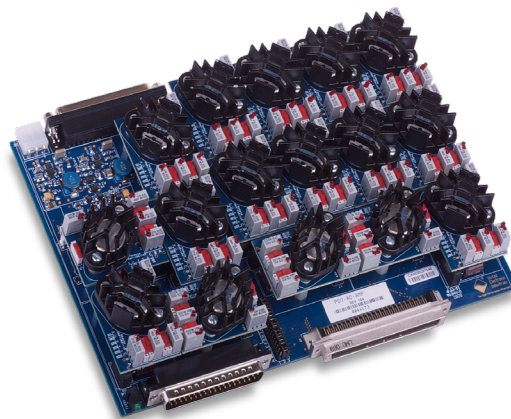


# PD-AO-AMP-115

## 16-Channel Analog Output 115V Amplifier

- 16 channels;  $\pm 115V$  output range
- Variable output settings
- Gain settings of 2, 10 and 20; gain error  $\pm 0.01\%$
- Multiple PD-AO-AMP-115s connect directly to PCI or PXI analog output high-voltage cards
- PSU-AO32G115 supplies power to drive two AMP-115s (32 channels)

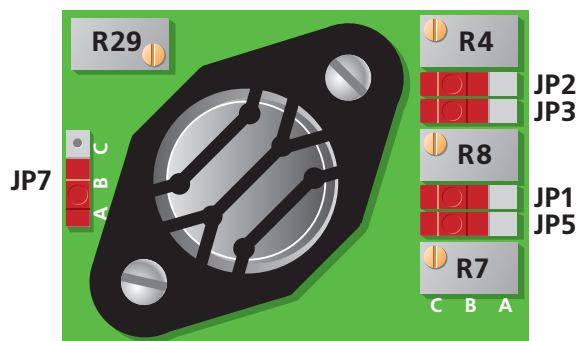
*PD-AO-AMP-115 is calibrated at 110V. Accuracy isn't guaranteed at higher voltages.*



## General Description

For some applications, the  $\pm 10V$  that's standard among almost all analog output cards just won't do the trick; they need voltage levels as much as ten times that amount. For that purpose, UEI has developed the PD-AOAMP-115, a 16-channel DIN-mountable accessory that connects directly to our family of PCI and PXI analog-output cards. By setting the gain on the card and the external panel with the appropriate values, you can set the output level of any channel independently to levels as high as  $\pm 115V$ . Further, you can attach as many AO-AMP-115s to an analog-output card as required to service all desired channels. To generate these high voltages, the PD-AO-AMP-115 requires an external power source. The PSU-AO32G115 is an external power supply that serves the needs of two PD-AO-AMP-115s, and thus it supplies the maximum rated power for 32 amplified outputs. The power supply provides  $\pm 125V$  of isolated dc power at 100 mA max.

## Single Channel Calibration/Adjustment:



Gain	Jumpers					Resistor
	JP1	JP2	JP3	JP5	JP7	
2*	AB	AB	AB	AB	BC	R8
10	BC	BC	BC	BC	AB	R7
20	BC	AB	BC	BC	AB	R4
2.9*	AB	AB	BC	AB	BC	R8

\* When changing gain from 2 to 2.9 and vice versa, new recalibration needed

### 1. Offset Calibration

- Apply 0.000V input on all channels
- Adjust 0.000V ( $\pm 1mV$  accuracy) on all outputs with R29

### 2. Gain Calibration\*\*

- Apply 5.000V input on all channels
- For gain of 2 use R8 to adjust output to 10.000V ( $\pm 1mV$  accuracy)  
for gain of 10 use R7 to adjust output to 50.000V ( $\pm 2mV$  accuracy)  
for gain of 20 use R4 to adjust output to 100.000V ( $\pm 3mV$  accuracy)  
for gain of 2.9 use R8 to adjust output to 14.500V ( $\pm 1mV$  accuracy)

\*\* For jumper settings refer to the table above

## Technical Specifications:

Number of Channels	16
Resolution	3 mV over $\pm 110V$ scale
Voltage Gains	2, 10, 20
Output Range	$\pm 110V$
Slew Rate	125 V/ $\mu s$
Accuracy	3 mV
Gain Error	$\pm 0.01\%$
Output Coupling	DC
Current Drive	$\pm 10mA$ max per channel
Capacitive Loads	180 pF min
Settling Time	3 ms to 0.003%
Gain Bandwidth	1 MHz
Noise	52 $\mu V$ pp
Output Protection	Short to ground
Gain Drift	25 ppm/ $^{\circ}C$
Dimensions	9.1" x 6.7" x 1"
Power	$\pm 125V$ DC @ 400 mA max $\pm 110$ mA unloaded
Operating range	0-85 $^{\circ}C$
Humidity range	10-90%, noncondensing

## Block Diagram:



### \*J4 Connector serves two purposes:

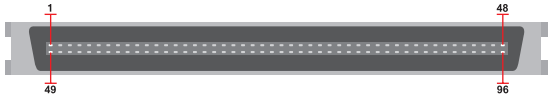
- When all jumpers on **J6** are set to **AB**: J4 works as a daisy-chaining connector for channels 16-31 from AO-32 card to the next AMP-115 amplifier or STP-37 terminal panel
- When all jumpers on **J6** are set to **BC**: J4 connects any source of the analog signal to channels 0-15 of AMP-115 amplifier.

# Pinout Diagrams:

## J3 — Pinless SCSI (male) 96-conductor connector:

32 channel input connector. This connector's inputs are supplied from the PD2-AO board's J1 connector using a PD-CBL-96.

AGND	49	1	AGND
AGND	50	2	AGND
AGND	51	3	AGND
AGND	52	4	AGND
AGND	53	5	NC
AGND	54	6	AGND
IN30	55	7	IN31
IN28	56	8	IN29
IN26	57	9	IN27
IN24	58	10	IN25
IN23	59	11	AGND
IN21	60	12	IN22
IN19	61	13	IN20
AGND	62	14	IN18
IN16	63	15	IN17
IN14	64	16	IN15
IN12	65	17	IN13
IN11	66	18	AGND
IN9	67	19	IN10
IN7	68	20	IN8
AGND	69	21	IN6
IN4	70	22	IN5
IN2	71	23	IN3
IN0	72	24	IN1
AGND	73	25	AGND
AGND	74	26	AGND
AGND	75	27	AGND
AGND	76	28	AGND
AGND	77	29	AGND
IN31	78	30	AGND
IN29	79	31	IN30
AGND	80	32	IN28
IN26	81	33	IN27
IN24	82	34	IN25
IN22	83	35	IN23
IN21	84	36	AGND
IN19	85	37	IN20
IN17	86	38	IN18
IN15	87	39	IN16
IN14	88	40	AGND
IN12	89	41	IN13
IN10	90	42	IN11
AGND	91	43	IN9
IN7	92	44	IN8
IN5	93	45	IN6
IN3	94	46	IN4
IN2	95	47	AGND
IN0	96	48	IN1



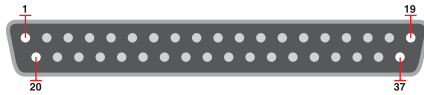
## J8 — Molex 3-pin connector:

1	2	3
+VIN	AGND	-VIN

## J4 — DB-37 (male) 37-pin connector:

16-channel connector. This connector is used when using more than 16 channels

AGND	20	1	IN15_1
AGND	21	2	IN14_1
AGND	22	3	IN13_1
AGND	23	4	IN12_1
AGND	24	5	IN11_1
AGND	25	6	IN10_1
AGND	26	7	IN9_1
AGND	27	8	IN8_1
AGND	28	9	IN7_1
AGND	29	10	IN6_1
AGND	30	11	IN5_1
AGND	31	12	IN4_1
AGND	32	13	IN3_1
AGND	33	14	IN2_1
AGND	34	15	IN1_1
AGND	35	16	IN0_1
EXT_GATEIN	36	17	AGND
EXT_CLKOUT	37	18	EXT_TRIGIN
	19		EXT_CLKIN



## J6 — Jumpers header:

These jumpers are used to determine if the first 16 channels in the J3 connector are amplified or the 16 channels from J4 are amplified.

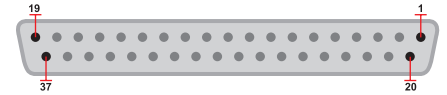
46	IN31	47	IN15_1	48	IN15
43	IN30	44	IN14_1	45	IN14
40	IN29	41	IN13_1	42	IN13
37	IN28	38	IN12_1	39	IN12
34	IN27	35	IN11_1	36	IN11
31	IN26	32	IN10_1	33	IN10
28	IN25	29	IN9_1	30	IN9
25	IN24	26	IN8_1	27	IN8
22	IN23	23	IN7_1	24	IN7
19	IN22	20	IN6_1	21	IN6
16	IN21	17	IN5_1	18	IN5
13	IN20	14	IN4_1	15	IN4
10	IN19	11	IN3_1	12	IN3
7	IN18	8	IN2_1	9	IN2
4	IN17	5	IN1_1	6	IN1
1	IN16	2	IN0_1	3	IN0



## J5 — DB-37 (female) 37-pin connector:

16-channel output connector. This connector supplies the 16 amplified channels. (For determining which 16 channels, see J6 jumper settings)

AGND	37	19	NC
AGND	36	18	OUT15
AGND	35	17	OUT14
AGND	34	16	OUT13
AGND	33	15	OUT12
AGND	32	14	OUT11
AGND	31	13	OUT10
AGND	30	12	OUT9
AGND	29	11	OUT8
AGND	28	10	OUT7
AGND	27	9	OUT6
AGND	26	8	OUT5
AGND	25	7	OUT4
AGND	24	6	OUT3
AGND	23	5	OUT2
AGND	22	4	OUT1
AGND	21	3	OUT0
NC	20	2	AGND
	1		NC



**Settings 1:** When amplifying channels 0 – 15 on the J3 connector, connect jumpers 1-2, 4-5, 7-8, 10-11, 13-14, 16-17, 19-20, 22-23, 25-26, 28-29, 31-32, 34-35, 37-38, 40-41, 43-44, 46-47. This jumper configuration will Amplify the first 16 channels from J3 (see The table for adjusting one channel of the amp-115). The second 16 channels will be outputted on J4.

**Settings 2:** When amplifying the 16 channels supplied to the J4 connector, Connect the jumpers 2-3, 5-6, 8-9, 11-12, 14-15, 17-18, 20-21, 23-24, 26-27, 29-30, 32-33, 35-36, 38-39, 41-42, 44-45, 47-48. This jumper configuration will Amplify the 16 channels from J4 (see The table for adjusting one channel of the amp-115).

To amplify 32 channels you will need two PD-AO-AMP-115 boards. Connect the 96 pin connector to the J3 connector of the first AMP-115 board. Set the jumpers on J6, on the first AMP-115 boards, to that of setting 1 of the jumper settings. Connect J4 of the first AMP-115 board to J4 on the second AMP-115 board. Set the jumpers on J6, on the second AMP-115 boards, to that of setting 2 of the jumper settings.

## Ordering Information:

Part Number	Description
PD-AO-AMP-115	16-channel analog output 110V amplifier
PSU-AO32G115	a pair of power supplies for PD-AO-AMP-115 (can power 32 channels)
PD-STP-3716	16-channel screw-terminal panel
PDXI-AO-CBL-96	96-way to 96-way (analog) and 37-way (digital) 1m, shielded cable (for PXI boards)
PD-CBL-96	96-way pin-less, 1m, round, shielded cable with metal cover plates (for PCI boards)
PD-CBL-3737	37-way, 1m flat ribbon cable (connects two analog output amplifiers)