1 Introduction

Software version 4.35 introduces two new features:

a. An enhancement to the Control Matrix logic operations which provides an option to prevent a Control Matrix rule from activating its outputs if a defined previous rule has activated. This involves:

i Modification to the manner in which transfer flags operate to allow a transfer flag to latch by being fed back into itself. This description is additional to the information contained in Section 7.9 of the Panel Configuration Manual.

Note: Section 7.9 of the Panel Configuration Manual defines the logic precedence rule, details various restrictions concerning logic operations and provides examples. **It is assumed that the reader is familiar with the content of that section.**

ii An additional panel setting to resolve the case where the inputs to two rules activate simultaneously but only one rule is required to activate its outputs. This description is additional to the information contained in Section 11.11 of the Panel Configuration Manual.

b. The Display Active Control Matrix Rules option now also displays active flag numbers in addition to the rule numbers. This information is additional to the information contained in Section 12.3 or 12.4 of the Panel Configuration Manual.

Example - Lockout

RULE	INPUT STATEMENT	OUTPUT STATEMENT
1	Zone 1	Flag 11 [AND]
2	Zone 2	Flag 12 [AND]
3	Zone 3	Flag 13 [AND]
4	Zone 4	Flag 14 [AND]
5	Zone 5	Flag 15 [AND]
6	Flag 11	Flag 11 [OR]
7	Flag 12	Flag 12 [OR]
8	Flag 13	Flag 13 [OR]
9	Flag 14	Flag 14 [OR]
10	Flag 15	Flag 15 [OR]
11	Flag 11	Flag 100 [OR]
12	Flag 12	Flag 100 [OR]
13	Flag 13	Flag 100 [OR]
14	Flag 14	Flag 100 [OR]
15	Flag 15	Flag 100 [OR]
16	Flag 100	Flag 11 [AND-NOT]
17	Flag 100	Flag 12 [AND-NOT]
18	Flag 100	Flag 13 [AND-NOT]
19	Flag 100	Flag 14 [AND-NOT]
20	Flag 100	Flag 15 [AND-NOT]
21*	Flag 11	Activate Control Module 1
22*	Flag 12	Activate Control Module 2
23*	Flag 13	Activate Control Module 3
24*	Flag 14	Activate Control Module 4
25*	Flag 15	Activate Control Module 5

* These rules can be on a different panel from rules 1-20.

Note: The zone numbers, flag numbers and module numbers used in the example are arbitrary, and the rules can be entered into the Control Matrix in any order (rule numbers are given in the example solely so that they can be referred to in the manual).

2 Logic Operation Enhancement

2.1 Control Matrix

The example shows how to configure the Control Matrix so that a rule will only operate if certain other rules have not already operated.

In this example there are five zones. An alarm in any zone will operate a specific control module, e.g. an alarm in zone 3 will operate control module 3. After this has occurred, a subsequent alarm in any of the other zones does not result in the corresponding control module operating. The output from zone 3 remains active until the panel is reset.

More than one group of inputs and outputs can be configured to operate in this mutually-exclusive manner, but for each the rules **must** be configured as follows:

1 A single unique transfer flag must be allocated to each input required to operate in the manner described above. These flags must be local to the panel in which these rules are programmed. In this example, flags 11 to 15 correspond to zones 1 to 5. Any input could be used instead of a zone, with additional flags if required e.g. to OR two non-adjacent zones, or zones from different panels.

2 For each of the inputs, a rule of the type 'input sets flag *n* [AND]' must be set. See rules 1 to 5 in the example.

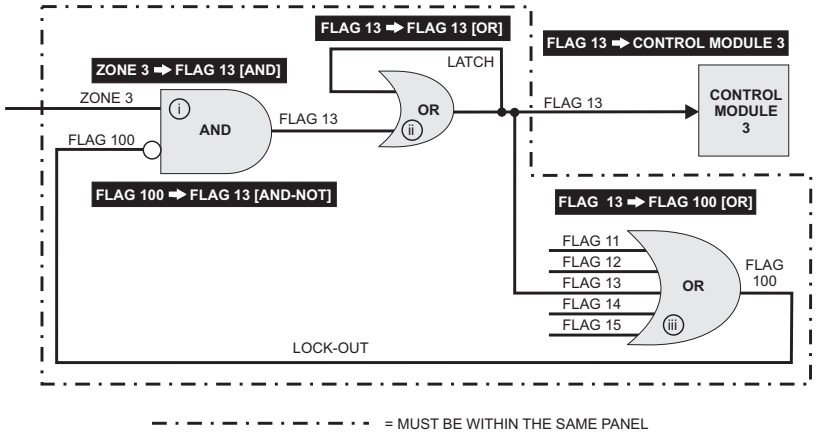
3 A flag must be allocated for lock out (see illustration and subsequent text for definition of lock out) - in this example it is flag 100. This flag must be local to the panel in which these rules are programmed.

4 To implement lock out, each input requires rules of the following types to be configured: 'flag *n* sets flag *n* [OR]' (see rules 6 to 10), 'flag *n* sets lock out flag [OR]' (see rules 11 to 15) and 'lock out flag sets flag *n* [AND-NOT]'. See rules 16 to 20 in the example.

Note: The panel does not implement lock out unless at least one rule of the type 'flag *n* sets flag *n* [OR]' is configured.

5 Configure rules to drive the outputs (additional flags can be used if required). See rules 21 to 25 in the example.

Note: Rules of steps 2 and 4 (Rules 1-20 in the example) must all be in the same panel (it does not have to be the panel at which the inputs or monitored, nor the panel from which the outputs are driven).



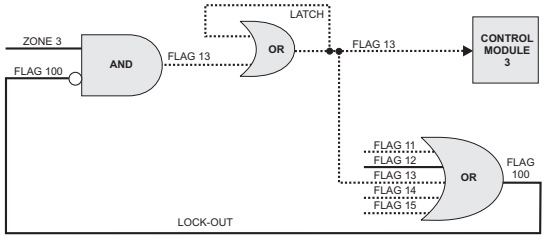

```
Control Matrix Configuration
▲INPUT: ALARM:
 ZONE 3
 OUTPUT:
▼TRANSFER FLAG no.13 [AND]
✓=edit/delete *=new entry X=cancel
```

```
Control Matrix Configuration
▲INPUT:
 TRANSFER FLAG no.13
 OUTPUT:
▼TRANSFER FLAG no.13 [OR]
✓=edit/delete *=new entry X=cancel
```

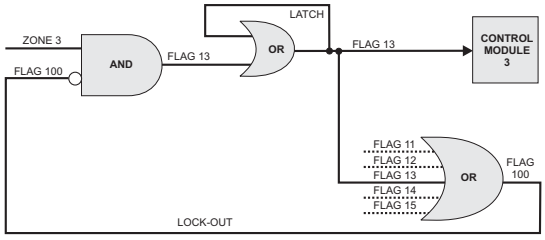
```
Control Matrix Configuration
▲INPUT:
 TRANSFER FLAG no.13
 OUTPUT:
▼TRANSFER FLAG no.100 [OR]
✓=edit/delete *=new entry X=cancel
```

```
Control Matrix Configuration
▲INPUT:
 TRANSFER FLAG no.100
 OUTPUT:
▼TRANSFER FLAG no.13 [AND-NOT]
✓=edit/delete *=new entry X=cancel
```

solid lines = active
dotted line = inactive



a - zone 2 (flag 12) in alarm first



b - zone 3 in alarm first

The illustration shows the effect on zone 3 - the corresponding Control Matrix rule for each step is shown in inverse text:

i If zone 3 detects an alarm, flag 13 is subsequently set if, and only if, flag 100 is not already set.

ii If flag 13 is set, then to prevent the Control Matrix from processing inputs associated with zones 1, 2, 4 or 5, flag 13 is latched by an OR logic operation and then used to set flag 100.

iii Flag 100 is set if **any** of flags 11 to 15 are set (corresponding to zones 1 to 5). Thus:

a. If zone 1, 2, 4 or 5 is already in alarm, then flag 100 prevents flag 13 from being set and thus control module 3 does not operate.

b. If zones 1, 2, 4 or 5 are not in alarm, then flag 100 is not set, allowing flag 13 to be set and control module 3 to operate. Flag 13 then sets flag 100 (see ii above), which then prevents flags 11, 12, 14 and 15 being set.

The locked out state is latched until the panel is reset.

To ensure that the panel does not begin processing another input BEFORE the locked out state occurs, the panel will process a number of flag-type rules in sequence, i.e. it is looking to see if a lock-out is configured. The number is pre-set, but can be adjusted if necessary (refer to **Section 2.2**).

2.2 Panel Settings - Unlatched Non-alarm Input Logging

```
Panel Settings
Maximum depth of recursion allowed into
Control Matrix, during processing of
latching FLAG rules (1-20): 5
```

Additional option:

Only available if a Control Matrix rule of the format 'flag *n* sets flag *n* [OR]' exists (see **Section 2.1**). Sets the number of flag-type rules processed in sequence by the panel before it starts processing another input, i.e. the panel is looking to see if a lock-out is configured. This should not normally need changing from its default (5).

To determine the optimum setting for this parameter, count the highest possible number of **sequential** steps involving **flag** outputs, in this panel's control matrix, from the initial alarm input **until the lock-out flag** (flag 100 in the example given in **Section 2.1**) has been reached. There is no need to count steps which do not progress towards the lock-out flag. In the example the applicable steps are rule 3 followed by rule 13, thus the parameter need only be set to 2.

It is not harmful to *slightly* over-specify the parameter; leaving it at its default (5) normally gives satisfactory performance. If set too low, the panel may start processing another input before detecting the lock out. If set too high, the panel may perform unnecessary processing of Control Matrix flags, slightly delaying the reporting of subsequent alarms.

3 Display Flags

```
Display Active Control Matrix Rules
    1   3   5  14  17  20  21  22
   23  24 F12 F100
```

In addition to active Control Matrix rules:

This display also shows active transfer flags (F12 and F100 in the example).