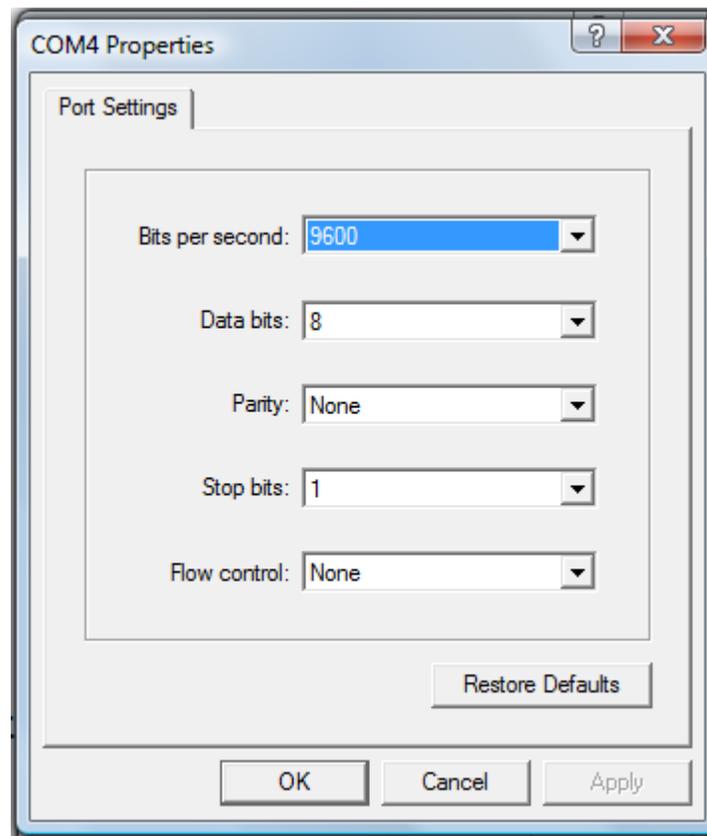


## RS-232 Serial Addressable Mass Flow Controller Operating Instructions

These notes are to help in the setup and operation of an RS-232 addressable network made up of Pneucleus Technologies Mass Flow Controllers and/or meters. The network can comprise of up to 10 units, where each unit is assigned a unique identification number that is user-selectable but must be 1 thru 10. The units on the network wait for their unique call signal before they enter an active state in which they operate just like our traditional RS-232 controlled units. Once a task is completed with a particular unit, the user can log off and/or directly switch to another unit.

### **Communication Port Setup:**

Communication to the units on the RS-232 addressable network is achieved using port communication software such as HyperTerminal, TeraTerm, etc. The communication port settings should be configured as follows:



It may also be helpful to echo typed characters locally.

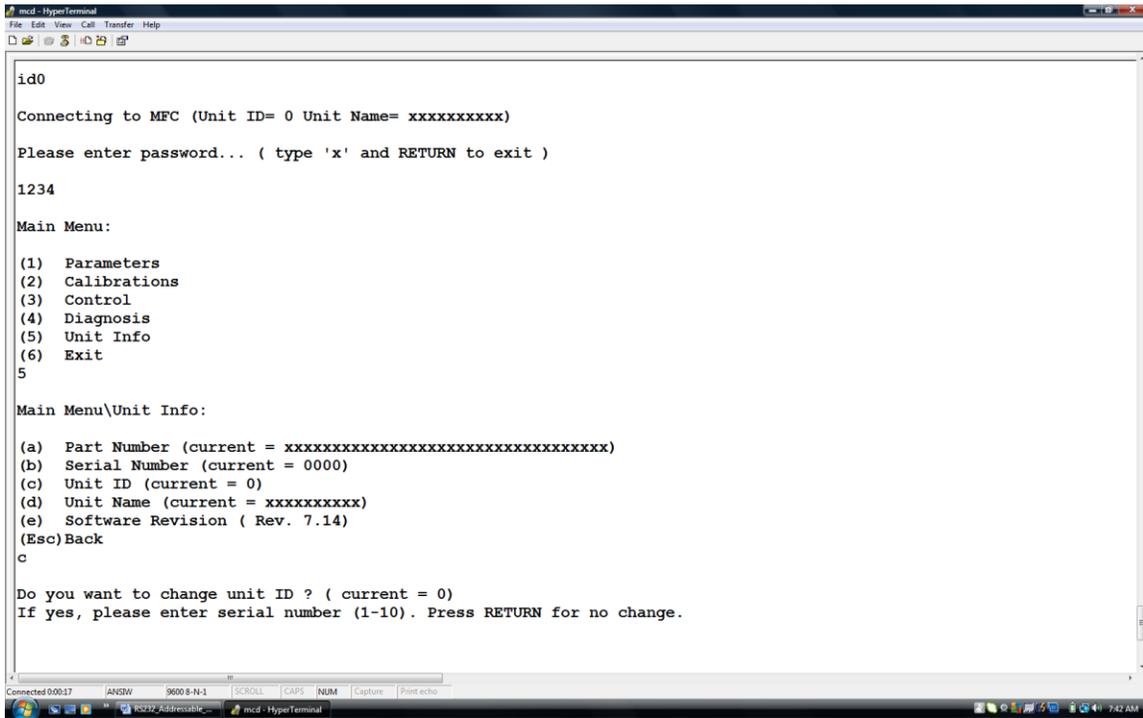
## Wiring:

All units on the network should be connected together by tying all of their transmit (Tx) and receive (Rx) signals together back to the computer communication port. Referring to the 9-pin connector of the units, Tx is on Pin 4 and Rx is on Pin 9.

## Initialization:

The units come stock from Pneucleus Technologies with the identification number ID0. Before using a unit in a network, it is recommended that the identification number be set to something other than the stock setting. This allows easy implementation of additional units to an established network. The units can be reassigned an identification number ranging from ID1 to ID10. To change the identification number of a unit, please refer to the Initialization Steps below. Repeat these initialization steps until all units on the network have been reassigned a unique identification number in the range ID1-ID10. Two units with the same identification number will result in interference when the network is setup and all Rx and Tx lines are tied together.

## Initialization Steps:



```

mcd - HyperTerminal
File Edit View Call Transfer Help
id0
Connecting to MFC (Unit ID= 0 Unit Name= xxxxxxxxxxx)
Please enter password... ( type 'x' and RETURN to exit )
1234
Main Menu:
(1) Parameters
(2) Calibrations
(3) Control
(4) Diagnosis
(5) Unit Info
(6) Exit
5
Main Menu\Unit Info:
(a) Part Number (current = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx)
(b) Serial Number (current = 0000)
(c) Unit ID (current = 0)
(d) Unit Name (current = xxxxxxxxxxx)
(e) Software Revision ( Rev. 7.14)
(Esc)Back
c
Do you want to change unit ID ? ( current = 0)
If yes, please enter serial number (1-10). Press RETURN for no change.

```

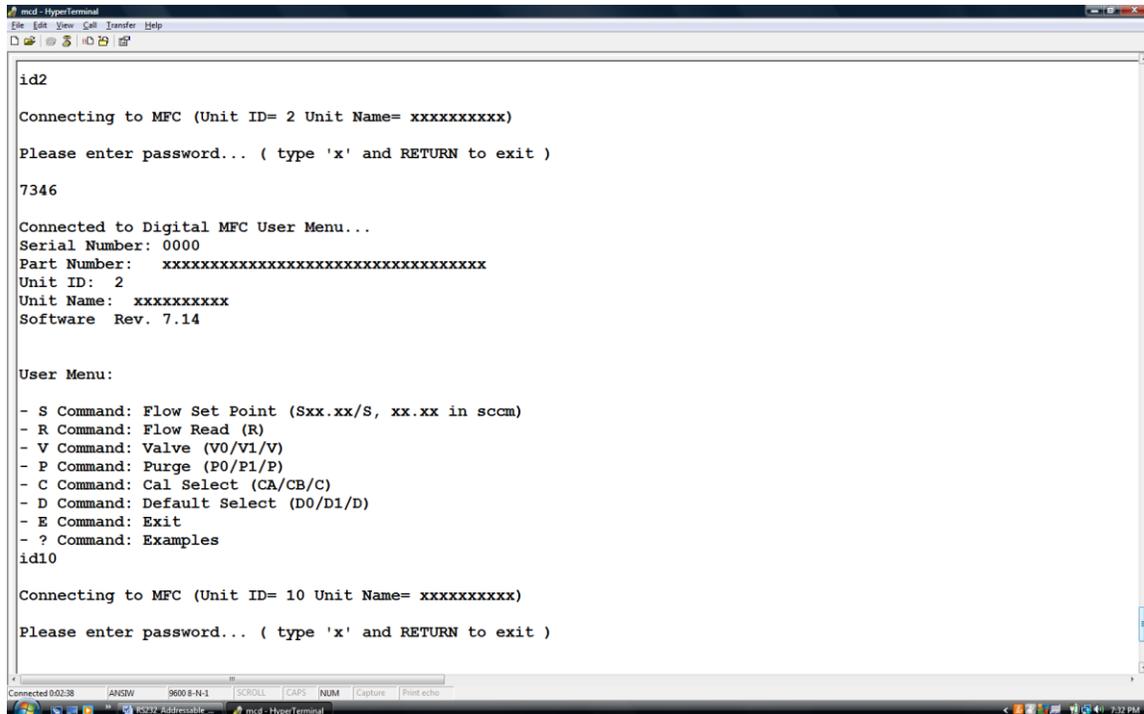
1. Connect Power, GND, Rx, and Tx to a single stock unit.
2. Type “ID0” into the communication portal and wait for the password prompt.
3. Type the password, “1234” to enter the Main Menu for configuring the unit.
4. Choose option “5 – Unit Info” by pressing 5
5. Choose option “C – Unit ID” by pressing C
6. Set the identification number by pressing a single number (1-10) and then enter.
7. Press ESC, then 6 to exit the configuration menu.

For the subsequent units introduced to the network, it is important to connect and initialize one unit at a time in order to avoid interference of multiple stock “ID0” units.

## General Operation:

Each unit on the network should have a unique identification number. To assign unique identification numbers to the units, please read the Initialization section.

Once all units are tied together on the same network, the user can access any one of the units by typing in the unit identification number, followed by the RS-232 control password “7346”. After entering the password the Unit Information is displayed, followed by the User Menu detailing the traditional Pneucleus Technologies RS-232 command set. At this point, one can control the unit using any one of the commands, or switch to another unit by typing in its identification number. If this is done, the user is logged out of the first unit and then asked for the RS-232 password “7346” to log on to the next unit. This example is shown here for two units ID2 and ID10:



```
mcd - HyperTerminal
id2
Connecting to MFC (Unit ID= 2 Unit Name= xxxxxxxxxx)
Please enter password... ( type 'x' and RETURN to exit )
7346
Connected to Digital MFC User Menu...
Serial Number: 0000
Part Number: xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
Unit ID: 2
Unit Name: xxxxxxxxxx
Software Rev. 7.14

User Menu:
- S Command: Flow Set Point (Sxx.xx/S, xx.xx in sccm)
- R Command: Flow Read (R)
- V Command: Valve (V0/V1/V)
- P Command: Purge (P0/P1/P)
- C Command: Cal Select (CA/CB/C)
- D Command: Default Select (D0/D1/D)
- E Command: Exit
- ? Command: Examples
id10
Connecting to MFC (Unit ID= 10 Unit Name= xxxxxxxxxx)
Please enter password... ( type 'x' and RETURN to exit )
```

Note the user will remain logged into a unit until they exit using the “E” RS-232 command, or the user switches to another unit by calling its identification number. It is not required that one must log off of a unit before directly switching to another.