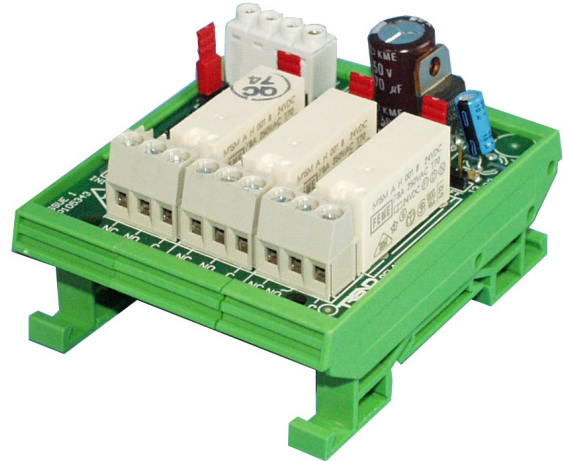


#### 3RM/24VAC Three Relay Module (24 Vac/dc)



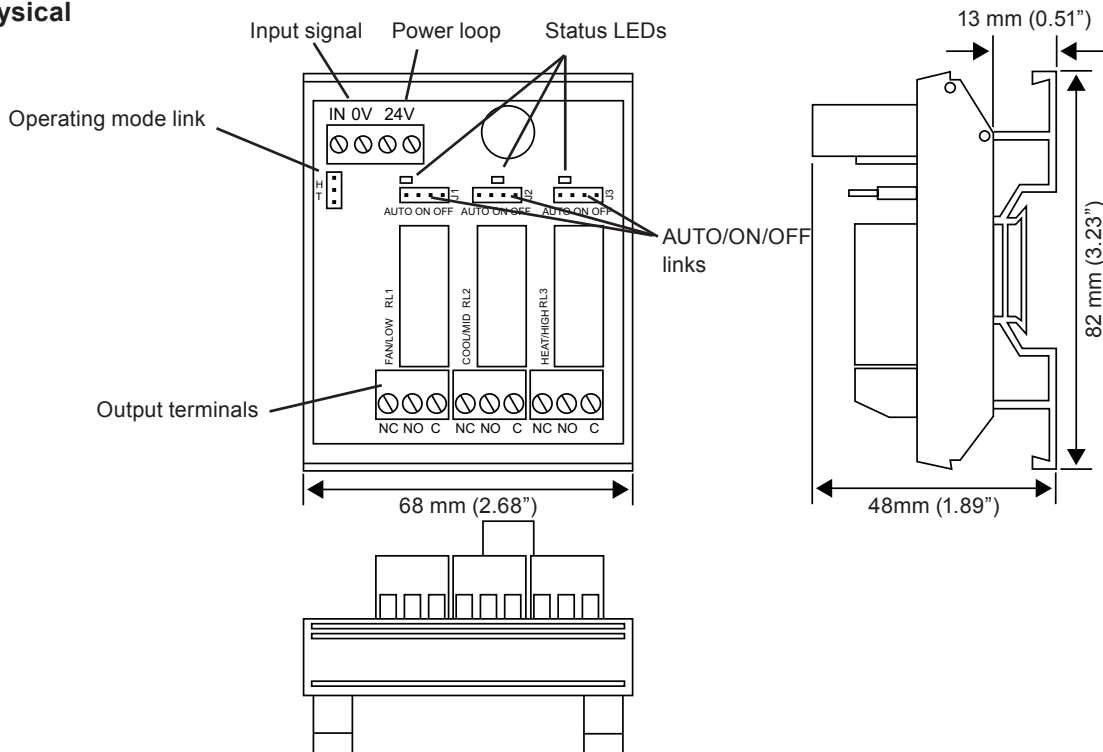
#### Description

The Three Relay Module (3RM) converts an analogue output of an IQ controller to three stages of relay output, and acts as an interface between the controller and heating and ventilating equipment. It may be configured as a Fan/Heating/Cooling sequence controller (HCM) or a 3 stage sequence controller (TRM) using the operating mode link. There are manual override links for each relay to aid commissioning. Field wiring is facilitated by rising cage clamp type terminals, and a supply loop terminal aids wiring to additional modules.

#### Features

- Dual function; Heat/Cool or Triple Relay, link selectable.
- AUTO/ON/OFF manual override links.
- LED status indication.
- Standard DIN rail mounting.
- Rising cage clamp terminals.
- 24 Vac/dc input power supply.

#### Physical



**FUNCTIONALITY**

**Operating Mode:** The 3RM converts an analogue voltage output of an IQ controller to three stages of relay output. It may be configured as a Fan/Heating/Cooling sequence controller (Heat Cool Mode - HCM), or a 3 stage sequence controller (Triple Relay Mode - TRM), using the operating mode link. In the HCM and TRM modes the relays switch in the sequences shown in the tables below.

TRM	Low	Mid	High	HCM	Fan	Cool	Heat
0 V	OFF	OFF	OFF	0 V	OFF	OFF	OFF
4 V (2.4)	ON	OFF	OFF	4 V (2.4)	ON	ON	OFF
7 V (5.4)	ON	ON	OFF	7 V (5.2)	ON	OFF	OFF
10 V (8.3)	ON	ON	ON	10 V (8.3)	ON	OFF	ON

Note that the voltage levels shown in the tables are approximate values - exact switching points are lower and may vary slightly from unit to unit. Typical threshold values are shown in brackets.

The 3RM, linked for TRM and with special wiring (see below), may also be used for binary switching allowing the switching of two unequal loads (Equipment 1 and Equipment 2). When used in this way it will switch the plant as shown in the adjacent table.

	Equipment 1	Equipment 2
0 V	OFF	OFF
4 V	ON	OFF
7 V	OFF	ON
10 V	ON	ON

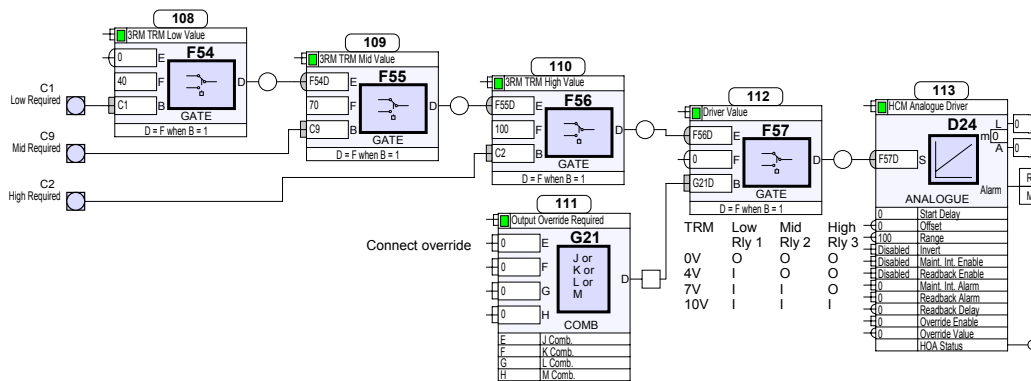
**Strategy:**

It is recommended to use SET (software tool) for configuring the controller. SET is supplied with 2RM strategy blocks for IQ1, IQ2, and IQ3 controllers. These can be used as they are or as examples.

There are 3 strategy blocks:

- HCM mode using analogue driver/analogue channel
- TRM mode using analogue driver/analogue channel
- HCM mode using R/L driver/analogue channel

These strategies are designed to apply the correct voltage to the 2RM module for the required action.



The above is an example strategy block; this strategy drives the 3RM in HCM mode via an analogue driver and analogue channel.

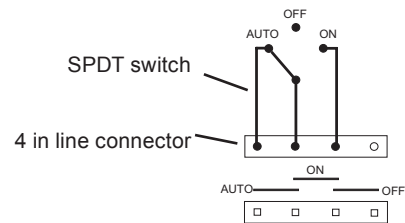
**Mounting:** The 3RM is designed to be mounted on a standard DIN rail.

**Power connection:** The relay's power connection is made to a 24 Vdc (e.g. IQ's auxiliary supply) or a 24 Vac supply (isolated or earthed, grounded, to IQ earth, ground) using the 0 V and 24 V terminals.

**AUTO/ON/OFF:** For commissioning purposes each relay may be switched ON or OFF using its AUTO/ON/OFF links. The relay operation may be checked by monitoring its LED. Each AUTO/ON/OFF link can be replaced with a SPDT switch.

Note that feeds switched from other relays on the same module or interlocks provided by other relays will not necessarily be operative when using manual overrides. It is the system designer's responsibility to ensure that adequate interlock protection is built into the design.

**Connectors:** 1 part screw terminals for 0.5 to 2.5 mm<sup>2</sup> cross section area (14 to 20 AWG) cable are used for inputs, outputs, and power connection. All terminals are rising cage clamp type. Each AUTO/ON/OFF link can be replaced by a 4 in line connector for connection of a switch .



## INSTALLATION

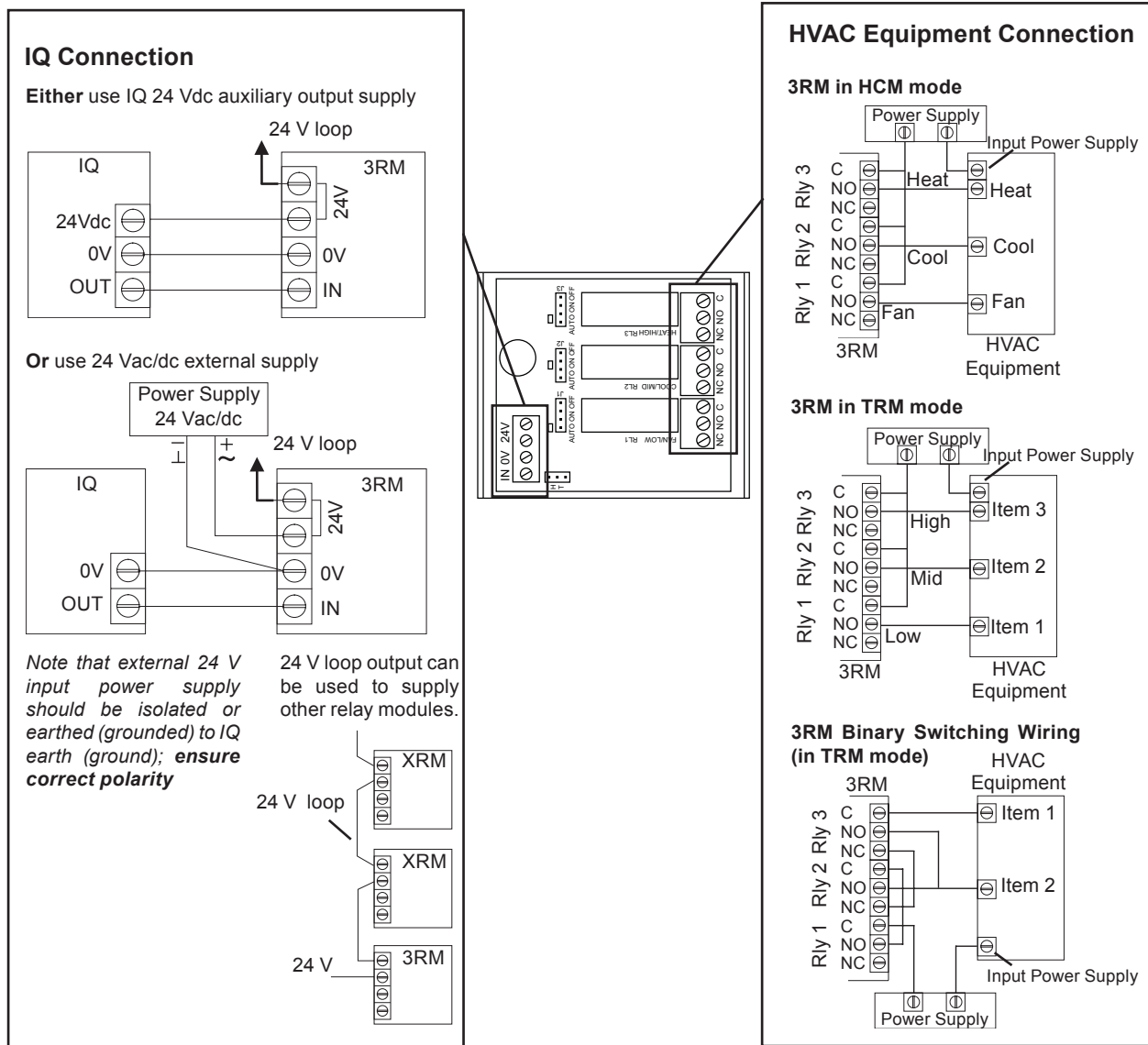
The 3RM must be mounted within a secondary/protective enclosure, conforming to EN61010-1, close to the IQ controller. The procedure involves:

- mount the 3RM in position
- set HCM/TRM link
- set AUTO/ON/OFF links
- set IQ analogue output channel for voltage
- wire the 3RM to the controller
- wire the 3RM to the HVAC equipment
- connect the 24 V input power supply
- check relay operation

The installation procedure is covered in the 3RM/24VAC Installation Instructions (TG200647).

## CONNECTIONS


Single part connectors for 0.5 to 2.5 mm<sup>2</sup> cross section area (20 to 14 AWG) cable - Cu only.



## DISPOSAL

COSHH (Control Of Substances Hazardous to Health - UK Government Regulations 2002 ) ASSESSMENT FOR DISPOSAL OF 3RM. No parts affected.

RECYCLING. All plastic and metal parts are recyclable. The printed circuit board may be sent to any PCB recovery contractor to recover some of the components for any metals such as gold and silver.



**WEEE Directive:**  
 At the end of their useful life the packaging and product should be disposed of by a suitable recycling centre.  
 Do not dispose of with normal household waste.  
 Do not burn.

## ORDER CODES

3RM/24VAC  
3RM/24VAC/USA/UL

1 off 3RM module for DIN rail mounting.  
1 off 3RM module for DIN rail mounting (for USA).

## SPECIFICATIONS

## Electrical

Input Power Supply voltage	:24 Vdc or 24 Vac $\pm$ 20%
Input Power Supply current	
24 Vac	:100 mA (34 mA per relay)
24 Vdc	:45 mA (15 mA per relay)
Input signal	:0 to 10 Vdc (10 mA maximum)
	See operating voltage levels in text above.
Relays	
Switching	:3 single pole changeover.
Contact rating	:5 A @ 240 Vac ( $\cos\phi=0.4$ ) 5 A @ 30 Vdc (resistive) 2 A @ 24 Vdc (inductive, $T\leq 30$ ms).
	NOTE: To meet safety requirements, relays being used must all be switching either low voltage or mains and not a mixture of voltages. If switching mains, they must all switch the same phase and polarity. Arc suppression circuit (RC) recommended for inductive loads, see TG200208. The UL rating applies to loads of up to 30 V.
Operating modes	:linkable HCM or TRM.
Manual override	:linkable AUTO/ON/OFF.
LED	:single LED for each relay, ON when energised.

## Mechanical

Dimensions	:82 mm (3.23") x 68 mm (2.68") x 48 mm (1.89").
Connectors	:Single part with rising cage clamp terminals for 0.5 to 2.5 mm <sup>2</sup> cross section area (20 to 14 AWG) cable. Use copper cable only.
DIN rail	:for use with top hat profile DIN46277-3, EN50022, BS5584:1978.

## Environmental

Safety	:EN61010-1: 2001.
UL	:The /USA/UL unit is rated as 'UL916 listed accessory to open energy management equipment'
Ambient limits	
Storage	:-10 °C (14 °F) to +70 °C (158 °F)
Operating	:-10 °C (14 °F) to +50 °C (122 °F)
Humidity	:0 to 90 %RH non-condensing
Altitude	:<2000m (6562 ft)

## IQ Configuration

It is recommended to use SET (software tool) for configuring the controller. SET is supplied with 3RM strategy blocks for IQ1, IQ2, and IQ3 controllers. These can be used as they are or as examples- see text above for details

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