



**OPAL-RT**  
TECHNOLOGIES

# **OP5332 USER GUIDE**

**Isolated Digital to Analog  
Converter Module**

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## **GETTING STARTED**

Before you begin, verify that your system meets the requirements of the OP5332 board:

### **SOFTWARE REQUIREMENTS**

- RT-LAB 11.0.7 and higher
- MATLAB 32 bits 6.5 and higher
- Windows XP and higher

### **HARDWARE REQUIREMENTS**

- OP5600 HIL simulator
- OP5600 I/O Expansion Unit

### **FEATURES**

- HYPERSIM compatible
- 16 analog output channels, isolated by pair
- All outputs are sampled simultaneously, up to 2 MS/s
- 16 bit resolution
- $\pm 10$  mA maximum current per channel
- Factory calibrated

## INTRODUCTION

### DESCRIPTION

The OP5332 digital to analog converter (DAC) provides 16 digital output channels, isolated by pair. Each channel uses a dedicated 16-bit resolution digital-to-analog converter.

The OP5332 is a part of the OP5000 series of optional modules for OPAL-RT's state of the art HIL (hardware-in-the-loop) systems, intended for use with OPAL-RT carrier boards (see "Hardware Requirements" on previous page). Designed for OPAL-RT's simulation systems, the OP5332 converts digital signals to analog.

Each OP5332 can sample up to 2 MS/s, giving a total throughput of 32 MS/s, all channels are simultaneously sampled. The onboard EEPROM provides offset and gain data adjustment written during the calibration process.

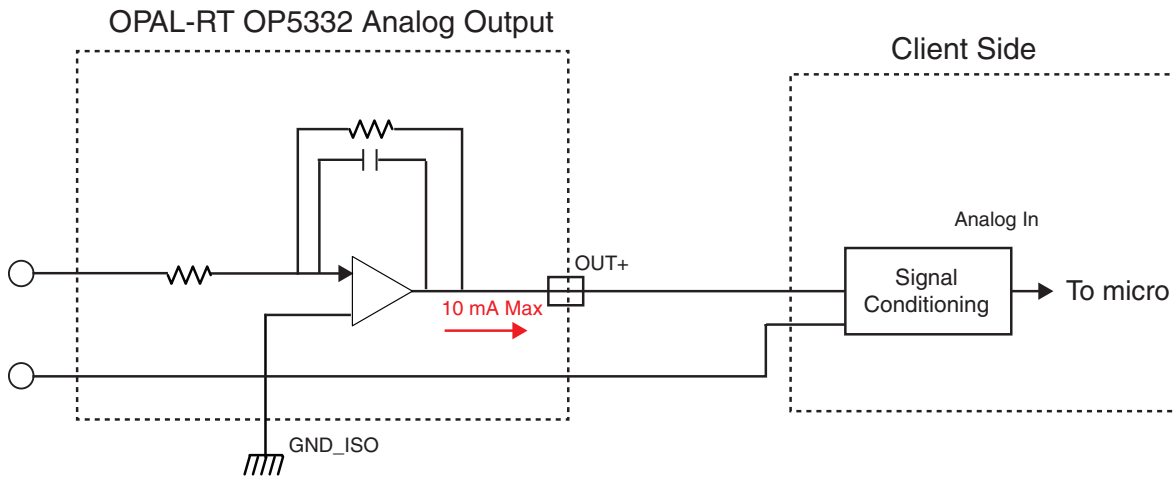
By default, the maximum output signal is set to  $\pm 16$  volts.

### OFFSET AND GAIN CALIBRATION

The OP5332 contains a serial EEPROM to store the module identification, calibration information and other important information. Each OP5332 is factory calibrated after assembly; during calibration, gain and offset are adjusted to ensure accurate output values with a  $\pm 10$  mV absolute error maximum.

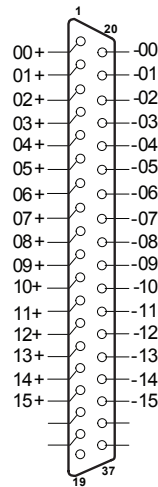
## TYPICAL APPLICATIONS

The following diagrams provide an example of a typical application using the OP5332



## OP5332 DB37F PIN ASSIGNMENTS

Connector P1 Ch. 0-15			
DB37F	OP5332 pin assignment	DB37F	OP5332 pin assignment
1	+OUT00	20	-OUT00
2	+OUT01	21	-OUT01
3	+OUT02	22	-OUT02
4	+OUT03	23	-OUT03
5	+OUT04	24	-OUT04
6	+OUT05	25	-OUT05
7	+OUT06	26	-OUT06
7	+OUT07	27	-OUT07
9	+OUT08	28	-OUT08
10	+OUT09	29	-OUT09
11	+OUT10	30	-OUT10
12	+OUT11	31	-OUT11
13	+OUT12	32	-OUT12
14	+OUT13	33	-OUT13
15	+OUT14	34	-OUT14
16	+OUT15	35	-OUT15
17		36	
18	Reserved	37	Reserved
19			



Standard OPAL-RT  
 Simulator DB37 connector

## SPECIFICATIONS

<b>Product Name</b>	<b>OP5332</b>
Part Number	126-0548
Number of channels	16 isolated by pair (8 pairs)
Resolution	16 bits
Default range	± 16 Volts
Maximum current	10 mA
Max. Sampling Frequency	2 MS/s
Min Conversion / Acquisition Time	500 ns per channel
<b>Dc Transfer Characteristics</b>	
Calibration	Programmable gain and offset calibration for each D/A. Calibration factors are stored in on-board non-volatile memory (EEPROM) - correction performed in FPGA
Maximum noise	15 mV peak-to-peak
Maximum offset (after calibration)	± 10 mV
Recommended warm-up time	10 min.
Calibration interval	as required
Dimensions	6.60 cm x 12.50 cm (2.6" x 4.92")
<b>Environmental</b>	
Operating temperature	10 to 40 °C
Storage temperature	-55 to 85 °C
Relative humidity	10 to 90%, non condensing
Maximum altitude	2,000 m

## **CONTACT**

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