SQUID iMAG

SQUID ELECTRONICS

Features:

- **Easy Setup**
- **Manual and Auto-Tuning of All SQUID Parameters**
- **Multichannel Capabilities**
- **Single Controller for LTS and HTS SQUIDs**
- **Digital and Analog Outputs**
- **Fiber-Optic Communication Avoids Inductive Pickup and Cross-talk**

Tristan's iMAG© SQUID electronics have been designed for the user who wants performance and flexibility. Microprocessor-driven hierarchical front panel menus allow fast setup for both LTS and HTS SQUID sensors. Multiple slew rates, gains and bandwidths allow the user to fine tune the measurement process. Individual tuning of each channel gives optimum performance in multichannel configurations. When you need the best in SQUID electronics, look to the iMAG© series to satisfy your needs.

MULTICHANNEL CONTROLLER

The Model iMC-303 iMAG SQUID controller forms the basis of a powerful and flexible measurement system. Its three channel capability accommodates nearly all laboratory SQUID applications without incurring the cost or complexity of eight-channel designs. A unique feature of the Tristan controller is its ability to simultaneously control both LTS and HTS devices. For the experienced user, the Tristan Multichannel Controller offers complete manual control of all SQUID parameters, including bias level, modulation amplitude, "skew" level, dc flux level in the SQUID (offset), heater and integrator reset. All parameters are easily adjusted using the membrane keypad and a convenient menu-driven interface. Users who want a fully automated system will use the one-touch tuning capability that rapidly and reliably optimize the level of all critical parameters.

High-resolution A/D convertors and the standard IEEE-488 bus make the iMAG controller ideal for use with computerized data acquisition. Use the rear-panel BNC connectors to monitor the high-level analog outputs. A "fourth channel" input allows you to synchronously digitize your own signal along with the three SQUID signals using the controller's internal A/D converter. LabView™ software drivers are also available.

FLUX-LOCKED LOOP

iMAG FLLs are offered in both HTS and LTS versions. The LTS version uses an advanced bias reversal technique that effectively reduces low-frequency noise in HTS SQUIDs without introducing noise spikes in the output spectrum. The less-expensive LTS FLL provides slightly higher frequency response.

The Model iFL-301 series iMAG flux-locked loops (FLLs) provide superior performance under a wide range of operating conditions. The Tristan design locates the FLL as close as practical to the SQUID sensors and eliminates the need to run low-level or high-frequency leads over long distances. A short cable connects the FLL to the probe or cryogenic cable, allowing the compact FLL to be conveniently mounted near the dewar, but out of the way of the liquid cryogen transfers. Connection to the iMC-303 controller is via a composite cable.

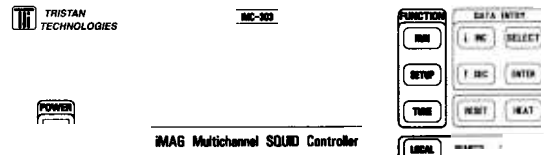
COMPOSITE CABLE

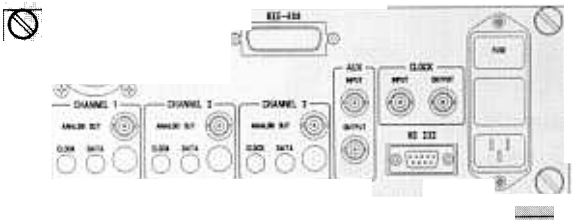
Tristan's advanced design provides superior radiofrequency (rfi) rejection and allows for long cable runs, even in hostile environments. It is a simple matter to locate the FLL inside a shielded room and operate it using an iMAG Multichannel Controller located outside the room.

The connection between the controller and flux-locked loop(s) is via the CC Series composite cables. Low level dc power and the high-level analog output are the only electrical connections required between the FLL and the Multichannel Controller. The high-frequency clock signal and digital control signals are all supplied via the composite cable's optical fiber.

This cable is offered in both 6 (Model CC-6) and 20 meter (Model CC-20) lengths. Custom lengths are available.

IMC-303 SQUID CONTROLLER





iMAG Controller (Model iMC-303)

Number of Channels: 3 SQUID channels that interface to both HTS and LTS Flux Locked-Loops (FLLs). The controller can operate any combination of LTS or HTS SQUIDs simultaneously using the appropriate FLLs. An auxiliary channel is supplied for synchronous data acquisition (see below)

Auxiliary I/O: One auxiliary analog input (10 kΩ impedance, 50 kHz BW) is provided for 16-bit digitizing of a user-supplied signal for synchronous acquisition or event triggering. Maximum output signal is 4.5 V FS. Gain is selectable to be ×1, ×2, ×5, ×10, ×20 or ×50.

User Interface: Interactive user interface via large LCD display and membrane keypad. Special function keys and menu-driven software provide friendly operating and setup environment.

Remote Interfaces: Both IEEE-488 and RS-232 remote control interfaces are standard. All control settings may be input and all instrument data may be output via these interfaces. Total maximum data rate via the IEEE-488 interface is 16 bits at 20 kHz for a single channel, or 5 kHz for all three SQUID channels plus the auxiliary channel.

Analog Outputs: 4 analog outputs (600Ω) provided on the back panel for the 3 SQUID channels and the auxiliary analog input.

Autotune: Autotuning of all SQUID parameters is accomplished by single button push. All adjustments may also be made manually or via the remote interfaces.

FLL Reset: Any channel may be reset manually or automatically at any user selectable output voltage.

Bandwidth & Gain: Selectable bandwidths of 5 Hz, 500 Hz, 5 kHz & 50 kHz. (4-Pole Butterworth response). Selectable gains of (1, 2, 5, 10, ..., 500) corresponding to full-scale outputs ranging from approximately 500 Φ_0 to 1 Φ_0.

Master/Slave: Multiple control units (up to 10) can be configured to operate more than 3 SQUID sensors. A clock input and output are provided so that a master clock can be used to drive all FLLs.

Dimensions: 321 mm wide, 121 mm high, 300 mm deep (12.6″ wide, 4.8″ high, 11.8″ deep); 6.1 kg (13.5 lbs).

Power Req. 100 to 125, 200 to 240 Volts AC, 50 or 60 Hz. DC power (±12 V) is available as an option. Operating voltage should be specified at time of order.

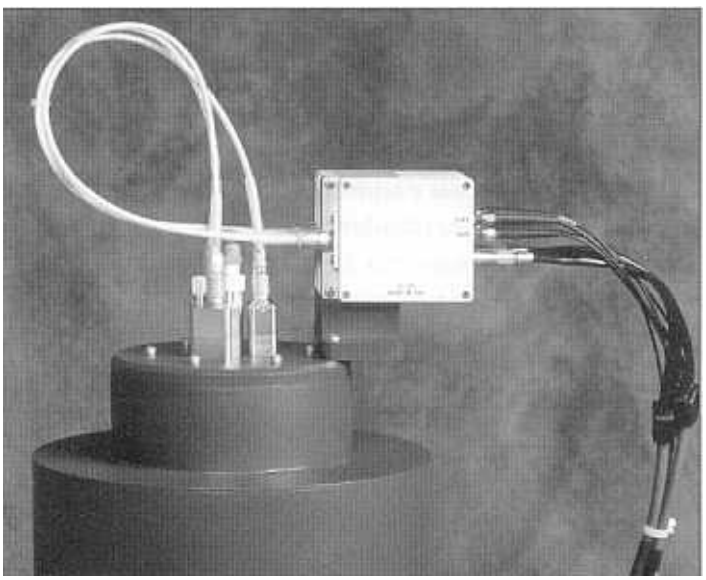
Flux Lock-Loop (Model iFL-301)

Two versions of the flux-locked loop are available, one for HTS sensors and one for LTS sensors. The HTS FLL has a 25 kHz maximum bandwidth (selectable to be 250 Hz from the iMC-303 controller) and uses high-frequency bias reversal to minimize low-frequency noise intrinsic to the HTS sensors. This bias reversal does not increase the white noise of the sensors or add any spikes within the specified bandwidth. The LTS FLL has a 50 kHz bandwidth (selectable to be 500 Hz from the iMC-303 controller) and uses no bias reversal since it is not required by the LTS sensors. Wider bandwidths on both LTS and HTS loops are available on special order.

All FLL functions are controlled remotely by the iMAG iMC-303 Controller. The FLLs connect to the iMC-303 via a composite cable. To minimize rfi, even when using very long cables, all high-frequency signals are transmitted by optical fiber between the FLL and Controller.

Dimensions: 77 mm wide, 77 mm high, 16 mm deep (3″ wide, 3″ high, 0.6″ deep); 190 gm (6 oz).

Specifications subject to change without notice.



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