Binary and Six Stage Digital Multiplexer Output Module MRM 6

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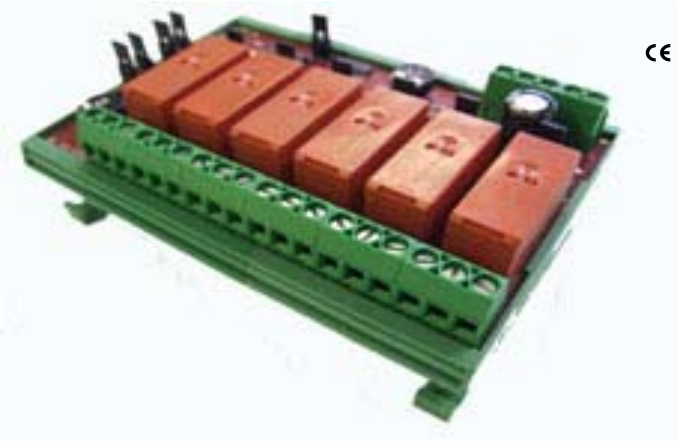

MRM 6

Technical Data

Input Signal	
Control	0-10Vdc/2-10Vdc (2mA typical)
Reverse	Volt Free Contact@impedance 10K
Output Contacts	6 x SPCO
Contact Rating	12A/250 Vac resistive
Current Consumption	150mA max@24Vdc 200mA max@24Vac
Mode of Operation	See Overleaf
Power Supply	24 Vac/dc (±10%)
Manual Override	On/Off/Auto link selectable
Terminals	Rising clamp for 0,5-2,5 mm^2 cable
LED Indication	ON when relay energised
Time Delay	0-60 seconds
Setting Time	0,1 or 1 second selectable
Dimensions	114 x 83 x 43 mm (approx.)
Ambient Range	0…+50°C
Weight	185 gms
Standard	This product meet the demand of CE-approval

Features

- **0-10Vdc or 2-10Vdc Input**
- **6 x SPCO relays**
- **On/Off/Auto Override**
- **Can be used with MUP 4A to provide 10 stages**
- **Adjustable Reaction Time**
- **Led Indication**
- **Reversed Output option**

Application

The MRM 6 converts a 0-10Vdc or 2-10Vdc analogue input into a 6 relay output.

The outputs can also be reversed.

The MRM 6 can be configured for a total of **9 modes** of operation:

- **Stage** - **Sequence** - **Power on staged**
- **Raise/lower** - **Circular sequence** - **Power on sequence**
- **Binary** - **Cascaded sequence** - **Cascaded stage**

In addition, the MRM 6 can be set via jumper links to work with a suitably configured MUP 4A to form a 10 stage unit, switching in 1 volt steps.

On/Off/Auto jumpers are provided as an aid for commissioning and LED's indicate relay status.

Reaction time is adjustable via a potentiometer.

The MRM 6 is designed to fit onto a TS35 section DIN rail.

Ordering Code

MRM 6 Six Stage Multiple Mode Relay Output Modul

Mode of Operation

- Stage
- Sequence
- Power on stage
- Power on Sequence
- Binary
- Circular
- Raise/lower
- Cascade Stage
- Cascade sequence

With the stage delay set to zero all modes will operate with step set internally to off.

Reverse Input

The outputs are reversed.

Only available in certain modes.

Step stages (On / Off)

When set to on this forces the output to change through all intermediate stages between the actual output and the required output.

If set to off the output will change directly to the required output.

Only available in certain modes

Input Range (0-10Volts or 2-10Volts)

Select an input voltage range of either 0 to 10 or 2 to10 volts.

The 2 to 10 volt range allows the relay module to be used with 4-20mA current source.

The current source is fed through a 500 ohm resistor to ground and the relay module input is connected across the resistor.

Stage Delay Timer (0 to 60 seconds)

This adjusts the minimum time between output stages switching on or off.

Once the time has elapsed the outputs will switch immediately the input changes.

With the stage delay set to zero all modes will jump intermediate output stages, step set to off.

Setting time (0,1 / 1 second)

This sets the time the input has to remain steady before being actioned.

It prevents the outputs changing to unwanted stages for slowly changing inputs.

Input Voltage Ranges

The following table shows the input voltage ranges for **non binary** operation

	0-10 V range			2-10 V range		
	Nominal	Min	Max	Nominal	Min	Max
NON BINARY	0.00	0.00	0.90	2..00	2.00	2.72
	2.00	1.10	2.40	3.60	2.88	3.92
	3.00	2.60	3.65	4.40	4.08	4.92
	4.50	3.85	5.15	5.60	5.08	6.12
	6.00	5.35	6.80	6.80	6.28	7.44
	7.80	7.00	8.80	8.24	7.60	9.04
	10.00	9.00	10.00	10.00	9.20	10.00

The following table shows the input voltage ranges for binary operation

BINARY

	0-10 V			2-10 V	
NOM	MIN	MAX	NOM	MIN	MAX
0.000	0.000	0.025	2.031	0.000	2.051
0.156	0.131	0.181	2.125	2.105	2.145
0.313	0.288	0.338	2.250	2.230	2.270
0.469	0.444	0.494	2.375	2.355	2.395
0.625	0.600	0.650	2.500	2.480	2.520
0.781	0.756	0.806	2.626	2.606	2.646
0.938	0.913	0.963	2.751	2.731	2.771
1.094	1.069	1.119	2.876	2.856	2.896
1.250	1.225	1.275	3.001	2.981	3.021
1.406	1.381	1.431	3.126	3.106	3.146
1.563	1.538	1.588	3.251	3.231	3.271
1.719	1.694	1.744	3.376	3.356	3.396
1.875	1.850	1.900	3.501	3.481	3.521
2.031	2.006	2.056	3.627	3.607	3.647
2.188	2.163	2.213	3.752	3.732	3.772
2.344	2.319	2.369	3.877	3.857	3.897
2.500	2.475	2.525	4.002	3.982	4.022
2.656	2.631	2.681	4.127	4.107	4.147
2.813	2.788	2.838	4.252	4.232	4.272
2.969	2.944	2.994	4.377	4.357	4.397
3.125	3.100	3.150	4.502	4.482	4.522
3.281	3.256	3.306	4.628	4.608	4.648
3.438	3.413	3.463	4.753	4.733	4.773
3.594	3.569	3.619	4.878	4.858	4.898
3.750	3.725	3.775	5.003	4.983	5.023
3.906	3.881	3.931	5.128	5.108	5.148
4.063	4.038	4.088	5.253	5.233	5.273
4.219	4.194	4.244	5.378	5.358	5.398
4.375	4.350	4.400	5.503	5.483	5.523
4.531	4.506	4.556	5.629	5.609	5.649
4.688	4.663	4.713	5.754	5.734	5.774
4.844	4.819	4.869	5.879	5.859	5.899
5.000	4.975	5.025	6.004	5.984	6.024
5.156	5.131	5.181	6.129	6.109	6.149
5.313	5.288	5.338	6.254	6.234	6.274
5.469	5.444	5.494	6.379	6.359	6.399
5.625	5.600	5.650	6.504	6.484	6.524
5.781	5.756	5.806	6.630	6.610	6.650
5.938	5.913	5.963	6.755	6.735	6.775
6.094	6.069	6.119	6.880	6.860	6.900
6.250	6.225	6.275	7.005	6.985	7.025
6.406	6.381	6.431	7.130	7.110	7.150
6.563	6.538	6.588	7.255	7.235	7.275
6.719	6.694	6.744	7.380	7.360	7.400
6.875	6.850	6.900	7.505	7.485	7.525
7.031	7.006	7.056	7.630	7.610	7.650
7.188	7.163	7.213	7.756	7.736	7.776
7.344	7.319	7.369	7.881	7.861	7.901
7.500	7.475	7.525	8.006	7.986	8.026
7.656	7.631	7.681	8.131	8.111	8.151
7.813	7.788	7.838	8.256	8.236	8.276
7.969	7.944	7.994	8.381	8.361	8.401
8.125	8.100	8.150	8.506	8.486	8.526
8.281	8.256	8.306	8.631	8.611	8.651
8.438	8.413	8.463	8.757	8.737	8.777
8.594	8.569	8.619	8.882	8.862	8.902
8.750	8.725	8.775	9.007	8.987	9.027
8.906	8.881	8.931	9.132	9.112	9.152
9.063	9.038	9.088	9.257	9.237	9.277
9.219	9.194	9.244	9.382	9.362	9.402
9.375	9.350	9.400	9.507	9.487	9.527
9.531	9.506	9.556	9.632	9.612	9.652
9.688	9.663	9.713	9.758	9.738	9.778
9.844	9.819	9.869	9.883	9.863	10.000

Description of Modes

Stage Mode

Jumper Selection: MODE2 = C, MODE1 = C

0-10 V	2-10 V	1	2	3	4	5	6
0.00	2.00	-	-	-	-	-	-
2.00	3.60	X	-	-	-	-	-
3.00	4.40	X	X	-	-	-	-
4.50	5.60	X	X	X	-	-	-
6.00	6.80	X	X	X	X	-	-
7.80	8.24	X	X	X	X	X	-
10.00	10.00	X	X	X	X	X	X

Sequence Mode

Jumper Selection: MODE2 = B, MODE1 = C
Single output switches on from 1 to 6 as input voltage increases

0-10 V	2-10 V	1	2	3	4	5	6
0.00	2.00	-	-	-	-	-	-
2.00	3.60	X	-	-	-	-	-
3.00	4.40	-	X	-	-	-	-
4.50	5.60	-	-	X	-	-	-
6.00	6.80	-	-	-	X	-	-
7.80	8.24	-	-	-	-	X	-
10.00	10.00	-	-	-	-	-	X

Sequence Mode

Jumper Selection: MODE2 = B, MODE1 = A
All outputs are staged on at power up.
Outputs accumulate from 1 to 6 when power applied.
Delay sets time between stages switching.

Power on Sequence (Step On)(Not reversible)

Jumper Selection: MODE2 = C, MODE1 = B
All outputs are sequenced on at power up.
Single output switches on from 1 to 6 when power applied.
Delay sets time between stages switching.

Raise/Lower

Jumper Selection: MODE2 = A, MODE1 = B
With an input of 5 volts all outputs are off.
As the input voltage rises above 5 volts relay 3 then 4 switches on.
At power on all relays are off.

0-10 V	2-10 V	1	2	3	4	5	6	
0.00	2.00	X	X	X	-	-	-	0.00
2.00	3.60	-	X	X	-	-	-	2.00
3.00	4.40	-	-	X	-	-	-	3.00
4.50	5.60	-	-	-	-	-	-	4.50
6.00	6.80	-	-	-	X	-	-	6.00
7.80	8.24	-	-	-	X	X	-	7.80
10.00	10.00	-	-	-	X	X	X	10.00

Binary (Step off))Not reversible)

Jumper Selection: MODE2 = B, MODE1 = B

Outputs switch in binary sequence

0-10V	2-10V	1	2	3	4	5	6
0.000	2.031	-	-	-	-	-	-
0.156	2.125	X	-	-	-	-	-
0.313	2.250	-	X	-	-	-	-
0.469	2.375	X	X	-	-	-	-
0.625	2.500	-	-	X	-	-	-
0.781	2.626	X	-	X	-	-	-
0.938	2.751	-	X	X	-	-	-
1.094	2.876	X	X	X	-	-	-
1.250	3.001	-	-	-	X	-	-
1.406	3.126	X	-	-	X	-	-
1.563	3.251	-	X	-	X	-	-
1.719	3.376	X	X	-	X	-	-
1.875	3.501	-	-	X	X	-	-
2.031	3.627	X	-	X	X	-	-
2.188	3.752	-	X	X	X	-	-
2.344	3.877	X	X	X	X	-	-
2.500	4.002	-	-	-	-	X	-
2.656	4.127	X	-	-	-	X	-
2.813	4.252	-	X	-	-	X	-
2.969	4.377	X	X	-	-	X	-
3.125	4.502	-	-	X	-	X	-
3.281	4.628	X	-	X	-	X	-
3.438	4.753	-	X	X	-	X	-
3.594	4.878	X	X	X	-	X	-
3.750	5.003	-	-	-	X	X	-
3.906	5.128	X	-	-	X	X	-
4.063	5.253	-	X	-	X	X	-
4.219	5.378	X	X	-	X	X	-
4.375	5.503	-	-	X	X	X	-
4.531	5.629	X	-	X	X	X	-
4.688	5.754	-	X	X	X	X	-
4.844	5.879	X	X	X	X	X	-
5.000	6.004	-	-	-	-	-	X
5.156	6.129	X	-	-	-	-	X
5.313	6.254	-	X	-	-	-	X
5.469	6.379	X	X	-	-	-	X
5.625	6.504	-	-	X	-	-	X
5.781	6.630	X	-	X	-	-	X
5.938	6.755	-	X	X	-	-	X
6.094	6.880	X	X	X	-	-	X
6.250	7.005	-	-	-	X	-	X
6.406	7.130	X	-	-	X	-	X
6.563	7.255	-	X	-	X	-	X
6.719	7.380	X	X	-	X	-	X
6.875	7.505	-	-	X	X	-	X
7.031	7.630	X	-	X	X	-	X
7.188	7.756	-	X	X	X	-	X
7.344	7.881	X	X	X	X	-	X
7.500	8.006	-	-	-	-	X	X
7.656	8.131	X	-	-	-	X	X
7.813	8.256	-	X	-	-	X	X
7.969	8.381	X	X	-	-	X	X
8.125	8.506	-	-	X	-	X	X
8.281	8.631	X	-	X	-	X	X
8.438	8.757	-	X	X	-	X	X
8.594	8.882	X	X	X	-	X	X
8.750	9.007	-	-	-	X	X	X
8.906	9.132	X	-	-	X	X	X
9.063	9.257	-	X	-	X	X	X
9.219	9.382	X	X	-	X	X	X
9.375	9.507	-	-	X	X	X	X
9.531	9.632	X	-	X	X	X	X
9.688	9.758	-	X	X	X	X	X
9.844	9.883	X	X	X	X	X	X

Circular (Step on))Not reversible)

Jumper Selection: MODE2 = C, MODE1 = A

The number of outputs on equals the input demand, within switching time constraints.
Using the Stage mode table you can determine the number of stages on for a given input voltage.

The stages are switched on and off in a circular order.
The first output on will be the first output off.

The next output on is the one following last output on.

The table below shows the output tracking a changing input.

0-10 V	2-10 V	Demand	1	2	3	4	5	6
0.00	2.00	0	-	-	-	-	-	-
2.00	3.60	1	X	-	-	-	-	-
3.00	4.40	2	X	X	-	-	-	-
4.50	5.60	3	X	X	X	-	-	-
3.00	4.40	2	-	X	X	-	-	-
4.50	5.60	3	-	X	X	X	-	-
6.00	6.80	4	-	X	X	X	X	-
4.50	5.60	3	-	-	X	X	X	-
3.00	4.40	2	-	-	-	X	X	-
2.00	3.60	1	-	-	-	-	X	-
0.00	2.00	0	-	-	-	-	-	-
2.00	3.60	1	-	-	-	-	-	X
3.00	4.40	2	X	-	-	-	-	X
4.50	5.60	3	X	X	-	-	-	X
3.00	4.40	2	X	X	-	-	-	-
2.00	3.60	1	-	X	-	-	-	-
0.00	2.00	0	-	-	-	-	-	-
2.00	3.60	1	-	-	X	-	-	-
0.00	2.00	0	-	-	-	-	-	-

Cascaded stage (Step off))Not reversible)

Jumper Selection: MODE2 = A, MODE1 = C

Allows an MUP 4A and an MRM 6 to be combined to function as an MRM 10 in stage mode.

The MUP 4A switches at 1, 2,4 and 4 volts with the MRM 6 switching at 5, 6, 7, 8, 9 and 10 volts as shown below

0-10 V	2-10 V	1	2	3	4	5	6
4.00 and below	5.20 and below	-	-	-	-	-	-
5.00	6.00	X	-	-	-	-	-
6.00	6.80	X	X	-	-	-	-
7.00	7.60	X	X	X	-	-	-
8.00	8.40	X	X	X	X	-	-
9.00	9.20	X	X	X	X	X	-
10.00	10.00	X	X	X	X	X	X

Cascaded sequence (Step off))Not reversible)

Jumper Selection: MODE2 = A, MODE1 = CA

Allows an MUP 4A and an MRM 6 to be combined to function as an MRM 10 in sequence mode.

The MUP 4A switches at 1, 2,4 and 4 volts with the MRM 6 switching at 5, 6, 7, 8, 9 and 10 volts as shown below

Input(V)	2-10 V	1	2	3	4	5	6
4.00 and below	5.20 and below	-	-	-	-	-	-
5.00	6.00	X	-	-	-	-	-
6.00	6.80	-	X	-	-	-	-
7.00	7.60	-	-	X	-	-	-
8.00	8.40	-	-	-	X	-	-
9.00	9.20	-	-	-	-	X	-
10.00	10.00	-	-	-	-	-	X

Connection

The diagram below shows the terminal designations for the MRM 6