

CHAPTER 5 RS232 & RS485 REMOTE CONTROL

5.1 INTRODUCTION

This chapter describes the operation of the ZUP series via the serial communication port. details of the initial set-up, operation via RS232 or RS485, the command set and the communication protocol are described in this chapter.

5.2 CONFIGURATION

5.2.1 Address setting

The ZUP addresses can be set to any address between 01 and 31. Follow the procedure described below to set the address.

1. Momentarily press the ADDR pushbutton on the front panel so the ADDR LED 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 to show the actual voltage and current approx. 3 sec. from termination of rotating knob.
3. While the unit is in operation, depressing the ADDR pushbutton will cause the display to show the selected address.

5.2.2 RS232 or RS485 selection

To select between RS232 or RS485 serial communication the following steps should be taken.

1. Press and hold REM pushbutton. (holding REM depressed for more than 1sec does not change the local/remote status).
2. Press and hold REM pushbutton. After approx. 3sec. the display will continuously cycle between 'rs232' and 'rs485' approx. every 3sec.
3. To select RS232, release the REM pushbutton while 'rs232' is displayed. To select RS485, release the REM pushbutton while 'rs485' is displayed.
4. Approx. 3sec. after releasing the REM, the display returns to show the actual voltage and current.

5.2.3 Baud rate setting

Six optional rates are possible: 300, 600, 1200, 2400, 4800, 9600. To select the desired rate, the following steps should be taken. The power supply should be at Local operation mode during the following procedure:

1. Press and hold 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 ADDR while that rate is displayed.
3. After releasing ADDR the display will return to show the actual voltage and current.

5.2.4 Local/Remote selection

To enable the operation via RS232 or RS485, the power supply should be at Remote mode. At this mode, all the front panel functions are disabled except Local/Remote pushbutton.

Transition from Local to Remote control:

1. Via the front panel: Momentarily press REM pushbutton so the REM LED illuminates. To return from Remote to Local control, momentarily press REM pushbutton so the REM LED extinguishes.
2. Via the serial communication port (RS232/RS485): By sending a :RMTn; command to the power supply. Refer to par. 5.5.2.

5.3 REMOTE PROGRAMMING VIA RS232

5.3.1 Introduction

The RS232 interface is accessible through the rear panel IN/OUT jacks. The jacks are 8 contacts each and conform to EIA/TIA-568A requirements. The IN and OUT jacks are used to connect the units in a RS232 or RS485 chain to a controller. The data format is ASCII, 8 bits/character no parity bit, one stop bit. The baud rate can be selected to one of the 6 possible rates between 300 and 9600bps (refer to par.5.2.3).Refer to par.5.6 for detailed explanation.

Up to 31 ZUP units can be connected to the RS232 control as shown in Fig.5-1.

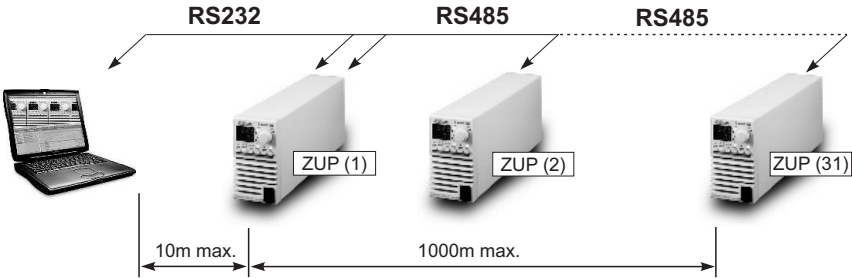


Fig. 5-1: Linking ZUP units with RS232 control.

5.3.2 Rear panel connectors pinout

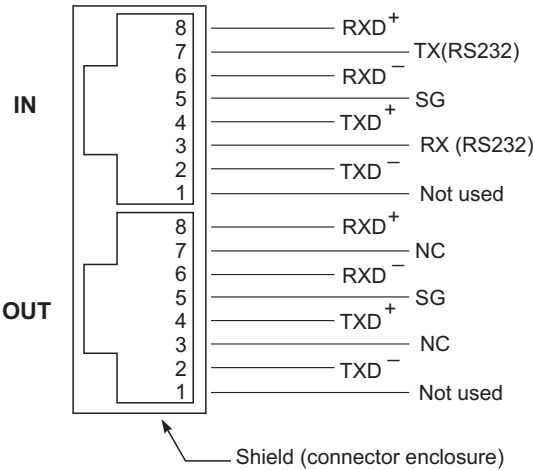


Fig. 5-2:
Rear panel connector pinout
(ZUP rear panel view)

NOTE

Tx and Rx are used for RS232 communication. Txd +/- and Rxd +/- are used for RS485 communication. Refer to RS232 and RS485 cables description for connection details.

5.3.3 RS232 cable (PC to ZUP) - ZUP/NC403 , ZUP/NC401

The RS232 is used only for connecting the power supply to the controller PC. For linking several power supplies, refer to par. 5.3.4.

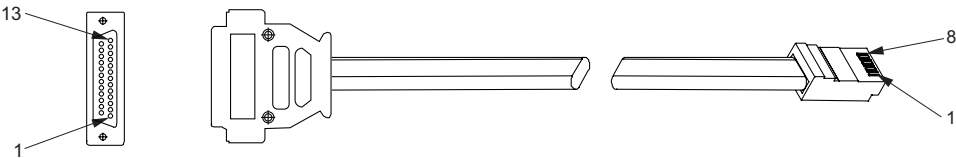


Fig. 5-3: RS232 cable with DB-25 female connector -P/N: NC403

DB-25 CONNECTOR		8 PIN CONNECTOR		REMARKS
PIN NO.	NAME	PIN NO.	NAME	
1	SHIELD			
2	TX	3	SHIELD	
3	RX	7	RX	TWISTED PAIR
7	SG	5	TX	
			SG	

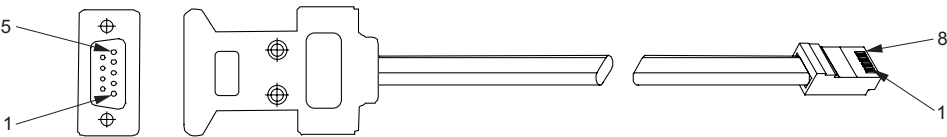
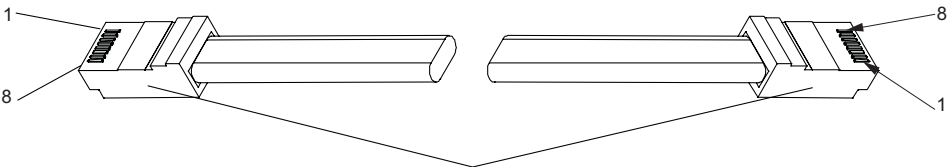


Fig. 5-4: RS232 cable with DB-9 female connector -P/N: NC401.

DB-9 CONNECTOR		8 PIN CONNECTOR		REMARKS
PIN NO.	NAME	PIN NO.	NAME	
HOUSING	SHIELD	HOUSING	SHIELD	
2	RX	7	TX	TWISTED PAIR
3	TX	3	RX	
5	SG	5	SG	

5.3.4 Linking power supplies - ZUP/NC405 / ZUP/W

It is possible to link up to 31 ZUP units, using rear panel In/Out connectors and linking cables as shown in Fig. 5-1. The first unit communicates with the PC via RS232 as shown in Figs. 5-3 and 5-4. The other units are linked by RS485 interface. Construction of the linking cable is shown in Fig. 5-5.



EIA/TIA-568A SHIELDED CONNECTORS

Fig. 5-5: ZUP units linking cable.
P/N: ZUP/NC405
ZUP/W

8 PIN CONNECTOR (IN)		8 PIN CONNECTOR (OUT)		REMARKS
PIN NO.	NAME	PIN NO.	NAME	
HOUSING	SHIELD	HOUSING	SHIELD	
5	SG	5	SG	
2	TXD -	2	TXD -	
4	TXD +	4	TXD +	
6	RXD -	6	RXD -	
8	RXD +	8	RXD +	

5.4 REMOTE PROGRAMMING VIA RS485

5.4.1 Introduction

For operation environments that require high noise immunity or long distance communication, it is recommended to use the built-in RS485 interface. The RS485 interface is accessible through the rear panel In/Out jacks in a similar way to the RS232. The communication is a four-wire type. Refer to par. 5-6 for detailed explanation. Up to 31 ZUP units can be connected to the RS485 control as shown in Fig. 5-6.

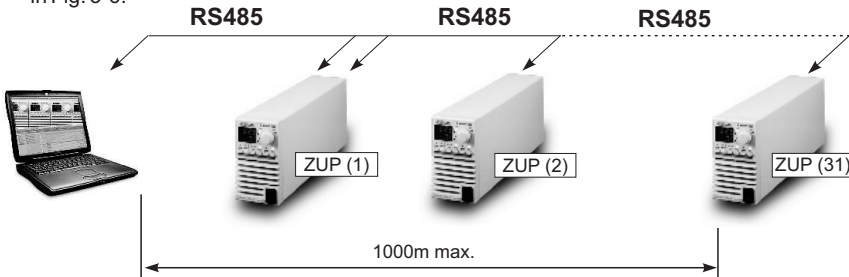


Fig. 5-6: Linking ZUP units to RS485 control.

5.4.2 RS485 cable (PC to ZUP) - NC402

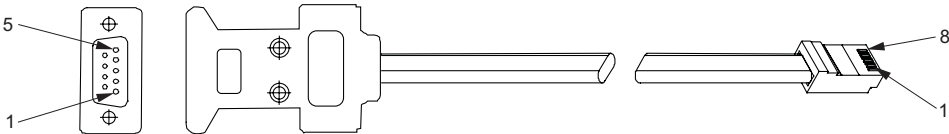


Fig. 5-7: RS485 cable with DB-9 female connector.

DB-9 CONNECTOR		8 PIN CONNECTOR		REMARKS
PIN NO.	NAME	PIN NO.	NAME	
HOUSING	SHIELD	HOUSING	SHIELD	
9	TXD -	6	RXD -	TWISTED PAIR
8	TXD +	8	RXD +	
1	SG	5	SG	
5	RXD -	2	TXD -	TWISTED PAIR
4	RXD +	4	TXD +	

5.4.3 Linking power supplies

Power supplies are linked in the same way as described in par. 5.3.4.

5.5 ZUP SERIES COMMAND SET DESCRIPTION

The ZUP command set is divided into four categories as follows:

1. Initialization Control
2. ID Control
3. Output Control
4. Status Control

The commands structure, syntax, and registers definition are described in this paragraph as listed above.

5.5.1 Initialization control

#	Commands	Description
1	:ADRN;	Sets the power supply address. ADR is followed by the address which can be 01 to 31.
2	:DCL;	Clears the communication buffer and the following registers: 1. Operational status register 2. Alarm (fault) status register 3. Programming error register
3	:RMTn;	Sets the power supply to local or remote mode. (This command is active when the unit is either in Local or Remote modes). Transition from Local to Remote mode is made via the front panel only. :RMT0; Transition from Remote to Local mode. :RMT1; Transition from latched Remote to non-latched Remote. :RMT2; Latched remote: Transition back to Local mode or to non-latched Remote can be made via the serial port (RS232/485). At this mode, the front panel Local/Rem function is disabled. Escape from this mode to non-latched remote mode can be made by turning the AC ON/OFF to OFF and after approx. 10sec. to ON again.
4	:RMT?;	Returns the remote/local setting. The returned data is an ASCII string. RM1 (The unit is in remote mode) RM2 (The unit is in latched remote mode)

5.5.2 ID control commands

#	Commands	Description
1	:MDL?;	Returns the power supply model identification as an ASCII string: Nemic-Lambda ZUP(XXV)-(YYA). XX - The rated output voltage YY - The rated output current example: Nemic-Lambda ZUP(6V-33A)
2	:REV?;	Returns the software version as an ASCII string: Ver XX-YY A.B XX- The rated output voltage YY- The rated output current A.B- Version identifier example: Ver 6-33 1.0

5.5.3 Output control

#	Commands	Description																																																												
1	:VOLn;	<p>Sets the output voltage value in volts. This programmed voltage is the actual output at constant-voltage mode or the voltage limit at constant current mode. The range of the voltage values are as shown in table 5-1.</p> <p>Use all digits for voltage programming</p> <table border="1"> <thead> <tr> <th>Model</th><th>MIN.</th><th>MAX.</th></tr> </thead> <tbody> <tr> <td>ZUP6-XY</td><td>0.000</td><td>6.000</td></tr> <tr> <td>ZUP10-XY</td><td>00.000</td><td>10.000</td></tr> <tr> <td>ZUP20-XY</td><td>00.000</td><td>20.000</td></tr> <tr> <td>ZUP36-XY</td><td>00.00</td><td>36.00</td></tr> <tr> <td>ZUP60-XY</td><td>00.00</td><td>60.00</td></tr> <tr> <td>ZUP80-XY</td><td>00.00</td><td>80.00</td></tr> <tr> <td>ZUP120-XY</td><td>000.00</td><td>120.00</td></tr> </tbody> </table> <p>Note: The ZUP can accept programmed value higher by up to 5% than the table values, however it is not recommended to program power supply over the rated voltage.</p> <p>Table 5-1: Voltage programming range.</p> <p>Example - ZUP6-XY :VOL5.010; ZUP10-XY :VOL08.500;</p>	Model	MIN.	MAX.	ZUP6-XY	0.000	6.000	ZUP10-XY	00.000	10.000	ZUP20-XY	00.000	20.000	ZUP36-XY	00.00	36.00	ZUP60-XY	00.00	60.00	ZUP80-XY	00.00	80.00	ZUP120-XY	000.00	120.00																																				
Model	MIN.	MAX.																																																												
ZUP6-XY	0.000	6.000																																																												
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ZUP80-XY	00.00	80.00																																																												
ZUP120-XY	000.00	120.00																																																												
2	:VOLi;	<p>Returns the string SV(Set Voltage) followed by the present programmed output voltage value. The actual voltage range is as shown in table 5-1.</p> <p>example: SV5.010 SV08.500</p>																																																												
3	:VOL?;	<p>Returns the string AV(Actual Voltage) followed by the actual output voltage. The actual voltage range is the same as the programming range.</p> <p>example: AV5.010 AV08.500</p>																																																												
4	:CURn;	<p>Sets the output current in Amperes. This programmed current is the actual output current at constant-current mode or the current limit at constant voltage mode. The programming range is shown in table 5-2:</p> <p>Use all digits for current programming.</p> <table border="1"> <thead> <tr> <th>Model</th><th>MIN.</th><th>MAX.</th></tr> </thead> <tbody> <tr> <td>ZUP6-33</td><td>00.00</td><td>33.00</td></tr> <tr> <td>ZUP6-66</td><td>00.00</td><td>66.00</td></tr> <tr> <td>ZUP6-132</td><td>000.00</td><td>132.00</td></tr> <tr> <td>ZUP10-20</td><td>00.000</td><td>20.000</td></tr> <tr> <td>ZUP10-40</td><td>00.00</td><td>40.00</td></tr> <tr> <td>ZUP10-80</td><td>00.00</td><td>80.00</td></tr> <tr> <td>ZUP20-10</td><td>00.000</td><td>10.000</td></tr> <tr> <td>ZUP20-20</td><td>00.000</td><td>20.000</td></tr> <tr> <td>ZUP20-40</td><td>00.00</td><td>40.00</td></tr> <tr> <td>ZUP36-6</td><td>0.000</td><td>6.000</td></tr> <tr> <td>ZUP36-12</td><td>00.000</td><td>12.000</td></tr> <tr> <td>ZUP36-24</td><td>00.000</td><td>24.000</td></tr> <tr> <td>ZUP60-3.5</td><td>0.000</td><td>3.500</td></tr> <tr> <td>ZUP60-7</td><td>0.000</td><td>7.000</td></tr> <tr> <td>ZUP60-14</td><td>00.000</td><td>14.000</td></tr> <tr> <td>ZUP80-2.5</td><td>0.0000</td><td>2.5000</td></tr> <tr> <td>ZUP80-5</td><td>0.000</td><td>5.000</td></tr> <tr> <td>ZUP120-1.8</td><td>0.0000</td><td>1.8000</td></tr> <tr> <td>ZUP120-3.6</td><td>0.000</td><td>3.600</td></tr> </tbody> </table> <p>Note: The ZUP can accept values higher by 5% than the rating. It is recommended to set the output current to 105% of the rating if the unit is required to supply the rated current.</p> <p>Table 5-2: Current programming range.</p> <p>Example - ZUP60-3.5 :CUR3.000; ZUP10-40 :CUR07.50;</p>	Model	MIN.	MAX.	ZUP6-33	00.00	33.00	ZUP6-66	00.00	66.00	ZUP6-132	000.00	132.00	ZUP10-20	00.000	20.000	ZUP10-40	00.00	40.00	ZUP10-80	00.00	80.00	ZUP20-10	00.000	10.000	ZUP20-20	00.000	20.000	ZUP20-40	00.00	40.00	ZUP36-6	0.000	6.000	ZUP36-12	00.000	12.000	ZUP36-24	00.000	24.000	ZUP60-3.5	0.000	3.500	ZUP60-7	0.000	7.000	ZUP60-14	00.000	14.000	ZUP80-2.5	0.0000	2.5000	ZUP80-5	0.000	5.000	ZUP120-1.8	0.0000	1.8000	ZUP120-3.6	0.000	3.600
Model	MIN.	MAX.																																																												
ZUP6-33	00.00	33.00																																																												
ZUP6-66	00.00	66.00																																																												
ZUP6-132	000.00	132.00																																																												
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ZUP20-20	00.000	20.000																																																												
ZUP20-40	00.00	40.00																																																												
ZUP36-6	0.000	6.000																																																												
ZUP36-12	00.000	12.000																																																												
ZUP36-24	00.000	24.000																																																												
ZUP60-3.5	0.000	3.500																																																												
ZUP60-7	0.000	7.000																																																												
ZUP60-14	00.000	14.000																																																												
ZUP80-2.5	0.0000	2.5000																																																												
ZUP80-5	0.000	5.000																																																												
ZUP120-1.8	0.0000	1.8000																																																												
ZUP120-3.6	0.000	3.600																																																												

5.5.3 Output control continued

#	Commands	Description																								
5	:CUR!;	Returns the string SA (Set Amper) followed by the present programmed output current. The programmed value range is shown in table 5-2. example- SA3.000 SA07.50																								
6	:CUR?;	Returns the string AA (Actual Amper) followed by the actual output current. The actual current range is the same as the programming range. example- AA3.000 AA07.50																								
7	:OUTn;	Sets the output to On or Off. :OUT1; - Output On :OUT0; - Output Off																								
8	:OUT?;	Returns OT followed by the output On/Off status. OT1 - Output is On OT0 - Output is Off																								
9	:FLDn;	Sets the Foldback protection to On or Off. :FLD1; Arm the foldback protection. :FLD0; Release the foldback protection. :FLD2; Cancel the foldback protection. When the foldback protection is activated, :FLD0; will release the protection and re-arm it while :FLD2; will cancel the protection. If the protection has not been activated, both commands are the same.																								
10	:FLD?;	Returns FD followed by the Foldback protection status. FD1 - Foldback is armed FD0 - Foldback is released																								
11	:OVFn;	<p>Sets the over-voltage protection level in volts. Over-voltage range settings are given in table 5-3:</p> <table border="1"> <thead> <tr> <th>Model</th><th>MIN.</th><th>MAX.</th></tr> </thead> <tbody> <tr> <td>ZUP6-XY</td><td>0.20</td><td>7.50</td></tr> <tr> <td>ZUP10-XY</td><td>00.5</td><td>13.0</td></tr> <tr> <td>ZUP20-XY</td><td>01.0</td><td>24.0</td></tr> <tr> <td>ZUP36-XY</td><td>01.8</td><td>40.0</td></tr> <tr> <td>ZUP60-XY</td><td>03.0</td><td>66.0</td></tr> <tr> <td>ZUP80-XY</td><td>04.0</td><td>88.0</td></tr> <tr> <td>ZUP120-XY</td><td>006.0</td><td>132.0</td></tr> </tbody> </table> <p>Table 5-3: Over-voltage programming range. Example - ZUP10-XY :OVP08.4;</p>	Model	MIN.	MAX.	ZUP6-XY	0.20	7.50	ZUP10-XY	00.5	13.0	ZUP20-XY	01.0	24.0	ZUP36-XY	01.8	40.0	ZUP60-XY	03.0	66.0	ZUP80-XY	04.0	88.0	ZUP120-XY	006.0	132.0
Model	MIN.	MAX.																								
ZUP6-XY	0.20	7.50																								
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ZUP36-XY	01.8	40.0																								
ZUP60-XY	03.0	66.0																								
ZUP80-XY	04.0	88.0																								
ZUP120-XY	006.0	132.0																								
12	:OVP?;	Returns the string OP followed by the present programmed over-voltage protection value. The over-voltage range is given in table 5-3. Example- OP08.4																								

5.5.3 Output control continued

#	Commands	Description																								
13	:UVPn;	<p>Sets the under-voltage protection limits in volts. Under-voltage range settings are given in table 5-4:</p> <table border="1"> <thead> <tr> <th>Model</th><th>MIN.</th><th>MAX.</th></tr> </thead> <tbody> <tr> <td>ZUP6-XY</td><td>0.00</td><td>5.98</td></tr> <tr> <td>ZUP10-XY</td><td>0.00</td><td>9.97</td></tr> <tr> <td>ZUP20-XY</td><td>00.0</td><td>19.9</td></tr> <tr> <td>ZUP36-XY</td><td>00.0</td><td>35.9</td></tr> <tr> <td>ZUP60-XY</td><td>00.0</td><td>59.8</td></tr> <tr> <td>ZUP80-XY</td><td>00.0</td><td>79.8</td></tr> <tr> <td>ZUP120-XY</td><td>000.0</td><td>119.8</td></tr> </tbody> </table> <p>Table 5-4: Under-voltage programming range.</p> <p>Example - ZUP20-XY :UVP07.3;</p>	Model	MIN.	MAX.	ZUP6-XY	0.00	5.98	ZUP10-XY	0.00	9.97	ZUP20-XY	00.0	19.9	ZUP36-XY	00.0	35.9	ZUP60-XY	00.0	59.8	ZUP80-XY	00.0	79.8	ZUP120-XY	000.0	119.8
Model	MIN.	MAX.																								
ZUP6-XY	0.00	5.98																								
ZUP10-XY	0.00	9.97																								
ZUP20-XY	00.0	19.9																								
ZUP36-XY	00.0	35.9																								
ZUP60-XY	00.0	59.8																								
ZUP80-XY	00.0	79.8																								
ZUP120-XY	000.0	119.8																								
14	:UVP?;	<p>Returns the string UP followed by the present programmed under-voltage protection value. The under-voltage range is given in table 5-4.</p> <p>example- UP07.3</p>																								
15	:ASTn;	<p>Sets the auto-restart mode to On or Off.</p> <p>:AST1; -Auto-restart is On</p> <p>:AST0; -Auto-restart is Off</p>																								
16	:AST?;	<p>Returns the string AS followed by the auto-restart mode status.</p> <p>AS1 - Auto-restart is ON</p> <p>AS0 - Auto-restart is Off</p>																								

5.5.4 Status control

5.5.4.1 Registers structure

1. Operational Status Register:

The operational status register records signals that are part of the power supply's normal operation. In addition to the normal operation data, the register holds an alarm bit which indicates that one of the alarm (fault) register bits is set. The register is automatically updated and reading it does not change it's content. Clearing the register is done by DCL command. See table 5-5 for Operational Status Register content.

Bit Name	Bit No	Meaning
cc/cv	1	'0' - Indicates constant voltage, '1' - constant current.
fold	2	'1' - Indicates foldback protection is armed.
ast	3	'1' - Indicates auto-restart is on, '0' - auto-restart is off.
out	4	'1' - Indicates output is on , '0' -output is off.
srf	5	'0' - Indicates foldback protection SRQ is disabled , '1' - enabled.
srv	6	'0' - Indicates over voltage protection SRQ is disabled , '1' - enabled.
srt	7	'0' - Indicates over temp. protection SRQ is disabled , '1' - enabled.
alarm	8	'1' - Indicates that an alarm register bit is set. (note*1)

Table 5-5: Operational status register content.

Note:

*1 In case of AC fail, the alarm status register 'AC fail' bit will be set but will not set the alarm bit.

2. Alarm Status Register:

The alarm status register records fault conditions occurring during power supply operation. Any set bit in this register causes the 'alarm' bit in the operational status register to be set. Reading the register does not change it's content. The register is cleared by :DCL; command.

Bit Name	Bit No	Meaning
ovp	1	'1' - Indicates that the over-voltage protection was tripped (*3)
otp	2	'1' - Indicates that the over-temperature protection was tripped (*3)
a/c fail	3	'1' - Indicates that a failure occurred at the input voltage supply (*1)
fold	4	'1' - Indicates that the foldback protection was activated (*2)
prog	5	'1' - Indicates a programming error has occurred (*3)

Table 5-6: Alarm status register content.

Notes: (*1) Since at each AC turn off the AC fail bit is generated and stored, it is recommended to send a :DCL; command following application of AC voltage to the power supply, to clear the alarm status register.

(*2) FOLD bit is automatically reset upon cancellation of FOLD protection.

(*3) OVP, OTP and 'prog' bits reset at AC turn-off or by :DCL; command.

In case the OTP or OVP is triggered, the front panel control is disabled until the AC input is recycled by turning the AC ON/OFF switch to OFF and after approx. 10 sec. to ON.

3. Error Codes Register:

The error codes register records errors that occurred during the programming of the power supply. Any set bit in this register causes the 'prog' bit in the alarm status register to be set. Reading the register does not change it's content. The register is cleared by :DCL; command.

Bit Name	Bit No	Meaning
not used	1	
wrong command	2	'1' - Indicates that an unknown string was received
buffer overflow	3	'1' - Indicates an overflow in the communication buffer
wrong voltage	4	'1' - Indicates an attempt to program the power supply to a voltage out of specification limits.
wrong current	5	'1' - Indicates an attempt to program the power supply to a current out of specification limits.

Table 5-7: Error codes register content.

5.5.4.2 Status control commands

#	Commands	Description
1	:STA?;	Reads the operational status register content. Returns the string OS followed by ASCII characters representing the register's content. Refer to table 5-5 for the register content description. example- OS00010000
2	:ALM?;	Reads the alarm status register content. Returns the string AL followed by ASCII characters representing the register's content. Refer to table 5-6 for the register content description. example- AL00000

5.5.4.2 Status control commands continued

#	Commands	Description
3	:STP?;	Reads the programming error register content. Returns the string PS followed by ASCII characters representing the register's content. Refer to table 5-7 for the register content description. example- PS00000
4	:STT?;	Reads the complete status of the power supply. This query returns ASCII characters representing the following data: AV<actual voltage > SV<voltage setting> AA<actual current> SA<current setting> OS<operational status register> AL<alarm status register> PS<programming error register> example: AV5.010SV5.010AA00.00SA24.31OS00010000AL00000PS00000

5.6 COMMUNICATION PROTOCOL

5.6.1 General Information

The average command processing time of the ZUP Series is 15mSec. It is not recommended to send strings of commands to the ZUP power supply without considering the processing time.
For query commands (? , !) , wait until the ZUP reply message has been completed , before sending a new command.

5.6.2 Accessing a ZUP Unit

The default condition of the ZUP series is Listen mode. In order to access a ZUP unit, for sending a command or query, the address of that unit should be sent by the host controller (:ADRN;). The ZUP that recognizes it's address becomes active and can communicate with the host controller. The other units remain in Listen mode, waiting to receive their address. To access another unit, the controller should send the address of that unit. The previously active unit changes it's state to Listen mode and the addressed unit becomes active.

5.6.3 End of Message

The messages generated by the ZUP are terminated by an end of message:
<CR> carriage return character
<LF> line feed character

When sending a message to the ZUP, there is no need for the end of message characters.

5.6.4. COMMUNICATION TEST SET UP

- 1. Equipment :** PC with Windows HyperTerminal Private Edition software installed , ZUP Power Supply , RS232 cable (NC401 when the PC uses DB-9 or NC403 when the PC uses DB-25 connector).

- ## 2. PC Set Up :

2.2 Enter a name

2.3 Connect to..... Direct to Com1 or Com2

2.4 Set the Port Properties as follows:

Bits per second..... 9600

Data bits..... 8

Parity..... None

Stop bits..... 1

Flow control..... Xon/Xoff

2.5 Open Properties in the program:

File:..... Properties

2.6 Setting: ASCII Set Up

select Echo characters locally

2.7 Press [Caps Lock] for capital letters

- 3. ZUP Set Up**
- 3.1** Connect ZUP Power Supply to the PC using RS232 cable (NC401 or NC403)
- 3.2** Set via the front panel: Baud Rate 9600, RS232/RS485 to RS232, address:01
- 3.3** Set Rem/Local to Rem (Rem LED illuminates)

- 4. Communication 4.1** Model identification test:
test PC

```
PC: write      :ADR01::MDL?;
ZUP response:  Nemico-Lambda<XXV-YYA>
```

4.2 Command test:

PC: write: :OUT1; :VOLn; :CURn; (for n refer 5.5.3)

The ZUP output should turn on and display will show the output voltage and actual output current.

ATTENTION: Do not use Backspace, Enter, Ctrl or Alt keys.
If an error was made during writing , press “:” and write again the command.

5.7 SERVICE REQUEST

5.7.1 Service Request (SRQ)

Service request is a message generated by the ZUP power supply to interrupt the controller. SRQ can be generated by a power supply fault condition.

Each of the following conditions can generate SRQ message:

1. Over Voltage Protection (OVP).
2. Over Temperature Protection (OTP).
3. Foldback Protection.

The operator decides which of the conditions are defined as faults. Enabling or disabling a condition from generating SRQ message does not affect the condition within the power supply.

5.7.2 Service Request message

The service request message consists of three characters terminated by EOS<CR><LF>.

The first character identifies the SRQ cause: 1-Foldback , 2-OVP , 3-OTP.

The 2'nd and 3'rd characters identify the ZUP power supply address.

Example: String generated by a ZUP unit :120<CR><LF> , means foldback protection was activated in power supply address 20.

5.7.3. Service request enable/disable commands

#	Command	Description
1	:SRVn;	Enable or disable OVP service request. :SRV1; Enable OVP service request. :SRV0; Disable OVP service request.
2	:SRV?;	Returns QV followed by the OVP service request status. :QV1; OVP service request enabled. :QV0; OVP service request disabled.
3	:SRTn;	Enable or disable OTP service request. :SRT1; Enable OTP service request. :SRT0; Disable OTP service request.
4	:SRT?;	Returns QT followed by the OTP service request status. :QT1; OTP service request enabled. :QT0; OTP service request disabled.
5	:SRFn;	Enable or disable Foldback protection service request. :SRF1; Enable Foldback protection service request. :SRF0; Disable Foldback protection service request.
6	:SRF?;	Returns QF followed by the Foldback protection service request status :QF1; Foldback protection service request enabled. :QF0; Foldback protection service request disabled.