

# N1410

## 4 Ch Reversible 1 kV/200 $\mu$ A NIM HV Power Supply Module (USB)





4 independent channels in 1U NIM module  
 Programmable output range  
 Individually selectable positive or negative polarity  
 SHV connectors  
 Common floating return

Voltage alert, overcurrent and max. voltage protection  
 Logic for board enable and Individual channel kill  
 High precision monitor resolution (with x10 Imon-Zoom: 500 pA)  
 LCD display  
 Remote control (USB2.0/RS485/RS232)  
 Fan capability  
 Input Power Equalizer  
 Tools for easy channel management

The **N1410** provides **4** independent High Voltage channels in a single width NIM mechanics. Each channel can provide a  $\pm 1\text{kV}$  max voltage, a  $200\ \mu\text{A}$  max current. The output polarity is selectable for each channel. Channels have **common floating return** (common return insulated from the crate ground); HV outputs are delivered through SHV connectors. Ramp-up and Ramp-down rates may be selected independently for each channel in the range  $1\div 100\ \text{V/s}$  in  $1\ \text{V/s}$  steps. The module features  $5\ \text{nA}$  Iset/Imon resolution. Features a current monitor resolution to  $500\ \text{pA}$ .

For more information, see 4 channels for Mod. N1410

See **connectors reference page** for technical information.

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. Also controllable via **TCP/IP** by the Smart Fan Unit of CAEN **NIM8301**.

A 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** are also supported.

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

**Overvoltage and Undervoltage**

When the output voltage differs from the programmed value by more than 2% of set value (minimum 1V).

**Overcurrent Protection**

If a channel tries to draw a current larger than its programmed limit, it enters TRIP status, keeping the maximum allowed value for a programmed time (TRIP), before being switched off.

**VMAX**

Programmable VMAX protection limit.

**Channel Kill logic**

Logic for channels enable/disable and individual inputs signal for channel Kill function.

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.

**Options:**

Input Power Equalizer.

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 (FT232RL) is available on **this page** or at **www.ftdichip.com**

## Specifications

M unit

Channels

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

Res

100 nA (IMRANGE = High)

10 nA (IMRANGE = Low) - Imon Zoom Active

Output Power

Function

Function

Function

Function

100 nA (IMRANGE = High) 500 pA (IMRANGE = Low) - Imon Zoom Active

Absolute maximum HV level that the channel is allowed to reach, independently from the preset value  $V_{set}$ . Output voltage cannot exceed the preset value  $V_{max}$ . The ac

Function

Function

100 Volt/s step

"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 pre

"trip" 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.

100 s; 1000 s = INFINITE. Step = 0.1 s (If trip= INFINITE, "overcurrent" lasts indefinitely).

Level

100 Hz. Typical: 3 mVpp / Maximum: 5 mVpp

100 Hz. Typical: 3 mVpp / Maximum: 5 mVpp

Output Accuracy

100 mV value  $\pm 500$  mV

Output Accuracy

100 mV value  $\pm 500$  mV

Output Accuracy

100 nA value  $\pm 20$  nA (IMRANGE = High)  $\pm 2\%$  of read value  $\pm 2$  nA (IMRANGE = Low) - Imon Zoom Active

Output Accuracy

100 nA value  $\pm 30$  nA (IMRANGE = High)  $\pm 2\%$  of read value  $\pm 3$  nA (IMRANGE = Low) - Imon Zoom Active

Range

Temperature

Temperature

Temperature coefficient

C

Temperature coefficient

C°; max 300 ppm/C° with Imon zoom

Stability Vout vs. Vset

(one week @ constant temperature)

Description

N1410 - 4Ch Reversible 1000 V/200  $\mu$ A NIM HV Power Supply Module

RoHS



High Voltage Cable Assemblies

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Inhibit - Kill Signal BNC Adapter for HV Power Supply Modules

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DC Power Input Equalizer for N14XX Family

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Kill Signal Adapter for N14XX series

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Inhibit - Kill Signal BNC Adapter for HV Power Supply Modules

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## Software



GEneral Control Software for CAEN HV Power Supplies

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## Software Libraries

### Upper Library



Library for CAEN Power Supply Control

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## Products



5U 10 slot 150 W Compact Crate



7U 12 slot smart fan unit Switching 2000 W Crate



2 Slot Switching 750 W Mini Crate



Control Software for NIM Power Supply Modules

## SM Power Supply Modules



EPICS IOC for Power Supply Modules



2 Slot Switching 450 W Mini Crate



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



5U 12 slot 300/600 W Crate

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**Power (PSM - Power Supply Modules)**



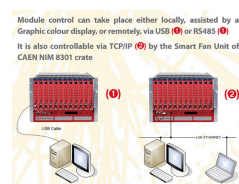
LabVIEW Instrument Driver for Power Supply Modules



**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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**CAEN S.p.A.**

Via Vetraia 11  
55049 - Viareggio  
Italy

**Phone +39.0584.388.398**

**Fax +39.0584.388.959**

**info@caen.it**

**www.caen.it**

**CAEN GmbH**

Brunnenweg 9  
64331 Weiterstadt, Germany

**Phone +49 (0)212.254.4077**

**Mobile +49 (0)151.16.548.484**

**info@caen-de.com**

**www.caen-de.com**

**CAEN Technologies, Inc.**

1 Edgewater Street - Suite 101  
Staten Island, NY 10305  
USA

**Phone +1.718.981.0401**

**Fax +1.718.556.9185**

**info@caentechnologies.com**

**www.caentechnologies.com**

**CAENspa India Private Limited**

B205, BLDG42, B Wing,  
Azad Nagar Sangam CHS,  
Mhada Layout, Azad Nagar, Andheri West  
Mumbai, Maharashtra 400053, India

**info@caen-india.in**

**www.caen-india.in**

