
3

Logic 24C is the mode selection logic used in safety equipment such as light curtains with solid state output. Safety output has four single safety outputs.

• Wiring Example



• Logic Chart



• LED Display



• Be sure to check the standards of the equipment before use.

FS1A-C21S Logic 24d

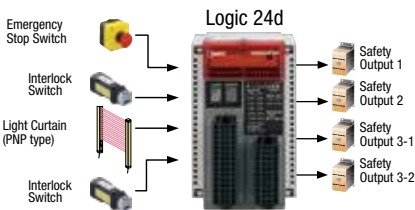
The logic constructing an OR circuit for various apparatus

Output Line: 4
4 single safety outputs of different operations

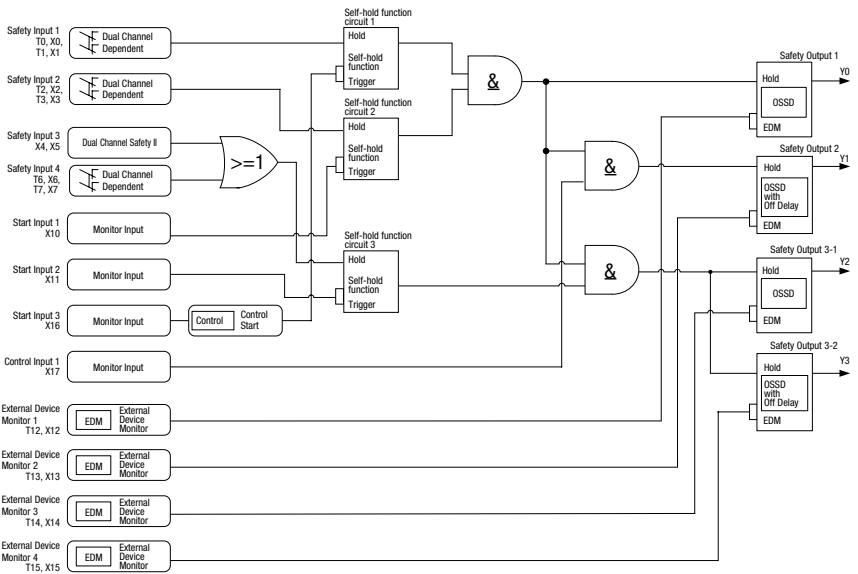
Maximum Category
3

Logic 24d is used to configure an OR circuit using a safety light curtain and safety switch. Safety output has four single safety outputs.

• Wiring Example



• Logic Chart



• LED Display



• Be sure to check the standards of the equipment before use.

| |
|--------------------------------|
| APEM |
| Switches & Pilot Lights |
| Control Boxes |
| Emergency Stop Switches |
| Enabling Switches |
| Safety Products |
| Explosion Proof |
| Terminal Blocks |
| Relays & Sockets |
| Circuit Protectors |
| Power Supplies |
| LED Illumination |
| Controllers |
| Operator Interfaces |
| Sensors |
| AUTO-ID |
| Interlock Switches |
| Non-contact Interlock Switches |
| Safety Laser Scanners |
| Safety Light Curtains |
| Safety Modules |
| FS1A |
| RF1V |
| RF2 |
| HR2S |
| HR1S |

 Safety Precautions

1. Do not disassemble, repair, or modify the SafetyOne, otherwise the safety characteristics of the SafetyOne are impaired. Turn off the power to the SafetyOne before installation, removal, wiring, maintenance, or inspection of the SafetyOne. Failure to do so may cause electrical shocks or fire hazard.
2. Before operating the SafetyOne, read the instruction sheet and the user's manual carefully, and ensure that the environment conforms to the requirements of the SafetyOne specifications. If the SafetyOne is operated in an environment that exceeds the specifications, the safety characteristics of the SafetyOne are impaired.
3. The installation, wiring, configuration, and operation of the SafetyOne must be performed by safety experts only. Safety experts are personnel who have necessary qualifications authorizing them to perform designing, installation, operation, maintenance, and disposal of the SafetyOne. Persons without technical expertise of safety products must not use the SafetyOne.
4. The SafetyOne must be subjected to a regular test which proves that all functions of the SafetyOne satisfy the required standard.
5. Perform operational checks on the SafetyOne periodically.
6. Install the SafetyOne according to the instruction sheet and the user's manual. Improper installation may cause failure of the SafetyOne.
7. Do not use the monitor outputs or solenoid/lamp outputs as safety outputs, otherwise the system safety is impaired in case the SafetyOne or connected components fail.
8. Do not use the start input and the external device monitor input as safety inputs, otherwise the system safety is impaired in case the SafetyOne or connected components fail.
9. Use the SafetyOne in compliance with laws and regulations of the country or region where the SafetyOne is used.
10. Use safety inputs and safety outputs in circuit configurations which conform to safety requirements and applications.
11. Calculate the respective safety distances, while taking into consideration the response time of the SafetyOne and safety components connected to the SafetyOne.
12. Separate the SafetyOne from components and wires which do not satisfy Class 2 circuit requirements.
13. Safety performance differs depending on system configurations.
14. Use a power supply that meets the following required specifications completely:
15. Ground the V- line (0V DC) for ground diagnosis.
16. After setting a new configuration or modifying a configuration, check each input and output function.
17. Implement protective measures so that personal other than safety responsible persons operating the SafetyOne do not modify the configuration.
18. The SafetyOne is designed for installation within an enclosure. Do not install the SafetyOne outside an enclosure. Install the SafetyOne in an enclosure of IP54 or higher protection.
19. Install the SafetyOne in environments specified in the catalog, instruction sheet, and user's manual. If the SafetyOne is used in places where the SafetyOne is subjected to high temperature, high humidity, condensation, corrosive gases, excessive vibrations, or excessive shocks, failure such as electrical shocks, fire hazard, or malfunction may result.
20. Use the SafetyOne in an environment of pollution degree 2. (IEC 60664-1).
21. Do not drop the SafetyOne during transportation, otherwise damage or malfunction may result.
22. Prevent metal fragments and pieces of wire from dropping inside the SafetyOne housing. Put a cover on the SafetyOne during installation and wiring. Ingress of such fragments and chips may cause fire hazard, damage or malfunction. Install the SafetyOne so that there is adequate distance from the walls, heat generating devices or peripherals, taking into consideration spacing requirements for maintenance and ventilation.
23. Install the SafetyOne on 35mm DIN rails with BNL6 end clips (sold separately) on both sides of the SafetyOne.
24. Wire to the connectors with proper cables or ferrules.
25. Ground the FE terminal to assure electromagnetic compatibility.
26. Use a common 0V DC line when different power supplies are used for the SafetyOne and other components (ex. light curtain).
27. Separate the input and output wiring from power lines.
28. When overcurrent flows into output terminals, the protective function turns off the output. However, when overcurrent status lasts long, internal protective elements will fuse. To protect the internal elements, insert fuses of double the rated value to each terminal.
29. Use the fuse compliant with IEC60127 requirements on the power line of the SafetyOne. (Required for equipment incorporating the SafetyOne for the use in Europe.)
30. When disposing of the SafetyOne, do so according to the regulations of the country or region.
31. Ensure to install the start switch outside the hazardous area, from where the operator of the start switch can confirm that no one is inside the hazardous area, when starting the operation of safety system.

For instruction sheet and user's manual, see <http://www.idec.com/>.



Operating Instructions

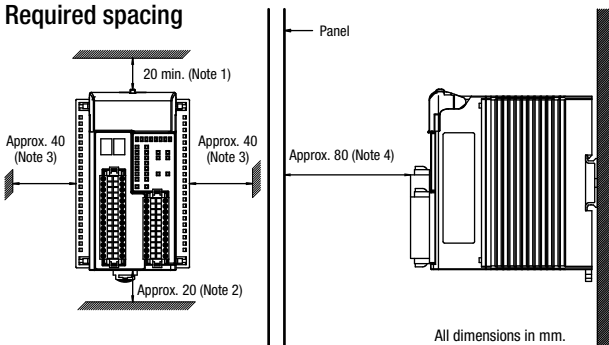
Installation Location

Install the SafetyOne in an IP54 enclosure such as a control panel, and make sure that the operating condition satisfies the specifications of the SafetyOne. Do not use the SafetyOne in an environment described below, or where the operating conditions exceed the limit of the SafetyOne. Otherwise electric shock, fire hazard, damage, or malfunction can be caused.

- Near an inductive device or heat source
- Where excessive dust, dirt, salt, or iron powder is present
- Where the SafetyOne is exposed to vibration or shock

For maintenance and ventilation, provide space around the SafetyOne as shown in the figure below, so that sufficient distance is kept from other components, heat source, or panel surface. Ensure to use the SafetyOne in the environment of operating temperature -10 to +55°C.

Required spacing



- Note 1: For opening/closing of protective cover.
- Note 2: For installation/removal of the SafetyOne on the DIN rail, and ventilation.
- Note 3: For heat generating equipment such as safety relays.
- Note 4: For wiring of input and output connectors

Direction

Install the SafetyOne vertically as shown in Figure 1. Do not install in other directions (Figure 2).

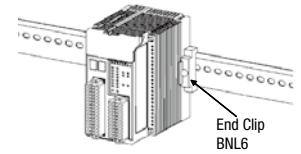


Figure 1. Correct Mounting Direction

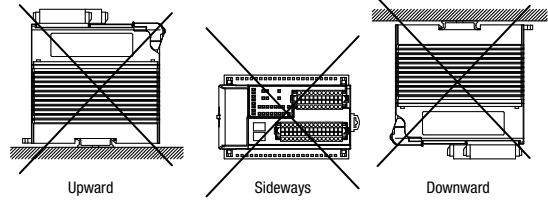


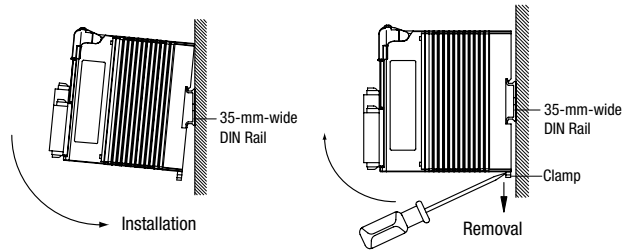
Figure 2. Incorrect Mounting Directions

Installing on DIN Rails

Use 35mm-wide DIN rails for installing the SafetyOne. Applicable DIN rails: BAA1000 (IDEC)

- Installing
 1. Fasten the DIN rail to a panel.
 2. Pull out the clamp from the SafetyOne module, and put the groove of the module on the DIN rail. Press the module towards the DIN rail and push in the clamp as shown below.
 3. Use BNL6 end clips on both sides of the SafetyOne to prevent the module from moving sideways.

- Removal
 1. Insert the tip of a flat screwdriver into the latch.
 2. Pull down the latch until the latch clicks.
 3. Pull out the SafetyOne lightly, and remove from the DIN rail.



FS1A

RF1V

RF2

HR2S

HR1S

Wiring

For wiring the SafetyOne, spring clamp (supplied with the SafetyOne) or crimp connector can be used. For crimp type connector, contact Tyco Electronics AMP.

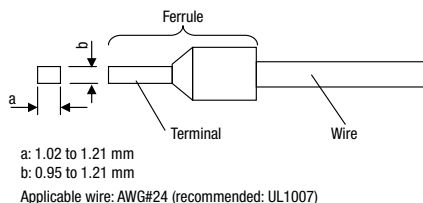
Push the connector into the SafetyOne until the latches click. For removal, make sure to press down the latches completely before removing the connector, otherwise the connector and wires may be damaged.

Applicable Wire and Ferrule Size(spring clamp type)

AWG#18 to 24 (recommended wire: UL1007)

Strip length 7.0 ±0.3mm.

When using a ferrule for wiring, select a ferrule which satisfies the terminal specifications shown below.



Wiring to Spring Clamp Connector

When wiring to a connector, make sure that the connector is removed from the SafetyOne, otherwise the connector and the SafetyOne may be damaged. For wiring, use the connecting tool FS9Z-SD01. When rewiring, use wire of the same type and size.

Wiring Using the Connecting Tool

1. Insert the connecting tool completely into the tool slot in the connector at an angle.



2. Insert a wire into the wire slot. When using a stranded wire, twist the wire beforehand so that the wire does not become loose.



3. While the wire is inserted, remove the connecting tool. Wiring is complete. Pull the wire lightly to confirm whether it is clamped securely.



4. To remove the wire, press down the spring using the connecting tool and pull out the wire.

Using a Screwdriver

When using a screwdriver for wiring, use a screwdriver 2.4mm wide maximum at the tip. Pay extra attention when using a screwdriver, so that the connector is not damaged.

1. Insert the screwdriver into the tool slot on the connector at an angle, and press down so as to pry open the spring. Do not apply excessive force when inserting the screwdriver, otherwise the connector will be damaged. Do not insert the screwdriver into the wire slot.
2. While the screwdriver is inserted, insert a wire into the wire slot. When using stranded wire, twist the wire beforehand so that the wire does not become loose.
3. While the wire is inserted remove the screwdriver. Wiring is complete. Pull the wire lightly to confirm whether it is clamped securely.
4. To remove the wire, press down the spring using the screwdriver and pull out the wire.

APEM

Switches & Pilot Lights

Control Boxes

Emergency Stop Switches

Enabling Switches

Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets

Circuit Protectors

Power Supplies

LED Illumination

Controllers

Operator Interfaces

Sensors

AUTO-ID

Interlock Switches

Non-contact Interlock Switches

Safety Laser Scanners

Safety Light Curtains

Safety Modules

FS1A

RF1V

RF2

HR2S

HR1S



Ordering Terms and Conditions

Thank you for using IDEC Products.

By purchasing products listed in our catalogs, datasheets, and the like (hereinafter referred to as "Catalogs") you agree to be bound by these terms and conditions. Please read and agree to the terms and conditions before placing your order.

1. Notes on contents of Catalogs

- (1) Rated values, performance values, and specification values of IDEC products listed in this Catalog are values acquired under respective conditions in independent testing, and do not guarantee values gained in combined conditions.
Also, durability varies depending on the usage environment and usage conditions.
- (2) Reference data and reference values listed in Catalogs are for reference purposes only, and do not guarantee that the product will always operate appropriately in that range.
- (3) The specifications / appearance and accessories of IDEC products listed in Catalogs are subject to change or termination of sales without notice, for improvement or other reasons.
- (4) The content of Catalogs is subject to change without notice.

2. Note on applications

- (1) If using IDEC products in combination with other products, confirm the applicable laws / regulations and standards.
Also, confirm that IDEC products are compatible with your systems, machines, devices, and the like by using under the actual conditions. IDEC shall bear no liability whatsoever regarding the compatibility with IDEC products.
- (2) The usage examples and application examples listed in Catalogs are for reference purposes only. Therefore, when introducing a product, confirm the performance and safety of the instruments, devices, and the like before use. Furthermore, regarding these examples, IDEC does not grant license to use IDEC products to you, and IDEC offers no warranties regarding the ownership of intellectual property rights or non-infringement upon the intellectual property rights of third parties.
- (3) When using IDEC products, be cautious when implementing the following.
 - i. Use of IDEC products with sufficient allowance for rating and performance
 - ii. Safety design, including redundant design and malfunction prevention design that prevents other danger and damage even in the event that an IDEC product fails
 - iii. Wiring and installation that ensures the IDEC product used in your system, machine, device, or the like can perform and function according to its specifications
- (4) Continuing to use an IDEC product even after the performance has deteriorated can result in abnormal heat, smoke, fires, and the like due to insulation deterioration or the like. Perform periodic maintenance for IDEC products and the systems, machines, devices, and the like in which they are used.
- (5) IDEC products are developed and manufactured as general-purpose products for general industrial products. They are not intended for use in the following applications, and in the event that you use an IDEC product for these applications, unless otherwise agreed upon between you and IDEC, IDEC shall provide no guarantees whatsoever regarding IDEC products.
 - i. Use in applications that require a high degree of safety, including nuclear power control equipment, transportation equipment (railroads / airplanes / ships / vehicles / vehicle instruments, etc.), equipment for use in outer space, elevating equipment, medical instruments, safety devices, or any other equipment, instruments, or the like that could endanger life or human health
 - ii. Use in applications that require a high degree of reliability, such as provision systems for gas / waterworks / electricity, etc., systems that operate continuously for 24 hours, and settlement systems
 - iii. Use in applications where the product may be handled or used deviating from the specifications or conditions / environment listed in the Catalogs, such as equipment used outdoors or applications in environments subject to chemical pollution or electromagnetic interference
If you would like to use IDEC products in the above applications, be sure to consult with an IDEC sales representative.

3. Inspections

We ask that you implement inspections for IDEC products you purchase without delay, as well as thoroughly keep in mind management/maintenance regarding handling of the product before and during the inspection.

4. Warranty

- (1) Warranty period
The warranty period for IDEC products shall be one (1) year after purchase or delivery to the specified location. However, this shall not apply in cases where there is a different specification in the Catalogs or there is another agreement in place between you and IDEC.
- (2) Warranty scope
Should a failure occur in an IDEC product during the above warranty period for reasons attributable to IDEC, then IDEC shall replace or repair that product, free of charge, at the purchase location / delivery location of the product, or an IDEC service base. However, failures caused by the following reasons shall be deemed outside the scope of this warranty.
 - i. The product was handled or used deviating from the conditions / environment listed in the Catalogs
 - ii. The failure was caused by reasons other than an IDEC product
 - iii. Modification or repair was performed by a party other than IDEC
 - iv. The failure was caused by a software program of a party other than IDEC
 - v. The product was used outside of its original purpose
 - vi. Replacement of maintenance parts, installation of accessories, or the like was not performed properly in accordance with the user's manual and Catalogs
 - vii. The failure could not have been predicted with the scientific and technical standards at the time when the product was shipped from IDEC
 - viii. The failure was due to other causes not attributable to IDEC (including cases of force majeure such as natural disasters and other disasters)Furthermore, the warranty described here refers to a warranty on the IDEC product as a unit, and damages induced by the failure of an IDEC product are excluded from this warranty.

5. Limitation of liability

The warranty listed in this Agreement is the full and complete warranty for IDEC products, and IDEC shall bear no liability whatsoever regarding special damages, indirect damages, incidental damages, or passive damages that occurred due to an IDEC product.

6. Service scope

The prices of IDEC products do not include the cost of services, such as dispatching technicians. Therefore, separate fees are required in the following cases.

- (1) Instructions for installation / adjustment and accompaniment at test operation (including creating application software and testing operation, etc.)
- (2) Maintenance inspections, adjustments, and repairs
- (3) Technical instructions and technical training
- (4) Product tests or inspections specified by you

The above content assumes transactions and usage within your region. Please consult with an IDEC sales representative regarding transactions and usage outside of your region. Also, IDEC provides no guarantees whatsoever regarding IDEC products sold outside your region.

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