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Installation of USB Driver:

1. Connect USB cable to PS3005D power supply USB interface and computer USB interface; switch on and in a few seconds dialogue box "Found new hardware wizard" will come out from Windows system (see figure 1 below). If this still doesn't come out, please check whether USB cable is connected correctly or not, whether programmable power supply works well or not. If connection and working are both good, please restart PC and power supply to check if the malfunction can be removed.



Figure 1: When connecting power supply and PC with USB cable, dialogue box "Found new hardware wizard" will come out.



2. In the interface of figure 1, please select the first one "Yes, this time only", and then click next> to enter figure 2 (see below); at this time, select the second choice and then enter the interface of figure 3.



Figure 2

3. In figure 3, please select "Search for the best driver in these locations" and "include this location in the search", and then choose the route of USB driver file. If USB driver is installed through the provided CD, please select as what figure 3 shows:



Found New Hardware Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM)
✓ Include this location in the search:
G:\USB driver 🛛 Browse
O Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< Back Next > Cancel

Figure 3

4. Something like Microsoft driver verification may come out from the system; if so, please click "Continue Anyway" (see figure 4), and after that, the system will start to install USB driver (see figure 5).

Found Nev	v Hardware Wizard	
Please v	Hardware Installation	
	The software you are installing for this hardware: Nuvoton Virtual Com Port	
2	has not passed Windows Logo testing to verify its compatibility with Windows XP. (<u>Tell me why this testing is important</u>) Continuing your installation of this software may impair or destabilize the correct operation of your system either impediately or in the future. Miscrest system either	
	that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.	
	Continue Anyway STOP Installation	
	< Back Next > Canc	el

Figure 4



Found New Hardware Wizard	
Please wait while the wizard installs the software	
Nuvoton Virtual Com Port	
usbser.sys To C:\WINDOWS\system32\DRIVERS	
<back next=""></back>	Cancel

Figure 5. USB driver is being installed

5. When USB driver is installed well, the completing interface from the system as below will come out (see figure 6).

Found New Hardware Wizar	d		
	Completing the Found New Hardware Wizard		
	The wizard has finished installing the software for:		
	Nuvoton Virtual Com Port		
	Click Finish to close the wizard.		
	< Back Finish Cancel		

Figure 6



6. After USB successfully, driver is installed there will be Nuvoton Virtual Com Port (COM3) coming out in the menu ports (COM&LPT) of Computer Management of My Computer, which means the installation is completed (see figure 7).



Figure 7 The hardware driver icon you will see in the interface of PC Computer Management after USB driver is installed well.

Note: in the icon

Nuvoton Virtual Com Port (COM3)

, please note (COMX);

if the value of X is more than 8, please change into ≤ 8 .



72-13300 Series Multiple Channel Remote Control Syntax V4.0

Command format: VSET<X>:<NR2>

- 1. VSET: command header
- 2. X: output channel, 1or 2
- 3.: separator
- 4. NR1: parameter

Command Details:

1. LOCK<NR1>

Description: LOCK or UNLOCK the front panel Example: LOCK1 LOCK the front panel

Example: LOCK0

UNLOCK the front panel

2. ISET<X>:<NR2>

Description: sets the output current. Example: ISET1:2.225 Sets the CH1 output current to 2.225A

3. ISET<X>?

Description: Returns the output current setting. Example: ISET1? Returns the CH1 output current setting.

4. VSET<X>:<NR2>

Description: Sets the output voltage.

Example: VSET1:20.50

Sets the CH1 voltage to 20.50V

5. VSET<X>?

Description: Returns the output voltage setting. Example: **VSET1?**

Returns the CH1 voltage setting.

6. IOUT<X>?

Description: Returns the actual output current. Example: IOUT1? Returns the CH1 output current



7. VOUT<X>?

Description: Returns the actual output voltage.

Example: VOUT1?

Returns the CH1 output voltage.

8. TRACK<NR1>

Description: selects the operation mode: independent, trackingseries, or tracking parallel.

NR1 0: Independent

1: Tracking series

2: Tracking parallel

Example: TRACK0

Selects the independent mode.

Note: This command is applied to Multiplel-channel models only.

9. BEEP<Boolean>

Description: Turns on or off the beep. Boolean: boolean logic.

Example: **BEEP1** Turns on the beep.

10. STATUS?

Description: Returns the POWER SUPPLY status.

Contents 8 bits in the following format

Bit Item Description

0 CH1 0=CC mode, 1=CV mode

1 CH2 0=CC mode, 1=CV mode

2, 3 Tracking 00=Independent, 01=Tracking series, 10=Tracking parallel

6 CH1 0 CH1 OUT OFF, 1CH1 OUT ON

7 CH2 0 CH1 OUT OFF, 1CH1 OUT ON

11. *IDN?

Description: Returns the identification.

Example: *IDN?

Contents TENMA 72-13300 VX.X SN: XXXXXX

12. RCL<NR1>

Description: Recalls a panel setting.

NR1 0-9: Memory number 0 to 9

Example RCL1 Recalls the panel setting stored in memory number 1



13. SAV<NR1>

Description: Stores the panel setting.

NR1 0-9: Memory number 0 to 9

Example: SAV1 Stores the panel setting in memory number 1

14. OUT<X>:<Boolean>

Description: Turns on or off the output.

X:, 10R2, refers to CH1 or CH2

Boolean: 0 OFF, 1 ON

Example: OUT1:1 Turns on the CH1

OUT1:0 Turns on the CH1

OUT2:1 Turns on the CH2

OUT2:0 Turns on the CH2

15. OUT<XX>:<Boolean>

Description: Turns on or off the output.

X: ,CH1 CH2

Boolean: 0 OFF, 1 ON

Example: **OUT12:1** Turns on the CH1 and CH2

OUT12:0 Turns on the CH1 and CH2

16. VASTEP<X>:<NR2>, <NR2>, <NR2>, <NR2>,

VASTOP<X>

Description: Set automatic step voltage output

Example: VASTEP1:1, 30, 0.1, 0.2

Set CH1 starting voltage to 1V, ending voltage 30V, step voltage 0.1V and step time **0.2**s; and execute the output.

VASTOP1

The step voltage on CH1 stops.

VASTEP2:30, 1, 0.1; 0.01

Set CH2 starting voltage to 30V, ending voltage 1V, step voltage 0.1V and step time **0.01**s; and execute the output.

VASTOP2

The step voltage on CH2 stops.

17. VSTEP<X>:<NR2>

VUP<X>

VDOWN<X>



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Description: Set trigger step voltage output Example: **VASTEP 1:1.5** Set CH1 trigger step voltage 1.5V VUP1 Set CH1 voltage up 1.5V VDOWN1 Set CH1 voltage down 1.5V 18. IASTEP<X>:<NR2>, <NR2>, <NR2>, <NR2>, <NR2> IASTOP<X> Description: Set automatic step voltage output Example: IASTEP2:1, 3, 0.1, 1 **OUT1:1** Set CH1 starting current to 1V, ending current 30V, step current 0.1V and step time 1s; and execute the CH1 output. IASTOP2 The step voltage on CH2 stops. 19. ISTEP<X>:<NR2> IUP<X> IDOWN<X> Description: Set trigger step current output Example: **ISTEP 1:0.5** Set CH1 trigger step current 0.5A IUP1 Set CH1 current up 0.5A

IDOWN1 Set CH1 current down 0.5A



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IP LAN Communication Protocol

1. Format of Commands

Definition format Query syntax :SYST:<X>+ ? + CR(0xA) Settings :SYST:<X>+ SPACE(0x20) + < PARAM> + CR(0xA) Comments <X>: Secondary subcommands 1). Set up IP address :SYSTem: IPADdress 192.168.1.199 Sets the IP address to 192.168.1.199. Query syntax :SYSTem: IPADdress? 192.168.1.199 2). Set up subnet mask :SYSTem: SMASK 255.255.255.0 Sets the subnet mask to 255.255.255.0 Query syntax :SYSTem: SMASK? 255.255.255.0 3).Set up the gateway :SYSTem: GATEway 192.168.1.1 Sets the Gateway to 192.168.1.1. Query syntax :SYSTem: GATEway? Return 192.168.1.1 4) Set up DHCP :SYSTem:DHCP {0|1|ON|OFF} :SYSTem: DHCP ON Set DHCP enable Query syntax :SYSTem: DHCP? Returns



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1 5). Obtaining MAC :SYSTem:MAC? Returns 93-47-df-48-48-48 6). Set up Port Port : 1~65535, The port can not set to 18191 ; :SYSTem: PORT 6325 Sets the port to 6325 Query syntax :SYSTem: PORT? returns 6325 7). Set up BAUDrate Baudrate:9600,19200,38400,57600,115200 :SYSTem:BAUDrate 9600 Query syntax :SYSTem:BAUDrate? Returns 9600 8). Query device information (auxiliary debugging commands) :SYST: DEVINFO? Returns DHCP:0 IP:192.168.1.198 NETMASK:255.255.255.0 GW:192.168.1.1 MAC:93-47-df-48-48-48 PORT:18190 BAUDRATE:115200 9). Restore factory default of the interface :SYST: FACTRESET Factory interface status: DHCP: 0 IP: 192.168.1.198 NETMASK: 255.255.255.0 GW: 192.168.1.1 PORT: 18190 BAUDRATE: 115200

2. Connection mode setting

Device default static IP address



IP:	192.168.1.198
NETMASK:	255.255.255.0
GW :	192.168.1.1

<1> Direct access

1) Plug the device through one end of the network cable, and connect the PC to the other end to make the IP address of the PC and the device address on the same network segment.

Such as 192.168.1.xx		
Networking	Internet Protocol Version 4 (TCP/IPv4) Properties	x
Connect using: Realtek PCIe GBE Family Controller #2 Confit This connection uses the following items: Confit This connection uses the following items: Confit C	General You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings. Obtain an IP address automatically Obtain an IP address automatically Use the following IP address: IP address: 192.168.1.191 Subnet mask: Default nateway: 192.168.1.1	
Instal Uninstal Prope Description Transmission Control Protocol/Internet Protocol. The de wide area network protocol that provides communicatio across diverse interconnected networks. OK	Obtain DNS server address automatically Use the following DNS server addresses: Preferred DNS server: Alternate DNS server: Alternate Server: Alternate DNS server: Advanced 	
	OK Cancel	

2). Connected with a switch or router

There are 2 ways to choose: <1> Route Allocation Method (DHCP)

<2> Access through a network device (router)

It can be connected in the following 2 ways

1. DHCP: the route dynamically allocates an address, and the IP address of

the device after each boot is allocated.

2. Use this method to enable DHCP ,

Command format ":SYSTem:DHCP 1",



2 Manual setting: manually fixing the IP address, you must set the IP and routing devices on the same network segment, and can't conflict with other network addresses (Routing device network segment can be viewed through the local network, or ask the network administrator).

For example, the current LAN segment IP is as follows:

IP: 1	0.10.1.32		
Subnet MASK:	255.0.0.0		
GW :	1010.1.1		

Then you need to modify the IP 10.10.1.67 range (2^{255}), the gateway and subnet mask don't need to be modified.

IP	10.10.1.67 (2~255)
Subnet MASK:	255.0.0.0
GW :	1010.1.1

3. Debugging assistant use

- 1. Click network debug, the local IP address will be displayed, and the device uses the UDP protocol port number 18190.
- 2. "Find device", automatically search for devices in the current LAN, and display the current online device in the list box, Figure 3.1
- 3. To communicate with a device, click the control in the list box.

Serial Debuger	Network Debug	er USB Debug	er GPIB Debuger		Communication Interface Sett		
Setting	N0.	Device IP	Device Mac	Port	IP Settings		
192.168.	1 1.188	192.168.1.198	7a-34-ec-48-4b-42	18190	DHCP		
Local host	port:				IP addres: 192.168.		
18190					SNet Mask: 255 . 255 . 2		
Scan Dev	ices			•	GateWay: 192 . 168 .		
Data Received	Receive as hex		CmdHex		Start O		
DHCP:0 IP:192.168.1 NETMASK:25 GateWay:192 MAC:7a-34- PORT:18190 BAUDRATE:1 115200 115200	.198 5.255.255.0 2.168.1.1 c-48-4b-42 15200	572: * 1925: 1975: 1975: 1975:	T:DEVINFO? T:ADDR? T:BAUD? T:BAUD?	*	Program Setting VOLTage Setiting: VSET CH1 12.0 Set Voltage Query VSET? CH1 OverVoltage Value Set: OVPSET CH1 31.0 Ouery OVP		

Figure 3.1

4. Set the DHCP function, check "DHCP", then click "OK" below to set the static IP. Then check "static IP" and press "OK". Finally, you need to restart the



device to make the current network configuration take effect.

- 5. If the setting is wrong, click "Restore Parma" to restore the factory parameters configuration.
- 6. Note: setting a static IP over the LAN interface requires a reboot to take effect.

4. Common troubleshooting

1 If the communication is not normal, first use the command to ping the device IP, as shown below:

Administrator: C:\windows\system32\cmd.exe		B
C:\Users\Administrator>ping 192.168.1.198	* III	
Pinging 192.168.1.198 with 32 bytes of data:		
Reply from 192.168.1.198: bytes=32 time=1ms TTL=255		
Reply from 192.168.1.198: bytes=32 time<1ms TTL=255		
Reply from 192.168.1.198: bytes=32 time<1ms ITL=255		
Reply from 192.168.1.198: bytes=32 time<1ms TTL=255		0
Ping statistics for 192.168.1.198:		5
Packets: Sent = 4, Received = 4, Lost = 0 <0% loss>,		ŀ
Approximate round trip times in milli-seconds:		ŀ
Minimum = Oms, Maximum = 1ms, Average = Oms		ľ
C:\Users\Administrator>		ŀ
		Ł

2 Whether the IP address is different from the current LAN setting.

The curren LAN IP is 192.168.10.133, the network segment is 192.168.10.xx and the device IP is 192.168.5.12.

- 3 Whether the IP conflicts with other IPs in the LAN.
- 4 Whether the port number is set incorrectly.
- 5 The firewall blocked the device port.

5. Programming steps

Connect to the device via a computer network cable (refer to the communication protocol command)

- 1 Select the network protocol type as UDP
- 2 Local host IP; such as the current computer IP (192.168.1.3)
- 3 Local host port number 18190
- 4 Device IP: (192.168.1.198)



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Device port number 18190 As shown in Figure 5-1 below:

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	TCP/UDP	Net Assi	istant		
Settings	Data Receive			25	AVAGE V4.2.
(1) Protocol	115200				
UDP 📐	DHCP:0				
(2) Least heat addr	IP:192.168.1.198				
	NETMASK: 255, 255, 255, 0				
192.168.1.3	GateWay: 192. 168. 1. 1				
(3) Local host port	MAC:8c=50=ea=48=4d=56				
18190	FURI . 10190 BAIMBATE : 115200				
	DRODARTE. 115200				
• Close					
Receive Options					
🔲 Receive to file					
🖵 Auto linefeed					
🗍 Show timestamp					
🗖 Receive as hex					
🗖 Pause receive					
<u>Save</u> <u>Clear</u>					
Send Options					
🔲 Data from file					
📃 🔲 Auto send checksum					
🗖 Auto reply			>		
🗌 Send as HEX	Remote: 192.168.1.19	98 :18190		-	Clean
Period 20 ms	:SYST:BAUD?				· [
Load Clear	:SYST:DEVINFO?				Send
					-
🍯 Ready!	•		TX:213	RX:638	Reset

Figure 5-1 Network debugging assistant and device communication

Precautions

- 1. The device port number and computer port number must be the same. The device port number is changed to 35876, then the computer configuration port must also be 35876;
- 2. Modify the IP and subnet mask through the network configuration. The gateway will take effect only after the device is restarted. If it is another interface (such as serial port or USB), it will take effect immediately;
- 3. If the parameter configuration is wrong, the network can't communicate, need to reset the parameters, and you can reset through RS232 serial port or USB, or use the restore factory command directly.

