

NanoGen 1

Smart HV Pulses Generator



Technical Presentation

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Version 3.0



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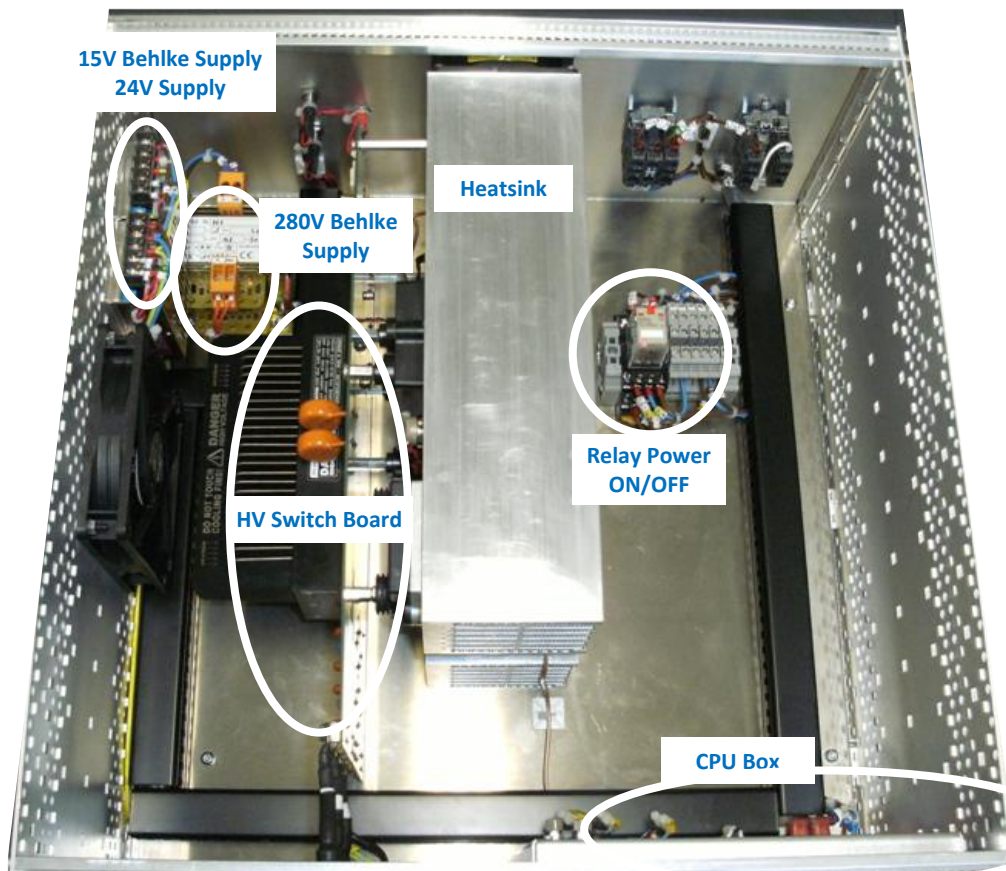
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II. NanoGen 1 Presentation

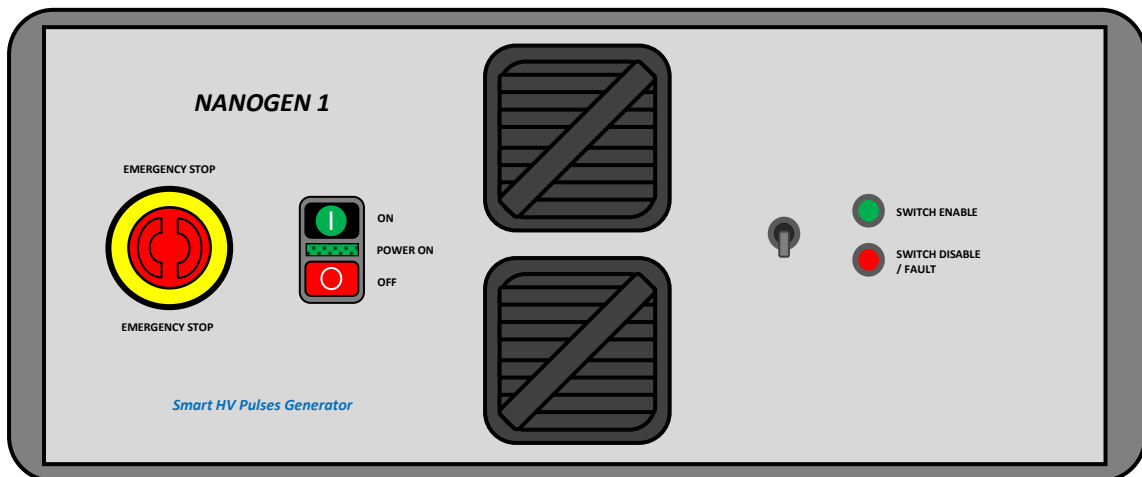
II.1. Main Features

Electrical Power Supply	230V-50/60Hz – 60 VA
Voltage Adjust	0 -10 kV
Pulse Frequency	1Hz – 100 kHz
Pulse Width	150 ns –50µs 20nS in Differential Mode
Output Current max	50A at $F_{max} = 1$ kHz, pulse width max = 10µs or duty cycle max = 1 %
3 Output Modes	- Normal Mode - Differential Mode (double pulse) - Burst Mode

II.2. Internal Wiring

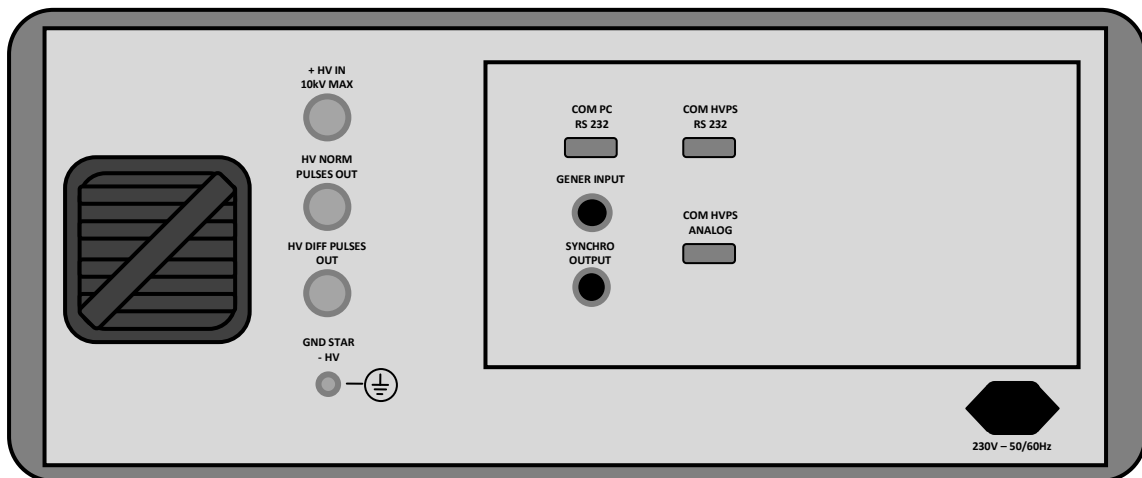


II.3. Description of Front Panel



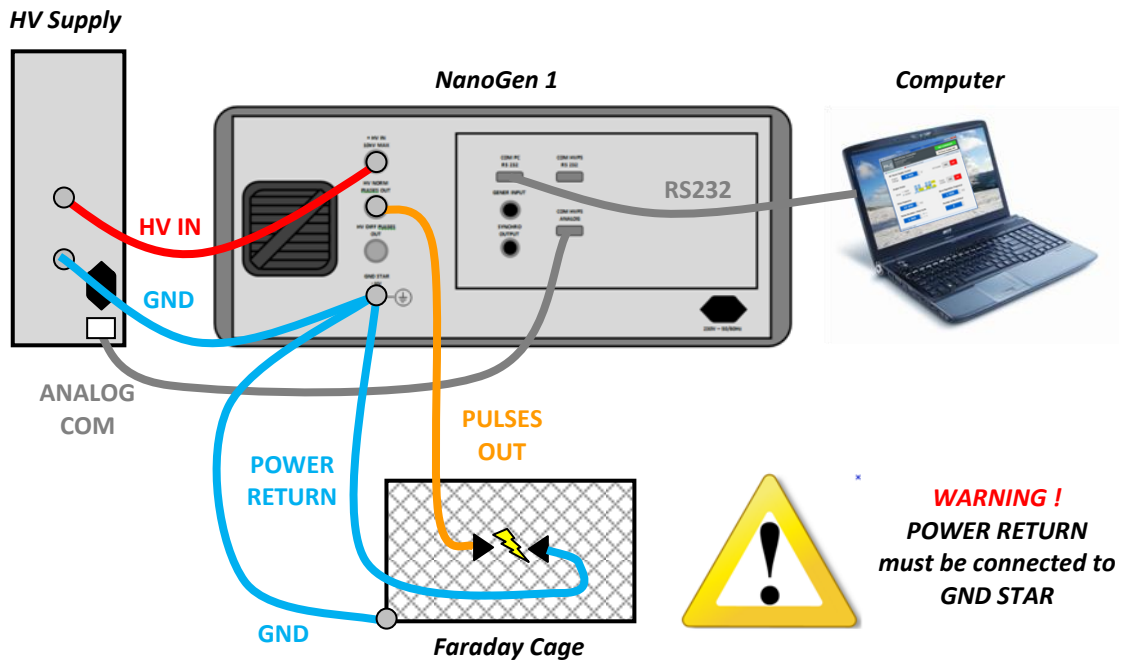
- Switch « **EMERGENCY STOP** »
- Switch « **POWER ON / OFF** » and LED « **POWER ON** »
- Switch « **SWITCH ENABLE** » : this switch enables or disables the HV Pulses Output
- Green LED « **SWITCH ENABLE** » : LED is on if the HV Pulses Output is enabled
- Red LED « **SWITCH DISABLE / FAULT** » : LED is on if the HV switch is disabled or in fault state

II.4. Description of Rear Panel



- Input Connector « **+HV IN** » : HV Supply Input (10kV max)
- Output Connector « **HV NORM PULSES OUT** » : HV Normal Pulses Outputs
- Output Connector « **HV DIFF PULSES OUT** » : HV Differential Pulses Outputs
- GND Connector « **GND STAR -HV** » : HV Ground
- SUBD9 Connector « **COM PC RS232** » : RS232 Communication with PC
- SUBD15 Connector « **COM HVPS ANALOG** » : HV Power Supply Analog Control Interface
- BNC Connector « **GENER INPUT** » : Input from External Generator
- BNC Connector « **SYNCHRO OUTPUT** » : Synchronization Output

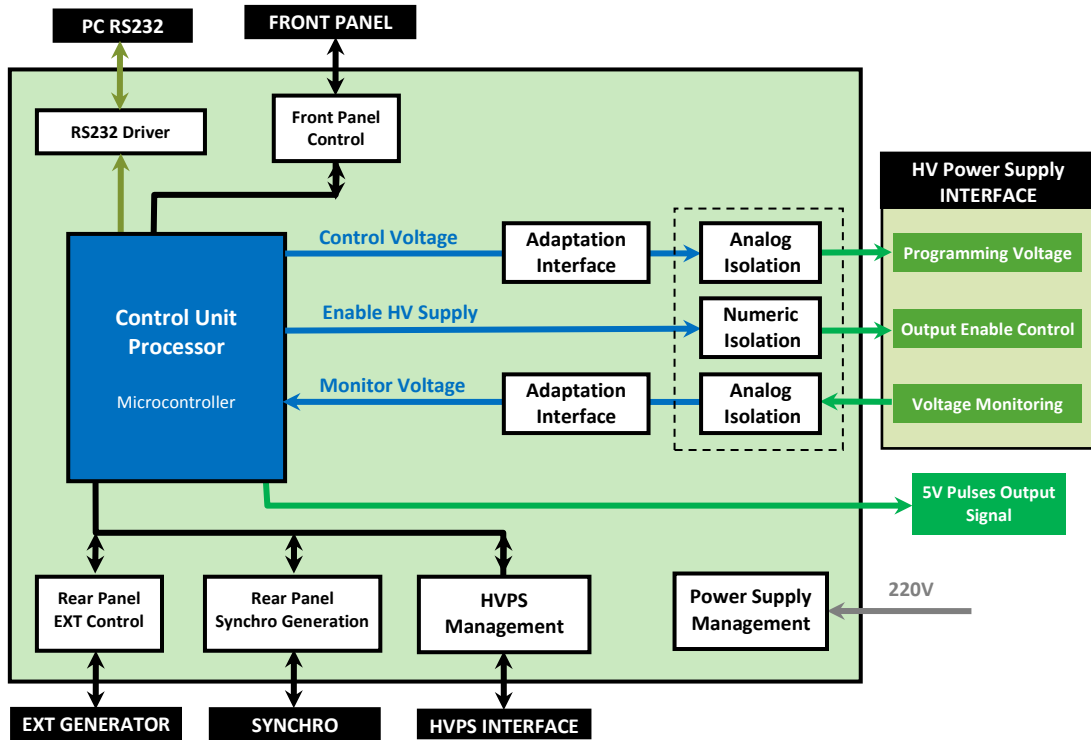
II.5. Global Wiring



III. CPU Board

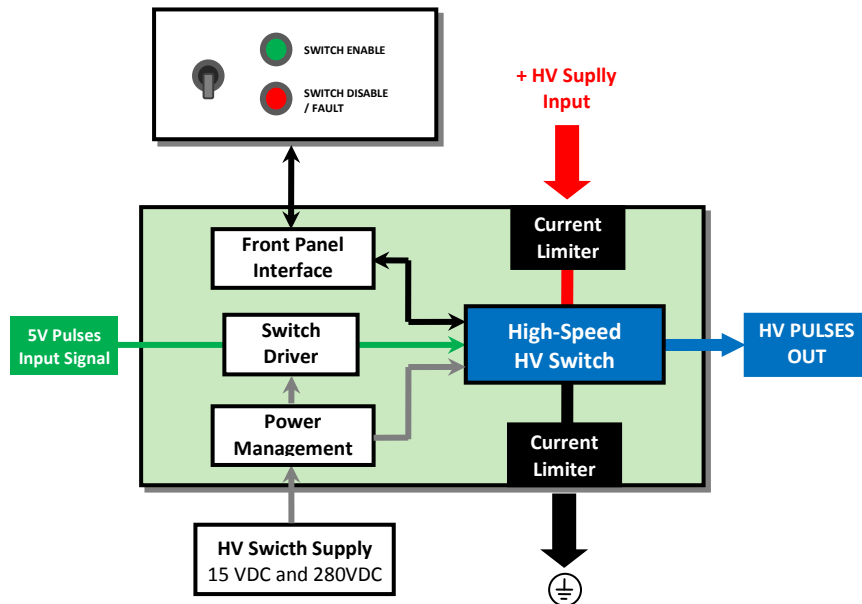
The CPU Board:

- manages the RS232 communication with the PC
- controls the external HV Power supply
- generates the PWM or BURST signal to control the HV Power Switch



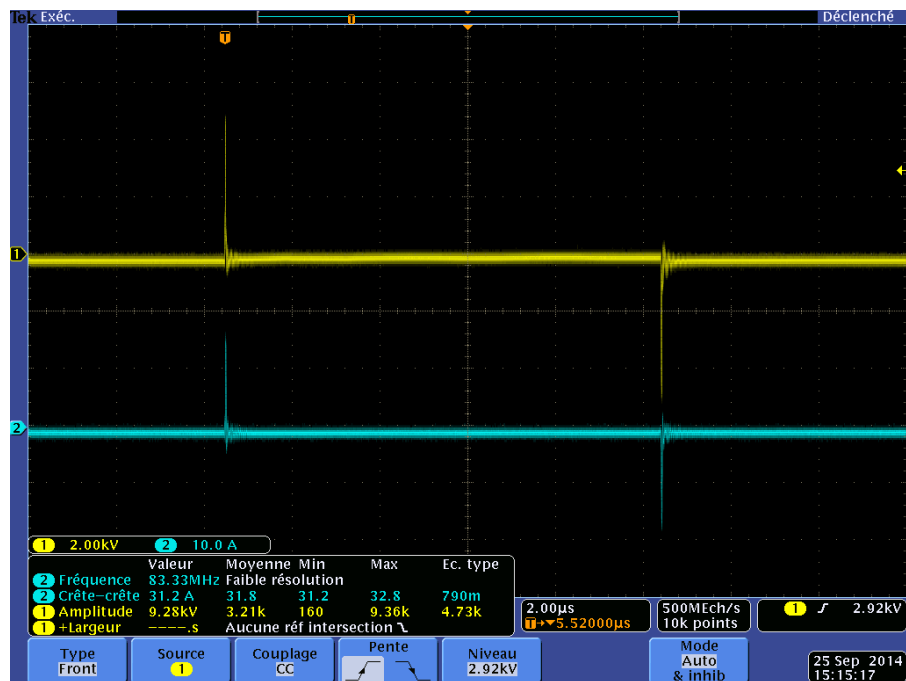
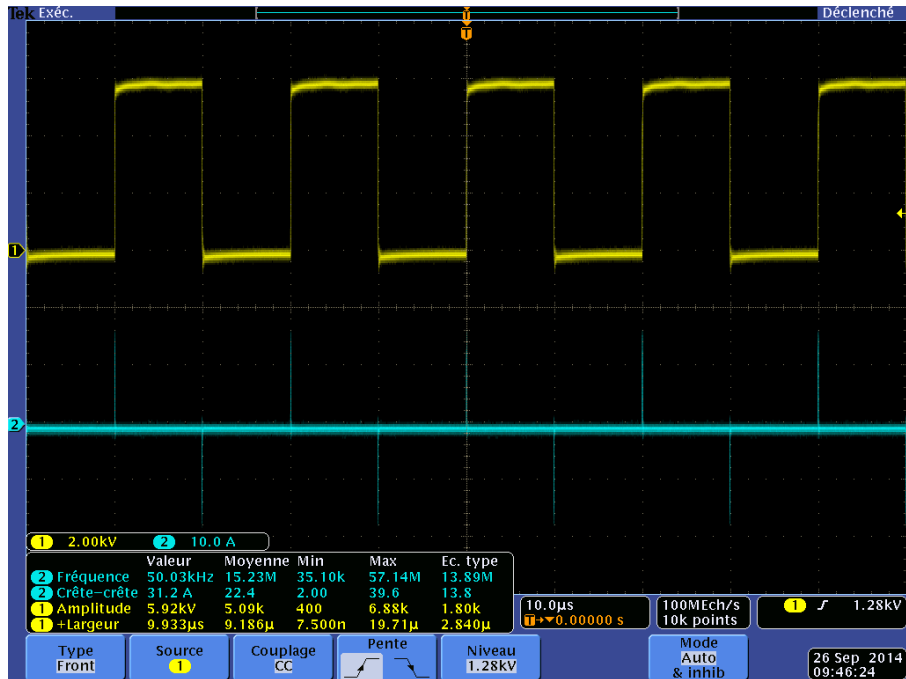
IV. HV Power Switch Board

The **HV Power Switch Board** is based on the BELHKE fast high voltage transistor switch HTS 11-06-GSM.



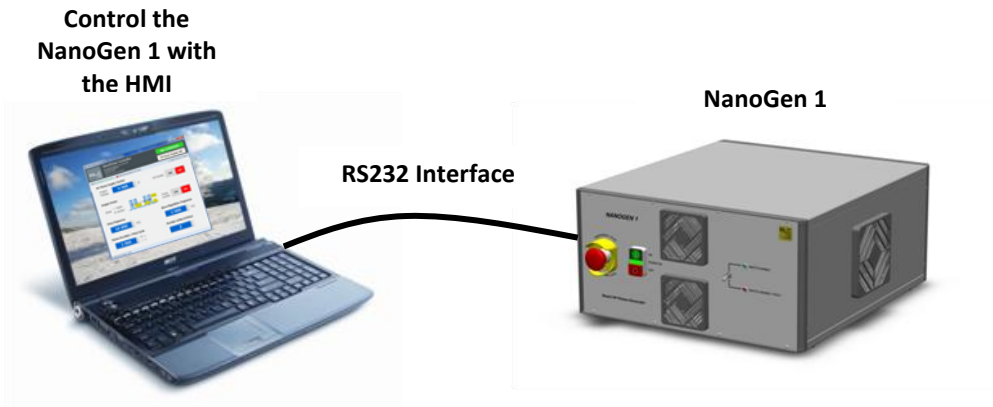
V. Oscillograms

V.1. Differential Principle



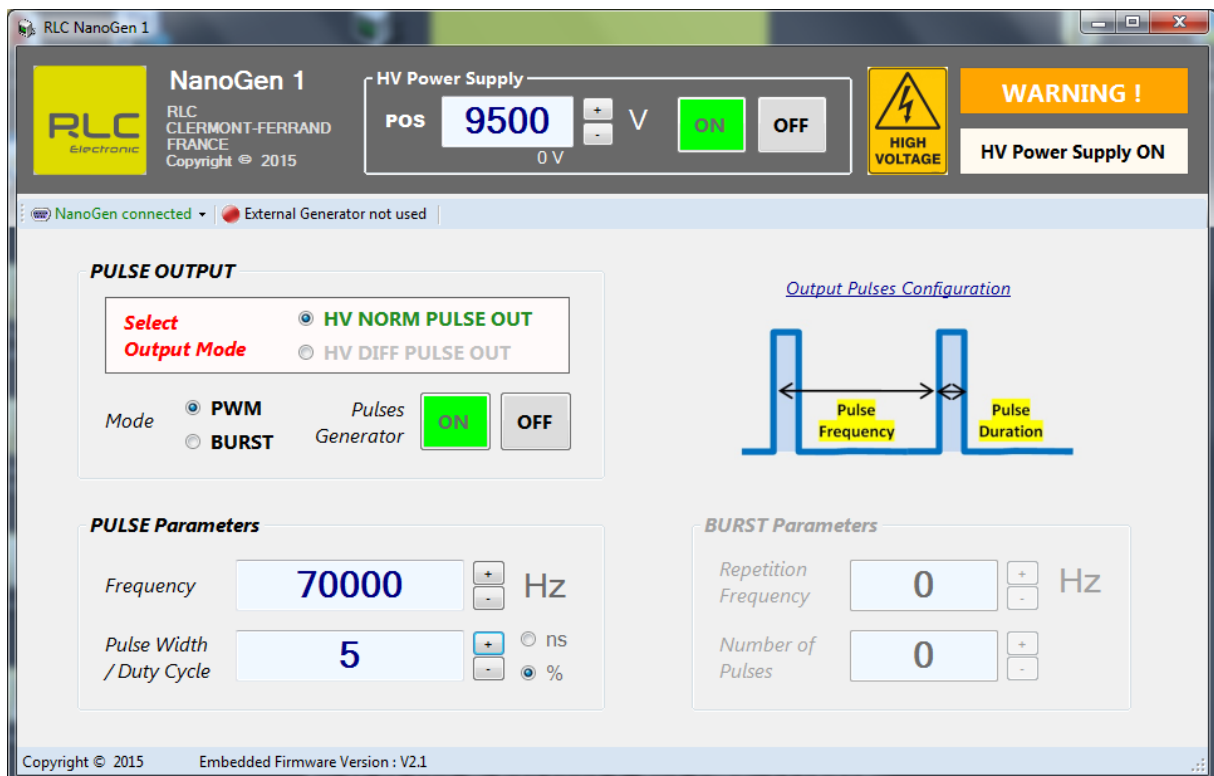
VI. NanoGen 1 HMI

The **NanoGen 1** is controlled by a « Human-Machine Interface », developed by RLC, that can be installed on any PC or on a laptop.



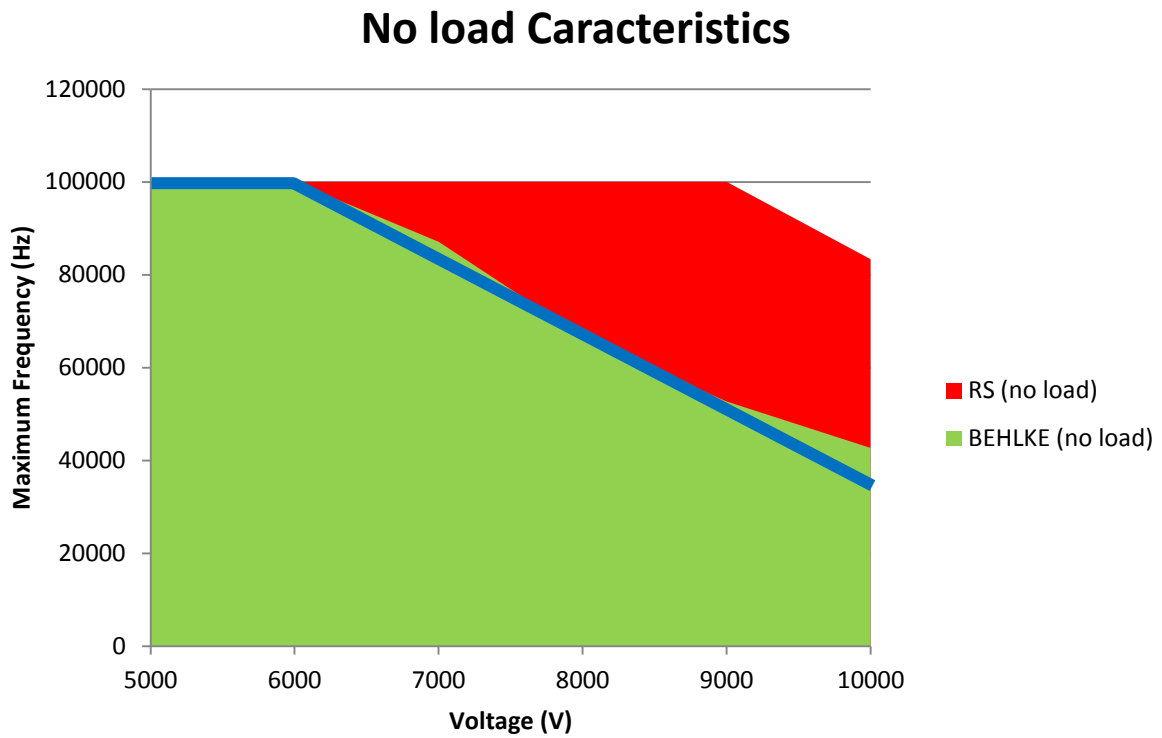
The **NanoGen 1 HMI** controls :

- The external HV Power Supply Output Voltage / ON / OFF
- The PWM or BURST Output Pulses parameters Pulse Frequency / Pulse duration...

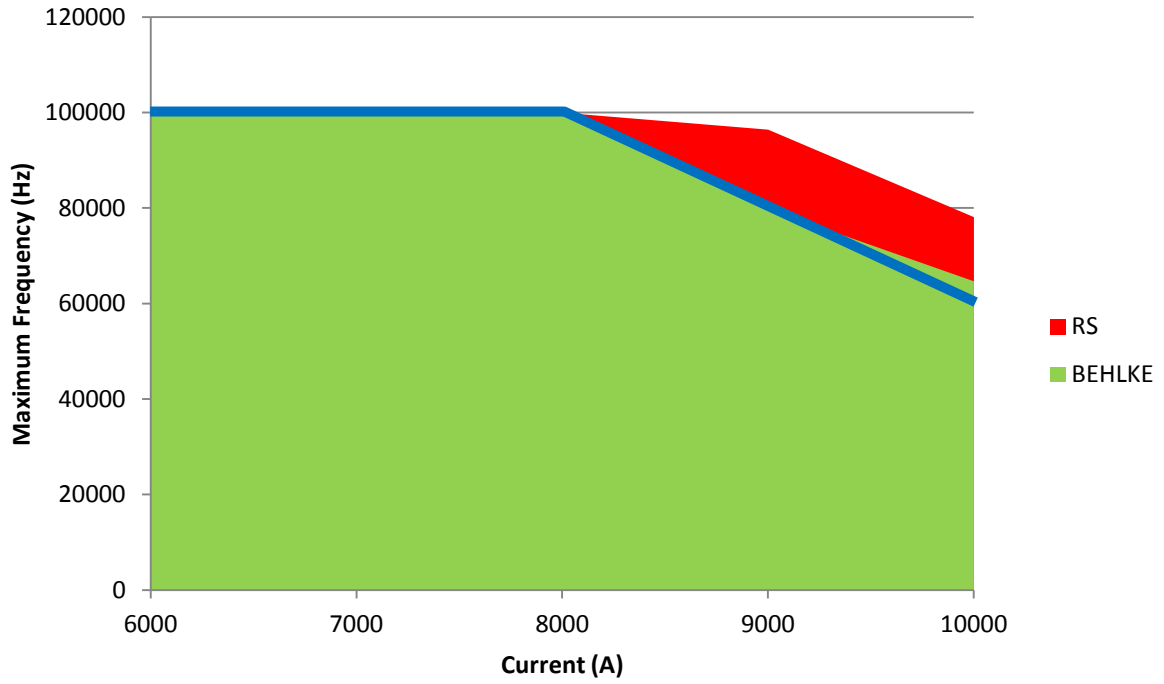


VII. Maximum Power Limitation (Update V2.1)

For each curve below, the **blue line** represents the maximum power limitation. The safety area is under this line. Thanks to the new software V2.1, the user can not go beyond the maximum power limits.



NORM PULSE OUT - Resistive Load - Duty Cycle = 1%



DIFF PULSE OUT - 100pF Load

