INSTRUCTION MANUAL

PROGRAMMED RAMP GENERATOR
(front configurable)

MODEL **MXMS**

BEFORE USE ....

Thank you for choosing us. Before use, please check contents of the package you received as outlined below.
If you have any problems or questions with the product, please contact our sales office or representatives.

■ PACKAGE INCLUDES:

Signal conditioner (body + base socket).....(1)

■ MODEL NO.

Confirm Model No. marking on the product to be exactly what you ordered.

■ INSTRUCTION MANUAL

This manual describes necessary points of caution when you use this product, including installation, connection and basic maintenance procedures.

POINTS OF CAUTION

■ CONFORMITY WITH EU DIRECTIVES

- This equipment is suitable for Pollution Degree 2 and Installation Category II (transient voltage 2500V). Reinforced insulation (signal input or output to power input: 300V) and basic insulation (signal input to output: 300V) are maintained. Prior to installation, check that the insulation class of this unit satisfies the system requirements.
- Altitude up to 2000 meters.
- The equipment must be mounted inside a panel.
- Insert a noise filter for the power source connected to the unit. TDK-Lambda Noise Filter Model RSAN-2006 or equivalent is recommended.
- The equipment must be installed such that appropriate clearance and creepage distances are maintained to conform to CE requirements. Failure to observe these requirements may invalidate the CE conformance.
- The actual installation environments such as panel configurations, connected devices, connected wires, may affect the protection level of this unit when it is integrated in a panel system. The user may have to review the CE requirements in regard to the whole system and employ additional protective measures to ensure the CE conformity.
- Install lightning surge protectors for those wires connected to remote locations.

■ POWER INPUT RATING & OPERATIONAL RANGE

- Locate the power input rating marked on the product and confirm its operational range as indicated below:
  100 – 240V AC rating: 85 – 264V, 47 – 66 Hz,
  approx. 3.8VA at 100 V AC
  approx. 5.2VA at 200 V AC
  approx. 6.1VA at 264V AC
  24V DC rating: 24V ±10%, approx. 3.5W
  110V DC rating: 85 – 150V, approx. 3.5W

■ GENERAL PRECAUTIONS

- Before you remove the unit from its base socket or mount it, turn off the power supply and input signal for safety.

■ ENVIRONMENT

- Indoor use.
- When heavy dust or metal particles are present in the air, install the unit inside proper housing with sufficient ventilation.
- Do not install the unit where it is subjected to continuous vibration. Do not subject the unit to physical impact.
- Environmental temperature must be within -5 to +55°C (23 to 131°F) with relative humidity within 30 to 90% RH in order to ensure adequate life span and operation.

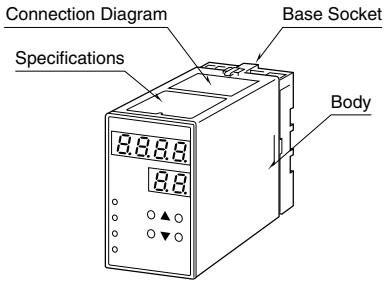
■ WIRING

- Do not install cables close to noise sources (relay drive cable, high frequency line, etc.).
- Do not bind these cables together with those in which noises are present. Do not install them in the same duct.

■ AND ....

- The unit is designed to function as soon as power is supplied, however, a warm up for 10 minutes is required for satisfying complete performance described in the data sheet.

COMPONENT IDENTIFICATION

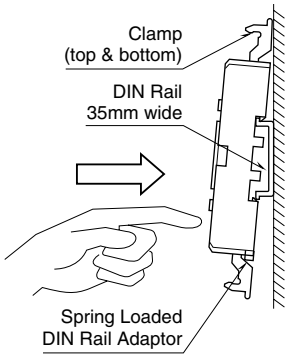


INSTALLATION

Detach the yellow clamps located at the top and bottom of the unit for separate the body from the base socket.

■ DIN RAIL MOUNTING

Set the base socket so that its DIN rail adaptor is at the bottom. Position the upper hook at the rear side of base socket on the DIN rail and push in the lower. When removing the socket, push down the DIN rail adaptor utilizing a minus screwdriver and pull.



Shape and size of the base socket are slightly different with various socket types.

■ WALL MOUNTING

Refer to "EXTERNAL DIMENSIONS."

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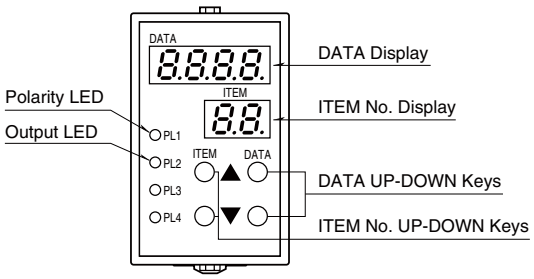
FRONT VIEW & PROGRAMMING

■ PROGRAMMING PROCEDURE

1) Press ITEM UP or DOWN key until ITEM display indicates “01”.
2) Press DATA UP or DOWN key and choose “2” on DATA display.
   1: Data indication only.
   2: All parameters are modifiable.
3) Press ITEM UP or DOWN key until ITEM display shows the ITEM No. you need to change.
4) Press DATA UP or DOWN key and choose a DATA No. or value you need on DATA display.
5) Repeat above 3 and 4. (Entered data is stored 1 sec. after the operation has been complete.)
6) Press ITEM UP or DOWN key until ITEM display indicates “01”.
7) Press DATA UP or DOWN key and choose “1” on the display.
8) Press ITEM UP or DOWN key until ITEM display indicates “P”. DATA display shows process input. You can now check data setting by choosing ITEM No.

Note: DO NOT press UP and DOWN keys simultaneously.



ITEM	MDF. CODE	DATA	CONTENTS	DEFAULT
P	N/A	-9999 – 9999	Output display in engineering unit (as set in ITEM 12/13)	---
01		1, 2, 3	Modification code 1: Data indication only. 2: All parameters are modifiable. 3: Only ITEM 20 is modifiable.	1
02	N/A	0 – 99	Status indication (“0” is normally indicated.)	---
03	N/A	0, 1, 2	Output range code 0: V1 (-1 – +1V) 1: V2 (-10 – +10V) 2: Z1 (0 – 20mA)	V1: 0 V2: 1 Z1: 2
04/L	2	-15.0 – 115.0	Output indicated in % with ITEM 01 DATA 1 (of the range set in ITEM 16/17) Loop test output with ITEM 01 DATA 2 (‘L’ is indicated as ITEM No.) (Use DATA UP/DOWN key to set the output signal.)	---
05	2	0 – 7	Output type 0: Constant value 1: Square wave 2: Triangle wave (Climbing ramp) 3: Triangle wave (Both ramps are symmetric.) 4: Triangle wave (Descending ramp) 5: Sine wave 6: Programmed ramps (square output) 7: Programmed ramps (segment output)	0
06	2	P0 – PF	Constant value selection (Valid only when ITEM 05 is set to “0.”) Set constant values in % for ITEM P0 through PF, and choose one to use.	P0: (0.0%)
07	2	0 – 60	Output cycle in seconds	0
08	2	1 – 9999	Output cycle in minutes	10
09	2	0, 1, 2	Output enable command 0: Not used 1: Output at Open, Interrupt at Closed 2: Output at Closed, Interrupt at Open	0
10	2	0, 1	Action at an output interruption 0: Reset to 0% 1: Hold output at the interruption	0
11	2	0, 1 – 60	Stand-by time between output cycles 0: No interruption between cycles 1 – 60: Stand-by time (minutes)	0
12	2	-9999 – 9999	Display range scaling 0% *1	0.0
13	2	-9999 – 9999	Display range scaling 100% *1	100.0
14	2	0, 1, 2, 3	Decimal point position 0: _ _ _ _ 1: _ _ _ . _ 2: _ _ . _ _ 3: _ . _ _ _	1
15	2	0, 1 – 60	Power-saving mode 0: Continuous display 1 – 60: Time before display turned off (minutes)	10

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ITEM	MDF. CODE	DATA	CONTENTS		DEFAULT
16	2	-1.00 – 1.00	Output code V1	0% output voltage (V) *2	-1.00
17	2	-1.00 – 1.00		100% output voltage (V) *2	1.00
16	2	-10.0 – 10.0	Output code V2	0% output voltage (V) *2	-10.0
17	2	-10.0 – 10.0		100% output voltage (V) *2	10.0
16	2	0.0 – 20.0	Output code Z1	0% output current (mA) *2	4.0
17	2	0.0 – 20.00		100% output current (mA) *2	20.0
18	2	-900 – 900	Zero adjustment *3		0
19	2	-900 – 900	Span adjustment *3		0
PP	2	1 – 16	Number of programmed output (segment) points		1
P0	2	0.0 – 100.0	Point P0 output setting (%)		0.0
P1	2	0.0 – 100.0	Point P1 output setting (%)		0.0
P2	2	0.0 – 100.0	Point P2 output setting (%)		0.0
P3	2	0.0 – 100.0	Point P3 output setting (%)		0.0
P4	2	0.0 – 100.0	Point P4 output setting (%)		0.0
P5	2	0.0 – 100.0	Point P5 output setting (%)		0.0
P6	2	0.0 – 100.0	Point P6 output setting (%)		0.0
P7	2	0.0 – 100.0	Point P7 output setting (%)		0.0
P8	2	0.0 – 100.0	Point P8 output setting (%)		0.0
P9	2	0.0 – 100.0	Point P9 output setting (%)		0.0
PA	2	0.0 – 100.0	Point PA output setting (%)		0.0
PB	2	0.0 – 100.0	Point PB output setting (%)		0.0
PC	2	0.0 – 100.0	Point PC output setting (%)		0.0
PD	2	0.0 – 100.0	Point PD output setting (%)		0.0
PE	2	0.0 – 100.0	Point PE output setting (%)		0.0
PF	2	0.0 – 100.0	Point PF output setting (%)		0.0
20	3	0, 1	Reset all settings *4		0
21	N/A	---	ROM version		---

*1. Of the range set in ITEM 16/17. ITEM 12 < ITEM 13.
*2. ITEM 16 < ITEM 17.
*3. Fine adjustment of ±2% (V1: ±0.04V, V2: ±0.4V, Z1: ±0.4mA) is available respectively for zero and span.
*4. Press DATA UP key and choose DATA 1. Double-click DATA DOWN key. The display shows DATA 0 after the initialization is complete.

■ SELECTING OUTPUT RANGE

[E.G.] -5.0 to 5.0V DC

1) Turn the unit into Program Mode.
2) 0% Output Voltage
   Choose ITEM 16 – DATA -5.0.
3) 100% Output Voltage
   Choose ITEM 17 – DATA 5.0.
4) Monitor Mode
   Set ITEM 01 – DATA 1 to turn the unit into Monitor Mode.
5) MV Indication
   Press ITEM UP or DOWN key until ITEM display indicates “P”.

■ DISPLAY RANGE SCALING

[E.G.] MV display range -10.0 to 10.0 modified to show -6500 to 350

1) Turn the unit into Program Mode.
2) Decimal Point Position
   Choose ITEM 14 – DATA 0.
3) 0% Scaling Value
   Choose ITEM 12 – DATA -6500.
   (Negative [–] range is identified with the PL1 turned on.)
4) 100% Scaling Value
   Choose ITEM 13 – DATA 350.
5) Turn the unit into Monitor Mode.
6) Set to ITEM P.

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■ OUTPUT WAVEFORMS

1) Turn the unit into Program Mode.
After the following procedure, turn the unit into Monitor Mode, then set to ITEM P.

• Constant Value

2) Specify a constant value.
Choose ITEM P0 – DATA X. (X = %)
Max. 16 settings can be programmed in ITEM P0 through PF.

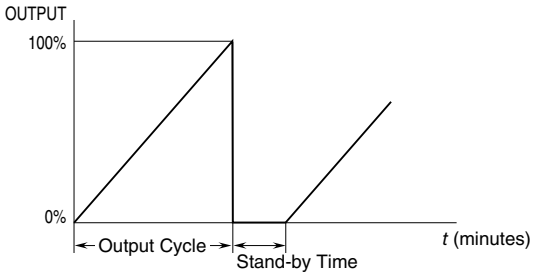
3) Output type
Choose ITEM 05 – DATA 0. (0 = Constant value)

4) Select a constant value setting
Choose ITEM 06 – DATA P0.
Max. 16 setting can be selected by ITEM P0 through PF.

• Preset Waveforms

2) Choose a preset waveform.
Choose ITEM 05 – DATA X. (X = 1 through 5)
Whenever a new waveform is selected, the program starts at 0%.
1 : Square wave
2 : Triangle wave (Climbing ramp. 0% to 100%)
3 : Triangle wave
(Both ramps are symmetric. 0% to 100% to 0%)
4 : Triangle wave (Descending ramp. 100% to 0%)
5 : Sine wave

[E.G.] Triangle wave (Climbing ramp)



• Programmed Ramps

2) Specify the number of output points you want to use.
Choose ITEM PP – DATA X. (X = 1 through 16)

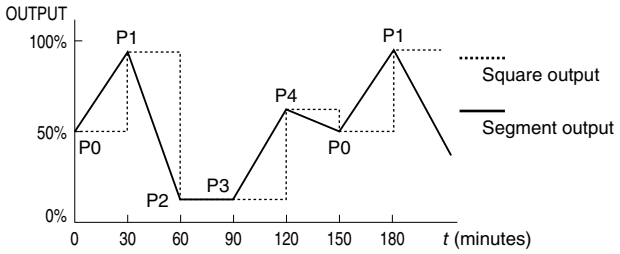
3) Specify % for each output point.
Choose ITEM P0 – DATA X. (X = %)
Max. 16 settings can be programmed in ITEM P0 through PF.

4) Output type
Choose ITEM 05 – DATA X. (X = 6, 7)
6 : Square output
7 : Segment output

[E.G.] Number of output points = 5
P0 = 50%, P1 = 100%, P2 = 10%, P3 = 10%, P4 = 70%
Output cycle = 150 minutes

Note: Intervals between two points

$$= \frac{\text{Output cycle}}{\text{Number of output points}} = 30 \text{ minutes}$$



■ OUTPUT CYCLE

1) Turn the unit into Program Mode.

2) Choose "Minutes" and "Seconds" in ITEM 08 and 07 respectively.
Stand-by time between cycles is defined in ITEM 11.

[E.G.] 15 minutes, 30 seconds
Choose ITEM 07 – DATA 30.
Choose ITEM 08 – DATA 15.

3) Turn the unit into Monitor Mode.

4) Set to ITEM P.

■ OUTPUT ENABLE COMMAND

Choose ITEM 09 – DATA X (X = 0, 1 or 2)
0 : Not used
1 : Output at Open, Interrupt at Closed
2 : Output at Closed, Interrupt at Open
Default setting is 0 : Not used.
Action at an interruption (0% or Hold) is defined in ITEM 10.

■ RUN OUTPUT (open collector)

• The RUN output usable for an external sequencing control turns ON while the PL2 is turned ON. See "CONNECTION DIAGRAM."

■ RESET ALL SETTINGS

Returning the unit into the default settings.

1) Turn the unit into Reset Mode.
Set ITEM 01 – DATA 3 to turn the unit into Reset Mode.

2) Call up the Reset menu.
Choose ITEM 20 – DATA 1. (Press DATA UP key.)

3) Resetting Enable
Double-click DATA DOWN key. DATA 0 is displayed after the initialization is complete.

4) Turn the unit into Monitor Mode.

If necessary, go to Display Range Scaling, Moving Average and other adjustments.
Set the unit to Monitor Mode other than for programming.

■ STATUS INDICATION

The unit's status can be identified with ITEM 02.

REF.	ERROR
0	Normal
12	Display range scaling: 0% Setting > 100% Setting, or Overrange: See ITEM 12 / 13.
16	Output range setting: 0% Setting > 100% Setting See ITEM 16 / 17.
99	Memory error: Initialize all the settings of the unit by operating ITEM 20 and program the unit again.

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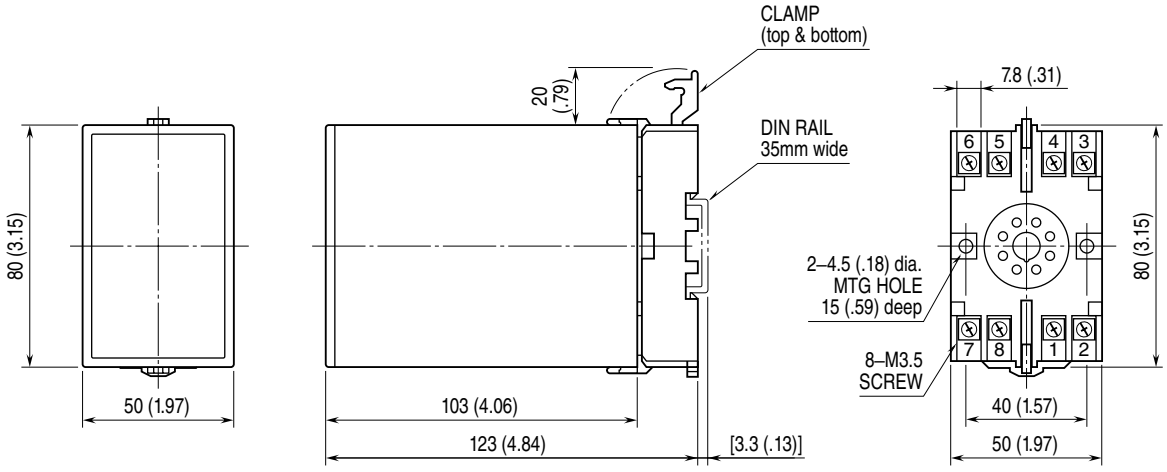
TERMINAL CONNECTIONS

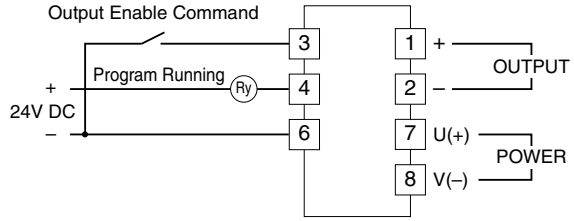
Connect the unit as in the diagram below or refer to the connection diagram on the top of the unit.

■ EXTERNAL DIMENSIONS unit: mm (inch)



• When mounting, no extra space is needed between units.

■ CONNECTION DIAGRAM



CHECKING

1) Terminal wiring: Check that all cables are correctly connected according to the connection diagram.
2) Power input voltage: Check voltage across the terminal 7 – 8 with a multimeter.
3) Input: Check the input signal.
4) Output: Check that the load resistance meets the described specifications.

MAINTENANCE

Regular calibration procedure is explained below:

■ CALIBRATION

Warm up the unit for at least 10 minutes.
Choose the output type "0" (Constant Output) at ITEM 05. Set the constant outputs at 0%, 25%, 50%, 75% and 100% for ITEM P0 through PF. Check that the output signal for the respective point remains within accuracy described in the data sheet. When the output is out of tolerance, recalibrate the unit according to the "PROGRAMMING" explained earlier.

LIGHTNING SURGE PROTECTION

We offer a series of lightning surge protector for protection against induced lightning surges. Please contact us to choose appropriate models.

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