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MOTECH INSTRUMENTS

LPS 505N
Programmable DC Power Supply
User's Manual

Edition
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P/N ZOM-505ME

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MOTECH INDUSTRIES INC.
6F, NO. 248, Pei-Shen Rd., Sec. 3, Shen Keng Hsiang, Taipei Hsien, 222, Taiwan
Telephone : (886-2) 2662-5093
Facsimile : (886-2) 2662-5097

Email : t&m@motechind.com
URL : www.motech.com.tw

※※※ Storage. Freight. Maintenance. Disposal ※※※

Storage

When don't use the device, please pack it properly and store under a good environment.

(The packing is no needed when the device under appropriate environment.)

Freight

Please use the original packing material when move the device. If the packing material is missing, please use the equivalent buffer material to pack and mark it fragile and waterproof to avoid the device damage during movement. The device is precision equipment, please use qualified transportation as possible. And, please avoid heavy hitting to damage the device.

Maintenance

There is no maintenance operation for the general user (except for the note in the manual). Please contact our company or agent when the device occurred the user judgment abnormal. Don't maintain by yourself to avoid occurred unnecessary danger and serious damage to the device.

Disposal

When the device in badly condition and can't be used or repaired, please discard it according to your company disposal procedures or local legal procedures. Don't discard arbitrary to avoid polluting environment.

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1. Introduction

1.1 An Overview of Product

Motech LPS 505N is a triple outputs and programming DC power supply. LPS 505N comes with 12 bits resolution. Total 210W power output is provided by triple independent outputs. Double output provide 0~30V/3A, the other one provides 0~10V/5A 30W. For the 0~10V/5A output, users can use auto-ranging while constant 30W power output. This is the unique feature and it differs from other traditional power supplies. Those two 0~30V/3A outputs are required to output in serial or parallel mode. Tracking function is convenient and changeable for users in circuit application. LPS 505N has rotary and number key for user to easily operation. The configuration can be stored in memory (Max.100). Timer (1 sec~100 hrs) control when output can be switched off. It can provide the safety for burning room and electroplating application. OVP, OCP can be controlled and monitored by front panel. Users will not change the original setting because of the key lock function. When source and load change, LPS 505N has stable output due to 0.01% load and line regulation and max. 50 us respond time. Average measurement time is 50 ms to increase the production quantity.

1.2 Features

1. **Triple output:**
   Voltage Ranges : 0～30V (CH1&CH2) / 0～10V (CH3)
   Current Ranges : 0 ～ 3A (CH1&CH2) /0～ 5A (CH3)
   Power Ranges : 0 ～ 90W (CH1&CH2) / 0～30W (CH3)
   The third output is an auto-ranging output. Users can change voltage and current as they want based on maximum 30W output. For example, output 10V/3A or 6V/5A voltage and current should be within the output range.
2. **Digital rotary, number key, function key setting:**
   Digital rotary can change voltage rapidly. Simulate the surge of the voltage output. It provides the solution for the trigger circuit testing. User can set up voltage by number key quickly. It differs from original VR adjusting. Function key provide users operation more friendly and easily.
3. **Precious measurement on voltage & current:**
   Besides precise output, LPS 505N provides voltage and current measurement. Users can reduce the measurement equipment budget and space.

4. **Memory and timer function:**
   LPS 505N has large memory to memorize 100 settings. Operators are unnecessary to remember the settings. It can be easily to recall the settings. For safety issue, timer function will automatically switch off the machine when they are burning in burning room. LPS 505N can also provides time control good current resolution for electroplate application as customers' need.
5. **OVP, OCP & lock protection function:**
   OVP, OCP provide the safety for the laboratory. The setting will not be changed due to the key lock function.
6. **Series, parallel mode:**
   In serial mode, CH1/CH2 can output maximum 60V with positive/negative output. It can be used for OP circuit design. In parallel mode, CH1/CH2 can output 6A maximum.
7. **Dual tracking:**
   Users only needs to setup CH1 output voltage and current, LPS 505N will output the same voltage/current at CH2. This is convenient to test two samples at the same time.

2. Specification

Model	LPS 505N	
Channel NO.	**CH1 & CH2**	**CH3**
Output Voltage	0～30V	0～15V
Output Current	0～3A	0～5A
Output Power (CH3 Auto Ranging)	90W	30W
Line Regulation ±(% of output +offset)		
Voltage	0.01% + 2mV	
Current	0.01% + 300uA	
Load Regulation ±(% of output +offset)		
Voltage	≦3mV	≦5mV
Current	0.01% + 300uA	
Ripple and Noise		
Normal Mode Voltage	300uVrms / 3mVpp	1mVrms / 20mVpp
Normal Mode Current	＜1mA	＜5mA
Resolution		
Programming	10mV / 1mA	10mV / 2mA
Readback	10mV / 1mA	3mV / 2mA
Programming Accuracy ±(% output +offset)		
Voltage	0.05% + 20mV	0.05% + 6mV
Current	0.05% + 3mA	0.05% + 4mA
Readback Accuracy ±(% output +offset)		
Voltage	0.05% + 20mV	0.05% + 6mV
Current	0.05% + 3mA	0.05% + 4mA
Temperature Coefficient per℃ ±(% output +offset)		
Voltage	＜0.1% + 3mV	
Current	＜0.2% + 2mA	
Tracking Accuracy ±(% of output +offset)		
Voltage	0.1% + 40mV	
Transient Response Time	**＜50uS**	
Stability，constant output & temperature ±(% of output +offset)，8hrs		
Voltage	＜0.2% + 2mV	
Current	＜0.1% + 1mA	

Voltage Programming Speed		
Rising Time at Full Load	1mSec	2mSec
Rising Time at No Load	1mSec	2mSec
Falling Time at Full Load	5mSec	8mSec
Falling Time at No Load	300mSec	100mSec
General		
AC Line Input Voltage Ranges	115／220 VAC ± 10％（47Hz ～ 63Hz）	
Temperature Ratings	Operating(0°C ～ 40°C)，Storage (- 10°C ～ 70°C)	
Common-Mode Voltage	±240Vdc	
Dimensions (W×H×D)mm	（ 216 × 135 × 432 ）	
Weight	6.5 kg	

LPS 505N Feature：

- LCD display, triple independent output and display on LCD
- CH3 auto-ranging output
- Low Ripple、Low Noise
- Number and function key
- Store and recall settings (100)
- Timer (1 sec ～ 100 hours)
- Precise voltage and current measurement
- OVP, OCP and key lock
- Serial and parallel mode
- Dual Tracking Mode
- Average measurement time 50m sec
- Standard RS232, USB interface
- Option: I/O port, GPIB, LAN interface

3. Notices before Using

3.1 Confirm Attachment before Using

Please follows the below items to protect your rights as you receive this instrument.

1. If there is ruin or scratch bad condition on product overlook.
2. The standard attachment as table 10-1, please confirm if there is any missing.

※ If above conditions, please inform us for prompt service.

3.2 The Description of Using

The tester is an accurate instrument. Please read through this manual to prevent improper operation and arbitary using from causing this instrument damaged. Please calibrate once a year for keeping accuracy.

3.3 Ambient Environment

1. Do not use the tester in a dusty, vibrating, sunlight and corrosive gas. Please use this instrument under the ambient temperature is 0～40°C and the relative humidity is 20%~80%. If the temperature is over 40°C, please don't use temporary until the temperature is down to normal. Please check to avoid the unit damage which result from over temperature.
2. The tester is equipped with a cooling fan on the rear panel to keep the internal temperature down, so adequate ventilation should be ensured. The tester should be located at least 10cm from any object or wall behind it. Do not block the ventilation holes to keep the tester in good precision.
3. The tester has been carefully designed to prevent the noise from the AC power source. However, it should be used in the noise-free environment as low as possible. If noise is inevitable, please install a power filter.

3.4 Storage

The tester should be stored within the temperature range -20°C ~ 70°C, the relative humidity 80% RH. If the unit is not to be in use for a long time, please store it in the original or similar package and keep it from direct sunlight and humidity.

3.5 Power-Line Voltage

The tester is an instrument which uses AC power 115V/230V 50Hz/60Hz. Before plugging in the power cord, make sure the power switch is in the off position and the voltage of the rear panel is the same as the required voltage.

3.6 Fuse

There is one fuse installed in the rear panel. When replacing the fuse, please notice the following:

1. Please turn off the power and disconnect the AC power cord and all the other connections to the power supply.
2. The checking of fuse can't sure with the eyes, the testing value under 15Ω is normal.
3. When replacing the fuse, the cap jut out the rear panel on fuse stand using flat type screwdriver or pressing softly by hand.

Mark	Center Voltage	Range	Fuse
115	115V	100V~125V	Slow
220	220V	200V~250V	Slow

Warning：

For continues protection against fire hazard, replace only with the same type and rating of fuse as specified.

3.7 Warming Up

This tester activates at power on. However, in order to meet the accuracy in the specification, please warm it up for 30 minutes or longer.

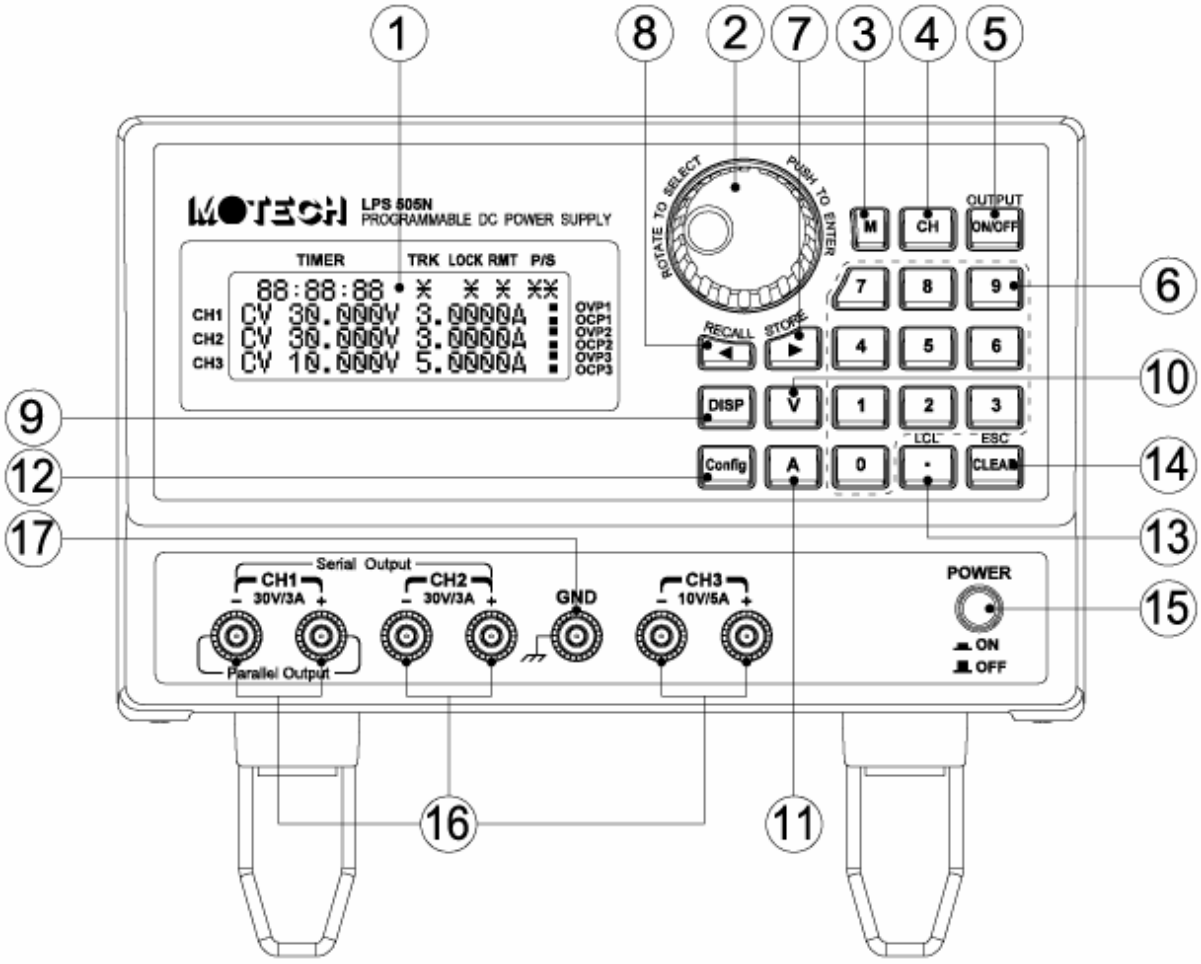
3.8 End Test

When tests are done and the tester is not in use or need to leave for a while during usage, make sure to turn off the power switch.

4. Panel Description

4.1 LPS 505N Panel Description

4.1.1 Front Panel Description



(1) Display:
Display is a 20x4 yellow green backlight LCD

(2) Rotary(ENTER):
Rotary can adjust voltage and current. Users can press it as ENTER function.

(3) M:
Press M key to memory configuration display. Users can select which setting to store and recall by pressing STORE and RECALL key.

(4) CH:
Selecting CH1/CH2/CH3

(5) ON/OFF:
Switching power output on or off of the instrument

(6) Number Key:
Input number by number key. To set the voltage or current, press the "V" or "A" key after the number input.

(7) ►(STORE):
When the output is on, press the key to move the cursor to select digit for adjustment. Users can adjust the digit by rotary. In memory function, store into memory by pressing this key.

(8) ◄(RECALL):
When the output is on, press the key to move the cursor to select digit for adjustment. Users can adjust the digit by rotary. In memory function, recall from the memory by pressing this key.

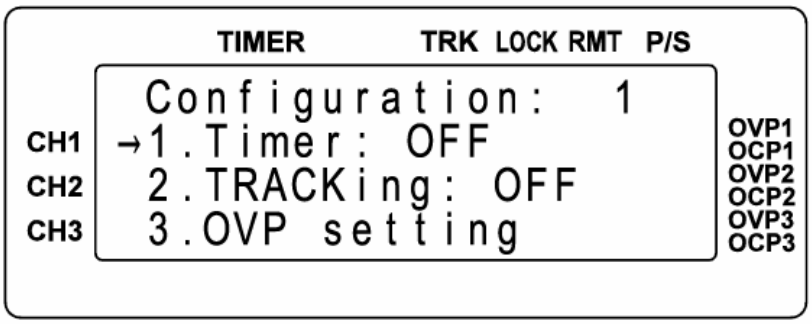
(9) DISP:
Press this key to select the display to show the voltage/current or power/resistance readout.

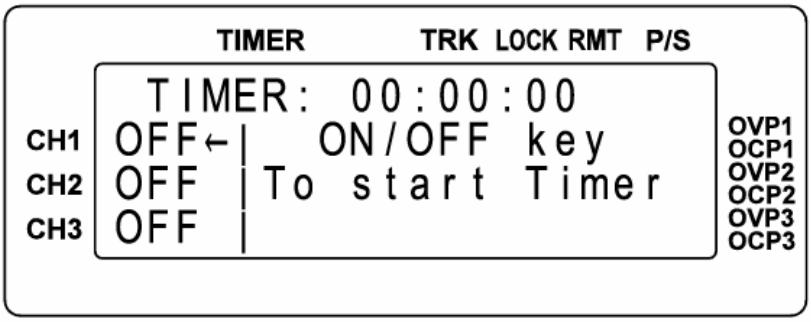
(10) V(Voltage):
Press this key to set voltage after number input.

(11) A(Current):
Press this key to set current after number input.

(12) Config:
Press this key to enter the configuration setting. There 16 items to be set in this mode.

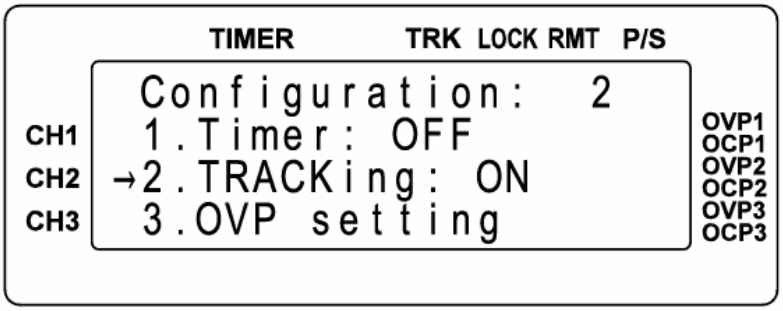
1. Timer: The initial value is OFF. Press the rotary to enter timer configuration.



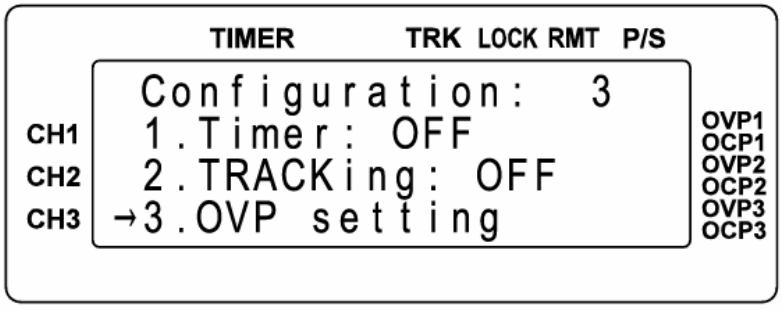


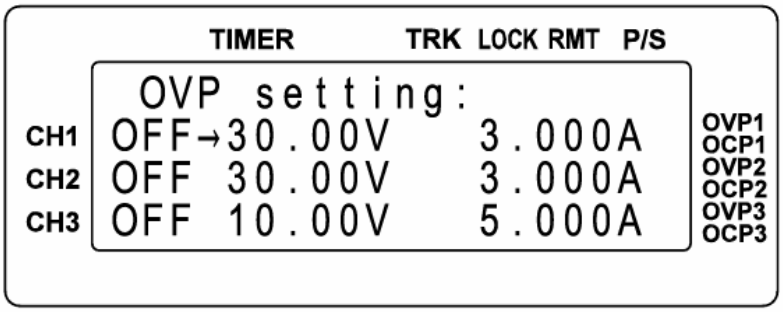
A. Using rotary or ◄►to move the cursor onto the digit and input the number. Timer: 00:00:00 (HH:MM:SS)
B. Switching CH1/CH2/CH3 by press CH key. Then press rotary to switch ON/OFF
C. Start Timer when press ON/OFF key
D. Press rotary + CLEAR to pause the timer. Restart by repeating the same step

2. TRACKING: The initial value is OFF, switch to ON by pressing the rotary. The CH2 will have the same voltage and current setting as the CH1.

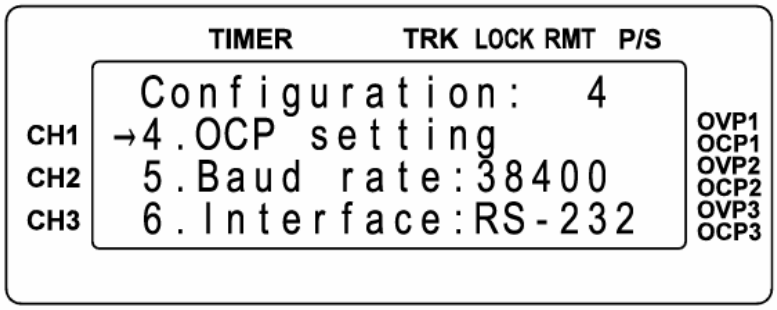


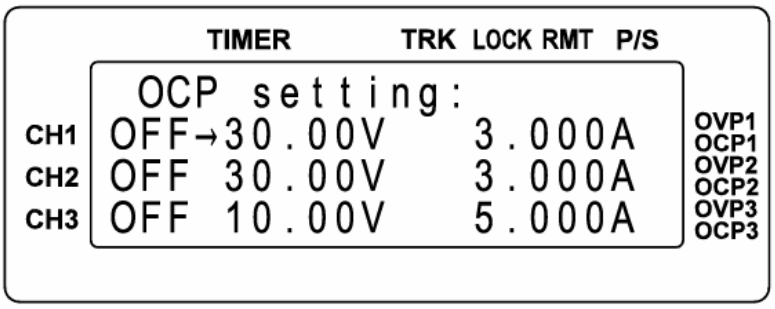
3. OVP setting: Over voltage protection. Press the rotary to enter OVP Configuration. Press “CH” to select CH1/CH2/CH3. Users can press ON/OFF to enable or disable OVP and input the voltage value via the number keys. Please remember to press rotary to save the settings.



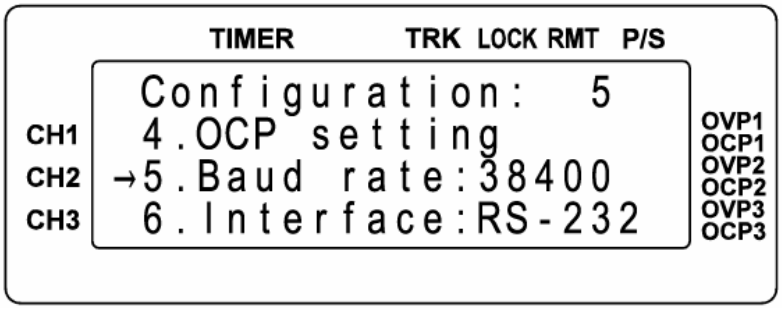


4. OCP setting: Over current protection. Press rotary to enter OCP Configuration. Press “CH” to select CH1/CH2/CH3. Users can press ON/OFF to enable or disable OCP and input current value via the number keys. Please remember to press rotary to save the settings.

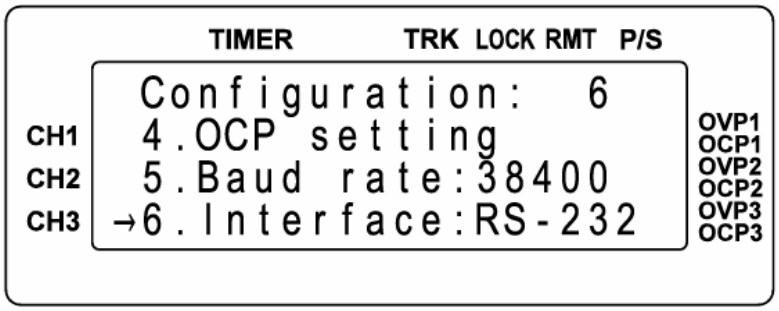




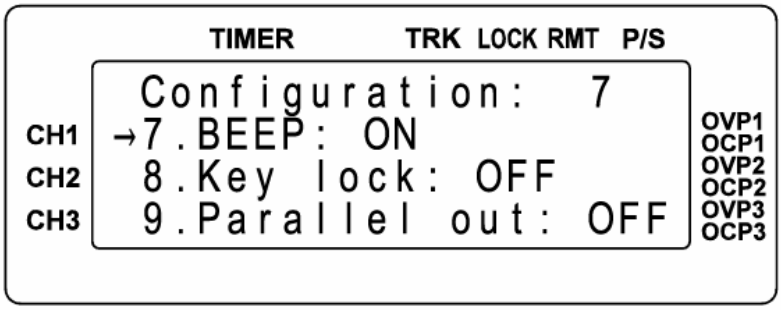
5. Baud rate: Transmission speed. Users can select baud rate for 1200, 2400, 4800, 9600, 19200, 38400 by rotary.



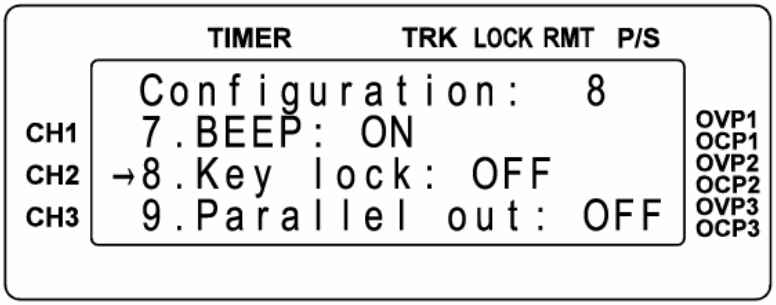
6. Interface: Transmission interface. Users can select RS232, USB by using rotary.



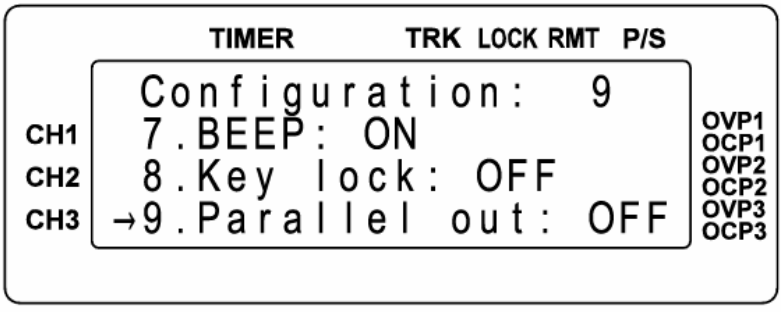
7. BEEP: Buzzer. Press rotary to switch the buzzer on or off.



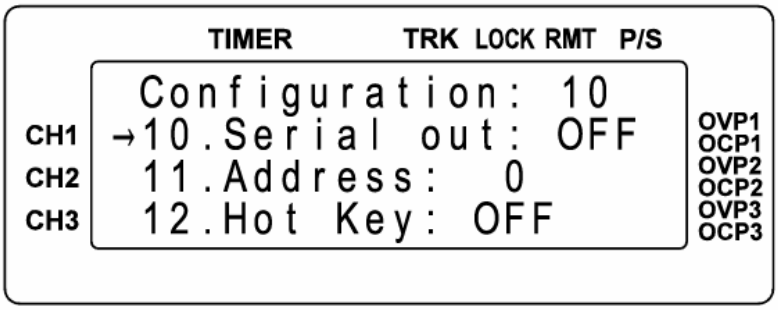
8. Key lock: Key lock function. The initial value is OFF. Press rotary to turn on key lock function. All keys are disabled except Rotary + CLEAR can disable the key lock.



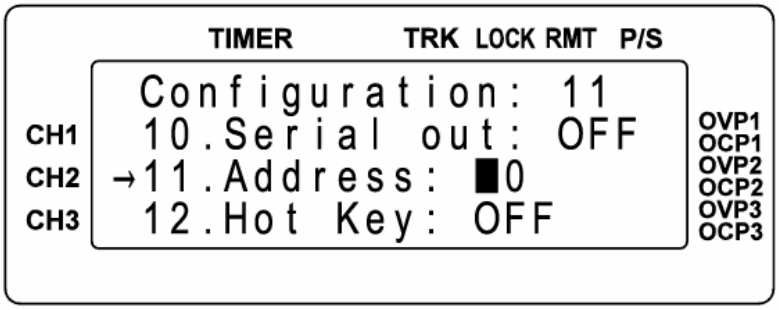
9. Parallel out: Parallel output. The initial value is OFF. Press rotary to turn on parallel output. The total output current is 6A because the CH1 and CH2 are connected parallelized.



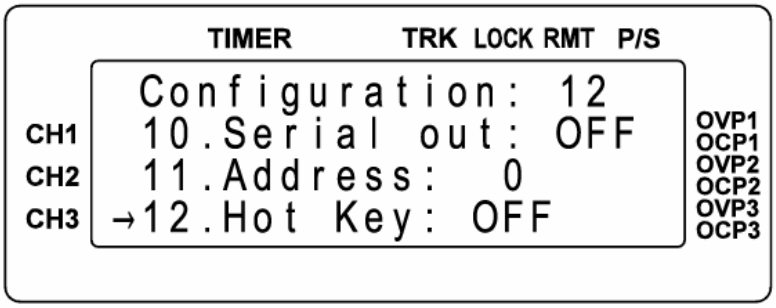
10. Serial out: Serial output. The initial value is OFF. Press rotary to turn on serial output. The total output voltage is 60V because the CH1 and CH2 are connected serialized.



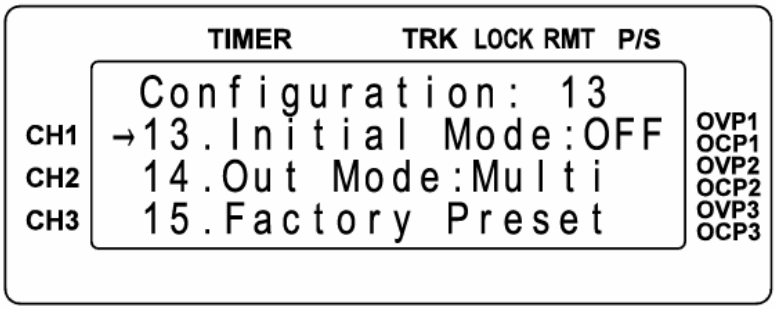
11. Address: GPIB address setting. Acceptable range is 00~31. Users can input the number and press rotary to save the settings.



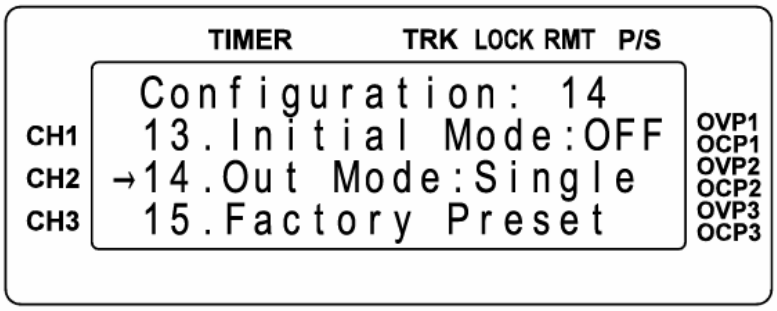
12. Hot Key: Express function key. The initial value is OFF. Press rotary to turn on hot key. The users can recall the correspondent settings from the memory via input 0~9.



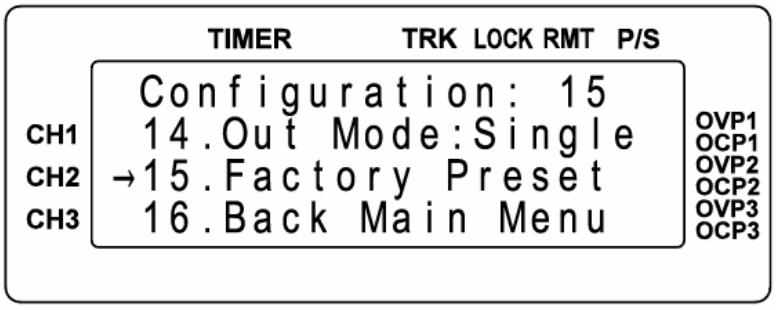
13. Initial Mode: Memorize the settings before the instrument shutdown. The initial value is OFF. Press rotary to turn on the function. When the function is enable, all setting will be saved before the instrument shutdown and recalled after the instrument power on.



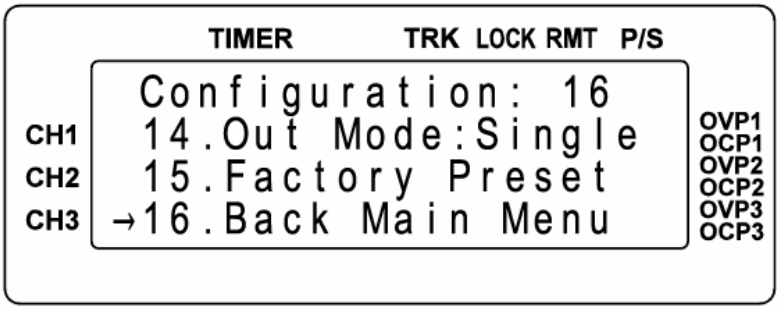
14. Out Mode: Output mode. The initial value is single. Press rotary to switch to multi mode. In the multi mode, CH1/CH2/CH3 output on or off will synchronize by press the ON/OFF key.



15. Factory Preset：Reset to default settings



16. Back Main Menu：Quit configuration and save the settings



PS ：Setting will be saved, after the last item (16. Back Main Menu) is entered.

(13) . (LCL):

Use as a decimal point. Or, users can press the key to reset to LOCAL mode when in REMOTE connection.

(14) CLEAR(ESC):

Clear the number input. Or, back to the previous display.

(15) Power Switch(POWER ON/OFF)

Power switch, ▉ is OFF, ▄ is ON. Please read **Notices before Using** before power on.

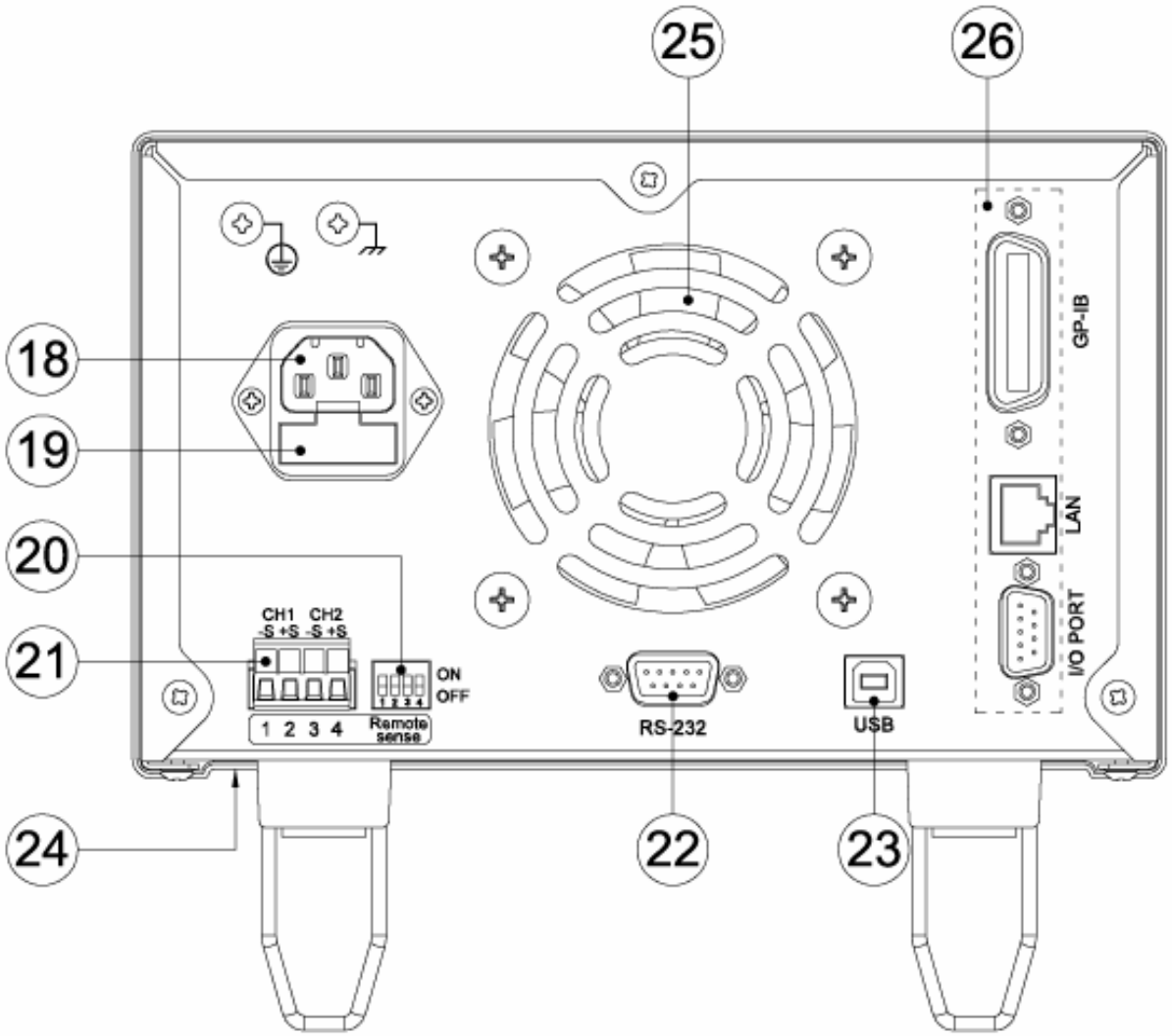
(16) CH1/CH2/CH3 Power Output:

Please recognize the mark on front panel and notice the positive and negative pole.

(17) GND:

Connected to the ground. Please note that the power core has the third pin, or it will not work.

4.1.2 Rear Panel Description



(18) AC Power Input:

The plug connected to the AC source. It uses for 115V/220V.

(19) Fuse:

The fuse used for power source. When the switch set to 115V, using 5A slow fuse; set to 220V, using 2.5A slow fuse.

(20) Remote Sense/Local Sense dip switch:

When the switch set to ON, it becomes to local sense mode, which means positive pole connect to +Sense, negative pole connect to -Sense. When the switch set to OFF, it becomes to remote sense mode. It has voltage compensation when it collaborate with ±Sense.

(21) CH1 ±S / CH2 ± S:

When the switch set to OFF, it becomes to local sense mode. It has

voltage compensation when it collaborates with ±Sense. CH1 +Sense and positive pole connect to DUT positive pole. CH1 -Sense and negative pole connect to DUT negative pole.

(22) RS232 Interface

(23) USB Interface

(24) 115V/220V Power switch (At the bottom of the instrument near the front panel)

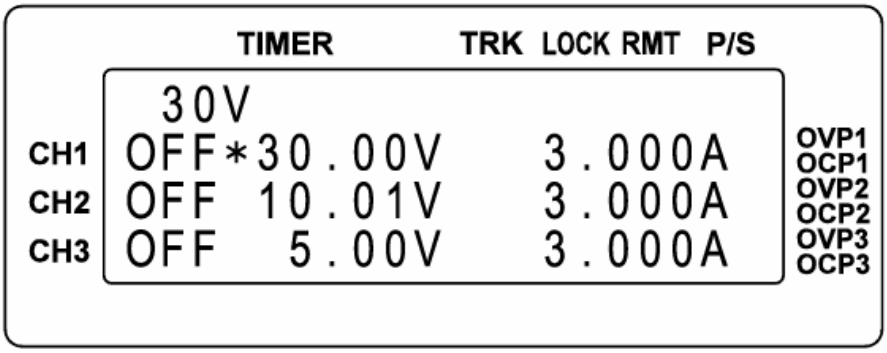
(25) Cooling Fan:
Depends on the current of the load, it will adjust the rotation speed of the fan. It is a fuzzy fan.

(26) Optional Interface:
There are GPIB, LAN, I/O port.

5. Operation Setting

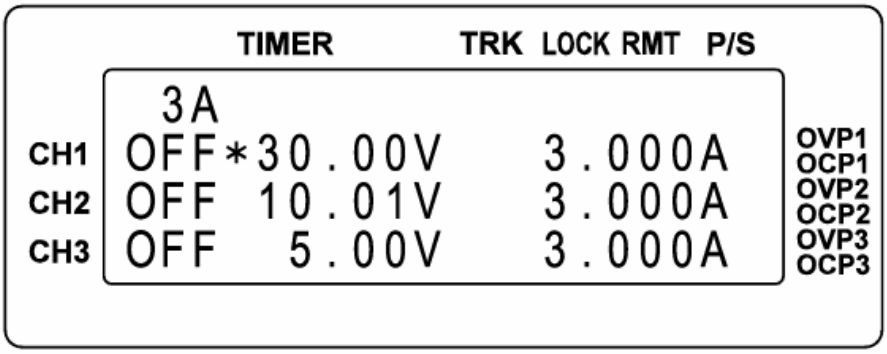
5.1 Voltage Setting

Press “CH” to select channel, there are CH1/CH2/CH3 to choose. (Please follow the * sign in the left side of the LCD) Use the number key to input the voltage. And, press “V” to finish the setting. The voltage will be set immediately.



5.2 Current Setting

Press “CH” to select Channel, there are CH1/CH2/CH3 to choose. (Please follow the * sign in the left side of the LCD) Use the number key to input the current. And, press “A” to finish the setting. The current will be set immediately.



5.3 OVP

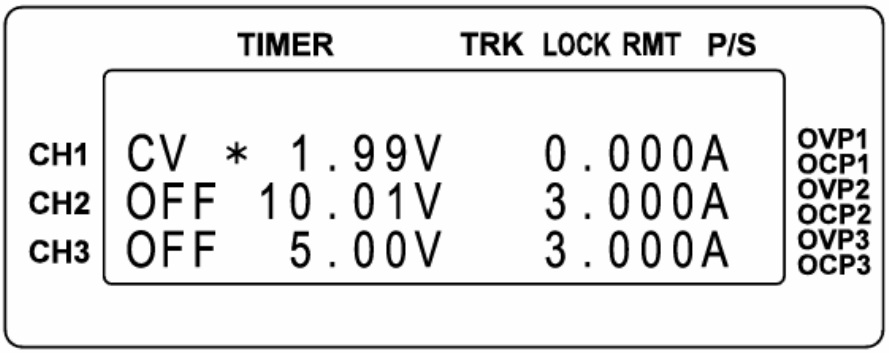
Press “Config” to enter Configuration display, adjust rotary or ◄► to move the cursor to OVP setting. Press rotary to enter OVP setting display. Users can press “CH” to select channel of setting. (Please follow the * sign in the left side of the LCD) Press the ON/OFF key to choose enable or disable. Use the number key to input the voltage. Please remember to press rotary to finish the setting.

5.4 OCP

Press “Config” to enter Configuration display, adjust rotary or ◄► to move the cursor to OCP setting. Press rotary to enter OCP setting display. Users can press “CH” to select channel of setting. (Please follow the → sign in the left side of the LCD) Press the ON/OFF key to choose enable or disable. Use the number key to input the current. Please remember to press rotary to finish the setting.

5.5 Rotary Controller (output on)

When output is on, users can adjust the voltage by rotary. Press ◄ or ► key to adjust the cursor position. Adjust the voltage by rotary. If users want to change channel, just press “CH”. This provides a convenient testing tool when users are observing the variation of the voltage.



6. Communication Protocol and Package Mode

Communication protocol includes MOTECH and SCPI instructions and low-error Protocol.

6.1 Preface

SCPI interface provides users to operate the power supply by connecting to PC via IEEE-488.2 or RS-232 interface. It also allows users to control and monitor the instrument remotely. SCPI IEEE-488 supports multiple power supply to control. (Max. 32 set)

6.2 Definition of Parameters

Type	Valid arguments
<boolean>	ON or 1 / OFF or 0
<NR1>	The data format <NR1> is defined in IEEE-488.2 for integers. Zero, positive and negative integer numeric values are valid data.
<NRf>	The data format <NRf> is defined in IEEE-488.2 for flexible numeric representation. Zero, positive and negative floating point numeric values are valid data.
<string>	Characters are enclosed by single or double quotes.
<NL>	New line, hex code is 0x0Ah
<Rtn>	Return, hex code is 0x0Dh
<END>	end or identify

6.3 Error Message List

The SCPI maintains an Error/Event Queue as defined by SCPI. The queue holds up to 10 errors and events. It is queried by using the system : error ? command which reads in a First In/First Out (FIFO) manner. The read operation removes the entry from the queue. The *CLS command will clear all entries from the queue.

Code	Description
-001	no error
-002	GET not allowed
-003	Parameter not allowed
-004	Missing parameter
-005	Command Header Error
-006	Header Separator Error
-007	Program mnemonic too long
-008	Undefined header
-009	Header suffix out of range
-010	Numeric data error
-011	Invalid character in number
-012	Exponent too large
-013	Too many digits
-014	Numeric data not allowed
-015	Suffix error
-016	Invalid suffix
-017	Suffix too long
-018	Suffix not allowed
-019	Character data error
-020	Invalid character data
-021	Character data too long
-022	Character data not allowed
-023	String data error
-024	Invalid string data
-025	String data not allowed
-026	Block data error
-027	Invalid block data
-028	Block data not allowed
-029	Expression error
-030	Invalid expression
-031	Expression data not allowed
-032	Macro error
-033	Invalid outside macro definition
-034	Invalid inside macro definition
-035	Macro parameter error
-036	Execution error
-037	Invalid while in local

-038 Settings lostdue to rtl
-039 Trigger error
-040 Trigger ignored
-041 Arm ignored
-042 Init ignored
-043 Trigger deadlock
-044 Arm deadlock
-045 Parameter error
-046 Settings conflict
-047 Data out of range
-048 Too much data
-049 Illegal parameter value
-050 Data corrupt or stale
-051 Data questionable
-052 Hardware error
-053 Hardware missing
-054 Mass storage error
-055 Missing mass storage
-056 Missing media
-057 Corrupt media
-058 Media full
-059 Directory full
-060 File name not found
-061 File name error
-062 Media protected
-063 Expression Error
-064 Math error in expression
-065 Macro error
-066 Macro syntax error
-067 Macro execution error
-068 Illegal macro label
-069 Macro parameter error
-070 Macro definition too long
-071 Macro recursion error
-072 Macro redefinition not allowed
-073 Macro header not found
-074 Program error
-075 Cannot create program

-076 Illegal program name
-077 Illegal variable name
-078 Program currently running
-079 Program syntax error
-080 Program runtime error
-081 Device-specific error
-082 Missing media
-083 Corrupt media
-084 Media full
-085 Directory full
-086 File name not found
-087 File name error
-088 Media protected
-089 Expression Error
-090 Math error in expression
-091 Macro error
-092 Macro syntax error
-093 Macro execution error
-094 Illegal macro label
-095 Macro parameter error
-096 Macro definition too long
-097 Macro recursion error
-098 Macro redefinition not allowed
-099 Macro header not found
-100 Program error
-101 Cannot create program
-102 Illegal program name
-103 Illegal variable name
-104 Program currently running
-105 Program syntax error
-106 Program runtime error
-107 Device-specific error
-108 Syntax error
-109 Data type error
-110 nput voltage overwrite error
-111 nput current overwrite error

6.4 MOTECH LPS Series Compatible Command List

Command	Description
ADDRess	set the address of the machine
BEEP	set beep on(1) or off(0)
CALi	calibration procedure
CURR[1]	channel 1 current setting
CURR[1]?	return channel 1 current setting
CURR2	channel 2 current setting
CURR2?	return channel 2 current setting
CURR3	channel 3 current setting
CURR3?	return channel 3 current setting
CURRENT[1]	channel 1 current setting
CURRENT[1]?	return channel 1 current setting
CURRENT2	channel 2 current setting
CURRENT2?	return channel 2 current setting
CURRENT3	channel 3 current setting
CURRENT3?	return channel 3 current setting
HOTKey	set hot key function, on(1) or off(0)
IOUT[1][?]	channel 1 current readback
IOUT2[?]	channel 2 current readback
IOUT3[?]	channel 3 current readback
ISET[1]	channel 1 current setting
ISET[1][?]	return channel 1 current setting
ISET2	channel 2 current setting
ISET2?	return channel 2 current setting
ISET3	channel 3 current setting
ISET3?	return channel 3 current setting
LOCK	set rotary and keypad lock on(1) or off(0)
MODEL	display model NO.
OCP[1]	set channel 1 current protect to off(0) or on(1)
OCP2	set channel 2 current protect to off(0) or on(1)
OCP3	set channel 3 current protect to off(0) or on(1)
OISET[1]	set channel 1 overcurrent protect
OISET[1]?	return channel 1 overcurrent value
OISET2	set channel 2 overcurrent protect
OISET2?	return channel 2 overcurrent value

OISET3	set channel 3 overcurrent protect
OISET3?	return channel 3 overcurrent value
OUT[1]	set channel 1 output on(1) or off(0)
OUT2	set channel 2 output on(1) or off(0)
OUT3	set channel 3 output on(1) or off(0)
OVP[1]	set channel 1 voltage protect to off(0) or on(1)
OVP2	set channel 2 voltage protect to off(0) or on(1)
OVP3	set channel 3 voltage protect to off(0) or on(1)
OVSET[1]	set channel 1 overvoltage protect
OVSET[1]?	return channel 1 overvoltage value
OVSET2	set channel 2 overcurrent protect
OVSET2?	return channel 2 overcurrent value
OVSET3	set channel 3 overcurrent protect
OVSET3?	return channel 3 overcurrent value
PARAllel	set parallel output on(1) or off(0)
SERIal	set seial output on(1) or off(0)
STATUS?	current NLPS working status
TRACK	set CH2=CH1
VERSION?	display version NO.
VOLT[1]	channel 1 voltage setting
VOLT[1]?	return channel 1 voltage setting
VOLT2	channel 2 voltage setting
VOLT2?	return channel 2 voltage setting
VOLT3	channel 3 voltage setting
VOLT3?	return channel 3 voltage setting
VOLTAGE[1]	channel 1 voltage setting
VOLTAGE[1]?	return channel 1 voltage setting
VOLTAGE2	channel 2 voltage setting
VOLTAGE2?	return channel 2 voltage setting
VOLTAGE3	channel 3 voltage setting
VOLTAGE3?	return channel 3 voltage setting
VOUT[1][?]	channel 1 voltage readback
VOUT2[?]	channel 2 voltage readback
VOUT3[?]	channel 3 voltage readback
VSET[1]	channel 1 voltage setting
VSET[1]?	return channel 1 voltage setting
VSET2	channel 2 voltage setting
VSET2?	return channel 2 voltage setting

VSET3	channel 3 voltage setting
VSET3?	return channel 3 voltage setting

example:

Q1. How to set machine address (same GPIB ID)?

ADDR 10 <NL>	==>	address is 10
ADDRESS 5 <NL>	==>	address is 5
ADDR 70 <NL>	==>	address is out of maxinum value, refer to error code

Q2. How to set beep?

BEEP 1 <NL>	==>	triger beep to on
BEEP off <NL>	==>	triger beep to off

Q3. How to enter calibration procedure?

Step 1: CALI 1 <NL>	==>	enter the calibration for channel 1
Step 2: CALI 7.5010203 <NL>	==>	input low scale voltage parameter
Step 3: CALI 23.123456 <NL>	==>	input high scale voltage parameter
Step 4: CALI 0.7510203 <NL>	==>	input low scale current parameter
Step 5: CALI 2.2567890 <NL>	==>	input high scale current parameter and stored to EEPROM

Q4. How to exit calibration procedure?

CALI OFF <NL>

Q5. How to set voltage?

VSET 10 <NL>	==>	set channel 1 voltage to 10V
VSET2 5.123 <NL>	==>	set channel 2 voltage to 5.123V
VOLT3 3.3V <NL>	==>	set channel 3 voltage to 3.3V
VOLTAGE1 35 <NL>	==>	set channel 1 voltage to 35V is fail, due to out of range

Q6. How to read the voltage setting value?

VSET? <NL>	==>	return channel 1 voltage setting
VSET2? <NL>	==>	return channel 2 voltage setting

Q7. How to set current?

ISET : 1.1 <NL>	==>	set channel 1 current to 1.1A
ISET2 : 2.1A <NL>	==>	set channel 2 current to 2.1A

CURR3 4.3022 <NL>	==>	set channel 3 current to 4.3022A
CURRENT1 0.250 <NL>	==>	set channel 1 current to 250mA

Q8. How to read the current setting value?

ISET? <NL>	==>	return channel 1 current setting
ISET2? <NL>	==>	return channel 2 current setting

Q9. How to read the voltage output value?

VOUT2?;	==>	return channel 2 voltage output
VOUT;	==>	return channel 1 voltage output

Q10. How to read the current output value?

IOUT2?;	==>	return channel 2 current output
IOUT;	==>	return channel 1 current output

Q11. How to set the tracking mode?

TRACK 1 <NL>	==>	CH2 = CH1
TRACK : ON;	==>	CH2 = CH1
TRACK 0 <NL>	==>	tracking off
TRACK OFF <NL>	==>	tracking off

Q12. How to set the parallel output mode?

PARA 1;	==>	parallel on
PARALLEL ON <NL>	==>	parallel on
PARA 0 <NL>	==>	parallel off
PARALLEL OFF <NL>	==>	parallel off

Q13. How to set the serial output mode?

SER : 1 <NL>	==>	serial on
SERIAL : ON <NL>	==>	serial on
SER 0 <NL>	==>	serial off
SERIAL OFF;	==>	serial off

Q14. How to read back calibration parameter?

CAL? ;	==>	return the calibration data
CALI? <NL>	==>	return the calibration data

Q15. How to lock keypad and knob?

LOCK : 1;	==>	lock the keypad and knob
LOCK ON <NL>	==>	lock the keypad and knob

6.5 IEEE-488.2 & SCPI Compatiable Information

The SCPI conforms to all specifications for devices as defined in IEEE-488.2 and complies with SCPI command syntax version 1995.0. Confirmed Commands are those commands which are approved commands in the SCPI 1995 Specification, Volume 2: Command Reference.

6.5.1 SCPI Frequent Command

Command	Description
*CLS	Clear status (include error code)
*IDN?	Returns: <Manufacturer>, <model>, <serial number>, <firmware type & version>
*RCL	Recalls settings from memory. Memory locations from 0 to 99 are valid.
*RST	Resets the power supply to its power on state.
*SAV	1. Saves defined parameters 2. Saves current settings to memory. Memory locations from 0 to 99 are valid.
*WAI	Sets the device to wait until all previous commands and queries are complete before executing commands following the *WAI command.

example:

Q1. How to save V/I to memory?

*SAV : 15;	==>	save current settings to memory location 15
SAV 0 <NL>	==>	save current settings to memory location 0

Q2. How to recall memory V/I variable to output?

*RCL : 3 <NL>	==>	recall setting from memory location 3
RCL 120;	==>	the data value is invaild

Q3. How to save parameter?

SAV;

*SAV <NL>

Q4. How to do the software reset procedure?

*RST;

RST <NL>

Q5. How to return the device identification?

*IDN?;

IDN? <NL>

6.5.2 SCPI Command for Subsystem

OUT[n]	on/off subsystem
[:STATe] <bool> <NL>	enable/disable output action
TRACK <NL>	enable track mode
PARAllel <NL>	enable parallel mode
SERial <NL>	enable serial mode
NORMAL <NL>	resume normal mode
STATus	status subsystem.
<NL>	read back machine status
ERRor[?] <NL>	read back machine error code
DISPlay	display subsystem
:0	simulate keypad action
:1	
:2	
:3	
:4	
:5	
:6	
:7	
:8	
:9	
:VOLT	simulate V key action
:AMP	simulate A key action

:OUTput	simulate ON/OFF key action
:Channel	simulate CH key action
:LEFT	currsor shift left
:RIGHT	currsor shift right
:MEMory	into memory item
:CLEAR	simulate CLEAR key
:ESC	simulate CLEAR key
:CLR	simulate CLEAR key
:ENTer	simulate enter key
:MULTI	simulate double key
:1	into calibration mode for channel 1
:2	into calibration mode for channel 2
:3	into calibration mode for channel 3
:CLEAR	unlock key or pause timer action
:ESC	unlock key or pause timer action
:CLR	unlock key or pause timer action
:DISPlay	select V,A/W,OHM select
:CONFIG	into config iotem
:KNOB	simute knob action
:LEFT	simulate knob turns left
:RIGHT	simulate knob truns right

example:

Q1. How to set tracking mode?

OUT TRACK <NL>

Q2. How to set serial output mode?

OUT SER <NL>

OUT SERIAL <NL>

Q3. How to set parallel output mode?

OUT PARA <NL>

OUT PARALLEL <NL>

Q4. How to resume normal output mode?

OUT NORMAL <NL>

Q5. How to read back machine status?

STATUS? <NL>

Q6. How to read back machine error code?

STAT ERR <NL>
STATUS ERR? <NL>
STATUS ERROR <NL>
STAT? ERROR? <NL>

Q7. How to simulate keypad?

DISPLAY 0 <NL>	==>	simulate keypad '0'
DISP 5 <NL>	==>	simulate keypad '5'
DISPLAY VOLT <NL>	==>	simulate keypad "V"
DISP AMP <NL>	==>	simulate keypad "A"
DISPLAY OUTPUT <NL>	==>	simulate keypad "ON/OFF"
DISP CHANNEL <NL>	==>	simulate keypad "CH"
DISPLAY LEFT <NL>	==>	simulate keypad "◄"
DISP RIGHT <NL>	==>	simulate keypad "►"
DISPLAY MEMORY <NL>	==>	simulate keypad 'M'
DISP CLEAR <NL>	==>	simulate keypad "CLEAR"

Q8. How to simulate double key?

DISPLAY MULTI 1 <NL>	==>	simulate keypad "ENTER" & "1"
DISP MULTI ESC <NL>	==>	simulate keypad "ENTER" & "CLEAR"

Q9. How to simulate rotary?

DISPLAY KNOB LEFT <NL>	==>	simulate rotary left scroll
DISP KNOB RIGHT <NL>	==>	simulate rotary right scroll

6.6 Rules of Status Definition

byte 0:	bit 7	channel 3 on/off status
	bit 6	channel 2 on/off status
	bit 5	channel 1 on/off status
	bit 4	channel 3 OVP setting flag
	bit 3	channel 2 OVP setting flag
	bit 2	channel 1 OVP setting flag
	bit 1	channel 3 OCP setting flag

	bit 0	channel 2 OCP setting flag
byte 1:	bit 7	channel 1 OCP setting flag
	bit 6	output mode status; 0: single output 1: multi-output
	bit 5	power on status; 0:output off,1: use pre-setting status
	bit 4	hot-key flag
	bit 3	serial output mode
	bit 2	parallel output mode
	bit 1	track output mode
	bit 0	beep trigger flag
byte 2:	bit 7	reserved
	bit 6	reserved
	bit 5	remote flag
	bit 4	reserved
	bit 3	machine running at time mode
	bit 2	machine running at sub-menu mode
	bit 1	machine running at configuration sub-menu mode
	bit 0	machine running at memory item mode
byte 3:	bit 7	machine running at power on status
	bit 6	keypad & Rotary lock flag
	bit 5	machine running at EPROM write or read mode
	bit 4	machine running at synchize mode
	bit 3	display I/V or W/ohm flag
	bit 2	machine running at LCD process mode
	bit 1	detect double- key flag
	bit 0	machine running at key-pad process mode
byte 4:	bit 7	channel 3 CV/CC status
	bit 6	channel 2 CV/CC status
	bit 5	channel 1 CV/CC status
	bit 4	channel 3 OVP is occur flag
	bit 3	channel 2 OVP is occur flag
	bit 2	channel 1 OVP is occur flag
	bit 1	channel 3 OCP is occur flag
	bit 0	channel 2 OCP is occur flag

byte 5:	bit 7	channel 1 OCP is occur flag
	bit 6	relay switch flag
	bit 5	reserved
	bit 4	reserved
	bit 3	machine running at DAC read-back mode
	bit 2	timer pasue flag
	bit 1	machine running at calibration mode
	bit 0	reserved
byte 6:		PWM value.

7. Accessories

Model :LPS 505N

Serial number:

Accessories **Date:**

No	Description	P/N	Q'ty	Selection
1.	Power cord	ZPO-640MI	1	☐Yes ☐No
2.	Black & Red Test Lead	ZTP-LPSMI-1	3	☐Yes ☐No
3.	User's manual	ZOM-505ME	1	☐Yes ☐No

Version: 1.0

MOTECH

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MOTECH INSTRUMENTS

MOTECH INDUSTRIES INCORPORATED

6 F,No.248,Sec.3,Pei-Shen Road,Shen-Keng Hsiang,Taipei Hsien 222,Taiwan

Tel:886-2-2662-5093, 886-2-2662-5194, Fax:886-2-2662-5097

http://www.motechind.com, e-mail:t&m@motechind.com

ZOM-505ME