N1471H

4 Ch Reversible 5.5 kV/20 µA NIM HV Power Supply High Accuracy Module (USB)

Features

- 4 independent channels in 1U NIM module (2 & 1 channel versions also available)
- 5.5 kV / 20 µA output range
- Channels with individually selectable positive or negative polarity
- SHV 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)
- Graphic color display
- Local and Remote control (USB2.0/RS485/RS232)
- Daisy-chain capability
- Optional DC Input Power Equalizer
- Software Tools for easy channel management

Description

The CAEN **Mod. N1471H** provides **4** independent High Voltage channels in a single width NIM mechanics. Two and one channel versions (N1471HA and N1471HB) are also available. Each channel can provide a **±5.5kV** / **20 µA** output. 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.

SHV connector

NIM single width, 4 channels for Mod. N1471H, N1471HA (2 Ch), N1471HB (1 Ch)

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

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 1nA Iset/Imon resolution. **Zoom** for Imon increases resolution to 50 pA. Power supply control can be performed either **locally**, assisted by a Graphic color display or **remotely**, via **USB**, **RS232** or **RS485**, the latter allowing to build a daisy chain network of modules N14XX. It is also controllable via **TCP/IP** by the Smart Fan Unit of CAEN **NIM8301**.

A complete set of **free software Tools** is available to control this unit: **GECO2020** with user friendly GUI and **CAEN HV Wrapper library** for custom SW development. **EPICS** and **LabVIEW** also supported.

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

Channels	can be enabled or disabled through the Global Interlock logic.
Overvoltage and Undervoltage warning	when the output voltage differs from the programmed value by more than 2% of set value (minimum 10V).
Overcurrent detection	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.
Hardware VMAX	programmable MAX 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 NIM 8301 crate:

Special versions available:

- 2 channels version (**N1471HA)**
- 1 channel version (**N1471HB**)
- 2U NIM module with 220/110 Vac plug for desktop operation equipped with **2.8" Touchscreen, Ethernet and USB interface** (**NDT1471H**)
- 2U NIM module equipped with **2.8" Touchscreen, Ethernet and USB interface** (**N1471HET**)

Available Options:

- **A1480** DC Input Power Equalizer.

N14xx modules are provided with a USB VCP interface and can be programmed via PC by connecting the PC USB port with the N14xx USB B-type port; the featured controller (FT232BM chip) requires a driver available on **this page** or at **www.ftdichip.com**

Technical Specifications

Packaging

Single width NIM unit

Output Channels

4 / 2 / 1 channels, Common Floating Return, SHV connector Positive or Negative Polarity (requires internal setting)

Output ranges

5.5 kV / 20 µA (IMRANGE = High)
5.5 kV / 2 µA (IMRANGE = Low) - Imon Zoom Active

Max. Ch. Output Power

0.11 W

Vset Resolution

100 mV

Vmon Resolution

100 mV

Iset Resolution

1 nA

Imon Resolution

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

Vmax

0 ÷ 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 % ± 5 V

Vmax resolution

± 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; o utput 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 o n 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 ±2V

Vset vs. Vout Accuracy

±0.02% of read value ±2V

Imon vs. Iout Accuracy

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

Iset vs. Iout Accuracy

±2% of read value ±3 nA (IMRANGE = High)
±2% of read value ±300 pA (IMRANGE = 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

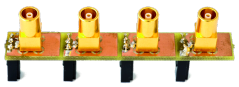
± 0.02% (after one week @ constant temperature)

Ordering Options

Code	Description	
WN1471HA05AC	N1471HA - 2 Ch NIM Programmable High CurrentRes. HV Power Supply (±5.5kV, 20µA, 1nA res.)	RoHS
WN1471HB05AC	N1471HB - 1 Ch NIM Programmable High CurrentRes. HV Power Supply (±5.5kV, 20µA, 1nA res.)	RoHS
WN1471HX05AC	N1471H - 4 Ch NIM Programmable High CurrentRes. HV Power Supply (±5.5kV, 20µA, 1nA res.)	RoHS

Accessories

A1481



Kill Signal Adapter for N14XX series

A1484

Inhibit - Kill Signal BNC Adapter for HV Power Supply Modules

A1480

DC Power Input Equalizer for N14XX Family

HV CABLES

High Voltage Cable Assemblies

A1483

Inhibit - Kill Signal BNC Adapter for HV Power Supply Modules

A148x

Inhibit - Kill Signal BNC Adapter for HV Power Supply Modules

Related Software

GECO2020

GEneral COntrol Software for CAEN HV Power Supplies

Related Software Libraries

CAEN HV Wrapper Library

Library for CAEN Power Supply Control

Related Products

NIM8303

5U 12 slot 300/600 W Crate

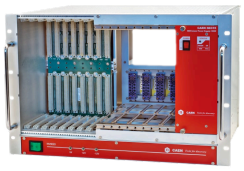
LabVIEW Driver (PSM - Power Supply Modules)

LabVIEW Instrument Driver for Power Supply Modules

NIM8304

7U 12 slot smart fan unit Switching 2000 W Crate

NV8020A



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

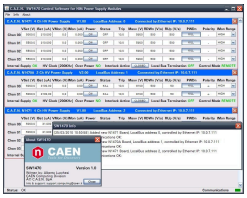
NIM8305

2 Slot Switching 450 W Mini Crate

EPICS IOC (PSM Power Supply Modules)

EPICS IOC for Power Supply Modules

SW1470

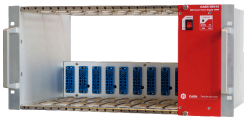


Control Software for NIM Power Supply Modules

NIM8306

2 Slot Switching 750 W Mini Crate

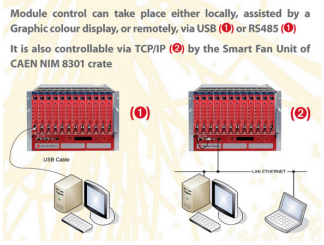
NIM8302



5U 10 slot 150 W Compact Crate

Gallery

Voltage & Current analogue monitor **HV-ON LED**



New innovative local control: encoder and colour display will make the setting easier than ever!

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