

Stack 2 or 3 maintenance free negative discharge sparker to boost penetration and resolution.

## Description

### DEVELOPMENT

In 2015 Geo Marine would develop the Multi-Layer Sparkers (Flip-Flop and Tuned modes) and revolutionized the data quality of ultra high-resolution seismic acquisition. The technique was then adopted by the industry as the benchmark for data quality.

### FLIP-FLOP

The Flip-Flop configuration consists of stacking two – or more – sources at different depths with each level firing alternatively. Typically, the top layer is dedicated to High Frequency pulse, whilst the bottom layer to the Low Frequency pulse. One dataset per source will then be recorded and successively processed and merged in order to produce a full spectrum profile.

### TUNED

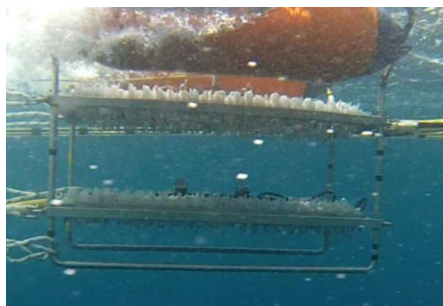
In the Tuned configuration the distance between layers follows the same fundamental Low frequency and High Frequency modes concept to which is added the design of an interference pattern, via trigger delay, that improves the wave shape and attenuates undesired bubble effects.

The two units shoot at almost the same time, with microseconds, sub-wavelet length, difference between them, which will generate a single source signature and one dataset only.

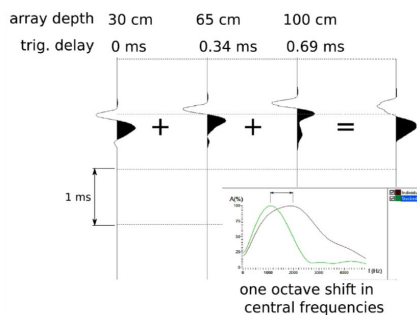
## Operational Features

- Real broadband and powerful signature.
- Two or Three layers of [200](#), [400](#) or [800](#) tip sparkers.
- Also applicable for 3D surveys.

## Marine Multi-Tip Sparker System



Dual-layer 400 tip sparker underwater



frequency spectrum of a processed data acquired with triple-layer 400 tip sparker



Three-layer 400 tip sparker

## Additional Features

### STILL, ALL THE BENEFITS FROM THE INNOVATIVE PRESERVING ELECTRODE MODE

The multi-layer sparkers are the very same equipment of the single-layer approach, so all the benefits from the maintenance free sparkers are kept. However, they are stacked one on top of the other to construct a broader band spectrum (tuned) or to increase horizontal resolution (Flip-Flop).

### OPTIMUM ACOUSTIC REPEATABILITY

Zero tip wear is essential for the repeatability of the acoustic pulse, which depends largely on a constant, unaltered electrode surface.

## Specification

<b>Dimensions (cm) &amp; Weight</b>	Dual Geo-Source 400: 110 (L) x 140 (W) x 95 (H) for 130 kg Triple Geo-Source 400: 110 (L) x 140 (W) x 130 (H) for 180 kg
<b>Operation Depth (m)</b>	5 to 2500
<b>Main remarks</b>	Dual Geo-Source 400 <ul style="list-style-type: none"> <li>- Flip-Flop: double horizontal resolution / Broad Spectrum (500 - 3,000 Hz)</li> <li>- Tuned: Broadband spectrum of 150 - 4,500 Hz</li> </ul>
<b>Compatible equipment</b>	<a href="#">Geo-Spark 2000</a> , <a href="#">24 multi-channel streamer</a>
<b>Recommended interface system</b>	<a href="#">Multi-Trace Server</a>