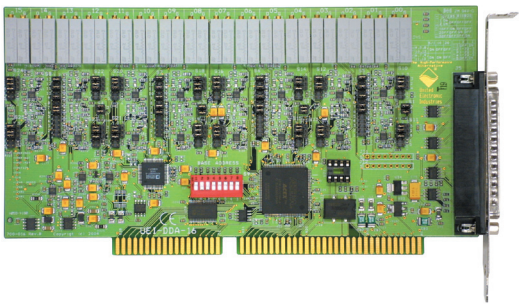
UEI-DDA-16

16-Channel, 12-bit ISA Analog Output Board

- 16 analog output channels (can be configured in 4-channel groups)
- 12-bit resolution
- Jumper-selectable output ranges (voltage or current)
- Voltage output ranges: 0-10V, 0-5V, ±2.5V, ±5V, ±10V
- Current output range 4mA - 20 mA
- Internal pacer clock; external pacer clock support
- Loop-powered option is not supported

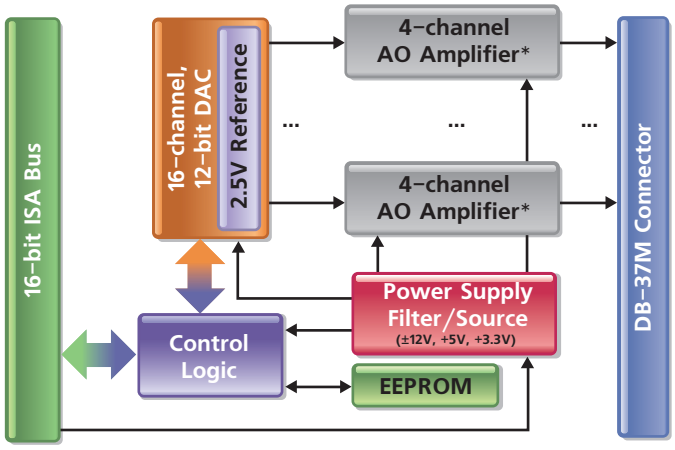


General Description:

UEI-DDA-16* is a drop-in replacement for Keithley's obsolete DDA-16 analog output board. UEI-DDA-16 provides 16 analog output channels, 12-bit resolution, jumper-selectable voltage or current output ranges, internal and external pacer clock support.

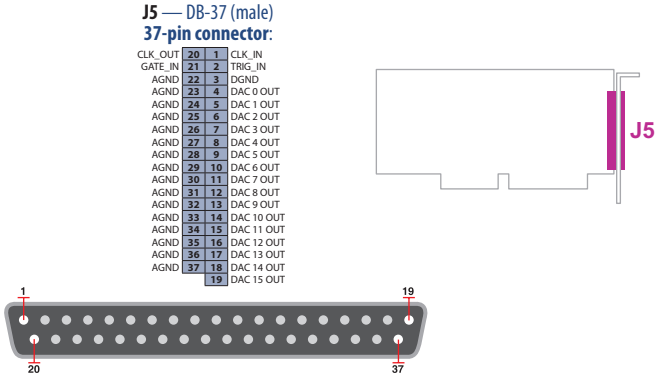
* Note: UEI provides no software for this board.

Block Diagram:



* Includes **range selectors** (±2.5V; ±5V; ±10V; 0-5V; 0-10V; 4-20mA) and manual **gain**/**offset** calibration circuitry.

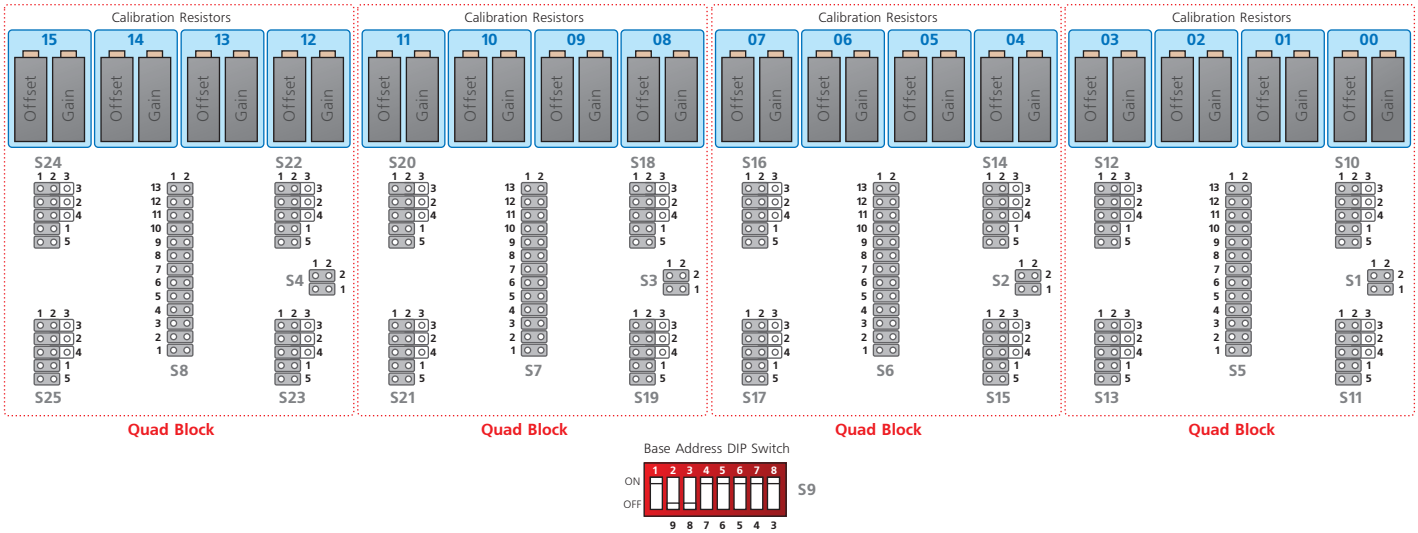
Pinout Diagram:



Technical Specifications:

Number of channels	16
Channel group	4 channels (max)
Resolution	12 bit
Voltage output ranges	0-10V, 0-5V, ±2.5V, ±5V, ±10V
Current output range	4-20mA (loop-powered option is not supported, 12V DC internal power used)
Default calibrated range	0-10V
Current load limits	0-400Ω
INL	±1 LSB
DNL	±1 LSB
Offset drift	15 ppm max/°C
Gain drift	30 ppm max/°C
Output resistance	0.1Ω typ
Output current	±15mA typ, ±45mA max
Calibration accuracy	@ 0-10V: 1mV - offset; 0.025% - gain
Protection	Short to ground, 4000V ESD
Internal pacer clock Rate: Prescaler value: Counter value:	(hardware) 1µs to 4.267 min (software-selectable) 1µs, 10µs, 100µs, 1ms, 10ms, 100ms, 1s 0 to 255
External pacer clock Polarity: Period:	(hardware) software-selectable 500ns, minimum
Output clock Prescaler value: Counter value:	 1µs, 10µs, 100µs, 1ms, 10ms, 100ms, 1s 0 to 255
Interrupt levels	3, 5, 7, 10, 11, 15 (software-selectable)
Trigger Signal: Polarity: Period:	(hardware) digital TTL software-selectable 500ns, minimum
Gate Signal: Polarity:	 digital TTL software-selectable
Power requirements	5V - 320mA typ; 480mA max ±12V - 132mA typ; 185mA max
Operating temperature	0°C to 50°C
Operating humidity	0 to 90%, non-condensing

Channel Groups/Jumpers Diagram:



Base Address Configuration:

I/O address configuration is required to select a location for the UEI-DDA-16 8-locations I/O address map in the PC I/O space. A factory default setting is 300H. To select an alternative I/O address, use DIP switch S9.

Hex I/O Address	Switch Position[1] 1	2	3	4	5	6	7	8
2xx	Switch 1 is used to reload DACs with default values from EEPROM. **OFF** - Enable; ON - Disable	OFF	ON					
3xx		**OFF**	**OFF**					
x0x				**ON**	**ON**	**ON**	**ON**	
x1x				ON	ON	ON	OFF	
x2x				ON	ON	OFF	ON	
x3x				ON	ON	OFF	OFF	
x4x				ON	OFF	ON	ON	
x5x				ON	OFF	ON	OFF	
x6x				ON	OFF	OFF	ON	
x7x				ON	OFF	OFF	OFF	
x8x				OFF	ON	ON	ON	
x9x				OFF	ON	ON	OFF	
xAx				OFF	ON	OFF	ON	
xBx				OFF	ON	OFF	OFF	
xCx				OFF	OFF	ON	ON	
xDx				OFF	OFF	ON	OFF	
xEx				OFF	OFF	OFF	ON	
xFx				OFF	OFF	OFF	OFF	
xx0..xx7								**ON**
xx8..xxF								OFF
		9	**8**	**7**	**6**	**5**	**4**	**3**
		Address Bit[2]						

Factory defaults are in **bold**

[1] As labeled on DIP switch (S9)

[2] As labeled on board (below the DIP switch)

Unipolar(Current)/Bipolar Configuration:

Unipolar/bipolar configuration is performed on a per-quad (4-channel group) basis using jumpers in S1 - S4 groups and selected jumpers (1-3) in S5 - S8 jumper groups.

		Unipolar/ Current	±2.5V	±5V	±10V
Span Settings*		5V/Current or 10V	5V	10V	20V
Jumpers in **S1 - S4**	2	▣ ▣	○ ○	○ ○	○ ○
	1	▣ ▣	○ ○	○ ○	○ ○
Jumpers in **S5 - S8**	3	○ ○	○ ○	○ ○	▣ ▣
	2	○ ○	○ ○	▣ ▣	○ ○
	1	○ ○	▣ ▣	○ ○	○ ○

* Refer to the span configuration table for more details

Current/Voltage Output Configuration:

Current/voltage output configuration is performed on a per-channel basis using S10 - S25 jumper groups. For the proper functionality of all four channels in the group, they should be configured as a current output channels for the span of 5V unipolar/current output.

Channel Number	Jumper Group
AOUT0	S10
AOUT1	S11
AOUT2	S12
AOUT3	S13
AOUT4	S14
AOUT5	S15
AOUT6	S16
AOUT7	S17
AOUT8	S18
AOUT9	S19
AOUT10	S20
AOUT11	S21
AOUT12	S22
AOUT13	S23
AOUT14	S24
AOUT15	S25

Jumpers position in **S10-S25** groups	Voltage Output	Current Output
3	1 ▣ 2 3	1 2 ▣ 3
2	1 ▣ 2 3	1 2 ▣ 3
4	1 ▣ 2 3	1 2 ▣ 3
1	1 ▣ 2	1 ▣ 2
5	1 ▣ 2	1 ▣ 2

Span Configuration:

Span configuration is performed on a per-quad (4-channel group) basis using selected jumpers (4-13) in S5 - S8 jumper groups.

Channel Number	Jumper Group
AOUT0	S5
AOUT1	
AOUT2	
AOUT3	
AOUT4	S6
AOUT5	
AOUT6	
AOUT7	
AOUT8	S7
AOUT9	
AOUT10	
AOUT11	
AOUT12	S8
AOUT13	
AOUT14	
AOUT15	

Jumpers 13-4 position in **S5-S8** groups	5V/ Current	10V	20V
13	▣ ▣	▣ ▣	○ ○
12	▣ ▣	○ ○	○ ○
11	▣ ▣	▣ ▣	○ ○
10	▣ ▣	○ ○	○ ○
9	▣ ▣	▣ ▣	○ ○
8	▣ ▣	○ ○	○ ○
7	▣ ▣	▣ ▣	○ ○
6	▣ ▣	▣ ▣	○ ○
5	▣ ▣	○ ○	○ ○
4	▣ ▣	○ ○	○ ○
3	Jumpers 3,2 and 1 are used for Unipolar(current)/Bipolar range configuration		
2			
1			