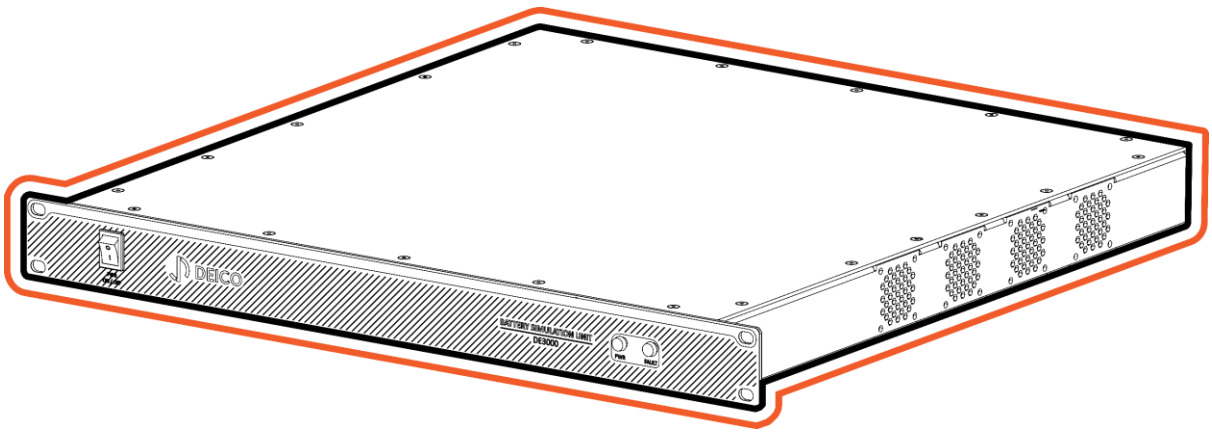
# DE3000 DATASHEET

12 CH BATTERY CELL SIMULATOR




DEICO

# Contents

# DESCRIPTION

DE3000 12 CH Battery Cell Simulator is a 12-channel instrument which enables safe, efficient, and accurate simulation of a wide range of battery pack and cell conditions. DE3000 provides 12 individually controlled simulated cells and several auxiliary analog and digital I/O channels. Onboard computing ability allows the unit to simulate various custom battery profiles and conditions. Multiple units can be connected in series to simulate battery packs that have higher number of batteries.

The general features of DE3000 are listed below:

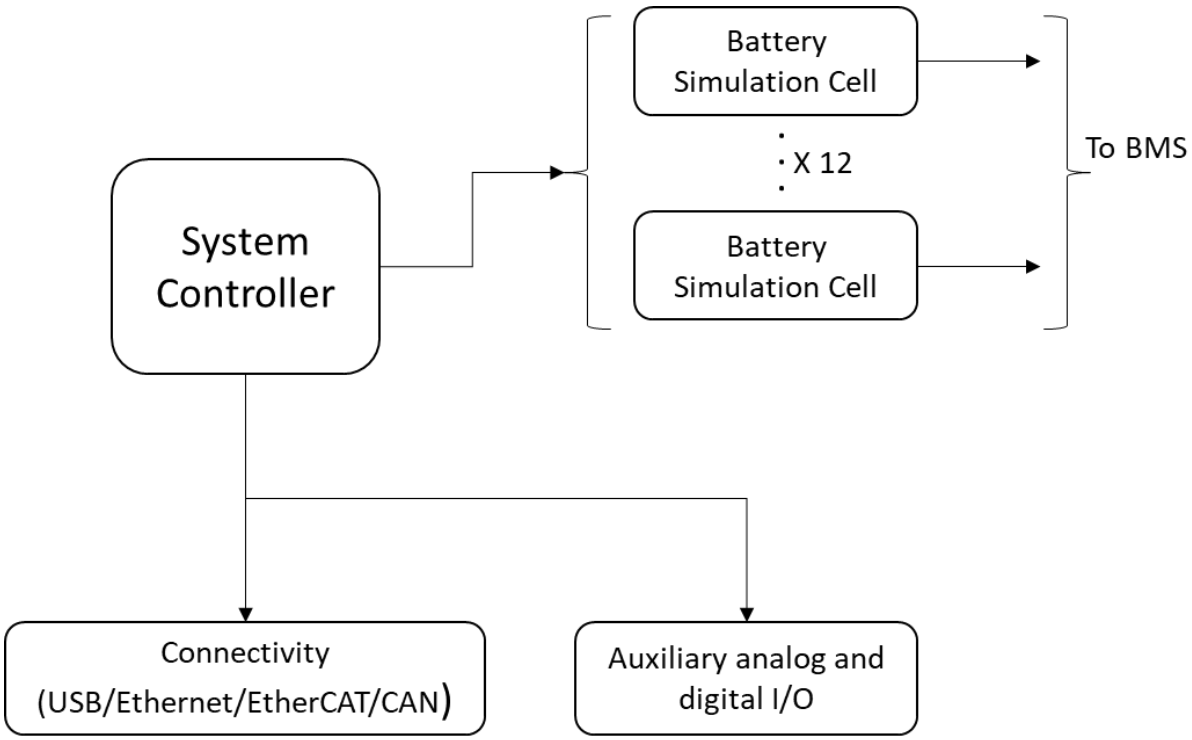
- ⇨ 1U rack-mountable instrument designed to meet all the testing requirements of battery-sensitive products
- ⇨ 12 independent cell channels
- ⇨ Up to 5V and 500mA source and sink capability per channel
- ⇨ 1600 VDC isolation
- ⇨ Auxiliary analog and digital I/O connections
- ⇨ Ethernet, USB, EtherCAT, and high-speed CAN control interfaces are available for remote control and configuration
- ⇨ Easy control via our user-friendly DEICO Battery Simulator Control Panel
- ⇨ Fast integration into existing software environments with the provided API library

Areas of application include:

- ⇨ HIL Testing
- ⇨ BMS validation, verification, and production testing
- ⇨ Testing any battery-sensitive electronic device

# HARDWARE OVERVIEW

## Circuitry




*Block Diagram of DE3000*

# Hardware Specifications

## Electrical Specifications

| Specification | Minimum | Typical | Maximum | Notes |
|---|---|---|---|---|
| **Input Voltage** | 85VAC/120VDC | — | 264VAC/373VDC | — |
| **Input Current** | — | — | 1.25A | — |
| **Number of Channels** | — | 12 | — | 12 independent channels with custom configuration |

## Cell Channels

| Specification | Minimum | Typical | Maximum | Notes |
|---|---|---|---|---|
| **Sink & Source Voltage** | 0V | — | 5V | — |
| **Voltage Resolution** | — | 10µV | — | — |
| **Sink & Source Current** | — | — | 500mA | — |
| **Current Resolution** | — | 67µA (on readback) | — | — |
| **Channel to Channel Isolation** | — | 1600VDC | — | — |

## Auxiliary I/O

| Specification | Minimum | Typical | Maximum | Notes |
|---|---|---|---|---|
| **Digital I/O Number** | — | 8 | — | Bidirectional |
| **Digital I/O Logic Level** | — | 3.3V | — | — |
| **Analog Input Number of Channels** | — | 8 | — | — |
| **Analog Input Voltage** | 0V | — | 5V | — |
| **Analog Input Voltage Resolution** | — | 0.1mV | — | — |
| **Analog Input Voltage Accuracy** | — | ±5 mV | — | — |
| **Analog Output Number of Channels** | — | 2 | — | — |
| **Analog Output Voltage** | 0V | — | 5V | — |
| **Analog Output Voltage Resolution** | — | 0.1mV | — | — |
| **Analog Output Voltage Accuracy** | — | ±5 mV | — | — |

### Physical Specifications

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

### Environmental Specifications

#### Temperature

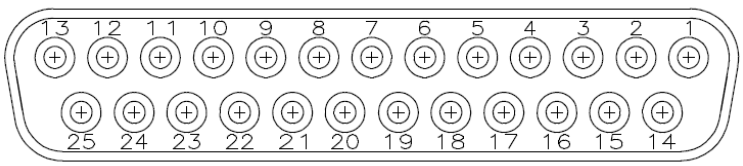
| Specification | Value | Notes |
|---|---|---|
| **Operating Temperature** | 0°C - 55°C | Tested in accordance with IEC-60068-2-1 and IEC-60068-2-2. Meets MIL-PRF-28800F Class 3 low temperature limit and MIL-PRF-28800F Class 2 high temperature limit. |
| **Storage Temperature** | -40°C - 71°C | Tested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

#### 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.) |

## SIGNAL CONNECTIONS

### D-SUB25 Connector




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

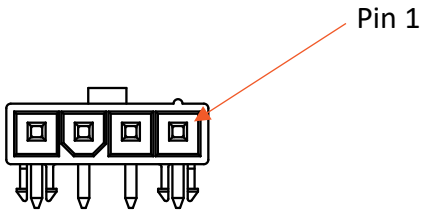
*D-SUB25 Signal Assignments*

| 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 |

*D-SUB Connector Pin Descriptions*

| Signal | Description |
|---|---|
| **Analog Inputs 1-8** | Single-ended analog inputs. Measures voltages from 0 to 5V. |
| **Analog Outputs 1-2** | Single-ended analog outputs. Generates voltages from 0 to 5V. |
| **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. |

## Cell Connectors




*Cell Connector Pinout (Part No:0039303046)*

*Cell Connector Connections*

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

# CONFIGURATION

An executable file will be provided along with DE3000 12 CH Battery Cell Simulator. Please refer to GUI manual for controls and configuration.

# PROGRAMMING THE DEVICE

DE3000 is controlled via a PC GUI that was designed and provided by DEICO. Please refer to the GUI manual for further details.

# SAFETY GUIDELINES

**Caution** Do not operate the DE3000 in a manner not specified in this document. Product misuse can result in a hazard. You can compromise the safety protection built into the product if the product is damaged in any way. If the product is damaged, return it for repair.

# Contact

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