

# A-8111

## 8-channel, 12-bit, 30KS/s Multi-Function board



### Functional Description

The A-8111 is 12-bit multifunction analog and digital I/O board for the PC/AT compatible computer. The A-8111 provides 8-channel single-ended analog input, 1-channel analog output with 12-bit resolution, 16-channel digital input, 16-channel digital output. The sampling rate of A-8111 is 30K samples/s. It is completely compatible to PCL-711B and ACL-9111.

### Applications

- Laboratory automation
- Sensor interface
- Production test

### Specifications

#### Analog Input

- Number of channels: 8 single-ended
- Resolution: 12-bit
- ADC conversion rate: 30KS/s max
- Input impedance:  $10M\Omega$  ||  $6pF$
- Over voltage protection:  $\pm 35V$
- Accuracy: 0.01% of reading
- Linearity:  $\pm 1$  bit
- On chip sample & hold
- Zero drift:  $\pm 25ppm/^{\circ}C$  of FS max
- Input range:
  - $\pm 5V$ ,  $\pm 2.5V$ ,  $\pm 1.25V$ ,  $\pm 0.625V$ ,  $\pm 0.3125V$

#### Analog Output

- Number of channels: 1 independent
- Type: 12 bit double buffered (AD-7948)
- Linearity:  $\pm 1/2$  bit
- Output range: 0~5V, 0~10V
- Output driving:  $\pm 5$  mA
- Settling time:  $0.6\mu s$  to 0.01% for full scale step

### Features

- 12-bit A/D converter
- 30 KS/s sampling rate(Max.)
- 8 single-ended analog inputs
- A/D trigger modes: software trigger, pacer trigger
- A/D data transfer modes: polling, interrupt
- Software programmable gain: 1,2,4,8
- Bipolar analog input
- One 12-bit analog output
- 16 digital inputs & 16 digital outputs

### Digital I/O

- 16 TTL-level input
- Input low  $V_{IL} = 0.8V$  max;  $I_{IL} = -0.4$  mA max
- Input high  $V_{IH} = 2.0V$  min;  $I_{IH} = 20\mu A$  max
- 16 TTL-level output
- Output low  $V_{OL} = 0.5V$  max; @ $I_{OL} = 8$  mA max
- Output high  $V_{OH} = 2.7V$  min; @ $I_{OH} = 0.4$  mA max

### Timer/Counter

- A/D pacer: cascaded 32-bit counter
- Programmable internal timer: 0.0047Hz~0.5MNz
- Interrupt channel: 2,3,4,5,6,7 software selectable

### General Specifications

- I/O connector: one of 37-pin D-Sub female  
two of 20-pin ribbon male
- Power requirements:

Device	+5V	+12V	-12V
A-8111	320 mA	60 mA	30 mA

- Operating temperature: 0 ~ 60°C
- Operating humidity: 0 ~ 90%, non-condensing
- Storage temperature: -20 ~ 70°C
- Dimensions: 157 mm x 106 mm

### Ordering Information

#### Standard

**A-8111:** 8-channel 12-bit multi-function board

#### Optional

**DB-8125:** Screw terminal board  
**DN-37:** DIN-rail mounting terminal board  
**DB-37:** Directly connection terminal board  
**DB-16P:** 16-channel isolated digital input board  
**DB-16R:** 16-channel SPDT relay board  
**DN-20:** DIN-rail mounting terminal board  
**ADP-20:** 20-pin extender

# Pin Assignment

A-812PG/A-8111/A-626/A-628

## Pin Assignment

### A-812PG

CN1				CN2			
AI 0	1	○	2 A.GND	AI 10	1	○	2 A.GND
AI 1	3	○	4 A.GND	AI 11	3	○	4 A.GND
AI 2	5	○	6 A.GND	AI 12	5	○	6 A.GND
AI 3	7	○	8 A.GND	AI 13	7	○	8 A.GND
AI 4	9	○	10 A.GND	AI 14	9	○	10 A.GND
AI 5	11	○	12 A.GND	AI 15	11	○	12 A.GND
AI 6	13	○	14 A.GND	AO 0	13	○	14 A.GND
AI 7	15	○	16 A.GND	AO 1	15	○	16 A.GND
AI 8	17	○	18 A.GND	AO 0 EXT REF	17	○	18 A.GND
AI 9	19	○	20 A.GND	AO 1 EXT REF	19	○	20 A.GND

  

CN4				CN5			
DI 0	1	○	2 DI 1	DO 0	1	○	2 DO 1
DI 2	3	○	4 DI 3	DO 2	3	○	4 DO 3
DI 4	5	○	6 DI 5	DO 4	5	○	6 DO 5
DI 6	7	○	8 DI 7	DO 6	7	○	8 DO 7
DI 8	9	○	10 DI 9	DO 8	9	○	10 DO 9
DI 10	11	○	12 DI 11	DO 10	11	○	12 DO 11
DI 12	13	○	14 DI 13	DO 12	13	○	14 DO 13
DI 14	15	○	16 DI 15	DO 14	15	○	16 DO 15
D.GND	17	○	18 D.GND	D.GND	17	○	18 D.GND
+5V	19	○	20 +12V	+5V	19	○	20 +12V

### A-8111

CN1			
N.C.	37	○	19 +5V OUT
N.C.	36	○	18 N.C.
N.C.	35	○	17 N.C.
N.C.	34	○	16 N.C.
N.C.	33	○	15 N.C.
N.C.	32	○	14 A.GND
N.C.	31	○	13 N.C.
D/A OUT	30	○	12 N.C.
A.GND	29	○	11 N.C.
A.GND	28	○	10 A.GND
A.GND	27	○	09 A.GND
A.GND	26	○	08 AI 7
A.GND	25	○	07 AI 6
A.GND	24	○	06 AI 5
A.GND	23	○	05 AI 4
A.GND	22	○	04 AI 3
A.GND	21	○	03 AI 2
A.GND	20	○	02 AI 1
		○	01 AI 0

CN3			
External Trigger	1	○	2 N.C.
DRDY	3	○	4 N.C.
Internal CLK 2MHz	5	○	6 Counter 1&2 Gate
N.C.	7	○	8 External CLK
N.C.	9	○	10 Counter 0 Out
N.C.	11	○	12 Counter 0 Gate
N.C.	13	○	14 Counter 1 Out
N.C.	15	○	16 N.C.
D.GND	17	○	18 Digital Ground
PC's+5V	19	○	20 N.C.

CN2				CN3			
DI 0	1	○	2 DI 1	DO 0	1	○	2 DO 1
DI 2	3	○	4 DI 3	DO 2	3	○	4 DO 3
DI 4	5	○	6 DI 5	DO 4	5	○	6 DO 5
DI 6	7	○	8 DI 7	DO 6	7	○	8 DO 7
DI 8	9	○	10 DI 9	DO 8	9	○	10 DO 9
DI 10	11	○	12 DI 11	DO 10	11	○	12 DO 11
DI 12	13	○	14 DI 13	DO 12	13	○	14 DO 13
DI 14	15	○	16 DI 15	DO 14	15	○	16 DO 15
D.GND	17	○	18 D.GND	D.GND	17	○	18 D.GND
+5V	19	○	20 +12V	+5V	19	○	20 +12V

### A-626 6-channel analog output

A.GND	37	○	19 +5V OUT
A.GND	36	○	18 D.GND
A.GND	35	○	17 Ext trg
N.C.	34	○	16 A.GND
N.C.	33	○	15 CH3 I.OUT
N.C.	32	○	14 CH3 Ext ref
A.GND	31	○	13 CH3 V.OUT
N.C.	30	○	12 A.GND
N.C.	29	○	11 CH2 I.OUT
N.C.	28	○	10 CH2 Ext ref
A.GND	27	○	09 CH2 V.OUT
CH5 I.OUT	26	○	08 A.GND
CH5 Ext ref	25	○	07 CH1 I.OUT
CH5 V.OUT	24	○	06 CH1 Ext ref
A.GND	23	○	05 CH1 V.OUT
CH4 I.OUT	22	○	04 A.GND
CH4 Ext ref	21	○	03 CH0 I.OUT
CH4 V.OUT	20	○	02 CH0 Ext ref
		○	01 CH0 V.OUT

### A-628 8-channel analog output

A.GND	37	○	19 +5V OUT
A.GND	36	○	18 D.GND
A.GND	35	○	17 Ext trg
N.C.	34	○	16 A.GND
N.C.	33	○	15 CH7 I.OUT
N.C.	32	○	14 CH7 Ext ref
A.GND	31	○	13 CH7 V.OUT
N.C.	30	○	12 A.GND
N.C.	29	○	11 CH6 I.OUT
N.C.	28	○	10 CH6 Ext ref
A.GND	27	○	09 CH6 V.OUT
CH5 I.OUT	26	○	08 A.GND
CH5 Ext ref	25	○	07 CH1 I.OUT
CH5 V.OUT	24	○	06 CH1 Ext ref
A.GND	23	○	05 CH1 V.OUT
CH4 I.OUT	22	○	04 A.GND
CH4 Ext ref	21	○	03 CH0 I.OUT
CH4 V.OUT	20	○	02 CH0 Ext ref
		○	01 CH0 V.OUT

### A-626/A-628 DIO

DI 0	1	○	2 DI 1
DI 2	3	○	4 DI 3
DI 4	5	○	6 DI 5
DI 6	7	○	8 DI 7
DI 8	9	○	10 DI 9
DI 10	11	○	12 DI 11
DI 12	13	○	14 DI 13
DI 14	15	○	16 DI 15
D.GND	17	○	18 D.GND
+5V	19	○	20 +12V

  

DO 0	1	○	2 DO 1
DO 2	3	○	4 DO 3
DO 4	5	○	6 DO 5
DO 6	7	○	8 DO 7
DO 8	9	○	10 DO 9
DO 10	11	○	12 DO 11
DO 12	13	○	14 DO 13
DO 14	15	○	16 DO 15
D.GND	17	○	18 D.GND
+5V	19	○	20 +12V