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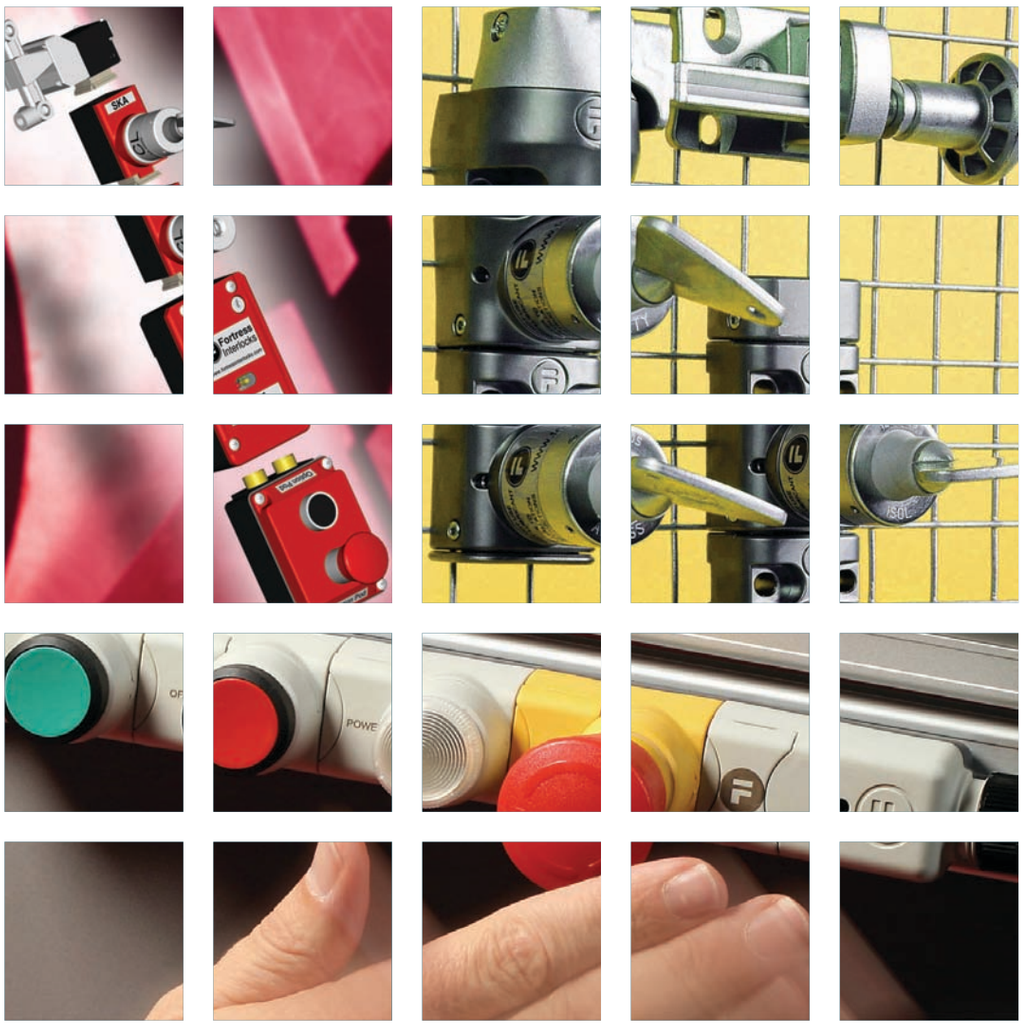
Fortress Interlocks

eGard
mGard
amGard



Product Selector

Total Access & Control

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Market Leaders

A market leader, **Fortress Interlocks** design and manufacture safety interlock systems for a wide variety of industrial applications.

"Who we are"

A market leader, **Fortress Interlocks** design and manufacture safety interlock systems.

Fortress offer an unrivalled portfolio of interlocks suitable for applications across a wide industrial base from power generation and distribution, steel, automotive, through to controlling and / or safeguarding a pick & place robot.

With in excess of 40 years experience in the safety market, **Fortress** are renown for their innovative design, robust engineering and reliability.

"What we do"

Fortress' help customers protect their human and capital assets. We create safe workplaces where employees are safeguarded from injury and plant is protected from damage. We are world leaders in access control products, and our products guarantee that actions and events are undertaken in a pre-determined sequence ensuring a safe working environment.

"Why choose Fortress"

Fortress are a solution provider and our extensive product offering and interlocking experience allows us to provide several solutions for all interlocking applications. We regularly create bespoke solutions, often by customising our standard products.

"Total Access & Control"

With the introduction of **eGard, Fortress** can now provide "Total Access & Control", from cost effective general duty access interlocks and simple automation control systems (**eGard**), to the most robust trapped key interlocks (**mGard**) or safety gate switches (**amGard**).

NB Our brochure is designed to give an overview of our brand portfolio. For detailed technical information including 2D autocad files to download, 3D animated product views and specific application information, visit our web site **www.fortressinterlocks.com**

Product Portfolio

eGard

eGard offers “Total Access & Control”.
The innovative modular design allows the creation of safety gate switches, trapped key interlocks and machine control stations or any configuration of all three.

Pages 4-7.

mGard

mGard is the premier range of robust modular trapped key products. Trapped key technology offers mechanical solutions to safeguarding dangerous machines and hazardous processes.

Pages 8-13.

amGard

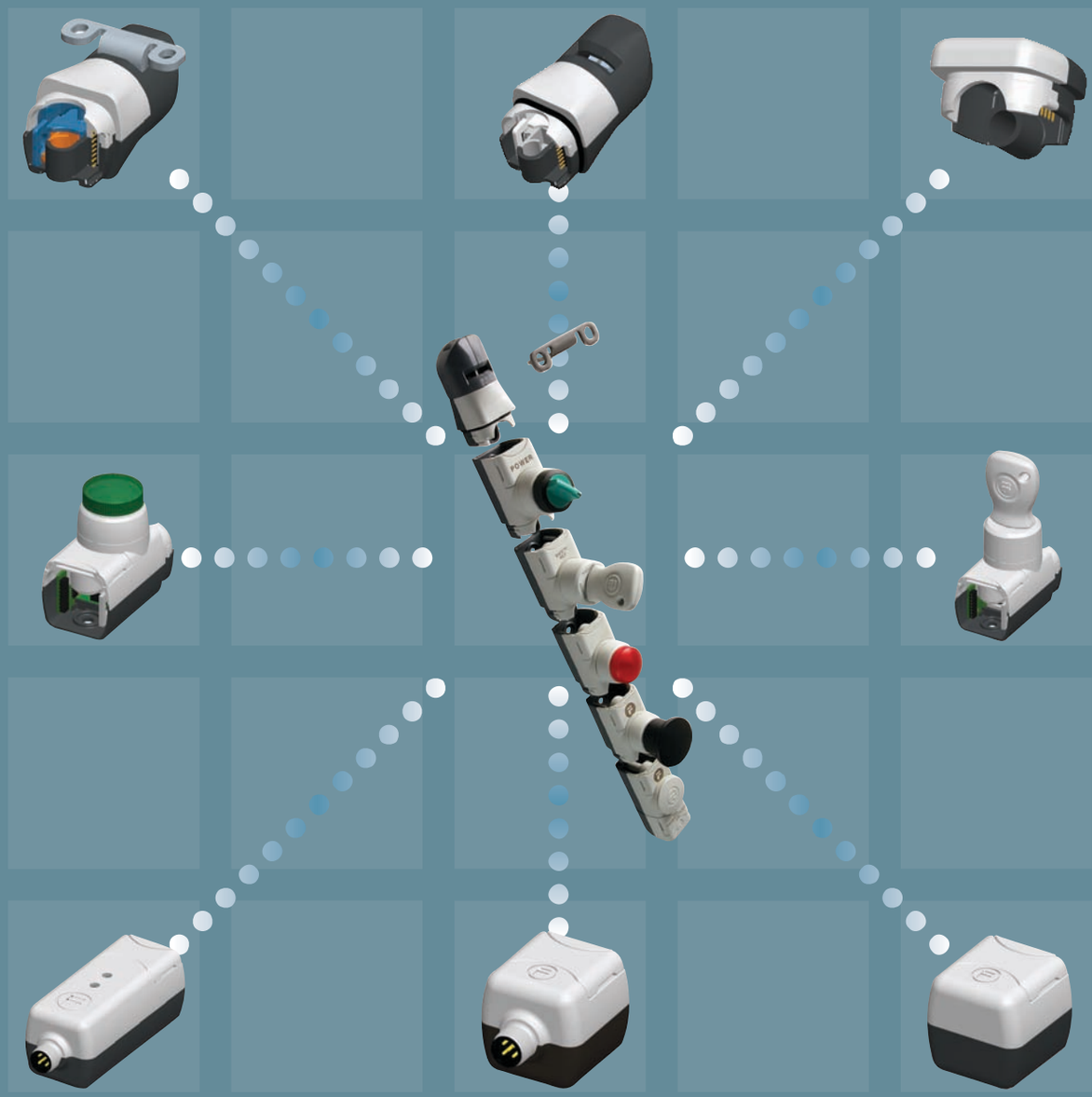
amGard is the ultimate range of safety gate switches. The robust modular arrangement offers an extensive variety of access solutions that can be tailored to suit any application.

Pages 14-19.

Introduction to eGard

eGard is the new fully modular approach to controlling access to hazardous machinery and equipment. A compact access and control system has been developed that enables a selection of modules including mechanical trapped key interlocks, electrical safety gate switch interlocks, and electrical operator controls, to be integrated in one unit.

The system features patented mechanical and electrical connections between every module. It simply clips together and the internal network is self-configuring. With over 4,000 billion combination of modules it can be easily customised for every access and control application. The **eGard** product range is defined into three sections: head modules, core modules and base modules.



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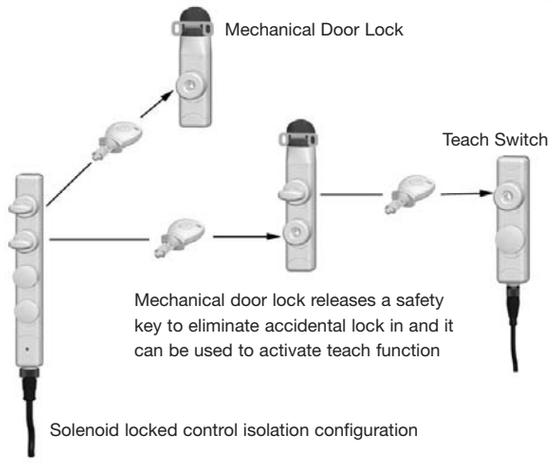
eGard Configurations

General configuration guidelines

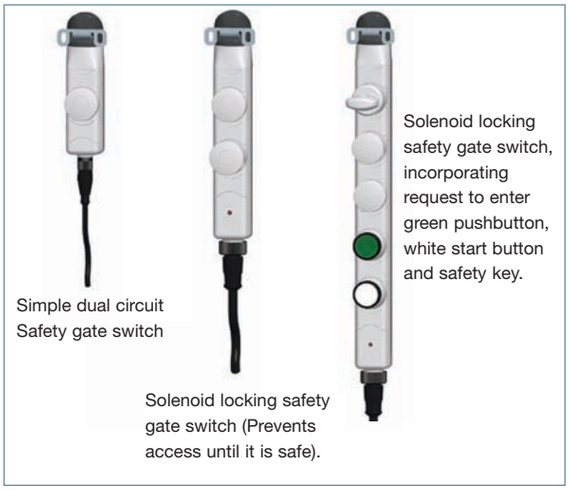
A configuration must be made up of one head module, at least one core module and one base module.

Max No of modules = 11.

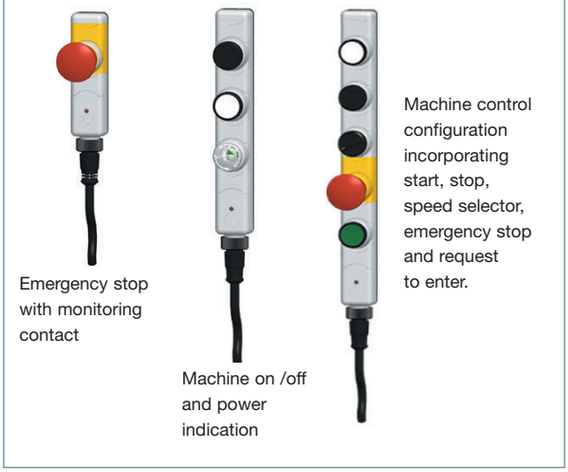
Trapped Key Interlocking



Safety Gate Switches



Machine Control



eGard Product Range

The **eGard** range is IP65 rated and constructed from PBT and 304 stainless steel. All mechanically tested to 1 million operations.

Head Modules

Head

For gate switch and door lock configurations.

- Rotatable through 360 degrees
- Top and side entry
- Operating force 5 to 10N
- Retention force 1000N - 1500N (dependent on orientation)

Cap

Used to terminate all non door lock or gate switch configurations.

- Used in mechanical exchange box, machine control or key switch configurations.

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Core Modules

Pushbuttons

- Illuminated pushbuttons use 1 output and 1 input
- All pushbuttons use 1 output pin
- All pushbuttons have 1NO contact

Button Options

flat
flat illuminated
mushroom

Selector Switches

Selector switch

Range of selector switches for machine control

- 2 position 1NO contact (each 2 position switch uses 1 output pin)
- 3 position 2NO contacts (each 3 position switch uses 2 output pin)
- Non Latching - spring return to original switch position
- Latching - stay in each switch position

Selector Options

2 position latching/non latching
3 position latching/non latching

Safety switches

Safety switch

Operates on dual safety circuits. Can be driven by either the operation of the head module (removal of actuator) or a mechanical lock.

- 2 force break positive make NC safety contacts (uses none of the I/O pins)

Electrical locking / unlocking

Solenoid module to electrically lock a door or trap a mechanical key. This module restricts access until it is safe (e.g. machines with run down cycles, or robot applications that shouldn't be interrupted).

- Power to unlock (standard)
- Power to lock
- Both have 1NO contact to monitor when the module is locked (uses 1 output pin).

Runner bar status

Additional monitoring contact. Can be driven by either the operation of the head module (removal of actuator) or a mechanical lock.

- 1 NO monitoring contact (each runner bar status module uses 1 output pin)

Lamps

Lamp - LED status indicators for either machine or interlock

- Each lamp uses 1 input pin

Lamp Options

clear

Mechanical Interlocking

Mechanical lock - for use in trapped key configurations (e.g. key switches, exchange boxes and door locks). It can also be used in conjunction with safety gate switches to add further levels of access control (e.g. modular safety keys to prevent accidental lock in of personnel in full body access applications).

- Robust radial disc tumbler lock
- >3000 combinations
- 10 mastered combinations (can be used with all 3000 individual combinations)

Emergency Stop

Standard twist release operates dual safety contacts

- Monitored version also has 1 NO monitoring contact, uses 1 output pin
- 2 force break positive make NC safety contacts (uses none of the I/O pins)

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Base Modules

Connectors

Selection of modules to terminate a configuration

- Foot for terminating mechanical configurations (no wiring)
- Safety only connector 4 pin M12 for connecting dual safety circuits 24V DC
- Safety and control, two versions both connect dual safety circuits and either up to 2 I/O or up to 8 I/O 24V DC
- ASi connector 4 pin (only 2 pins used) M12 for connecting dual safety circuits and up to 4 inputs and up to 4 outputs

Accessories

Actuators

Selection of robust tongue actuators.

- Handle actuators suitable for bracketless mounting for either sliding or hinged doors
- Fixed actuator suitable for bracketless mounting of gate switches and door locks mounted on the inside of hinged doors

Cables

Black single ended straight connector.

- 4 pin M12 in either 2m or 5m lengths
- 14 pin in either 2m or 5m lengths

landscape vertical

Marked legend plates

Custom laser marked.

- Grey (or yellow for emergency stop modules)
- For vertically mounted configuration (landscape legend plate) up to 3 lines of text 17 digits long and 3mm high
- For horizontally mounted configuration (portrait legend plate) up to 2 lines of text 11 digits long and 3mm high

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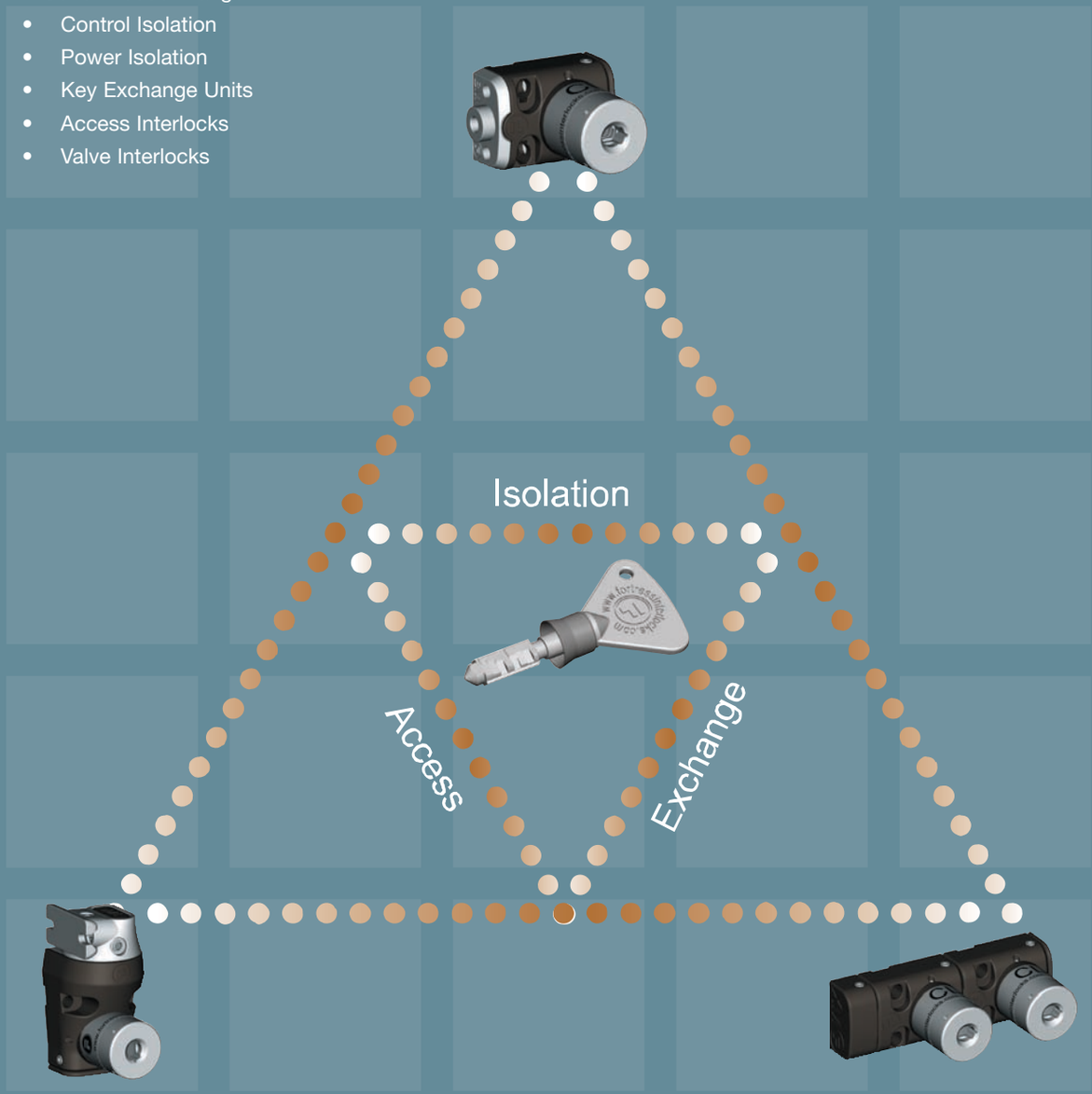
Introduction to mGard

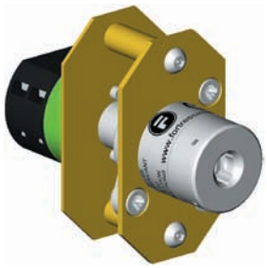
mGard is the premier range of modular robust trapped key interlocks for heavy duty applications. Trapped key interlocking is a tried and tested method of mechanically safeguarding dangerous machines and hazardous processes, and is suitable for category 4 applications. It is called “Trapped Key” as it works by releasing and trapping keys in a predetermined sequence. After the control or power has been isolated, a key is released that can be used to grant access to individual or multiple doors.

mGard Product Range

- Control Isolation
- Power Isolation
- Key Exchange Units
- Access Interlocks
- Valve Interlocks



mGard - Trapped Key Interlocks



S
Panel Mounted Key Switch

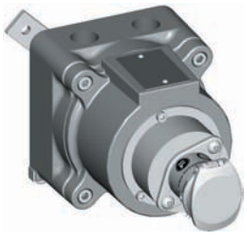
A panel mounted key switch suitable for isolation or switching current. The S unit may be used to isolate power to machinery. The standard sequence of operation is: Key trapped - Power on, Key free - Power off.

- Direct drive operation - positively opens contacts
- 20A, 32A and 63A switches available as standard
- 4NO or 2NO/2NC contact arrangements available as standard
- UL and CSA switches available upon request

SE
Surface Mounted Key Switch

An enclosure mounted key switch suitable for isolating or switching current. The SE may be used to isolate power to machinery. The standard sequence of operation is: Key trapped - Power on, Key free - Power off.

- Direct drive operation - positively opens contacts
- 20A, 32A and 63A switches available as standard
- 4NO or 2NO/2NC contact arrangements available as standard
- UL and CSA switches available upon request
- Enclosure sealed to IP66
- Metal enclosure sealed to IP40 available upon request



FLP
Flameproof Key Switch

A key switch suitable for use in areas where explosive/flammable gases or dust particles may be present. The standard sequence of operation is: Key trapped - Power on, Key free - Power off.

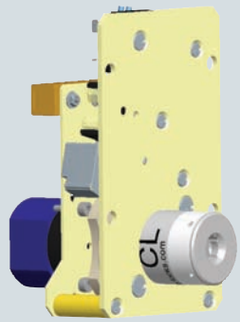
- BASEEFA (ATEX Directive 94/9/EC Certification - July 2003)
- EExdIIC T6 Zones 1 & 2
- Direct drive operation - positively opens contacts
- 16A switch available as standard
- 4NO or 2NO/2NC contact arrangements available as standard

SS
Solenoid Controlled Switch

A solenoid controlled key switch suitable for panel mounting. An alternative enclosure version is available for surface mounting.

The device is used where the key(s) need(s) to remain trapped until an electronic signal has been received. The standard sequence of operation is: De-energise solenoid, Key trapped - Power on, Energise solenoid, Key free - Power off.

- Solenoid monitoring contacts as standard
- Solenoids available in 24V DC and 110 Vac
- 20A switches available as standard
- 4NO or 2NO/2NC contact arrangements available as standard
- Accommodates up to 7 keys trapped by a single solenoid
- Enclosure versions available for surface mounting



Application

Machine guarding application featuring control isolation and single door access

Key A

Key A from S is free when power is off and can be used to open DM1 guard access lock. **Key A** is trapped in DM1 when guard door is open.

Control Isolation

SLS

Solenoid Controlled Switch Unit

A panel mounted solenoid controlled key release station. The device ensures that keys may not be released until both the solenoid has been energised and the control power has been isolated.

It is supplied with dual channel circuitry and a mechanical override system that is used in the event of a power failure.

- Solenoid available in 24V DC or 110 Vac
- Suitable for machines with a run-down cycle
- Extendable units with up to 6 release keys
- 10A switch available as standard
- 4NC/2NO contact arrangements available as standard

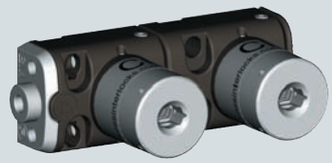
BM2

Multiple Interlock Deadlock

A robust, multiple modular mechanical bolt interlock that is used to interface with power breakers, valves, earth switches etc. It is used where hazards need to be indirectly interlocked.

Available with up to 10 modules BM is unsuitable for use as an access lock. The standard sequence of operation is: Primary Key Free – Secondary Key Trapped - Bolt Shot. This product is also available in full stainless steel, BMS.

- No product handing issues
- Horizontal and vertical mounting
- 16mm Diameter bolt with 16mm of travel
- Extend or trim down units and use surplus modules elsewhere



Primary Secondary

BM1

Single Interlock Deadlock

A robust, modular mechanical bolt interlock that is used to interface with power breakers, valves, earth switches etc. It is used where hazards need to be indirectly interlocked. BM is unsuitable for use as an access lock. The standard sequence of operation is: Key Free - Bolt Shot. This product is also available in full stainless steel, BMS.

- No product handing issues
- Horizontal and vertical mounting
- 16mm Diameter bolt with 16mm of travel
- Extendable bolt length

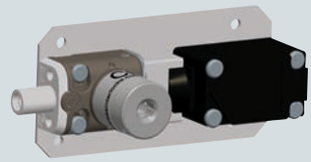
BM1-S

Single Deadlock Switch

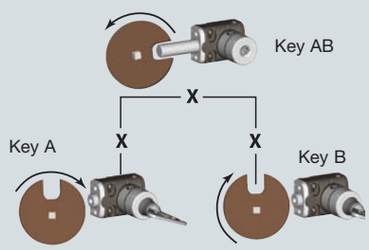
A robust single key deadlock with a 16mm dia bolt. This device is fitted with a limit switch to provide electrical indication of the bolt position.

This product is unsuitable for use as an access lock. The standard sequence of operation is: Key free - Bolt shot.

- Bolt travels 16mm
- Available in full stainless steel
- No product handling issues
- Extendable bolt length
- Switch rating: I_{the} 3A 240V (AC15)
- Contact arrangement: 1NO/1NC



Application



Electrical switchgear application featuring 2 incoming supplies and a bus coupler

The 2 supply isolators and the bus coupler are fitted with interlocks that only allow the switches to be closed when a key is trapped in the lock mechanism.

XM

Modular Key Exchange Box

A modular, mechanical key exchange unit that is used to exchange one or more keys for a number of other keys. This device forms the link between isolation devices and access locks. Multiple isolation/access XM modules and keys are possible.

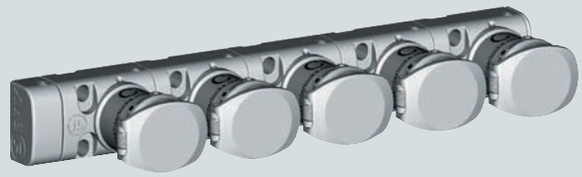
- Tested to over a 1,000,000 operations
- Sequential or Non-sequential key operation
- Easy to configure
- Extend or trim-down units and use surplus modules elsewhere.

XMS

Full Stainless Steel Modular Key Exchange Box

A modular, mechanical key exchange unit that is used to exchange one or more keys for a number of other keys. This device is the full stainless steel alternative to the XM product and is ideally suited to high frequency applications and arduous environments.

- No product handing issues
- Patented sequencing system



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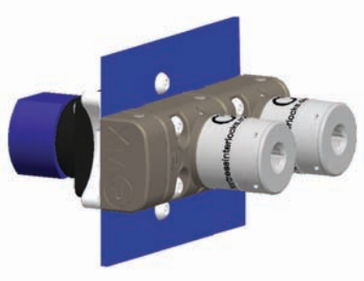


XMR-P

Modular Key Exchange Units with Rotary Switches Panel (sealed)

The XMR is a modular key exchange unit. These units are fitted with rotary switch(es) that can be used for power or control isolation.

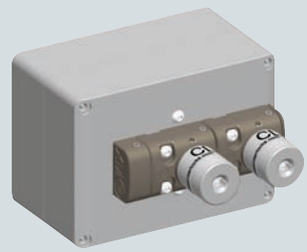
- Panel or enclosure mounting
- Sequential or non sequential key operation
- Any combination of isolation / access keys possible
- Colour coding of locks and keys available
- 20A, 32A, 63A or 150A switches
- 4NO or 2NO 2NC Switch contacts

XMR-E

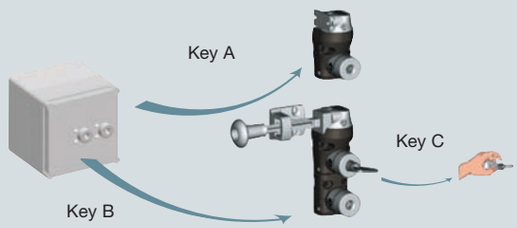
Modular Key Exchange Units with Rotary Switches Enclosure (sealed)

The XMR is a modular key exchange unit. These units are fitted with rotary switch(es) that can be used for power or control isolation.

- Panel or enclosure mounting
- Sequential or non sequential key operation
- Any combination of isolation / access keys possible
- Colour coding of locks and keys available
- 20A, 32A, 63A or 150A switches
- 4NO or 2NO 2NC Switch contacts



Application



Machine guarding application featuring control isolation and multiple guard door access

Turn and release both **keys A and B** to isolate machine.

Keys may be used to open DM1 and DM2 guard access locks, releasing **Key C** which in turn may be used as a Safety Key for operator protection

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Access Interlocks

DM1

Single Panel Door Interlock

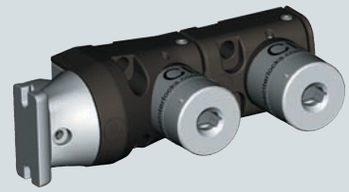
A robust, modular access interlock for use on all types of doors. The stainless steel head provides rotational adjustment of 360° at 90° increments with +/-5° fine adjustment.

- No product handing issues
- 8 head configurations with +/-5° of fine adjustment
- Tamper resistant head mechanism
- Extend or trim-down units and use surplus modules elsewhere

DM2

Multiple Modular Panel Door

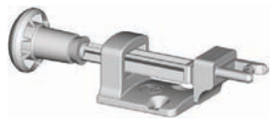
A robust, multiple modular access interlock suitable for use on all types of doors. Sold as a single or multiple door interlock, it is available with up to 10 CL / ML lock modules. A choice of 4 actuators are available dependent upon your application requirements.



Actuators

DM-F (fixed)

- Supplied as standard
- Ideal for most guard doors
- Compact (fits within DM body's space envelope)



DM-H (handle)

- Suitable for use where secondary action is required to open/close the guard
- Detent holds actuator in place when door is open
- Vertical adjustment: +/- 6mm
- Rotational adjustment of bracket to suit all mounting orientation

DM-S (self aligning)

- Ideal for small radius hinged doors
- Can be bolted through from the front, top or bottom
- Horizontal adjustment: +/-7.5mm
- Vertical adjustment: +/-3.75mm
- Rotational adjustment: any angle in 360°
- Adjustment ideal for guards subject to misalignment through wear

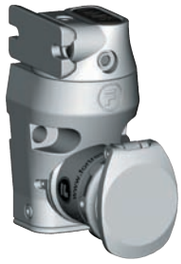
DM-C (compressible)

- Ideal for doors where the final location can vary (e.g. sealed doors)
- Can be used on small radius doors
- Suitable for situations where the door is likely to be slammed

Application

Machine guarding application featuring control isolation, exchange and multiple guard door access

Key A from **S** is free when power is off and is trapped in the exchange box, releasing **Keys B** to **D**. These keys are used to open the access locks (**DM1** and **DM2**). Key E is released from the **DM2** and may be used as a Safety Key for operator protection.



DMS

Full Stainless Steel Single Panel Door Interlock

A robust, modular access interlock suitable for use on all types of doors. DMS is available with a choice of 4 actuators dependent upon your application requirements.

- Full stainless steel
- No product handing issues
- 8 head configurations with +/-5° of fine adjustment
- Tamper resistant head mechanism
- Extend or trim-down units and use surplus modules elsewhere

CE Ex II 2G c

DMS2

Full Stainless Steel Multiple Panel Door Interlock

A robust, multiple modular access interlock suitable for use on all types of doors. Available as a multiple door interlock with up to 5 CLS / MLS lock modules, DMS offers a choice of 3 actuators.

- No product handing issues
- 8 head configurations with +/-5° of fine adjustment
- Tamper resistant head mechanism
- Extend or trim-down units and use surplus modules elsewhere

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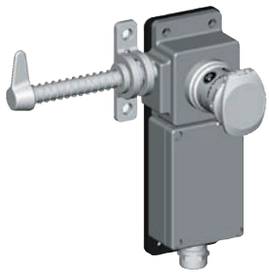


ALS

Panel Door Interlock with Switch

A stainless steel access interlock featuring a control switch. Ideally suitable for whole body access applications. Releasing the key operates the switch and allows access to hazardous areas.

- Available in 2 orientations: RE and LE
- Self Aligning bolt as standard
- Reverse sequences available on request
- Lock-out facility available as an optional extra
- Suitable for fast and frequent application
- Provides a safety key for the operator (preventing accidental restart)
- Switch rating: 10A as standard
- Contact arrangement: 2NO/2NC

ET

Electronic Time Delay Unit

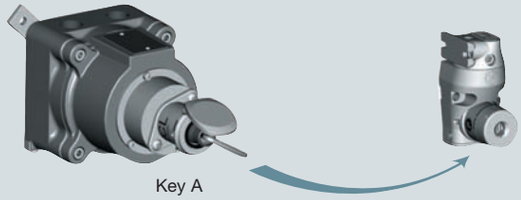
An electronically operated time delay unit that releases keys at the end of a pre-determined time period. This device is suitable for use in applications that have a run down cycle.

- Available in 110 V or 230 V versions
- 0 - 5 min & 0 - 30 min time delays available
- Releases up to 3 keys
- Complete with solenoid monitoring contacts as standard
- Panel mounted version available
- Rotation and temperature sensing versions also available

Application

Machine guarding application featuring control isolation and single guard door access

Key A from **FLP** is free when power is off and can be used to open **DMS1** guard access lock. **Key A** is trapped in **DMS1** when guard door is open.



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Introduction to amGard

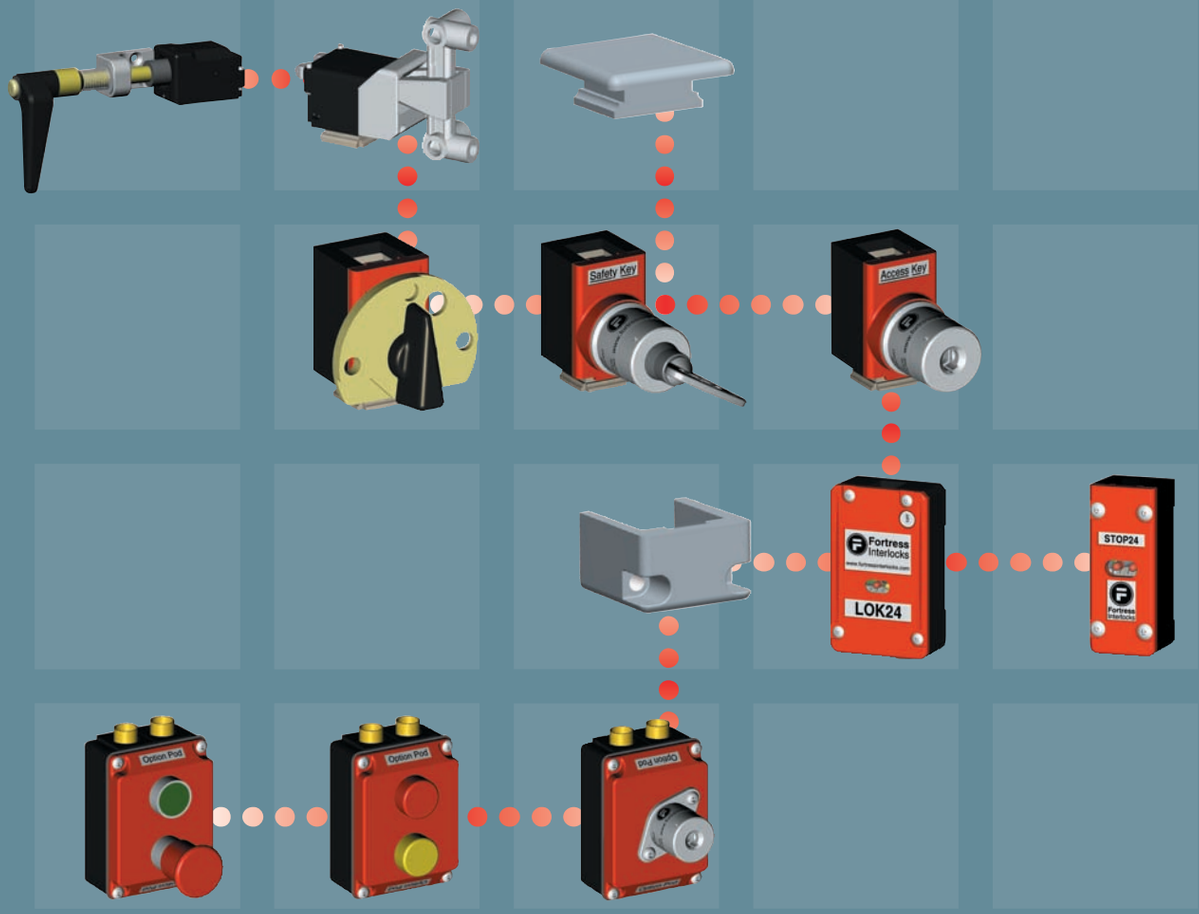
amGard is the ultimate range of safety gate switches, for heavy duty applications. Its modular construction allows the easy configuration of interlocking solutions that can be tailored for any application.

The tamperproof locking mechanism combined with dual channel safety circuitry offers the ultimate in security to ensure safe working practices.

Quick and easy access to machinery provides minimum production down time. Suitable for category 4 applications the **amGard** range is ideal for harsh environments and is tested to over 1,000,000 operations.

amGard Product Range

- Safety Gate Switches
- Modular Components
- AS-Interface



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amGard - Sample Configurations

Non solenoid (STOP), tongue (AuTo) and handle (AM) operated gate switches

Opening the guard breaks the dual safety circuits

Solenoid (LOK), tongue (AuTo) and handle (AM) operated gate switches

Energising the solenoid breaks the dual safety circuits allowing entry to the guarded area.

AMLOK with safety and access key modules.

Energising the solenoid allows the access key to be inserted, releasing the safety key and allowing entry to the guarded area.

Slidebar operated AuToLOK with internal release.

With the guard locked hitting the internal release button overrides the LOK allowing exit from the guarded area.

AMLOK with keyswitch option pod.

Removal of the safety key electrically requests entry. Once it is safe the solenoid is energised allowing entry. The safety key eliminates accidental lock in.

AuToSTOP with safety key and internal release.

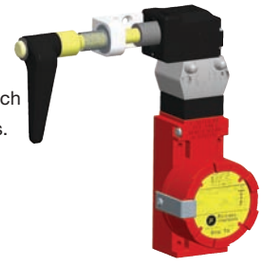
Removal of the safety key breaks the dual safety circuits and allows entry. With the key in and guard locked, hitting the internal release button overrides the locking mechanism allowing exit from the guarded area.

AuToSTOPXP

UL / CSA certified product Heavy duty explosion protected safety gate switch. Suitable for zone 1 & 2 environments.

AMSTOPTX

ATEX certified product. Heavy duty explosion protected safety gate switch suitable for zone 1 & 2 environments.



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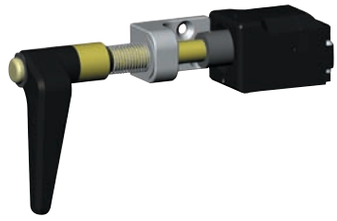
Head Units

Head units provide the primary operating function for the **amGard** product range and are suitable for use on both hinged and sliding doors.

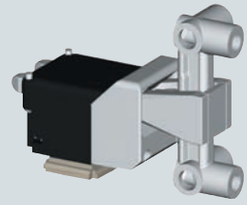


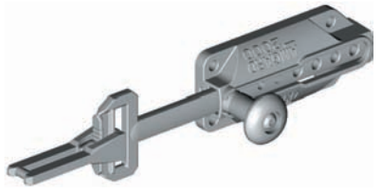
AM Head

- Heavy-duty handle unit
- 4 position fixing at 90° increments
- Operating handle can be rotated in 45° increments
- Allows for guard misalignment
- Can be fitted with lock-out devices for additional safety

Auto Head

- Heavy-duty tongue unit
- Suitable for fast, frequent access
- 4 position fixing at 90° increments
- Misalignment tolerance of +/- 12mm
- Can be fitted with lock-out devices for additional safety





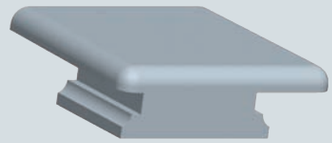
Slide Bar

- Used in conjunction with the Auto Head
- May be used with other modular **amGard** products
- Particularly useful for applications using small radius, hinged doors
- Available in two variants: Internal Release (as standard) and a Spring Loaded option.
- Stainless steel castings
- Built in lock-out facility

Cap

Suitable for use with the stop body or adaptor products.

- Protects the unit from debris
- Removable to enable modification



Adaptors

Adaptors are available as modular assemblies. Key and padlock adaptors may be integrated vertically dependant upon the application. When linked with head units, adaptors may be used as mechanical guard door access locks.

Access Key Adaptor

- Ideally suited for authorised access only, or for linked access to other machinery
- Ensures a specific sequence of operation
- Provides unique link to **mGard** range

Safety Key Adaptor

- Prevents personnel being accidentally locked inside a guarded area
- Ensures that the machine/process cannot be restarted without returning the keys
- Can be stacked or combined with other adaptors

Safety Key Adaptor with Internal Release

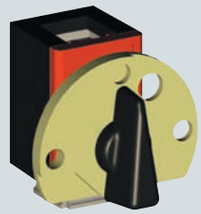
- Overrides the safety key mechanism and provides a means of escape from inside the guarded area
- If incorporated into a Stop Body the internal release mechanism puts the machine into emergency stop
- Of modular arrangement the product may be used with an Auto head and/or a Stop body

Single Lock-Out Padlock Adaptor

- Provides a link with other lockout tagout safety procedures
- Provides padlocking only in the OFF position
- Accommodates up to 5 padlocks with 7.5mm diameter hasps
- Facilitates enhanced supervisor security

Dual Lock-Out Padlock Adaptor

- Provides a link with other lockout tagout safety procedures
- There are two padlock positions for use as a voluntary lockout facility
- Accommodates one padlock with up to 8mm diameter hasp
- Enables quick and easy access



Base Units

Base units are the electromechanical elements of the heavy-duty modular **amGard** range that interface with safety relays and PLC's, providing controlled access to machinery or a guarded area. Tested to over 1 million operations these units contain dual channel safety circuitry making them suitable for category 4 applications.

Lok Body

- Ideal for machines with run-down cycles
- Solenoid controlled
- LED indicators for status identification
- Prevents access until machine is safe
- Solenoid override facility for increased safety in the event of power failure
- AS-Interface chip technology
- Solenoid voltages - 24V AC, 48V AC/DC, 110V AC, 220V AC or 230V AC

Stop Body

- Ideal for quick access to machines with no run-down cycles
- Non-Solenoid controlled
- LED indicators for status identification
- AS-Interface chip technology

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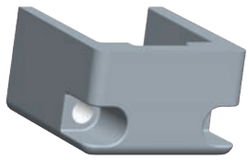


Foot

- Secures unit firmly to mounting surface
- Removable to allow for modification

Option Pods

Option Pods provide an added control feature for assembled **amGard** units. There are 3 types, each serving a specific purpose.

Keyswitch

The removal of the key enables the machine to stop at the end of a run down cycle. When the solenoid has been energised within the AutoLok or AmLok, access can be gained. The operator takes the safety key into the hazardous area preventing inadvertent restart of the machinery.

- Contains 2no/2nc contact arrangement
- Prevents inadvertent re-start and/or provides a request to stop/start
- Can be used as a 'Stand Alone' keyswitch

Indicator Lamp

Ideal complimentary module where multiple interlocks are used for enhanced identification of status. The pod can contain either one or two indicator lamps.

- Easy, clear indication of machine status
- Can be modified to suit one or two lamps
- Standard colours are red and yellow, other colours are available to suit

Pushbutton

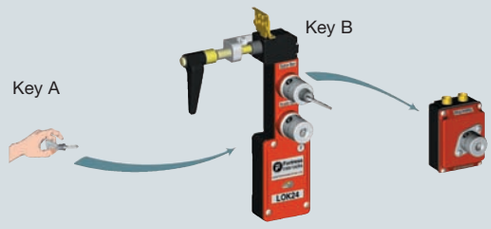
Ideal for use as an emergency stop or request to stop/start. The pod can contain either one or two pushbuttons which interface with the machine control.

- Request stop/start at the gate
- Can be modified to suit one/two pushbuttons
- Easy, reliable interface with machine controls

Application

Machine guarding application featuring control isolation, single access, personnel protection and teach / jog capability.

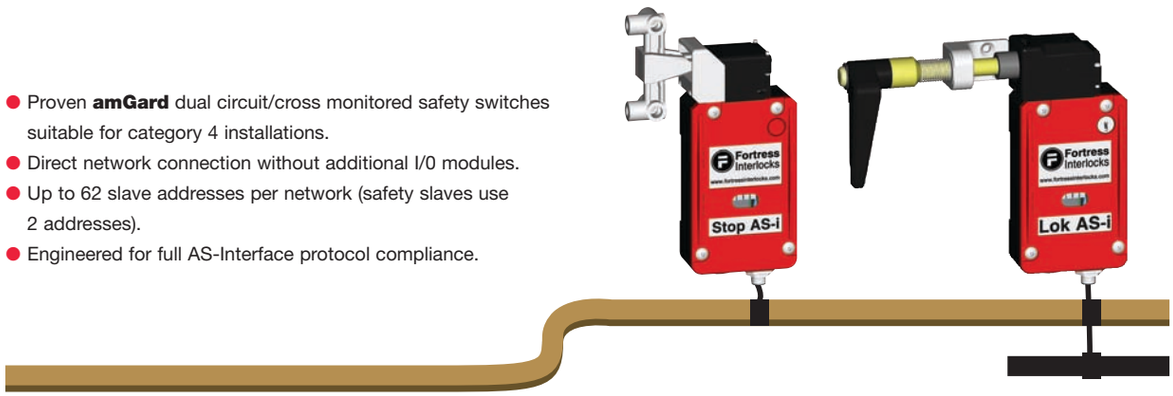
Request end of machine cycle and insert authority **Key A** releasing **Key B** and allowing guard door to be opened. **Key B** may then be used in option pod for teach or jog purposes.



AS-Interface Enabled Safety Gate Switches

To work in conjunction with the AS-Interface Safety at Work safety bus protocol, **Fortress** have developed a pair of capable safety slaves. AS-Interface is the industrial bus that allows the use of standard and safety slaves on the same network and provides a guaranteed response time for safety circuits when used in conjunction with an AS-Interface Safety at Work safety monitor.

- Proven **amGard** dual circuit/cross monitored safety switches suitable for category 4 installations.
- Direct network connection without additional I/0 modules.
- Up to 62 slave addresses per network (safety slaves use 2 addresses).
- Engineered for full AS-Interface protocol compliance.



Benefits

- Significant installation cost savings
- Checks for errors
- Provide local and remote status indication
- Solenoid and non solenoid products
- Enhanced tamper proofing
- Suitable for Category 4 Applications
- Dual Channel Safety Circuitry
- Modularity allows Access & Safety key adaptors to be added
- Handle or tongue operated heads available

Lok ASi solenoid operated Gate switches

Ideal for machines with run down cycles.

Black auxiliary power cable required to power the solenoid.

Stop ASi Gate switch

Ideal for quick access to machines with no run-down cycles.

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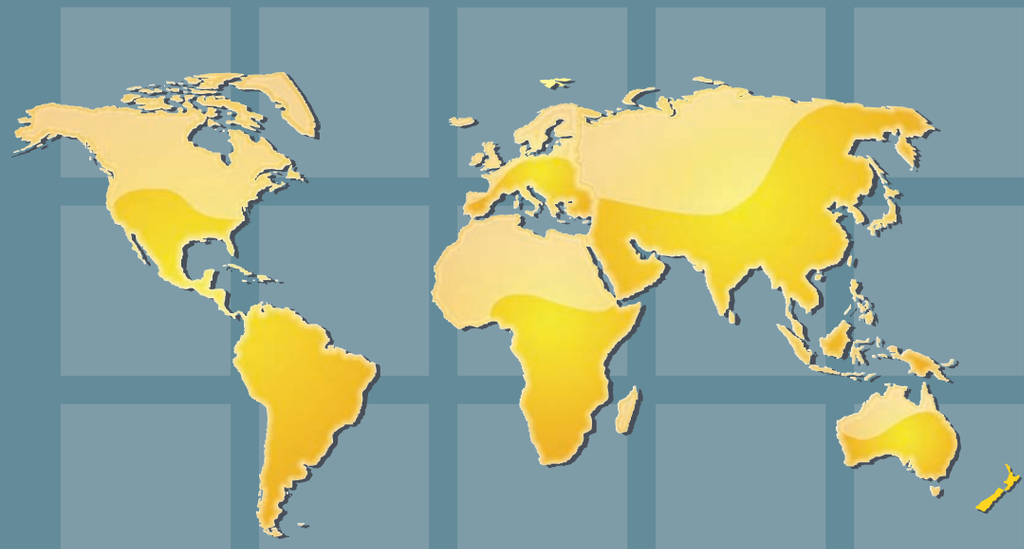

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