HCS 3600/3602/3604 USB

Laboratory-quality switched-mode power supply with high interference immunity and encoder control

1. Introduction

Since the introduction of the HCS power supply series in 2009, we have made numerous improvements to the hardware modules, the firmware and the software framework. In the current version of the HCS power supply series, both the hardware and the firmware have been modified and new functions have been added to the application software.

Additional functions on the user interface:

1. Set the current display to zero if no load is connected
2. Resetting the three presets to factory settings

2. Warnings / safety instructions

- Never use this power supply unit near water or in a damp environment.
- Never touch or use this power supply unit with wet hands.
- Never open the housing of the power supply unit if it is still connected to the mains power supply.
- Only allow qualified personnel to carry out maintenance or repair work.
- Before changing the appliance fuse at the mains connection, first look for the cause of the fault and rectify it.
- Only replace the fuse with the same type/value as the original fuse.
- The maximum output voltage of the HCS 3604 model is more than 60 V DC. It is therefore essential to avoid touching the output connection terminals!
- This power supply unit is not intended for cascaded connection and should therefore never be connected in series or parallel with other or identical power supply units/voltage supplies.
- The analogue remote control or remote programming via the USB interface is only intended for individual operation of the power supply unit.
- Do not use this power supply unit in conjunction with electric motors, magnets or inductive loads, which generate overvoltages or retroactive voltage peaks due to induction (EMF) and can damage the power supply unit.

3. Attention

- Only connect the power supply unit to a professionally installed earthed socket outlet
- This appliance is only authorised for use in dry rooms
- Never operate this appliance in a damp or dusty environment, in direct sunlight or near heat sources.
- Before connecting the power supply unit to the AC power supply, check the connection data against the rating plate on the back of the device

- Never close the ventilation openings of the appliance
- This power supply unit may only be operated within its specified rated power. Continuous and excessive strain can damage the appliance.
- Never short-circuit the sensor connection
- The conductor cross-section of the power supply cable must be at least 0.75 mm². The total length of the supply cable must not exceed 3 m.

4. Operating and ambient conditions

- Operating humidity: 10-80%
- Operating altitude up to 2,000 m
- Installation category: CAT 2
- Degree of soiling: 2
- Mains voltage fluctuation: +/- 10%
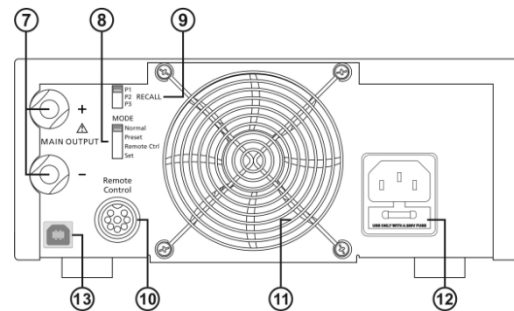
5. Controls and displays
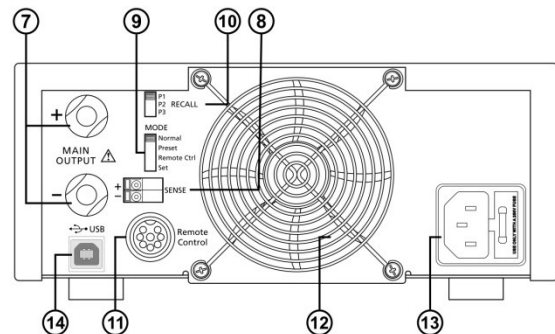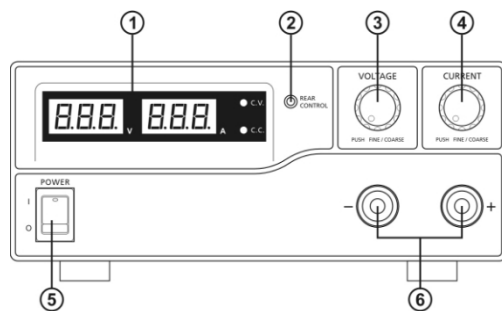
1. LED display with display for
   Constant voltage (C.V.) and constant current (C.C.)
2. Rear Control Indicator - lights up in preset, remote control or setting mode
3. Regulator for output voltage level
4. Regulator for output current level
5. Main switch
6. Aux. Output connections (max. 5A)
   Note: HCS 3600: Total rated current (Aux.+Main) 60 A
          HCS 3602: Total rated current (Aux.+Main) 30 A
          HCS 3604: Total rated current (Aux.+Main) 15 A

7. Output connections (MAIN OUTPUT) Note:
          HCS 3600: Rated current 60 A
          HCS 3602: Rated current 30 A
          HCS 3604: Rated current 15 A
8. Remote Sensing connection (sensor connection) (HCS-3600 model only)
   Warning: Short-circuiting or reversing the polarity of this connection will damage the power supply unit

9. Operating mode switch (normal, preset, remote control, setting mode)
10. Recall switch (RECALL)
11. Connection for analogue remote control
12. Fan grille Cooling fan
13. Mains connection and fuse
14. USB connection

6. Selecting the operating mode

There are four operating modes: Normal, Preset, Set and Remote Control.

6.1 Normal mode

This is the factory-set operating mode in which the output voltage and output current are set using the controls on the front panel.
Press the control buttons to switch between coarse and fine adjustment. Note the changes in brightness of the LED. Set the desired value by turning the control knobs in the two setting positions as required.
To check the preset current value, turn the control knob slightly in any direction.
A few seconds after the adjustment, the display returns to its normal brightness.

6.2 Preset mode

a) In this operating mode, the **Rear Control Indicator** lights up and indicates that the voltage and current regulators have no effect.

b) Three factory preset values (P1/P2/P3) can be recalled using the **recall selection** switch on the back of the device.

c) The following table shows the factory-set values:

Recall no.	Output voltage	Output current
P1	5V	Maximum
P2	13,8V	Maximum
P3	HCS-3600: 15V HCS-3602: 25V HCS-3604: 55V	Maximum

d) To make your own presettings, see point 6.3

6.3 Set mode

This mode is activated by the **Mode** operating mode switch on the back of the device (SET position).

6.3.1 Defining the preset values P1 / P2 / P3

a) Set the **RECALL** switch to the desired position of the preset to be changed.

b) Use the **VOLTAGE** regulator on the front of the device to set the desired voltage.

c) Use the **CURRENT** control on the front of the appliance to set the desired current.

d) Repeat the steps for each preset to be changed.

e) Set the **MODE** operating mode switch to the **Preset** position to confirm the settings.

Notes:

All preset settings are retained even after the power supply unit is switched off.
Please always check the output voltage of the desired preset before connecting loads/consumers. To do this, set the **MODE** switch to **Preset** and the **RECALL** switch to the desired preset (P1, P2 or P3). The current and voltage values assigned to the individual presets are shown on the LED display.

The PC software offers a more convenient way of assigning current and voltage values to the presets. After defining and saving the values using the PC software, the presets can be activated using the **RECALL** switch.

6.4 Analogue remote control mode

To change the current and voltage values via the remote control connection, see point 9.

7. Using the power supply unit

7.1   This series comprises three models. Please ensure that you use the correct device for your purposes.
The values for output voltage and output current are as follows:

Model	Output voltage range	Total rated current
HCS-3600	1 ~ 16V	0 ~ 60A
HCS-3602	1 ~ 32V	0 ~ 30A
HCS-3604	1 ~ 60V	0 ~ 15A

7.2 Use the device data to ensure that it is suitable for the mains voltage range at the intended connection location. Use the cable supplied to connect the device to the mains supply. Make sure that the **MODE** switch is in the **Normal** position. The following table

shows the device self-test messages.

Self-test display and test sequence	Test result
r E U v 1.5 A	Software version
888 v 888 A	Testing the LED segments
C.V.	Test Display constant voltage
C.C.	Test Display constant current
REAR CONTROL and C.V.	Test Rear Control display
C.V.	Return to constant voltage
t E v S E A	Exam start
O U P v C H E A	Testing overvoltage protection
O L P v C H E A	Overload protection test
O t P v C H E A	Overheating protection test
F A n v C H E A	Cooling fan test
O P v O F F A	Output switched off (remote control mode)

7.3 After switching on, the power supply unit runs through a series of self-tests.
The LED indicators and other indicators on the front of the appliance light up alternately. A clear fan noise can be heard when the cooling fan is tested.
Once the self-test is complete, the C.V LED and the LED displays for voltage and current light up. The current display shows 0.0. To find out the set constant current value, turn the **CURRENT** control one click in any direction. The current display automatically returns to 0.0 after a few seconds.

7.4   Using the voltage and current regulators

The rotary encoders of the controllers have a coarse and a fine adjustment, which can be switched between by pressing the controller button. This changes the brightness of the LED display assigned to the controller. The desired value can be set by turning the control knob to coarse or fine adjustment. A few seconds after the setting has been completed, the display returns to normal brightness.

7.5   Connect the desired load to the power supply unit.
Red (+) to the positive input of the consumer and black (-) to the negative input.

7.6   First switch on the power supply unit. The LED display and the green C.V. LED should light up.

7.7   Switch on the load. The LED display and the green C.V. LED should continue to light up green.

7.8   You can now work with the connected load. At the end of work, switch off the load first and then the power supply unit.

7.9   Manual reset of the current display (Current Meter Offset)

The power supply unit automatically resets the offset of the current display when it is switched on. To reset this manually if required and without restarting the power supply unit, proceed as follows:
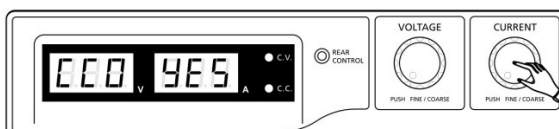
Press and hold the voltage regulator button for 30 seconds to switch to the MENU **mode**. The LED display shows
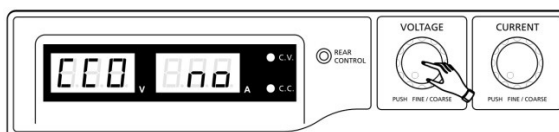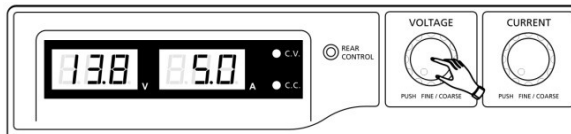
Turn the power control knob until the display looks like this
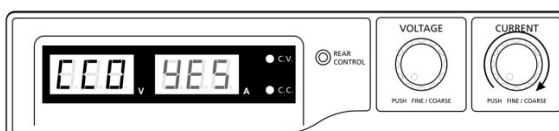
Press the current control button once to confirm. Once the offset has been successfully reset, "YES" lights up in the current display.

Finally, press the voltage regulator button to exit MENU **mode**.

### 7.10 Resetting the presets P1 / P2 / P3 to the factory setting

Section 6.3 describes how to assign your own values to the presets.
To reset the presets to the factory settings if required, proceed as follows:

Press and hold the voltage regulator button for 30 seconds to switch to the
MENU **mode**. The LED display shows
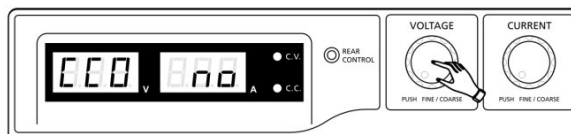
When **CCO** lights up in the display, turn the voltage regulator knob until the voltage display
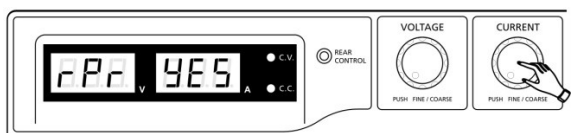shows **rPr.**
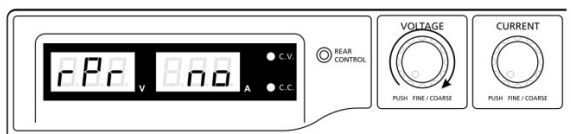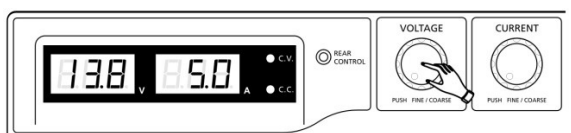

The power indicator shows **no** at this moment.
Now turn the power control knob until the power display shows **YES.**
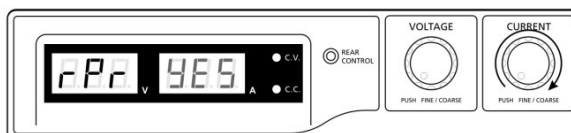
Press the power control knob once to confirm. The **YES** indicator lights up as soon as the
presets have been reset to the factory settings.

Finally, press the voltage regulator button to exit MENU **mode**.

7.11   Upper voltage and current limitation (UVL and UCL)

This power supply unit allows the upper output voltage and output current values to be limited. However, these settings can only be made in the PC software.

If the output voltage is increased during operation and reaches the specified value for the upper output voltage, the display shows

If the output current is increased during operation and reaches the specified value for the upper output current, the display shows

8. Remote Sensing (HCS-3600 only)

Observe the warnings, an incorrect disconnection sequence will damage the power supply unit.

Warning: Never short-circuit the sensor connection. Always
         disconnect the sensor connection first.

Connection: 1. first establish the power connection between the power supply unit
            and the load to be connected.
           2. Make sure that all power connections are secure, check all power connections.
           3. Then establish the connection between the sensor connection and the
            load to be connected.

Warning: Never short-circuit the sensor connection.
          Never connect the sensor connection with the wrong polarity.

The following diagram shows the connections of the sensor connection, power supply output and the load to be connected:
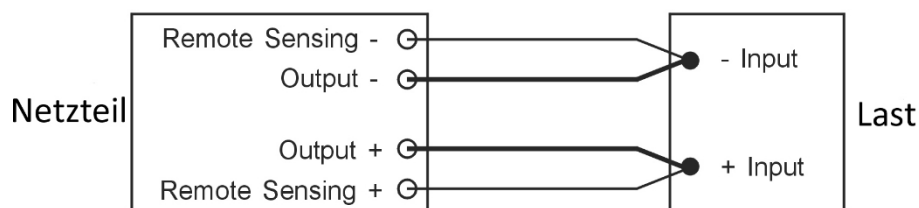
Fig. 3

The sensor cable must have a minimum cross-section of approx. 0.5 mm² (22AWG). Disconnection

sequence: An incorrect disconnection sequence will damage the power supply unit.

1. **First disconnect the sensor connection from the load.**
2. **Then disconnect the power supply line between the power supply unit and the load.**

9. Analogue remote control mode

Output voltage and output current can be set remotely using two control elements.
It is necessary that one of the two control elements is connected when the remote control mode is selected, otherwise the power supply unit will only work in constant current mode.

9.1   Option A - Using two variable DC voltages as a control element Pin assignment for

external variable voltage sources

Pin assignment of remote control connection for external variable voltage sources		
PIN	**Function**	**Notes**
1	Internal DC voltage +5V	< 50mA
2	Voltage setting	0 - 5V
3	Current setting	0 - 5V
4	Mass	
5	Output OFF	Switched to earth
6	not used	
7	not used	
8	not used	

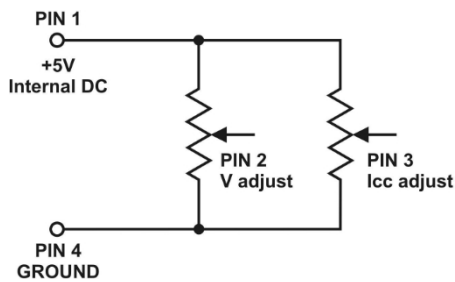Constant current setting via remote control
Short-circuit the output on the rear (MAIN OUTPUT) with a 4 mm² (12 AWG) cable and adjust the output current using a variable control voltage on pin 3.

Output voltage setting via remote control
Check the output voltage range of the power supply unit by changing the external control voltage on pin 2.

9.2 Option B - Using two 0 - 5 kOhm potentiometers as control elements

Both potentiometers must be wired as follows:

Pin assignment of remote control connection for potentiometer		
PIN	**Function**	**Remarks**
1	Internal DC voltage +5V	Potentiometer end connection
2	Voltage setting	Wiper potentiometer
3	Current setting	Wiper potentiometer
4	Mass	Potentiometer end connection
5	Output OFF	Switched to earth
6	not used	
7	not used	
8	not used	

9.3 Switching the output on/off via remote control

This function can be activated in any operating mode (Normal, Preset, Remote and Set).

A. Pin 5 is open: Output is ON (default)
B. Pin 5 connected to pin 4 (ground) : Output is OFF
C. If the output is OFF, the C.V. and C.C. LEDs flash
   The LED display shows the current output voltage and the status of the output.
D. Even when the output is switched off, the output voltage and output current can be set to the desired value using the controls on the front panel.

Note: Use the supplied 8-pin remote control plug and a conductor cross-section of 0.34 mm² (22 AWG).
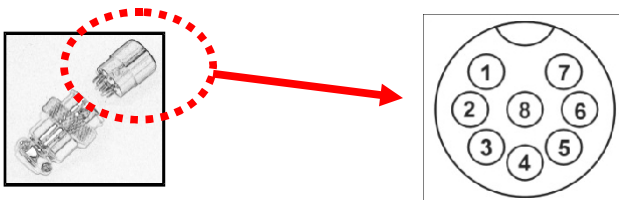
Attention!

The maximum permissible switching frequency (on/off) is 10 times per second.
If the switching frequency is exceeded, the power supply unit may not work properly and protective devices could be triggered.

10. Errors and troubleshooting

10.1   OUP: Overvoltage protection

This power supply unit has a built-in overvoltage protection function. If the output voltage exceeds the set value (please refer to the specification table for the corresponding range), the protection function is activated and the output voltage is switched off. The OUP warning appears on the display.

To reset the warning, switch off the power supply unit and disconnect all connected loads from the power supply unit. Switch the power supply unit back on and normal operation should be possible again. If the problem persists, please contact your dealer.

10.2   OPT: Overheating protection

A thermal sensor monitors the temperature and prevents overheating inside the power supply unit. In the event of overheating, no output voltage is supplied and the message **OtP appears** on the LED display.

If this warning appears, switch off the power supply unit and disconnect all connected loads from the power supply unit.

Check the connected load and the setting for output voltage and output current. Allow the device to cool down for at least 30 minutes.
Check whether the ventilation openings of the power supply unit are covered / the ventilation is obstructed and whether there is enough free space around the power supply unit.
Check carefully whether you can hear a short fan noise when you switch the power supply unit back on.
If you cannot hear the fan noise when switching on the power supply unit during the device self-test, the fan is faulty. Do not use the power supply unit and please contact your dealer.

10.3 OLP: Overload protection

Normally, the overload protection is maintained by the constant current mode.
If a failure of the constant current mode is not noticed, this can lead to serious damage to the load connected to the power supply unit.
The overload protection is designed to limit the extent of this damage.
Switch off the power supply unit immediately when you see the following message on the LED display.

To reset this warning display, switch off the power supply unit and disconnect all connected loads from the power supply unit.

Carefully check the load to be connected and the set output values after switching on the power supply unit.
If the problem is not resolved, please contact your dealer.

11. Specifications / Technical data

Model	HCS-3600	HCS-3602	HCS-3604
Output			
Variable output voltage	1 - 16V DC	1 - 32V DC	1 - 60 VDC
Variable output current	0 - 60A	0 - 30A	0 - 15A
Voltage regulation			
Load (10-100% load)	50mV		
Mains voltage (170-264 VAC variation)	20mV		
Current control			
Load (10-90% nominal voltage)	200mA	150mA	100mA
Mains voltage (170-264V AC variation)	50mA		
Ripple			
Residual ripple (RMS)	5mV		
Ripple (peak-to-peak)	50mV	50mV	100mV
Residual current ripple (RMS)	100mA	40mA	15mA
Display accuracy			
Voltage display	Three-digit LED display ±0.2% +3 counts		
Current display	Three-digit LED display LED display ±0.2% +3 counts		
More			
Input voltage	220 - 240VAC 50/60Hz~ (or on request)		
Power consumption at full load	4.7A	4.5A	4.5A
Efficiency	85%	86%	88%

Switching frequency	65 - 85Khz~	75-95Khz~	65-85Khz~
Model	**HCS-3600**	**HCS-3602**	**HCS-3604**
Maximum permissible overvoltage at the output until the overvoltage protection is activated (OVP tracking):	Range 1-5V: +2V above setting value Range 5-15V: +3V above setting value	Range 1-5V: +2V above setting value Range 5-20V: +3V above setting value Range 20-30V: +4V via setting value	Range 1-5V: +2V above setting value Range 5-20V: +3V above setting value Range 20-60V: +4V via setting value
Transient response time (50-100% load)	1.5ms		
Power factor control	>0.95 at optimum load		
Cooling	Thermostat-controlled fan from 0 to maximum		
Protective circuits	Overload, short circuit (CC constant current), overvoltage, overtemperature		
Special features	Three user-defined V/A presets, remote control V/A and ON/OFF, sensor connection (HCS-3600 only)		
Authorisations	CE EMC: EN 55011, 55022LVD: EN 60950, 61010		
Dimensions (WxHxD)	200 x 90 x 275 mm		
Weight	3.2kg		

12. PC connection

Supported operating systems: Windows XP/Vista/7 (32 and 64 bit)

Driver: Silicon Lab CP210x USB driver
(Included on the CD in the directory
USB CP210x Drivers V6.6.1 for Win_XP_S2K3_Vista_7)

Programme execution: <CD drive>:\pscs\pscs.bat

A. User interface

1. Anzeige

2. Konfigurations- und Datenanzeige

Rating: 15V 40A

13.7V   [SETTING]
0.0A   ⊙ C.V.   13.8V
0.0W   22.5A
                  OUTPUT ○─○

| External Timed Program | Internal Preset Memory | Data Log | Setting | Calibration |

3. Solldaten

Voltage: 13.8 V
0   16.2
Current: 22.5 A
0   43.0
Output: ⊙ On ○ Off   [Set]

4. Daten-
management

5.
Programm-
bezeich-
nung

External Timed Program Description:
HCS-3400 external timed program

6. Programm-
zyklen

Running Cycle: 1

Step	Voltage(V)	Current(A)	Time	Output
1	1.0	10.0	0:00:02	☑
2	5.0	10.0	0:00:01	☑
3	10.0	5.6	0:00:04	☑
4	15.0	8.1	0:00:02	☑
5	14.6	10.0	0:00:03	☐
6	13.0	6.1	0:00:02	☑
7	7.3	9.5	0:00:03	☑
8	13.0	8.5	0:00:02	☐
9	10.8	9.9	0:00:03	☑
10	13.0	9.2	0:00:03	☑
11	8.9	5.4	0:00:02	☑
12	16.2	8.0	0:00:02	☑
13	5.6	9.2	0:00:02	☑
14	2.0	10.1	0:00:02	☑
15	16.2	9.4	0:00:04	☑
16	9.5	7.8	0:00:02	☑
17	14.6	9.2	0:00:02	☑
18	6.1	2.2	0:00:03	☑

[Run]   [Clear Table]

MaxV: 16.2V MaxC: 43.0A Sampling: 3S UVL: 16.2V UCL: 43.0A Ver: V1.9.7

7. Informationsfeld

The user interface is divided into seven areas:

1. Display - provides real-time information on current/voltage and power
2. Configuration and data display - for changing programme settings and displaying data
3. Target data - for setting the default values
4. Data management - for saving, loading and printing data
5. Programme name - for the name and designation of the external timed programme
6. Programme cycles - for specifying the sequence cycles of the external timed programme
7. Information field - for displaying the maximum values of voltage and current, sampling time, overvoltage / current limitation and software version

B. Display
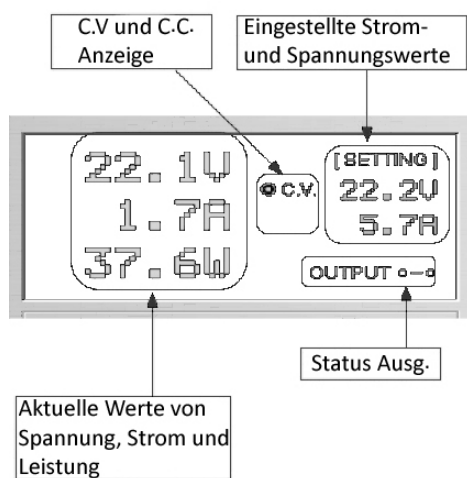
The display provides the following information:

- Output voltage
- Output current
- Output power
- Status of the output (on/off)
- Constant current / constant voltage mode
- Setting values

C. Set target data

The target data can be entered using the keyboard and confirmed by clicking on the Set button, or by changing the sliders.

D. External Timed Programme

Step	Voltage(V)	Current(A)	Time	Output
1	1.0	10.0	0:00:02	☑
2	5.0	10.0	0:00:01	☑
3	10.0	5.6	0:00:04	☑
4	15.0	8.1	0:00:02	☑
5	14.6	10.0	0:00:03	☐
6	13.0	6.1	0:00:02	☑
7	7.3	9.5	0:00:03	☑
8	13.0	8.5	0:00:02	☐
9	10.8	9.9	0:00:03	☑
10	13.0	9.2	0:00:03	☑
11	8.9	5.4	0:00:02	☑
12	16.2	8.0	0:00:02	☑
13	5.6	9.2	0:00:02	☑
14	2.0	10.1	0:00:02	☑
15	16.2	9.4	0:00:04	☑
16	9.5	7.8	0:00:02	☑
17	14.6	9.2	0:00:02	☑
18	6.1	2.2	0:00:03	☑

Tabs: External Timed Program | Internal Preset Memory | Data Log | Setting | Calibration

[Run]   [Clear Table]

It is possible to have the power pack perform a PC-controlled time and data sequence with 20 steps.
After selecting the **External Timed Programme** tab, double-click on each cell whose value you want to set.

Example for Step 2 (Step 2), setting the voltage

Step	Voltage	Current	Time	Output
1	10.0	1.00	0:00:15	☑
2	20.0 ——◯——	0.00	0:00:00	☑
3	0.0	0.00	0:00:00	☑

Drag the slider to the desired value.

Set the running time for step 2. The time range is 0 to 9 hours, 59 minutes and 59 seconds. You can make the setting by clicking on the up/down arrow buttons or by entering it directly using the keypad.
If the set value is 0, this step is skipped.

Select the number of cycles between 0 and 999. You can enter the value directly via the keyboard or using the slider. A value of 0 means that the programme runs indefinitely.
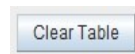
Running Cycle: [20] ◻━━━━━━

Start the programme by clicking on the button Run
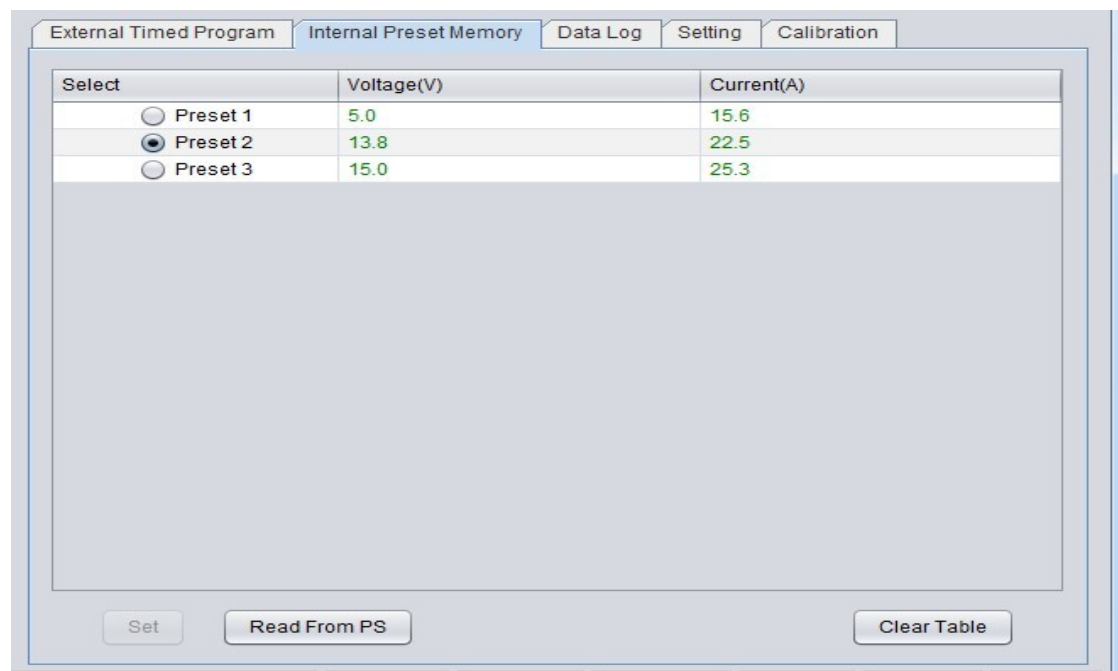
The programme can be   interrupted with the button   Stop .

Click   Clear Table   to delete the settings.

E. Internal preset memory

| External Timed Program | Internal Preset Memory | Data Log | Setting | Calibration |

Select	Voltage(V)	Current(A)
○ Preset 1	5.0	15.6
● Preset 2	13.8	22.5
○ Preset 3	15.0	25.3

Set   Read From PS   Clear Table

The PC interface simplifies the input of values. By displaying all values together, incorrect entries should be avoided as far as possible. Data from different groups can be classified, saved, exported and retrieved at any time.

In addition, retrieved data is displayed in red if it exceeds the currently preset voltage limits in the upper voltage range or the current limit value.

Clear Table - Delete all data in the table, ready to enter new data Read for PS - Read

data from the power supply unit.

F. Data Log

Data log window
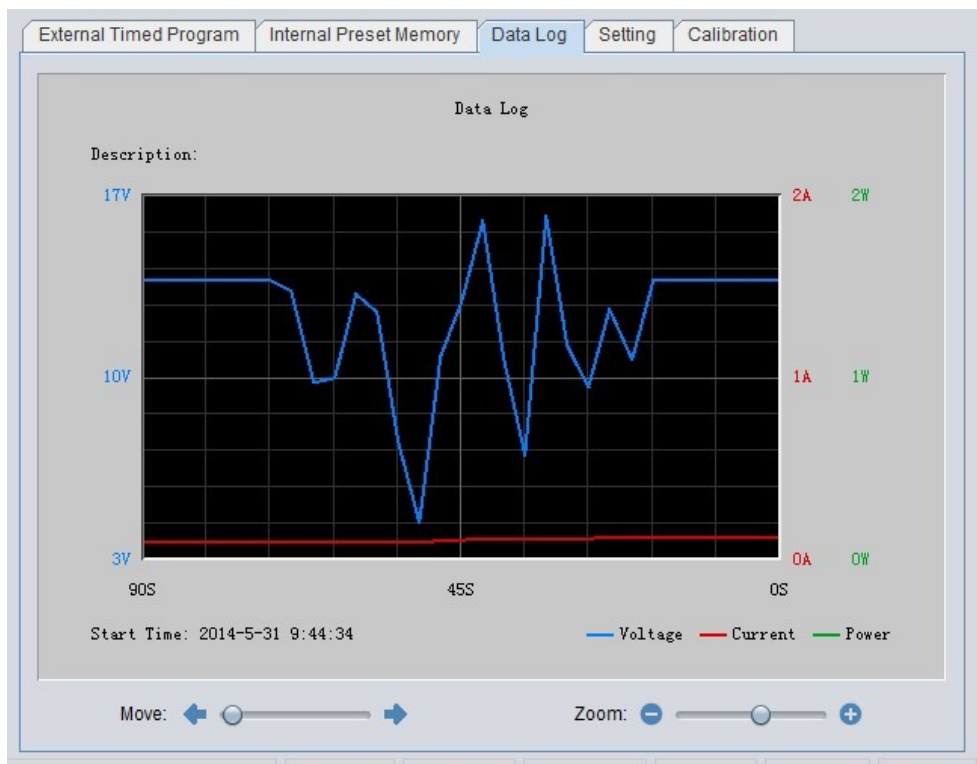
Here you can display the output voltage, current and power curves graphically. The diagram can be moved to the left and right by changing the "Move" slider. It is possible to zoom into the diagram using the "Zoom" slider.
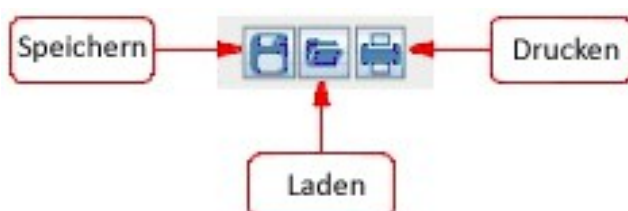
They can save the data in a CSV file for later analysis.

Click on to save the data in a CSV file.

Click on to import data for a programme analysis from a CSV file.

Click on on for a printout.

G. Saving, loading and printing

The function of these three buttons is not only available in the Data Log function, but also for the External Timed Programme and Internal Preset Memory functions.
To do this, first select the corresponding tab in the configuration and data display.

If "External Timed Programme" is selected, these buttons are used to save, load and print this function.

Click   to save the External Timed Programme settings in a CSV file.

Click on   to import External Timed Programme settings from a CSV file.

Click   for a printout of the External Timed Programme settings.

To add a description of the settings, write it in the field

External Timed Program Description:

If "Internal preset memory" is selected, these buttons are used to save, load and print this function.

Click on   to save the internal preset memory settings in a CSV file.

Click on   to import internal preset memory settings from a CSV file.

Click   on for a printout of the internal preset memory settings.

H. Settings

You can make basic programme settings under the Setting tab.

The software automatically recognises the power supply model and the COM interface used. The following setting options are available:

- Language
- COM interface to which the power supply unit is connected
- The sampling time for Data Log by changing the slider
- Upper limit value for the output voltage (UVL) to protect low-voltage applications
- Upper limit value for the output current (UCL) to protect applications with low currents
- Firmware update of the power supply unit
  Note: Only for devices that were delivered with version 3.1 or higher

Note:
The UVL and UCL settings are saved in the power supply unit. The values can only be changed using the PC software.
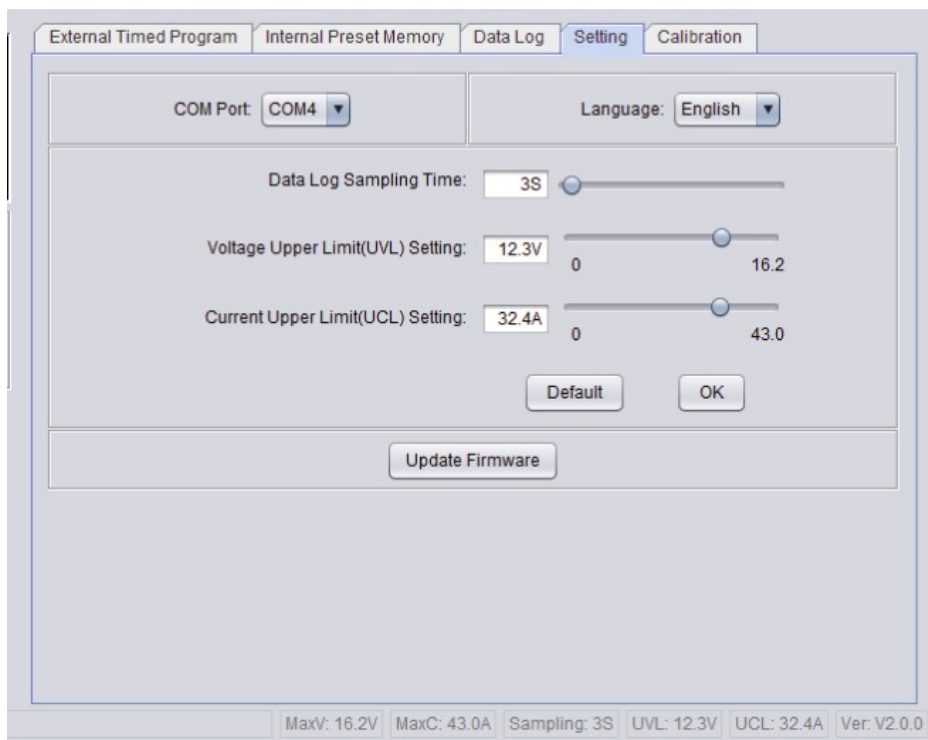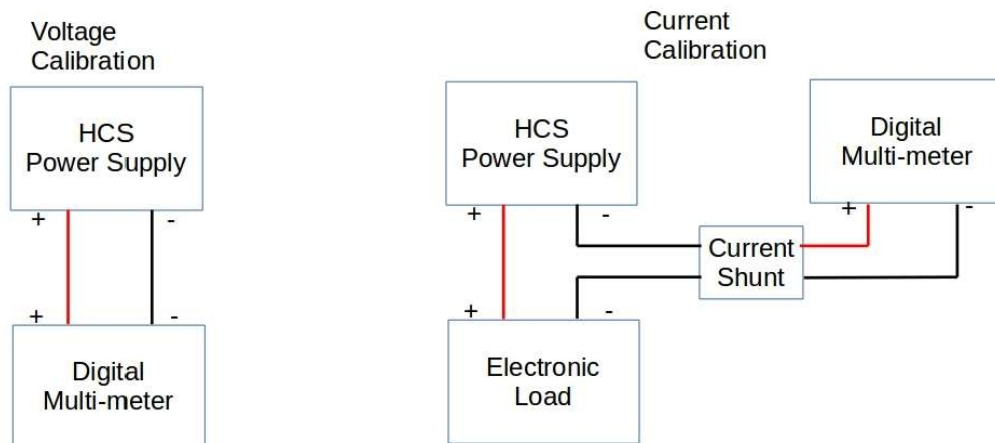
I. Calibration of the power supply unit (only available from firmware 3.1 or higher)
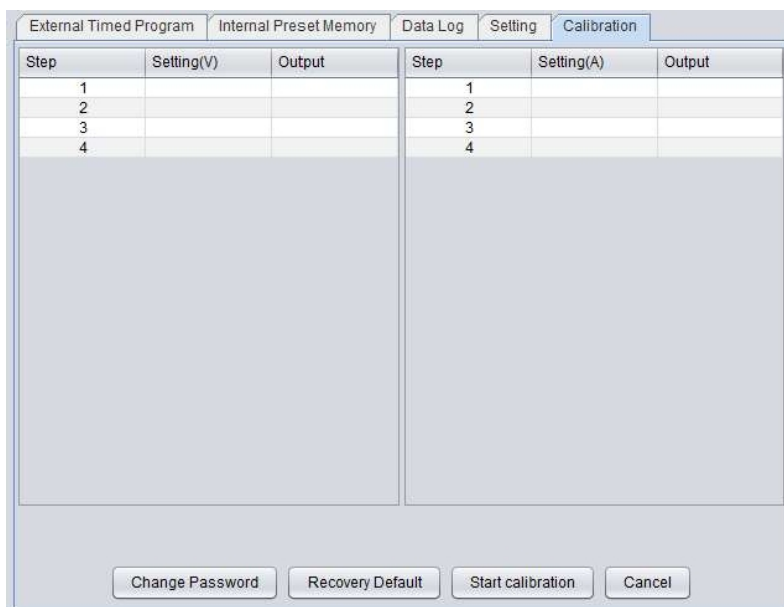
WARNING:
It is strongly recommended that calibration is only carried out by experienced technicians!

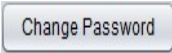The power supply unit can be calibrated using the Manson PC control software.

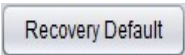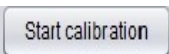Please connect as shown below in order to carry out the voltage and current calibration.
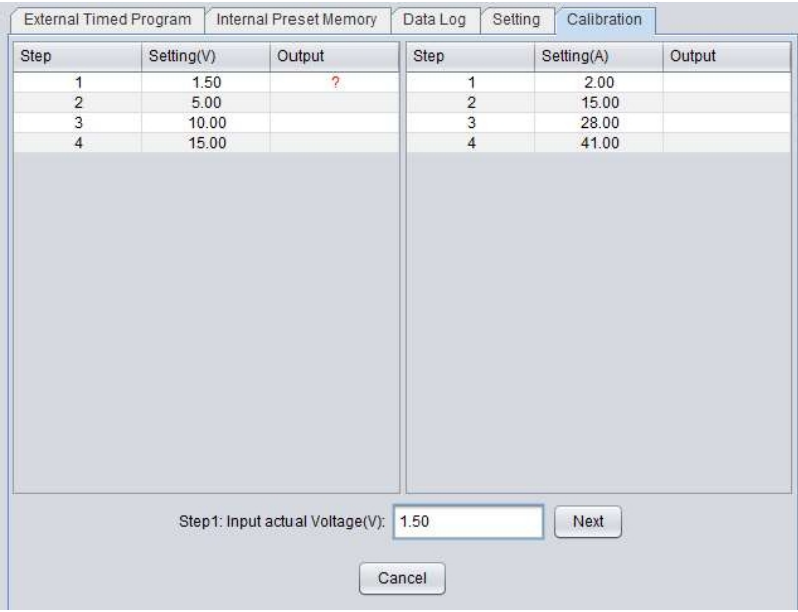

Click on the **Calibration** tab

The password must be entered in order to perform the calibration. The default password is **password**.

It can be changed after login by clicking on the [Change Password] button.

The factory calibration settings can be restored by clicking on the button . [Recovery Default]

Click on [Start calibration] to start the calibration.

Step	Setting(V)	Output	Step	Setting(A)	Output
1	1.50	?	1	2.00	
2	5.00		2	15.00	
3	10.00		3	28.00	
4	15.00		4	41.00	

Step1: Input actual Voltage(V): 1.50   [Next]

[Cancel]

Calibration comprises eight steps. Four steps for the voltage calibration and four steps for the current calibration. Follow the steps step by step to complete the calibration.
Start with the voltage calibration**. Do not connect a load during voltage calibration**.
As shown in the diagram above, the power supply unit automatically sets the output voltage for each step. Check the output voltage with a digital multimeter and enter the measured voltage. Then click on the button [Next] to continue with the next step.

After four steps of voltage calibration, the current calibration takes place. This requires the connection of an electronic load. The calibration steps are similar to those for current calibration.

Calibration can be cancelled at any time by clicking on the button . [Cancel]

Command set

Command line format:
Command<Parameter1><Parameter2>...[CR]

Note:
One decimal place for the current value for HCS-3100, 3150, 3200, 3202, 33XX, 34XX, 36XX
Two decimal places for the current value for HCS-3102, 3014, 3204

| Command code & return value	Function	Example
Input Command: **GMAX**[CR] Return value: <voltage><current>[CR] OK[CR]	Get PS maximum Voltage & Current value <voltage>=??? <current>=???	Input command: **GMAX**[CR] Return value: 180200[CR] OK[CR] Meaning: Maximum Voltage is 18.0V Maximum Current is 20.0A
Input Command: **SOUT<status>**[CR] Return value: OK[CR]	Switch on/off the output of PS <status>=0/1 (0=ON, 1=OFF)	Input command: **SOUT0**[CR] Return value: OK[CR] Meaning: Switch on the output of PS
Input Command: **VOLT<voltage>**[CR] Return value: OK[CR]	Preset Voltage value <voltage>=000<???<Max-Volt *Max-Volt value refer to product specification	Input command: **VOLT127**[CR] Return value: OK[CR] Meaning: Set Voltage value as 12.7V
Input Command: **CURR<current>**[CR] Return value: OK[CR]	Preset Current value <current>=000<???<Max-Curr *Max-Curr value refer to product specification	Input command: **CURR120**[CR] Return value: OK[CR] Meaning: Set Current value as 12.0A
Input Command: **GETS**[CR] Return value: <voltage><current>[CR] OK[CR]	Get PS preset Voltage & Current value <voltage>=??? <current>=???	Input command: **GETS**[CR] Return value: 150180[CR] OK[CR] Meaning: The Voltage value set at 15V and Current value set at 18A

Command code & return value	Function	Example

Input Command:
  GETD[CR]
 	
Return value:
<voltage><current><status>[CR]
OK[CR]
	Get PS Display values of Voltage, Current and Status of CC/CV
	
	<voltage>=????
	<current>=????
	<status>=0/1 (0=CV, 1=CC)
		Input command:
		  GETD[CR]
		
		Return value:
		  150016001[CR]
		  OK[CR]
		
		Meaning:
		The PS Display value is 15V and 16A.
		It is in CC mode.

Input Command:
PROM<voltage0><current0>
    <voltage1><current1>
    <voltage2><current2>[CR]
 	
Return value:
  OK[CR]
	Save Voltage and Current value into 3 PS memory locations
	
	<voltageX>=???
	<currentX>=???
	(X is memory location number start from 0 to 2)
		Input command:
		PROM111111022122033133[CR]
		
		Return value:
		  OK[CR]
		
		Meaning:
		Preset Memory 0 as 11.1V and 11.1A
		Preset Memory 1 as 2.2V and 12.2A
		Preset Memory 2 as 3.3V and 13.3A

Input Command:
  GETM[CR]
 	
Return value:
  <voltage0><current0>[CR]
  <voltage1><current1>[CR]
  <voltage2><current2>[CR]
  OK[CR]
	Get saved Voltage and Current value from 3 PS memory loctions
	
	<voltageX>=???
	<currentX>=???
	(X is memory location number start from 0 to 2)
		Input command:
		  GETM[CR]
		
		Return value:
		  111111[CR]
		  122122[CR]
		  133133[CR]
		  OK[CR]
		
		Meaning:
		
		PS return following preset value from 3 memory locations;
		Memory 0 is 11.1V and 11.1A
		Memory 1 is 12.2V and 12.2A
		Memory 2 is 13.3V and 13.3A

Input Command:
RUNM<memory>[CR]
 	
Return value:
  OK[CR]
	Set Voltage and Current using values saved in memory locations
	
	<memory>=0/1/2
		Input command:
		  RUNM1[CR]
		
		Return value:
		  OK[CR]
		
		Meaning:
		Set Voltage and Current using values saved in memory location 1

13. Appendix

HCS USB configuration for remote programming

This note describes the configuration of the USB port for HCS remote programming.
The remotely programmable HCS power supply unit with USB connection can be connected to the

PC can be connected. A new COM port appears in the device manager, e.g. COM 3 (see diagram below).
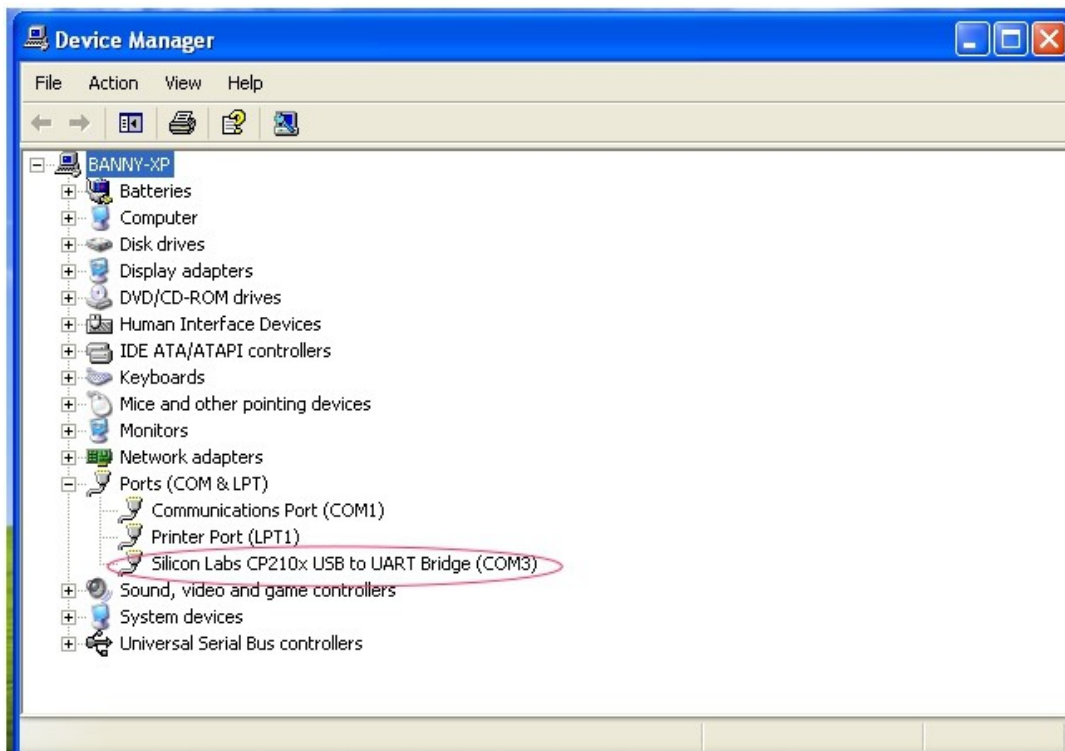
If the COM port does not appear, please check whether the driver is installed. The USB driver can be found on the HCS software CD.
The standard configuration of the COM port is

Baud rate: 9600
Data bits: 8
Stop bit: 1 Parity bit:
None

The power supply unit can be programmed using the ASCII commands via the COM interface. All command sets are listed in the operating instructions for the power supply unit.