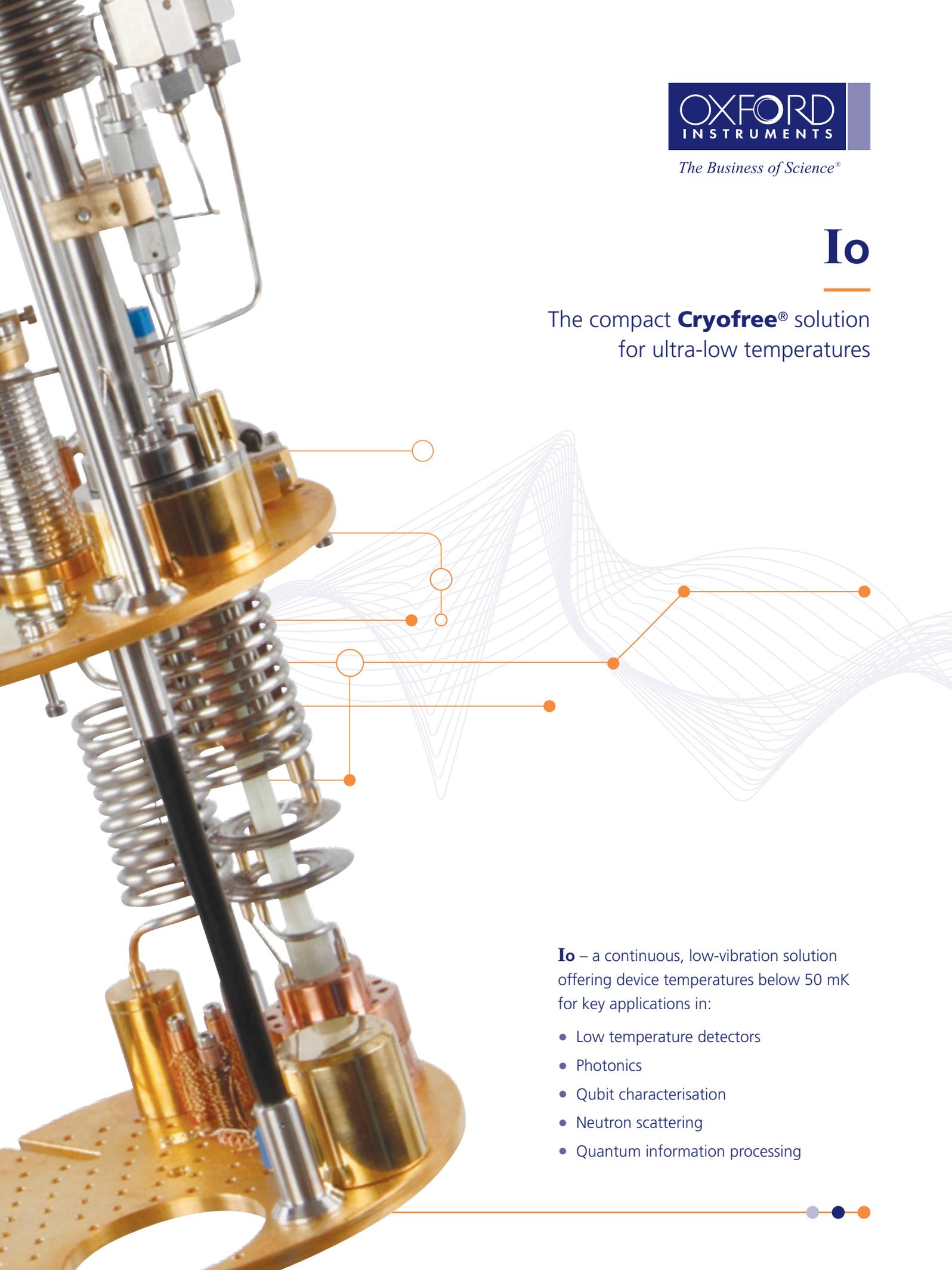


# Io

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The compact **Cryofree®** solution  
for ultra-low temperatures



**Io** – a continuous, low-vibration solution  
offering device temperatures below 50 mK  
for key applications in:

- Low temperature detectors
  - Photonics
  - Qubit characterisation
  - Neutron scattering
  - Quantum information processing
- 

## Why choose **Io**?

**Io** is a compact **Cryofree** system ideal for sub-50 mK research and detector applications. It offers continuous cooling together with lower device temperatures compared to ADR and  $^3\text{He}$  refrigerators; the space and integration benefits that other techniques cannot offer; whilst retaining key capabilities in sample wiring and superconducting magnet integration.

**Io** builds on Oxford Instruments' leading expertise in **Cryofree** technology, brought into a new, compact footprint for specific applications.



## Compact and lightweight

**Io** is easy to be installed and operated where space comes at a premium, or where the system needs to be frequently moved from one location to another.

- A single 19" control rack contains the pumps, gas handling and control electronics
- A small footprint 550 mm outer diameter, 750 mm tall cryostat
- Only requires 3 litres of  $^3\text{He}$

## Easy to use

- Continuous operation over a wide temperature range
- Simple, push-button cooldown procedure
- Engineered technology for customer ease of use
  - Automatic operation
  - Demountable magnet current leads (no soldering necessary)
- Control of device/sample temperature via remote interface

## Superior experimental integration

Space at 50 K, 4 K, 1 K and 50 mK for mounting of experimental devices and cold signal chain elements.

- 150 mm diameter plate at 50 mK
- 160 mm diameter plate at 1 K
- No magnetic field used in the cooling process, allowing easy integration of field-sensitive samples and SQUID components

## Wiring capacity for a variety of applications

- 50 mm line-of-sight port – up to eight UT-85 coaxes
- 4 non-line-of-sight ports – DC loops, flexible coaxes, single and/or multimode optical fibres

## Optional compact frames

## Optional tailsets for various experiments

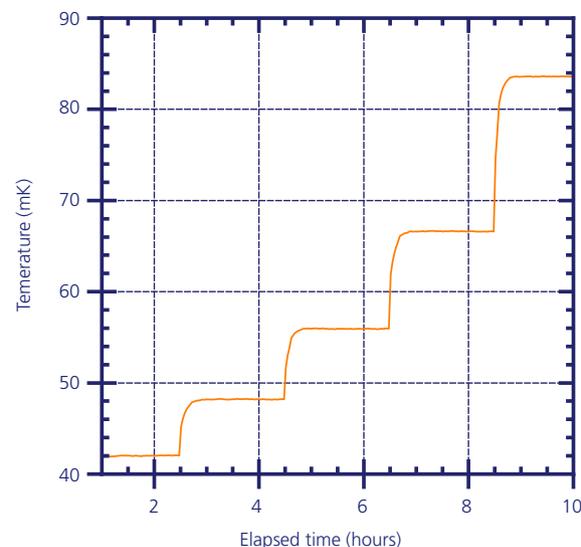
- Thinned aluminium tails for neutron scattering
- Window tails
- Cryoperm shield

## Optional integrated 8 T magnet

## **Io** 1 K – compact cryogen free $^4\text{He}$ refrigerator system

The **Io** can be purchased as a 1 K version which can be easily upgradable to a 50 mK system with the addition of a dilution unit.

|                           | 1 K   | 50 mK  |
|---------------------------|---|--|
| Base temperature          | < 1.4 K                                       | < 50 mK  |
| Cooling power             | 10 mW at 1.6 K<br>100 mW at 2 K               | 30 $\mu\text{W}$ at 100 mK<br>300 $\mu\text{W}$ at 250 mK      |
| Temperature stability     | $\pm 5$ mK below 2 K<br>$\pm 20$ mK above 2 K | $\pm 20$ $\mu\text{K}$ below 700 mK<br>$\pm 1\%$ 700 mK – 10 K |
| Magnet ramp to full field | < 60 mins                                     | < 60 mins  |



Temperature stability of the **Io**.  
At approximately 55 mK the measured stability was < 20  $\mu\text{K}$ .

Visit [www.oxinst.com/io](http://www.oxinst.com/io) or email [nanoscience@oxinst.com](mailto:nanoscience@oxinst.com)

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