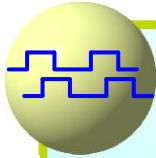




Bridging the Gap between Real World and Computer



LSI3188

New

Application Specific Encoder Counter Card



Features

- ▶ PCI plug and play function with card ID for 16 identical cards
- ▶ High noise immunity with magnetic/photo-coupler isolation
- ▶ Supports DIN rail mounted wiring board
- ▶ 32-bit timer based on 1us time base
- ▶ 8 photo isolated digital input
- ▶ 8 photo isolated digital output
- ▶ Software debounce for digital input
- ▶ Software programmable I/O polarity
- ▶ Interrupt from IN07~IN00
- ▶ 32-bit Position counter
- ▶ 16 MHz max. Quadrature input rate
- ▶ Quadrature, pulse/direction and up/down counting
- ▶ Programmable multiple rate at X1, X2, X4
- ▶ Software debounce for input signals
- ▶ Multiple counter reset (homing) modes
- ▶ Differential or single-end input signal
- ▶ Station to station distance : 16-bit
- ▶ Station to station FIFO : 7(max)
- ▶ Programmable duration for Compare output
- ▶ Interrupt on compare equal

Introduction

The LSI3188 is a one-axis high speed quadrature counter card designed for CCD inspection (or test instrument) up to max. 8 stations. Only one sensor to sense device presence and one encoder as position information sensor, the system can easy to configure as multi-station inspection system. It triggers CCD (or test instrument) while the under inspection device comes to the check point. Come with the hardware DLL is provided for WinXP, Win7 and later or Linux platform, sample source code in VB and Linux Qt are also available.

Encoder Interface

The input signals are magnetic coupled and signal type of single end or differential can be set at wiring board. The software debounce time is programmable to filter the unwanted glitches.

Counters and compare function

The signal input of the counter can be configured as quadrature (multiple rate at 1, 2, 4), single pulse or dual pulse mode and the position counter is 32-bit width sampled at 198MHz. Together with the counter, there are 6 Homing modes (Counter clear mode) to choose.

There are 8 station counters with 7 station to station buffers, while the distance counting up, it will generate a pulse to trigger the test instrument or CCD.

Timer

A 32-bit timer based on 1MHz clock can work as a hardware periodic timer to trigger sampling event.

Digital I/O

8 photo-coupler isolated digital input and 8 photo-coupler isolated digital output of standard digital I/O interface can connect to any type of the ADP9201DIN wiring board. Need no extra digital I/O card, in small applications. There are digital filters for the digital input and programmable polarity to adjust the logic to convenient state and the input transition can generate the request of interrupt

Applications

- ▶ For counting pulses on the fly, such as:
 - Encoder on various kinds of servo motor
 - Proximity sensor/detector with relative motion
- ▶ Application specific for inspection trigger on rotary or linear production line
- ▶ X-Y Table linear Scale F/B
- ▶ Pulse signal receiver /display



Bridging the Gap between Real World and Computer

Specifications (With Matched Wiring Board)

Counter

- ▶ Number of axes : 1
- ▶ Input : 5 magnetic isolation (A ,B, Z, HOME input), TTL level
- ▶ Output : 8 differential position compare out
- ▶ Maximum quadrature input frequency : 16MHz x 4
- ▶ Encoder Type : Single-end or differential (with ADP-3101 DIN wiring board)
- ▶ Input software debounce : 512k, 1M, 2M, 4M, 8M,10M,16M (programmable)
- ▶ Input multiple rate : X1, X2, X4 programmable (quadrature signal only)
- ▶ Counter Mode : (QUADRATURE), (CLOCK/DIRECTION), (UP CLOCK/DOWN CLOCK)
- ▶ Position counter length : 32-bit
- ▶ Station to station distance : 16-bit
- ▶ Under inspection device FIFO : 7 (Station to station)
- ▶ Allowable station : 1 ~ 8(max)
- ▶ Trigger out pulse width : 16-bit @1us
- ▶ Sample clock frequency : 198 MHz
- ▶ PCI data width : 32-bit

Digital

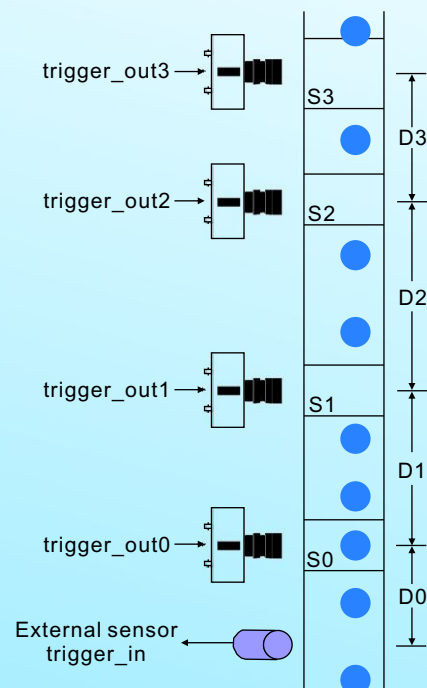
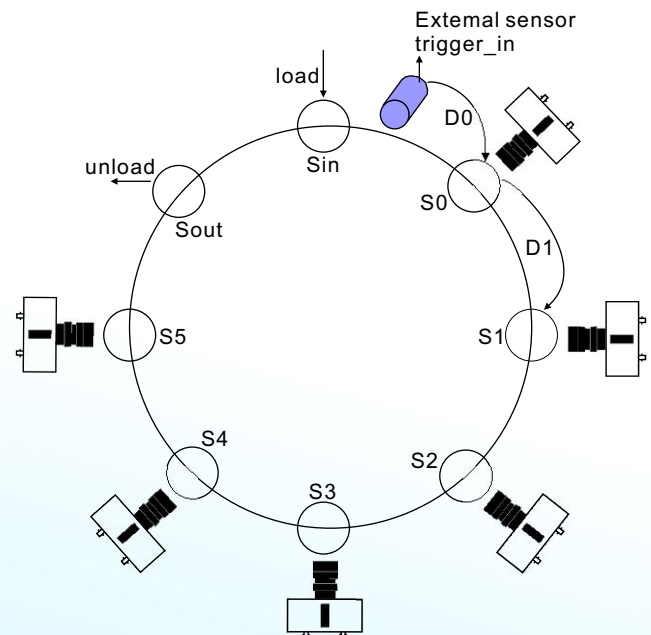
- ▶ Input : 8 photo-coupler isolated
- ▶ ON state : 2.8Vdc(max) 4.5mA(min)
- ▶ OFF state : 8Vdc(min) 3mA(max)
- ▶ Switching speed : 10KHz max. (limit by photo coupler speed and debounce filter)
- ▶ Software debounce : 100Hz, 200Hz, 1KHz, No debounce (programmable)
- ▶ Interrupt at IN07 ~ IN00
- ▶ Output : 8 photo-coupler isolated
- ▶ Output range : Open collector 0 ~ 45Vdc (on card)
- ▶ Output rating : (With ADP3101DIN wiring board)
 - 3A @250Vac, 30Vdc (Relay)
 - 1A @ 24Vdc (PMOS)
 - 2A @ 240Vac (SSR)
- ▶ Sink current : 500mA(peak) per channel (on card)
- ▶ Switching speed : 20KHz(max)(MOS out only)

Timer

- ▶ Timer time base : 1us
- ▶ Timer/counter length : 32-bit

Main Card General

- ▶ Card ID : 4-bit, 16 position
- ▶ Insulation resistance : 1000Mohm (min) at 1000Vdc
- ▶ Isolation voltage : 2500Vac 1 min
- ▶ Connector : one 20 pin SCSI-II female connector
one 20 pin flat cable connector
- ▶ Operation temperature : 0 °C ~ +70 °C
- ▶ Storage temperature : -20 °C ~ +80 °C
- ▶ Operation humidity : 5-95% RH, non-condensing
- ▶ Dimension : 130(W) * 102(H)mm, 5.2(W) * 4.1(H)in



● : Under inspection device



Bridging the Gap between Real World and Computer

Pin Assignments

JF1

NC	20	10	NC
CMP_OUT	19	9	NC
NC	18	8	HOME
NC	17	7	NC
CLR_IN-	16	6	CLR_IN+
Z-	15	5	Z+
B-	14	4	B+
A-	13	3	A+
EXTG	12	2	+5Vin
EXTG	11	1	+5Vin

ADP9201_JM1

EXT +24Vin	20	19	EXT +24Vin
EXTG	18	17	EXTG
EXT_OUT07	16	15	EXT_IN07
EXT_OUT06	14	13	EXT_IN06
EXT_OUT05	12	11	EXT_IN05
EXT_OUT04	10	9	EXT_IN04
EXT_OUT03	8	7	EXT_IN03
EXT_OUT02	6	5	EXT_IN02
EXT_OUT01	4	3	EXT_IN01
EXT_OUT00	2	1	IN00_EXT(compare out gate input)

JM1

NC	25	13	NC
NC	24	12	NC
EXTG	23	11	NC
EXTG	22	10	EXTG
CMP7_OUT-	21	9	EXTG
CMP6_OUT-	20	8	CMP7_OUT+
CMP5_OUT-	19	7	CMP6_OUT+
CMP4_OUT-	18	6	CMP5_OUT+
CMP3_OUT-	17	5	CMP4_OUT+
CMP2_OUT-	16	4	CMP3_OUT+
CMP1_OUT-	15	3	CMP2_OUT+
CMP0_OUT-	14	2	CMP1_OUT+
		1	CMP0_OUT+

Software Support

► PC OS Support

WinXP, Win7 and later or Linux O.S.
Embedded XP, Win CE (at request)

► Library

DLLs, VI library

► Develop Software

Visual C++, Visual Basic,
Borland C/C++ Builder, LabVIEW etc

► Example Source Code

Visual Basic

Ordering Information

- **LSI3188** : Single-axis Quadrature Encoder Counter Card(up to 16MHz x 4 quadrature input)
- **ADP3101DIN** : DIN rail mounted wiring board for LSI3101 quadrature counter related function P.41
- **M262020150** : 20-pin SCSI II centronic cable 1.5 M for JF1 I.18
- **M262020300** : 20-pin SCSI II centronic cable 3.0 M for JF1 I.18
- **ADP9201DIN(R)** : DIN rail mounted wiring board with 16 I/O LED indicators and Relay output for 8 DI, 8DO (for ADP9201_JM1) P.79
- **ADP9201DIN(P)** : DIN rail mounted wiring board with 16 I/O LED indicators and PMOS output for 8 DI, 8DO (for ADP9201_JM1) P.79
- **ADP9201DIN(S)** : DIN rail mounted wiring board with 16 I/O LED indicators and SSR output for 8 DI, 8DO (for ADP9201_JM1) P.79
- **JS51053** : DIN rail mounted dummy wiring board for general Digital I/O, Transistor out (for ADP9201_JM1) I.12
- **M23207** : 20-pin flat cable 1.5 M for ADP9201_JM1 I.17
- **M23209** : 20-pin flat cable 3.0 M for ADP9201_JM1 I.17
- **JS51050** : DIN rail mounted dummy wiring board (D type 25P male to terminals) for JM1 I.12
- **M270325X4** : D type 25P male-female cable 1.5M for JM1 I.17
- **M270325X4S** : D type 25P male-female cable 1.5M, shielding for JM1 I.17
- **M270325X0** : D type 25P male-female cable 3.0M for JM1 I.17
- **M270325X0S** : D type 25P male-female cable 3.0M, shielding for JM1 I.17
- **SM23415** : Extension kit for JM1 (bracket and flat cable for 25P female D type connector)

Note