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Find the *DDC SB36243IA-3L0* at our website: *Click HERE*

Synchro Angle Position Indication PCI Card Data Sheet

MODEL: SB-3624XIX-3L0

www.ddc-web.com



FEATURES

- Universal (3.3V or 5V) PCI Signalling
- Six Independent R-D Conversion Channels
- Short (Half-Size) PCI Form Factor
- Internal Synthesized Reference
- Software Programmable Resolution (10-, 12-, 14- or 16-bit) and Bandwidth (see Table 1)
- Input Amplitudes: 2 Vrms L-L, 11.8 Vrms L-L, or 90 Vrms L-L for Reference Frequencies of 47Hz to 7KHz
- On-Board Programmable Oscillator with 1.5VA Drive, Frequency Options of 57Hz to 7KHz
- Transformer Isolation Available for 90 VL-L Synchro Application
- On-Board Self-Test
- Separate BIT Output per Converter Channel (LOS/LOT/LOR)
- Incremental Encoder Emulation or Velocity Output (Field Programmable)
- Turns Counter
- Rotational Direction Indicator
- Two-Speed Measurement Capability
- DLL's and Libraries for Windows® 2000/XP and Windows NT® - Contact factory for availability of Linux® and LabVIEW®.
- 0° to 71°C Standard Operating Temperature
- Drop-in Replacement for SB-3621X card (No Application Software or Wiring Changes Required)
- Replacement for SDC-36015/6 ISA cards

DESCRIPTION

The SB-3624XIX-3L0 is a PCI card that contains six channels of fully independent Synchro- or Resolver-to-digital conversion. For each channel the conversion process is implemented using a DDC RD-19230 16-bit monolithic converter and a thin-film resistor network or Scott-T transformer. The power oscillator comes in two variations that support voltages up to 26 Vrms or 115 Vrms with input frequencies from 57 to 7 kHz (see Table 1).

Each channel has an independent signal and reference input, and the standard input is solid state. Transformer isolation is available for 90 V Synchro applications. Signal connections are provided through a 68-pin mini D-type connector (P1). The RD-19230 converter has an incremental encoder output, also known as "A quad B" or quadrature output, which consists of the A, B, and Zero Index (ZI) outputs. Other features include a self-test mode that places predetermined angular values on the input to the RD-19230, a turns counter to keep track of the number of rotations the synchro or resolver has made, and direction information to determine if the converter is counting up or down.

APPLICATIONS

Applications include modern, high performance industrial and military position feedback and control systems. Typical motion feedback applications include motor control, machine tool control, antenna control, robotics and process control systems. The SB-3624XIX-3L0 is supplied with a Graphical User Interface (GUI) to analyze position information, turns count, direction and BIT.

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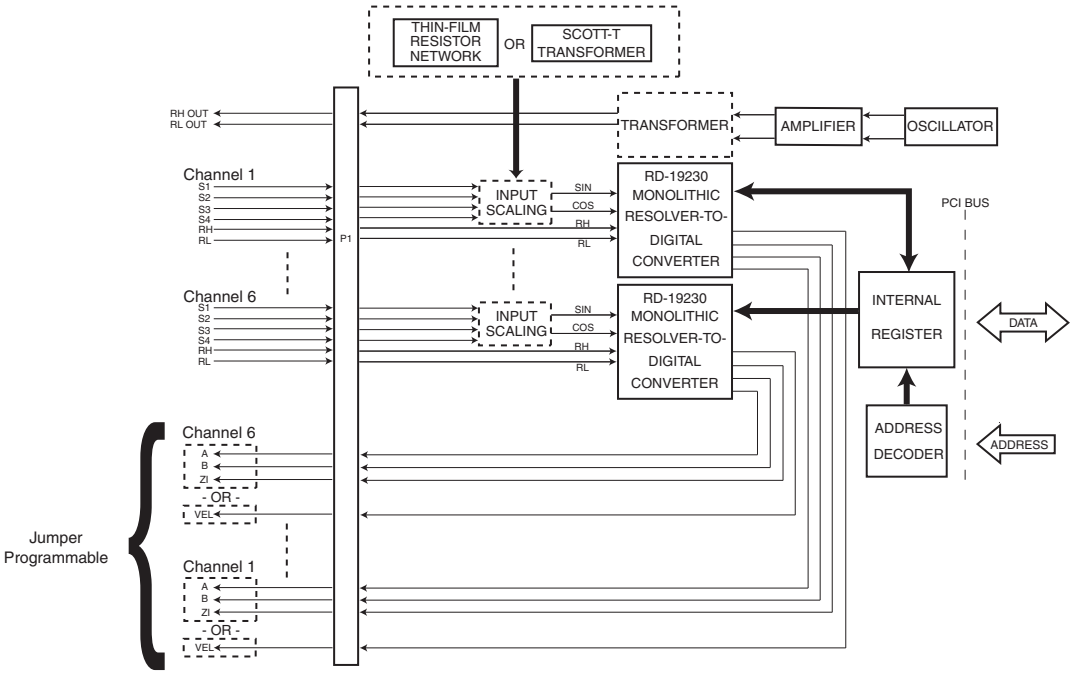


FIGURE 1. SB-3624XIX-3L0 BLOCK DIAGRAM

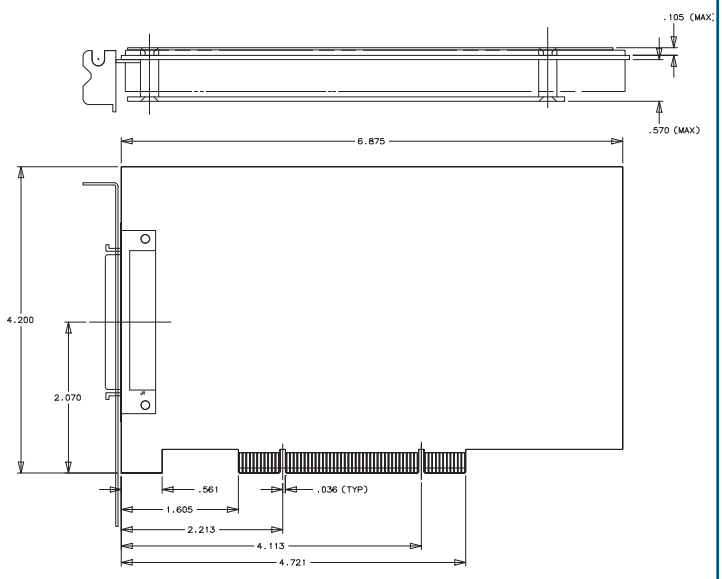
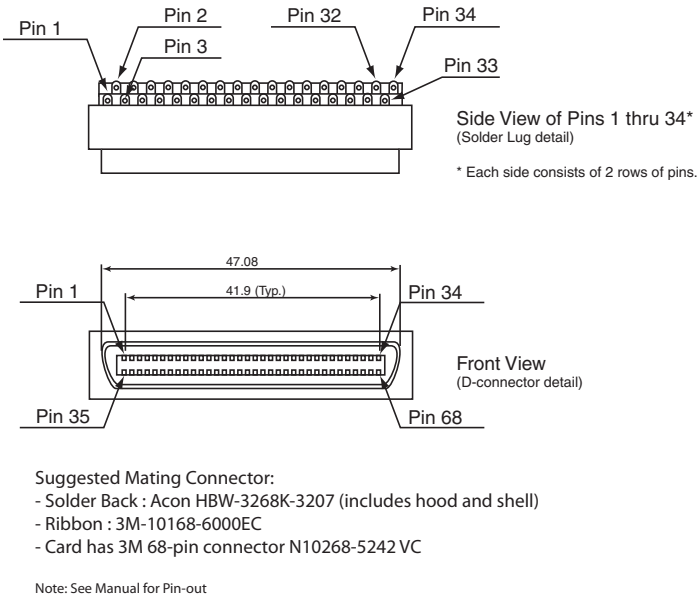


FIGURE 2. MECHANICAL OUTLINE



Suggested Mating Connector:
- Solder Back : Acon HBW-3268K-3207 (includes hood and shell)
- Ribbon : 3M-10168-6000EC
- Card has 3M 68-pin connector N10268-5242 VC

Note: See Manual for Pin-out

FIGURE 3. 68-PIN (MDR-TYPE) SOLDER BACK MATING CONNECTOR

HARDWARE CONFIGURATION

The SB-3624XIX-3L0 is a plug-and-play PCI device, and as such does not require jumpers or switches to set the base address or interrupt values. Configuration is performed by the PC BIOS. The SB-3624XIX-3L0 PCI card and software drivers allow for shared interrupts, thus simplifying the installation and reducing the risk of device conflicts.

BUILT-IN-TEST

The Built-In-Test (BIT) will flag Loss-of-Signal (LOS), Loss-of-Tracking (LOT), and Loss-of-Reference (LOR) fault conditions. Also, excessive error is detected when the difference between the analog input and the digital output exceeds approximately 100 LSBs of positive or 250 LSBs of negative error (in the selected resolution), the BIT will be asserted.

SELF-TEST

The card has built-in capability which runs a simulated test angle of 45 degrees on each channel. Any channel not reporting back an answer of 45° ± 1° will be failed. See the card manual for instructions to run self-test.

SYNTHESIZED REFERENCE

The synthesized reference eliminates errors due to phase shift between the reference and the signal inputs up to 45°.

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TABLE 1. SB-3624XIX-3L0 SPECIFICATIONS (PER CHANNEL)

These specifications apply over the rated power supply, temperature, and reference frequency ranges; 10% signal amplitude variation and 10% harmonic distortion. Refer to the RD-19230 data sheet (available at www.ddc-web.com)for specific converter specifications.

PARAMETER	UNIT	VALUE			
RESOLUTION	Bits	10, 12, 14, or 16 programmable			
ACCURACY (NOTE 1, NOTE 3)		**Input Frequency**			
		47 - 1k (NOTE 3)	**1k - 5k**	**5k - 7k**	
	Minutes	1 + 1 LSB	1 + 1 LSB	2 + 1 LSB	
OSCILLATOR		**Transformer Isolated**			
Oscillator Option P/N		(option IA)		(option IB)	
Carrier Frequency	Hz	360 - 7k		57 - 440	
Voltage Range	Vrms	0 - 26		0 - 115	
Drive	mA max.	60		13	
SIGNAL INPUT		**Solid State**			
Input Option P/N		(option 1, 2)	(option 3, 4)	(option 5, 6, 7, 8)	(option 9)
Synchro	Vrms L-L	2 direct	11.8	90	90
• Zin line-to-line	Ohms	10M || 20pF	70k	195k	250k
• Zin each line-to-ground	Ohms	—	140k	130k	125k
Resolver	Vrms L-L	2 differential	11.8	90v	—
• Zin single ended	Ohms	140k	70k	195k	—
• Zin differential	Ohms	280k	140k	130k	—
Common-mode Range	V	8 max.	30 max.	180 max	—
REFERENCE INPUT		**Solid State**			
Option P/N		(option 1, 2, 3, 4)		(option 5, 6, 7, 8,)	(option 9)
Carrier Frequency	Hz	47 - 7k		47 - 7k	—
Type		differential		differential	—
Voltage Range	Vrms	2 - 40		50 - 130	—
Input Impedance					
• single ended	Ohms	130k		2M	619k
• differential	Ohms	260k		500k	916k
Common-mode Range	Vpeak	50		200	—
DIGITAL OUTPUTS DRIVE CAPABILITY A, B, Zero Index (ZI)		50 Pf+ Logic 0: TTL load, 1.6 mA at 0.4 V Logic 1: 10 TTL loads, = 0.4 mA at 2.8 V min. Logic 0: 100 mV max. driving CMOS Logic 1: +5 V supply minus 100mV min. driving CMOS			
POWER SUPPLY					
Voltage	Vdc	+5		+5	
Current		0.665A min with oscillator, no load		1.725A max with oscillator loaded	
TEMPERATURE RANGE					
Operating	°C	0 to +71			
Storage	°C	-40 to +85			
PHYSICAL CHARACTERISTICS	in.	Short (half size) PCI format 6.875 x 4.2 x 0.57			

TABLE 1 NOTES:
1. Add 1 minute to specified accuracy for transformer isolated cards.
2. || = “in parallel with.”
3. Expect ±1 LSB jitter for frequencies between 47 and 1 kHz.

ON-BOARD INTERNAL REFERENCE OSCILLATOR

The on-board oscillator may be used to take the place of an external drive oscillator for the excitation signal. This oscillator is available in several options, see the ordering information page for details. Depending on oscillator selected, there are three programmable voltage ranges. Via software, the oscillator frequency and voltage are programmed. Voltage can be programmed up to max voltage selection ordered.

TWO SPEED

Two speed allows resolutions greater than 16 bits to be achieved. See “CalculateTwoSpeed” in Appendix A of the card manual for details. Also refer to the RD/RDC Applications manual (MN-19220XX-001) and the Synchro/Resolver Conversion Handbook. These documents are available at www.ddc-web.com.

INTERNAL INCREMENTAL OPTICAL ENCODER EMULATION

The card can be programmed to encoder emulation mode with ‘A’ and ‘B’ outputs available on the 68-pin mini D connector. ZI is the zero index.

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ORDERING INFORMATION

SB-3624 X I X -3L0

- 0 = 6 channel card
- L = Lab, non-rugged
- 3 = Operating Temperature 0°C to 71°C
- Oscillator Options: (note 6)

Option Number	Voltage Range	Frequency Range	Output Power (max)	Output Type
A	0 - 26 Vrms	360 - 7 KHz	1.5 VA	Transformer Isolated
B	0 - 115 Vrms	57 - 440 Hz	1.5 VA	Transformer Isolated

- Input Options:

#		Nominal Operating Frequency	Bandwidth	Oscillator Option
1	2 Vrms Direct	400 Hz	100 Hz / 300 Hz	A
2	2 Vrms Resolver (differential)	400 Hz	100 Hz / 300 Hz	A
3	11.8 Vrms Resolver	400 Hz	100 Hz / 300 Hz	A
4	11.8 Vrms Synchro	400 Hz	100 Hz / 300 Hz	A
5	90 Vrms Synchro	400 Hz	100 Hz / 300 Hz	B
6	90 Vrms Resolver	400 Hz	100 Hz / 300 Hz	B
7	90 Vrms Synchro	60 Hz	15 Hz / 45 Hz	B
8	90 Vrms Resolver	60 Hz	15 Hz / 45 Hz	B
9	90 Vrms Synchro - Transformer Isolated (note 5)	60 Hz	15 Hz / 45 Hz	B

Notes:

1. See TABLE 1 for accuracy vs. frequency.
2. Solid state input types use surface mount resistors, and the reference input has a voltage divider network. This voltage divider will allow for reference input ranges of 2.0 Vrms to 40 Vrms (for the 26 Vrms nominal option) or 50 Vrms to 130 Vrms (for the 115 Vrms nominal option). This is preset at the factory as specified by the ordering information. When the signal input is transformer isolated, the reference is also isolated.
3. Consult factory for switch on the fly option. See RD-19230 data sheet.
4. See manual for detailed hardware/software information.
5. Add 1 minute to specified accuracy.
6. Oscillator output is programmable to max voltage of option selected. Frequency range is programmable per the Oscillator Options table above.
7. The above products contain tin-lead solder.
8 Ref configuration is by surface mount resistors, and is not customer configurable.
9. Synchro vs. Resolver configurations can be modified in the field via thin-film resistor socket locations.

INCLUDED ACCESSORIES:

- MN-3624XIX-001 Hardware/Software Manual
- Windows GUI, DLL's & Libraries, Software Provided (CD Format)
- 1 Mating Connector
- Slot Guide Hardware
- PCI Retainer and Screws

STANDARD DDC PROCESSING FOR DISCRETE MODULES/PC BOARD ASSEMBLIES		
TEST	**METHOD(S)**	**CONDITION(S)**
INSPECTION / WORKMANSHIP	IPC-A-610	Class 3
ELECTRICAL TEST	DDC ATP	—

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