The essential guide to eGard
**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 combinations of modules it can be easily customised for every access and control application. The *eGard* product range is defined into three sections of head modules, core modules and base modules.

**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**

**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.
- **Cap** - used to terminate all non doorlock or gate switch configurations.
- **Head and Fixed Actuator** - head incorporating standard fixed actuator.

**Core Modules**

- **Pushbutton** - range of pushbuttons for machine control
  - Button Options:
    - Flat
    - Flat illuminated
    - Mushroom

- **Selector switch** - range of selector switches for machine control
  - Selector Options:
    - 2 position latching / non latching
    - 3 position latching / non latching

**Standard eGard Configurations**

- Emergency stop with monitoring contact
- Machine on / off and power indication
- Simple dual circuit Safety gate switch
- Solenoid locking safety gate switch, incorporating request to enter green pushbutton, white start button and safety key.
- Machine control configuration incorporating start, stop, speed selector, emergency stop and request to enter.

**Selector Options**

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

**Solenoid locked control isolation configuration**

**Teach switch**

- Mechanical door lock releases a safety key to eliminate accidental lock in and it can be used to activate teach function.

**Solenoid locking safety gate switch (Prevents access until it is safe).**

**Solenoid locking safety gate switch, incorporating request to enter green pushbutton, white start button and safety key.**

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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.

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).

Runner bar status - additional monitoring contact. Can be driven by either the operation of the head module (removal of actuator) or a mechanical lock.

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).

Lamps - LED status indicators for either machine or interlock

Lamp options
- Green
- Red
- Clear

Each lamp uses 1 input pin

Emergency stop - standard twist release operates dual safety contacts

- 2 force break positive make NC safety contacts (uses none of the I/O pins)
- Power to unlock (standard)
- Power to lock
- Both have 1NO contact to monitor when the module is locked (uses 1 output pin)
- 1 NO monitoring contact (each runner bar status module uses 1 output pin)

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

Base modules - 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
- Cables - black single ended straight connector
- Marked legend plates - custom laser marked

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

**electrical guidelines**

Control modules with inputs/outputs (I/O) (pushbuttons/lamps/selector switches) can be configured in any order in the stack (the internal eGard network is self configuring). Table 1 shows how many I/O connections can be made using the different types of connector, and table 2 shows each core modules I/O requirements.

**Table 1. max I/O connections per base connector type:**

<table>
<thead>
<tr>
<th>Part No</th>
<th>Desc</th>
<th>Max I/O</th>
<th>Connects safety circuits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BS</td>
<td>Safety Only</td>
<td>Zero</td>
<td>Yes</td>
</tr>
<tr>
<td>BB</td>
<td>Safety and Control 2 IO</td>
<td>Max 2 I/O</td>
<td>Yes</td>
</tr>
<tr>
<td>BC</td>
<td>Safety and Control 8 IO</td>
<td>Max 8 I/O</td>
<td>Yes</td>
</tr>
<tr>
<td>BA</td>
<td>Safety and Control ASi</td>
<td>Max 4 I &amp; 4 O</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Table 2. core module I/O requirements:**

<table>
<thead>
<tr>
<th>(I/O relative to eGard)</th>
<th>Input (I)</th>
<th>Output (O)</th>
<th>Assignment bases to head</th>
<th>Module operating on safety circuits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Head only</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Cap</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Safety switch</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Safety circuits</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Mechanical locks</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Mechanical traps</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Extension blank</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>e-stop start / restart</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Status</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Mechanical switch</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Safety &amp; Access</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**mechanical trapped key, sequencing guidelines:**

Mechanical lock modules and safety switch modules need to be configured in a specific order and runner bars linked (or un-linked) in the stack, to produce the desired trapped key sequence.

**lock choice**

1. Choose safety or access function:

With the machine operating and therefore all access doors locked, the locks with keys in are Safety modules (and come including keys) and the locks without the keys are Access modules.