

PIO-821LU/PIO-821HU

Universal PCI, 45 kS/s, 16-ch, 12-bit AI Multifunction Board

Features

- Universal PCI (3.3 V/5 V) Interface
- 16 Single-ended/8 Differential Analog Input Channels
  - 12-bit, 45 kS/s AD Converter
  - AD Trigger: Software-trigger, Pacer-trigger, External-trigger
  - Interrupt Handling
- 16-channel 5 V/TTL Digital Output
- 16-channel 5 V/TTL Digital Input
  - Pull-high and Pull-low Resistors for DI Channels
- 1-channel, 12-bit Analog Output
- Supports Card ID (SMD Switch)

Introduction

The PIO-821LU/HU card is designed as an easy replacement for the PIO-821L/H without requiring any modification to the software or the driver.

The PIO-821LU/HU is a multifunction board for PC/AT compatible computers. The PIO-821LU provides for low gain (1, 2, 4, 8), and the PIO-821HU supports high gain (1, 10, 100, 1000). The PIO-821L/H contains a 12-bit ADC with up to 16 single-ended or 8 differential Analog Input channels. The cards also have a 12-bit DAC voltage output and 16 TTL-compatible Digital Input and Digital Output channels, respectively. The maximum sampling rate for the AD converter is around 45 kS/s.

The PIO-821LU/HU also includes an onboard Card ID switch and pull-high/low DI resistors. The Card ID enables the board to be recognized via software if two or more PIO-821LU/HU cards are installed in the same computer. The pull-high/pull-low resistors allow the DI status to be predefined instead of remaining floating if the DI channels are disconnected or interrupted.

Pin Assignments

Pin Assignment	Terminal No.		Pin Assignment
AI_0	01	20	AI_8
AI_1	02	21	AI_9
AI_2	03	22	AI_10
AI_3	04	23	AI_11
AI_4	05	24	AI_12
AI_5	06	25	AI_13
AI_6	07	26	AI_14
AI_7	08	27	AI_15
A.GND	09	28	A.GND
A.GND	10	29	A.GND
N.C.	11	30	DAOUT
N.C.	12	31	N.C.
+12V	13	32	GATE0
A.GND	14	33	N.C.
D.GND	15	34	GATE2
COUT0	16	35	COUT2
N.C.	17	36	EXT_INT
COUT1	18	37	EXT_CLK
VCC	19		

CON3

Pin Assignment	Terminal No.		Pin Assignment
DI 0	01	02	DI 1
DI 2	03	04	DI 3
DI 4	05	06	DI 5
DI 6	07	08	DI 7
DI 8	09	10	DI 9
DI 10	11	12	DI 11
DI 12	13	14	DI 13
DI 14	15	16	DI 15
GND	17	18	GND
+5 V	19	20	+12 V

CON1

Pin Assignment	Terminal No.		Pin Assignment
DO 0	01	02	DO 1
DO 2	03	04	DO 3
DO 4	05	06	DO 5
DO 6	07	08	DO 7
DO 8	09	10	DO 9
DO 10	10	12	DO 11
DO 12	12	14	DO 13
DO 14	14	16	DO 15
GND	16	18	GND
+5 V	18	20	+12 V

CON2

Software

Drivers

- [x] 32/64-bit Windows 10/11
- [x] Linux

Sample Programs

- [x] DOS Lib and TC Demo
- [x] VB/VC/Delphi/VB.NET/C#.NET/VC.NET/LabVIEW/Python/MATLAB

Applications

- High speed data acquisition system.
- Process monitor and control.
- Vibration analysis.
- Digital pattern generator from digital I/O port.

Ordering Information

PIO-821LU CR	Universal PCI, 45 kS/s, 16-ch, 12-bit AI Multifunction Board (RoHS) Includes one CA-4002 D-Sub connector
PIO-821HU CR	Universal PCI, 45 kS/s, 16-ch, 12-bit AI Multifunction Board (RoHS) Includes one CA-4002 D-Sub connector

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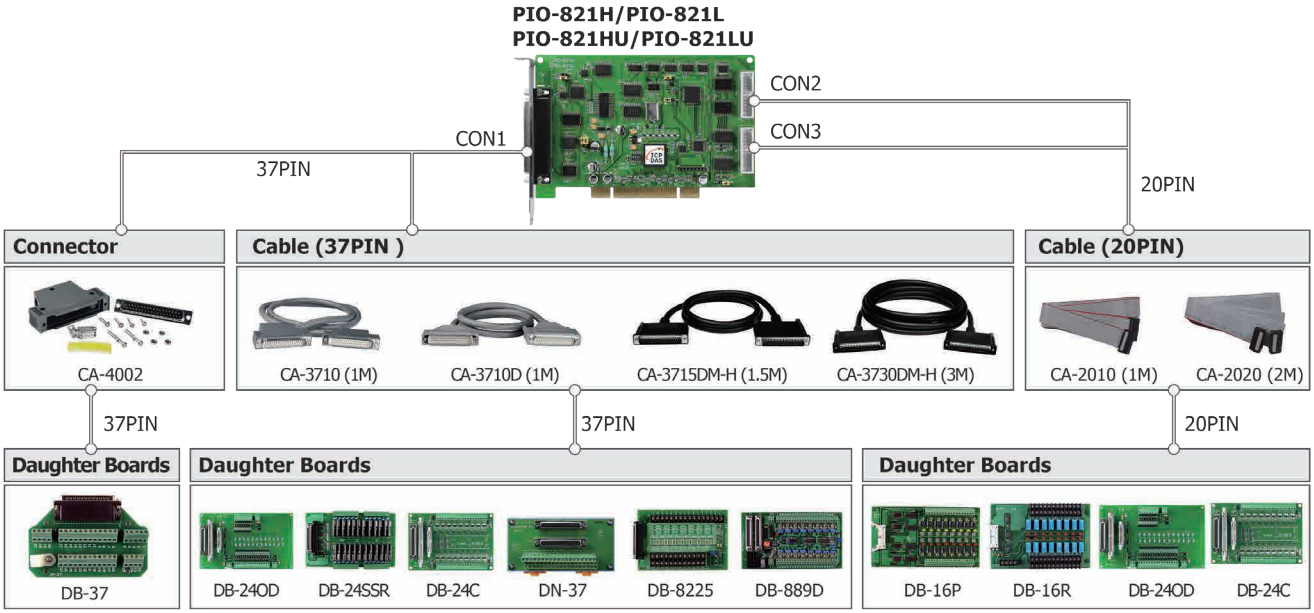
Hardware Specifications

Model	PIO-821LU	PIO-821HU
Hardware		
Card ID	Yes (4-bit)	
Connector	Female DB37 x 1 , 20-pin box header x 2	
Analog Input		
Channels	16 single-ended/8 differential	
Range	Gain: 1, 2, 4, 8 Bipolar Range: ±5 V, ±2.5 V, ±1.25 V, ±0.625 V	Gain: 1, 10, 100, 1000 Bipolar Range: ±5 V, ±0.5 V, ±0.05 V, ±0.005 V
Resolution	12-bit	
Accuracy	0.01% of FSR ±1 LSB @ 25 °C, ± 10 V	
Sampling Rate	45 kS/s. Max.	
Input Impedance	10 MΩ/6 Pf	
Overvoltage Protection	Continuous ±35 Vp-p	
Zero Drift	±4 ppm/°C of FSR	
Trigger Mode	Software, Internal programmable pacer	
Data Transfer	Polling, Interrupt	
Analog Output		
Channels	1	
Range	Unipolar:0 ~ 5 V, 0 ~ 10 V, 0 ~ Ext Ref	
Resolution	12-bit	
Accuracy	0.01% of FSR ± 1/2 LSB @ 25 °C, ±10 V	
Response Time	500 kHz (Typical)	
Voltage Output Capability	±5 mA	
Slew Rate	0.3 V/μs	
Operation Mode	Static Update	
Digital Input		
Channels	16	
Type	5 V/TTL	
ON Voltage Level	2.0 V Min.	
OFF Voltage Level	0.8 V Max.	
Response Speed	1.0 MHz (Typical)	
Trigger Mode	Static Update	
Digital Output		
Channels	16	
Type	5 V/TTL	
Operation Mode	Static Update	
Load Voltage	Logic 0: 0.4 V Max. , Logic 1: 2.4 V Min.	
Load Current	Sink: 2.4 mA , Source: 0.8 mA	
Response Speed	1.0 MHz (Typical)	
Timer/Counter/Frequency		
Channels	3 (Internal pacer x 1/Independent x 2)	
Type	5 V/TTL	
Resolution	16-bit	
Reference Clock	Internal: 2 MHz	
PC Bus		
Type	3.3 V/5 V Universal PCI, 32-bit, 33 MHz	
Data Bus	8-bit	
Power		
Consumption	960 mA @ +5 V	
Mechanical		
Dimensions (mm)	97 x 159 x 22 (W x L x D)	
Environment		
Operating Temperature	0 ~ +60°C	
Storage Temperature	-20 ~ +70°C	
Humidity	5 ~ 85% RH, Non-condensing	

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Accessories

CA-2010 CR	20-pin flat cable, 1 M (RoHS)
CA-2020 CR	20-pin flat cable, 2 M (RoHS)
CA-3710 CR	DB-37 Male-Male D-sub cable 1 M (Cable for Daughter Board (45°)) (RoHS)
CA-3710D CR	DB-37 Male-Male D-sub cable 1 M (Cable for Daughter Board (180°)) (RoHS)
CA-3715DM-H CR	DB-37 Male-Male Cable, 1.5 M, 180° (RoHS)
CA-3730DM-H CR	DB-37 Male-Male Cable, 3.0 M, 180° (RoHS)
DB-8225 CR	Screw terminal board , filter circuitry can be added for 1800HU, 1800LU (RoHS)
DB-889D CR	16-channel Analog Input Multiplexer Board (RoHS)
DB-16P CR	16-channel Isolated Digital Input Daughter Board (RoHS)
DB-16R CR	16-channel Relay Output Daughter Board (RoHS)
DB-37 CR	Directly connect signal to D-sub 37-pin connector (RoHS)
DN-37 CR	DIN Rail Mounting 37-pin Connector (RoHS)
DB-24C CR	24-channel Open Collector Output Daughter Board (RoHS)
DB-24OD CR	24-channel Open-Drain Output Board (RoHS)
DB-24SSR CR	24-channel SSR Output Board (RoHS)
DN-20/DN-20-381 CR	20-pin DIN-RAIL mounting I/O connector board (RoHS)
2AB125R CR	Resistor DIP 125R 0.1% 1/4W MF 50PPM (1PCS) (RoHS)



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