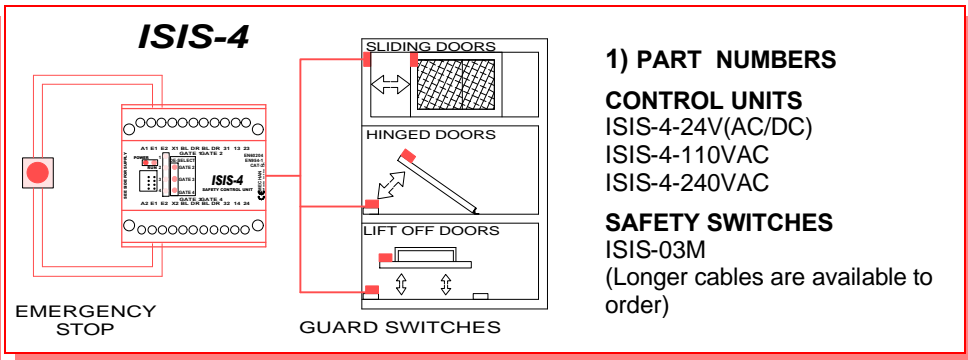


MECHAN CONTROLS

ISIS-4

SAFETY SYSTEM INSTALLATION GUIDE



1) PART NUMBERS

CONTROL UNITS

ISIS-4-24V(AC/DC)

ISIS-4-110VAC

ISIS-4-240VAC

SAFETY SWITCHES

ISIS-03M

(Longer cables are available to order)



This information is designed to help suitably qualified personnel install and operate Mechan Safety Switch equipment. Before using this product, read this guide thoroughly along with any relevant European and/or National standards e.g. Machinery Directive 89/392/EEC and it's amendments, Provision and Use of Work Equipment Regulations. Further information can be obtained from Mechan Controls Limited

***** KEEP THIS GUIDE FOR FUTURE REFERENCE *****

CONTENTS

1	Part Numbers	4	System Assembly (DIN Mounting, Gate selection & Switch installation)
2	Description	5	Installation (Standard circuit for 4 Gates and Emergency Stop)
3	Product Identification	6	Technical Specification (Dimensions; Specification; Ordering Information)

2) DESCRIPTION

The **ISIS-4** is a tamper resistant safety system for monitoring machine guards. Comprising of a safety control module and safety switches, the ISIS safety system uses dynamic signal and dual cross monitoring techniques to provide a fail-safe system. The **ISIS-4** can monitor up to 4 guard switches and the emergency stop circuit. It will detect both open and short circuit faults between the safety switches and the control unit, it can also provide guard status indication. The safety control unit has two safety contacts and one auxiliary contact outputs.

THE SAFETY SWITCHES

The ISIS safety switches are non-contact, tamper resistant safety switches, resin encapsulated into an ABS case providing environmental protection to IP67. The switches can withstand most conditions including: water, dust and high pressure hose cleaning which have little or no affect on their performance.

THE CONTROL UNIT

The **ISIS-4** control unit contains power supply regulation, monitoring circuit, 2 x safety circuit + 1 x auxiliary circuit outputs, external reset/proving circuit, guard selection/status, power and run indication. The **ISIS-4** requires a minimum 1 guard switch input. If more than one gate is required (up to a maximum of 4 per control unit) the 'DE-SELECT SWITCH', which is located under the top lid (see Fig. 4.1a), must be used to set the required number of inputs. The GREEN 'DE-SELECT' LEDs (No. 16 on Fig. 3a) indicate which input channels are activated. The status of each guard switch input is shown by the YELLOW LED's numbered 1 to 4 (see No. 15 on Fig 3a).

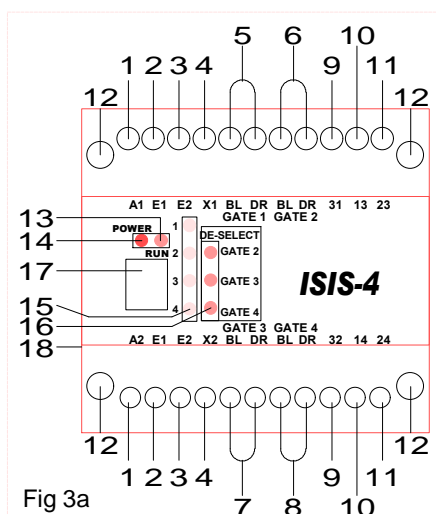
FUSING The **ISIS-4** has an internal electronic fuse for short circuit protection. In case of a fault, remove the supply and clear the fault. The recovery time of the fuse is 2 seconds. If the fault persists consult Mechan Controls.

EMERGENCY STOP BUTTONS

The **ISIS-4** control unit has the ability to monitor the normally closed contacts of Emergency Stop Buttons (see No.s 2 & 3 on Fig. 3a). This combines guard switches and emergency stop buttons into one control unit, simplifying installation and control circuits.

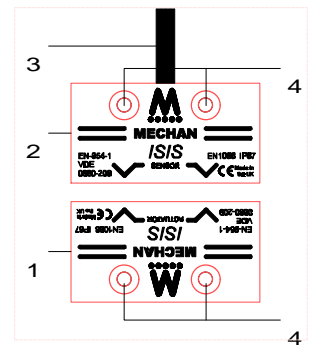
3) PRODUCT IDENTIFICATION

No.	Description
1	Power Supply Input 24Vac/dc, or 110Vac/dc or 230Vac (See side label No. 18 for details)
2	Emergency Stop Input No. 1 (N/C)
3	Emergency Stop Input No. 2 (N/C)
4	External Monitoring / Re-set
5,6,7,8	Guard Switch Inputs (Minimum 1; Maximum 4)
9	N/C Auxiliary Contact (31-32)
10+11	N/O Safety Contacts (13-14;23-24)
12	Terminal Block Fixing Screws
Indication	
13	Run LED, Green
14	Power LED, Red
15	Guard Status Indicators, Yellow
16	Guard De-select Indicators, Green
17	Remote Indication Connection (optional)
18	Information Label



No. Description

1. Safety switch actuator
2. Safety switch sensor
3. Cable.
4. Fixing holes. (Use tamper proof fixing screws supplied)

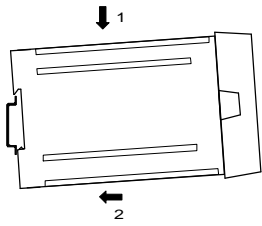


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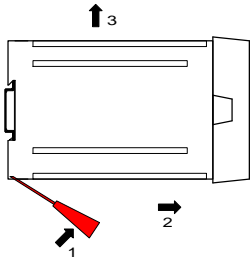
MECHAN CONTROLS LIMITED, 14/16 SEDDON PLACE, STANLEY INDUSTRIAL ESTATE, SKELMERSDALE, LANCASHIRE, WN8 8EB
Tel : + 44 (0)1695 722264 Fax : + 44 (0)1695 729664 WEB : www.mechancontrols.co.uk Email : technical@mechancontrols.co.uk

SYSTEM ASSEMBLY

4) CLIP ON TO DIN-RAIL



The **ISIS-4** control unit is designed to fit standard 35mm symmetric DIN rail.



To remove: Place the tip of a small screwdriver into the white catch at the bottom of the box (1) and gently lever out. This releases the retaining clip and allows the unit to be tilted (2) and removed (3)

Fig 4a

4.1) LID REMOVAL & SWITCH SELECTION

The central part of the **ISIS-4** lid (1) is removable. Using a small screwdriver in the recess (2) gently prise the lid upwards.

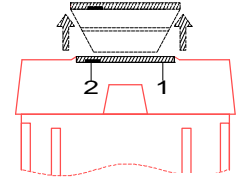


Fig 4.1a

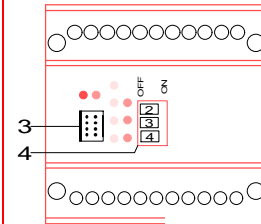


Fig 4.1b

This allows access to the Remote Indicator Connection (3) and the Guard Switch Selector (4).

Using the GATE SWITCH SELECTOR chart below set the **ISIS-4** to the required number of inputs.

NOTE: The number of inputs (safety switches) must match the gate selector setting. Any difference will stop the system from operating.

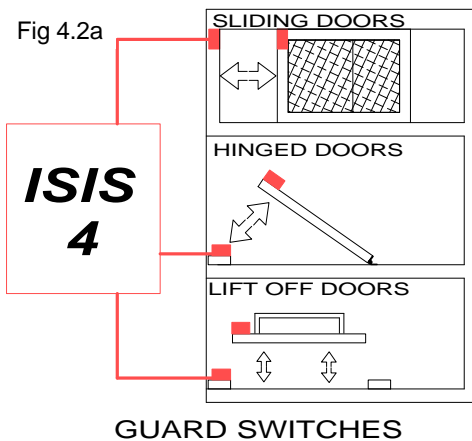
GATE SWITCH SELECTOR	
<input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4	1 Gate Operation
<input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4	2 Gate Operation
<input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4	3 Gate Operation
<input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4	4 Gate Operation

Fig 4.1c

4.2) MOUNTING SAFETY SWITCH SENSORS

The ISIS safety switches can be fitted to sliding, hinged or removable machine guards. Mount the fixed part of the safety switch to the machine frame and the actuator on to the opening edge of the door (see Fig 4.2c), ensuring that the targets on the printed faces of the switches are aligned (see Fig 4.2b).

Fig 4.2a



GUARD SWITCHES

The sensors should be mounted with a gap of approximately 1 mm. when the guard is closed, this gives a good level of lateral tolerance to allow for 'gate sag' and freedom from nuisance tripping due to machine / guard vibration.

The ISIS safety switch sensors have 2 pre-drilled fixing holes and are supplied with M4 x 20mm Tamper Proof fixing screws and tool. (see back page for dimension / position details)

DO NOT enlarge the fixing holes !

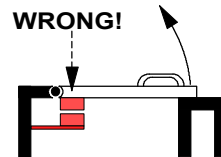


Fig 4.2c

Fig 4.2b

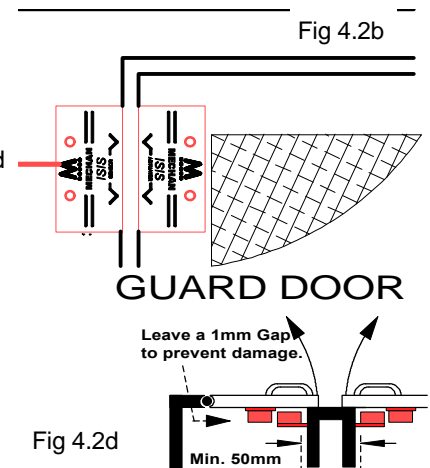


Fig 4.2d

Always try to mount the switch on non-ferrous material. Ferrous materials will reduce the switching distance.

Leave a minimum gap of 50mm between actuators as above.

CABLE CONNECTION / EXTENSION

The ISIS safety switches are supplied with 3, 5, 10 or 15 metres of cable potted into the fixed switch. This ensures a completely water-tight seal. Run the cable back to the control unit through cable protection (if required) and terminate into the appropriate input channel, follow the colour coding of the wires to the labels on the input terminals.

APPLICATION NOTE

EN 1088 provides some mounting suggestions, see example below.

When fixing the switches to a sliding door (see Fig 4.2f), ensure that when the door is opened (see Fig 4.2g) the switch is not easily accessible, helping prevent the system being overridden.

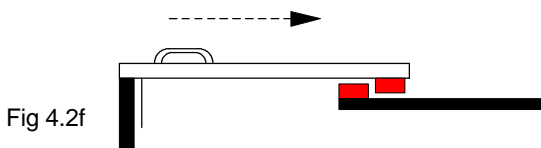


Fig 4.2f

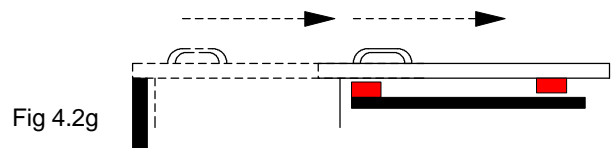
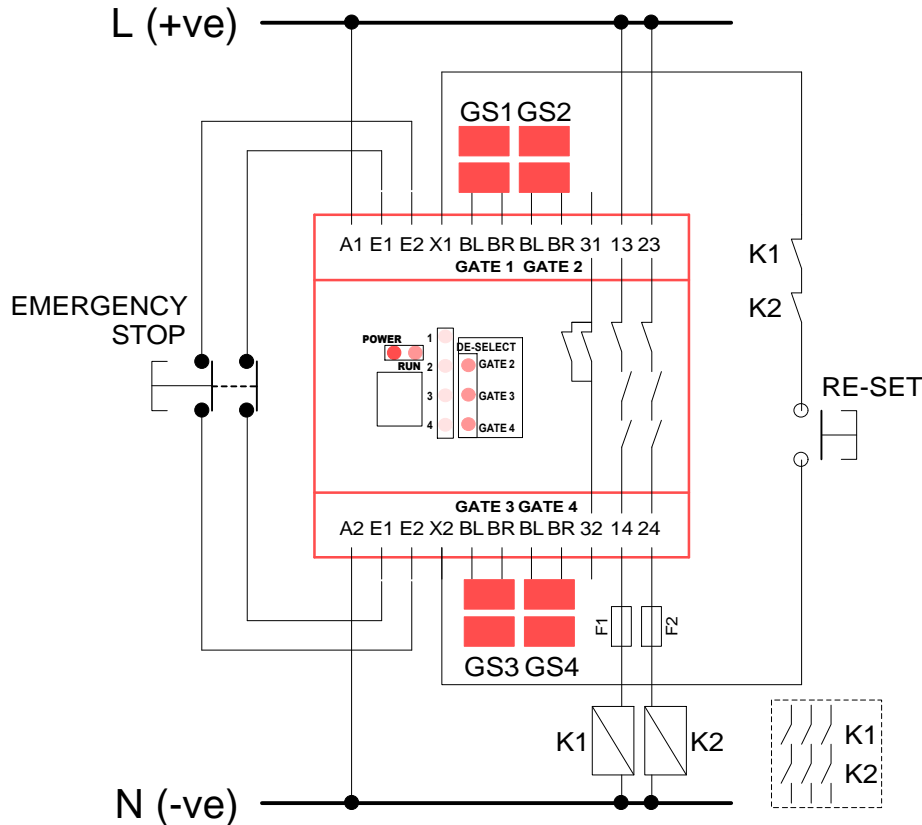


Fig 4.2g

INSTALLATION

5) 4 GATE SYSTEM WITH EMERGENCY STOP AND RE-SET



POWER SUPPLY

- The **ISIS-4** control unit is available to suit 24Vac/DC ; 110Vac or 230Vac (+/- 15%, 6VA consumption) Please specify the voltage when ordering.

RE-SET & MONITORING

- As shown above the **ISIS-4** control unit has a separate re-set circuit (X1, X2) which can be used for manual or automatic re-set and for monitoring external contactors.
- For **manual re-set** connect a normally open momentary push button across X1 & X2. The **ISIS-4** control unit will only re-set when all active guards are closed and the re-set button is pushed.
- For **automatic re-set** link X1 & X2
- To **monitor external contactors**, (K1 & K2) place a normally closed contact from each in series with X1 & X2 (and the re-set button if required). The **ISIS-4** control unit will monitor K1 & K2. If one of the contactors 'welds', the other contactor will operate and the **ISIS-4** control unit will prevent a re-start. (NOTE: K1 & K2 should have Positively Guided Contacts)

CONTROL CONTACTS

- The **ISIS-4** has two sets of positively guided N/O safety contacts brought out to terminals, 13,14; and 23,24.
- The **ISIS-4** output contacts are rated at 4 Amps. Suitable external fuses should be fitted.
- In single channel control systems the safety contacts (13,14 & 23,24) should be linked in series.
- The **ISIS-4** also has an auxiliary N/C contact, (31-32)

EMERGENCY STOP BUTTON

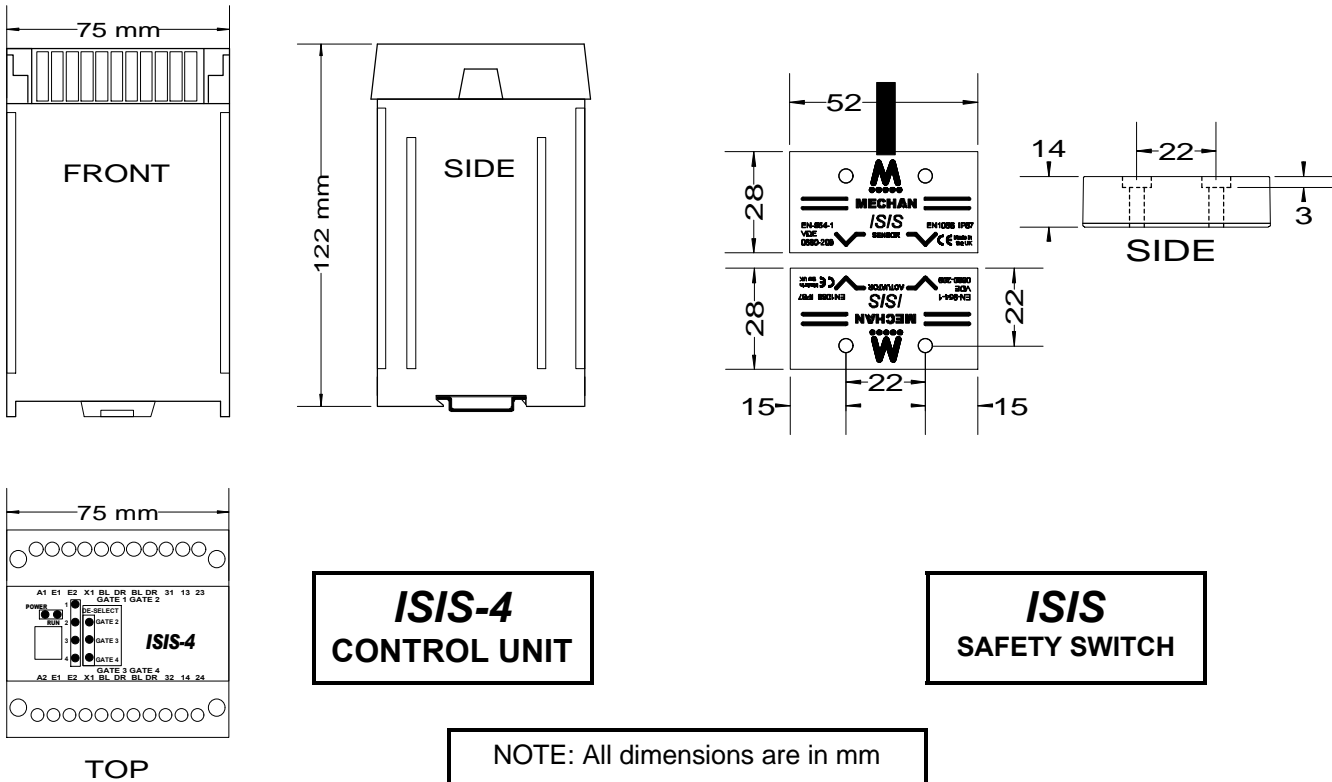
- The **ISIS-4** control unit can be used to monitor emergency stop button in dual channel control circuits.
- Connected as shown above, the **ISIS-4** will detect open and short circuit faults in the emergency stop circuit
- If this feature is not used link terminals E1 to E1 & E2 to E2.

SYSTEM OPERATION / INDICATION

- When power is applied to the control module, the RED POWER LED will illuminate.
- The GREEN DE-SELECT indicators will show how many gates have been selected by the de-select switch. **NOTE: The number of inputs selected must match the number of guard switches, more or less and the control unit will not operate.**
- The YELLOW GUARD STATUS indicators will be illuminated if the guard is closed. De-selected inputs will remain illuminated.
- If all the monitored machine guards are closed, the EMERGENCY STOP buttons are re-set and the RE-SET button is pressed, the control relays will energize and the normally open safety contacts on terminals 13,14 / 23,24 will be close, the normally closed auxiliary contact 31 & 32 will open. If set to automatic re-set (link in X1 & X2) the control relays will energize if the guards are closed and the emergency stop button(s) are re-set.
- Faults on the safety switch cables, either open or short circuit will be detected immediately causing the control relays to de-energize. Single faults on the Emergency stop contacts will be detected upon the next demand and will prevent a restart.

TECHNICAL SPECIFICATIONS

6) DIMENSIONS



6.1) TECHNICAL SPECIFICATION

ISIS-4 CONTROL UNIT	
Power Supply	24V ac/dc; 110V ac; 230V ac
Power Consumption	6VA
Safety Contacts	2 x N/O
Safety Contact Rating	4A/250Vac; 2A/30V dc
Auxiliary Contact	1 x N/C
Auxiliary Contact Rating	4A/250V ac; 2A/30V dc
Operating Temperature	-10C to 55C
Storage Temperature	-20C to 60C
Housing	Polycarbonate, RED
Environmental Protection	Housing IP40; Terminals IP20
Mounting	35mm Symetric DIN Rail

ISIS-03m SAFETY SWITCH	
Construction	ABS case RED, Resin Filled
Environmental Protection	IP67
Fixing	M4 Security Screws Supplied
Fixing Centres	22mm Centres
Cable Length	3 metres (longer available)
Switching Distance	5-7mm ON; 8-12mm OFF
Optimum Gap	1mm
Operating Temperature	-10C to 55C
Maximum Cable Length	100 Metres
Dimensions (L,W,H)	52 x 28 x 14mm

6.2) ORDERING INFORMATION

SYSTEM	DESCRIPTION	PART NUMBER	STOCK NUMBER
ISIS-4	Control Unit - 24V ac/dc	ISIS-4-24V	370.000
ISIS-4	Control Unit 110V ac	ISIS-4-110VAC	370.001
ISIS-4	Control Unit 230V ac	ISIS-4-230VAC	370.002
ISIS	Safety Switch, 3 metre cable	ISIS-03M	372.000
ISIS	Safety Switch, 5 metre cable	ISIS-05M	372.001
ISIS	Safety Switch, Actuator only	ISIS-ACT	372.099



The ISIS Safety system complies with all relevant Essential Health and Safety Requirements of the Machinery Directive (89/392/EEC & amendments 91/368/EEC, 94/44/EEC).

Copies of the Certificate of Conformity can be obtained from Mechan Controls Limited