PCI-Based Serial Communication Cards



Recycled Paper

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Questions	
Product Model	
Environment to Use	OS _____ Computer Brand _____ M/B : CPU : Chipset : BIOS : Video Card : Network Interface Card : Other :
Challenge Description	
Suggestions for ADLINK	

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ADLINK PCI Multiport Card Comparison Chart

	C485	C514	C518	C584	C588	C888	C960/990/ 990D
Serial port	4~8	4~32	8~64	4~8	8~16	8~16	8~128
CPU	-	-	-	-	-	-	-
Serial communication controller	16C550	16C550	16C550	16C550	16C554	CD1865	16C554
MAX System throughput	115.2K*4	115.2K*4	115.2K*8	115.2K*4	115.2K*8	115.2K*8	104 /240 /360
Memory	-	-	-	-	-	128KByte SRAM	128KByte SRAM
Hardware compatibility	PCI bus	PCI bus	PCI bus	PCI bus	PCI bus	PCI bus	PCI bus
Software compatibility	DOS Windows (3.1/95/98/NT) LINUX SCO Open Server	DOS Windows (3.1/95/98/NT) LINUX SCO Open Server	DOS Windows (3.1/95/98/NT) LINUX SCO Open Server	DOS Windows (3.1/95/98/NT) LINUX SCO Open Server	DOS Windows (3.1/95/98/NT) LINUX SCO Open Server	SCO UNIX SCO XENIX AT&T UNIX Windows NT LINUX	SCO UNIX SCO XENIX AT&T UNIX Windows NT LINUX
External connector	Four DB25 male cable connector	Four DB25 male cable connector	Four DB25 male cable connector	Four DB25 male cable connector	Four DB25 male cable connector	Four DB25 male cable connector	F641 male modular box
Modular box 8 RS422 DB25 males	RS422 or RS485	-	-	Option (RS422)	Option (RS422)	Option (RS422)	F642
Remote access Box (building Mux)	-	-	-	-	-	-	R102 (Local) R106 (Remote)
Surge protection	Y	Y	Y	Y	Y	N	Y
Isolation protection (500VDC) (RS232,RS422, RS485)	Port A~D: Isolated for RS422 or RS485	Port D: Isolated RS422 or RS 485	Port H: Isolated RS422 or RS485	Y (RS4232-4) option	Y (RS4232-8) option	Y (RS4232-8) option	N
Dimension	6.25inch (length) 4.25inch (width)	5.75inch (length) 4.25inch (width)	6.25inch (length) 4.25inch (width)	5.5inch (length) 4.0inch (width)	5.5inch (length) 4.2inch (width)	6.2inch (length) 4.2inch (width)	5.5inch (length) 4.25inch (width)
Other specification	Box dimension : F641, F642 9.1 inch (length), 3.5 (width)						

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1

Introduction

1.1 About the Serial Communication Cards

- The serial communication cards are intelligent serial input/output multi-port controller cards which are suitable to PC AT with PCI bus machine. The cards can reduce the interval for serial communication controller to interrupt main CPU on the mainboard to improve the whole system performance.
- Traditionally, the serial communication controller will interrupt the MPU character by character. This action will waste MPU processing time and drop the system computing power. If the MPU is processing some non-interrupted task, then the serial controller will overrun and data lost.
- The serial communication interface series can support buffer capability or local processor and dual port RAM in each port's transmit and receive channel simultaneously. This capability will reduce the number of interrupt and increase the non-interrupt task's interval.
- The serial communication interface series used ASIC PCI controller to interface the board to PCI bus. The ASIC fully implement the PCI local bus specification Rev. 2.1. All bus relative configurations, such as base memory address and interrupt assignment, are automatically controlled by BIOS software. It does not need any user interaction and pre-study for the configurations. This removes the burden of searching for a conflict-free configuration.

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1.2 Overview of C514

1.2.1 What is C514?

The C514 is an enhanced four ports serial communication card used for PC with PCI bus. It includes a PGA to support the serial communication controller and a 37-pin connector to connect external I/O port.

The expansion cable has four standard DB25 connectors and one DB37 connector to connect to C514 interface card.

1.2.2 Feature of C514

- PCI Rev.2.1 Plug and Play
- IRQ and IO address automatically assigned by PCI plug-n-play
- 4 communication ports intelligent buffer
- 3 RS-232C compatible ports plus 1 isolated RS-422/485 interface
- Suitable for modems, data display, data collection, telecommunication
- Supports up to 8 cards/32 ports per system
- Supports Windows 95/98, NT operation system

1.2.3 Specification of C514

- **Compliant with PCI Spec.2.1**
- **Serial communication controller:**
  - 16C550A compatible
  - 1.8432 ~ 7.3728 MHz
  - Baud programmable upto 112Kbps ~ 448Kbps
- **System IO mapping:**
  - Assigned by PCI BIOS
  - Shared IRQ

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- **Flow control**
  - Xon/Xoff control
  - RTS/CTS control
- **Port Capability:**
  - 3 independent RS-232C compatible ports
  - 1 isolated RS-422/485 port with 500Vdc isolation voltage
  - Max. port per system: 32 (8 cards)
- **Operation System Compatibility: Windows 95/98/NT**
  - Connector : DB37 female connector
  - Cable : External cable with 4 standard DB25 male connector
  - Operating temperature : 0 ~ 55 °C
  - Storage temperature: -20 ~ 65 °C
  - Humidity : 10% ~ 95%, non-condensing
  - Power consumption : +5V @ 1400mA typical

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1.2.4 Connector Pin Assignment of C514

DB37 female connector pin assignment for C514.

DB37 Pin No.	Signal Name	DB37 Pin No.	Signal Name
1	RXD1(IN)	20	TXD1(OUT)
2	CTS1(IN)	21	RTS1(OUT)
3	DSR1(IN)	22	DTR1(OUT)
4	DCD1(IN)	23	RI1(IN)
5	GND	24	RXD2(IN)
6	TXD2(OUT)	25	CTS2(IN)
7	RTS2(OUT)	26	DSR2(IN)
8	DTR2(OUT)	27	DCD2(IN)
9	GND	28	RI2(IN)
10	GND	29	RI3(IN)
11	GND	30	DCD3(IN)
12	DTR3(OUT)	31	DSR3(IN)
13	RTS3(OUT)	32	CTS3(IN)
14	TXD3(OUT)	33	RXD3(IN)
15	GND4(ISO)	34	422RTS4-(OUT)
16	422CTS4-(IN)	35	422TXD4-(OUT)
17	422RXD4-(IN)	36	422RTS4+(OUT)
18	422CTS4+(IN)	37	422TXD4+(OUT)
19	422RXD4+(IN)	--	

Note: Please refers to 3.2 for pins connect of RS-485.

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1.3 Overview of C584

1.3.1 What is C584?

The C584 is an enhanced four ports serial communication card used for PC with PCI bus. It includes a PGA to support the serial communication controller and a 37-pin connector to connect external I/O port.

The expansion cable has four standard DB25 connectors and one DB37 connector to connect to C584 interface card. User may also use one DB37 to DB37 cable to connect between one C584 and C584XB for providing 4 channel isolated RS-232/422/485 interface.

1.3.2 Feature of C584

- PCI Rev.2.1 Plug and Play
- IRQ and IO address automatically assigned by PCI plug-n-play
- 4 communication ports intelligent buffer
- Suitable for modems, data display, data collection, telecommunication
- Supports up to 2 cards/8 ports per system
- Supports Windows 95/98, NT operation system
- Optional isolated RS-232/422/485 interface for each port independently
- One jumper to assign board & COM number .No problem to fix COM number for each card.
- Supports surge protector in TXD/RXD signal line

1.3.3 Specification of C584

- **Compliant with PCI Spec.2.1**
- **Serial communication controller:**
  - 16C550A compatible
  - 1.8432 ~ 7.3728 MHz

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- System IO mapping:
  - Assigned by PCI BIOS
  - Shared IRQ
- **Flow control**
  - Xon/Xoff control
  - RTS/CTS control
- **Port Capability:**
  - 4 independent RS-232C compatible ports
  - Optional external C584XB box for extending to 4 isolated RS-232/422/485 port
  - Max. port per system: 8 (2 cards)
- **Baud rate: Each port can be configured to 50~115,200 bps**
  - Operation System Compatibility: Windows 95/98/NT
  - Connector : DB37 female connector
  - Cable : External cable with 4 standard DB25 male connector
  - Operating temp erature: 0 ~ 55 °C
  - Storage temperature: -20 ~ 65 °C
  - Humidity : 10% ~ 95%, non-condensing
  - Power consumption: +5V @ 1400mA typical

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1.3.4 Connector Pin Assignment of C584

DB37 female connector pin assignment for C584.

DB37 Pin No.	Signal Name	DB37 Pin No.	Signal Name
1	RXD1(IN)	20	TXD1(OUT)
2	CTS1(IN)	21	RTS1(OUT)
3	DSR1(IN)	22	DTR1(OUT)
4	DCD1(IN)	23	RI1(IN)
5	GND	24	RXD2(IN)
6	TXD2(OUT)	25	CTS2(IN)
7	RTS2(OUT)	26	DSR2(IN)
8	DTR2(OUT)	27	DCD2(IN)
9	GND	28	RI2(IN)
10	GND	29	RI3(IN)
11	GND	30	DCD3(IN)
12	DTR3(OUT)	31	DSR3(IN)
13	RTS3(OUT)	32	CTS3(IN)
14	TXD3(OUT)	33	RXD3(IN)
15	GND	34	RI4(IN)
16	DCD4(IN)	35	DTR4(OUT)
17	DSR4(IN)	36	RTS4(OUT)
18	CTS4(IN)	37	TXD4(OUT)
19	RXD4(IN)	--	

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1.4 Overview of C518

1.4.1 What is C518?

The C518 is an enhanced eight ports serial communication card used for PC with PCI bus. It includes a PGA to support the serial communication controller and a 62-pin connector to connect external I/O port.

The expansion cable has eight standard DB25 connectors and one DB62 connector to connect to C518 interface card.

1.4.2 Feature of C518

- PCI Rev.2.1 Plug and Play
- IRQ and IO address automatically assigned by PCI plug-n-play
- 8 communication ports intelligent buffer
- 7 RS-232C compatible ports plus 1 isolated RS-422/485 interface
- Suitable for modems, data display, data collection, telecommunication
- Supports up to 8 cards/64 ports per system
- Supports Windows 95/98, NT operation system
- One DIP switch to assign board & COM number. No problem to fix COM number for each card

1.4.3 Specification of C518

- **Compliant with PCI Spec.2.1**
- **Serial communication controller:**
  - 16C550A compatible
  - 1.8432 ~ 7.3728 MHz
  - Baud programmable upto 112Kbps ~ 448Kbps
- **System IO mapping:**
  - Assigned by PCI BIOS

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- Shared IRQ

♦ **Flow control**

- Xon/Xoff control
- RTS/CTS control

♦ **Port Capability:**

- 7 independent RS-232C compatible ports
- 1 isolated RS-422/485 port with 500Vdc isolation voltage
- Max. port per system: 64 (8 cards)

♦ **Operation System Compatibility: Windows 95/98/NT**

♦ **Connector: DB62 female connector**

♦ **Cable: External cable with 8 standard DB25 male connector**

♦ **Operating temperature: 0 ~ 55 °C**

♦ **Storage temperature: -20 ~ 65 °C**

♦ **Humidity: 10% ~ 95%, non-condensing**

♦ **Power consumption: +5V @ 1400mA typical**

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1.4.4 Connector Pin Assignment of C518

DB62 female connector pin assignment for C518.

DB62 Pin No.	Signal Name	DB62 Pin No.	Signal Name	DB62 Pin No.	Signal Name
1	TXD1(OUT)	22	TXD2(OUT)	43	TXD3(OUT)
2	RXD1(IN)	23	RXD2(IN)	44	RXD3(IN)
3	RTS1(OUT)	24	RTS2(OUT)	45	RTS3(OUT)
4	CTS1(IN)	25	CTS2(IN)	46	CTS3(IN)
5	DSR1(IN)	26	DSR2(IN)	47	DSR3(IN)
6	DTR1(OUT)	27	DTR2(OUT)	48	DTR3(OUT)
7	DCD1(IN)	28	DCD2(IN)	49	DCD3(IN)
8	GND 1,4	29	GND 2,5	50	GND 3,6
9	DCD4(IN)	30	DCD5(IN)	51	DCD6(IN)
10	DTR4(OUT)	31	DTR5(OUT)	52	DTR6(OUT)
11	DSR4(IN)	32	DSR5(IN)	53	DSR6(IN)
12	CTS4(IN)	33	CTS5(IN)	54	CTS6(IN)
13	RTS4(OUT)	34	RTS5(OUT)	55	RTS6(OUT)
14	RDX4(IN)	35	RXD5(IN)	56	RXD6(IN)
15	TXD4(OUT)	36	TXD5(OUT)	57	TXD6(OUT)
16	TXD7(OUT)	37	RTS7(OUT)	58	DTR7(OUT)
17	RXD7(IN)	38	CTS7(IN)	59	DCD7(IN)
18	GND7	39	DSR7(IN)	60	GND8(ISO)
19	422RXD8+	40	422RXD8-	61	422CTS8-
20	422RTS8+	41	422RTS8-	62	422CTS8+
21	422TXD8+	42	422TXD8-	--	--

Note: Please refers to 3.2 for pins connect of RS-485.

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1.5 Overview of C588

1.5.1 What is C588?

The C588 is an enhanced eight ports serial communication card used for PC with PCI bus. It includes a PGA to support the serial communication controller and a 62-pin connector to connect external I/O port.

The expansion cable has eight standard DB25 connectors and one DB62 connector to connect to C588 interface card. User may also use one DB62 to DB62 cable to connect between one C588 and C588XB for providing 8 channel isolated RS-232/422/485 interface.

1.5.2 Feature of C588

- PCI Rev.2.1 Plug and Play
- IRQ and IO address automatically assigned by PCI plug-n-play
- 8 communication ports intelligent buffer
- Suitable for modems, data display, data collection, telecommunication
- Supports up to 2 cards/16 ports per system
- Supports Windows 95/98, NT operation system
- Optional isolated RS-232/422/485 interface for each port independently
- One jumper to assign board & COM number. No problem to fix COM number for each card
- Supports surge protect in TXD/RXD signal line

1.5.3 Specification of C588

♦ **Compliant with PCI Spec.2.1**

♦ **Serial communication controller:**

- 16C550A compatible
- 1.8432 ~ 7.3728 MHz

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- **System IO mapping:**
  - Assigned by PCI BIOS
  - Shared IRQ
- **Flow control**
  - Xon/Xoff control
  - RTS/CTS control
- **Port Capability:**

- 8 independent RS-232C compatible ports
- Optional external C588XB box for extending to 8 isolated RS-232/422/485 port
- Max. port per system: 16 (2 cards)

- **Baud rate: Each port can be configured to 50~115,200 bps**
- **Operation System Compatibility: Windows 95/98/NT**
- **Connector: DB62 female connector**
- **Cable: External cable with 8 standard DB25 male connector**
- **Operating temperature: 0 ~ 55 °C**
- **Storage temperature: -10 ~ 70 °C**
- **Humidity: 10% ~ 95%, non-condensing**
- **Power consumption: +5V @ 1400mA typical**

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1.5.4 Connector Pin Assignment of C588

DB62 female connector pin assignment for C588.

DB62 Pin No.	Signal Name	DB62 Pin No.	Signal Name	DB62 Pin No.	Signal Name
1	TXD1(OUT)	22	TXD2(OUT)	43	GND
2	RXD1(IN)	23	RXD2(IN)	44	GND
3	RTS1(OUT)	24	RTS2(OUT)	45	GND
4	CTS1(IN)	25	CTS2(IN)	46	TXD4(OUT)
5	DSR1(IN)	26	DSR2(IN)	47	RXD4(IN)
6	DTR1(OUT)	27	DTR2(OUT)	48	RTS4(OUT)
7	DCD1(IN)	28	DCD2(IN)	49	CTS4(IN)
8	TXD3(OUT)	29	TXD7(OUT)	50	DSR4(IN)
9	RXD3(IN)	30	RXD7(IN)	51	DTR4(OUT)
10	RTS3(OUT)	31	RTS7(OUT)	52	DCD4(IN)
11	CTS3(IN)	32	CTS7(IN)	53	TXD8(OUT)
12	DSR3(IN)	33	DSR7(IN)	54	RXD8(IN)
13	DTR3(OUT)	34	DTR7(OUT)	55	RTS8(OUT)
14	DCD3(IN)	35	DCD7(IN)	56	CTS8(IN)
15	TXD5(OUT)	36	TXD6(OUT)	57	DSR8(IN)
16	RXD5(IN)	37	RXD6(IN)	58	DTR8(OUT)
17	RTS5(OUT)	38	RTS6(OUT)	59	DCD8(IN)
18	CTS(IN)	39	CTS6(IN)	60	GND
19	DSR5(IN)	40	DSR6(IN)	61	GND
20	DTR5(OUT)	41	DTR6(OUT)	62	GND
21	DCD5(IN)	42	DCD6(IN)	--	--

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1.6 Overview of C485

1.6.1 What is C485?

The C485 is an enhanced four ports serial communication card used for PC with PCI bus. It includes a PGA to support the serial communication controller and a 37-pin connector to connect external I/O port.

The expansion cable has four standard DB25 connectors and one DB37 connector to connect to C485 interface card.

1.6.2 Feature of C485

- PCI Rev.2.1 Plug and Play
- IRQ and IO address automatically assigned by PCI plug-n-play
- 4 communication ports intelligent buffer
- Suitable for modems, data display, data collection, telecommunication
- Supports up to 2 cards/8 ports per system
- Supports Windows 95/98, NT operation system
- Isolated RS-422/485 interface for each port independently

1.6.3 Specification of C485

♦ **Compliant with PCI Spec.2.1**

♦ **Serial communication controller:**

- 16C550A compatible
- 1.8432 ~ 7.3728 MHz

♦ **System IO mapping:**

- Assigned by PCI BIOS
- Shared IRQ

♦ **Flow control**

- Xon/Xoff control

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- RTS/CTS control

♦ **Port Capability:**

- 4 isolated RS-422/485 port with 500Vdc isolation voltage
- Max. port per system: 8 (2 card)

♦ **Baud rate: Each port can be configured to 50~115,200 bps**

♦ **Operation System Compatibility: Windows 95/98/NT**

♦ **Connector: DB37 female connector**

♦ **Cable: External cable with 4 standard DB25 male connector**

♦ **Operating temperature: 0 ~ 55 °C**

♦ **Storage temperature: -10 ~ 70 °C**

♦ **Humidity: 10% ~ 95%, non-condensing**

♦ **Power consumption: +5V @ 1400mA typical**

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1.6.4 Connector Pin Assignment of C485

DB37 female connector pin assignment for C485.

DB37 Pin No.	Signal Name	DB37 Pin No.	Signal Name
1	RXDA+(IN)	20	TXDA+(OUT)
2	---	21	---
3	RXDA-(IN)	22	TXDA-(OUT)
4	---	23	---
5	GND.A	24	RXDB+(IN)
6	TXDB+(OUT)	25	---
7	---	26	RXDB-(IN)
8	TXDB-(OUT)	27	---
9	GND.B	28	---
10	---	29	---
11	GND.C	30	---
12	TXDC-(OUT)	31	RXDC-(IN)
13	---	32	---
14	TXDC+(OUT)	33	RXDC+(IN)
15	GND.D	34	---
16	---	35	TXDD-(OUT)
17	RXDD-(IN)	36	---
18	---	37	TXDD+(OUT)
19	RXDD+(IN)	--	

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1.7 Overview of C888

1.7.1 What is C888?

The C888 is intelligent eight ports serial communication card used for PC with PCI bus. It includes a local high performance processor to manage the data flow between main CPU and external interface. It also includes dual port RAM, through the dual port RAM, the local processor can communicate with main CPU.

The expansion cable has eight standard DB25 connectors and one DB62 connector to connect to C888 interface card. User may also use one DB62 to DB62 cable to connect between one C888 and C888XB for providing 8 channel isolated RS-232/422/485 interface.

1.7.2 Feature of C888

- PCI Rev.2.1 Plug and Play
- IRQ and IO address automatically assigned by PCI plug-n-play
- 8 intelligent communication ports
- Built-in 80960KA RISC processor
- Built-in RISC type communication controller CD1865
- Suitable for modems, data display, data collection, telecommunication
- Supports up to 2 cards/16 ports per system
- Supports Windows NT & UNIX/XENIX operation system
- Optional isolated RS-232/422/485 interface for each port independently

1.7.3 Specification of C888

- **Compliant with PCI Spec.2.1**
- **Built-in Intel i960KA RISC processor, 20MHz**
- **128K byte dual port RAM**
- **Serial communication controller:**
  - CD1865 compatible

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- 29.4912 MHz

♦ **System IO mapping:**

- Assigned by PCI BIOS
- Shared IRQ

♦ **Flow control**

- Xon/Xoff control
- RTS/CTS control

♦ **Port Capability:**

- 8 independent RS-232C compatible ports
- Optional external C588XB box for extending to 8 isolated RS-232/422/485 port
- Max. port per system: 16 (2 cards)

♦ **Baud rate: Each port can be configured to 50~115,200 bps**

♦ **Throughput 104K byte/sec**

♦ **Operation System Compatibility: Windows NT, UNIX/XENIX**

♦ **Connector: DB62 female connector**

♦ **Cable: External cable with 8 standard DB25 connector**

♦ **Operating temperature: 0 ~ 55 °C**

♦ **Storage temperature: -20 ~ 65 °C**

♦ **Humidity: 10% ~ 95%, non-condensing**

♦ **Power consumption: +5V @ 1700mA typical**

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1.7.4 Connector Pin Assignment of C888

DB62 female connector pin assignment for C888.

DB62 Pin No.	Signal Name	DB62 Pin No.	Signal Name	DB62 Pin No.	Signal Name
1	TXD1(OUT)	22	TXD2(OUT)	43	GND
2	RXD1(IN)	23	RXD2(IN)	44	GND
3	RTS1(OUT)	24	RTS2(OUT)	45	GND
4	CTS1(IN)	25	CTS2(IN)	46	TXD4(OUT)
5	DSR1(IN)	26	DSR2(IN)	47	RXD4(IN)
6	DTR1(OUT)	27	DTR2(OUT)	48	RTS4(OUT)
7	DCD1(IN)	28	DCD2(IN)	49	CTS4(IN)
8	TXD3(OUT)	29	TXD7(OUT)	50	DSR4(IN)
9	RXD3(IN)	30	RXD7(IN)	51	DTR4(OUT)
10	RTS3(OUT)	31	RTS7(OUT)	52	DCD4(IN)
11	CTS3(IN)	32	CTS7(IN)	53	TXD8(OUT)
12	DSR3(IN)	33	DSR7(IN)	54	RXD8(IN)
13	DTR3(OUT)	34	DTR7(OUT)	55	RTS8(OUT)
14	DCD3(IN)	35	DCD7(IN)	56	CTS8(IN)
15	TXD5(OUT)	36	TXD6(OUT)	57	DSR8(IN)
16	RXD5(IN)	37	RXD6(IN)	58	DTR8(OUT)
17	RTS5(OUT)	38	RTS6(OUT)	59	DCD8(IN)
18	CTS(IN)	39	CTS6(IN)	60	GND
19	DSR5(IN)	40	DSR6(IN)	61	GND
20	DTR5(OUT)	41	DTR6(OUT)	62	GND
21	DCD5(IN)	42	DCD6(IN)	--	--

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1.8 Overview of C960/C990/C990D

1.8.1 What is C960/C990/C990D?

The C960/C990/C990D is an intelligent serial port controller card used for PC with PCI bus. It includes a local high performance processor to manage the data flow between main CPU and external interface. It also includes dual port RAM, through the dual port RAM, the local processor can communicate with main CPU.

The expansion cable has one DB37 connectors to connect external I/O ports, all the I/O interface control circuitry and connector are built in one expansion box. There are different boxes for different interface and control function requirement.

1.8.2 Feature of C960/C990/C990D

- PCI Rev.2.1 Plug and Play
- IRQ and IO address automatically assigned by PCI plug-n-play
- Built-in 80960KA-20 RISC processor for C960
- Built-in 80960JF-25 RISC processor for C990
- Built-in 80960JD-50 RISC processor for C990D
- Suitable for modems, data display, data collection, telecommunication
- Modular structure, easy to setup and expand ports
- Expand from 8 serial ports to 64 serial ports in just 5 second
- Supports up to 2 cards/128 ports per system
- Supports Windows NT & UNIX/XENIX operation system

1.8.3 Specification of C960/C990/C990D

- **Compliant with PCI Spec.2.1**
- **Built-in Intel i960KA RISC processor, 20MHz for C960**
- **Built-in Intel i960JF RISC processor, 25MHz for C990**
- **Built-in Intel i960JD RISC processor, 50MHz for C990D**

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- **128K byte dual port RAM**
- **A system includes one controller board and at least one expansion box**
- **At most 8 expansion boxes in one system**
- **System IO mapping:**
  - Assigned by PCI BIOS
  - Shared IRQ
- **Port Capability:**
  - 8 independent RS-232C compatible ports for F641 expansion box
  - 8 independent RS-422 compatible ports for F642 expansion box
- **Throughput 104K byte/sec for C960+F641/2**
- **Throughput 240K byte/sec for C990+F641/2**
- **Throughput 360K byte/sec for C990D+F641/2**
- **Operation System Compatibility: Windows NT, UNIX/XENIX**
- **Connector: DB37 male connector**
- **Operating temperature: 5 ~ 40 °C**
- **Storage temperature: 0 ~ 65 °C**
- **Humidity: 10% ~ 90%, non-condensing**
- **Power consumption: +5V @ 1400mA typical for C960**
- **Power consumption: +5V @ 1170mA typical for C990**
- **Power consumption: +5V @ 1260mA typical for C990D**

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1.8.4 Connector Pin Assignment of C960/C990/C990D

DB37 male connector pin assignment for C960/C990/C990D.

DB37 Pin No.	Signal Name	DB37 Pin No.	Signal Name
1	BOXD0	20	BOXIRQ0
2	BOXD1	21	BOXIRQ1
3	BOXD2	22	BOXIRQ2
4	BOXD3	23	BOXIRQ3
5	BOXD4	24	VCC +5V
6	BOXD5	25	V- -12V
7	BOXD6	26	GND
8	BOXD7	27	V+ +12V
9	BOXA1	28	GND
10	BOXA2	29	VCC +5V
11	BOXA3	30	GND
12	BOXA4	31	V- -12V
13	BOXA5	32	GND
14	BOXA6	33	V+ +12V
15	BOXA7	34	GND
16	BOXA8	35	VCC +5V
17	BOXA9	36	BOXRESET
18	BOXRD	37	BOXCE
19	BOXWR	--	--

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2

Installation

This chapter describes the configurations of the serial communication cards. At first, the contents in the package and unpacking information that you should care about are described. The serial communication cards are plug-and-play and very easy to install into any PC system with PCI slots.

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2.1 What You Have

In addition to this *User's Manual*, the package includes the following items:

For C514/C584/C518/C588/C485/C888:

- C514/C584/C518/C588/C485/C888 Serial Communication Interface Card
- Expansion Cable
- Software Utility CD or Disks

For C960/C990/C990D:

- C960/C990/C990D Serial Communication Controller Card
- Software Utility CD or Disks

For F641/F642:

- F641/F642 Expansion Box
- Expansion Cable

For C584XB/C588XB:

- C584XB/C588XB Isolated Extension Box
- Expansion Cable

If any of these items is missing or damaged, contact the dealer from whom you purchased the product. Save the shipping materials and carton in case you want to ship or store the product in the future.

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2.2 Unpacking

Your serial communication card contains sensitive electronic components that can be easily damaged by static electricity.

The card should be done on a grounded anti-static mat. The operator should be wearing an anti-static wristband, grounded at the same point as the anti-static mat.

Inspect the card module carton for obvious damage. Shipping and handling may cause damage to your module. Be sure there are no shipping and handing damages on the module before processing.

After opening the card module carton, extract the system module and place it only on a grounded anti-static surface component side up.

Again inspect the module for damage. Press down on all the socket IC's to make sure that they are properly seated. Do this only with the module place on a firm flat surface.

Note: DO NOT APPLY POWER TO THE CARD IF IT HAS BEEN DAMAGED.

You are now ready to install your PCI Card.

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2.3 Installation Procedure

1. Turn off your computer

2. Turn off all accessories (printer, modem, monitor, etc.) connected to computer.

3. Remove the cover from your computer.

4. Select a 32-bit PCI expansion slot.

Caution! Don't put PCI card into ISA or EISA slot.

5. Before handling the serialcommunication card, discharge any static buildup on your body by touching the metal case of the computer. Hold the edge and do not touch the components.

6. Position the board into the PCI slot you selected.

7. Secure the card in place at the rear panel of the system unit using screw removed from the slot.

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2.4 Hardware Configuration

The serial communication card has plug and play component, the card can requests memory usage (I/O port locations) of the card which is assigned by system BIOS. The address assignment is done on a board-by-board basis for all serial communication cards in the system.

The jumper JP1 for the serial communication card is used for the system to recognize the first or second card of the same model in the system if there are two cards of the same on board.

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2.5 Software Installation

2.5.1 Windows NT Installation

Once Windows NT system has been started, login using an account with administrative right.

1. Start the [Control Panel] applet by double clicking the icon in the [Program Managers] main group

2. In the [Control Panel] applet, double click [Network] icon to bring up the Network Control Panel Applet (NCPA).

3. Within the NCPA, select the [Add Adaptor] button, a list of possible adaptors should be displayed. Go to the end of this list and select <Other> requires disk from manufacturer.

4. When prompted for the path, specify the drive and directory where the NCPA can find the new driver for the card you install.

   For C514, we may specify as follow:

   X:\NuCOM\C514518\P514\NT4

   For C584, we may specify as follow:

   X:\NuCOM\C584588\P584\NT4

   For C518, we may specify as follow:

   X:\NuCOM\C514518\P518\NT4

   For C588, we may specify as follow:

   X:\NuCOM\C584588\P588\NT4

   For C485, we may specify as follow:

   X:\NuCOM\C584588\P584\NT4

   For C888/C960/C990/C990D, we may specify as follow:

   X:\NuCOM\C9x0888\Nt4

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1. Now, you can follow the configuration dialog boxes to install the driver.

2. In the default condition, the TTY port is given name from “COM3”. User can specify the start “COM” port number in installation procedure.

3. We can install up to two same type serial communication cards in one NT system.

4. When you need to install two same type serial communication cards in one NT system, you must confirm to let one card’s jumper JP1 is ON while the other card’s jumper JP1 is OFF.

5. The card with jumper ON will have low COM port number. The card with jumper OFF will have higher COM port number follow the card with jumper ON.

6. If you install two same type serial communication cards with jumper ON or OFF simultaneously, we can not confirm that both cards will active properly.

7. If you install multiple cards in one NT system simultaneously, please confirm that the COM port number assigned do not overlap for different card. Or you may have improperly operation in your system.

8. For easy to maintain NT system’s COM port number, we suggest that you must set the jumper ON for the first card to be installed in NT system.

9. After you install the driver, you need to reboot your PC, then you can have more COM port available.

10. If you had installed our NT driver in your system before, you might remove this driver firstly, then you can install our new version driver. Or you might have some problem in your system.

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2.5.2 Windows 95/98 Installation

Once Windows 95/98 system has been started, the plug & play function in 95/98 system will find the new serial communication card. If this is the first time to install serial communication card in your Windows 95/98 system, you will be informed to install the driver. Please follow the steps to install the driver.

1. Click the Next button in the Update Device Driver Wizard window, Win95 will start to search floppy drive A for the Serial Communication card driver information, After fail to find the information in drive A, it will display the message "Windows was unable to locate a driver for this device."

2. Insert ADLINK's All-in-one CD-ROM drive.

3. Click the "Other Location…" button in the Update Device Driver Wizard Window, then the Select Other Location windows will appear.

4. Click Browse button to invoke the Browser for Folder window, then select the location

   X*:\NuCOM\C584588** (X*** indicates the CD-ROM drive).

Because the resource will be assigned by PCI BIOS, it is not easy to check which card is first or second from resource. So the jumper JP1 will play the role for system to fix the COM port number for each card.

After you had installed the driver, you might be informed to have new hardware found. You do not have to install the driver again, Windows 95/98 will add the COM port automatically.

1. You can install up to two C584/C588 cards in one 95/98 system.

2. When you need to install two same type cards in one 95/98 system, you must confirm to let one card's jumper is ON, and the other card's jumper is OFF.

3. The card with jumper ON will have COM port number assigned for first card. The card with jumper OFF will have COM port number assigned for second card.

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4. If you install two same type serial communication cards with jumper ON or OFF simultaneously, we can not confirm that both cards will active properly.

5. If you install multiple cards in one 95/98 system simultaneously, please confirm that the COM port number assigned do not overlap for different card. Or you may have improperly operation in your system.

6. For easy to maintain 95/98 system's COM port number, we suggest that you must set the jumper ON for the first card to be installed in 95/98 system.

7. The serial communication card can be used in interrupt shared mode. PCI BIOS will assign IRQ for each serial communication card. For multi-card application, we can just share one IRQ in each card, but you must confirm that one system may have minimum one IRQ left for P&P function. If there are no IRQ left to be assigned to serial communication card, you might have wrong operation.

2.5.3 UNIX/XENIX Installation

Under the UNIX/XENIX operation system, the serial communication card is an extra peripheral device. A device driver should be linked with the kernel to build a new kernel system. The serial communication system will work after the new kernel system is restarted.

The installation environment could be

1. IBM PC/AT X86 or other compatible machine.

2. UNIX system V release 3 releases 4 or SCO XENIX system V.

3. Under the above environment, all the link kit packages should be installed completely.

Files in the installation diskette have

1. /etc/PCIIOP/README

2. /etc/PCIIOP/build

3. /etc/PCIIOP/d1

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4. /etc/PCIIOP/OBJ/P960F.O (For different card, replace P960F to relative name)

5. /etc/PCIIOP/DRIVER/Driver.x

6. /etc/PCIIOP/DRIVER/Driver.u

7. /etc/PCIIOP/DRIVER/Driver.u1

8. /etc/PCIIOP/DRIVER/Driver.s

9. /etc/PCIIOP/DRIVER/Driver.e

10. /etc/PCIIOP/DRIVER/Driver.e2

11. /etc/PCIIOP/DRIVER/Driver.e6

12. /etc/PCIIOP/etty

13. /etc/PCIIOP/om (This is the utility file for interface card operation condition monitor.)

What may be happened while installing:

1. Link kit packages have not been installed completely. (Install like kit completely.)

2. Can not boot the system due to low voltage. (Use a higher wattage power supply.)

Installation Procedures:

1. Login as a super user.

   Login: root

   Password:

   # /etc/custom

2. Choose the “Add a Supported Product” item, and then select “Install one or more packages” item.

   How many cards can be installed?

   Enter 1-2 or enter q to quit:

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3. Please strike the numeric key 1 to 2 to continue the installation procedure.

   Updating system configuration.

   Making terminal device 100%.

   Editing terminal definitions 100%.

   Installing serial communication card driver.

   You must create a new kernel to effect the driver change to your specified.

   Do you wish to create a new kernel now? (y/n)

4. Now strike “n” key if you want to quit this procedure, or “y” key to continue the procedure.

5. From this procedure, the screen message and installation procedure will be different for XENIX and UNIX system.

   In XENIX system:

   Re-linking the kernel.

   Kernel with driver modifications is in /usr/sys/conf/xenix

   Do you want this kernel to reboot by default? (y/n) y

   The new kernel is installed in /xenix.

   Reboot your system to activate it.

   #

   In UNIX system:

   The UNIX operating system will now be rebuild.

   This will take a few minutes. Please wait.

   The UNIX Kernel has been rebuilt

6. At sight of the above message, you can assure that you have finished your installation. At this moment, please shutdown the operating system and reboot it.

When there is no “custom” command in system, you can use the “tar” command.

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1. Login as a super user.

   Login: root
   Password:
   # cd/

2. Extract all the files on the diskette by “tar” command.

   tar xvf /dev/fd0135ds18

3. # cd /etc/PCIIOP

4. # ./build

5. System will display following main menu on the screen:

   Global View Intelligent Input/Output Processor

   Installation:

   Install PCIIOP Driver

   Remove PCIIOP Driver

   Select an option or enter q to quit: 1

6. Choose the “Add a Supported Product” item, and then select “Install one or more packages” item.

   How many cards can be installed?

   Enter 1-2 or enter q to quit:

7. Please strike the numeric key 1 to 2 to continue the installation procedure.

   Updating system configuration.

   Making terminal device 100%.

   Editing terminal definitions 100%.

   Installing serial communication card driver.

   You must create a new kernel to effect the driver change to your specified.

   Do you wish to create a new kernel now? (y/n)

8. Now strike “n” key if you want to quit this procedure, or “y” key to continue the procedure.

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9. From this procedure, the screen message and installation procedure will be different for XENIX and UNIX system.

   In XENIX system:

   Re-linking the kernel.

   Kernel with driver modifications is in /usr/sys/conf/xenix

   Do you want this kernel to reboot by default? (y/n) y

   The new kernel is installed in /xenix.

   Reboot your system to activate it.

   #

   In UNIX system:

   The UNIX operating system will now be rebuild.

   This will take a few minutes. Please wait.

   The UNIX Kernel has been rebuilt

10. At sight of the above message, you can assure that you have finished your installation. At this moment, please shutdown the operating system and reboot it.

After restarting the new kernel, the IO processor will indicate as follows:

PCIIOP: unit = 0 type = P960F bus = 0 dev = 0 fun = 0 map = 0xF4000000 : 8KB

.
.
.
.

Downloading PCIIOP card(s) ……

PCIIOP: unit = 0 type = P960F dram = 0MB ports = 8 (F641)

.
.
.
.

Here:

"unit =" denotes the installation card number in the system.

"type =" denotes the PCIIOP interface card type.

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“map =” denotes the mapping address and memory space of dual port RAM, should be assigned by PCI bus.

“dram =” denotes the PCIIOP interface card’s built-in memory space.

“ports =” denotes the number of ports, which should be octal of the number of expansion boxes.

When the above message appears and all of the LED in F641/F642 expansion boxes light on, it means the communication interface controller has been installed successfully.

If the message of “map =” or “ports =” is not correct (including no message) or any of the LED in F41/F641 box is not on, you should proceed error detecting and correcting procedure as follows:

1. Shutdown the operating system, turn off the power.

2. If you can not boot the system successfully, please check the voltage level. If the voltage level is too low to boot the system, check the number of controller card and F641/F642 box.

3. Insure the controller interface card has been inserted correctly at system expansion slot. Insure the DB37 cable has been connected correctly between controller card and F641/F642 box.

4. Check the memory mapping setting and insure that it does not conflict with other device’s memory mapping.

5. Check the PCI bus clock is 33 MHz and 5V slot. Some main board manufacture may set to higher PCI frequency.

6. Turn on the power and reboot the operating system. If you can insure the device driver is well installed, it is not necessary to re-execute the software installation procedure. Otherwise you may need to re-execute the software installation procedure.

7. If the message does not indicate correctly, please repeat previous procedure or contact your supplier.

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Definitions of serial port device:

Card No.	Device Name
1	tty6??
2	tty7??

Card number 1 is the card with JP1 jumper on.

F641/F642 Box No.	Device Name
1	tty?1?
2	tty?2?
3	tty?3?
4	tty?4?
5	tty?5?
6	tty?6?
7	tty?7?
8	tty?8?

Port No.	Device Name (non Modem)	Device Name (Modem)
1	tty??a	tty??A
2	tty??b	tty??B
3	tty??c	tty??C
4	tty??d	tty??D
5	tty??e	tty??E
6	tty??f	tty??F
7	tty??g	tty??G
8	tty??h	tty??H

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3

Expansion/Isolation Box User Guide

3.1 Introduction

An APU is the kernel of a serial communication controller system. It can manage up to 8 pieces of F641/F642 box. The APU communicates with the MPU via dual port RAM and processes the data transfer between MPU and I/O devices.

F641 box:

Interface: RS-232

Controller: FIFO type ST16C554 controller

Connector: 25 pin D-type male (8 ports per box)

F642 box:

Interface: RS-422

Controller: FIFO type ST16C554 controller

Connector: 25 pin D-type male (8 ports per box)

C584XB/C588XB is used to convert RS-232 input signal to isolated RS-232, RS-422 or RS-485 interface. We support signal ground isolation system between PC system and external application system. We have two models to support four ports (C584XB) or eight ports (C588XB).

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Each port has two bit DIP switch to set for RS-232, RS-422 or RS-485 interface. In RS-485 mode, we had auto data direction function to maintain no local echo condition, but user may still need to maintain just only one port to output data, so RS-485 mode must be used in half-duplex transmission environment. For full-duplex transmission environment, user may need to use RS-422 mode.

In C584XB/C588XB box, we have one built-in switching power supply. This power supply can accept 100-265VAC input or 48-60VDC input (option).

In C584XB box, we can use one DB37 to DB37 cable to connect with C584 card. In C588XB box, we can use one DB62 to DB62 cable to connect with C588/C888. All the cable is connected in pin to pin direct connection type.

RS-422 interface application note:

RS-422 interface is used for point to point connection or multi-drop application. We can use RTS & CTS signal to have hardware handshake between two devices. But user may need to keep in mind that we can only let one driver output signal to be active in one time, or you may let the driver IC be burnt.

Even though we had put one 120 ohm terminator resistor in each input signal pair, user may need to remove this terminator resistor for proper operation.

Due to proper operation, user may not let one cable left in unconnected condition. Because the crosstalk problem may let one transmit data signal to be coupled to receive data input. This may lead wrong process in some application environment.

Because RS-422 interface do not use DTR/DSR/DCD signal, user may not use DTR/DSR handshake and DCD signal checking function in its application, these signals are in inactive condition for RS-422 interface.

RS-485 interface application note:

RS-485 interface is used for multi-drop half-duplex application. Because we had put auto-direction capability in the box, user may not use RTS signal to control the data direction. So it is no use for RTS/CTS signal in RS-485 interface. Because we had put one 120 ohm terminator resistor in RXD input signal pair, user may need to remove this terminator resistor for proper operation.

Due to proper operation, user may not let one cable left in unconnected condition. Because the crosstalk problem may let one transmit data signal to be coupled to receive data input. This may lead wrong process in some application environment.

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Because RS-485 interface do not use RTS/CTS/DTR/DSR/DCD signal, user may not use RTS/CTS or DTR/DSR handshake and DCD signal checking function in its application, these signals are in inactive condition for RS-422 interface.

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3.2 Pin Definition / DIP Switch Setting

The pin definition for F641 box DB25 male connector.

Pin No.	Signal Name
1	Frame Ground
2	Transmit Data Out
3	Receive Data In
4	RTS Out
5	CTS In
6	DSR In
7	Signal Ground
8	DCD In
20	DTR Out

The pin definition for F642 box DB25 male connector.

Pin No.	Signal Name
1	Frame Ground
7	Signal Ground
9	RTD+
10	RTD-
11	TXD+
12	TXD-

The pin definition for RS-232 DB25 male connector.

Pin No.	RS-232 Mode Signal Name
2	TXD (Out)
3	RXD (In)
4	RTS (Out)
5	CTS (In)
6	DSR (In)
7	GND
8	DCD (In)
20	DTR (Out)

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The pin definition for RS-422/485 DB25 male connector.

Pin No.	RS-422/485 Mode Signal Name
2	TXD+ (Out)
3	RXD+ (In)
4	RTS+ (Out)
5	CTS+ (In)
7	GND
13	RTS- (Out)
14	TXD- (Out)
16	RXD- (In)
19	CTS- (In)

RS-485 mode may let pin 2 and pin 3, pin 14 and pin 16 short together to connect with other device.

We have 120-ohm terminator resistor built in each input signal pair. In RS-485 mode, you may need to remove this terminator resistor.

Mode setting for C584XB/C588XB

DIP Switch Bit 1,3,5,7	DIP Switch Bit 2,4,6,8	Interface Mode
ON	ON	RS-232
ON	OFF	RS-232
OFF	ON	RS-422
OFF	OFF	RS-485

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Product Warranty/Service

ADLINK warrants that equipment furnished will be free from defects in material and workmanship for a period of one year from the date of shipment. During the warranty period, we shall, at our option, either repair or replace any product that proves to be defective under normal operation.

This warranty shall not apply to equipment that has been previously repaired or altered outside our plant in any way as to, in the judgment of the manufacturer, affect its reliability. Nor will it apply if the equipment has been used in a manner exceeding its specifications or if the serial number has been removed.

ADLINK does not assume any liability for consequential damages as a result from our product uses, and in any event our liability shall not exceed the original selling price of the equipment. The remedies provided herein are the customer's sole and exclusive remedies. In no event shall ADLINK be liable for direct, indirect, special or consequential damages whether based on contract of any other legal theory.

The equipment must be returned postage-prepaid. Package it securely and insure it. You will be charged for parts and labor if the warranty period is expired or the product is proves to be misuse, abuse or unauthorized repair or modification.

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