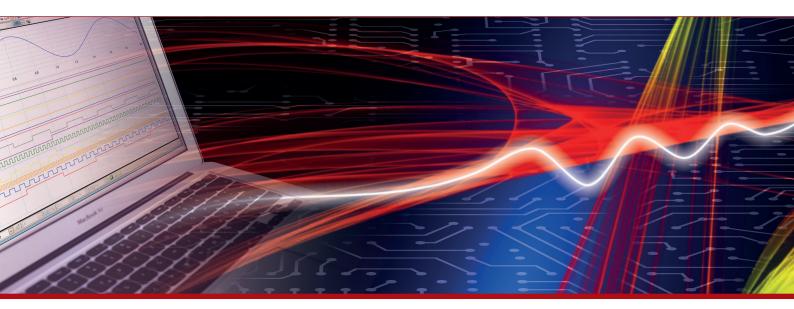


# **Product Datasheet - Technical Specifications**



More information in our Web-Shop at **www.meilhaus.com** and in our download section.

#### Your contact

Technical and commercial sales, price information, quotations, demo/test equipment, consulting:

Tel.: +49 - 81 41 - 52 71-0

FAX: +49 - 81 41 - 52 71-129

E-Mail: sales@meilhaus.com

Downloads:

www.meilhaus.com/en/infos/download.htm

Meilhaus Electronic GmbH | Am Sonnenlicht 2 82239 Alling/Germany

 Tel.
 +49 - 81 41 - 52 71-0

 Fax
 +49 - 81 41 - 52 71-129

 E-Mail
 sales@meilhaus.com

Mentioned company and product names may be registered trademarks of the respective companies. Prices in Euro plus VAT. Errors and omissions excepted.
© Meilhaus Electronic.

# PeakTech® Prüf- und Messtechnik



Spitzentechnologie, die überzeugt



# **Table of Contents**

1. Safety precautions	18
2. Technical specifications	19
3. Introduction	19
4. Controls and indicators	20
5. General operation principle	21
5.1. Quick reference of keypad functions	21
6. User manual	22
6.1. Operation modes	22
6.1.1. Output ON/OFF	22
6.1.2. Lock/ Unlock the Keypad and Jog Dial	22
6.1.3. RS-485 Address setting	22
6.1.4. Upper voltage limit setting	22
6.1.5. Output Enable/Disable at Power Up	23
6.1.6. Adjust LCD brightness	23
6.1.7. Enable/disable SCPI function	24
6.2. Basic Operation	24
6.2.1. Setting of Voltage and Current by Jog Dial and UP & DOWN Key	
6.2.2. Setting of Voltage and Current Using Keypad	25
6.3. Using the Programming Features	25
6.3.1. Preset Program	25
6.3.2. Setting of Timed Program	26
6.3.4. Run Timed Programming	26
7. PC-Connection	27
8.1. Connect Multiple Power Supplies to PC via RS-485	27
8.2. Connection diagram for multiple power supply	27
APPENDIX	
Appendix A – Command Set	28

# 1. Safety Precautions

This product complies with the requirements of the following European Community Directives: 2004/108/EC (Electromagnetic Compatibility) and 2006/95/EC (Low Voltage) as amended by 2004/22/EC (CE-Marking).

To ensure safe operation of the equipment and eliminate the danger of serious injury due to short-circuits (arcing), the following safety precautions must be observed.

Damages resulting from failure to observe these safety precautions are exempt from any legal claims whatever.

- \* Do not use this instrument for high-energy industrial installation measurement.
- \* Prior to connection of the equipment to the mains outlet, check that the available mains voltage correspond to the voltage setting of the equipment.
- \* Connect the mains plug of the equipment only to a mains outlet with earth connection.
- \* Do not place the equipment on damp or wet surfaces.
- \* Do not cover the ventilations slots of the cabinet to ensure that air is able to ciculate freely inside.
- \* Do not insert metal objects into the equipment by the way of ventilation slots
- \* Do not place water-filled containers on the equipment (danger of short-circuit in case of knockover of the container)
- \* Do not operate the equipment near strong magnetic fields (motors, transformers etc.).
- \* Do not operate the meter before the cabinet has been closed and screwed safely as terminal can carry voltage.
- \* Replace a defective fuse only with a fuse of the original rating. Never short-circuit fuse or fuse holding.
- \* Check test leads and probes for faulty insulation or bare wires before connection to the equipment.
- \* Please use only 4mm-safety test leads to ensure immaculate function.
- \* To avoid electric shock, do not operate this product in wet or damp conditions. Conduct measuring works only in dry clothing and rubber shoes, i. e. on isolating mats.
- \* Never touch the tips of the test leads or probe.
- \* Comply with the warning labels and other info on the equipment.
- \* The measurement instrument is not to be to operated unattended.
- \* Do not subject the equipment to direct sunlight or extreme temperatures, humidity or dampness.
- \* Do not subject the equipment to shocks or strong vibrations.
- \* Keep hot soldering irons or guns away from the equipment.
- \* Allow the equipment to stabilize at room temperature before taking up measurement (important for exact measurements).
- \* Use caution when working with voltages above 35V DC or 25V AC. These Voltages pose shock hazard.
- \* Periodically wipe the cabinet with a damp cloth and mid detergent. Do not use abrasives or solvents.
- \* The meter is suitable for indoor use only
- \* Do not store the meter in a place of explosive, inflammable substances.
- Opening the equipment and service and repair work must only be performed by qualified service personnel
- \* Do not place the equipment face-down on any table or work bench to prevent damaging the controls at the front.
- \* Do not modify the equipment in any way
- \* Measuring instruments don't belong to children hands.

#### Cleaning the cabinet:

Prior to cleaning the cabinet, withdraw the mains plug from the power outlet.

Clean only with a damp, soft cloth and a commercially available mild household cleanser. Ensure that no water gets inside the equipment to prevent possible shorts and damage to the equipment.

#### **Precautions For Use**

1. The unit has a built-in Tracking O.V.P (Over voltage Protection) features. In the event of output voltage becoming 10% greater than the set value, the O.V.P. will be triggered and the output power will be cut off and >FAULT< warning appears.

When you get this warning, switch off the unit and remove all loading, switch the unit back on again and it should resume normal operation.

In the event this problem persists, the unit must be investigated by your agent.

2. This unit has a buzzer built inside. The buzzer will sound when over temperature/ overload/ over voltage has been triggered.

When you get this warning sound, switch off the unit and remove all loading.

Check your load and output settings.

Allow the unit to cool down for 30 minutes.

If you switch on the unit again, it should resume the normal operation.

In the event of this problem persists, the unit must be investigate by your agent.

# 2. Technical Specifications of Power Supplies

Specifications	P 1890	P 1885	
Output voltage	1-20 V DC	1-40 V DC	
Output current	0-10 A	0-5 A	
Rated Output Power	200 W		
Ripple & Noise (p-p)	30 mV <sub>p-p</sub>	0001/	
Load Regulation	300 mV 10 mV	200mV	
Line Regulation Input Voltage	100-240 V AC, 50/60 Hz		
Max. Input Power	285 W		
Power Factor	≥ 0.9		
Display Meter	4 digits - Display LCD Ammete	er, Voltmeter and Power Meter	
Meter's Accuracy	( +/- 1% + 5 counts for range V		
	( +/- 1% + 2 counts for range V	≥ 5V, I ≥ 0.5A)	
LCD Dimension	48 x 66 mm		
Cooling System	Thermostatic Control Fan		
Operating Temperature Protection	0- 40°C -Tracking OVP (Over Voltage F	Protection)	
Protection	-Current Limiting,	notection),	
	-Over Temperature Protection.		
Approvals	CE EMC EN 55011, CE LVD	EN 61010	
Dimension (WxHxD)	193 x 98 x 215 (mm)		
Weight	3kg `´		
Accessory	-User's Manual,		
	-PC Windows® software, Comn	•	
	-USB cable, RS-485 Connector	and one 120ohms Resistor	
Optional Accessory	-USB to RS-485 Adapter		
Remarks -Adjustable Upper Voltage limit, -Power Factor Correction.			
	-i owei i acioi coneciion.		

## **Remote Programming Specifications**

Communications Interface
Remote Programming Functionality
Data Logging

USB (single device) and RS-485 (up to 31 Power Supplies).
Full control of power supply functions and data readback.
Yes, with supplied software.

Baud Rate 9600bps

#### 3. Introduction

This series of Programmable Switching Mode Power Supplies are designed for full remote programming with data logging functionality. Up to 31 power supplies can be connected via RS- 485. It is ideal for applications which require various groups of output settings and running periods for repetitive tests especially with multiple power supplies.

The front panel allows users to all programming and output settings as a stand alone laboratory power supply.

Full command sets are given in this manual to facilitate the integration of your own control software.

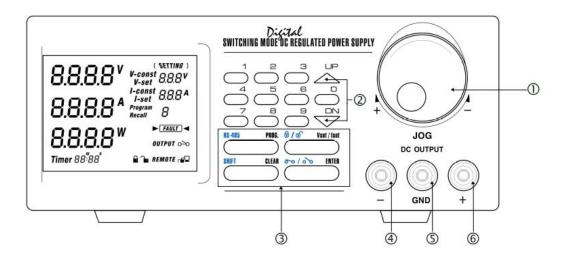
This series of power supplies have obtained the safety approval EN-61010 and EN-55011 EMC approval for scientific , industrial equipment of the CE directives.

Please keep this manual in a safe place and contact your vendor for any special requirement in optional accessories for RS-485.

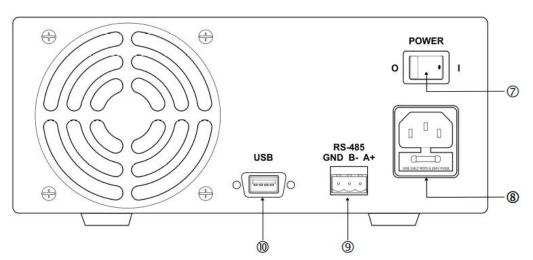
#### NOTE:

Laboratory Power Supplies are not designed for charging batteries. Any use of this type can cause serious damage to the device, which are exempt from any legal claims whatever.

## 4. Controls and Indicators



- 1. Jog Dial
- 2. Up & Down Key
- 3. Dual Function Control Key
- 4. Black colour negative polarity output terminal
- 5. Green colour ground terminal (connected to chassis).
- 6. Red colour positive polarity output terminal.



- 7. Power Switch
- 8. AC 100-240 V AC Power Socket with input power fuse.
- 9. RS-232 Port
- 10. RS-485 Port

5. General Operation Principle
Note: This section contains a condensed overview of the unit. Read this section to quickly get started.
5.1 Quick Reference of Keypad Functions

- The front Keypad is organised as follow:
  (1) Number Keys, UP/DOWN Keys and Jog Wheel
- (2) 4 Dual Function Control Keys

The front panel functions are summarized as follow:

Keypad	Function	Section		
Number Keys, UP/DOWN Keys and Jog Wheel				
thru	Press to select numerical values	6.2.2		
	Press to ascend the numerical values	6.2.1		
DN	Press to descend the numerical values	6.2.1		
Jog Wheel	Rotate to adjust the voltage and current settings	6.2.1		
	Dual Function Control Keys			
SHIFT	Press to access second function of the control keys			
CLEAR	Press to terminate any input process and the unit will exit to normal operation			
PROG.  thru	Press to use recall preset program features.  Use to exit the use of any preset program  Use thru to specify the location of preset program to be used  Use to confirm	6.3.1 6.3.3		
SHIFT RS-485	Press and to enter RS-485 set menu	6.1.3		
SHIFT 0/0	Press and to Lock/Unlock the Keypad and Jog Wheel	6.1.2		
ENTER	Press to confirm the new settings			
SHIFT 00/00	Press and to Enable/Disable the output	6.1.1		
SHIFT	Press to Enable the output at power up	6.1.5		
SHIFT	Press to Disable the output at power up	6.1.5		
SPECIAL Function				
SHIFT	Press to get to the Upper Voltage Limit Setting  Use thru to input the numerical values  Use to confirm	6.1.4		
Vset / Iset	Switch between set output Voltage and output Current			

# 6. User Manual

# 6.1 Setting Operation Modes

# 6.1.1. Enable/Disable Output

	Action	LCD Display	Description
1.	Press Then	OUTPUT O-O	Output ENABLE
2.	Press Then	OUTPUT 00	Output <b>DISABLE</b>

# 6.1.2 Lock/ Unlock the Keypad and Jog Dial

	Action	LCD Display	Description
1.	Press Then		Keypad and Jog Dial Locked
2.	Press Then	<b>C</b>	Keypad and Jog Dial UnLocked

6.1.3 RS-485 address setting

	Action	LCD Display	Description
1.	Press <sup>pSHIFT</sup> Then	485 001	This will enter into RS-485 address set menu.
2.	to g		Use numbering keypad to key in address from 1 to 255 for RS-485 connection
3.	Press		Press this key to confirm

6.1.4 Upper Voltage Limit Setting

	Action	LCD Display	Description
1.	Press Then	0+8-* 25.6	This will enter into Upper Voltage Limit Adjustment.
			e.g. 25.6V present upper voltage limit.
2.	to g		Use the number key to input your desired voltage
3.	Press		Press this key to confirm

**Note**: Whenever to terminate the Upper Voltage Limit Setting, press "CLEAR" to return to normal operation.

# 6.1.5 Output Enable/Disable at Power Up

	Action	LCD Display	Description
1.	Press Then Then	Pr UP	This will enable the output at power up. i.e. When you switch on the power supply, the output is also ON automatically with last set voltage value.
2.	Press Then	PrUP OFF	This will disable the output at power up. i.e. The output will be OFF at next power up. This is the default setting for safety reason!!

# 6.1.6 Adjust LCD brightness

	Action	LCD Display	Description
1.	Press Then Then	B1 6	Press and to enter into brightness set menu.
2.	Rotate Jog		Use JOG adjust LCD brightness. It has 10 level of brightness. 0 means LCD brightness off. 9 means the most brightest.
3.	Press		Press this key to confirm

# 6.1.7 Enable/Disable SCPI

	Action	LCD Display	Description
1.	Press Then		Press and to enter into SCPI enable/disable menu
2.	Rotate Jog		Use JOG select between Y and N
3.	Press		Press this key to confirm

# 6.2 Basic Operation

# 6.2.1 Setting of Voltage and Current by Jog Dial and UP & DOWN Key

	Action	LCD Display	Description
1.	Press Vset/Iset	V-const V-set  ( NATING )  V-const  V-const  I-set	Press to switch between V-set and I-set.
2.	Rotate or Press and		Rotate JOG or Press

# 6.2.2 Setting of Voltage and Current Using Keypad

	Action	LCD Display	Description
1.	Press Vset / Iset	V-const V-set  V-set  V-set  V-const  V-const  V-const	Press to switch between V-set and I-set.
2.	to g		Setting voltage/current by pressing numbers on Keypad.
3.	Press		Press this key to confirm

**Note**: whenever to terminate the settings of voltage and current, press "CLEAR" to return to the normal operation.

# **6.3 Using the Programming Features**

# 6.3.1 Preset Program

	Action	LCD Display	Description
1.	Press Then thru	Учерон Ц	Press and then thru to select Preset program. e.g. to select preset program 4
2.	Use Jog Viset / Iset and		Use JOG and V-set/I-set adjust Voltage an d Current setting if you want to adjust the preset value.
3.	Press		Press this key to confirm
4.	Press Then		Press and to exit preset program.

Note: whenever to terminate the Timed Program, press "CLEAR" to return to the normal operation.

# 6.3.2 Setting of Timed Program

	Action	LCD Display	Description
1.	Press Then Then	5&2P 00 a	Press and to enter into timed program step setting.
2.	Use Jos or thru		Use JOG or numbering Keypad to select step to be review.
3.	Press and DN		Use UP/DOWN key to move around voltage, current and time setting of step. The select part will flash to indicate it is under modification.
4.	Use Jog or thru		Use JOG or numbering keypad to modify the voltage, current and time.
5.	Press		Press this key to confirm

**Note**: whenever to terminate the Timed Program, press "CLEAR" to return to the normal operation.

# 6.3.3 Run Timed Programming

	Action	LCD Display	Description
1.	Press 2 Then 2	rVMP 02	Press and to enter in run menu.
2.	Use Jog or thru		Use JOG or numbering keypad select number of steps to be run start from step 0.  The minimum steps to be run is 2.
3.	Press		Press this key next to set number of cycle to be run.

	Action	LCD Display	Description
4.	Use Jog or thru	0000 mm 0	Use JOG or numbering keypad select number of cycle to be run.
5.	Press		Press this key to start running
6.	CLEAR		Press this key terminate the program running anytime.

Note: whenever to terminate the Preset Program, press "CLEAR" to return to the normal operation.

# 7. PC connection

The new SDP series can be connect use USB or RS-485. It is auto select between USB and RS-485.

# Connect Multiple Power Supplies to PC via RS-485

For multiple power supplies, use the RS-485 Interface through the RS-485 port at rear panel of the power supply. Up to 31 power supplies can be connected via RS-485. You will need a USB to RS-485 Adapter and the connection shown in Figure 6a & 6b.

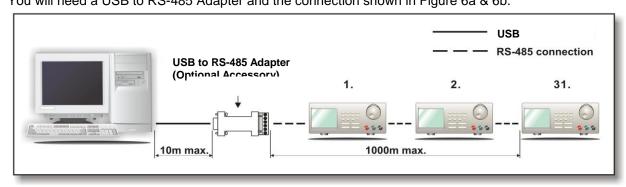


Figure 7a. Connection diagram for multiple power supply

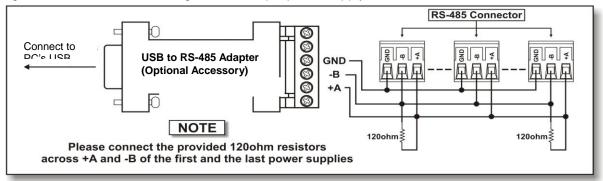


Figure 7b. Connection diagram between USB Adapter and RS-485 Connectors.

<sup>\*</sup>Please do not connect both USB and RS-485 at the same.

# APPENDIX A

#### **COMMMAND SET**

Remarks in using the Remote Programming Mode The USB/485 interface is always ready for connection to PC for remote programming operation .

{ }- command data, [ ] - return data, [OK] = "OK", [CR] = 0dh ???? = 30h, 30h, 30h, 30h - 39h, 39h, 39h, 39h (4 bytes data) ??? = 30h, 30h, 30h - 39h, 39h, 39h (3 bytes data) ?? = 30h, 30h - 39h, 39h (2 bytes data) <address> 30h, 30h - 3fh, 3fh (2 bytes data).

## **Bold – Input Command**

Italic – Return Data from Power Supply

PS = Power Supply

Command Code & Return Data	Description
Input Command: SESS <address> <cr></cr></address>	Disable front panel keypad and make PS to Remote Mode
Return Data from Power Supply:	
[OK] [CR]	
Input Command: ENDS <address> <cr></cr></address>	Enable front panel
Return Data from Power Supply:	keypad and make PS to exit Remote Mode
[OK] [CR]	
Input Command: CCOM <address> <rs> {000-256} <cr></cr></rs></address>	Change RS485 <rs> = 0 -&gt; RS-232</rs>
Return Data from Power Supply:	<rs> = 1 -&gt; RS-485</rs>
[OK] [CR]	
Input Command: GCOM <address> <cr></cr></address>	Get the RS-485 address
Return Data from Power Supply:	aduless
[RS] RS485 Address [??] [CR] [OK] [CR]	
Input Command: GMAX <address> <cr></cr></address>	Get maximum voltage
Return Data from Power Supply:	and current of PS
Voltage [???] Current [???] [CR] [OK] [CR]	
Input Command: GOVP <address> <cr></cr></address>	Get Upper Voltage
Return Data from Power Supply:	Limit of PS
Voltage [???] [CR] [OK] [CR]	
Input Command: GETD <address> <cr></cr></address>	Get Voltage & Current reading from PS

Command Code & Return Data	Description
Return Data from Power Supply:	
Voltage [????] Current [????] [0] [CR] [OK] [CR]	PS in CV mode
Voltage [????] Current [????] [1] [CR] [OK] [CR]	PS in CC mode
Input Command: GETS <address> <cr></cr></address>	Get Voltage & Current Set Value from PS
Return Data from Power Supply:	Set value nom r S
Voltage [???] Current [???] [CR] [OK] [CR]	
Input Command: GETM <address> <cr></cr></address>	Get All Preset Memory Values from PS
Return Data from Power Supply:	values from Fe
Memory 1 Voltage [???] Current [???] [CR] Memory 2 Voltage [???] Current [???] [CR]	
Memory 9 Voltage [???] Current [???] [CR] [OK] [CR]	
Input Command: GETM <address> location {1-9} <cr></cr></address>	Get Memory from Specific Preset of PS
Return Data from Power Supply:	Operation 1 reserver 2
Voltage [???] Current [???] [CR] [OK] [CR]	
Input Command: GETP <address> <cr></cr></address>	Get all the Timed
Return Data from Power Supply:	Program Memory of PS
Program 00 Voltage [???] Current [???] Minute [??] Second [??] [CR] Program 01 Voltage [???] Current [???] Minute [??] Second [??] [CR]	
Program 19 Voltage [???] Current [???] Minute [??] Second [??] [CR] [OK] [CR]	
Input Command: GETP <address> program {00-19} <cr></cr></address>	Get Timed Program
Return Data from Power Supply:	Memory from Specific Program of PS
Voltage [???] Current [???] Minute [??] Second [??] [CR] [OK] [CR]	
Input Command:  GPAL <address> [CR]</address>	Get LCD Display
Return Data from Power Supply:	momadon
Reading voltage [####] V [ON] Reading current [####] A [ON]	

Command Code & Return Data	Description
Reading watt [####] W [ON] Timer minute [####] second [##] timer [ON] colon [ON] m [ON] s [ON] Setting voltage [###] V-const [ON] V-bar [ON] V [ON] Setting current [###] I-Const [ON] I-bar [ON] A [ON] Program [#] Program [ON] P-bar [ON] SETTING [ON] Key lock [ON] Key open [ON] FAULT [ON] Output on [ON] Output off [ON] Remote [ON] [CR] [OK] [CR]	
Input Command: VOLT <address> voltage {000-XXX} <cr></cr></address>	Set Voltage Level XXX-Max. Output Rating
Return Data from Power Supply:	Voltage = XX.X V Current = X.XX V
[OK] [CR]	
Input Command: CURR <address> current {000-XXX} <cr></cr></address>	Set Current Level
Return Data from Power Supply:	
[OK] [CR]	
Input Command: SOVP <address> voltage {000-XXX} <cr></cr></address>	Set Upper Voltage Limit of PS
Return Data from Power Supply:	
[OK] [CR]	
Input Command: SOUT <address> 1 <cr></cr></address>	Disable Output of PS
Return Data from Power Supply:	
[OK] [CR]	
Input Command: SOUT <address> 0 <cr></cr></address>	Enable Output of PS
Return Data from Power Supply:	
[OK] [CR]	
Input Command: POWW <address> location {1-9}0 <cr></cr></address>	Enable the output when switch on the
Return Data from Power Supply:	power supply.
[OK] [CR]	
Input Command: POWW <address> location {1-9}1 <cr></cr></address>	Disable the output
Return Data from Power Supply:	when switch on the power supply.
[OK] [CR]	
Input Command: PROM <address> location {1-9} Voltage {000-XXX} Current {000-XXX} <cr></cr></address>	Set Voltage and
Return Data from Power Supply:	Current values of Preset Memory
[OK] [CR]	
Input Command:	
20	

Command Code & Return Data	Description
PROP <address> location {00-19} Voltage {000-XXX} Current {000-XXX} Minute {00-99} Second {00-59} <cr></cr></address>	Set Voltage, Current and Time period of Timed Program
Return Data from Power Supply:	- missa i regiaini
[OK] [CR]	
Input Command: RUNM <address> location {1-9} <cr></cr></address>	Recall Preset Memory 1-9
Return Data from Power Supply:	
[OK] [CR]	
Input Command: RUNP <address> times {000-256} <cr></cr></address>	Run Timed Program (000 = run infinite
Return Data from Power Supply:	times)
[OK] [CR]	
Input Command: STOP <address> <cr></cr></address>	Stop Timed Program
Return Data from Power Supply:	
[OK] [CR]	

This manual is according the latest technical knowing. Technical changings, which are in the interest of progress, reserved.

We herewith confirm that the units are calibrated by the factory according to the specifications as per the technical specifications.

We recommend to calibrate the unit again, after 1 year.

© *PeakTech*® 07/2019 / AW./EHR.