

# Integrated Cryogenic Electronics Test-bed Model ICE-T

## Features

- ICE-T accommodates two interchangeable Electrical Inserts with a standard vacuum flange.
- Modular design of Electrical Inserts allows maximum flexibility and convenience for experiments.
- Turn-key operation with two native temperature stages at 4K and 40K and controlled variable temperature test capability in custom Electrical Inserts.
- Quick and convenient superconductor IC mounting capability

## Applications

- High-speed superconducting electronics chips for supercomputing applications
- Process Control Monitors and Digital diagnostics
- High performance cryogenic Analog-to-Digital Converters (ADCs) for RF receivers
- Analog low-noise measurements for SQUIDs and SQIFs
- Cryogenic semiconductor devices



ICE-T

Universal High-Speed  
40-line Insert

## Description

The Integrated Cryogenic Electronics Test-bed (ICE-T) is designed for rapid and convenient testing of low-temperature electronics, especially for superconductor electronics (SCE) integrated circuits (ICs) and multi-chip modules (MCMs). When properly configured, it provides the entire cryocooled infrastructure required to test a wide variety of devices and ICs. Modular in its design, ICE-T can be reconfigured through user specified Electrical Inserts, ranging from standard to fully customized ones.

Completely cryogen-free ICE-T runs off a single standard 110V/20A power supply. The versatile, modular design allows inserts to function as liquid helium immersion cryoprobes, without the associated high cost of Liquid Helium. ICE-T can pay for itself in helium saving alone in less than 2 years.

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## Configuration Options

### 1. Chip Inserts

(Select at least one from the list of available inserts)

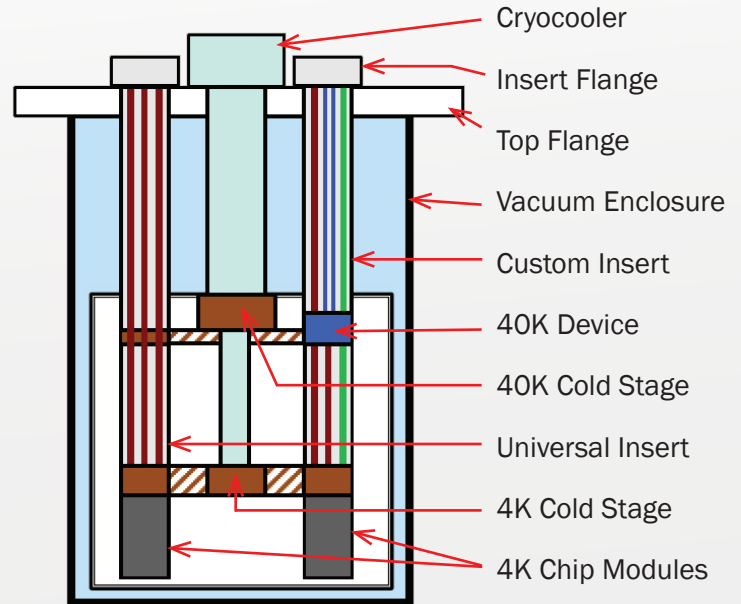
- Universal High-speed 40-line Insert for 5mmx5mm superconductor ICs
- Universal High-speed 80-line Insert for 10mmx10mm superconductor ICs
- Universal Low-Speed 120-line Device/PCM Diagnostic Insert for three 5mmx5mm superconductor ICs
- Custom inserts (e.g. Superconductor MCM, semiconductor devices)

### 2. Optional Accessories

- 17-channel Digital Amplifier unit (16 data channel + clock); Amplifies 2mV SCE signals to LVDS for interfacing to FPGA/Logic Analyzers at 2Gbps per line. (Model DA-17-2500-QSE60)
- Input Current Source (Model CS-48-100), for providing current bias to SCE circuits
- FPGA/Logic Analyzer Output Interface Board allows for interfacing Digital Amplifier unit to Xilinx/Altera or HP/Tek Logic Analyzers
- External Integrated clock source (20 GHz, 40 GHz, 50 GHz)
- Integrated monitor amplifier box with 4-channel digital oscilloscope
- Active Magnetic Shielding (available soon)

## Includes

- Cryocooler: Sumitomo SRDK-415D, 1.5 W heat lift @4.2K
- Vacuum Pump
- Temperature Controller
- Vacuum enclosure with Radiation shields



## General Specification

- ICE-T Rack Dimension : 22.5" wide, 33" deep, 56" high
- ICE-T Rack Power: 110 V, 60 Hz, Single-phase
- ICE-T Compressor Power: 200 V, 60 Hz, Three-phase, 7.5 KW.
- ICE-T Rack Weight: 415 lbs.
- ICE-T Compressor Weight: 225 lbs.
- Operating Temperature: +5 °C to +35 °C

## Installation and Warranty

- On-site installation and training
- 1-year warranty
- Service Contract recommended.
- Maintenance: Every 8,000 Hours