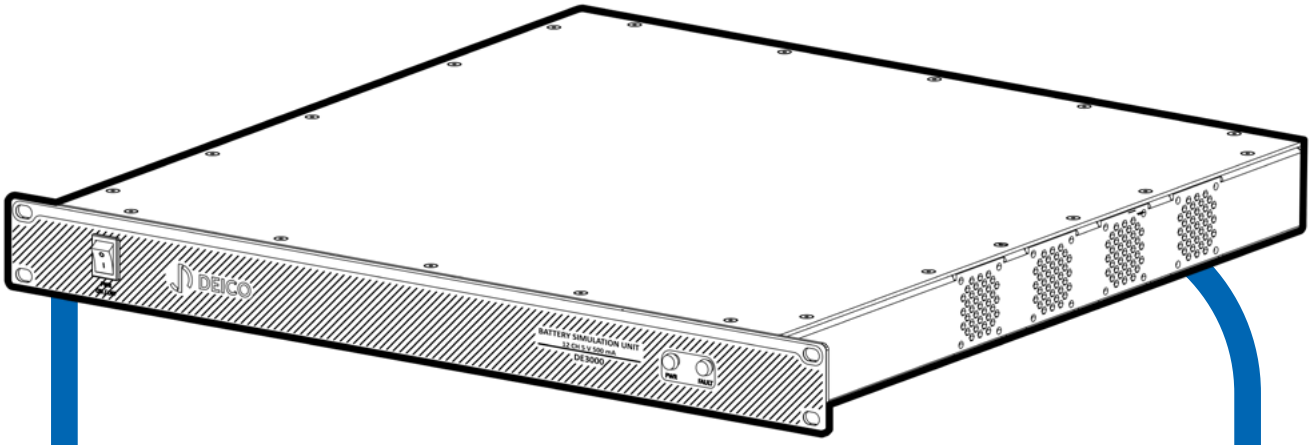
Datasheet



DE3000

Battery Simulation Unit

12 CH 5 V 500 mA

DEICO

www.deico.com.tr

Contents

1. Description

DEICO DE3000 Battery Simulation Unit 12 CH 5 V 500 mA is a high-performance, 12-channel system engineered for precise, efficient, and safe emulation of a wide spectrum of battery pack behaviors and cell-level conditions. Each of the 12 channels operates independently, enabling accurate simulation of individual cells. Integrated analog/digital I/O and auxiliary channels, combined with onboard computing capabilities, allow the simulation of complex battery characteristics and custom profiles under diverse operational scenarios. Multiple units can be connected in series to emulate high-cell-count battery packs.

1.1. Key Features

- 1 U rack-mountable form factor, designed to meet stringent testing requirements for battery-sensitive systems
- 12 independent simulation channels, each configurable for individual cell emulation
- Source/sink capability up to 5 V and 500 mA per channel, supporting precise current control
- High isolation voltage of 1600 V DC, ensuring safe operation and system protection
- Dedicated analog and digital I/O channels for seamless integration with auxiliary systems
- Multiple communication interfaces including Ethernet, USB, EtherCAT, and high-speed CAN for flexible and remote operation (Note: USB and EtherCAT interfaces are not currently available for customer use and may be supported in a future release.)
- Intuitive control software, the DEICO Battery Simulator Control Panel, enabling user-friendly configuration and monitoring
- Comprehensive API support for seamless integration into existing automated test environments and software platforms

1.2. Typical Applications

- Hardware-in-the-Loop (HIL) testing of battery management systems (BMS) and electronic control units (ECUs)
- BMS algorithm development, validation, and production-level testing
- Evaluation and verification of battery-dependent electronic components under controlled and repeatable test conditions

2. Hardware Overview

2.1. Circuitry

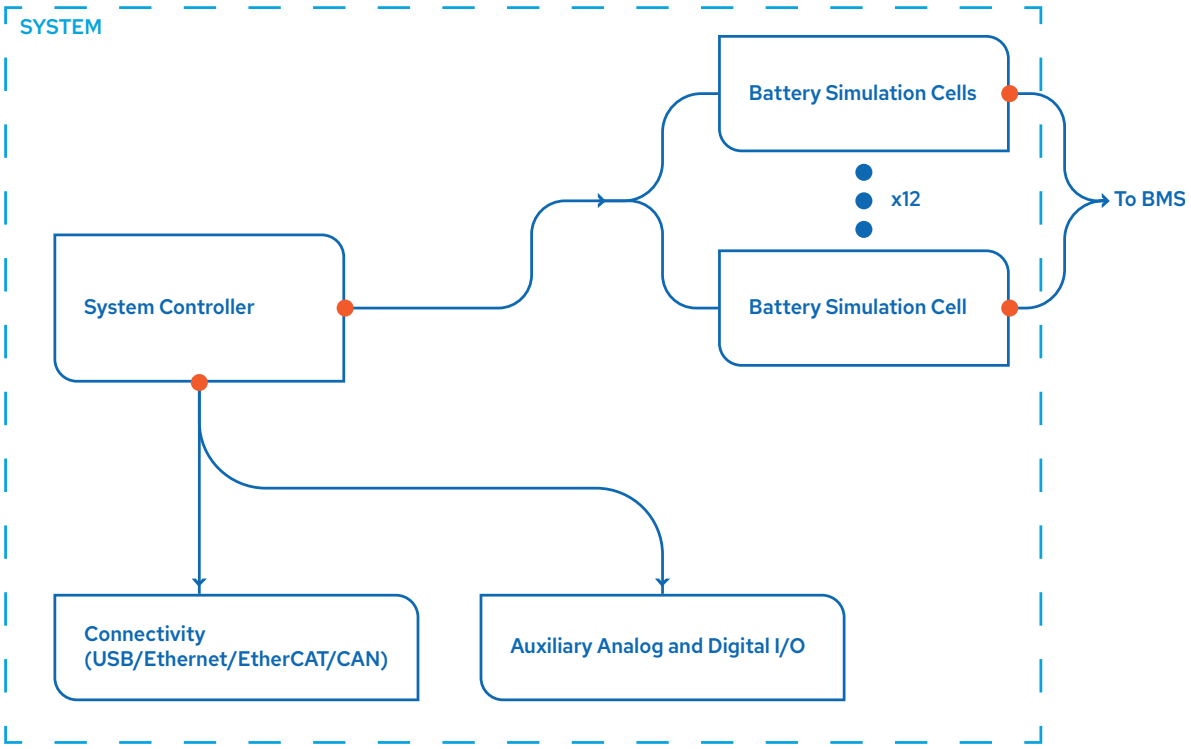


Figure 1: Block Diagram of DE3000

2.2 Hardware Specifications

2.2.1. Electrical

Specification	Minimum	Typical	Maximum	Notes
Input Voltage	85 V AC/120 V DC	—	264 V AC/373 V DC	—
Input Current	—	—	1.25 A	—
Number of Channels	—	12	—	12 independent channels with custom configuration

2.2.2. Cell Channels

Specification	Minimum	Typical	Maximum	Notes
Sink & Source Voltage	0 V	—	5 V	—
Output Voltage Accuracy	—	±500 µV (±0.01%)	±3.5 mV (±0.07%)	—
Output Voltage Resolution	—	75 µV	—	—
Sink & Source Current	—	—	500 mA	—
Current Resolution	—	100 µA	—	(on readback)
Current Accuracy	—	±500 µA (±0.2%)	±3.3 mA (±0.6%)	(on readback)
Current Limiting Accuracy	—	2%	—	—
Channel to Channel Isolation	—	1600 V DC	—	—

2.2.3. Auxiliary I/O

Specification	Minimum	Typical	Maximum	Notes
Digital I/O Number	—	8	—	Bidirectional
Digital I/O Logic Level	—	3.3 V	—	—
Analog Input Number of Channels	—	8	—	—
Analog Input Voltage	0 V	—	5 V	—
Analog Input Voltage Resolution	—	0.5 mV	—	—
Analog Input Voltage Accuracy	—	±3 mV (±0.06%)	±20 mV (±0.4%)	—
Analog Output Number of Channels	—	2	—	—
Analog Output Voltage	0 V	—	5 V	—
Analog Output Voltage Resolution	—	0.8 mV	—	—
Analog Output Voltage Accuracy	—	±5 mV (±0.1%)	±30 mV (±0.6%)	—

2.2.4. Physical

Specification	Typical
Dimensions	482.6 mm x 456 mm
Height	44.5 mm
Weight	5000 g

2.2.5. Environmental

2.2.5.1. Temperature

Specification	Value	Notes
Operating Temperature	0 °C - 55 °C	Tested in accordance with IEC-60068-2-1 and IEC-60068-2-2. Meets MIL-PRF-28800F Class 3 low temperature limit and MIL-PRF-28800F Class 2 high temperature limit
Storage Temperature	-40 °C - 71 °C	Tested in accordance with IEC 60068-2-1 and IEC 60068-2-2. Meets MIL-PRF-28800F Class 3 limits

2.2.5.2. Humidity

Specification	Value	Notes
Operating Humidity	10% to 90%	Noncondensing (Tested in accordance with IEC 60068-2-78.)
Storage Humidity	5% to 95%	Noncondensing (Tested in accordance with IEC 60068-2-78.)

3. Signal Connections

3.1. D-SUB25 Connector

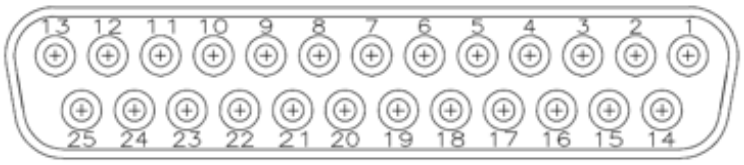


Figure 2: Pinout of D-SUB25 Connector (Part No: L77SDB25S1ACH4F)

Table 1: D-SUB25 Signal Assignments

Pin Number	Connection
Pin 1	Analog in #1
Pin 2	Analog in #3
Pin 3	Analog in #5
Pin 4	Analog in #7
Pin 5	GND
Pin 6	Analog out #1
Pin 7	GND
Pin 8	Digital I/O #2
Pin 9	Digital I/O #4
Pin 10	Digital I/O #6
Pin 11	Digital I/O #8
Pin 12	GND
Pin 13	CANH
Pin 14	Analog in #2
Pin 15	Analog in #4
Pin 16	Analog in #6
Pin 17	Analog in #8
Pin 18	GND
Pin 19	Analog out #2
Pin 20	Digital I/O #1
Pin 21	Digital I/O #3
Pin 22	Digital I/O #5
Pin 23	Digital I/O #7
Pin 24	GND
Pin 25	CANL

Table 2: D-SUB Connector Pin Descriptions

Signal	Description
Analog Inputs 1-8	Single-ended analog inputs. Measures voltages from 0 to 5 V.
Analog Outputs 1-2	Single-ended analog outputs. Generates voltages from 0 to 5 V.
CANH, CANL	Controller area network connections.
Digital I/O 1-8	Bidirectional digital I/Os. Each I/O can be configured as input or output.
GND	Ground connection.

3.2. Cell Connectors

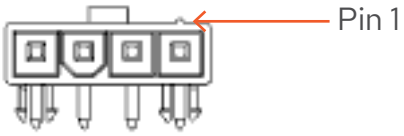


Figure 3: Cell Connector Pinout (Part No:0039303046)

Table 3: Cell Connector Connections

Pin Number	Connection
Pin 1	Sense+
Pin 2	Vout+
Pin 3	Vout-
Pin 4	Sense-

4. System Configuration

The DEICO DE3000 Battery Simulation Unit 12 CH 5 V 500 mA comes with an executable software package for system configuration and control. This software provides access to configuration parameters and settings. Detailed instructions, interface parameters, and operational procedures are available in the user manual.

5. Device Programming

The DE3000 is programmed through the DEICO Battery Simulator Control Panel, a software designed for communication with the hardware. For programming instructions, command structure, and guidelines, refer to the user manual.

6. Safety Guidelines

Caution

Do not operate the DE3000 outside the parameters or procedures specified in the documentation. Improper use may compromise safety protections, leading to hazardous conditions. If the device is damaged or malfunctioning, stop use immediately and return the unit for inspection and service.