Title: Solid-State Bipolar Marx Generator with Voltage Droop Compensation

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Editor(s): CamarinhaMatos, LM; Shahamatnia, E; Nunes, G

Source: Technological Innovation for Value Creation

Book Series: IFIP Advances in Information and Communication Technology Volume: 372

Pages: 411-418 Published: 2012

Conference: 3rd IFIP/SOCOLNET Doctoral Conference on Computing, Electrical and Industrial Systems **Location:** Costa da Caparica, Portugal **Date:** Feb 27-29, 2012

Sponsor(s): Soc Collaborat Networks; IFIP; IEEE Ind Elect Soc; IFIP WG 5 5 COVE; UNINOVA

Document Type: Proceedings Paper

Language: English

Abstract: This paper addresses the voltage droop compensation associated with long pulses generated by solid-stated based high-voltage Marx topologies. In particular a novel design scheme for voltage droop compensation in solid-state based bipolar Marx generators, using low-cost circuitry design and control, is described. The compensation consists of adding one auxiliary PWM stage to the existing Marx stages, without changing the modularity and topology of the circuit, which controls the output voltage and a LC filter that smoothes the voltage droop in both the positive and negative output pulses. Simulation results are presented for 5 stages Marx circuit using 1 kV per stage, with 1 kHz repetition rate and 10% duty cycle.

Author Keywords: Bipolar High-Voltage Pulses; Solid-State Switches; Voltage Droop Compensation; Marx Converter Topology; PWM Control

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Publisher: Springer-Verlag Berlin

Publisher Address: Heidelberger Platz 3, D-14197 Berlin, Germany

ISSN: 1868-4238

ISBN: 978-3-642-28255-3

Citation: Canacsinh H, Silva J F, Pinto S F, Redondo L M. Solid-State Bipolar Marx Generator with Voltage Droop Compensation. Technological Innovation for Value Creation. 2012; (372): 411-418.