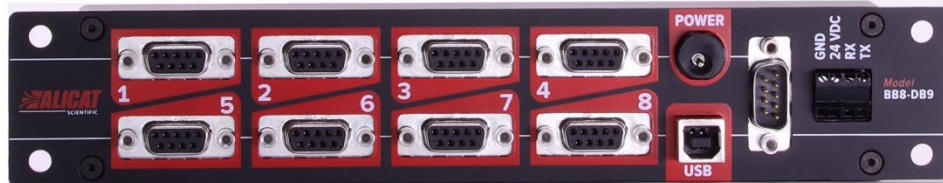




A **Halma** company



USB MULTI-DROP BOX USER MANUAL

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Multi-Drop Box Operating Bulletin

Introduction

Alicat multi-drop boxes enable connection of multiple flow and/or pressure instruments via a single USB port. Each box has multiple ports available, depending on the model:

- BB3-232: three 8-pin mini-DIN ports
- BB3-232-I: three 6-pin Locking Industrial connectors
- BB8-DB9: eight 9-pin D-Sub ports
- BB9-232: nine 8-pin mini-DIN ports
- BB9-232-I: nine 6-pin Locking Industrial connectors

The ports are to be used either with a standard double ended 8-pin mini-DIN (DC-62RS) style cable, a 6-pin Locking Industrial (IC102) style cable, or 9-pin D-Sub (DB9MDB9F) style cables from the box to each flow or pressure instrument.



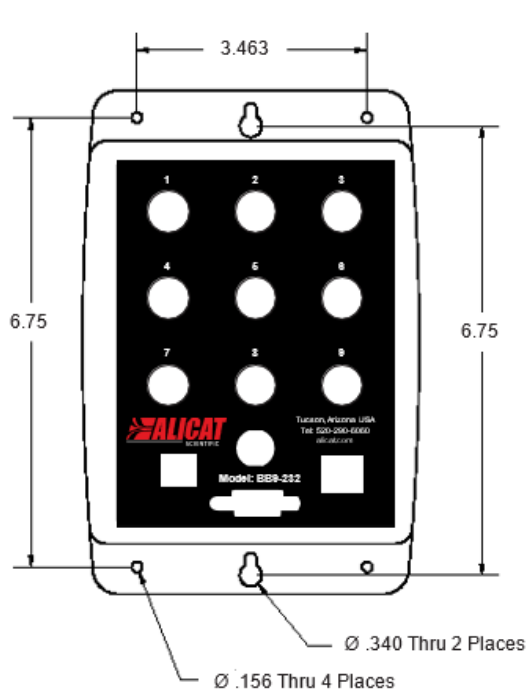
Note: For cables with non-standard pinouts, contact Alicat support for assistance (page 2).

The multi-drop box connects to a computer's USB port via the provided USB cable. Instrument power is provided via a terminal block on the front of the box, or by connecting the box or a single instrument to a PVPS24U power supply (page 4).

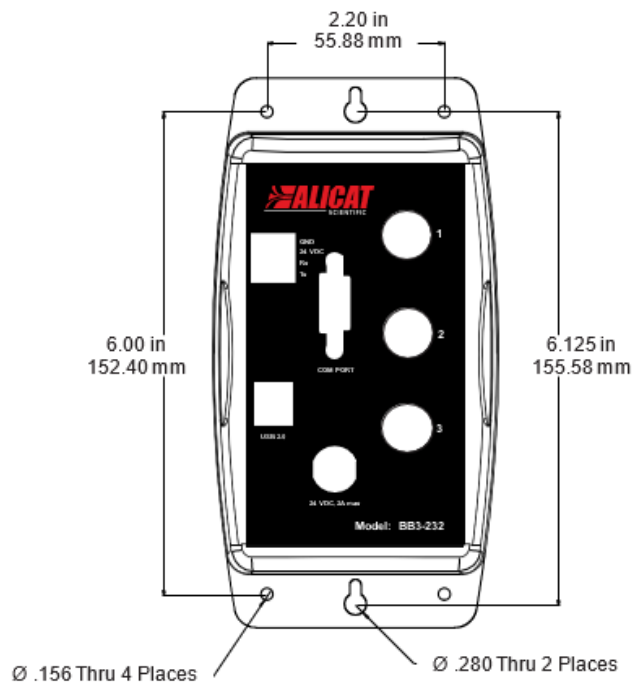
Multiple BB8 or BB9 multi-drop boxes can be daisy-chained to accommodate additional instruments (page 7).

Mounting

BB3 or BB9 multi-drop boxes can be vertically mounted, or they can be placed on horizontal surfaces when risk of exposure to liquids is minimal. To mount a box on a vertical surface, use two screws with heads no larger than 3/16" (4.7 mm) diameter. For a BB9, the screws should be spaced vertically by 6.75" (171 mm); for a BB3 the spacing should be 6.125" (156 mm).

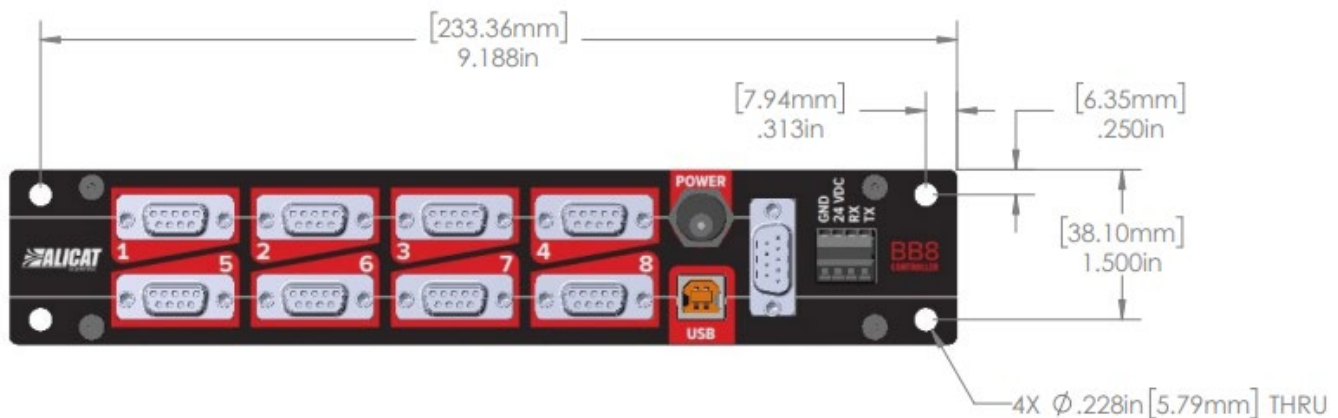


BB9



BB3

A BB8 multi-drop box can be mounted in a half rack enclosure or placed on a horizontal surface when risk of exposure to liquids is minimal. The BB8 is 1 RU (1.75", 44.5 mm) in height.



Power


Power can be supplied to the instruments connected to a multi-drop box in one of three ways.

Via the Terminal Block

When the total current required by all connected instruments is between 1 A and 10 A, apply positive DC voltage to the multi-drop box terminal block (see the Power Requirements table on page 5). Attach power to the **24VDC** socket and ground to the **GND** socket, connecting the wires as follows:

1. Strip approximately 3/16" (0.188 mm) of insulation from the end of the wire.

2. Turn the socket screw counterclockwise until there is sufficient space for the stripped end of the wire to fit into the socket.
3. Insert the wire into the open socket and gently turn the screw clockwise until it is snug.
4. Visually inspect the connection to make sure the socket has closed on the conductive part of the wire and not on the insulation.
5. Gently tug the wire to make sure it does not come out of the socket.


 **Note:** The Rx and Tx communications sockets on the terminal block are typically not used.

Via the Power Jack

When the total current required by all connected instruments is less than 1 A, you can connect a PVPS24U power supply to the Power jack on the multi-drop box.

Via an Instrument

When the total current required by all connected instruments is less than 1 A, power can be supplied to all instruments by connecting any single flow or pressure instrument to a PVPS24U power supply.

 **WARNING:** Do not power instruments individually through their AC/DC adapter jacks while also supplying power through the multi-drop box. Potential differences between instruments could damage the power bus in the multi-drop box or damage individual instruments by supplying too much voltage.

Alicat Instrument Power Requirements

The following table describes the typical power requirements for various Alicat meters and controllers.

Instrument	Voltage (Vdc)	Nominal Current
Standard Meters and Gauges M, P, L Series Meters	9–24	40 mA (0–5 V, 0–10 V signals) 80 mA (4–20 mA signals)
Small Valve Controllers MC, MCD, MCP, MCPD Series Mass Flow Controllers PC, PCD, PCP, PCPD Series Pressure Controllers LC Series Liquid Controllers	12–24	250 mA
Large Valve Controllers MCR, MCRD Series Mass Flow Controllers PCR, PCRD Series Pressure Controllers LCR Series Liquid Controllers	24	500 mA
Large Valve Controllers with -PAR	24	1.0 A
MCRH or PCRH Controllers	24	2.0 A
BASIS 2.0 Meters	12–24	12 mA
BASIS 2.0 Controllers	12–24	210 mA

Connecting the Multi-Drop Box to a Computer for Serial Communications

The multi-drop box is a USB 2.0 full speed device. All instruments that will be connected via the multi-drop box will require appropriate USB drivers. For Linux, Mac OS 10.3, or Windows® drivers visit ftdichip.com/drivers/vcp-drivers/. When the multi-drop box is connected to a Windows computer with internet access, the computer should automatically locate and install the required drivers.

✓ **Note:** In lieu of a USB-A cable, RS-232 communication can also be established via the provided DB9F-DB9F cable connected to a DB9 serial port on the computer/PLC.

Assigning Individual Device Addresses

To communicate with multiple instruments via RS-232 through the single USB serial port, **each instrument must have a unique device address (unit ID).**

Instruments with a Standard Display and Manufactured After Nov. 2005

The device address can be changed via the instrument's front panel as follows:

1. Select **MENU > SETUP > RS-232 Serial > Unit ID.**
2. Use the **UP/DOWN** buttons to select the ID from the list. Valid addresses are the letters of the alphabet. The default address is A.
3. Press **SET.** The new address will be displayed.
4. Place an external label on the instrument to denote its device address.

✓ **Note:** These instructions may differ slightly for older instruments. Consult your legacy instrument user manual if necessary.

Instruments Manufactured Prior to Nov. 2005, and All Instruments Without a Display

Each instrument must be connected to the multi-drop box one at a time and assigned a unique address as follows:

1. Connect the multi-drop box to power and to the computer.
2. Disconnect all instruments except the one to be assigned.
3. Connect a DC-62RS, IC102, or DB9MDB9F cable from one instrument to any port on the multi-drop box.
4. If the instrument has a display, check to make sure that it has powered up properly.
5. Establish serial communication as outlined in the operating manual for the instrument.
6. With the flow or pressure instrument in polling mode, enter ***@=NEWADDRESS↵**
where NEWADDRESS is any capital letter A thru Z and ↵ is the Enter key. Example: ***@=B↵**
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. Place an external label on the instrument to denote its address.
9. If necessary, remove the instrument from the multi-drop box and repeat until all instruments have a unique address.
10. Once all instrument addresses have been assigned, connect all of the instruments to the multi-drop box.

Daisy Chaining Multi-Drop Boxes

Daisy chained BB8 or BB9 multi-drop boxes can provide RS-232 communication for up to 26 Alicat instruments. In this arrangement, one primary multi-drop box is connected to the computer via USB, while the additional multi-drop boxes further down the chain are connected via RS-232.

To daisy chain multi-drop boxes, connect double-ended DC-62RS, IC102, or DB9MDB9F cables from any port on one box to any port on the next in the chain. If the total required current for all connected instruments will be ≥ 500 mA it is also necessary to daisy chain wires between the power and ground sockets on the terminal blocks of the multi-drop boxes. **These wires must be of sufficient gauge to power all connected instruments.**

! **WARNING:** Use proper wire gauge for the expected load between the boxes. Failure to do so may result in damage and possible fire.

Troubleshooting

Issue: Communication can't be established with an instrument.

Action: When connecting multiple devices to a single COM port (or virtual COM port if using USB), be sure each Alicat instrument has a unique Unit ID (page 6). If the instrument does not appear in the Device Manager at all, check the power connection and any 3rd party USB cables.

Issue: BB3 or BB9 multi-drop box is listed under "other" in the Device Manager.

Action: The multi-drop box should appear under "Ports (COM & LPT)." If it does not, the most likely cause is a missing driver. While the drivers should install automatically when the box is plugged into the computer, security settings may prohibit drivers from installing. In this case, manually download and install the driver at alicat.com/documentation/software-drivers/.

Issue: USB port not responding under Windows 7.

Action: When the USB port itself is not responding properly with Windows 7, the error, "One of the USB devices attached to this computer has malfunctioned and Windows does not recognize it" may appear. A solution is available in the Microsoft Community forum, [here](#).

Issue: COM Port does not appear in Device Manager

Action: If the serial connection on your computer does not appear in Device Manager, the port or the cable may have stopped functioning. Replace the cable or try connecting via a different port (USB).

Issue: Multi-drop box appears in the Device Manager as a mouse

Action: Choose **Start Menu > Device Manager > Ports > USB Serial Port**. Under **Properties** choose **Port Settings/Advanced > Miscellaneous Options** and deselect **Serial Enumerator**.

For more troubleshooting review the Power and Communications sections at alicat.com/support/troubleshooting-an-alicat-device/.