

OP7817 16 Digital Outputs Module

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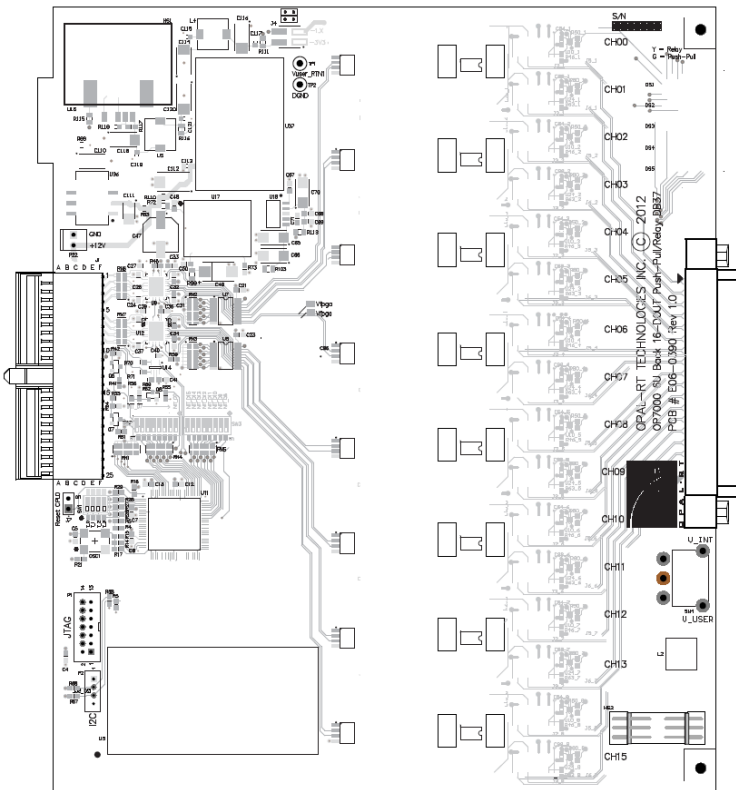
The OP7817 (also named OP7817-2) provides 16 push-pull digital output signals with specific voltage conditioning. All outputs are updated individually by the OP7000 or OP7000V2 Primary FPGA with a maximum time delay of fewer than 75 nanoseconds.

All outputs support voltages up to 30V and the output current is up to 100mA in push-pull.

The board also holds a CPLD which allows controlling the line states when the Primary FPGA is inactive, such as during the power-up phase of the chassis.

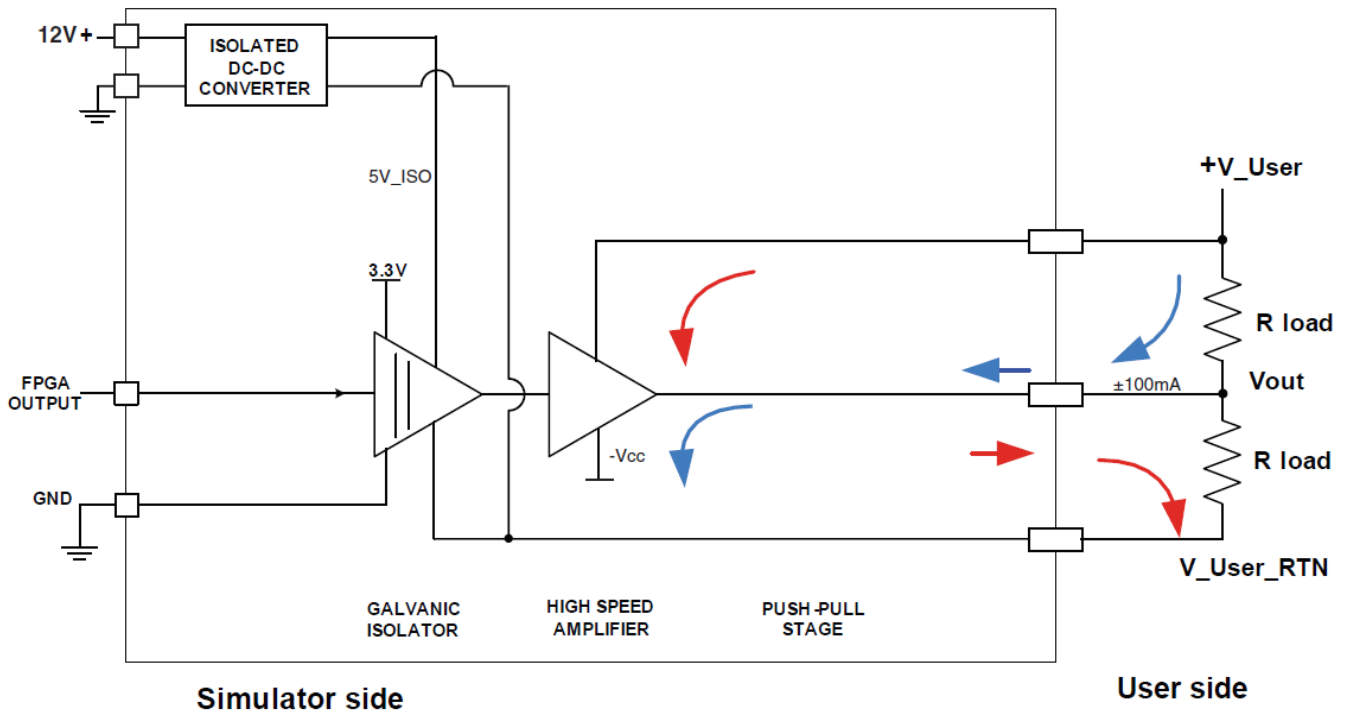
Board Layout

The 16 channels are routed via the mid-plane of the chassis to the Primary FPGA card (OP7161-1 or OP7170-1) which controls the channels' state.



Output Circuit Description

The diagram below illustrates the circuit for one channel. The state of the Vout output is controlled by the FPGA, and its value depends on the V_User and V_User_RTN values.



On the actual board, the circuitry uses dual opto-coupler and operational amplifiers for consecutive channels (channels 0 and 1, 2 and 3, etc.).

Electrical Specifications

The measurements provided below are for typical V_{user} values, but the board can also operate between the specified ranges.

$V_{user} = 5V$	Conditions	MINIMUM	TYPICAL	MAXIMUM	UNITS	MODE
High Level	RL (1 kohm)	3	3.4		VDC	Pull Down
	lout source max* 80 mA	2.2	2.8		VDC	
Low Level	lout sink max* 80 mA			0.2	VDC	Pull Up

$V_{user} = 12V$	Conditions	MINIMUM	TYPICAL	MAXIMUM	UNITS	MODE
High Level	RL (1 kohm)	10	10.4		VDC	Pull Down
	lout source max* 100 mA	8.4	9.4		VDC	
Low Level	lout sink max* 100mA			0.2	VDC	Pull Up

$V_{user} = 24V$	Conditions	MINIMUM	TYPICAL	MAXIMUM	UNITS	MODE
High Level	RL (1 kohm)	21.7	22.4		VDC	Pull Down
	lout source max* 100 mA	20.4	21.4		VDC	
Low Level	lout sink max* 100mA			0.2	VDC	Pull Up

*Due to the dual component used in the design, the maximum current value applies to two consecutive channels of the card, and this limitation must be taken into account. For example, for any two consecutive channels, the 100mA limit shared between the two channels can be distributed as follows:

- First and second channel driving 50mA each
- First channel at 80mA and second channel at 20mA
- First channel at 0mA and second channel at 100mA
- etc.

Installation

The OP7817 digital output signal conditioning module must be inserted at the back of the OP7000 simulator. The card can be installed in any of the 16 back slots, provided the front slot configuration is compatible. Refer to the page [OP7000V2: Adding or Replacing Boards](#) for more information on digital I/O card placement in the chassis - the same applies to the OP7000 chassis.

Make sure that the board is properly aligned using the guide tracks before pressing it into place.

Face Plate

The faceplate provides a DB37F connector (see "[connector pins assignment](#)" for details).

DB37F Connector Pins Assignment

DB37 Connector	Channel	DB37 Connector	Channel
1	+IN00	20	-IN00
2	+IN01	21	-IN01
3	+IN02	22	-IN02
4	+IN03	23	-IN03
5	+IN04	24	-IN04
6	+IN05	25	-IN05
7	+IN06	26	-IN06
8	+IN07	27	-IN07
9	+IN08	28	-IN08
10	+IN09	29	-IN09
11	+IN10	30	-IN10
12	+IN11	31	-IN11
13	+IN12	32	-IN12
14	+IN13	33	-IN13
15	+IN14	34	-IN14
16	+IN15	35	-IN15
17		36	
18		37	
19			

Specifications

Product name	OP7817-2
Part number	126-0390
Product type	OP7000 back 16 Dout push-pull
Number of channels	16
Isolation	opto-isolator
Output Current max	±100 mA continuous (shared between 2 consecutive channels)
Output Protection	Reverse Bat/Overvoltage protection (33V)/short-circuit protection
Output Voltage range	3.3V to 30 Vdc

Vuser (external)	5 Vdc to 30 Vdc
Delay Low-to-High	65 ns (with 500 load)
Delay High-to-Low	65 ns (with 500 load)
Rise/Fall times	50 ns (with 500 load)
Bandwidth	500 kHz
Dimensions	18.8 x 16.4 cm (7.4 in x 6.46 in)
I/O connector	DB37F
Operating temperature	10 to 40 °C (50 to 104°F)
Storage temperature	-55 to 85°C (-67 to 185°F)
Relative humidity	10 to 90%, non-condensing
Maximum altitude	2,000 m (6562 ft.)