The XMR unit is used as a **key interchange**, exchanging one or more keys for one or more other keys with switching capability. Switch adapters are suitable for isolating or switching current and may be used to isolate power to machinery.

Reference States of Units

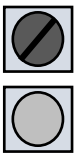
XMR/XMSR devices can be in two distinct states; normal and opposite.

Normal State is defined for machine guarding applications as the required unit state while machine is running. Any safety circuits will be closed in this state.

Opposite State is the exact opposite of the *Normal State* (for example where the machine is isolated, and machine access is performed). Referenced safety circuits will be open in this state.

In the Normal State:

- All locks **with** keys in are referred to as "**Normally In Locks"** (NIL)
- All locks **without** keys in are referred to as "**Normally Out Locks"** (NOL)

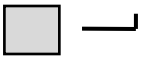


ISO/TS 19837 (2018) Safety of Machinery – Trapped Key Interlocking Devices – Principles for design and selection provides useful guidance on designing trapped key systems below shows the key used within this standard, with some Fortress-specific additions.

Key (ISO/TS 19837(2018))

Actuator trapped

Actuator unlocked



Actuator free

Key trapped in lock

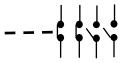
Key free

Key (Fortress Additions)

XM Cap (the top of a key exchange)

Red Arrows indicate release of keys from NIL; the number in white the order of release.

Green Arrows indicate insertion of keys into NOL; the number in white the order of insertion.

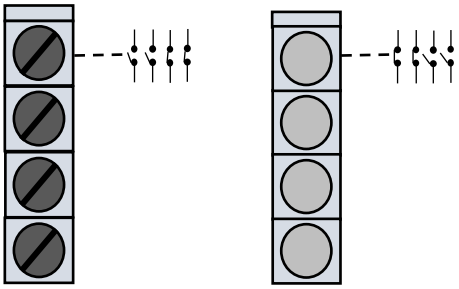


Switches in 'normal state' and the lock which alters their state

(Normal State)

XMR4-4-0-CLIN-W-02022

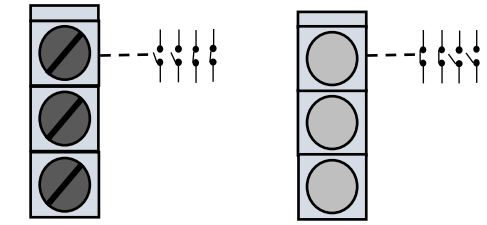
(Normal State) *(Opposite State)*



(Opposite State)

XMS3-3-0-CLSN-W-02022

(Normal State) *(Opposite State)*



1. I'm defining a new system, how will this product operate?

XMR units

Part Number

XMR3-2-1-…

Total Locks

Normally In Locks

Normally Out Locks

Standard Key Sequence – "W"

NIL: Partially Sequential
NOL: Non-Sequential

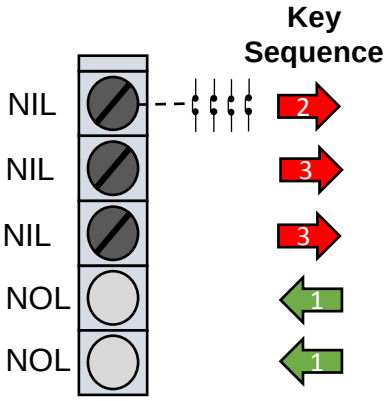
Switch Operation

Rear mounted "R" is always actuated by the lock closest to the top cap.

Example

XMR5-3-2-CLSS-W-02040

- NIL partially sequential
- NOL non-sequential
- 4NC/0NO switch
- R switch operated by top NIL
- NIL closest to top cap



2. I need to match an existing system:

contact our team to discuss your enquiry at
partnumbergroup@fortressinterlocks.com

Key Sequences:

For each group of locks (NIL and NOL) on a unit, all keys must be inserted in the group before any keys from the other group can be removed

e.g. On a gate unit, all NOL must have keys in before the personnel keys can be removed from the NIL (and the gate be unlocked).

The order the keys in a group can be removed are:

Non-Sequential:

- The keys in the group can be removed/inserted in any order
- This is never relevant where a switch is present

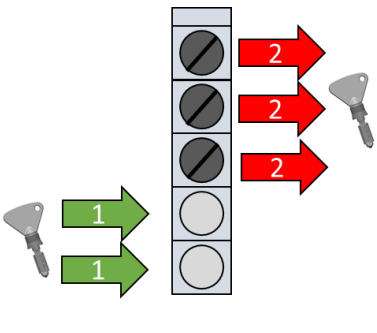
Partially Sequential:

- The key from the top lock in the group is removed first, with the other keys able to be removed in any order
- When inserting keys, the top lock must have the key inserted last
- If the group of locks controls a switch, the switch will be actuated by the top lock in the group

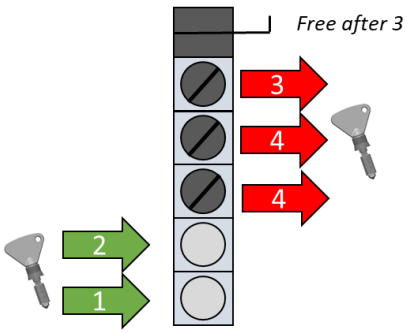
Fully Sequential:

- The keys are removed from the locks top to bottom
- This is where insertion or removal of keys from locks is required in a specific order
- In the example below, to remove key 5 from the top NIL, keys for the NOL must be inserted in order from bottom to top.

Non-Sequential



Partially Sequential



Fully Sequential