QBLOX

SPI D5a
Voltage Source Module | SPI Series 19” Rack Mounted

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Description

The D5a is the ideal DC source for quantum computing applications that require voltage biasing, specifically designed for the high demands of quantum processors.

The output range of the 16 channels can be software selected between ±4 V, ±2 V, +4 V and the 18 bit DAC resolution is maintained for all the ranges. This allows the user to choose the optimal range without sacrificing resolution. The outputs have a 550 Ω output impedance and a compliance current limit of ±7.3 mA.

Extra care has been taken for ultra stability and extremely low noise performance together with its host rack, the SPI mainframe. Thanks to the galvanically-isolated control interface and isolated power supply, ground loops are avoided and interference (like 50 Hz) is minimized.

The D5a DC voltage sources are controlled by the C1b module which is connected to the host pc via USB link and configured via our Python and QCoDeS drivers.

Features

- Ultra-stable DC voltage source
- 16 channels per module / 18 bit resolution
- Software-selectable range: ±4 V, ±2 V, +4 V
- Hosting up to 11x D5a modules in a 3 U SPI mainframe
- Up to 176 channels per 19” 3 U rack
- Ramp-to-0 switch for manual slow and safe ramp down of all channels simultaneously

Specifications SPI D5a - Voltage Source Module

Analog output channels	16
DAC resolution (vertical)	18 bit
Output range	±4 V, ±2 V, +4 V
Compliance current	±7.3 mA
Output impedance	550 Ω
DNL	±0.2 LSB
INL	±0.5 LSB
Drift (measured into high impedance with ±4 V range)	0.7 ppm/°C of range + 1.5 ppm/°C of output
Noise (measured into high impedance with ±4 V range)	<70 nV/√Hz @ 2 Hz <30 nV/√Hz @ 100 Hz
Wideband Noise (0.1-10 Hz, measured into high impedance with ±4 V range)	<0.5 µVrms

Driver/API	SCPI / Python / QCoDeS
Data connection to host pc	USB
Power supply	via SPI rack
Power consumption	1.04 W (no load) 1.76 W (all shorted @ max out)
Output connector type	MCX
Dimensions	35.3 x 128.7 x 182 mm³
Weight	0.360 kg