LABORATORY GRADE

REMOTE PROGRAMMING SWITCHING MODE

DC REGULATED POWER SUPPLIES

SDP - 3618 / 3636 / 3660

User Manual

Table of Contents

1. Safety Instructions

The following safety precaution must be observed during all phase of operation and service of this equipment. If you do not follow the instructions and information on proper handing in this manual, we assume no liability for any resulting personal injury or damage to property.

General Safety Instructions

- Do not use the unit near water
- Do not install unit near heating sources and heating emitting devices
- Clean only with dry cloth
- Do not block the fan ventilation
- Prevent the power cord from being walked and / or pinched
- Unplug this unit when not use
- Unplug this unit during lighting and storms
- Do not open the cover
- Never replace components when the power cable is connected
- Always disconnect power, discharge circuit and removed external voltage before touching components
- Only use optional accessories with this unit
- Please contact qualified service personnel for repair

Supply Input Range

- The unit is of universal input: 100 - 240Vac, 50 / 60Hz~

2. Technical Specifications

Models	SDP-3618	SDP-3636	SDP-3660
Output			
Variable Output Voltage	1 - 18Vdc	1 - 36Vdc	1 - 60Vdc
Variable Output Current	0 - 20A	0 - 10A	0 - 5A
Output Rated Power	360W	360W	300W
Voltage Regulation			
Load (10-100% Rated Voltage)	≤50mV		
Line (90-264Vac Variation)	≤20mV		
Current Regulation			
Load (10-90% Rated Current)	≤50mA		
Line (90-264Vac Variation)	≤50mA		
Ripple & Noise			
Ripple & Noise (r.m.s.) Voltage	≤5mV		
Ripple & Noise (peak-peak) Voltage	≤50mV		
Output Tracking OVP	O/P 1-5V: set voltage +2V O/P 5-18V: set voltage +3V	O/P 1-5V: set voltage +2V O/P 5-20V: set voltage +3V O/P 20-36V: set voltage +4V	O/P 1-5V: set voltage +2V O/P 5-20V: set voltage +3V O/P 20-36V: set voltage +4V
Meter Type & Accuracy			
Display Meter	Colour LCD (4 digit - Ammeter, Voltmeter & Power meter)		
Meter Accuracy	±1% +5counts for V <5V, I <0.5A ; ±1% +2counts for V <5V, I <0.5A		
LCD Dimension	48 X 66 mm		
Input Voltage	100 - 240Vac 50 / 60Hz~		
Full Load Input Curr. (230 / 100 Vac)	2.1 / 4.6A	2.1 / 4.6A	1.7 / 3.8A
Efficiency (230Vac)	≥85%	≥86%	≥86%
Power Factor Control	Power factor correction >0.95 at optional load		
Cooling Method	Thermostatic control fan from zero to full speed		
Operating Temperature	0 - 40°C		
Protections	Overload, Short Circuit by Constant Current, Output Tracking Over Voltage, Over Temperature		
Approvals	CE EMC: EN 55011, 55022 LVD: EN 60950, 61010		
Dimensions	193 x 98 x 215 mm 7.6 x 3.9 x 8.5 inch		
Weight	Approx. 2.4kgs 5.2lbs		
Accessories	User Manual ; USB Cable		
Remote Programmable Specification			
Communication Interface	USB 2.0, RS-485, 10/100Mb Ethernet		
Remote Programming Functionality	Full control of power supply functions and data read-back		
Data Logging	Yes, with supplied software		

● All values are based on the standard ambient temperature 25°C and pressure 0.1Mpa.

3.   Introduction

The SDP series of high performance programmable with new advanced microprocessor technology allow programming and setting of all parameters on the unit's key pad without the use of PC. The colour LCD display facilitates setting of multiple parameters and real time output V/ I/ W wave form.

The convenient closed housing firmware upgrade and calibration procedure allow up keeping of the optimal state of the power supply. The power supplies come with Ethernet, USB and RS-485 ports for remote control, Programming, Monitoring and Data Logging via PC interface through SCPI commands.

Groups of control settings and cyclic sequence can be stored in the PC and input to the selected power supply via Ethernet, RS-485 and USB. When using RS-485, one PC can control and data log as many as 31 power supplies of the same series. There are features in this new series that are only found in higher price category power supplies.

This series of power supplies have obtained the safety approval EN-61010 and EN-55011 EMC approval for scientific, industrial equipment of the CE directives.

Features

- Single output laboratory grade programmable switching mode PS
- Color LCD display multiple parameters & real time output V/ I/ W graph
- Full panel setting of cyclic program and all system parameters including LAN
- Full remote programming, monitoring and data logging
- One PC can control, monitor and data log up to 31 power supplies via RS-485.
- One PC can control, monitor and data log any number of power supplies via Ethernet.
- Built in Ethernet, RS-485 and two USB ports.
- One device USB port for remote programming, control and data logging.
- Local and remote programmable cyclic run of 20 sets V, I, Time and up to 999 cycles.
- Supplied with control software, SCPI command sets, and LabView™ driver.
- Convenient close housing calibration and firmware upgrade.
- 4 digit ammeter, voltmeter and power meter.
- Tracking OVP plus user defined max. output voltage.
- 9 user presets of voltage and current limit at the key pad.
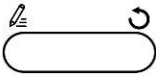
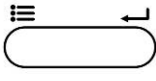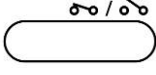# 4. Front & Rear Panel

4.1 Front Panel Annotation
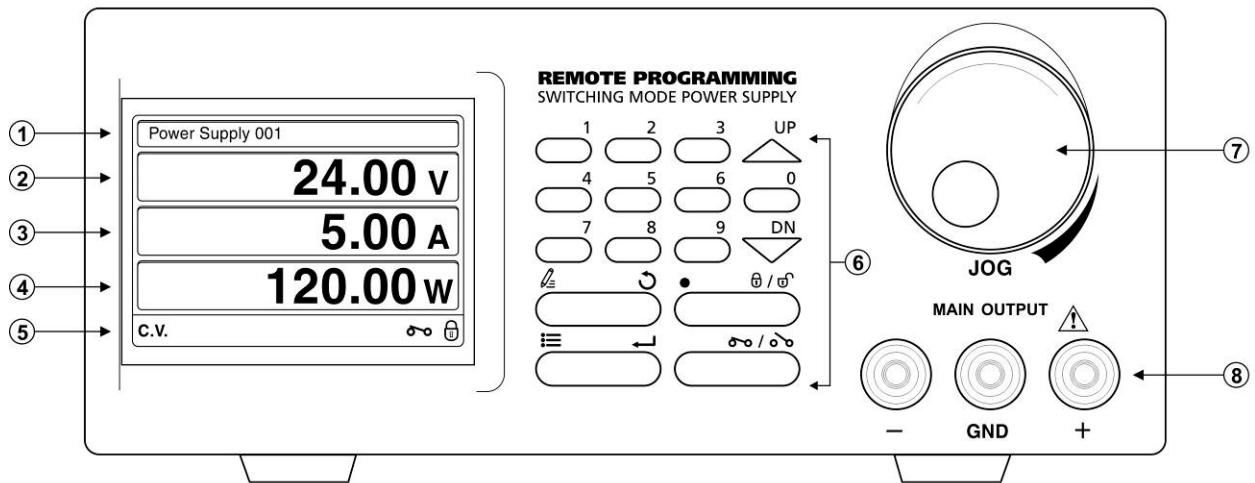
1. Power supply identity: It can assign a number, which from 1 to 254, for power supply to identity it.
2. Output Voltage Display: Showing the output voltage
3. Output Current Display: Showing the output current
4. Output Power Display: Showing the output power
5. Status Bar: Show this status of power supply. It included

C.C.	The power supply operating in Constant Current Mode
C.V.	The power supply operating in Constant Voltage Mode
OVP	The power supply is in Over Voltage Protection
OCP	The power supply is in Over Current Protection
OTP	The power supply is in Over Temperature Protection
CAL	The power supply is in Calibration Mode
무무무	The power supply is in Remote Mode, all keypad is locked in the mode
⌇⊸	The output is ON
⊶⌇	The output is OFF
🔒	The keypad is locked
🔓	The keypad is unlocked
🕘	The power supply is running internal program
LAN	Power supply is configured to use LAN as remote control, USB is still enabled is this mode
485	Power supply is configured to use RS485 as remote control, USB is still enabled is this mode
🔊	Keypad sound ON
🔇	Keypad sound OFF

6. Keypad Definition:

0 thru **9**	Press to select numerical values
UP	Press to ascend numerical values
	Press to move highlight upward
DN	Press to descend numerical values
	Press to move highlight downward
✍ ↺	In Main screen, use to enter program step menu
	In Setup Menu screen, exit to one level up
☰ ↵	In Main screen, use to enter Menu
	In Setup Menu screen, use to confirm setting
● 🔒 / 🔓	In Main screen, use to lock and unlock keypad
	In numerical input area, use to enter decimal point
⌁ / ⌁	Setting output ON / OFF

7. JOG:
    The JOG has 5 Functions
    - During the setting of voltage or current, rotate to increase / reduce value of setting
    - In voltage or current setting, press to move to different digit for setting
    - In menu screen, rotate to move selection to right / left
    - During input a value, press JOG can reset input from beginning
8. Main Output Terminal

4.2   Rear Panel Annotation
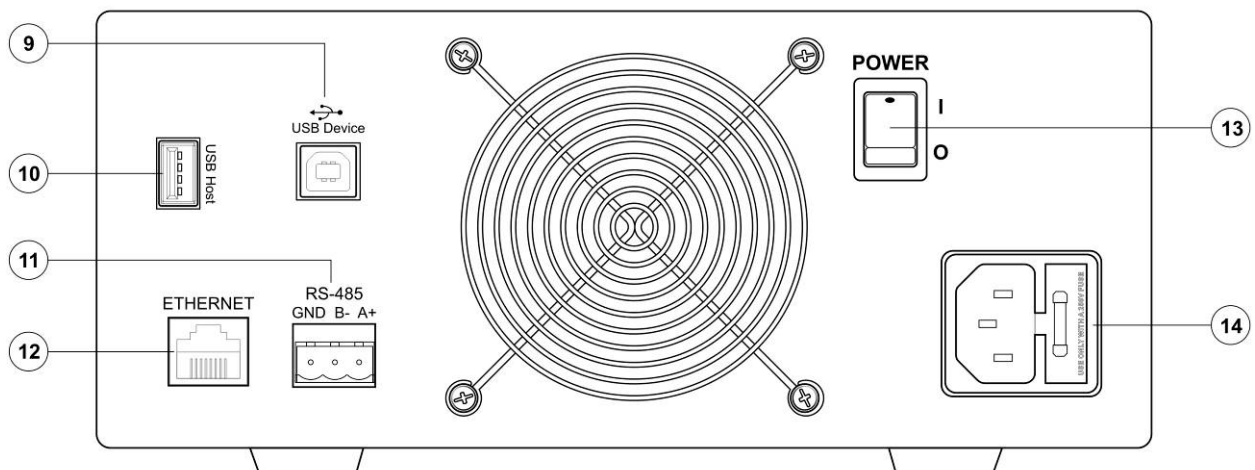
9.   USB Device Port
10. USB Host
11. RS-485 Port
12. Ethernet
13. Power Switch
14. Power Socket

5.   Operation with Main Screen

```
┌─────────────────────────────┐        ┌─────────────────────────────────┐
│ ┌─────────────────────────┐ │        │ ┌─────────────────┐             │
│ │ Power Supply 001        │ │        │ │ Power Supply 001│             │
│ ├─────────────────────────┤ │        │ ├─────────────────┤             │
│ │          24.00 V        │ │        │ │   24.00 V       │             │
│ ├─────────────────────────┤ │        │ ├─────────────────┤ 1. Preset:    0 │
│ │           5.00 A        │ │        │ │    5.00 A       ├─────────────────┤
│ ├─────────────────────────┤ │        │ │                 │ Output Setting: │
│ │        120.00 W         │ │        │ ├─────────────────┤ 2. Volt:  12.15V│
│ └─────────────────────────┘ │        │ │ 120.00 W        │ 3. Curr:     8A │
│ C.V.              ∽ ⌓       │        │ └─────────────────┘                 │
└─────────────────────────────┘        │ C.V.              ∽ ⌓              │
                                       └─────────────────────────────────┘
```
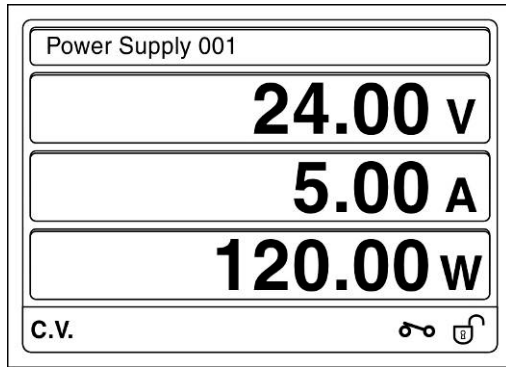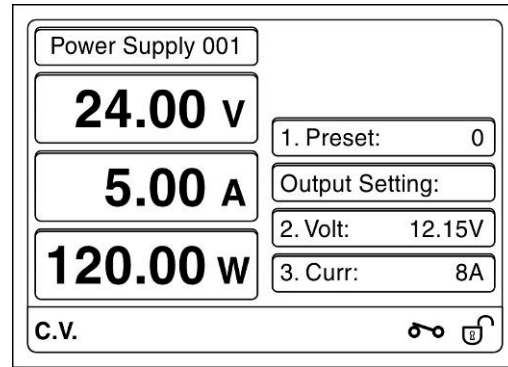
Basic Screen	**Output Setting Screen**

The   Main   Screen of SDP has two parts

- Basic screen shows actual output status of power supply
- Output setting screen shows actual output status as well as output setting area.
  You can recall preset setting, set output voltage and current in this screen.

5.1   Enter and exit Output Setting Screen

Rotating JOG anti-clockwise to pull out Output Setting Screen. The voltage setting is highlighted by default.

You can press ⌷ to exit Output Setting Screen.

The Output Setting Screen will automatically exit after ideal for 2 minutes.

5.2   Change Output Voltage and Current Setting

It has 2 ways to change output setting for voltage and current.

5.2.1   Use JOG to Change Output Setting

By using JOG to change output setting, the actual output will effective immediately when you are rotating the JOG.

i.   Enter Output Setting Screen

ii.   Highlight Voltage / Current by using △(UP) / ▽(DN)

iii. Rotate JOG clockwise / anti-clockwise to increase and decrease setting

iv.   Press JOG highlight to different decimal place for cross and fine adjustment

v.   Press ⌷ to exit

5.2.2   Use Keypad to Change Output Setting

You can direct key-in value in setting area to change output setting. The output will only effective after press ⌷ to confirm

i.   Enter Output Setting Screen

ii.   Highlight Voltage / Current by using △(UP) / ▽(DN)

iii. Direct key-in value. (example: to set 12.34V, then key-in 1234)

iv.   Press ⌷ to confirm setting

v.   If you make mistake during key-in, input value from beginning again, the value will be overide.

5.3 Change Output by Recalling Preset Value

You can recall preset 0 to 9 to set output value quickly

i.   Enter Output Setting Screen

ii.   Highlight preset by using ⬜ / ⬜

iii.   Enter number 0 to 9 for step you prefer (If you forget the setting, press JOG once to show all of them)

iv.   Press ⬜ to confirm

6.   Main Setup MENU
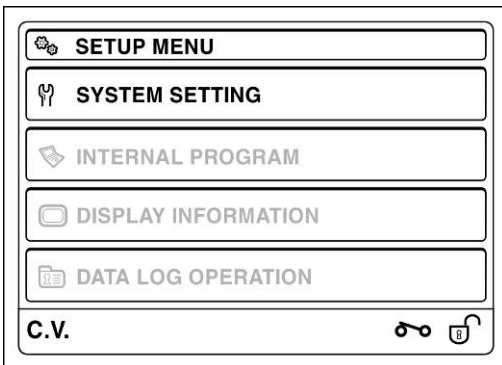
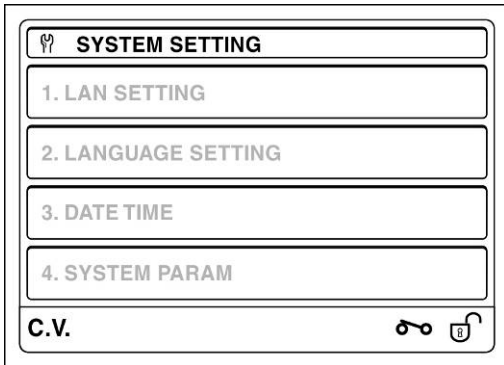This model of SDP is using Menu Base operation. The Setup Menu can preform following 4 things.

- Configure System Setting

- Configure Internal Program

- Show system information

- Perform Data log operation

6.1   Main Setup MENU

Press ⬜ in basic to enter main SETUP MENU. It content 4 sub-menus. You can use ⬜ / ⬜ key or JOG to move between different menu. You can also press number 1 to 4 to quick move between menus.

6.2   System Setting MENU

Select SYSTEM SETTING in main SETUP MENU then press ⊂▭⊃ to enter SYSTEM SETTING MENU. You can configure LAN setting, Language setting, Date time setting and System parameter in this sub-menu.
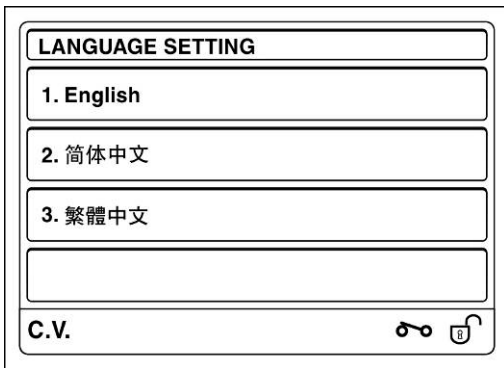
```
┌─────────────────────────────────┐
│ ⌖  SYSTEM SETTING               │
│ ┌─────────────────────────────┐ │
│ │ 1. LAN SETTING              │ │
│ └─────────────────────────────┘ │
│ ┌─────────────────────────────┐ │
│ │ 2. LANGUAGE SETTING         │ │
│ └─────────────────────────────┘ │
│ ┌─────────────────────────────┐ │
│ │ 3. DATE TIME                │ │
│ └─────────────────────────────┘ │
│ ┌─────────────────────────────┐ │
│ │ 4. SYSTEM PARAM             │ │
│ └─────────────────────────────┘ │
│ C.V.                    ⚷  🔓   │
└─────────────────────────────────┘
```

6.2.1   LAN SETTING

```
┌─────────────────────────────────┐
│ LAN SETTING                     │
│ ┌─────────────────────────────┐ │
│ │ 1. Lan Type:    DHCP / STATIC│ │
│ └─────────────────────────────┘ │
│ ┌─────────────────────────────┐ │
│ │ 2. IP Addr:     192.168.1.250│ │
│ └─────────────────────────────┘ │
│ ┌─────────────────────────────┐ │
│ │ 3. Lan Mask:   255.255.255.0 │ │
│ └─────────────────────────────┘ │
│ ┌─────────────────────────────┐ │
│ │ 4. Gateway:      192.168.1.5 │ │
│ └─────────────────────────────┘ │
│ C.V.                    ⚷  🔓   │
└─────────────────────────────────┘
```
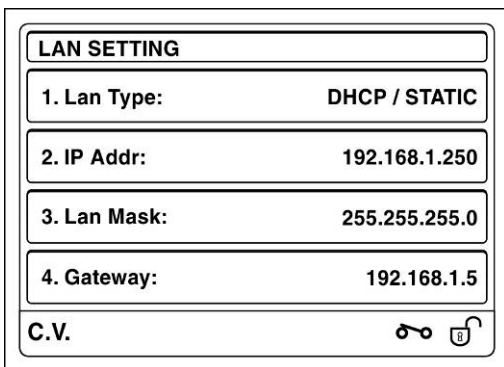
i.   In SYSTEM SETTING menu, use △(UP) / ▽(DN) key to move to LAN SETTING. Then press ⊂▭⊃.

ii.   Configure LAN type

       You can configure power LAN card use "DHCP" or "Static". Use △(UP) / ▽(DN) key to move to "Lan type" setting. The rotate JOG to select between DHCP and Static. Then press ⊂▭⊃ to confirm setting.

iii.   Configure IPv4 address

       To configure IPv4 address of power supply. Use △(UP) / ▽(DN) key to move to "IP Addr" line. Direct key-in IP address. Use rotate JOG to move between 4 segments of IP address.

       If you input incorrect number, the number will highlight in red colour. You can press JOG once to start over input another value.

iv.   Configure Lan Mask

       Use △(UP) / ▽(DN) key to move to "Lan Mask" line. Direct key-in netmask of your network using. Use JOG to move between 4 segments of netmask setting.

v.   Configure default gateway

       Use △(UP) / ▽(DN) key to move to "Gateway" line. Direct key-in IP address of your network default gateway. Use JOG to move between 4 segments of default gateway setting.

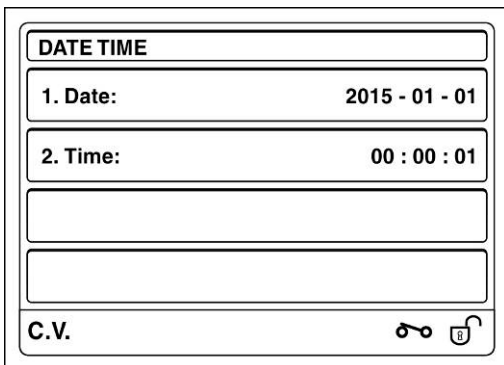vi.   Finally press ⊂▭⊃ to confirm and exit LAN Setting.

6.2.2　　LANGUAGE SETTING

```
┌─────────────────────────────────┐
│ ┌─────────────────────────────┐ │
│ │ LANGUAGE SETTING            │ │
│ ├─────────────────────────────┤ │
│ │ 1. English                  │ │
│ ├─────────────────────────────┤ │
│ │ 2. 简体中文                  │ │
│ ├─────────────────────────────┤ │
│ │ 3. 繁體中文                  │ │
│ ├─────────────────────────────┤ │
│ │                             │ │
│ ├─────────────────────────────┤ │
│ │ C.V.                  ⚬⚬ 🔓 │ │
│ └─────────────────────────────┘ │
└─────────────────────────────────┘
```

This power supply support multi-language setting for MENU.

i.　In SYSTEM SETTING menu, use △(UP) / ▽(DN) key to move to LANGUAGE SETTING. Then press ⬚.

ii.　Then press ⬚ to enter language setting menu.

iii.　Select your prefer language for menu.

iv.　Press ⬚ to confirm and exit setting. Then menu will change to language you selected.

6.2.3　　DATE TIME SETTING

```
┌─────────────────────────────────┐
│ ┌─────────────────────────────┐ │
│ │ DATE TIME                   │ │
│ ├─────────────────────────────┤ │
│ │ 1. Date:       2015 - 01 - 01│ │
│ ├─────────────────────────────┤ │
│ │ 2. Time:        00 : 00 : 01 │ │
│ ├─────────────────────────────┤ │
│ │                             │ │
│ ├─────────────────────────────┤ │
│ │                             │ │
│ ├─────────────────────────────┤ │
│ │ C.V.                  ⚬⚬ 🔓 │ │
│ └─────────────────────────────┘ │
└─────────────────────────────────┘
```

You can configure date and time

i.　In SYSTEM SETTING menu, use △(UP) / ▽(DN) key to move to DATE TIME. Then press ⬚.

ii.　Then use △(UP) / ▽(DN) key to move to Date configuration line.

iii.　Direct key-in date. The date format is yyyy-mm-dd.

iv.　Use △(UP) / ▽(DN) key to move to Time configuration line.

v.　Direct key-in time.

vi.　Press ⬚ to store and exit.

6.2.4   SYSTEM PARAMETER SETTING

SYSTEM PARAM	
1. Key Sound:	OFF / ON
2. Alarm:	OFF / ON
3. System ID:	254
4. LAN Port:	8888
C.V.	

SYSTEM PARAM	
5. UVL Setting:	60V
6. UCL Setting:	5A
C.V.	

You can set Key Sound ON / OFF, Alarm ON / OFF, System ID number, LAN Port for remote control, UVL and UCL in this sub-menu.

i.   In SYSTEM SETTING menu, use △ / ▽ key to move to SYSTEM PARAM. Then press ⌷.

ii.   Use △ / ▽ key to move to Key Sound setting line, then rotate JOG to select ON / OFF.

iii. Use △ / ▽ key to move to System ID line, then direct key-in number 1 to 254. The number will turn to red if you input invalid number. Press ⌷ to confirm the input.

v.   Use △ / ▽ key to move to LAN Port line, direct key-in port number for remote control.
      e.g. IP address is 192.168.1.100 and port number is 8888. The remote control software can be connect to system through 192.168.1.100:8888.

vi.   Use △ / ▽ key to move to UVL Setting, direct key-in upper voltage limit which range is between 1V to maximum rating voltage for model.

vii. Use △ / ▽ key to move to UCL setting, direct key-in upper current limit which range is between 0.01A to maximum rating current for model.

6.3 INTERNAL PROGRAM

INTERNAL PROGRAM
1. STEPS PROGRAM
2. PRESET PROGRAM
C.V.

The SDP power supply has two types of internal program. The first one is a 20 steps program which can be run step by step for some cycle. The other type is 10 preset programs for quick switch of preset value.

6.3.1 Edit steps for internal program

i. In "INTERNAL PROGRAM" MENU, select "1. STEPS PROGRAM" then press ⬭ to enter the below menu screen.

| Step	Volt [V]	Curr [A]	Dura [s]
1	6.60	2.00	10
2	5.00	1.51	5
3	12.0	3.25	3
4	13.0	2.75	20
5	20.0	6.55	7

⬧ INTERNAL PROGRAM

C.V.

ii. Rotate JOG to show steps you would like to edit.

iii. Press △ / ▽ once, the voltage setting area of the step will be highlighted for edit.

iv. Direct key-in value you would like to set. Use ⬭ for input dot. (e.g. 12.34 press 12 ⬭ 34).

v. Rotate JOG to current setting area to edit current.

vi. Rotate JOG to duration setting area to edit running duration.

vii. If finish the editing, press ⬭ twice to exit. If continuous to edit other step, rotate JOG to highlight voltage setting area. Then press △ / ▽ to move to next / previous step.

viii. If you would like to exit without save the change, press ⬭ to exit editing.

6.3.2 Edit Preset Program

i. In "INTERNAL PROGRAM" MENU, select "1. STEPS PROGRAM" then press ⬭ to enter the below menu screen.

PRESET PROGRAM

Index	Volt [V]	Curr [A]
01	2.12	1.55
02	5.67	2.55
03	6.00	5.00
04	5.88	2.10
05	6.55	3.00

C.V.

ii. Rotate JOG to show steps you would like to edit.

iii. Press △ / ▽ once, the voltage setting area of the step will be highlighted for edit.

iv. Direct key-in value you would like to set. Use ⬭ for input dot. (e.g. 12.34 press 12 ⬭ 34).

v. Rotate JOG to current setting area to edit current.

vi. If finish the editing, press ⬭ twice to exit. If continuous to edit other step, rotate JOG to highlight voltage setting area. Then press △ / ▽ to move to next / previous preset.

vii. If you would like to exit without save the change, press ⬭ to exit editing.

6.3.3 Internal Program Start / Stop
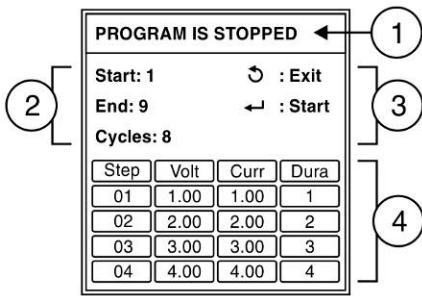
The above internal program running menu content 4 perts.
Part 1   Indicate program is running or stopped.
Part 2   Indicate and edit start running step, end running step and number of cycles to be run.
Part 3   Reminder for Exit key, Start key and Stop key.
Part 4   Steps review windows.

i.   Press ⟲ in Main Screen to pull up above internal program running menu.

ii.   Rotate JOG to review steps.

iii.   Press △ᵁᴾ / ▽ᴰᴺ to move between Start, End and Cycles input space.

iv.   Enter setting use keypad (e.g. The above example is run from 1 to 9 for 8 cycles)

v.   Press ⟱ to start running.

vi.   If the program is running, press ⟱ again to stop.

When the internal program is running. The screen will show following stepping view. It shows voltage, current and duration of step. As well as cycle and step are running.
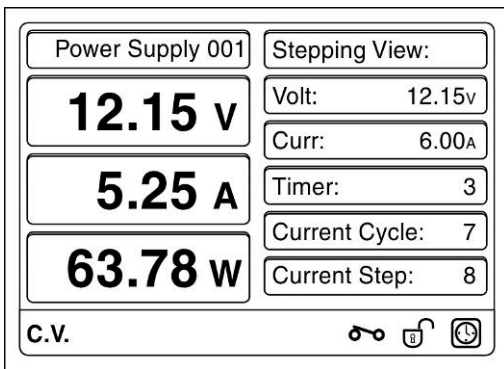
6.3.4 Select Preset Program

It has two ways to select preset program.

```
┌─────────────────────────────────────┐
│  ┌──────────────────┐               │
│  │ Power Supply 001 │               │
│  └──────────────────┘               │
│  ┌──────────────────┐               │
│  │  24.00 V         │               │
│  └──────────────────┘ ┌───────────────────┐
│                       │ 1. Preset:      0 │
│  ┌──────────────────┐ └───────────────────┘
│  │   5.00 A         │ ┌───────────────────┐
│  └──────────────────┘ │ Output Setting:   │
│                       └───────────────────┘
│  ┌──────────────────┐ ┌───────────────────┐
│  │ 120.00 W         │ │ 2. Volt:   12.15V │
│  └──────────────────┘ └───────────────────┘
│                       ┌───────────────────┐
│                       │ 3. Curr:       8A │
│                       └───────────────────┘
│  C.V.                          ⌖  🔓       │
└─────────────────────────────────────┘
```
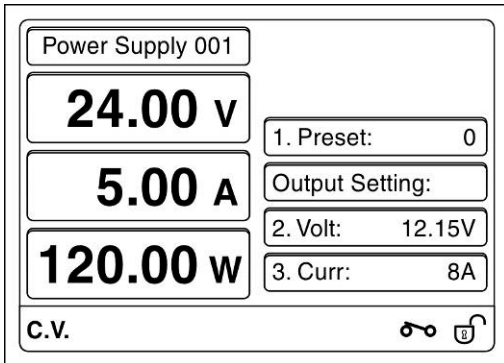
6.3.4.1 Use direct key in to select preset program

i. Rotate JOG to show voltage/current setting mode.

ii. Press ⌃(UP) to move highlight to Preset area then input 0 ~ 9 to select preset value.

iii. Press ⊂⊃ to confirm preset selection.

6.3.4.2 Use JOG to select preset program

i. Rotate JOG to show voltage/ current setting mode.

ii. Press ⌃(UP) to move highlight to preset area then input 0 ~ 9 to select preset value.

iii. Press JOG to show preset program table.

iv. Rotate JOG to preset value you would like to select. Then press JOG.

v. Press ⊂⊃ to confirm preset selection.

6.4 Display Power Supply Information

```
┌─────────────────────────────────────┐
│ ┌─────────────────────────────────┐ │
│ │ ▭  DISPLAY INFORMATION          │ │
│ ├─────────────────────────────────┤ │
│ │ 1. SYSTEM INFORMATION           │ │
│ ├─────────────────────────────────┤ │
│ │ 2. LAN INFORMATION              │ │
│ ├─────────────────────────────────┤ │
│ │                                 │ │
│ ├─────────────────────────────────┤ │
│ │                                 │ │
│ └─────────────────────────────────┘ │
│  C.V.                     ⚬⚬  🔓    │
└─────────────────────────────────────┘
```

You can check system information and LAN setting information in DISPLAY INFORMATION sub-menu.

i.   Select DISPLAY INFORMATION in SETUP MENU, then press ⬭ to enter above menu screen.
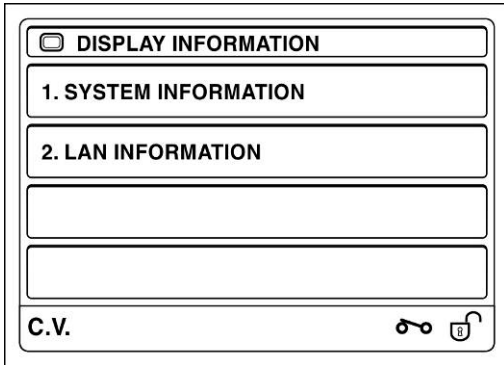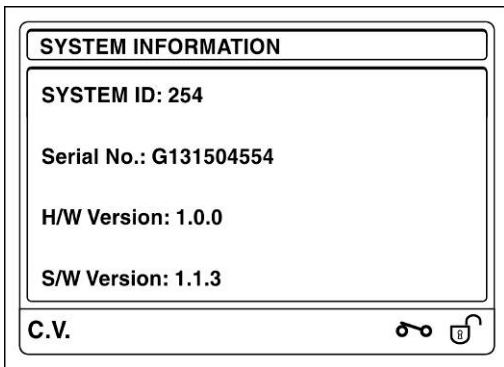
ii.   Use △ / ▽ to select system information, then press ⬭ to show system information.

```
┌─────────────────────────────────────┐
│ ┌─────────────────────────────────┐ │
│ │ SYSTEM INFORMATION              │ │
│ ├─────────────────────────────────┤ │
│ │ SYSTEM ID: 254                  │ │
│ │                                 │ │
│ │ Serial No.: G131504554          │ │
│ │                                 │ │
│ │ H/W Version: 1.0.0              │ │
│ │                                 │ │
│ │ S/W Version: 1.1.3              │ │
│ └─────────────────────────────────┘ │
│  C.V.                     ⚬⚬  🔓    │
└─────────────────────────────────────┘
```

iii. Use △ / ▽ to select LAN information, then press ⬭ to show LAN setting information.

```
┌─────────────────────────────────────┐
│ ┌─────────────────────────────────┐ │
│ │ LAN INFORMATION                 │ │
│ ├─────────────────────────────────┤ │
│ │ addr: 192.168.1.100             │ │
│ │ Bcast: 192.168.1.255            │ │
│ │ Mask: 255.255.255.0             │ │
│ │                                 │ │
│ │ HWaddr: 1E:A1:1A:9A:AD:BF       │ │
│ └─────────────────────────────────┘ │
│  C.V.                     ⚬⚬  🔓    │
└─────────────────────────────────────┘
```

6.5   DATA LOG CONFIGURE

```
┌─────────────────────────────────────────┐
│  ┌───────────────────────────────────┐   │
│  │ 📖 DATA LOG OPERATION             │   │
│  ├───────────────────────────────────┤   │
│  │ 1. LOG CONFIGURE                  │   │
│  ├───────────────────────────────────┤   │
│  │ 2. CHART DISPLAY                  │   │
│  ├───────────────────────────────────┤   │
│  │                                   │   │
│  ├───────────────────────────────────┤   │
│  │                                   │   │
│  ├───────────────────────────────────┤   │
│  │ C.V.                    ⚬━⚬  🔓   │   │
│  └───────────────────────────────────┘   │
└─────────────────────────────────────────┘
```
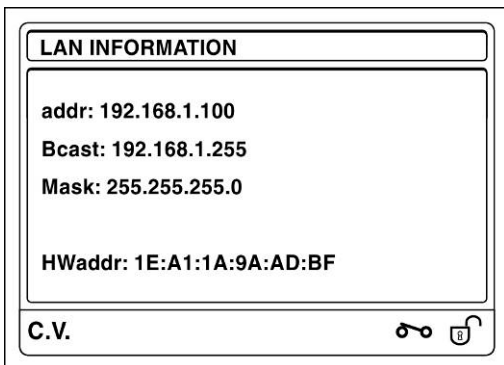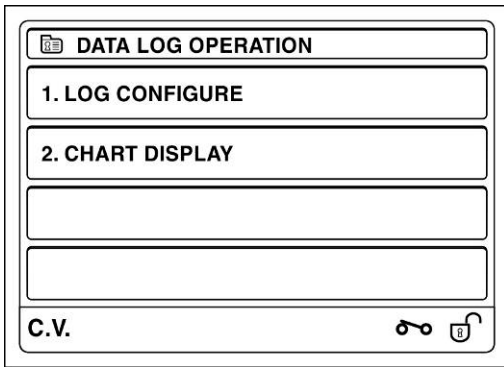
The DATA LOG OPERATION menu allow you to setup sampling time in second and display output graph for voltage, current and power of power supply.

i.   Select DATA LOG OPERATION in SETIP MENU, then press ⬭ to enter above menu screen.

ii.   Use △ / ▽ to select LOG CONFIGURE sub-menu.

```
┌─────────────────────────────────────────┐
│  ┌───────────────────────────────────┐   │
│  │ LOG CONFIGURE                     │   │
│  ├───────────────────────────────────┤   │
│  │ Sample Time                    1  │   │
│  ├───────────────────────────────────┤   │
│  │ Sample Length                300  │   │
│  ├───────────────────────────────────┤   │
│  │                                   │   │
│  ├───────────────────────────────────┤   │
│  │                                   │   │
│  ├───────────────────────────────────┤   │
│  │ C.V.                    ⚬━⚬  🔓   │   │
│  └───────────────────────────────────┘   │
└─────────────────────────────────────────┘
```
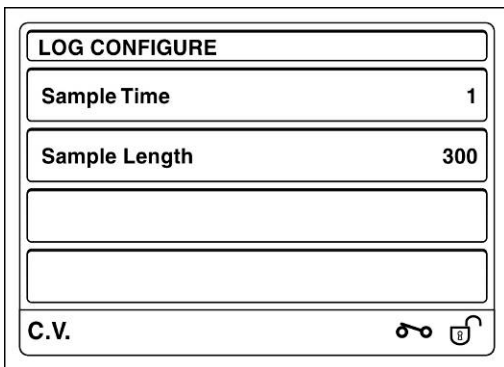
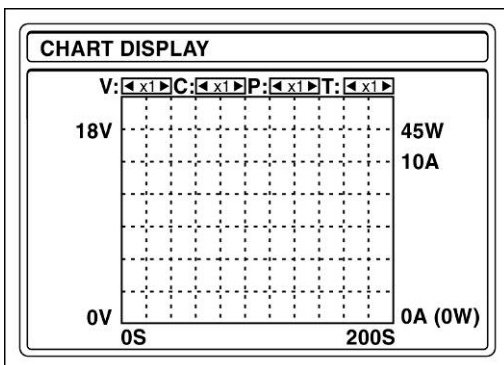iii.   Press ▽ to highlight Sample Time setting. The Sample Length is maximum data logging time in second. (The maximum time is limited due to memory size of storage used to store data).

iv.   Press ⬭ to exit.

v.   Use △ / ▽ to select CHART DISPLAY. The following output chart will come up. (You can also press key 1 in basic main screen to quick access to this display).

```
┌─────────────────────────────────────────┐
│  ┌───────────────────────────────────┐   │
│  │ CHART DISPLAY                     │   │
│  ├───────────────────────────────────┤   │
│  │   V:◄x1►C:◄x1►P:◄x1►T:◄x1►        │   │
│  │ 18V ┌─┬─┬─┬─┬─┬─┬─┬─┐ 45W        │   │
│  │     ├─┼─┼─┼─┼─┼─┼─┼─┤ 10A        │   │
│  │     ├─┼─┼─┼─┼─┼─┼─┼─┤            │   │
│  │     ├─┼─┼─┼─┼─┼─┼─┼─┤            │   │
│  │     ├─┼─┼─┼─┼─┼─┼─┼─┤            │   │
│  │     ├─┼─┼─┼─┼─┼─┼─┼─┤            │   │
│  │  0V └─┴─┴─┴─┴─┴─┴─┴─┘ 0A (0W)    │   │
│  │     0S            200S           │   │
│  └───────────────────────────────────┘   │
└─────────────────────────────────────────┘
```

vi.   It allow you to change display scale for voltage, current, power and time. Press JOG to select between V:, C:, P: and T: on the top of chart display. Then rotate the JOG to adjust display scale for selected display.

vii.   You can press ⬭ to exit.