

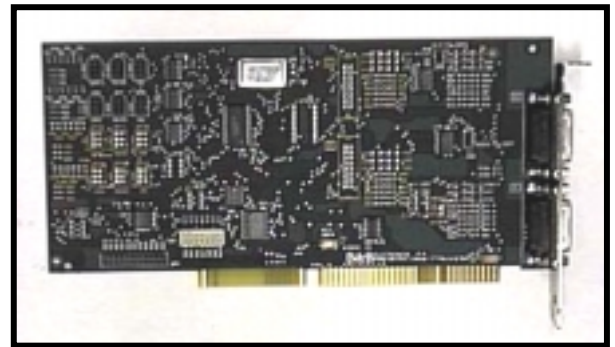
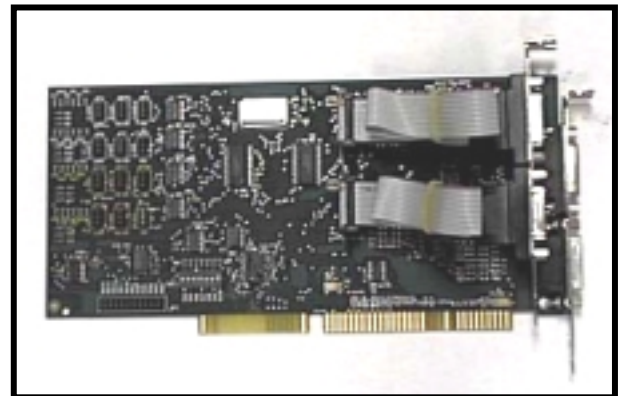
## Monitor High Speed Encoders with this Flexible 2 or 4 Channel Card

### Model 2IQEC2 (Two Axis) and Model 2IQEC4 (Four Axis)

The 2IQEC series is a quadrature encoder 24 bit counter card used to track the position of up to 4 separate encoders. The 2IQEC can be used in either an 8 or 16 bit ISA slot. This card allows the computer to keep track of position with minimal CPU overhead, freeing it up for more important tasks. The 2IQEC series offers a huge amount of flexibility. Upon a borrow or carry the card can be configured to reset, load a preset, cause an interrupt request or simply send out a TTL signal to indicate the carry or borrow. The card contains two inputs per axis, which can be configured to clear the counter or load the preset into the counter. The index lines may also be used to clear the counter, load the preset or cause an interrupt. All channels share a single IRQ to minimize the computer's resource requirements.

With a count rate of up to 12MHz, differential RS-422 or TTL inputs and the ability to cascade the channels, the 2IQEC series encoder card is the perfect solution in almost any industrial application. This product includes working example BASIC and C programs to make integration with new or existing code a simple task.

- Bus: IBM PC ISA bus
- Slot: Requires 1 full length slot for complete IRQ selectability. When installed in a short slot, IRQs 10-15 will not be available. For the four channel card an additional space is required to mount the connectors in the back panel. This space does not need a slot on the motherboard.
- Dimensions: 8.75" x 4.4"
- I/O connection: 15-pin female D-sub connectors
- Interrupt: IRQ 2-7, 10-12, 14, or 15
- 16 byte I/O space
- Address: Switch programmable, 0 to hex 7F0
- RS-422 Differential inputs
  - Differential input high-threshold voltage 0.2V max.
  - Differential input low threshold voltage -0.2V max.
  - Input differential voltage range 1.5 to 6 volts
- TTL inputs
  - Input high threshold 2 V Maximum
  - Input low threshold 0.7 V Maximum
  - Input voltage range -0.2 to 5.5 volts
- TTL outputs
  - 1 mA source @ 4.375 V
  - 5 mA sink @ 0.5 V
- 12 MHz count rate in quadrature 4X mode
- 30 MHz count rate in non-quadrature mode
- 24-bit counters for up to four axes
- Digital filtering of the quadrature clocks
- Power Consumption
  - +5 VDC @ 250 mA

**2IQEC2****2IQEC4**

## Pin Description

1.	A+
2.	A-
3.	A (TTL)
4.	B+
5.	B-
6.	B (TTL)
7.	I+
8.	I-
9.	I (TTL)
10.	FLG 2 (Programmed output)
11.	FLG 1 (Programmed output)
12.	Load Counter (Input)
13.	Reset Counter (Input)
14.	+5VDC
15.	Ground

## Quadrature Mode

Parameter	Symbol	Min. Value	Max. Value	Unit	Remarks
FCK High Pulse Width	t1	21	-	ns	-
FCK Low Pulse Width	t2	21	-	ns	-
FCK Frequency	f <sub>FCK</sub>	-	24	MHz	-
Mod-n Filter Clock (FCKn) Period	t3	42	-	ns	t3 = (n+1) (t1+t2), where N=PSC=0 to FFH
FCKn Frequency	f <sub>FCKn</sub>	-	24	MHz	-
Quadrature Separation	t4	83	-	ns	t4 ≥ 2t3
Quadrature Clock Pulse Width	t5	167	-	ns	t5 ≥ 4t3
Quadrature Clock Frequency	f <sub>QA</sub> , f <sub>QB</sub>	-	3	MHz	f <sub>QA</sub> =f <sub>QB</sub> =1/8t3
Quadrature Clock to Count Delay	tQ1	5t3	6t3	-	-
X1/X2/X4 Count Clock Pulse Width	tQ2	42	-	ns	tQ2=t3
Index Input Pulse Width	t <sub>idx</sub>	125	-	ns	t <sub>idx</sub> ≥ 3t3
Index Skew from A-	t <sub>Ai</sub>	-	42	ns	t <sub>Ai</sub> ≤ t3
Carry/Borrow/Compare Output Width	tQ3	42	-	ns	tQ3=t3

## Non-Quadrature Mode

Parameter	Symbol	Min. Value	Max. Value	Unit	Remarks
Clock A – High Pulse Width	t6	16	-	ns	-
Clock A – Low Pulse Width	t7	16	-	ns	-
Direction Input B Set-up Time	t8S	20	-	ns	-
Direction Input B Hold Time	t8H	20	-	ns	-
Gate Input (ABG) Set-up Time	tGS	20	-	ns	-
Gate Input (ABG) Hold Time	tGH	20	-	ns	-
Clock Frequency (non-Mod-N)	f <sub>A</sub>	-	30	MHz	f <sub>A</sub> =(1/(t6+t7))
Clock Frequency (Mod-N)	f <sub>AN</sub>	-	25	MHz	-
Clock to Carry or Borrow Out Delay	t9	-	30	ns	-
Carry or Borrow Out Pulse Width	t10	16	-	ns	t10=t7
Load CNTR, Reset CNTR and Load OL Pulse Width	t11	20	-	ns	-
Clock to Compare Out Delay	t12	50	-	ns	-