

# INSTRUCTION MANUAL

## ANALOG TELEMETERING MODULE

model

**TMA**

Thank you for choosing M-System. Before use, check specifications on the product label.

If you have any problems or questions with the product, please contact M-System's Sales Office or representatives.

### General Description

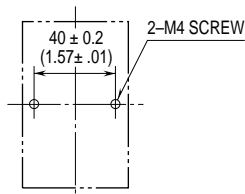
The Model TMA transmits 1-point analog signal (water level, pressure, flow or ingredients analysis) through leased circuit of 50 b/s.

Both transmitter (TMA-S) and receiver (TMA-R) modules are approved of Technical Requirements Compliance Approval by Japan Approvals Institute for Telecommunications Equipment.

- Approval No. M90-N239-0 (TMA-S), M90-N240-0 (TMA-R)
- No interference by inductive noise on telecommunication line

### Installation [Scale: mm(inch)]

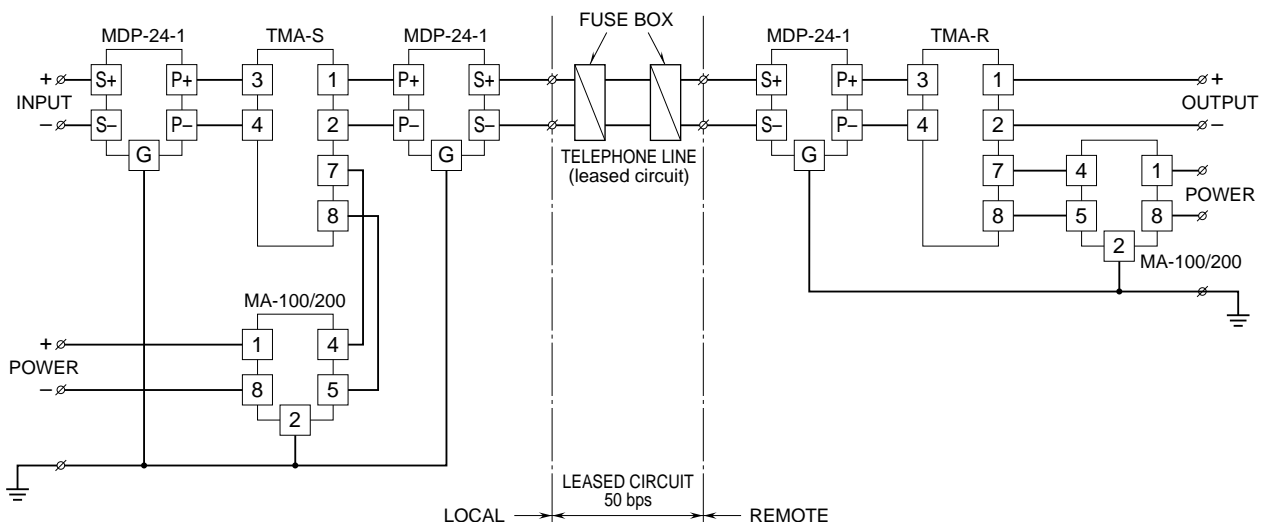
- Operating temperature: -5 to +60°C (23 to 140°F)
  - Operating humidity: 30 to 90% RH (non-condensing)
- Keep away from water, corrosive gas, dust and vibration. Wall or DIN rail mounting available. Use DIN rail of 35 mm width.



When mounting, no extra space is needed between units.

### Connection Diagram

Maintenance personnel must be qualified. Only qualified person or non-qualified person under the supervision of such person can execute connection to the leased circuit.



### Adjustments

This module is factory calibrated within  $\pm 0.1\%$  of reference input level. ZERO and SPAN are adjustable to  $\pm 5\%$ . Calibration procedure is as follows:

- ZERO: With minimum (0%) input, adjust output to 0%.
- SPAN: With full-scale (100%) input, adjust output to 100%.
- Check ZERO adjustment again with the minimum input.
- When ZERO value is changed, repeat the procedure A) to C).

### Troubleshooting

When output is irregular, check the following points:

- Terminal wiring
- Power wiring and polarity
- Input to TMA-S: Check voltage across the terminal 3 (+) – 4 (-) to show a proper value within 1 to 5V DC.
- Output of TMA-R: This module requires at the minimum of 750Ω load. Check that total connected load exceeds the value.
- Cable resistance: This module allows at the maximum of 3kΩ resistance. Check that connected leased circuit does not exceed the value including return.

### Lightning Protection

In order to prevent lightning surges entering through power supply line and signal line, proper lightning protection will be recommended.

### M-SYSTEM WARRANTY

M-System warrants such new M-System product which it manufactures to be free from defects in materials and workmanship during the 36-month period following the date that such product was originally purchased if such product has been used under normal operating conditions and properly maintained, M-System's sole liability, and purchaser's exclusive remedies, under this warranty are, at M-System's option, the repair, replacement or refund of the purchase price of any M-System product which is defective under the terms of this warranty. To submit a claim under this warranty, the purchaser must return, at its expense, the defective M-System product to the below address together with a copy of its original sales invoice.

THIS IS THE ONLY WARRANTY APPLICABLE TO M-SYSTEM PRODUCT AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. M-SYSTEM SHALL HAVE NO LIABILITY FOR CONSEQUENTIAL, INCIDENTAL OR SPECIAL DAMAGES OF ANY KIND WHATSOEVER.

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