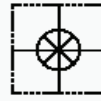


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FMA1600-MDB Multi-Drop Box



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The information contained in this document is believed to be correct, but OMEGA Engineering, Inc. accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.

WARNING: These products are not designed for use in, and should not be used for, patient-connected applications.

FMA1600-MDB Multi-Drop Box Operating Bulletin

Introduction

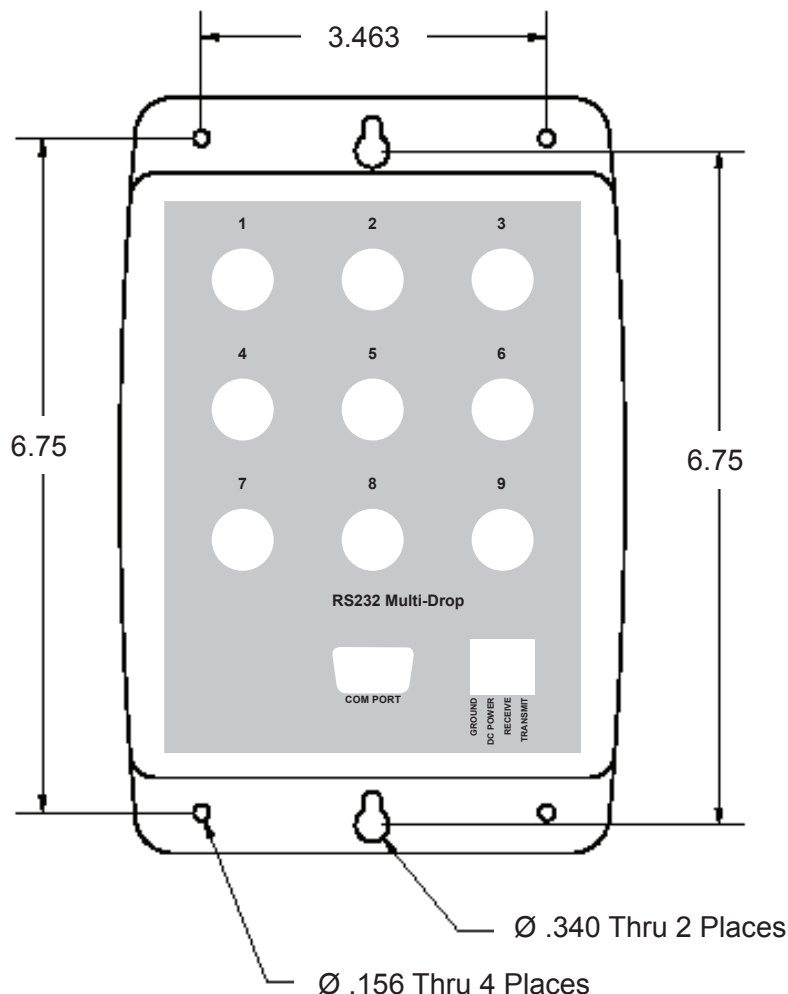
The FMA1600-MDB Multi-Drop Box makes it convenient to wire multiple FMA-1600A, FMA-2600A, FLR-1600A and FLV-4600A series flow devices to a single RS232 port. The Multi-Drop Box has nine 8 pin mini-DIN ports available. The ports are to be used either with a standard double ended 8 pin mini-DIN style cable going from the box to each flow device.

A single DB9 D-SUB type connector (COM PORT) connects, using the included cable, to the serial connector on a PC or laptop. All of the flow devices are powered via a terminal block on the front of the box.

If more than nine devices will be required, additional Multi-Drop Boxes can be daisy chained together with a double ended 8 pin mini-DIN cable plugged into any receptacle on both boxes. (Page 6.)

Mounting

The FMA1600-MDB Multi-Drop Box can be vertically mounted in any convenient orientation or placed on a horizontal surface where risk of exposure to liquids is minimal. To mount the box on a vertical surface, place two screws, with heads that are not larger than about 3/16 (0.312) of an inch in diameter, 6.75" apart in a vertical line.



Connecting the FMA1600-MDB Multi-Drop Box to a computer

Connect the included serial cable (or another appropriate serial cable if the included cable is too short) to the 9 pin D-SUB connector labeled "COM PORT". Connect the other end to a valid serial port on your computer.

If you will be making your own cable, or you wish to run the RS232 Input/Output off to another device, you can bypass the 9 pin D-SUB connector and simply use the terminal block on the front of the device.

To do this, you must;

1. Connect the transmit line from the computer to the receive line on the terminal block,
2. Connect the receive line from the computer to the transmit line on the terminal block,
3. Connect the ground line from the computer to the ground line on the terminal block.

For these devices, the power and signal grounds are common and will be connected to the same socket on the terminal block.

To connect a wire to the terminal block:

1. Strip approximately 3/16 (0.312) of an inch of insulation from the end of the wire.
2. Turn the screw on the socket to which you will be attaching the wire counter-clockwise.
3. Turn the screw until the socket is opened enough to fit the stripped end of the wire into the socket.
4. Insert the wire into the open socket and gently turn the screw clockwise until it is snug.
5. Visually inspect the connection to make sure the socket is closed on the conductive part of the wire and not on the insulation.
6. Gently tug the wire to make sure it does not come out.

Power

All of the devices attached to the FMA1600-MDB Multi-Drop Box are normally powered through a common power bus applied to the terminal block on the front of the box.

When power is supplied through the 4-pin terminal block, the input current must not exceed 9 amps.

Under some circumstances power may be supplied from a connected device. **If power is being supplied from a connected device, the input current must not exceed 2 amps.**

The terminal block requires DC VOLTAGE, appropriate for the devices hooked up to the box and of sufficient current to run all of the devices. (See table page 5.)

Positive DC voltage must be applied to the socket labeled "POWER" and the power ground must be applied to the socket labeled "GROUND". Connect the wires to the terminal block by following the six steps previously listed.

Device	Voltage (Vdc)	Current (milliamps)
Meters (all ranges)	7-30	50 mA each
0-20 SLPM Controllers	12-30	250 mA each
20+ to 100 SLPM Controllers	24-30	750 mA each
100+ to 1500 SLPM Controllers	24-30	750 mA each

CAUTION! Do not apply AC voltage to the Multi-Drop Box terminal block or to individual units as immediate damage will occur!

Do Not power units individually through their AC/DC adapter jacks. Potential differences between units could damage the power bus in the Multi-Drop Box or damage individual units which may be supplied too much voltage.

Assigning Individual Addresses to Flow Devices

In order to communicate with multiple units through a single RS232 serial port, ***each unit must have a unique address.***

On units with a standard display and manufactured after November 2005, the device address can be changed via the RS232 Communication menu on the front panel of the device as outlined below.

Change the address from the front panel of a flow device as follows:

1. Push the MODE button until the SELECT MENU screen is shown.
2. Push the lower left button dynamically labeled "Comm. RS232".
3. Push the upper left button dynamically labeled "Select" once to move the selection arrow down one line to "Unit ID (Current Address)...(New Address)"
4. The default address is A.
5. Use the lower left and middle button dynamically labeled "UP" or "DOWN" to change the address to any letter between A and Z that is unique from other units you intend to connect to the Multi-Drop Box.
6. The new address is shown at the end of the dotted line.
7. When the desired new address is shown at the end of the dotted line, press the MODE button to exit the screen and make the address change take affect.
8. It is prudent to put some sort of external label on the device that denotes its address, though this can be checked at any time by visiting the "Comm. RS232" screen.

On units manufactured prior to November 2005 and all units without the standard display, it is necessary to first connect each unit individually (one at a time) to a computer and assign a unique address. Then connect all of the units to the Multi-Drop Box.

Assign each flow device a unique address as follows:

1. Make sure the Multi-Drop Box is connected to appropriate power and to the computer.
2. Connect a 8 pin mini-DIN cable between the device and any port on the Multi-Drop Box.
3. If the unit has a display, check to make sure the device powers up properly.
4. Make sure ONLY the unit you want to change is connected.
5. Establish serial communication as outlined in the operating manual for the flow device.
6. With the flow device in polling mode, type `*@=NEWADDRESS` followed by the Enter key where NEWADDRESS is any capital letter A thru Z. (e.g. `*@=B` followed by the Enter key)
7. To test that the address has been accepted, type the new address followed by the Enter key. The computer should respond with the new address followed by one line of data.
8. Put some sort of external label on the device that denotes its address. If you forget the device's address, you will have to check the device individually (with all other units disconnected).
9. Remove the device from the Multi-Drop Box and connect the next device to be addressed. Repeat until all of the units have a unique address.

Daisy Chaining FMA1600-MDB Multi-Drop Boxes For More Devices

Up to 26 flow devices can be attached to a single RS232 port by cabling up to four Multi-Drop Boxes together. Valid RS232 addresses for the flow instruments are the 26 letters of the alphabet, A-Z.

To daisy chain Multi-Drop Boxes when only **metering** devices are being used, simply use a double ended 8 pin mini-DIN cable to connect any port on one box to any port on another.

To daisy chain Multi-Drop Boxes when **controlling** devices are being used, use a double ended 8 pin mini-DIN cable to connect any port on one box to any port on another. It is also necessary to daisy chain additional wires of sufficient gauge (to power the extra units) between the power and ground sockets on the terminal blocks of the Multi-Drop Boxes.

CAUTION: Failure to provide proper wire gauge for the expected load between boxes may result in damage and possible fire!



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's 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 malfunctions, 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 having been 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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The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

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

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

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