

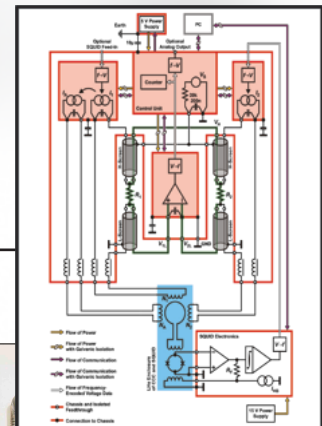
Cryo Current Comparator System

MAGNICON

physical research and instrumentation

CCC – cryo current comparator system

- Fully computer controlled
- High-performance SQUID sensor and XXF-1 electronics
- 12 Bit CCC torus with 18 coils (4647 windings in total)
- Adjustable to almost any resistor ratio
- CCCViewer software allows convenient operation
- 2 digitally controlled current sources with 9 ranges
- Low-noise chopper amplifier
- Easily calibratable compensation network (27 Bit)



A robust and flexible System:



Technical Data

General	- robust and flexible system for use even in standard laboratory environment - integrated data acquisition - frequency modulated optical precision interfaces - adapted XXF-1 SQUID electronics with integrated wideband feedback (IWF) - battery powered with integrated isolated charger and power supply - PTFE isolated sockets for resistor/CCC connections - breakout boxes for easy access to the resistors and coil in/outputs and ULCA-1 calibration - optional 100 L LHe vessel with 50 mm neck diameter - adjustable to almost any resistor ratio - LabView based CCCViewer software for full measurement documentation - resistor range $< 1 \Omega$ to $> 10 \text{ M}\Omega$ - typical ($k=2$) uncertainty $< 5 \cdot 10^{-9}$ (resistances up to QHR) $< 1.5 \cdot 10^{-8}$ (resistance 100 kΩ) $< 2 \cdot 10^{-7}$ (resistance 10 MΩ)
Current Sources I1 and I2	9 ranges $\pm 5 \mu\text{A}$ to $\pm 300 \text{ mA}$ - resolution 16 Bit - adjustable current reversal (ramp) time 100 μs to 10 s - typical current reversal (ramp) time 200 ms
Compensation Network	- fully calibratable - includes high-performance hermetically sealed z-foil resistors - resolution 27 Bit
Amplifier	- low-noise chopper amplifier - flexible post amplification and filter stages - highly linear optically isolated voltage output - voltage noise 0.73 nV/$\sqrt{\text{Hz}}$ @ mHz - current noise 40 fA/$\sqrt{\text{Hz}}$ @ 570 Hz chopping frequency - gain 1000 - input range $\pm 3 \text{ mV}$ - small signal bandwidth 300 kHz - post amplification gain 1 to 9000 - post amplification filters 0.1 Hz to 3 kHz
CCCProbe	50 mm diameter stainless steel probe - integrated Cryoperm and Niobium magnetic shielding 12 Bit CCC torus with 18 coils between 1 and 2048 windings - low-noise high-performance SQUID current sensor with wire wound pick-up coil - CoilSelectorBox for easy and flexible coil winding selection - port for LHe refill



CCCViewer software included
Easy access to all parameters
Automatic full measurement documentation