

mesytec MVHV-4 is a modern VME 4-channel high precision bias supply unit for detector bias voltages up to 800 V. It is designed to supply highly stable bias voltage for all types of silicon and gas detectors. The output current is limited to 20 μ A.

Features:

- Precise voltage setting up to 800 V, in steps of 12.5 mV
- lowest noise voltage of < 1 mV rms at 400 V
- Read current with 1 nA resolution
- Adjustable HV ramp speed
- Output connectors: SHV or BNC
- Adjustable current threshold and voltage limit for each channel.
- Individual polarity select for each channel via register setting
- Remote control and monitoring via VME bus and USB
- Settings are permanently stored and recovered after power up.
- LED Indicators for Polarity and channel status
- VME access: Address format: A24, A32
Data format: D16



Technical Data

Power consumption

- +5 V +200 mA
- +12 V -50 mA
- -12V -70 mA
- due to low power consumption no cooling fans necessary

Voltage Output

- Voltage range: 0 ... ± 800 V
- adjustable in steps of 12.5 mV
- Typical noise $N < 1$ mV (400 V, 5 Hz to 100 MHz)
- Voltage stability: typ 0.015 %/ °C
- Calibration precision: 0.5 %
- Output current max. 20 μ A per channel, limited
- Adjustable voltage ramp up and down of 5 V/s up to 500 V/s
- Ramp up after power failure

Connectors

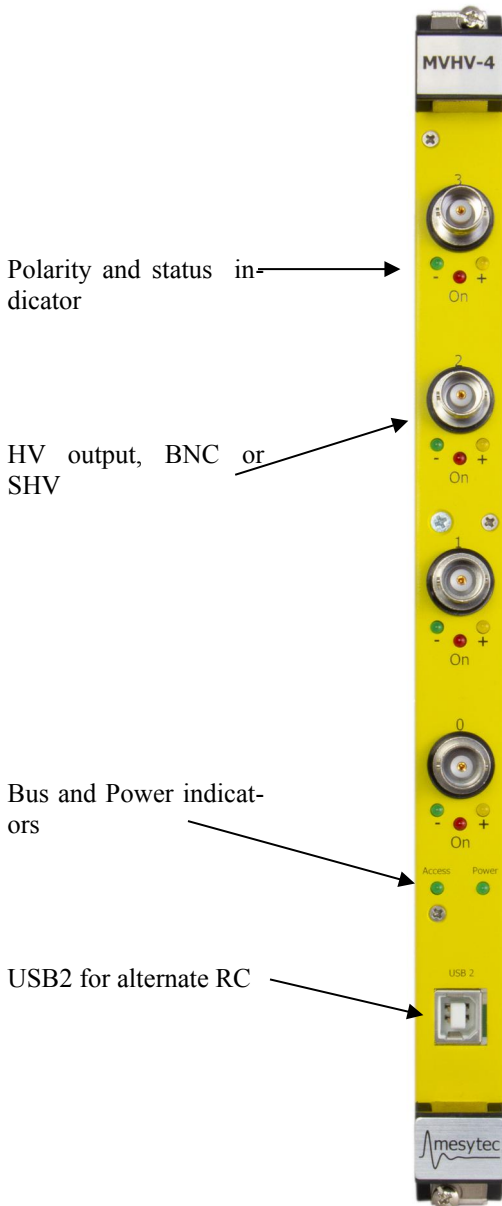
- HV outputs: BNC or SHV
- USB remote control: standard USB B

Auto Shutdown

MHV-4 offers an automatic shutdown of channel voltage in case current exceeds the given current limit.

Shut down channels are switched off automatically and remain off until switched on again.

When current limit is set to 0, Auto Shutdown is disabled.

MHV-4 Front panel

Remote control via USB

- MVHV-4 can be remote controlled via USB, e.g. using a standard ASCII terminal program. (FTDI virtual com port)
- Baud rate: 9.600 Bd
- Data Format: 8N1 (8 bit, no parity, 1 stoppbitt),
- input characters are echoed

Commands

c = channel number 0...3, 4/a = all

USB Set Commands

- ON c* switch channel n on
- OFF c* switch channel n off
- SU c vvvv* set voltage of channel n
 $vvvv$ = voltage in 0.1 V
 e.g.: *SU 0 4000* sets channel 0 to 400V
- SIL c iiiii* set current limit of channel n
 $iiiiii$ = current in nA
 e.g.: *SIL 0 4000* sets current limit channel 0 to 400 V
- SP c p* set polarity of channel n
 p = polarity: p/+/-1 or n/-/0
 e.g.: *SP 0 n* sets polarity channel 0 to negative
 For security reasons: if HV is on, it will be switched off automatically, HV preset will be set to 0 V, polarity is switched when HV is down.
 After switching:
 set presets again to desired values.
- AS c n* enable ($n=1$)/disable ($n=0$) auto shutdown of channel c
- SRA n* set HV ramp speed
 $n = 0$: 5 V/s, 1: 25 V/s,
 2: 100 V/s, 3: 500 V/s

Read Commands

- RU c* read voltage channel c
- RUP c* read voltage preset channel c
- RI c* read current channel c
- RIL c* read current limit channel c
- RP c* read polarity channel c
- RRA* read HV ramp speed

Remote Control via VME bus

Value	Register Address	Direction	Comment
<ul style="list-style-type: none"> • Write addresses can be read and written. • Read on write addresses delivers written value (possibly corrected by boundary check). • Read addresses are „read only“ and deliver current hardware status which might deviate from written value. 			
Voltage 0	2	r/w	Set / read channel voltage Write: 0... 8000 = 0 ... 800.0 V Read: 0 ... (-)8000 = 0 ... (-) 800.0 V (also indicating polarity)
Voltage 1	4	r/w	
Voltage 2	6	r/w	
Voltage 3	8	r/w	
On/Off 0	10	r/w	1 = switch on HV
On/Off 1	12	r/w	
On/Off 2	14	r/w	
On/Off 3	16	r/w	
Cur. Lim. 0	18	r/w	Set / read current limit. Shuts off channel when exceeded. Read / Write: 0 ... 20.000 = 0 ... 20.000 nA (0 ... 20 μ A) Writing 0 disables auto shutdown \rightarrow 20 μ A current limit.
Cur. Lim. 1	20	r/w	
Cur. Lim. 2	22	r/w	
Cur. Lim. 3	24	r/w	
Polarity 0	30	r/w	Set / read channel polarity Read / Write: 0 = negative, 1 = positive Switching polarity automatically includes: channel switched off, voltage preset = 0 for security reasons. Switching may take time depending on HV ramp speed.
Polarity 1	32	r/w	
Polarity 2	34	r/w	
Polarity 3	36	r/w	
Current 0	38	r	Read channel current Read: 0 ... 20.000 nA
Current 1	40	r	
Current 2	42	r	
Current 3	44	r	
HV prec. 0	76	r/w	Alternate binary set and read of voltage: Read / set voltage in binary units, 1 = 12.5 mV Read / write: 0 ... 64.000 = 0.0 ... 800.0 V
HV prec. 1	78	r/w	
HV prec. 2	80	r/w	
HV prec. 3	82	r/w	
Ramp Speed	84	r/w	Read / set HV ramp speed Read / write: 0 ... 3 0 = 5 V /s, 1 = 25 V /s, 2 = 100 V /s, 3 = 500 V /s

Value	Register Address	Direction	Comment
Hw_Rev	86	r	Hardware Revision
CPU_Rev	88	r	CPU Firmware Revision
CPLD_Rev	90	r	CPLD Firmware Revision