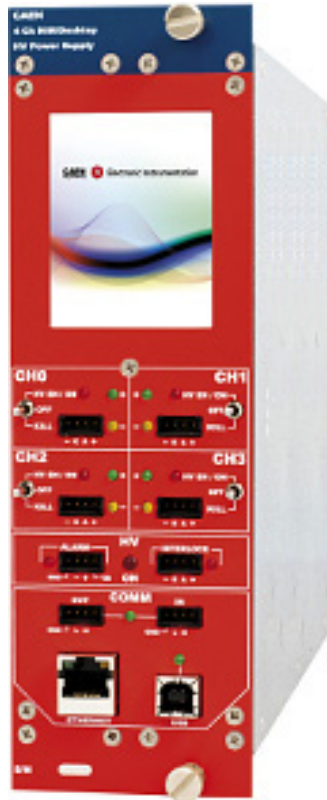


## **N1470ET**

# **4 Ch Reversible 8 kV/3 mA (8 W) NIM HV Power Supply Module (USB/Ethernet/T.scr een)**



## Features



- 4 independent channels in 2U NIM module
- 8 kV / 3mA output range
- Max output power:
  - 9 W (<3 kV output)
  - 8 W (>3 kV output)
- 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
- 50 nA Current monitor resolution (with x10 Imon-Zoom: 5 nA)
- 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. N1470ET** provides **4** independent High Voltage channels in a double width NIM mechanics. Each channel can provide a **±8 kV** max voltage, a **3 mA** max current and a **9 W** max power (8 W max power when output voltage is larger than ±3 kV). 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 50nA Iset/Imon resolution. Zoom (x 10) for Imon increases resolution to 5nA.

### SHV connector

NIM double width, 4 channels for Mod. N1470ET

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:

### Overvoltage and Undervoltage warning

when the output voltage differs from the programmed value by more than 2% of set value (minimum 10V).

### Overcurrent detection

when a channel attempts to exceed the programmed current limit, it signalled to be in "overcurrent" and enter in a TRIP status. The output voltage is varied to keep the current below the programmed limit for a programmable TRIP time, then the channel is switched off. If TRIP is set to "constant current mode", the channel behaves like a current generator.

### VMAX

programmable VMAX protection limit.

### Safety Board Interlock

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

8 kV / 3 mA (IMonRange = High)  
8 kV / 300  $\mu$ A (IMonRange = Low) - Imon Zoom Active

### Max. Ch. Output Power

9 W ( Vset < 3 kV)  
8 W ( Vset > 3 kV)

### Vset Resolution

200 mV

### Vmon Resolution

200 mV

### Iset Resolution

50 nA

### Iset / Imon Resolution

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

### Vmax

0 ÷ 8100 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: < 1 V; current~5mA; HIGH: 4÷6 V

### Ramp Up/Down

1÷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:

3kV/200  $\mu$ A. Maximum: 25 mVpp  
3kV/3 mA. Typical: 20 mVpp / Maximum: 30 mVpp  
8kV/800  $\mu$ A. Typical: 25 mVpp / Maximum: 30 mVpp

1 ÷ 20000 kHz:

3kV/200  $\mu$ A. Maximum: 10 mVpp  
3kV/3 mA. Typical: 5 mVpp / Maximum: 10 mVpp  
8kV/800  $\mu$ A. Typical: 10 mVpp / Maximum: 15 mVpp

## Vmon vs. Vout Accuracy

$\pm 0.02\%$  of read value  $\pm 2V$

## Vset vs. Vout Accuracy

$\pm 0.02\%$  of read value  $\pm 2V$

## Imon vs. Iout Accuracy

$\pm 2\%$  of read value  $\pm 2 \mu A$  (IMonRange = High)  
 $\pm 2\%$  of read value  $\pm 200 nA$  (IMonRange = Low) - Imon Zoom Active

## Iset vs. Iout Accuracy

$\pm 2\%$  of read value  $\pm 2 \mu A$  (IMonRange = High)  
 $\pm 2\%$  of read value  $\pm 200 nA$  (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 X10 zoom

## Long term stability Vout vs. Vset

$\pm 0.02\%$  (after one week @ constant temperature)

## Ordering Options

Code	Description
WN1470ETXAAA	N1470ET - 4 Channel 8kV/3mA (9W) NIM HV Power Supply Module with Ethernet & 2.8" Touchscreen <span data-bbox="1404 268 1484 313">RoHS</span>

## Accessories

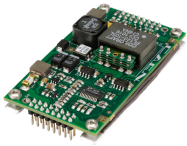
### HV CABLES



High Voltage Cable Assemblies

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### A1480

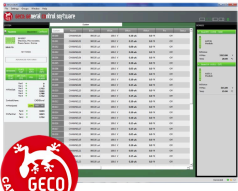


DC Power Input Equalizer for N14XX Family

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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

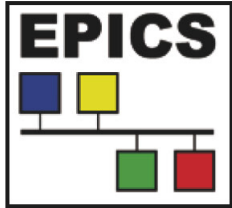
## Related Products

### NIM8305



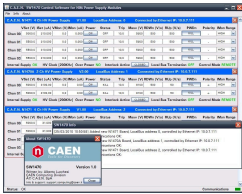
2 Slot Switching 450 W Mini Crate

### EPICS IOC (PSM Power Supply Modules)



EPICS IOC for Power Supply Modules

### SW1470



Control Software for NIM Power Supply Modules

### NIM8306



2 Slot Switching 750 W Mini Crate

### LabVIEW Driver (PSM - Power Supply Modules)



LabVIEW Instrument Driver for Power Supply Modules

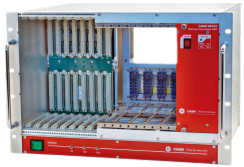
### **NIM8303**



5U 12 slot 300/600 W Crate

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### **NV8020A**



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

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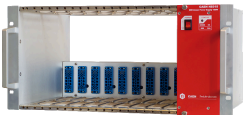
### **NIM8304**



7U 12 slot smart fan unit Switching 2000 W Crate

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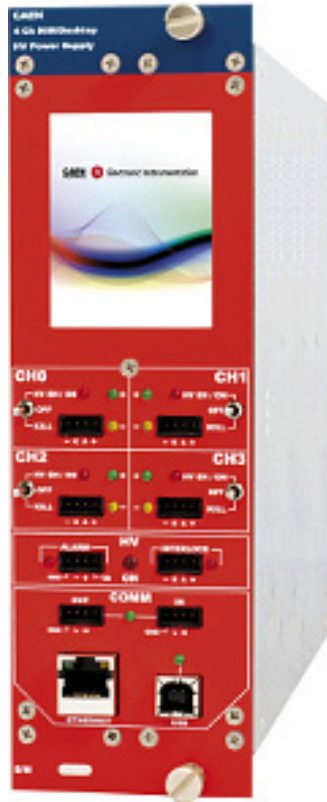
### **NIM8302**



5U 10 slot 150 W Compact Crate

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# Gallery



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