

Introduction of RS232 Communication Interface for Digital Power Supply(DPS-4005)

DPS-4005 supports RS232 communication interface. Through RS232 interface, you could control voltage, limited current, output relay, etc. Also, you could monitor, control and record this power supply and loading status in order to make your experiment more easy and more accurate.

I. Hardware Interface

Communication protocol is as below :

Baud Rate	2400 bps
Data Length	8 bit
Stop Bit	1 bit
Parity	None

Hardware connection interface between DPS-4005 & control unit(host) is as listed :

<u>Computer or other control unit</u>	<u>DPS-4005 (9 pin D-type connector)</u>
RX ←	-----TX (Pin 9)
TX	-----→RX (Pin 6)
GND	-----→GND (Pin 7)
+12V (Note*)	-----→V (Pin 1)

- Note* : The RS232 of the power supply is completely isolated safety design, so the power of RX signal must be provided. If the host is computer, you could short-circuit Pin 4 & Pin 6 of 9-Pin D-type connector and Pin 7 & Pin 8. And then connect Pin 4 to Pin 1(V) which should be +12V. If it's not +12V, computer could send out the Handshake signal of RTS alternatively.

II. Software Command Format

DPS-4005 provides 25 commands. Every command is ended by <cr> (ASCII 0Dh or ASCII 0D 0A). The response of <cr> from the power supply is CR/LF(ASCII 0D 0A).

25 commands are listed as below :

Command : L

Function : Catch all status value of power supply

Syntax: L<cr> HEX = 4C 0D

Description: While the computer send L<cr> to the power supply, the power supply will return back the following word string :

Vvv.vvAa.aaaWwww.wUuuIi.iiPpppFfffff 37 words(include decimal) totally.

vv.vv = output voltage, dimension is Volt(V)

a.aaa = output current, dimension is Ampere(A)

www.w = output power, dimension is watt(W)

uu = output voltage limit, dimension is Volt(V)

ii.ii = output current limit, dimension is Ampere(A)

ppp = output power limit, dimension is Watt(W)

fffff = status of power supply

1'st f =status of Relay

0 : OFF 1 : ON

2'nd f =status of Over Temperature

0 : Normal 1 : Over Temp.

3'th f =status of Flying Wheel

0 : Normal 1 : Fine

4'th f =status of Flying Wheel

0 : Unlock 1 : lock

5'th f =status of Remote

0 : Normal 1 : Remote (Note*)

6'th f =status of Lock

0 : Unlock 1 : Lock

Note* : When Remote = 1, computer can make setting.

When Capital letter U changes to small letter u, it stands for Output Voltage Limit Setting mode.

When Capital letter I changes to small letter i, it stands for Output Current Limit Setting mode.

When Capital letter P changes to small letter p, it stands for Output Power Limit Setting mode.

Example : The following word string is return back from power supply

V20.00A2.500W050.0U40I5.00P200F101000<cr>

V20.00 stand for the output voltage is 20.00 V
A2.500 stand for the output current is 2.500 A
W050.0 stand for the output power is 50.0 W
U40 stand for the output voltage limit is 40 V
I5.00 stand for the output current limit is 5.00 A
P200 stand for the output power limit is 200 W

F101000

+	Unlock mode
+	Not in Remote mode
+	Flying Wheel is in Unlock mode
+	Flying Wheel is in Fine mode
+	Not Over Temperature
+	Relay ON

Command : V

Function : Output voltage, dimension is Volt(V)

Syntax: V<cr> HEX = 56 0D

Description: While the computer send V<cr> to the power supply, the power supply will return back the following word string :

Vvv.vv<cr> 6 words(include decimal) totally + CR/LF

vv.vv = output voltage, dimension is Volt(V)

Command : A

Function : Output current, dimension is Ampere(A)

Syntax: A<cr> HEX = 41 0D

Description: While the computer send A<cr> to the power supply, the power supply will return back the following word string :

Aa.aaa<cr> 6 words(include decimal) totally + CR/LF

a.aaa = output current, dimension is Ampere(A)

Command : W

Function : Output power, dimension is Watt(V)

Syntax: W<cr> HEX = 57 0D

Description: While the computer send W<cr> to the power supply, the power supply will return back the following word string :

Wwww.w<cr> 6 words(include decimal) totally + CR/LF

Wwww.w = output power, dimension is Watt(V)

Command : U

Function : Output voltage limit, dimension is Volt(V)

Syntax: U<cr> HEX = 55 0D

Description: While the computer send U<cr> to the power supply, the power supply will return back the following word string :

Uuu<cr> 3 words totally + CR/LF

uu = output voltage limit, dimension is Volt(V)

When Capital letter U changes to small letter u, it stands for Output Voltage Limit Setting mode.

Command : I

Function : Output current limit, dimension is Ampere(A)

Syntax: I<cr> HEX = 49 0D

Description: While the computer send I<cr> to the power supply, the power supply will return back the following word string :

Ii.ii<cr> 5 words(include decimal) totally + CR/LF

i.ii = output current limit, dimension is Ampere(A)

When Capital letter I changes to small letter i, it stands for Output Current Limit Setting mode.

Command : P

Function : Output power limit, dimension is Watt(W)

Syntax: P<cr> HEX = 50 0D

Description: While the computer send P<cr> to the power supply, the power supply will return back the following word string :

Pppp<cr> 4 words totally + CR/LF

ppp = output power limit, dimension is Watt(W)

When Capital letter P changes to small letter p, it stands for Output Power Limit Setting mode.

Command : F

Function : Catch status value of power supply

Syntax: F<cr> HEX = 46 0D

Description: While the computer send F<cr> to the power supply, the power supply will return back the following word string :

Ffffff<cr> 7 words totally + CR/LF

ffffff = status of power supply

1'st f =status of Relay	0 : OFF	1 : ON
2'nd f =status of Over Temperature	0 : Normal	1 : Over Temp.
3'th f =status of Flying Wheel	0 : Normal	1 : Fine
4'th f =status of Flying Wheel	0 : Unlock	1 : lock
5'th f =status of Remote	0 : Normal	1 : Remote (Note*)
6'th f =status of Lock	0 : Unlock	1 : Lock

Note* : When Remote = 1, computer can make setting.

Command : SV+

Function : Increase one dimension of output voltage setting

Syntax: SV+<cr> HEX = 53 56 2B 0D

Description: While the computer send SV+<cr> to the power supply, the output voltage setting of power supply will be increased one dimension immediately.

Example :

Assume Flying Wheel mode is Normal and the output voltage is 20.00 V. While the computer send SV+<cr> to the power supply, the output voltage setting become 21.00 V.

Command : SV-

Function : Decrease one dimension of output voltage setting

Syntax: SV-<cr> HEX = 53 56 2D 0D

Description: While the computer send SV-<cr> to the power supply, the output voltage setting of power supply will be decreased one dimension immediately.

Example :

Assume Flying Wheel mode is Normal and the output voltage is 20.00 V. While the computer send SV-<cr> to the power supply, the output voltage setting become 19.00 V.

Command : SU+

Function : Increase one dimension of output voltage limit setting

Syntax: SU+<cr> HEX = 53 55 2B 0D

Description: While the computer send SU+<cr> to the power supply, the output voltage limit setting of power supply will be increased one dimension immediately.

Example :

Assume Flying Wheel mode is Normal and the output voltage limit is 30.00 V. While the computer send SU+<cr> to the power supply, the output voltage limit setting become 31.00 V.

Command : SU-

Function : Decrease one dimension of output voltage limit setting

Syntax: SU-<cr> HEX = 53 55 2D 0D

Description: While the computer send SU-<cr> to the power supply, the output voltage limit setting of power supply will be decreased one dimension immediately.

Example :

Assume Flying Wheel mode is Normal and the output voltage limit is 30.00 V. While the computer send SU-<cr> to the power supply, the output voltage limit setting become 29.00 V.

Command : SI+

Function : Increase one dimension of output current limit setting

Syntax: SI+<cr> HEX = 53 49 2B 0D

Description: While the computer send SI+<cr> to the power supply, the output current limit setting of power supply will be increased one dimension immediately.

Example :

Assume Flying Wheel mode is Normal and the output current limit is 3.00 A. While the computer send SI+<cr> to the power supply, the output current limit setting become 3.10 A.

Command : SI-

Function : Decrease one dimension of output current limit setting

Syntax: SI-<cr> HEX = 53 49 2D 0D

Description: While the computer send SI-<cr> to the power supply, the output current limit setting of power supply will be decreased one dimension immediately.

Example :

Assume Flying Wheel mode is Normal and the output current limit is 3.00 A. While the computer send SI-<cr> to the power supply, the output current limit setting become 2.90 A.

Command : SP+

Function : Increase one dimension of output power limit setting

Syntax: SP+<cr> HEX = 53 50 2B 0D

Description: While the computer send SP+<cr> to the power supply, the output power limit setting of power supply will be increased one dimension immediately.

Example :

Assume Flying Wheel mode is Normal and the output power limit is 100 W. While the computer send SP+<cr> to the power supply, the output power limit setting become 101 W.

Command : SP-

Function : Decrease one dimension of output power limit setting

Syntax: SP-<cr> HEX = 53 50 2D 0D

Description: While the computer send SP-<cr> to the power supply, the output

power limit setting of power supply will be decreased one dimension immediately.

Example :

Assume Flying Wheel mode is Normal and the output power limit is 100 W. While the computer send SP-<cr> to the power supply, the output power limit setting become 099 W.

Command : SUM

Function : Setting the output voltage limit maximum

Syntax: SUM<cr> HEX = 53 55 4D 0D

Description: While the computer send SUM<cr> to the power supply, the output voltage limit setting of power supply will be set maximum(40 V) immediately.

Example :

Assume the output voltage limit is 20.00 V. While the computer send SUM<cr> to the power supply, the output voltage limit setting become 40.00 V.

Command : SIM

Function : Setting the output current limit maximum

Syntax: SIM<cr> HEX = 53 49 4D 0D

Description: While the computer send SIM<cr> to the power supply, the output current limit setting of power supply will be set maximum(5.10 A) immediately.

Example :

Assume the output current limit is 2.40 A. While the computer send SIM<cr> to the power supply, the output current limit setting become 5.10 A.

Command : SPM

Function : Setting the output power limit maximum

Syntax: SPM<cr> HEX = 53 50 4D 0D

Description: While the computer send SPM<cr> to the power supply, the output power limit setting of power supply will be set maximum(204 W) immediately.

Example :

Assume the output power limit is 100 W. While the computer send SPM<cr> to the power supply, the output voltage limit setting become 204 W.

Command : KF

Function : Setting Flying Wheel mode be Fine mode

Syntax: KF<cr> HEX = 4B 46 0D

Description: While the computer send KF<cr> to the power supply, the Flying Wheel mode will be set Fine mode immediately.

Command : KN

Function : Setting Flying Wheel mode be Normal mode

Syntax: KN<cr> HEX = 4B 4E 0D

Description: While the computer send KN<cr> to the power supply, the Flying Wheel mode will be set Normal mode immediately.

Command : KO

Function : Make the status of Relay opposite

Syntax: KO<cr> HEX = 4B 4F 0D

Description: While the computer send KO<cr> to the power supply, the status of Relay will be opposite immediately.

Example :

Assume the status of Relay is OFF. While the computer send KO<cr> to the power supply, the status will be changed to be ON. If this command is sent to power supply again, the status will be changed to be OFF accordingly.

Command : KOE

Function : Setting the status of Relay ON

Syntax: KOE<cr> HEX = 4B 4F 45 0D

Description: While the computer send KOE<cr> to the power supply, the status of Relay will be set ON immediately no matter what it is.

Command : KOD

Function : Setting the status of Relay OFF

Syntax: KOD<cr> HEX = 4B 4F 44 0D

Description: While the computer send KOD<cr> to the power supply, the status of Relay will be set OFF immediately no matter what it is.

Command : EEP

Function : Save setting value to EEPROM

Syntax: EEP<cr> HEX = 45 45 50 0D

Description: While the computer send KOE<cr> to the power supply, all setting value will be saved in EEPROM immediately.