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Parallel operation by computer for the ZUP series power supply

Up to 5 units of the same rating can be connected in an auto-parallel configuration.

1. **Hardware connections**
   Shown in section 4.4.13 “Auto Parallel Operation”, on page 33 of the ZUP User’s Manual. Modification of the jumpered 14 pin connector that is included with the power supply is required.

2. **Additional Hardware connections. Determine which unit is the master and which is the slave.**
   Master goes to the computer, slave goes to master. Connect the ZUP RS232 communications cable (ZUP/NC401 (DB-9) or ZUP/NC403 (DB-25)) to Comport 1 or 2 from your PC to the RS232/485 “IN” connector on the ZUP (master). Connect the serial link cable (ZUP/W) to the RS232/485 “OUT” connector on the master ZUP to the RS232/485, “IN” connector of the slave ZUP. These cables are not included with the ZUP but can be ordered as options.

3. **ZUP front panel set-up**
   Turn all of the ZUP power supplies on. (Be sure that the REM and OUT L.E.D.’s are off).

   A. Address setting

   1. Momentarily press the ADDR pushbotton on the front panel so the ADDR L.E.D. illuminates and the Volts display shows ‘Addr’.
   2. Rotate the front panel knob. While rotating the knob the AMPS display will show the selected address. When the rotation is stopped, the address shown will be the selected address. The display will return the actual voltage and current approx. 3 sec. from termination of rotating the knob.

   B. RS232 or RS485 selection

   To select between RS232 and RS485 serial communication the following steps should be taken. Paralleled units should be treated as one as they use the same address.

   1. From the computer to the first unit (Master) and subsequent (slave) unit(s) using the same address should be set for RS232.
   2. All additional daisy chained units with different addresses should be set for RS485.
      a. Press and hold the REM pushbutton. (depressing the REM pushbutton for more than I sec. does not change the local/remote status). After approx. 3 sec. the display will continuously cycle between ‘rs232’ and ‘rs485’ approx. every 3 sec.
      b. To select RS232, release the REM pushbutton while ‘rs232’ is displayed. To select RS485, release the REM pushbutton while ‘rs485’ is displayed.
      c. Approx. 3 sec. after releasing the REM pushbutton, the display returns to show the actual voltage and current.

   C. Baud rate setting

   Six optional rates are possible: 300, 600, 1200, 2400, 4800, 9600.

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1. Press and hold the ADDR pushbutton. After approx. 3 sec. the display will continuously cycle between the six optional rates approx. every 2 seconds.
2. To select the desired rate, release the ADDR pushbutton while that rate is displayed.
3. After releasing the ADDR pushbutton the display will return to show the actual voltage and current.

4. **Set output voltages**
   From the front panels of the ZUP's set the maximum possible voltage on the slave unit(s) and up to 5% less on the master. (toggle V/A on ZUP front panel to "V" then adjust knob. Note that FA U = fast voltage adjust, SL U = slow voltage adjust, FA A = fast adjust Amps).

5. **Set current limits**
   Set the current limits on each of the ZUP's from the front panels to their maximum settings (toggle V/A on ZUP front panel to "A" (green L.E.D. above "A" on. (FA A) then adjust knob).

6. **Set-up the communications software on your computer**
   Treat the parallel units as 1 (use only one address each group of paralleled power supplies). For use with Hyper Terminal go to "ZUP Series Communication Test Set UP using Hyper Terminal (windows) software". This can be found at www.lambdapower.com under "Products", "Tech Downloads", "ZUP Series", "zup_comtest.pdf"
   To find Hyper Terminal on your PC you must have Microsoft Windows. Go to "Start" button then "Programs" then "Accessories" then "Communications" then "Hyper Terminal".

7. **Final front panel set-up**
   Set "REM" to on for each ZUP (green L.E.D.'s will be on)

8. **Software note**
   When communicating via RS232, the current limit in your software should be divided by the number of ZUP's in parallel. Exa. If a total of 12A is required with three ZUP's in parallel your program should show the current limit, :CURn; as :CUR4.xxx (3 zup's at 4A each = 12A. See section 5.5.3 on page 43 of the manual for the correct command configuration as it is model dependent.

Additional notes:

1. As more Zup's are added to your system you may have to reduce the baud rate for the units to communicate properly.
2. For use with Hyper Terminal upper case letters must be used and back spacing is not allowed.
3. The ZUP internal software is model specific when entering voltage and current values. See. Section 5.5.3 on page 43 of the ZUP User's Manual.

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