# Fusion 4000 Updated Serial Commands for Full Computer Control

**help**

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 **help**                  **-Show Help Information**

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## Movement Commands

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 **[x] start [y]**                  **- Pump [x] [y](0 Basic/1 Program) Run**
 **[x] stop**                        **- Pump [x] Stop**
 **[x] pause**                       **- Pump [x] Pause**
 **start [y]**                       **- All Pump [y](0 Basic/1 Program) Run**
 **stop**                            **- All Pump Stop**
 **pause**                           **- All Pump Pause**
 **restart**                         **- Pump Restart**

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## Setting Commands

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 **[x] set units [xxx]**             **-Pump [x] Set Units(0,1,2,3 or ml/min,ul/hr)**
 **[x] set diameter [x.x]**          **-Pump [x] Set Diameter**
 **[x] set rate [x.x,x.x,...]**      **-Pump [x] Set Rate**
 **[x] set volume [x.x,x.x,...]**    **-Pump [x] Set Volume**
 **[x] set delay [xxx]**             **-Pump [x] Set Delay**
 **[x] set time [x.x,x.x,...]**      **-Pump [x] Set Time(will calculate rate)**

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## Status Commands

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 **[x] read limit parameter [y]**   **-Pump [x] Return [y](0 Basic/1 program) Max/Min Volume & Rate**
 **[x] dispensed volume**           **-Pump [x] Return Volume Dispensed**
 **[x] elapsed time**               **-Pump [x] Return Time Elapsed**
 **[x] pump status**                **-Pump [x] Return System Status**

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## Additional Optional Commands

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 **[x] hexw2 [units] [mode] [diameter] [volume] [rate] [delay]**          **-Sends All Settings**
 **[x] hexw2 [units] [mode] [diameter] [volume] [rate] [delay] start**    **-Sends All Settings and Starts**

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The red part will be the updated commands.

- [x] can be 1, 2, or 3
    - When [x] = 1, that controls Pump Channel 1
    - When [x] = 2, that controls Pump Channel 2
    - When [x] = 3, that controls Pump Channel 1,2 Cycle Mode
- [y] can be 0 or 1
    - When [y] = 0, that sets the pump in Basic Mode
    - When [y] = 1, that sets the pump in Programmable Mode

For example,
- 1 start 1\r = start Pump 1 in Programmable Mode
- 2 set rate 5 = sets Pump 2 to infuse at a rate of 5 unit/time
- 1 set volume 1.0,-2.0,3.0\r = sets Pump 1 to Programmable Mode to:
    - First step volume: infuse 1.0
    - Second step volume: withdraw 2.0
    - Third step volume: infuse 3.0
- 1 set volume 2.0 loop 1, -1.0 loop 2\r = sets Pump 1 to loop in Programmable Mode
    - First step volume: infuse 2.0; loop once
    - Second step volume: withdraw 1.0; loop twice

To set a step to withdrawal mode, add a negative value before the volume!