

DIRAC-2

1st Generation QUDIT Entropy Quantum Computer

QCI | Innovative Quantum
Solutions Company

Dirac-2™ is a portable, low power, and room temperature qubit entropy quantum computer (EQC). Dirac-2 solves problems of Objective Function Minimization and Maximization for **integer optimization** by finding the ground state of a complex system with many inter-correlated variables.

These problems correspond to minimizing or maximizing the expected return of the objective function:

$$E = \sum_{i=1}^N C_i V_i + \sum_{i,j=1}^{N,N} J_{ij} V_i V_j$$

under the constraint of a fixed resource $R = \sum_{i=1}^N V_i$

where V_i is the value of each variable,

C_i is the linear coefficient of each variable, which is a real number that can be positive, negative, or zero,

J_{ij} is the coupling coefficient of two variables, which can be any real number

Key Features

EQC type	Qudit of 64 dimensions
Maximum size of variables	N = 11,000 (up to 2,000 with decreased connectivity requirements)
Connectivity	All-to-all
Order of correlation	Any types of second-order correlations, where interactions between qudits can be repulsive (positive correlation) or attractive (negative correlation)
Operating Temperature	25 °C (room temperature)
Power Consumption	<80 W
Physical size	Contained in a 3U rack-mountable unit