ACQUISITION – REFRACTION - INFILL – IMPULSIVE SURFACE SOURCE

# ICIS

## Internal Combustion Impulse Source

**ICIS is a compact, man-portable impulsive source available from GSR, as a solution for infill where access for conventional sources is restricted, and for low-impact surveys for shallow targets. The source is self-contained, robust and reliable which makes it easy to deploy in remote areas and challenging environments. It has been tested in temperatures down to-40˚C making it suitable for winter use in North America and the Arctic. It is powered by readily-available propane and oxygen fuel which provide an extended operating life of 3000 shots between refueling.**

ICIS can be easily integrated with other sources for infill thanks to a custom shooting system compatible with Sercel SN408 or SN428 recording systems which allows the observer to switch rapidly from explosive or vibroseis mode to ICIS on a shot-by-shot basis. A GPS-driven high-accuracy clock and a specially developed impact sensor provide accurate time-stamping and recording of timebreak information to better than 1 µs, allowing GPS Time-Stamps for all Nodal Systems.

### BENEFITS:

- Low environmental impact: operate in areas with strict environmental regulations
- Efficient: high-productivity for cost-effective infill shooting or shallow high-resolution surveys
- Versatile: integrates seamlessly with conventional sources for infill
- Convenient: man-portable, readily available fuel, extended operating life
- Reliable and Safe: designed and tested for harsh conditions with rigorous HSE compliance

### IDEAL FOR 2D/3D REFLECTION AND REFRACTION SURVEYS IN:

- Heavy oil infill for riparian zones and other areas with strict environmental regulations
- Shallow oil and gas (e.g. Coal Bed Methane)
- Mineral exploration
- Near-surface characterization
- Structural and engineering surveys

## APPLICATIONS:

In the heavy oil regions of Canada, there are many riparian areas (rivers and water margins) where environmental regulations restrict the use of mechanical transportation. The consequence is that gaps are left within surveys because conventional sources cannot be deployed. Hand-drilling is allowed in some areas but is expensive and slow and may also become restricted. By deploying ICIS, infill can be economically acquired while respecting the environmental regulations to mitigate the imaging problems associated with lack of coverage.

ICIS is also ideal for low-impact and efficient shallow target exploration. With reduced energy output depth of penetration will depend on geology. However, with its accurate time break ICIS shots can be stacked to provide increased signal-to-noise ratio and to achieve better penetration. For example, ICIS has been demonstrated on 300-450 m deep targets on a coal project in South Africa. Other applications where ICIS can be considered include near-surface surveys and structural engineering surveys.

### ICIS SpECIFICATIONS

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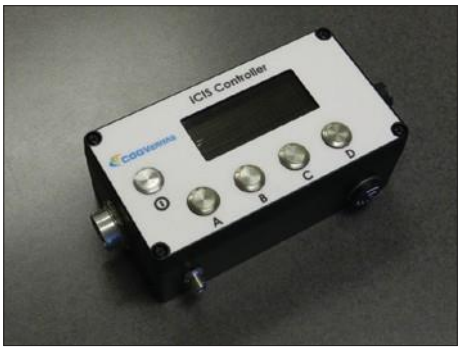
| Peak Force: | 1275 lbs (5600 N) |
| Timing Accuracy: | < 1 µsec |
| Shooting cycle: | 2.5 sec (min) |
| Dimensions: | 25 cm (10”) X 44 cm (18”) X 114 cm (45”) |
| Weight: | 49.5 kg (109 lbs) - with Fuel/Oxygen canisters |
| Fuel: | Propane, Propylene, Butane/IsoButane mix |
| Canister/Fitting: | Fuel: CGA 600, EN417<br>Oxygen: M4A Medical w/CGA-870 Toggle Valve, 40g (1.4 oz) w/CGA-601 |
| Capacity: | ~3000 Hits per 465g (16 oz) Propane canister |
| Power: | 12VDC<br>Decoder: 9W (775mA) - quiescent<br>14W (1150mA) - OCXO heat up<br>13W (1075mA) - Radio TX<br>ICIS Unit: 2W (150mA) - quiescent<br>35W (2900mA) - firing |
| Radio Band: | VHF/UHF |
| Radio Power: | 5W |

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