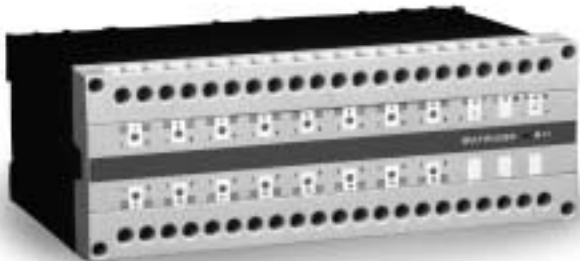




User's Guide



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**DRA-M-11
MULTIPLEXER UNIT FOR DRA-MDM-11
MUX/DEMUX SYSTEM**



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1. GENERAL DESCRIPTION

The DRA-M-11 is the multiplexer unit of DRA-MDM-11, Mux/deMux system. The DRA-M-11 multiplexer receives 16, 4-20mA current loops. The transmitter/transducers currents are input via "I" terminals. Each input is protected by a 63mA fuse.

The multiplexer inputs are scanned in one of three, user selected, rates and transmitted via a pair of leads to the DRA-DM-11 de-multiplexer unit. The scan rates are selected according to the distance between the DRA-M-11 and the DRA-DM-11 units.

The unit provides 16, current limited ($\sim 40\text{mA}$), voltage supply ("V") outputs. These outputs are derived from the mux's power supply input and are used to feed two-wire transmitters. The current limitation avoids fuse blowing in cases of a short-circuit of the transmitters' leads.

WARNING: Never connect a voltage source as an input to the multiplexer. Its internal low dynamic impedance will cause immediate fuse blowing.

2. MOUNTING INSTRUCTIONS

The DRA-M-11 is designed for standard DIN rail mounting.

Place the unit on the upper part of the mounting rail with the fastening tab facing down. Using a suitable flat screwdriver loosen the tab slightly and attach the unit to the rail. Once the tab is loosened, ensure that the unit is fastened securely in place.

3. REPLACING FUSES

To replace a blown fuse, disassemble the unit as follows:

- a. Take off both terminal strips by removing the four screws at the edges.

Note: This does not require disconnecting the cables connected to the strips.

- b. Remove the front panel using a suitable flat screwdriver. Press down gently on the plastic spring-loaded tabs located in the slots on either side of the unit.
- c. Disconnect the flat connectors which connect the front panel printed circuit.
- d. Replace the blown fuse.

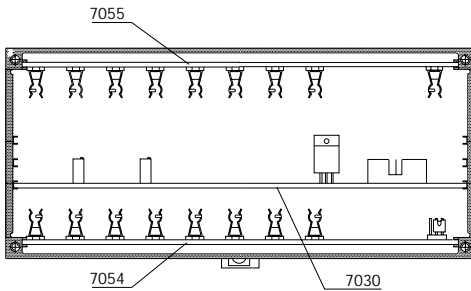


Figure 1.

4. ASSEMBLY

The DRA-M-11 unit includes three printed circuit boards designated as P.N 7055, P.N 7054 and P.N 7030. The printed circuit boards should occupy the slots in the enclosure according to fig 1.

Connect the flat cables between the printed circuit boards and the front panel. The front panel must be inserted into the grooves on both sides of the case while pressing down until a distinct "click" is heard. Assembly is completed by laying the terminal strips in place.

WARNING: Never install a channel fuse rated more than 100mA, and main fuse rated more than 800mA.

Note: The terminal strips are polarized and must not be placed backwards.

5. POWER SUPPLY

The DRA-M-11 is powered by a regulated power supply at a range of 24-36Vdc. The minimal voltage required for activating the DRA-M-11 depends on the minimal voltage required by the transmitters and on the resistance of the leads connecting the mux and de-mux. The above should comply with the equation in para. 5.1. The total load presented by the mux/de-mux system is 400Ω at an 20 mA input. For most practical applications where the minimum required voltage of the transmitter is 12V and the leads' resistance is less than 200Ω (two-ways), a 24V power supply is suitable.

5.1 MINIMUM SUPPLY VOLTAGE

The minimum supply voltage required to operate the multiplexer and the transmitters fed by it can be calculated using the following equation:

$$V_{min} = V_t + 0.02 \cdot (R_l + 400)$$

Where:

- V_{min} - the minimum required supply voltage
- V_t - The minimum required voltage specified for the connected transmitter (at load=0)
- R_l - Total lead resistance

Example:

The minimum operational voltage of a given transmitter is 15V.
 The total lead resistance 150Ω .

Solving the above voltage:
 $V_{min} = 26V_{dc}$

6. CONNECTING THE TRANSMITTERS TO THE MULTIPLEXER

6.1 TWO-WIRE TRANSMITTER

A Two-Wire transmitter is connected so that its positive terminal is connected to the "V" terminal, and its negative terminal is connected to the "I" terminal. (see fig 2)

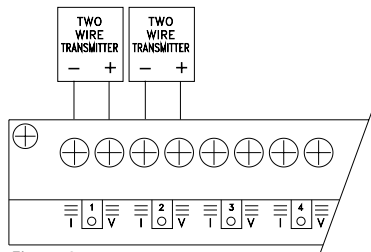


Figure 2.

6.2 THREE-WIRE TRANSMITTER

A Three-Wire transmitter is connected so that its positive terminal "+V" is connected to the multiplexer's "V" terminal, its negative terminal "-V" is connected to the multiplexer "COM" terminal and the current output terminal "Io" is connected to the DRA-M-11 "I" terminal (see fig 3).

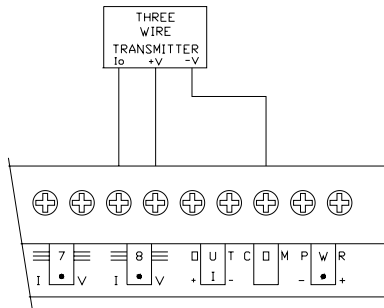


Figure 3.

6.3 FOUR-WIRE TRANSMITTER

A Four-Wire transmitter is connected so that its positive terminal is connected to the "I" terminal, and its negative terminal is connected to the "COM" terminal. (see fig 4).

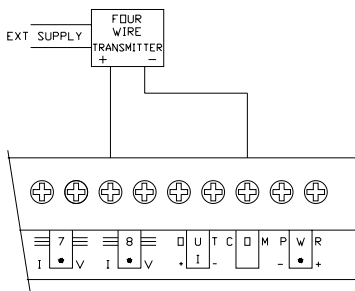


Figure 4.

7. DISTANCE SETTING

The DRA-M-11 scan rate depends on the distance between the multiplexer and the de-multiplexer. There are three jumper switches marked as 500, 1Km and 2Km on the printed circuit board 7054; set the jumper to the proper distance selector.

8. CONNECTING THE DRA-M-11 TO DRA-DM-11

The DRA-M-11 is connected to the DRA-DM-11 by a twisted pair of leads. In an hostile environment, a shielded cable is recommended.

To avoid ground-loop problems it is recommended to use a floating power supply and to ground, if necessary, the negative terminal of the DRA-DM-11 power supply.

Connection Diagram

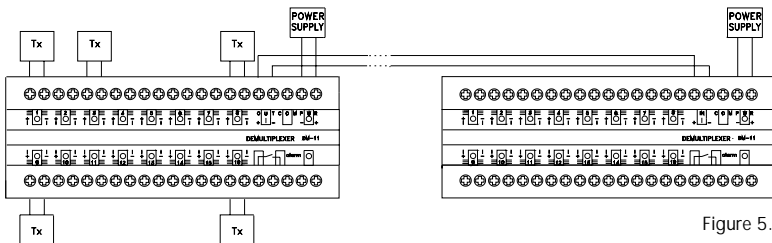


Figure 5.

9. SPECIFICATIONS

INPUTS	
ANALOG INPUTS	16, 0/4-20mA Current loop channels
Max Input Current	25mA
Reverse Polarity Protection	Yes
LOOP LOAD (Composed by DRA-MDM-11)	400 Ω +leads' resistance
OUTPUT	
Scan rates:	Multiplexed Current Loop
500m:	Aprox. 1000 ch/sec.
1Km:	Aprox. 500 ch/sec.
2Km:	Aprox. 250 ch/sec.
CURRENT LIMITING	
Active Current Limiters	16
Limitation Current	40 \pm 1mA
Automatic Temperature Shut-down	Above 80 $^{\circ}$ C
INDICATORS	
	1 Yellow LED, Power-On indicator
	16 Red LEDs, current activity indicators
SUPPLY	
Supply Voltage	24 Vdc +10% (regulated)
Supply Current Consumption	20mA (transmitters not included)
FUSES	
Main Fuse	630mA, Fast Blow (5x20 mm)
Channel Fuse	63mA, Fast Blow (5x20 mm)
TEMPERATURE	
Operating	0 to 70 $^{\circ}$ C (32 to 158 $^{\circ}$ F)
Storage	-25 to +85 $^{\circ}$ C (-13 to 185 $^{\circ}$ F)
HUMIDITY	
	5 to 95% Relative humidity, non condensing
HOUSING	
Box	Plastic Polycarbonate
Terminals	According to IP50 DIN 40050 According to IP20 DIN 40050
WEIGHT	0.75 Kg. (1.5 lb.)
DIMENSIONS	73Hx200Wx121mmD (2.88"x7.88"x4.76")

WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of 13 months from date of purchase. OMEGA Warranty adds an additional one (1) month grace period to the normal one (1) year product warranty to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product. If the unit should malfunction, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of being damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear are not warranted, including but not limited to contact points, fuses, and triacs.

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FOR WARRANTY RETURNS, please have the following information available BEFORE contacting OMEGA:

1. P.O. number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
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1. P.O. number to cover the COST of the repair,
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3. Repair instructions and/or specific problems relative to the product.

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