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3P28 - Flexible Control of Pulsed Power Generator for Research Applications with Sensors

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Pulsed power generators have been required high-reliability usability and portability by research applications such as bioelectrics, ozonizers, sterilization and water treatment. However, those pulsed power generators are difficult to develop a conventional pulsed power generator using only electric circuits.

The present work aims to develop a high-performance pulsed power generator using field programmable gate array (FPGA), Microcomputer, a Windows PC and sensors. The design specifications are as follows: a peak output voltage of 1.5 kV without a pressure transformer; universal serial bus (USB) connection; oscilloscope, high voltage probe and current monitor for measurement of output; sensors on temperature, pressure, humidity and luminous intensity; flexible control of pulse interval, pulse width, shot number and output voltage. The software, running on the Windows PC, is made from Visual C# with Visual studio 2017. It has a graphical user interface (GUI) and several functions such as selection of using PC or using controller. The complex control of pulsed power which this software and sensors enables is particularly applicable to industrial fields.

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