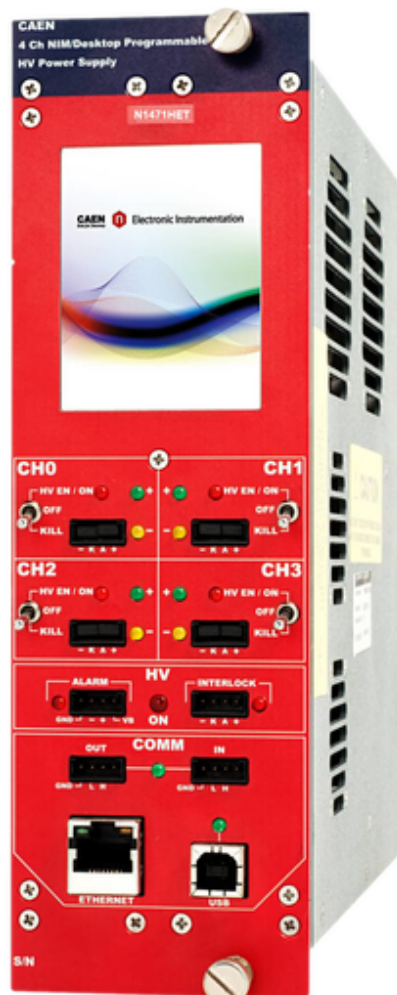
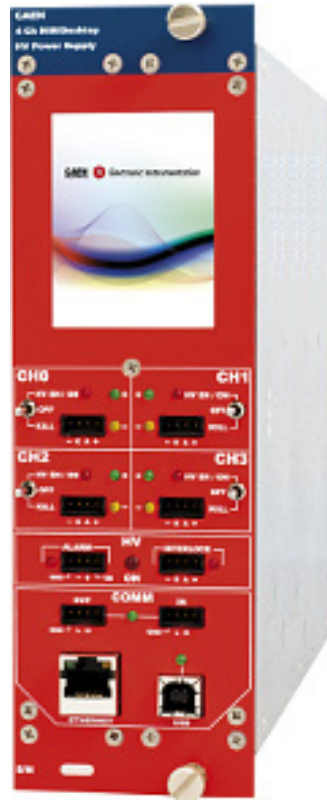


# N1471HET

## 4 Ch Reversible 5.5 kV/20 $\mu$ A NIM HV Power Supply High Accuracy Module (USB/Ethernet/T.scr een)



## Features



- 4 independent channels in 2U NIM module
- 5.5 kV / 20  $\mu$ A output range
- Channels with individually selectable positive or negative polarity
- SHV coaxial output connectors
- Common floating return
- Low Ripple
- Under/over-voltage alert, overcurrent and max. voltage protection
- Interlock logic for board enable and Individual channel kill
- 1 nA Current monitor resolution (with x20 Imon-Zoom: 50 pA)
- 2.8" color touch screen display
- Local and Remote control (USB2.0/Ethernet)
- Daisy-chain capability
- Software Tools for easy channel management

## Description

The CAEN **Mod. N1471HET** provides **4** independent High Voltage channels in a double width NIM mechanics. Each channel can provide a **±5.5 kV** max voltage and a **20 µA** max current. The output polarity is independently selectable for each channel.

Channels have **common floating return** (common return insulated from the crate ground); HV outputs are delivered through SHV connectors. The HV output Ramp-up and Ramp-down rates may be selected independently for each channel in the range 1÷500 V/s in 1 V/s steps. The module features 1 nA Iset/Imon resolution. Zoom for Imon increases resolution to 50 pA.

### SHV connector

NIM double width, 4 channels for Mod. N1471HET

Consult our **connectors reference page** for technical information.

Module control can take place either **locally** thanks to a **2.8" Touchscreen Graphic color LCD display** with a completely redesigned user interface or **remotely**, via **USB 2.0** or **Ethernet**. A complete set of **Software Tools** is available to control these units; the user can freely download low level libraries, LabVIEW driver and Graphical application software.

Safety features allows the module to perform as a current generator and includes:

<b>Channels can be enabled or disabled</b>	can be enabled or disabled through the Global Interlock logic.
<b>Overvoltage and Undervoltage warning</b>	warning when the output voltage differs from the programmed value by more than 2% of set value (minimum 10V).
<b>Overcurrent detection</b>	if a channel tries to draw a current larger than its programmed limit, it enters TRIP status, keeping the maximum allowed value for a programmable time (TRIP), before being switched off.
<b>Hardware VMAX</b>	programmable VMAX protection limit.
<b>Safety Board Interlock</b>	common Interlock logic for channels enable/disable and individual inputs signal for channel Kill function.

Module control can take place either locally, assisted by a Graphic colour display, or remotely, via USB (1) or RS485 (1). It is also controllable via TCP/IP (2) by the Smart Fan Unit of CAEN NIM8301 crate:

### Available Options:

- **A1480** DC Input Power Equalizer.

## Technical Specifications

### Packaging

Double width NIM mechanics. Weight: ~2.6 kg

### Output channels

4 channels, Common Floating Return, SHV connector Positive or Negative Polarity (requires internal setting)

### Output ranges

5.5 kV / 20  $\mu$ A (IMonRange = High)  
5.5 kV / 2  $\mu$ A (IMonRange = Low) - Imon Zoom Active

### Max. Ch. Output Power

0.11W

### Vset Resolution

100 mV

### Vmon Resolution

100 mV

### Iset Resolution

1 nA

### Iset / Imon Resolution

1 nA (IMonRange = High)  
50 pA (IMonRange = Low) - Imon Zoom Active

### Vmax

0  $\div$  5600 V Absolute maximum HV level that the channel is allowed to reach, independently from the preset value Vset. Output voltage cannot exceed the preset value Vmax. The accuracy is 1 %  $\pm$  5 V

### Vmax resolution

$\pm$  1 V

### Alarm output

Open collector, 100 mA maximum sink current

### Interlock input

LOW: <1V; current~5mA; HIGH: 4 $\div$ 6 V

### Ramp Up/Down

1 $\div$ 500 Volt/s, 1 Volt/s step

## Trip

- Max. time an “overcurrent” can last (seconds). A channel in “overcurrent” works as a current generator; output voltage varies in order to keep the output current lower than the programmed value.
- “Overcurrent” lasting more than set value (1 to 9999) causes the channel to “trip”.
- Output voltage will drop to zero either at the Ramp-down rate or at the fastest available rate, depending on Power Down setting; in both cases the channel is put in the OFF state.
- Trip range: 0 ÷ 999.9 s; 1000 s = INFINITE. Step = 0.1 s (If trip= INFINITE, “overcurrent” lasts indefinitely)

## Voltage Ripple

- 20 ÷ 1000 Hz: Typical: 12 mVpp, Maximum: 20 mVpp
- 1 ÷ 20000 kHz: Typical: 2 mVpp, Maximum: 5 mVpp

## Vmon vs. Vout Accuracy

±0.02% of read value ±2 V

## Vset vs. Vout Accuracy

±0.02% of read value ±2 V

## Imon vs. Iout Accuracy

±2% of read value ±2 nA (IMonRange = High)  
±2% of read value ±200 pA (IMonRange = Low) - Imon Zoom Active

## Iset vs. Iout Accuracy

±2% of read value ±3 nA (IMonRange = High)  
±2% of read value ±300 pA (IMonRange = Low) - Imon Zoom Active

## Humidity range

0 ÷ 80%

## Operating temperature

0 ÷ 45°C

## Storage temperature

-10 ÷ 70°C

## Vout / Temperature coefficient

max. 50 ppm / °C

## Imon / Temperature coefficient

max 100 ppm / °C; max 300 ppm / °C with Imon zoom

## Long term stability Vout vs. Vset

± 0.02% (after one week @ constant temperature)

## Ordering Options

Code	Description	RoHS
WN1471HETXAA	N1471HET - 4 Channel 5.5kV NIM HV Power Supply High Accuracy Module with Ethernet & 2.8" TouchScreen	RoHS

## Accessories

### A1480



DC Power Input Equalizer for N14XX Family

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### HV CABLES



High Voltage Cable Assemblies

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## Related Software

### GECO2020



General Control Software for CAEN HV Power Supplies

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## Related Software Libraries

### CAEN HV Wrapper Library



Library for CAEN Power Supply Control

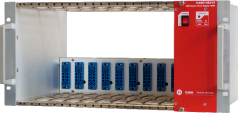
## Related Products

### NV8020A



7U CRATE VME/NIM 8 slot VME64 365W, 5 slot NIM 150W

### NIM8302



5U 10 slot 150 W Compact Crate

### NIM8306



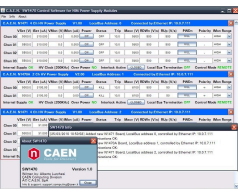
2 Slot Switching 750 W Mini Crate

### NIM8304



7U 12 slot smart fan unit Switching 2000 W Crate

### SW1470



Control Software for NIM Power Supply Modules

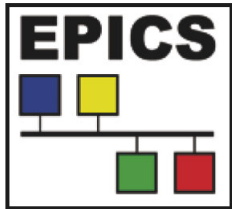
## NIM8305



2 Slot Switching 450 W Mini Crate

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## EPICS IOC (PSM Power Supply Modules)



EPICS IOC for Power Supply Modules

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## NIM8303



5U 12 slot 300/600 W Crate

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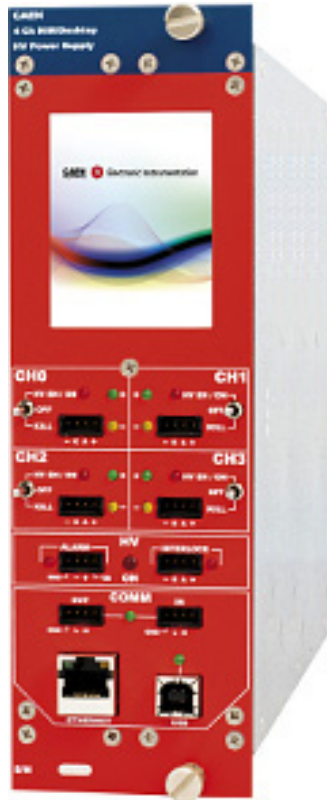
## LabVIEW Driver (PSM - Power Supply Modules)



LabVIEW Instrument Driver for Power Supply Modules

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# Gallery



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