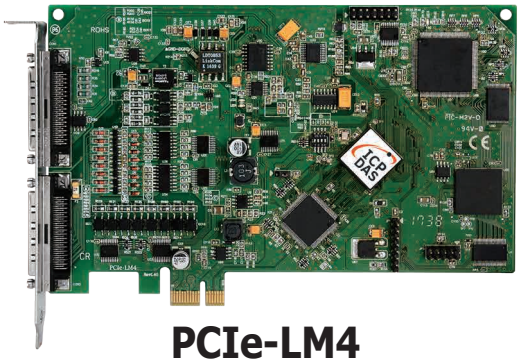


PCIe-LM4

PCI Express, 24-bit Precision Load Cell Input, Multi-function Motion Control Board

Features

- PCI Express x1 Interface
- Supports CardID (SMD Switch)
- 4-channel Load Cell Transducer Input
  - 24-bit ADC with Max. 15 kS/s. Sampling Rate
- 4 Differential general analog input Channels
  - 24-bit ADC with Max. 15 kS/s. Sampling Rate
- 2-axis pulse output and encoder
  - Support mode CW/CCW, Pulse/DIR and EA/EB
- 2-channel 16-bit analog output
- 16-channel Isolated Digital Input
- 16-channel Isolated Digital output

Introduction

The PCIe-LM4 is a powerful multifunction board based on the PCI Express. Equipped with four Load Cell (strain gauge) input channels, four general analog input channels, a 2-axis motion controller, two analog output channels, sixteen isolated digital input channels and sixteen isolated digital output channels.

The PCIe-LM4 also adds a Card ID switch. Users can set Card ID on a board and recognize the board by the ID via software when using two or more PCIe-LM4 cards in one computer.

These cards support various OS versions, such a Windows 32/64-bit Windows 7/8/10. DLL together with various language sample programs based on Visual C++, Borland Delphi, Borland C++ Builder, Visual Basic, C#.NET, Visual Basic.NET and LabVIEW are provided in order to help users quickly and easily develop their own applications.

Hardware Specifications

Hardware	
Connector	SCSI VHDCI 68-pin x 2
Card ID	Yes (4-bit)
Encoder Input	
No. of Axes	2-axis
Mode	A/B pulse, Up/Down
Ring Counter Mode	32-bit
Counting Rate	12 MHz (Max.)
Counter Width	32-bit
Isolation	3 KVrms
Pulse Output	
No. of Axes	2-axis
Mode	CW/CCW, PULSE/DIR
Rate	4 MHz (Max.)
Isolation	3 KVrms
Analog Input	
Channels	4 differential
Range	±10 V, ±5 V, ±2.5 V, ±1.25 V
Resolution	24-bit
Accuracy	0.05% of FSR ±1 LSB @ 25°C, ±10 V
Sampling Rate	15 kS/s
Input Impedance	10,000 MΩ/4 pF
Overvoltage Protection	Continuous ±35 Vp-p
Trigger Mode	Software
Data Transfer	Polling
Analog Output	
Channels	2
Range	±5 V, ±10 V
Resolution	16-bit
Accuracy	±10 LSB
Response Time	500 kS/s (Max.)
Voltage Output Capability	±5 mA
Slew Rate	2.8 V/μs
FIFO Size	512 Samples
Operation Mode	Static update, Waveform generation
Mechanical	
Dimensions (mm)	102 x 149 x 22 (W x L x D)
Environment	
Operating Temperature	0 ~ +60°C
Storage Temperature	-20 ~ +70°C
Humidity	5 ~ 85% RH, Non-condensing

Digital Input	
Channels	16
Type	Wet Contact
Sink/Source (NPN/PNP)	Sink/Source, Photo coupler isolated channel with common power or ground
ON Voltage Level	5 ~ 24 V
OFF Voltage Level	0 ~ 1 V
Response Speed	4 kHz (Typical)
Trigger Mode	Static Update
Data Transfer	Polling
Isolation	2500 V_{DC}
Digital Output	
Channels	16
Sink/Source (NPN/PNP)	Sink, Open Drain
Operation Mode	Static Update
Load Current	100 mA/+ 30V for each channel @100% duty
Response Speed	4 kHz (Typical)
Isolation	2500 V_{DC}
DO Readback	No
Strain Gauge, Load Cell Input	
Channels	4
Type	Strain Gauge
Range	±227 mV
Wiring	Full-Bridge
Accuracy	0.05% of FSR ±1 LSB @ 25°C, ±10 V
Resolution	24-bit
Sampling Rate	15 kS/s
Impedance	10,000 MΩ/4 pF
Overvoltage Protection	Continuous ±35 Vp-p
Excitation Voltage Output	
Channels	4 differential
Range	+ 10V (all 4-ch shared the same settings)
Max. Load Current	Driving up to four 120-ohm loadcells
Timer/Counter/Frequency	
Channels	2
PC Bus	
Type	PCI Express x 1
Data Bus	32-bit
Power	
Consumption	1 A @ +5 V

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Software

Drivers

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

Sample Programs

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

Pin Assignments

Pin Assignment	Terminal No.		Pin Assignment
IO			IO
N.C.	01	35	N.C.
N.C.	02	36	N.C.
N.C.	03	37	N.C.
N.C.	04	38	N.C.
N.C.	05	39	N.C.
AGND	06	40	AGND
AGND	07	41	AGND
AGND	08	42	AGND
AGND	09	43	AGND
VO0	10	44	AGND
AGND	11	45	AGND
VO1	12	46	AGND
AGND	13	47	AGND
AI4+	14	48	AI4-
AI5+	15	49	AI5-
AI6+	16	50	AI6-
AI7+	17	51	AI7-
AGND	18	52	AGND
N.C.	19	53	N.C.
SENSE+	20	54	SENSE-
EXC+	21	55	EXC-
AI3+	22	56	AI3-
N.C.	23	57	N.C.
SENSE+	24	58	SENSE-
EXC+	25	59	EXC-
AI2+	26	60	AI2-
N.C.	27	61	N.C.
SENSE+	28	62	SENSE-
EXC+	29	63	EXC-
AI1+	30	64	AI1-
N.C.	31	65	N.C.
SENSE+	32	66	SENSE-
EXC+	33	67	EXC-
AI0+	34	68	AI0-



CON1

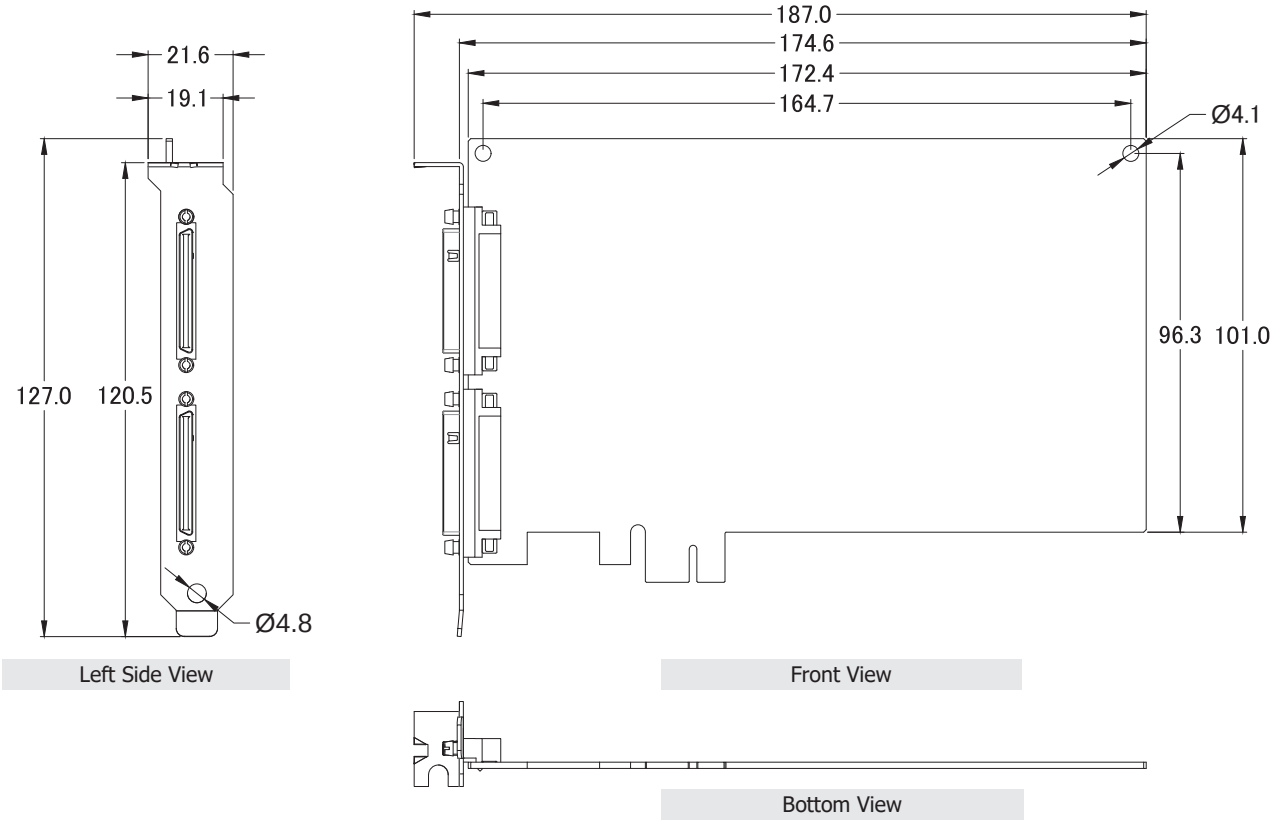
Pin Assignment		Terminal No.		Pin Assignment	
Motion	IO			IO	Motion
N.C.	DI.COM1	01	35	DI.COM1	N.C.
RDY0	DI0	02	36	DI1	INP0
ALM0	DI2	03	37	DI3	SLD0
ORG0	DI4	04	38	DI5	MEL0
PEL0	DI6	05	39	DI7	E.EMG
N.C.	DI.COM2	06	40	DI.COM2	N.C.
RDY1	DI8	07	41	DI9	INP1
ALM1	DI10	08	42	DI11	SLD1
ORG1	DI12	09	43	DI13	MEL1
PEL1	DI14	10	44	DI15	E.LTC0
N.C.	EXT.PWR1	11	45	EXT.GND1	N.C.
E.SVON0	DO0	12	46	DO1	E.ERC0
ALMRST0	DO2	13	47	DO3	CMP0
E.SVON1	DO4	14	48	DO5	E.ERC1
ALMRST1	DO6	15	49	DO7	CMP1
N.C.	EXT.PWR2	16	50	EXT.GND2	N.C.
N.C.	DO8	17	51	DO9	N.C.
N.C.	DO10	18	52	DO11	N.C.
N.C.	DO12	19	53	DO13	N.C.
N.C.	DO14	20	54	DO15	N.C.
N.C.	N.C.	21	55	N.C.	N.C.
N.C.	N.C.	22	56	N.C.	N.C.
A1+	N.C.	23	57	N.C.	A1-
B1+	N.C.	24	58	N.C.	B1-
Z1+	N.C.	25	59	N.C.	Z1-
A2+	N.C.	26	60	N.C.	A2-
B2+	N.C.	27	61	N.C.	B2-
Z2+	N.C.	28	62	N.C.	Z2-
CW0.P	N.C.	29	63	N.C.	CW0.N
CCW0.P	N.C.	30	64	N.C.	CCW0.N
CW1.P	N.C.	31	65	N.C.	CW1.N
CCW1.P	N.C.	32	66	N.C.	CCW1.N
ITR.5V	ITR.5V	33	67	ITR.5V	ITR.5V
ITR.GND	ITR.GND	34	68	ITR.GND	ITR.GND



CON2

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Dimensions (Units: mm)

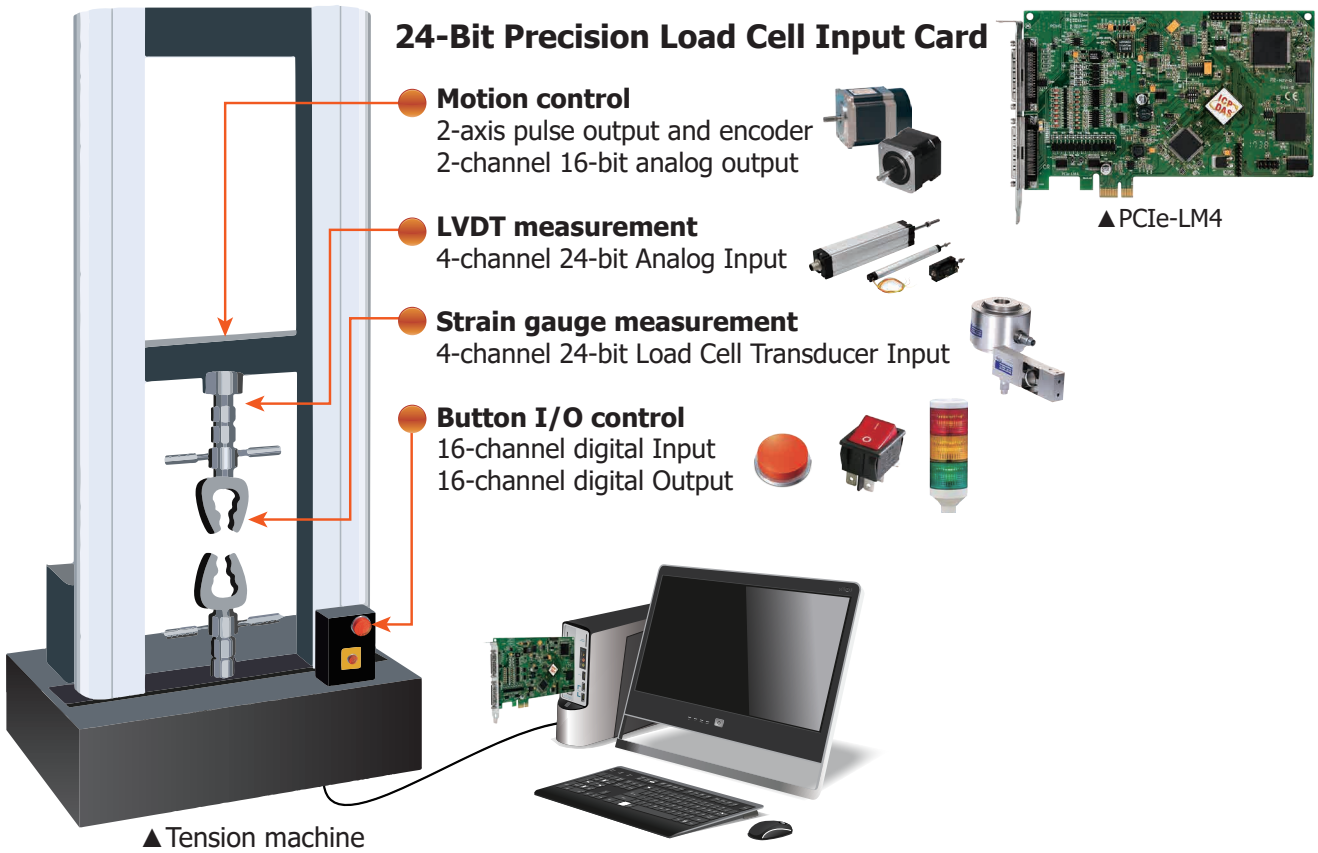


Left Side View

Front View

Bottom View

Applications

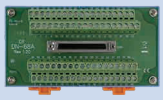


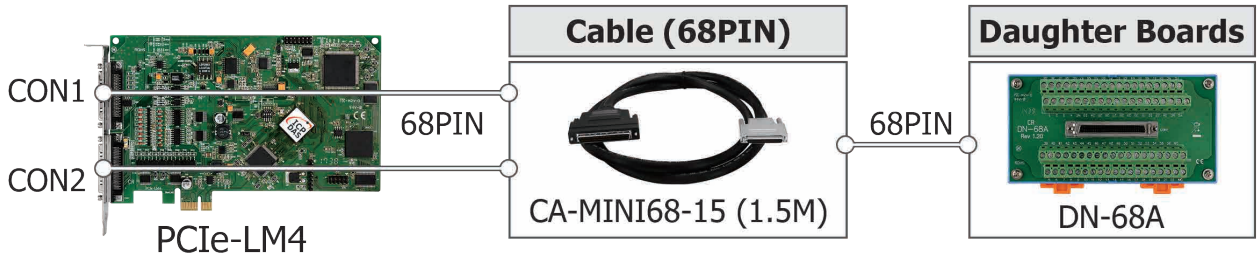
Ordering Information

PCIe-LM4 CR	PCI Express, 24-bit Precision Load Cell Input, Multi-function Motion Control Board (RoHS)

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Accessories

 CA-MINI68-15 CR	68-pin VHDCI to SCSI-II Connector Cable, Length 1.5 M (RoHS)
 DN-68A CR	DIN-Rail Mountable I/O Connector Block with 68-pin Female SCSI II Connector (RoHS)
 2AB125R CR	Resistor DIP 125R 0.1% 1/4W MF 50PPM (1PCS) (RoHS)



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