USER'S MANUAL

MCA-E2701

Product Model: CBI-2701

Ver. 1.3

Interface®

www.interface.co.jp

Notes to Users

The specifications of the product are under continuous improvement and while every effort is made to keep this manual up-to-date, we reserve the right to update the contents of this user's manual without prior notice. Therefore, you should thoroughly read this user's manual even if you have often purchased this product before.
Using this product requires technical knowledge of hardware and software.
Use this product only under the specified conditions such as power supply, voltage, temperature, and humidity range.
Interface Corporation's products are not designed with components intended to ensure a level of reliability suitable for use under conditions that might cause serious injury or death.
Please consult our Technical Support Center if you intend to use our products for special purpose, such as use for moving vehicles, medical treatment, aerospace engineering, controlling nuclear power, submerged translators and so on. This product is made under strict quality management, however, when using this product for the purposes that may result in any damages, lost profits, or any other incidental or consequential damages resulting from breakdown of this product, the user is required to take adequate and appropriate measures, such as installing safety devices to avoid possible serious accidents.

Conventions Used in This Manual

	This icon denotes a warning, which advises you of precautions to take to avoid injury, data loss, or system crash.
	This icon denotes a note, caution, or warning.

Indemnification

Interface Corporation makes no warranties regarding damages resulting from installation or use of this product, whether hardware or software, and assume that such risk reverts to the user.
Interface Corporation shall not be liable for any incidental or consequential damages, including damages or other costs resulting from defects which might be contained in the product, product supply delay or product failure, even if advised of the possibility thereof. Customer's right to recover damages caused by fault or negligence on the part of Interface Corporation shall be limited to the amount paid by the customer for that product.
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Warranty

Interface Corporation products are warranted for a period of either one year or two years from the date of shipment, as evidenced by receipts or other documentation. This warranty does not apply to the software products and expendable supplies such as batteries.
Note: You can determine the warranty period at our Web site by the serial number of your product. Those without Internet access should contact the Sales Information Center.

During the warranty period Interface Corporation will, as a general rule, replace or recondition the defective product without charge, in which case the user will be required to pay the shipping costs, except as set forth below.

The Warranty provided herein does not cover expendable supplies such as batteries and damages, defects, malfunctions, or failures caused by impact during transportation while under owner's responsibility; owner's failure to follow the instructions and the precautions contained in this manual; modification and/or repair of the product by other than Interface Corporation, trouble caused by use with peripherals not specified by Interface Corporation, power failure or surges, fire, earthquake, tidal wave and/or flood.
This warranty applies only when the product is used in Japan.
Interface Corporation warrants its repairs for six months, and will again repair the same defective part without additional charge provide the product is economically repairable. In that case, the user should attach a copy of the most recent repair report to the repair request form. If no repair report is attached, it will be considered as a new repair request.

Before You Export Interface Products

The foreign exchange and foreign trade law of Japan controls the export of this product, due to its possible use as a STRATEGIC MATERIAL. Therefore, before you export this product, you must secure an export permit from the Ministry of Economy, Trade and Industry of Japan.

Revision History

Version	Date	Comments
1.0	October 2003	User's manual MCA-E2701 published.
1.1	October 2003	Manual revised: The model of user's manual MCA-E2701 changed from the CBI-2701 and CBI-2702 to the CBI-2701.
1.2	December 2003	Manual revised: Section 3.1 Hardware Specifications Low-level input current changed from I_{IL} = -0.6 mA (max.) to I_{IL} = -1.1 mA (max.). High-level input current changed from I_{IH} = +40 µA (max.) to I_{IH} = +11 µA (max.). Low-level output voltage added. Chapter 6 Address Assignment added. Section 7.1 Checkpoints A problem and solution added.
1.3	July 2004	Manual revised: Section 4.2 Protecting Output Transistors added. Section 5.4 Multiple CardBus Cards added. Chapter 6 Address Assignment deleted.

Due to constant product improvements, the information in this user's manual is subject to change without prior notice.

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Chapter 1 Introduction

1.1 Summary

The CBI-2701 is a multifunction digital input/output card for CardBus-based computers. It provides 48 CMOS gated high-voltage digital input and 48 TTL open-collector output channels. This card includes a timer/counter circuit. This timer/counter circuit can be used as an interval timer. This card does not require an external power supply because the input circuit is CMOS-gated high-voltage input. External reset signal input is supported by a connector.

1.1.1 Features

1. TTL open-collector output channels (+5 Vdc to +24 Vdc)
   Output circuits on the CBI-2701 have TTL open-collector buffers. This feature provides up to +40 mA (max.) of current.

2. CMOS-gated high-voltage input channels (0 Vdc to +24 Vdc)
   Input circuits have protection diode, so this product inputs +30 Vdc (max.). It can also input TTL level signal because of +5 Vdc pull-up resistor of 4.7 kΩ.

3. External reset input (RSTIN)
   The RSTIN signal resets this card. This signal can also be configured as one of the interrupt sources.

4. Built-in timer/counter
   The CBI-2701 has a timer/counter circuit that can be used as an interval timer as mentioned above. A software selectable clock period of 10 μs, 100 μs, 1 ms, 10 ms, and 100 ms and a software programmable frequency divisor in the range of 1 through 15 are supported. The output of the built-in timer/counter circuit can be used as interrupt sources.

5. Software configurable interrupt source
   Software configurable interrupt sources are supported. Each interrupt can be masked or unmasked individually.

6. Cable
   The JKC-0124 cable is included with the CBI-2701. You can modify one side as desired.

1.2 Optional Products

1.2.1 Accessories

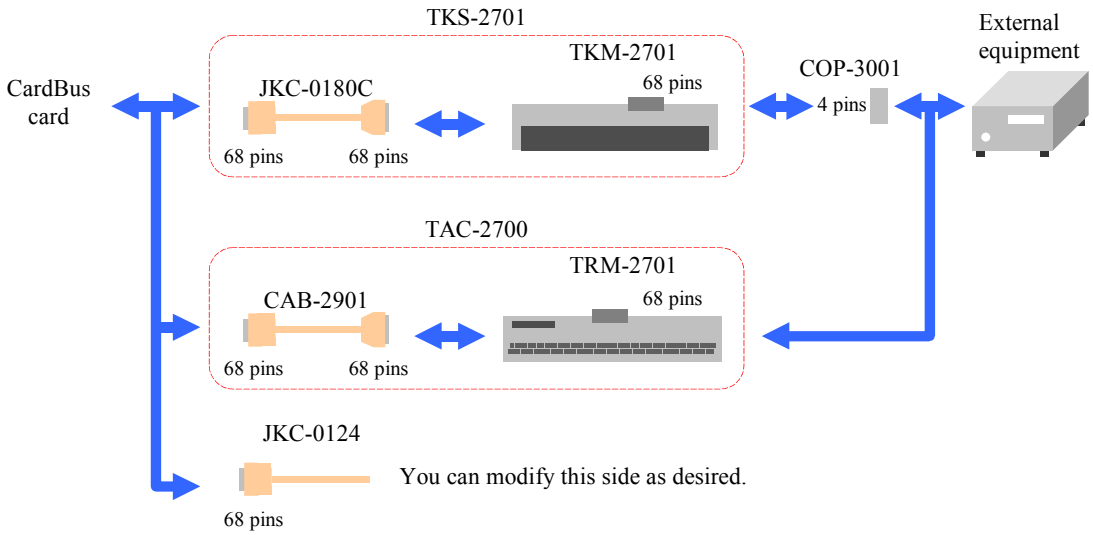
Part Number	Description
TKS-2701 Cable: JKC-0180C Terminal block: TKM-2701	The TKS-2701 is composed of a cable and terminal block. The JKC-0180C straight cable converts a PC Card 68-pin male connector to 68-pin female connector. The cable length is 1.2 m. The TKS-2701 terminal block has 68 screw terminals for easy connection of field signals. It has a PC Card 68-pin male connector. It also includes hardware for mounting on a standard DIN rail. * The e-CON plug connector is not included in this product, so please prepare our connector pack COP-3001 or equivalent.
TAC-2700 Cable: CAB-2901 Terminal block: TRM-2700	The TAC-2700 is composed of a cable and terminal block. The CAB-2901 straight cable converts a PC Card 68-pin male connector to 68-pin half-pitch female connector. The cable length is 1.5 m. The TRM-2700 terminal block has 68 screw terminals for easy connection of field signals. It has a 68-pin half-pitch male connector. It also includes hardware for mounting on a standard DIN rail.
COP-3001	This is a 18-pack of e-CON connector. Connector catalog number: XN2A-1430 (OMRON Corporation)
BBD-0817 (Japanese)	This is a CardBus enable for DOS.
BPA-0507 (Japanese)	The BPA-0507 software controls Interface digital input/output boards from your application running on Windows XP, Windows 2000, Windows Me, or Windows 98.
BPC-0506 (Japanese)	This software provides VI (diagram) for Interface digital input/output card on LabVIEW of National Instruments Corporation.
BPD-0805 (Japanese)	This software retrieves the configuration registers for MS-DOS and PC DOS.
GPC-2000 (Japanese)*	Digital input/output driver software for Windows XP/2000/Me/98/95
GPD-2000 (English)*	Digital input/output driver software for Windows XP/2000/Me/98/95
GPF-2000 (Japanese)	Digital input/output driver software for MS-DOS and PC DOS
GPG-2000 (Japanese)	Digital input/output driver software for Linux, RTLinux, SH-Linux, and SH-RTLinux
GPH-2000 (English)	Digital input/output driver software for Linux, RTLinux, SH-Linux, and SH-RTLinux

Refer to our Web site for the latest information and prices of optional products.

Notes:

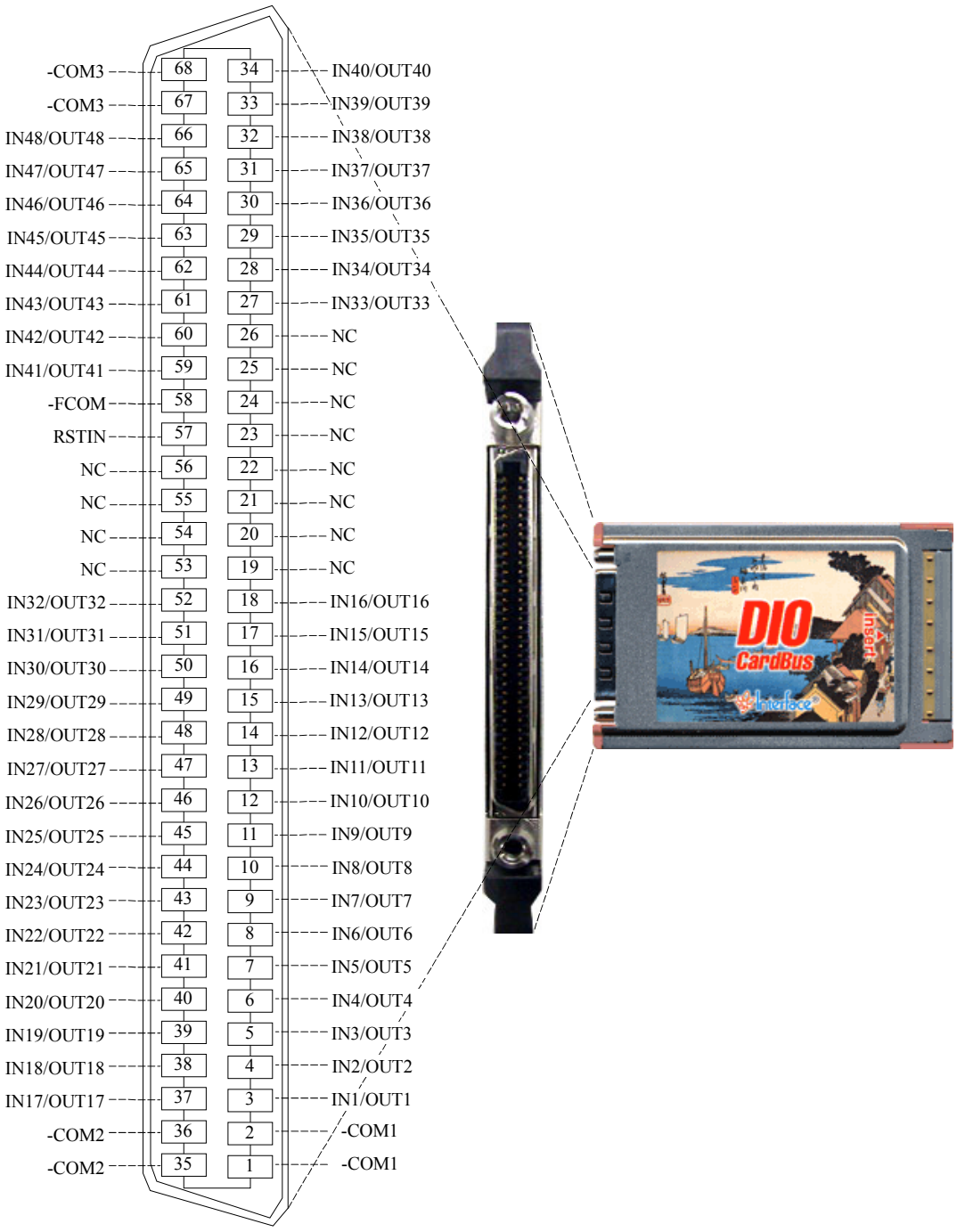
- You may download software drivers from our Web site free of charge. We also provide software drivers on CD-ROM for a nominal fee.
- * The CBI-2701 does not support Windows NT and Windows 95.

Connection Diagram



Chapter 2 Signal Definitions

2.1 Cable Connector Pin Assignments



NC: Not connected

Note: For prevention of incorrect insertion, the card frame and contraction tube of the attached cable are the same color. Check if they are the same color when you connect the cable with the card.

2.2 Signals

Signal Description

Signal	Pin Number	Direction	Description	
IN1/OUT1	3	Input/output	Digital input/output signal (bi-direction)	General purpose digital input/output Interrupt input signal 1
IN2/OUT2	4			General purpose digital input/output Interrupt input signal 2
IN3/OUT3	5			General purpose digital input/output Interrupt input signal 3
IN4/OUT4	6			General purpose digital input/output Interrupt input signal 4
IN5/OUT5 through IN48/OUT48	7 through 18, 27 through 34, 37 through 52, 59 through 66			General purpose digital input/output
RSTIN	57	Input	External reset signal	This is a reset signal input. An external circuit can reset this CardBus card by asserting this signal, and an external circuit can request service from the computer.

Use corresponding pins for ground.

Ground Pin Selection[*1]

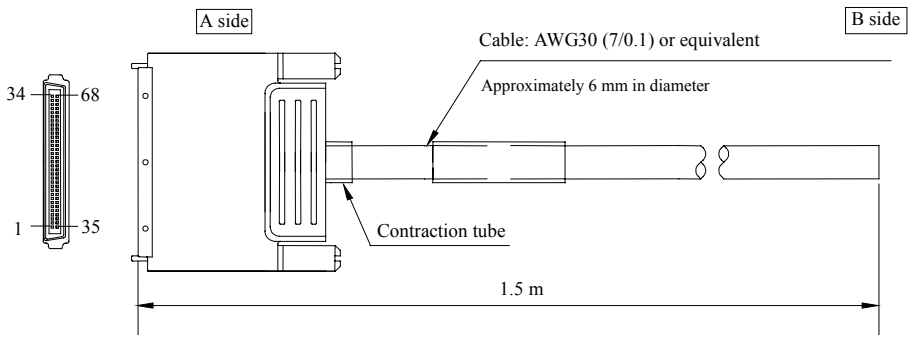
Signal	Pin Number	Ground
IN1 through IN16	1, 2	-COM1
IN17 through IN32	35, 36	-COM2
IN33 through IN48	67, 68	-COM3
RSTIN	58	-FCOM

Note: [*1] -COM1, -COM2, -COM3, and -FCOM are connected inside the CardBus card.

2.3 Attached Cable

The JKC-0124 cable is included with the CBI-2701. This cable has a single 68-pin half-pitch female on the A side. You can modify the B side as desired. The cable length is 1.5 m.

2.3.1 Dimensions of the Connector



2.3.2 Wire Connection

CN1	Color of Wire Cover	Dot Mark . Color
1	gray	red
2	gray	black
3	orange	red
4	orange	black
5	gray	red
6	gray	black
7	white	red
8	white	black
9	yellow	red
10	yellow	black
11	pink	red
12	pink	black
13	orange	red
14	orange	black
15	gray	red
16	gray	black
17	white	red
18	white	black
19	pink	red
20	pink	black
21	gray	red
22	gray	black
23	white	red
24	white	black
25	orange	red
26	orange	black
27	yellow	red
28	yellow	black
29	pink	red
30	pink	black
31	orange	red
32	orange	black
33	gray	red
34	gray	black

CN1	Color of Wire Cover	Dot Mark . Color
35	white	red
36	white	black
37	white	red
38	white	black
39	yellow	red
40	yellow	black
41	pink	red
42	pink	black
43	orange	red
44	orange	black
45	orange	red
46	orange	black
47	gray	red
48	gray	black
49	white	red
50	white	black
51	yellow	red
52	yellow	black
53	orange	(*1) red
54	orange	(*1) black
55	yellow	red
56	yellow	black
57	pink	red
58	pink	black
59	gray	(*1) red
60	gray	(*1) black
61	white	(*1) red
62	white	(*1) black
63	yellow	(*1) red
64	yellow	(*1) black
65	pink	(*1) red
66	pink	(*1) black
67	yellow	red
68	yellow	black

Notes:

- *1 These dot marks are printed in straight succession.
- The heavy lines indicate twisted-pair wires.
- The braided shield is connected to the ground of CN1.

Chapter 3 Specifications

3.1 Hardware Specifications

General Purpose Digital Input Circuits

Parameter	Specification
Input signals	IN1 through IN48 (bi-direction), RSTIN
Input configuration	CMOS-gated high-voltage input (with 4.7 kΩ pull-up resistor and protection diode, able to connect to TTL level output)
	74VHC14 or equivalent
Input logic	1 ← Low 0 ← High
Maximum voltage rating	+30 Vdc
Input voltage range	0 Vdc to +24 Vdc
Input impedance	4.7 kΩ pull-up resistor
Low-level input current	I_{IL} = -1.1 mA (max.)
High-level input current	I_{IH} = +11 μA (max.)
Low-level input voltage	V_{IL} = +0.7 V (max.)
High-level input voltage	V_{IH} = +3.1 V (min.)
Input response time	T_{RON} = 0.1 μs (typ.) T_{ROFF} = 0.1 μs (typ.)

General Purpose Digital Output Circuits

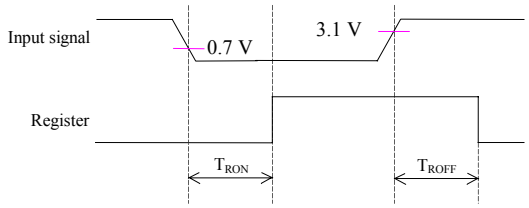
Parameter	Specification
Output signals	OUT1 through OUT48 (bi-direction)
Output configuration	TTL open-collector output (with 4.7 kΩ pull-up resistor)
	TD62597AFN or equivalent
Output logic	1 → Low 0 → High
Maximum voltage rating	+30 Vdc
Applied voltage range	+5 Vdc to +24 Vdc
Output voltage range	0 Vdc to the applied voltage
Maximum output current	I_{OL} = +40 mA
Low-level output voltage	V_{OL} = +0.2 V (max.) (I_{OL} = +10 mA) V_{OL} = +0.5 V (max.) (I_{OL} = +40 mA)
Output response time	T_{RON} = 1.0 μs (typ.) (with the maximum load) T_{ROFF} = 1.0 μs (typ.) (with the maximum load) (Low-to-high transition time varies depending on the load impedance.)

Basic Specifications

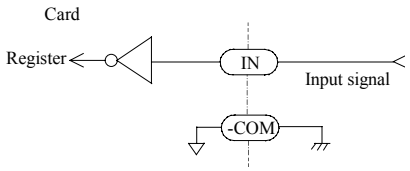
Parameter	Specification
Isolation	No-isolation
Interrupt sources	6 sources (IN1, IN2, IN3, IN4, interval timer, and RSTIN) One IRQ required (automatically assigned by the Plug and Play system)
Wiring requirements	Approximately 1.5 m or less (depending on the wiring environment)
Number of slot required	1 slot
Number of I/O ports	16 ports (automatically assigned by the Plug and Play system)
Power consumption	+3.3 Vdc: 175 mA (typ.)
Bus requirements	PC Card Standards-Based CardBus
Card size	PCMCIA/JEITA Type II
Environmental conditions	Operating temperature: 0 °C to 50 °C Relative humidity: 20% to 90% (non-condensing)
Acceptable cable connector	CN1: HDRA-E68FT2-SL (68-pin PC Card connector) (Honda Tsushin Kogyo Co., Ltd.) or equivalent

● Input Response Time

We define the input response time as required for the input data to travel to the CardBus card register. The input response time includes propagation delays of input buffer ICs. The following figure shows an input waveform and the corresponding CardBus card register timing chart.

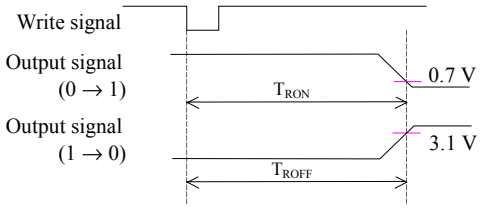


The following figure shows the test circuit for the input response time.

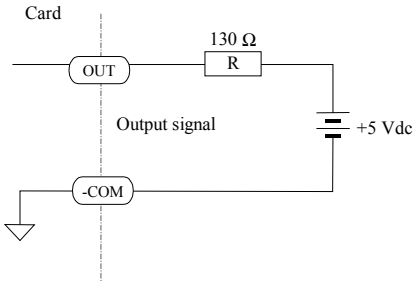


● Output Response Time

We define the output response time as required for the output data to travel to an output pin on the CardBus card after a CBI write command is issued. The output response time includes CBI write cycle duration and propagation delays of output buffer ICs. The following figure shows a CBI write signal and output waveforms.

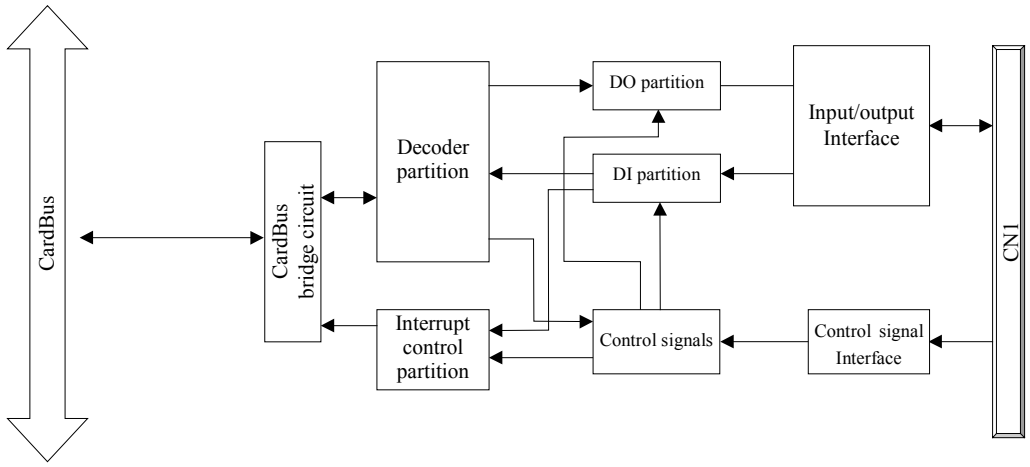


The following figure shows the test circuit for the output response time.



Note: The input response time and output response time do not include the processing time of the computer.

3.2 Circuit Diagram

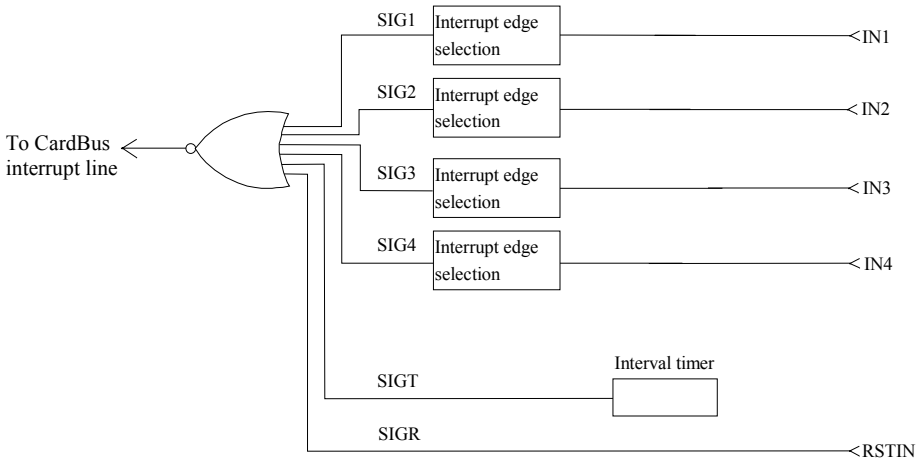


3.3 Interrupt Sources

This board can generate interrupts to the computer with the following sources.

Interrupt Source	Description
SIG1	Input signal from IN1
SIG2	Input signal from IN2
SIG3	Input signal from IN3
SIG4	Input signal from IN4
SIGT	Interval timer interrupt
SIGR	External reset input (RSTIN)

The interrupt circuit consists of the interrupt edge selection circuit blocks and the interrupt source selection circuit blocks.



Interrupt requests are cleared under the following conditions:

- SIG1, SIG2, SIG3, SIG4
  - When the software deasserts the request explicitly.
  - When you change the settings of the interrupt edge selection, the interrupt source selection, or the interrupt mask. (Only the corresponding interrupt source)
  - When the CardBus reset occurs.
  - When the RSTIN signal is asserted.
- SIGT
  - When the software deasserts the request explicitly.
  - When you change the interrupt mask. (Only the corresponding interrupt source)
  - When the CardBus reset occurs.
  - When the RSTIN signal is asserted.
  - When the interval timer is reset.
- SIGR
  - When the software deasserts the request explicitly.
  - When you change the interrupt mask. (Only the corresponding interrupt source)
  - When the CardBus reset occurs.

When the computer is turned on, all interrupt requests are cleared.

3.3.1 Interval Timer

The interval timer can be used to generate an interrupt to the host computer every timer cycle period. The timer cycle period is given by the following equation:

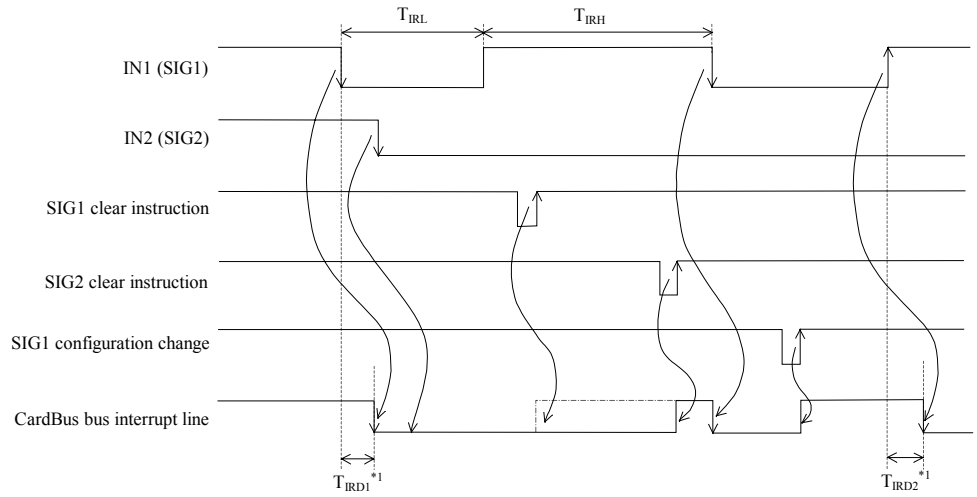
$$T = RATE \times CLK.$$

T: Timer cycle period
RATE: integer 1 through 15
CLK: 10 µs, 100 µs, 1 ms, 10 ms, 100 ms

This timer begins counting immediately after both *RATE* and *CLK* are programmed, and it will keep counting until a stop instruction is issued. It is recommended that you use an interrupt timer interval greater than or equal to 10 ms. Windows XP, Windows 2000, Windows NT 4.0, Windows Me, and Windows 98 cannot handle a large number of interrupts within a short time period. In such a case, Windows may hang up or freeze.

3.3.2 Timing Chart for Interrupt Signals

Where we assume that IN1 and IN2 are selected as interrupt sources for SIG1 and SIG2, respectively and the falling edge of each signal is selected as an interrupt edge.

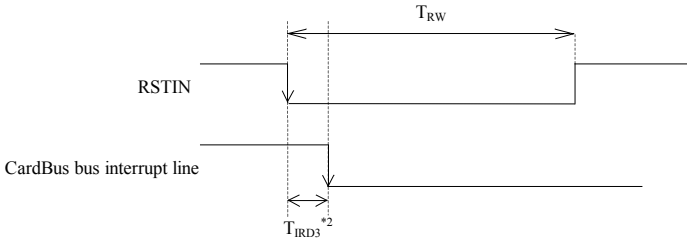


The computers accept interrupt requests when the CardBus bus interrupt signal is low level.

Switching Characteristics for IN1, IN2, IN3, IN4

Symbol	Parameter	Min.	Typ.	Unit
T_{IRL}	Low-level time	600	—	ns
T_{IRH}	High-level time	1.5	—	µs
T_{IRD1} *1	High-to-low transition to interrupt request delay time	—	500	ns
T_{IRD2} *1	Low-to-high transition to interrupt request delay time	—	1	µs

Note: *1 The delay time T_{IRD1} and T_{IRD2} are the interval between the instant when input signals go from high-level to low-level or from low-level to high-level and the instant when the card requests an interrupt on the CardBus bus, not when the computer begins to process the interrupt request.



Switching Characteristics for RSTIN

Symbol	Parameter	Min.	Typ.	Unit
T_{RW}	RSTIN low-level time	10	—	µs
T_{IRD3} *2	High-to-low transition of RSTIN to interrupt request delay time*3 (clear delay time for output flip-flop and internal registers)	—	5	µs

Notes:

- *2 In another aspect, T_{IRD3} is the delay time for output flip-flops and internal registers to be cleared after RSTIN is asserted. Output pins require a response time of 0.5 µs plus T_{IRD3} to be cleared to high-level.
- *3 The delay time T_{IRD3} is the interval between when RSTIN goes from high-level to low-level and when the card requests an interrupt on the CardBus bus, not when the computer begins to process the interrupt request.

Chapter 4 External Connections

Keep these important points in mind when connecting the card with external equipment.

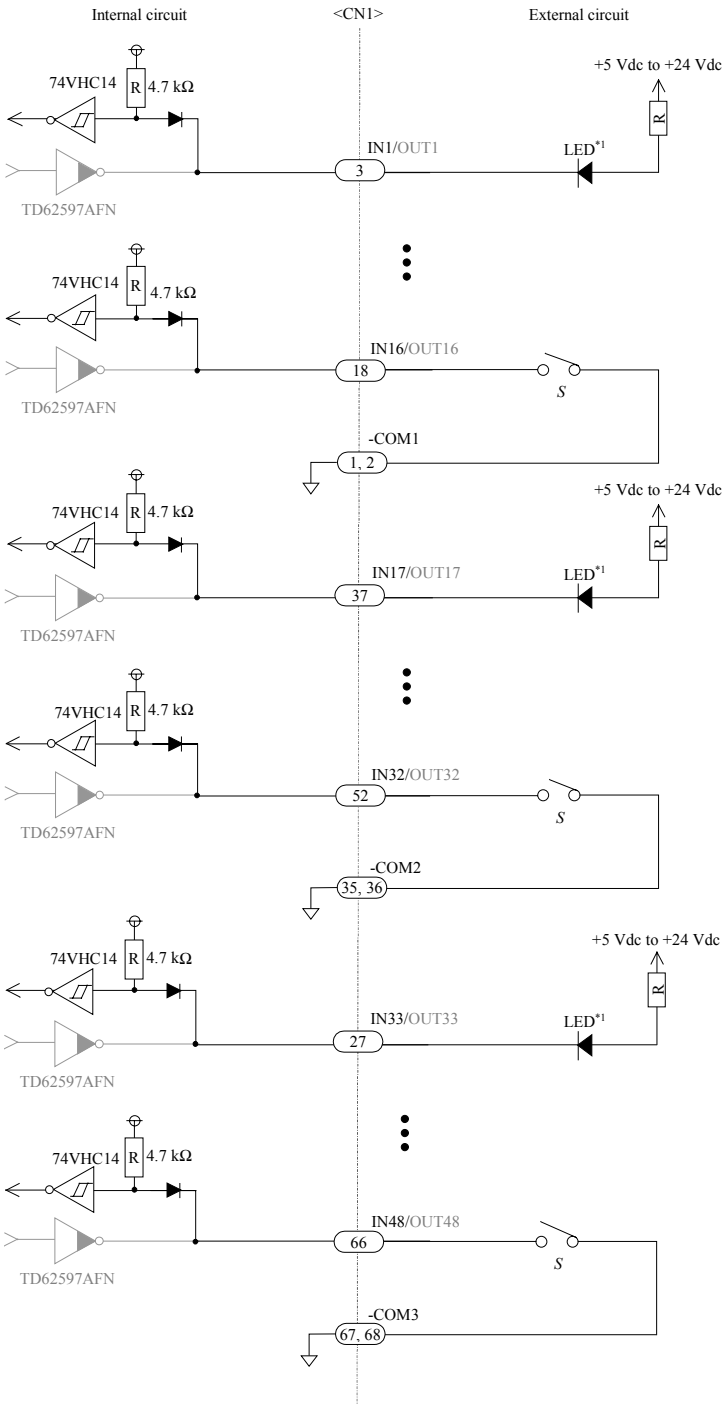
FAILURE TO OBSERVE THESE IMPORTANT SAFETY PRECAUTIONS MIGHT RESULT IN EXCESSIVE VOLTAGE IN THE CARDBUS CARD CIRCUITS, CAUSING AN ELECTRICAL FIRE, WITH POSSIBLE OPEN FLAME AND SMOKE.

- ! Never connect an output signal to other output signals except open-collector outputs that are capable of wire-OR connection.
- ! Never short-circuit an output signal to external power supply anodes.
- ! The maximum voltage rating of output cirtcuit is +30 Vdc.
- ! The maximum output current of each general purpose digital output channel is +40 mA.
- ! The maximum voltage rating of input cirtcuit is +24 Vdc.
- ! Double-check that polarities are correct before connecting external power supplies.
- ! Keep the signal cable away from other equipment as far as possible to avoid electromagnetic interference.

4.1 Example Connections

4.1.1 General Purpose Digital Inputs/Outputs (IN1/OUT1 through IN48/OUT48)

The digital input/output circuit has 48 inputs/outputs, numbered from IN1/OUT1 through IN48/OUT48. Each pin can be configured as an input pin or an output pin. The maximum output current per channel is +40 mA.



1. Digital input

Programs can read data from the input pins by issuing the IN instructions to the corresponding I/O port addresses.

Input Data	IN*xx*	External Circuit
1	Low	Closed (*S*: on)
0	High	Open (*S*: off)

2. Digital output

Programs can write data to output pins by issuing the OUT instructions to the corresponding I/O port addresses.

Output Data	OUT*xx*	External Circuit
1	Low	Closed (LED: on)
0	High	Open (LED: off)

Notes:

- Data 0 must be previously output to the pin before using it as an input. Data 0 is output when the CardBus card is powered up or reset.
- *1 The following description shows how to determine resistance of the currrent limiting resistor. Where I_{LED} (A) is the LED operating current, V_{LED} (V) is the LED forward bias, V_{OL} (V) is the low-level output voltage of the output pin, and V_{DD} (V) is the supply voltage, the current limiting resistance R (Ω) is obtained by the following equation:

$$R = (V_{DD} - V_{LED} - V_{OL}) / I_{LED}.$$

Use appropriate resistors to meet the operating conditions of the LED and supply voltage.
Power consumption P (W) of the resistor is obtained by the following equation:

$$P = I_{LED}^2 \times R.$$

Power consumption of the resistor must be less than the power rating of the resistor.

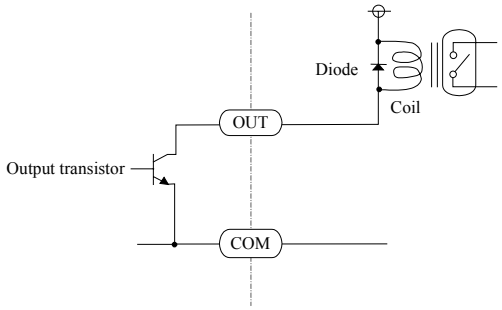
4.2 Protecting Output Transistors

4.2.1 Suppressing Inductively Induced Voltage

When the dc voltage is switched off in an inductive circuit, a high voltage is induced to attempt to maintain the current in the circuit. As a result, an arc is produced at the contact of the switch. When you use this board to control an inductive circuit, the high voltage spike generated by switching off an inductive device may damage the output transistor on the board. You should protect the circuit by using a clamping or despiking diode.

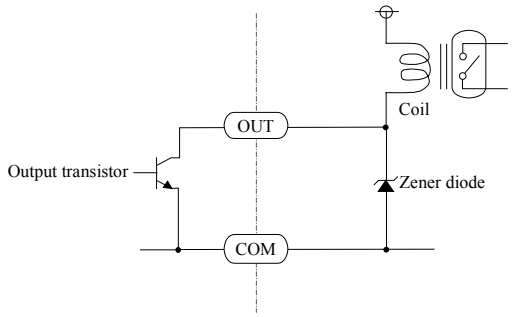
Rectifying Diode

The diode connects in reverse bias against the power supply positive voltage to prevent short circuit. When the transistor switches off the circuit, the induced voltage forward-biases the diode then the current flows through the diode. The coil is safely discharged. The reverse direction breakdown voltage of the diode requires ten times the applied voltage.



Zener Diode

The Zener diode connects with the coil in series and with the output transistor in parallel. When the transistor switches off the circuit, the reverse-biased Zener diode flows the current to discharge the coil. The Zener voltage of the Zener diode is recommended to be nearly equal to the power supply voltage.

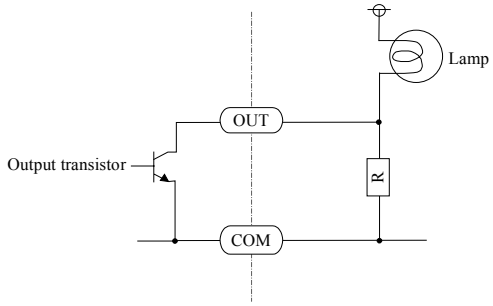


4.2.2 Suppressing In-Rush Current

When a lamp is turned on, excessive current called as in-rush current could flow in the circuit. The overcurrent may damage the output transistor of this board. The in-rush current could reach 10 times normal operating current. If the peak value of the current exceeds the maximum current rating of the output transistor, you should protect the output transistor.

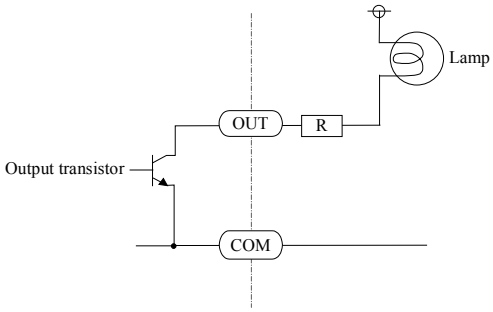
Shunt Resistor

A shunt resistor connects in parallel to an output transistor to sink, or bypass, current. The resistance of the shunt resistor may require from 20% to 30% of the lamp resistance to reduce the peak of the in-rush current to half. In this shunt resistor configuration, the circuit dissipates power regardless of the output transistor switching state.



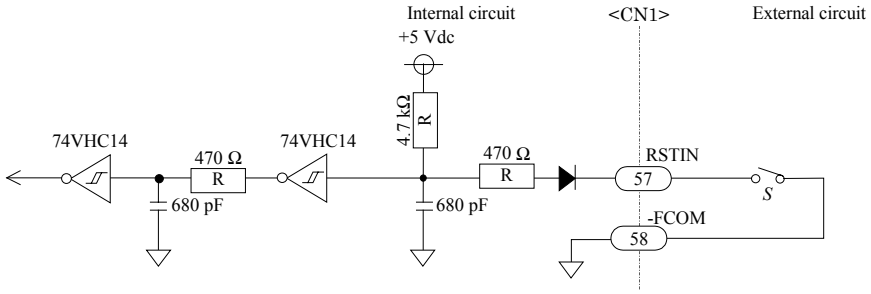
Series Resistor

A resistor connects in series between the lamp and the output transistor. This series resistor reduces the current flowing in the circuit. Reducing the current decreases the brightness of the lamp.



4.3 Reset Input (RSTIN)

A signal on the pin 57 of CN1 is an external reset signal. When this signal is asserted, an interrupt occurs to your computer. This signal can be masked or unmasked. To be recognized as a valid reset signal, a 10 µs minimum assertion of the RSTIN signal is required.



Board Status	RSTIN	External Circuit
Reset	On	Closed (*S*: on)
Operating	Off	Open (*S*: off)

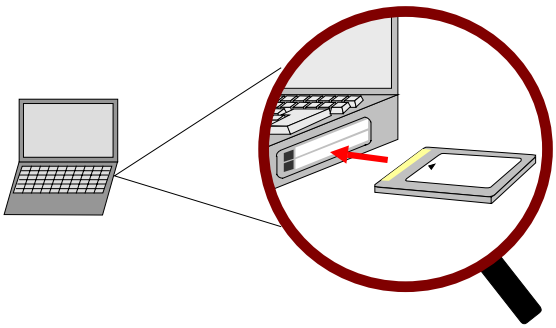
Chapter 5 Installation

BE SURE TO ELIMINATE STATIC ELECTRICITY OF YOUR BODY BEFORE YOU INSTALL OR REMOVE THIS PRODUCT.

5.1 Card Installation

When you install this product in your system, read the manual of your system which refers to the PC card slot.

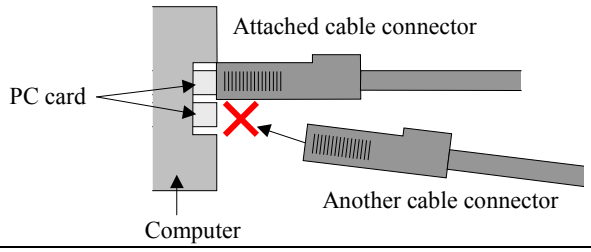
1. Make sure that the system is turned off and the power cable is unplugged.
   (This card corresponds to Hot Swap. You can insert this card when the system turns on.)
2. Insert the card into the PC card slot in your system.



3. Plug in the power cord, and turn on the system.

! Be careful of the insert direction when you insert this product into your system to avoid system damage.

! The mounting with the computer may be restricted by the connector form of the attached cable. As shown in the following figure, the attached cable may interfere with the card cable connector for the adjacent slot or computer.



5.2 Driver Software Installation

Refer to our Web site for the Help of each optional software when you install and use it.

5.3 Card Uninstallation

The method of removing PC card from your system differs depending on each system. Please read the manual of your system.

! Do not remove this product when accessing to the external equipment. Your system may not operate correctly.

5.4 Multiple CardBus Cards

When using multiple cards in one system, it is required to write the CardBus ID number to the ROM in the card. The CardBus ID configuration utility program in the software can configure the number. Refer to Help files for more details.

Notes:

- Write the configured CardBus ID number on the back side of each card to easily confirm the number.
- Please download and use the newest version about software.

The following example shows the CardBus ID number is “0.”

Back side of the card

Chapter 6 Notes for Users

For your safety, follow all warnings and instructions described in this manual.

6.1 Cautions, Periodic, Inspections, and Storage

Failure to follow this warning may result in electric shock, burns, serious injury, and in some cases, even cause death.

⚠ Warning!

- Keep this product away from flammable gases.

Use this product only under the conditions as shown below.

Environmental Specifications

Parameter	Specification
Temperature Range	0 °C to 50 °C
Relative Humidity Range	20% to 90% (non-condensing)
Dust	Typical office environment
Corrosive Gas	None
Noise	Far from power source and its wiring
Voltage Requirements	CardBus specification: +3.3 Vdc (+/-3 V)

The following inspections should be carried out on this card periodically.

Periodic Inspections

Item	Checkpoint
Cable Connections	Be sure that all connectors and cables are installed correctly.
Connector Contacts	Check for dirt or corrosion.

TO AVOID DAMAGE TO THE CARD AND POSSIBLE INJURY, TAKE APPROPRIATE PRECAUTIONS AS DESCRIBED BELOW WHEN HANDLING IT.

Caution!

! This card should be stored exactly the same way as when it was received. Proceed as follows:

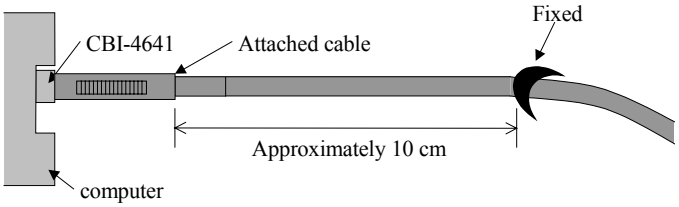
1. Put the card back in its PC card case.
2. Wrap the PC card case with the original packing material.
3. Avoid excessive humidity.
4. Do not expose the card to the direct rays of the sun.
5. Store the card at room temperature.

! Do not modify the card. Interface Corporation assumes no liability for any malfunctions resulting from users' unauthorized modification of the card.

! Take measures to avoid and minimize shock, vibration, magnetic fields, and static electricity in the storage or operating environment of this card.

! Make sure that the card is disconnected from the cable before inserting or removing any cards.

! Please keep the attached cable in a horizontal position for approximately 10 cm from the card connection part as below, and fix it not to move, even if stress starts.



Chapter 7 Troubleshooting

7.1 Checkpoints

Problem	Solution
Data cannot be transferred correctly.	Double-check all cable connections.
	Set up your equipment to meet the timing characteristics of this card, such as data setup time, input/output response time.
	If the power requirements exceed the system power budget, the circuits on the card or connected external circuits cannot be driven properly. Prepare an external power supply for your CardBus card.
Interrupts do not occur.	Set up the card interrupt configuration such as edge selection or sources to be consistent with your application and external circuits.
	If the interrupt configuration is correct, but the interrupt is masked, the interrupt will not occur. Unmask the interrupt that you want to use.
The computer does not recognize this card.	Use the PCI device viewer (BPF-0801) to examine the CardBus cards on your computer after downloading it from our Web site. Please send the result to our Technical Support Center by fax or e-mail. The PCI device viewer may be downloaded from our Web site free of charge.
The computer does not response after Standby mode. (Input and output are disabled.)	Set the System standby setting to “Never”.

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For Assistance:

Please visit our Web site (www.interface.co.jp) or send a fax (0120-621553(in Japan)) or e-mail (support@interface.co.jp) to the Technical Support Center.
We recommend you to ask questions from our Web site to shorten the answering time.

If the problem is urgent, please consult the Sales Information Center.
When you contact us, we need the information on the **Technical Support Form** provided with this manual plus the information listed below so we can answer your questions as quickly as possible.

Computer Environment	Computer brand and model, specific operating system, software configuration, other interface boards installed if any.
Description of The Problem	Situations where the product was used.

Technical support is available during business hours.
We provide a product rental service so you can evaluate our product prior to purchase.

Inquiries	Refer to	Phone	FAX
Product Rental Service	Technical Support Center	082-262-1630 (in Japan)	082-262-1552 (in Japan)
Distributors, Shipping Date, Prices, Others	Sales Information Center	0120-447213 (in Japan)	0120-458257 (in Japan)
		E-mail : sales@interface.co.jp	

Repair and Maintenance

The company will, at its option, replace its product, which the company, upon inspection, shall determine to be defective in material and/or workmanship. If the product is obviously damaged or defective, please return it using procedures outlined below.

1. Fill out the **Repair Request Form**. Describe hardware configurations of the board and malfunction in detail.
2. Fax the **Repair Request Form** to the Technical Support Center.
3. We will send you a repair quotation by return fax.
4. Carefully repack the damaged product, enclosing the **Repair Request Form**, and forward it (shipping prepaid) to the repair group, at our Oita Plant (address shown below).

When the damage or defect is not obvious, please contact the Sales Information Center or our Technical Support Center.
Be aware that depending on the extent and type of damage, the unit may not be economically repairable. If so, we will notify you immediately.

Receiver's Address	Repair Group, Oita Plant, Interface Corporation 1428, Shimobaru, Aki-machi, Higashikunisaki-gun, Oita, 873-0231 Japan
Contact Information	Technical Support Center Phone: 082-262-1630 (Available during business hours) FAX: 082-262-1552

Visit our Web site (www.interface.co.jp) for:

Technical Support	Frequently asked questions, related technical terminology
Product Information	The latest information about our products; specifications, product selection guides, etc
Useful Information	Discount information, rental information, distributors
Downloads Service	Drivers, technical documents such as I/O port maps, sample programs, and user's manual data.

The design and contents of the web site are under constant review. Therefore, there might be some changes in its design and contents.