



Intelligent control of cryogenic  
and magnetic environments



*The Business of Science®*



# Mercury Instrumentation

## MercuryiTC Intelligent Temperature Controller

### Accurate Measurements

- Measures and controls temperatures to below 250 mK with a precision of 0.1 mK. (24 bit A to D resolution)
- Heater output up to 80 W per channel
- Uses a true constant voltage source for sensor excitation, preventing self-heating and allowing for high quality measurements at the lowest temperature
- Supports all standard cryogenic sensors (ruthenium oxide, cernox, silicon diodes, platinum, thermocouple and RhFe)
- Base system includes a single temperature sensor input and 80W heater output for precise temperature PID control

### Expandable

Customization is possible through the addition of plug and play expansion cards. The controller features 9 expansion slots (8 multi-function slots and a dedicated GPIB slot) which can be used to extend its capability.

Expansion cards include additional temperature sensor inputs and heater outputs, pressure transducer inputs, stepper motor drive allowing gas flow regulation and efficient use of liquid helium in flow cryostats and cryogen level metering of both helium and nitrogen.



Temperature sense



Heater



Gas flow control



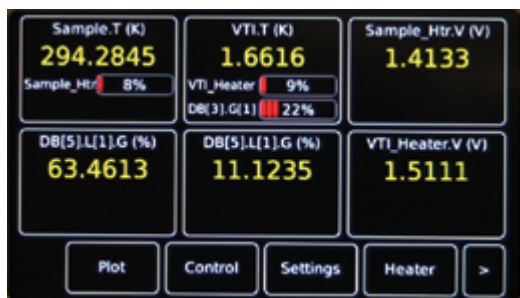
Level meter



Pressure sense



GPIB



Back and front panel of MercuryiTC

\* Base system includes thermometer and heater control as standard. Additional configuration to a maximum of 8 options can be installed.

### System control

The intuitive touch screen user interface facilitates easy monitoring, control and configuration of your experimental system.

## MercuryiPS Intelligent Magnet Power Supply

### Stable Measurements

- Bi-polar, four quadrant magnet power supply
- $\pm 60$  A and  $\pm 10$  V output
- Highly accurate and stable, better than 2.8 mA current stability at 120 A
- Low noise
- iSense intelligent magnet monitoring and quench protection. Auto-rundown allowing the **MercuryiPS** to be programmed to run magnet down safely in event of over temperature or low cryogen levels
- Supports vector rotate magnets

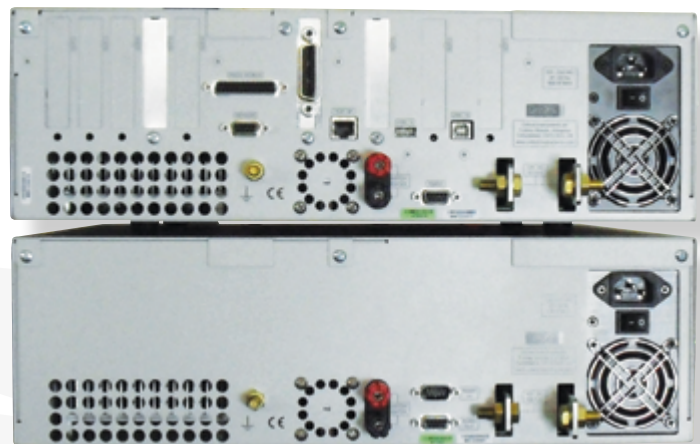


MercuryiPS

### Configurable

- Design based on 60 A master and slave units
- Configurable in series or parallel combinations up to 600 A output. For example 180 A with  $\pm 20$  V output or 600 A with  $\pm 10$  V

Back panel of MercuryiPS



- Easy connection to your Mercury instrument via multiple remote interfaces: Ethernet, GPIB, or serial
- Easy integration within your data acquisition programs and direct and remote control of your cryogenic and superconducting magnet system

The **MercuryiTC** has also a number of custom control modes:

For instance, the Heliox mode is used to control a single shot helium-3 refrigerator

Front panel of MercuryiTC in Heliox mode.





## MercuryiTC Temperature Controller

### Thermometry

Number of inputs	1 incl. as standard, up to 8 extra
A/D Resolution	24-bit analog to digital
Maximum reading rate	Up to 4 readings per sec
Isolation	All sensors independently isolated
Supported sensor types	All standard types for diode/RTD and thermocouple

### Heater

Number of inputs	1 incl. as standard, up to 3 extra
A/D Resolution	16-bit
Max heater power	80 W
Max current	2 A
Max voltage	40 V
Heater load range	20 Ohms to 120 Ohms
Heater noise (0 - 2MHz)	2 mV

### Configuration Options\*

Sensor input	Up to 9
Heater output	Up to 4
N2 / He level meter	Up to 2
Auxillary control (stepper motor)	Up to 4
GPIB	1

### Control

Number of loops	1 incl. as standard, up to 3 extra
PID control	Fixed or zonal
Set point	Programmable
Proportional gain	0 to 200 K (resolution 0.1)
Integral time	0 to 200 mins (resolution 0.001)
Derivative rate	0 to 300 mins (resolution 0.001)

## MercuryiPS Magnet power supply

### Configurable Module Specifications (typical)

Output current	$\pm 60$ A via rear panel busbar per module
Output voltage	$\pm 10$ V
Output polarity	Bi-polar
Current resolution	0.15 mA
Current stability	$\pm 2$ mA or 0.005% per °C
Current ripple	<0.001%
Max sweep rate	1200 A/min
Resolution	0.01 A/min
Load inductance	Up to 1000H
Switch heater output	0 to 120 mA into 0 – 100 ohms. 12 V max
Max steady state power	600 W

### Input

Mains input	3 pin UL/CSA compliant. Auto range setting
Supply voltage	90 to 264 VAC
Frequency	47 to 63Hz

### Interface

RS232	With isobus support. Configured as DCE
Ethernet	10/100 RS422 IEE802.3
USB	Serial port emulation
GPIB	IEEE-488 (Option)
RS485 Modbus	Control between Master and Slave

Visit [www.oxford-instruments.com/mercury](http://www.oxford-instruments.com/mercury) for more information

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