

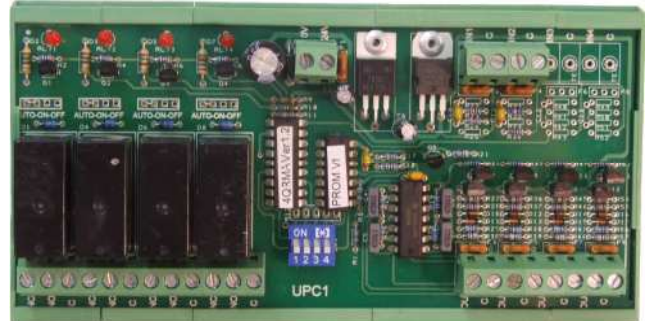
MOD4QRM-A Four Relay Analogue Sequencing Module

Description

The MOD 4 QRM-A is intended for use with Direct Digital Controllers and Analogue Ramp Output Controllers to convert an Analogue Output signal to 4 Digital and 4 Analogue output stages. Full sequencing of 4 stage or 2 x two stage loads can be implemented.

The MOD 4 QRM-A is constructed on a Epoxy Glass Laminate and housed in an industry standard 80mm DIN Rail Mounting. Generous 2.5mm² terminals are provided for the field interconnections.

The MOD 4 QRM-A Module is CE rated and is RoHS compliant.



Applications

Applications include the switching via Relay contacts of any Plant up to a 10Amp resistive load.

Switching of multiple stage electric heater banks, compressor racks or boilers.

Control of multiple analogue devices such as V.S.D's and Chillers with digital unit start output.

Auto remote sequence changeover.

To provide a Local LED indication of Output Status.

To provide isolation of the controller from the Harsh Plant Environment, protecting the Controller.

The inputs require only 1mA @ 0 to 10V DC to switch which allows controllers with limited output capability to operate correctly.

Features

Expands controllers output capacity.

Auto remote sequence change over.

Microprocessor based, power fail restart timer.

Differential and timers in all operation modes eliminates relay bounce.

Universal AC or DC Supply, LED status indication

Design for DIN rail mounting, Rising cage terminals

Flame retardant Polyamide DIN mounting.

Unique input verification for seamless output with no dead spots.



Specifications

Input Signal:	0 to 10V DC @ 1mA Max. Differential 150mV all modes. 0 to 20mA or 4 to 20mA available on request. A digital input to trigger the sequence change is available on request.
Digital Input:	Close for 5 seconds for sequence rotation.
Output Contacts:	10 Amp @ 230V AC Resistive.
Analogue Outputs:	4x 0 to 10V DC with a 20mA current limit.
Power Supply:	24V DC @ 160mA or 24V AC @ 4 VA (+/-15%) S.P.D.T.
LED Indication:	ON when relay energised.
Dip Switch:	For selection of 14 operating modes, see tables.
Factory Set Timers:	Relay on 10 sec after valid input. Total ramp time 90 sec Auto sequence rotation after 30 sec of input = <0.5V DC.
Electrical connections:	Rising cage terminals for 0,5 to 2,5mm ² cable.
Ambient Conditions:	-10 to 50°C 0 to 80% RH non-condensing.
Dimensions:	80 x 160 x 52mm.
Weight	216g
I.P. Rating:	IP00.
Mounting	Flame retardant green Polyamide 66 UL 94V0 moulding. To suit 35mm top hat din rail.

Stage Control

The module can be configured to control and sequence a 4 stage device (or 4 separate devices) or 2 x two stage devices.

Four stage control is sequential 1-2-3-4.

Two stage control can be either Lo-Hi or Lo-Lo, see MOD4QRM-A Installation Sheet for wiring details.

Relay 1 and Out 1 = Device 1 Stage 1 (low)
Relay 2 and Out 2 = Device 1 Stage 2 (high)
Relay 3 and Out 3 = Device 2 Stage 1 (low)
Relay 4 and Out 4 = Device 2 Stage 2 (high)

The output are sequenced as selected by the DIP SW settings as shown on page 3

Operating Modes

Operating modes can be Sequenced in Auto Mode or Sequenced by a Digital Input or fixed in Manual Mode .

Auto Sequence Operation Mode: In Auto mode set the analogue control input to 0 Volts for 30 Seconds minimum and re-apply to rotate the next stage in the sequence. The module will ramp down the analogue outputs and switch off the digital outputs under the control of the on board timers then ramp up in the new sequence to the required output. The digital input has no effect in auto mode.

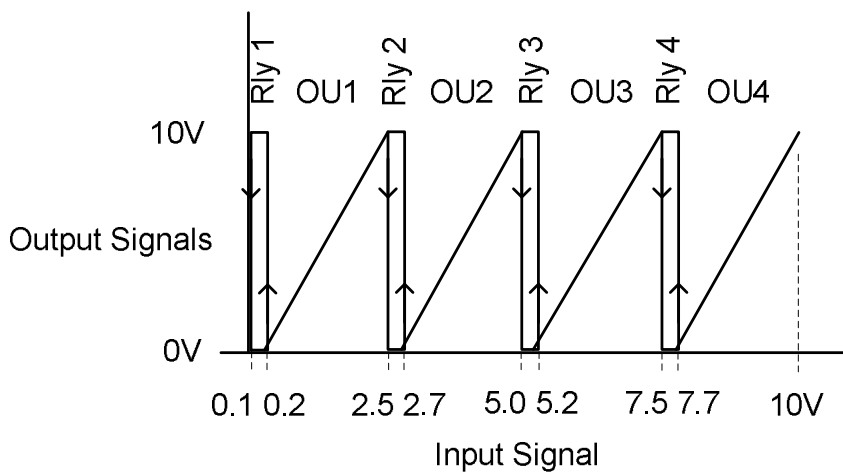
Digital Sequence Operation Mode: When using the Digital Input option close the Digital Input to ground for 5 Seconds and release to rotate the next stage in the sequence. The module will ramp down the analogue outputs and switch off the digital outputs under the control of the on board timers then ramp up in the new sequence to the required output. The analogue input has no effect in digital mode.

Fixed Manual Operation Mode: When in manual mode the sequence is fixed and the analogue and digital inputs have no effect on the sequencing.

DIP Switch Settings

SW1	SW2	SW3	SW4	MODE	SEQUENCE
OFF	OFF	OFF	OFF	Auto 4 Stage	1234-2341-3412 4123
OFF	OFF	OFF	ON	Auto Lo-Hi	1234-3412
OFF	OFF	ON	OFF	Auto Lo-Lo	1324-3142
OFF	OFF	ON	ON	Digital 4 Stage	1234-2341-3412 4123
OFF	ON	OFF	OFF	Digital Lo-Hi	1234-3412
OFF	ON	OFF	ON	Digital Lo-Lo	1324-3142
OFF	ON	ON	OFF	Manual 4 Stage (1)	1234
OFF	ON	ON	ON	Manual 4 Stage (2)	2341
ON	OFF	OFF	OFF	Manual 4 Stage (3)	3412
ON	OFF	OFF	ON	Manual 4 Stage (4)	4123
ON	OFF	ON	OFF	Manual Lo-Hi (1)	1234
ON	OFF	ON	ON	Manual Lo-Hi (2)	3412
ON	ON	OFF	OFF	Manual Lo-Lo (1)	1324
ON	ON	OFF	ON	Manual Lo-Lo (2)	3142
ON	ON	ON	OFF	Manual 4 Stage (1)	1234
ON	ON	ON	ON	Manual 4 Stage (1)	1234

Example: 4 stage with sequence (1) selected.



MOD4QRM-A Continued

4 Stage Control Sequence Table

Outputs as selected by sequence control

Input				Seq 1 Out	Seq 2 Out	Seq 3 Out	Seq 4 Out
0.0V-2.5V	2.5V-5.0V	5.0V-7.5V	7.5V-10V	1234 (1)	2341 (2)	3412 (3)	4123 (4)
ON 0-10V	ON 10V	ON 10V	ON 10V	Relay 1 Analogue 1	Relay 2 Analogue 2	Relay 3 Analogue 3	Relay 4 Analogue 4
OFF 0V	ON 0-10V	ON 10V	ON 10V	Relay 2 Analogue 2	Relay 3 Analogue 3	Relay 4 Analogue 4	Relay 1 Analogue 1
OFF 0V	OFF 0V	ON 0-10V	ON 10V	Relay 3 Analogue 3	Relay 4 Analogue 4	Relay 1 Analogue 1	Relay 2 Analogue 2
OFF 0V	OFF 0V	OFF 0V	ON 0-10V	Relay 4 Analogue 4	Relay 1 Analogue 1	Relay 2 Analogue 2	Relay 3 Analogue 3

2 x Two Stage Lo-Hi Control Sequence Table

Outputs as selected by sequence control

Input				Seq 1 Out	Seq 2 Out
0.0V-2.5V	2.5V-5.0V	5.0V-7.5V	7.5V-10V	Lo-Hi (1)	Lo-Hi (2)
ON 0-10V	ON 10V	ON 10V	ON 10V	Relay 1 Analogue 1	Relay 3 Analogue 3
OFF 0V	ON 0-10V	ON 10V	ON 10V	Relay 2 Analogue 2	Relay 4 Analogue 4
OFF 0V	OFF 0V	ON 0-10V	ON 10V	Relay 3 Analogue 3	Relay 1 Analogue 1
OFF 0V	OFF 0V	OFF 0V	ON 0-10V	Relay 4 Analogue 4	Relay 2 Analogue 2

2 x Two Stage Lo-Lo Control Sequence Table

Outputs as selected by sequence control

Input				Seq 1 Out	Seq 2 Out
0.0V-2.5V	2.5V-5.0V	5.0V-7.5V	7.5V-10V	Lo-Lo (1)	Lo-Lo (2)
ON 0-10V	ON 10V	ON 10V	ON 10V	Relay 1 Analogue 1	Relay 3 Analogue 3
OFF 0V	ON 0-10V	ON 10V	ON 10V	Relay 3 Analogue 3	Relay 1 Analogue 1
OFF 0V	OFF 0V	ON 0-10V	ON 10V	Relay 2 Analogue 2	Relay 4 Analogue 4
OFF 0V	OFF 0V	OFF 0V	ON 0-10V	Relay 4 Analogue 4	Relay 2 Analogue 2

See also the MOD 4 QRM-A Installation Sheet for wiring detail.

Watchtower Trading reserves the right to update this product, revise and update this publication including information hereof without obligation to notify any person of such updates, revisions or changes.

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