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Leader in Pulsed Power Systems

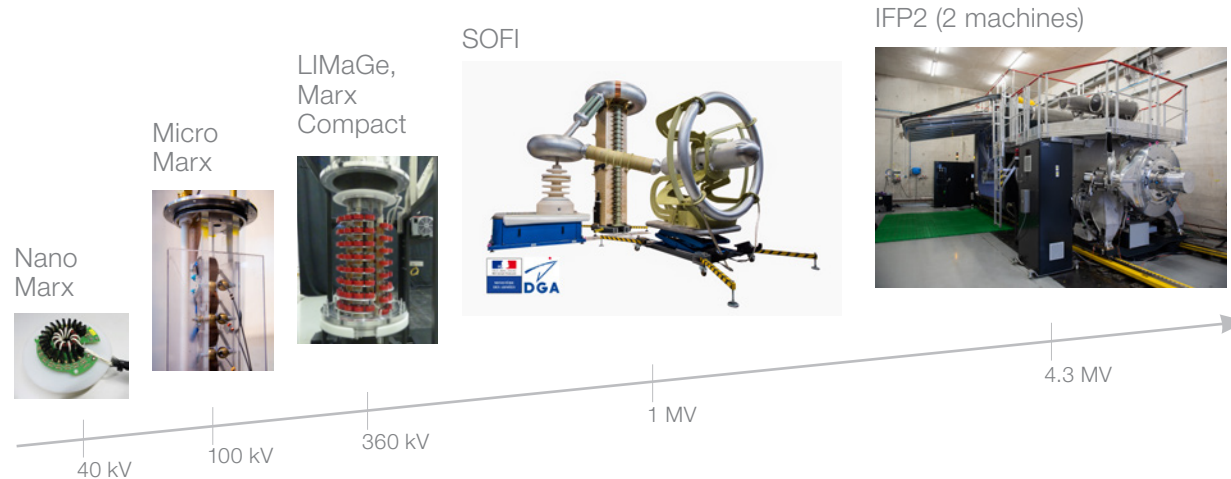
Marx Generators tailored  
to meet your specifications

from spark to lightning

# ITOPP designs and manufactures Marx Generators to customer specifications

This technology is adaptable to different types of needs with low energy applications or high energy (up to several hundred kJ stored). The pulses are delivered in an extremely short time, ranging from a few nanoseconds to a few microseconds, depending on the application and the energy of the system. They can also use a single-shot or repetitive operation (from a few Hertz to a few tens of Hertz).

With over 25 years of experience, ITOPP has acquired expertise in the maintenance and the development of Marx generator systems and can respond to customers' specific needs by adapting existing architectures (modifying the output current and voltage), or by studying a complete design taking into consideration the required performances and the targeted application.



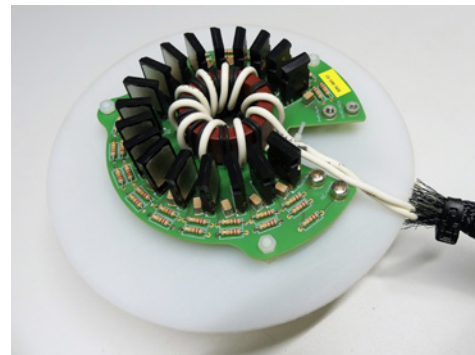
## Nano Marx Generator

Output voltage **20-40 kV** (1 or 2 stages)

Used for triggering purposes on moderate voltages gas switches.

### Technical parameters

Output voltage	20/40 kV (Single / Double Stage)
Peak voltage	25/50 kV (High Impedance)
Rise time	< 12 ns / 20 ns (High Impedance / Sparkgap)
Very Low jitter (solid switching)	< ~3 ns
Overall dimensions (single / double stage)	Diameter: 140 mm / 200 mm Height: 50 mm / 120 mm



## Micro Marx Generator

Output voltage **~100 kV**

Use for triggering purposes (Mini-Marx, high voltage gas switches, LTD Patm bricks etc.).

### Technical parameters

Output voltage	> 100 kV on HV cable end in open circuit
Pulse duration	~75 ns
Rise time	30 ns
Low jitter	< 2-3 ns 1σ
Overall dimensions	Diameter: 180 mm – Height: 600 mm



## LIMaGe (Low Inductance MARx GEnerator)

Compact PFN-Marx generator to drive high power microwave source

Output voltage **~360 kV**

This compact Marx generator is designed for horizontal and vertical positioning. It is equipped with a control command. It is a fully automated system with self-diagnosis capabilities during firing.

### Technical parameters

PFN Marx	<b>“Square Pulse”</b>
Output voltage	<b>360 kV</b> (with 90Ω impedance)
Flat top voltage	<b>~80 ns</b>
Fast rise time (no peaking stage)	<b>&lt;10 ns</b>
Adjustable pulse repetition	<b>up to 100 Hz</b>
	<b>No SF6 or any greenhouse gases</b>
Dimensions	Diameter: ~ 800 mm – Height: <b>1,100 mm</b>
Weight	<b>170 kg</b>



## SOFI (Système d'Onde Foudre Indirecte)

Marx generator to assess indirect effects of lightning strikes on aeronef

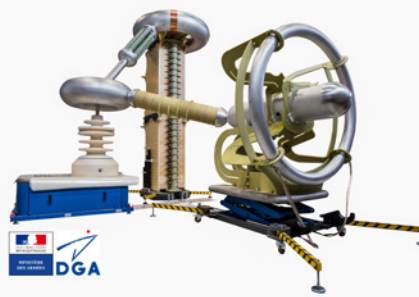
Output voltage **~1.0 MV**

A three-in-one system, generating A-wave and two standard waveforms to assess lightning system vulnerability.

This system can be stored in two containers and requires only two people for assembly and disassembly. This is a versatile system for assessing the vulnerability to lightning of aircraft structures (planes, helicopters, UAVs) and land-based vehicles, including heavy weapon systems.

### Technical parameters

	A waveform	H waveform
$I_{max}$	<b>up to 50 kA</b>	<b>up to 10kA</b>
$t_m$	<b>&lt; 1.4 μs</b>	<b>&lt; 290 ns</b>
RL load	<b>R: up to 100mΩ – L: up to 6 μH</b>	
	<b>No SF6 or any greenhouse gases</b>	
Dimensions deployed	<b>6 x 5.5 x 8 m</b>	



## IFP2 (Interim Firing Point 2)

Marx-PFL generator for Flash radiography

Output voltage **2 MV**

Two Marx-based generators for radiography applications. The tank of each generator is equipped with a hydraulically operated side door under which the Marx generator can be motorized and suspended for easy assembly and maintenance.

### Technical parameters

Marx peak voltage	<b>4.3 MV</b>
Output voltage	<b>~2 MV</b>
Pulse duration	<b>~100 ns</b>
Output current	<b>~650 kA</b>
Jitter	<b>&lt; 100 ns min-max</b>
Overall dimensions of each machine	<b>9 x 6.3 (door open) x 4.6 m</b>
Total weight including fluids	<b>~70 t.</b>
Operable	<b>by 2 persons</b>
	<b>SF6-free technology</b>



With more than 25 years of existence, ITOPP has become the French leader in pulsed power and high-power microwave technologies. Based on the customer's specifications,

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ITOPP designs and manufactures highly innovative adapted systems related to these technologies for scientific research as well as civil and military applications.

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