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Find the *Interface PCI-7414M* at our website: *Click HERE*

USER'S MANUAL

PCI Series Interface Module

Isolated 4-Axis Motion Controller Product
(Circular, Linear Interpolation, and Encoder Input +24 Vdc)

(Product Model: PCI-7414M)

4 axes	Pulse output rate 6.5 Mpps (max.)	Differencial line driver output
Isolation	Circular interpolation/ Linear interpolation/ S-curve	Simultaneous start/ Simultaneous stop/ Clock synchronization
Velocity override during operation/ Comparator function/ Target position override	Encoder input voltage: +24 Vdc	Digital input: 12 channels Digital output: 8 channels

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■ Notes to Users

You should carefully read **Handle with Care** for your safety before using this product.

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.

All official specifications are expressed in metric. English unit is supplied for convenience. Using this product requires technical knowledge of hardware and software.

Conventions Used in This Manual



This mark means that there is a possibility of death or serious injury if you ignore or do not follow the said instructions.



This mark means that there is a possibility of injury or physical harm if you ignore or do not follow the said instructions.

	**Prohibited Action**	Stated action must be avoided.
	**Don't Disassemble**	Equipment must not be disassembled.
	**Don't Handle with Hands**	Equipment must not be touched with hands.
	**Keep away from static electricity**	Be careful of static electricity for the product damage.
	**Note**	Denotes a note.

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Document Description

Interface Corporation provides the following documents for this product. Please read carefully before using it.

Manual	Price	Description
User's Manual	Free of charge	The user's manual including setup and hardware specifications describes the basic operation to install this product. - Interface module installation - Device driver software installation - Product summary - Features - External interface specifications - Example connection of external equipment
Technical Data Book	Free of charge	The technical data book is for a person who designs hardware and software. It includes direct control methods for hardware, I/O map, and external specifications.

Note: You may download software drivers from our Web site (www.interface.co.jp) free of charge.
We also provide software drivers on CD-ROM for a nominal fee.

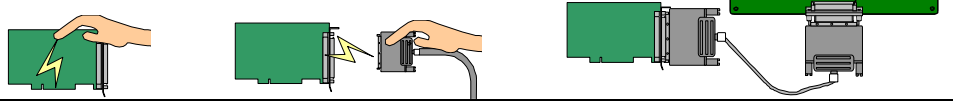
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Handle with Care

Warning

	Please consult our Customer Support Center if you intend to use our products for special purposes, such as the use for moving vehicles, medical treatment, aerospace engineering, controlling nuclear power, submerged translators and so on. Refer to “Chapter 10 Information Service,” page 47, for more details.
	Keep this product away from flammable gases.
	Do not modify the product. Interface Corporation assumes no liability for any malfunctions resulting from users’ unauthorized modification of the product.

Caution

	Do not touch around the following label because of high temperature when using this product. Do not remove the label from the product. 
	Do not touch around the following label because electric shock may occur when using high-voltage (50 Vdc or greater) for an external circuit. Do not remove the label from the product. 
	Do not touch around the following label when using this product because there is a rotary part near here. Do not remove the label from the product. 
	Discharge static electricity from your body by touching a grounded metal object before handling the product. The static electricity may damage the product. **Care should be taken in the following situations.** **- When touching this product.** **- When connecting a cable.** **- When wiring a terminal block.** 

	**Make sure the external cable connector is disconnected before installing or removing any interface modules. It may cause short-circuit with the interface modules in adjacent slots.**
	**To avoid possible injury or malfunction, do not touch the soldered surfaces of the interface module.**
	**Use this product only under the specified conditions such as power supply, voltage, temperature, and humidity range.**
	**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.**
	**Take measures to avoid and minimize shock, vibration, magnetic fields, and static electricity in the storage or operating environment of this interface module.**
	**Avoid the following conditions for storage and operation.** **• Extremely high temperature and humidity** **• Exposure to the direct rays of the sun** **• A lot of soot and dust** **• Vibrations and mechanical shocks** **• Chemical vapors** **Keep this product away from foreign matter.**
	**Do not forcibly bend the cable connected to each module.**
	**This interface module has a detection circuit for insertion into and removal from a PCI slot. This circuit allows the interface module to protect itself from incorrect operation such as inserting it into or removing it from the PCI slot while the power is on. We call this feature Safety Bus. The Safety Bus does not guarantee a successful Hot Swap.**

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Environmental Specifications

Use this product only under the conditions as shown below.

Environmental Conditions	Operating temperature: 0 degrees C to 50 degrees C Relative humidity: 20% to 90% (non-condensing)
Dust	Typical office environment
Corrosive Gas	None
Noise	Keep this product away from power source such as motors as far as possible to avoid electromagnetic interference.
Voltage Requirements	+5 Vdc (+/-5%): 1.0 A (all inputs/outputs and control signals active) (typ.)
Bus Requirements	PCI local bus (Rev. 2.1 or later), 32 bits, 33 MHz 5 V or 3.3 V signaling environment
Interface Module Dimensions	174.63 (D) × 106.68 (H) [mm]
Number of Slots Required	1 slot

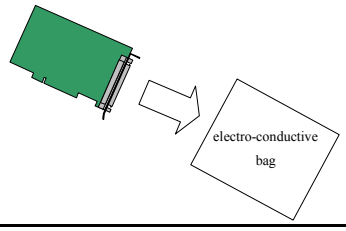
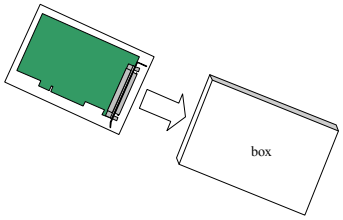
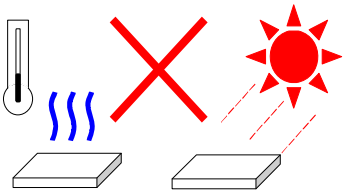
Periodic Inspections

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

Item	Checkpoint
Cable connections	Be sure that all connectors and cables are installed correctly.
Card edge	Check for dirt or corrosion.
Connector contacts	Check for dirt or corrosion.
Interface module surfaces	Surface should be free of dust and foreign matter.

Storage

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

	1. Put this product back in its electro-conductive bag.
	2. Wrap this product with the original packing material.
	3. Do not expose this product to the direct rays of the sun. Avoid excessive humidity. Store the product at room temperature.

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Contents

Document Description 1

Handle with Care 2

Chapter 1 Summary 7

1.1 Features 7
1.2 Product Models 8

Chapter 2 Factory Default Settings 9

2.1 Factory Default Settings 9

Chapter 3 Setup 11

3.1 Interface Module Installation 11

Chapter 4 Software Installation 12

4.1 Windows 12
4.1.1 Installation of Device Driver Software 13
■ Windows Vista 13
■ Windows XP Embedded, Windows XP, or Windows Server 2003 14
■ Windows 2000 15
■ Windows NT 4.0 15
■ Windows Millennium Edition 16
■ Windows 98 16
■ Windows 95 17
4.1.2 Installation of Utility Disk 18
4.1.3 Uninstallation of Utility Disk 18
4.2 Linux 19
4.2.1 Installation 19
■ Loading a Driver Module and Making a Device Node 20
■ Kernel Version 21
4.2.2 Uninstallation 21

Chapter 5 Uninstallation 22

5.1 Interface Module Uninstallation 22

Chapter 6 Hardware Description 23

6.1 Hardware Specifications 23

Chapter 7 Functional Description 26

7.1 Parallel Configuration (CN2, CN3) 26
7.1.1 Synchronous Connector Pin Assignments 27
7.1.2 Acceptable Synchronous Cable Connector 28
7.2 Interrupt Sources 28

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Chapter 8 External Connections 29
8.1 External Connections 29
8.2 Interface Product Pin Assignments 31
8.3 Signals 32
8.4 Connection Diagrams 34
8.4.1 Motor Driving Pulse Output 34
8.4.2 Encoder Input 34
8.5 Example Connections 35
8.5.1 Motor Driving Pulse Output Circuit 35
8.5.2 Encoder Input Circuit 40
8.5.3 Control Signal Input/Digital Input 41
8.5.4 Hardware Interlock Circuit 43
8.5.5 Digital Output/Servo Driver Deviation Counter Clear Signal Output 44
8.5.6 Clock Synchronous Signal Input/Output 45
8.5.7 Synchronous Start/Stop Signal 45
Chapter 9 Optional Products 46
9.1 Accessories 46
Chapter 10 Information Service 47
10.1 How to Get Information 47

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Chapter 1 Summary

The PCI-7414M, a motion controller product for PCI-based computers, supports four axes of a stepper or servo motor. This product controls four axes individually and supports linear interpolation operation among four axes by configuring parameters. With synchronous cables, up to eight interface modules (32 axes) can operate synchronously and the following three parallel operations are allowed; clock synchronization, simultaneous start, and simultaneous stop. This product also supports circular interpolation between two axes. This product incorporates PCL6045 (Nippon Pulse Motor Co., Ltd.) or equivalent as a controller LSI, which supports smooth S-curve motion profile.

1.1 Features

>>Individual axis control

The PCI-7414M supports individual control of four axes (max.). You can easily control constant velocity, acceleration/deceleration, and any other motion profiles.

>>High-speed pulse output

The PCI-7414M can control the motor at high resolution because of high-speed pulse output rate of 6.5 Mpps (max.).

>>Speed change

The PCI-7414M can change the steady-state velocity while pulse is output.

>>S-curve motion

The PCI-7414M supports smooth S-curve motion profile (parabolic).

>>Various motion pattern

The PCI-7414M gives various motion instructions as follows:

- 4 axes: individual motion
- 2 axes: linener interpolation, 2 axes: individual motion
- 3 axes: linear interpolation, 1 axis: individual motion
- 4 axes: linear interpolation
- 2 axes: circular interpolation, 2 axes: individual motion
- 2 axes: circular interpolation, 2 axes: linear interpolation

>>Interlock

The PCI-7414M can stop the motion activation pulse by opening the interlock pin (INTLOCK) or pulling it up to high level. Using this feature, the pulse output can be stopped in an emergency, for example in case the motor goes out of control.

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>>Interrupt sources

Interrupt occurs when each pulse output is completed.

>>Parallel synchronous operation

By using a synchronous cable, up to eight interface modules (any of PCI-7404M, PCI-7404V, PCI-7414M, and PCI-7414V) can operate synchronously with the following three parallel operations: clock synchronization, simultaneous start, and simultaneous stop.

1.2 Product Models

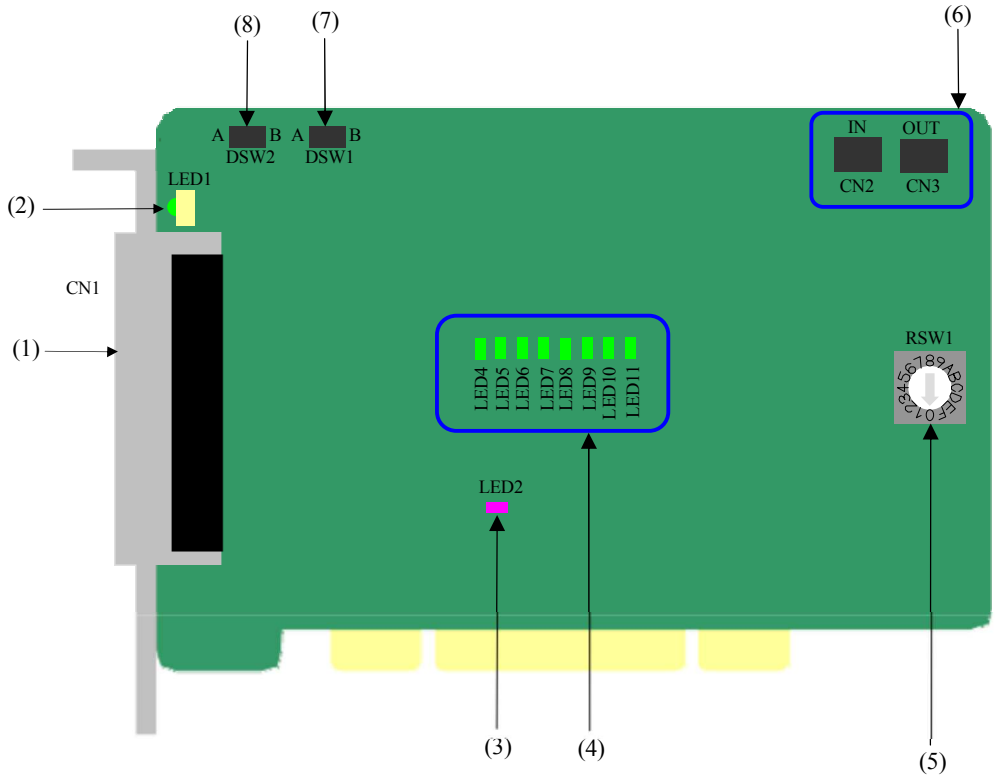
The chart below shows product models and power supply specifications of PCI series interface module.

Interface module	Isolation	Encoder input	ERCCOM	Pulse output	Control signal input Digital input/output	+5 Vdc output
PCI-7404V	—	+5 Vdc	Internal power supply: +5 Vdc	+5 Vdc (Differential line driver output)	5 Vdc to +50 Vdc (Recommendation: +5 Vdc to +48 Vdc)	+5 Vdc
PCI-7414V	Isolated					
PCI-7404M	—	+24 Vdc	External power supply			
PCI-7414M	Isolated					

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Chapter 2 Factory Default Settings

2.1 Factory Default Settings



(1) 100-pin half-pitch female connector (CN1)

This connector is used for the external connection.

(2) Access LED (LED1)

The LED1 glows green to indicate the CPU accesses to this product. A single access lights the LED1 for 100 ms. When continual accesses cease, the LED1 turns off 100 ms later.

(3) Interlock status LED (LED2)

The LED2 glows red while the interlock is in operation. The LED is turned off when the interlock is released.

(4) Pulse output monitor LED (LED4 through LED11)

These LEDs glow green when the LSI controller outputs a pulse. Each output status for motor drive can be confirmed by the LED status.

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(5) Interface module ID rotary switch (RSW1)

The rotary switch on each of our PCI interface modules is used to uniquely identify each interface module in cases where our multiple PCI interface modules of PCI-7404M, PCI-7404V, PCI-7414M, and PCI-7414V are installed in the same system. Remember to set this switch to a unique setting on each interface module so there is not a conflict among products. When using an interface module, set the rotary switch to "0" (Factory default setting: 0). Up to 16 interface modules can be identified.

(6) Synchronous connector (CN2, CN3)

These connectors provide a connection to parallel sampling.

(7) +5 Vdc power supply output switch (DSW1)

Use the DSW1 DIP switch to configure +5 Vdc power supply output. Set the switch to position A when you do not use external power supply output.

Setting	Description
A B  (Factory default setting)	Pin 16, pin 32, pin 66, and pin 82 of the CN1are not connected. (These pins are connected internally.)
A B 	+5 Vdc is output from pin 16, pin 32, pin 66, and pin 82 of the CN1.

The ■ shows the switch setting position.

(8) ERCCOM output selection (DSW2)

Use the DSW2 DIP switch to configure ERCCOM output. It configures whether input of external power supply is output from CN1. Set the switch to position A when you do not use external power supply output.

Setting	Description
A B  (Factory default setting)	Pin 21, pin 37, pin 71, and pin 87 of the CN1 are not connected. (These pins are connected internally.)
A B 	External power supply voltage is output from pin 21, pin 37, pin 71, and pin 87 of the CN1.

The ■ shows the switch setting position.

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Chapter 3 Setup

This chapter explains about preparations for using this product.

<Flow>

Interface module installation

↓

Driver installation

↓

How to setup software

The interface module installation is completed. We recommend you to check the operation. Refer to "4.1.3 Uninstallation of Utility Disk," page 18 and "Chapter 5 Uninstallation," page 22, for uninstallation.

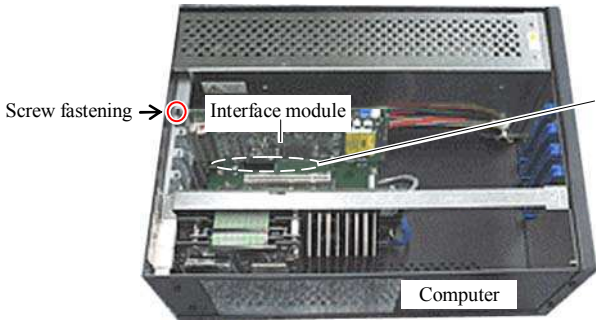
3.1 Interface Module Installation

Note: The following pictures are for reference purpose only.

1. Make sure that the system is turned off, and unplug the power cord.

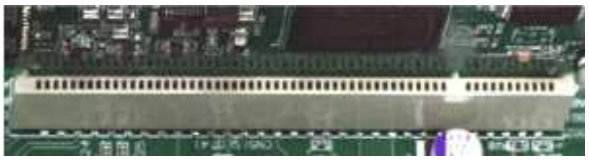
2. Remove the PC case cover and a slot cover.

3. Insert the interface module into an open slot.



Insert the interface module into an open slot in your computer.

PCI connector



Make sure that the goldfingers are properly inserted into the PCI connector.

⚠ Caution

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

4. Fasten the panel to the bracket with a screw.

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5. Replace the cover, plug in the power cord, and turn on the computer.

Chapter 4 Software Installation

Information

!	**To operate this product, the driver software is required. To download the driver software free of charge, please visit our Web site (www.interface.co.jp) and get a user ID.**
!	**Refer to Help in the software about how to use the DLL functions, sample programs, and utilities.**

4.1 Windows

The Interface device driver software is composed as follows.

• Driver disk

This disk contains the device drivers.

Downloading procedure

>> Download the Driver Disk of GPF-7400 for your operating system from our Web site.

>> Execute the downloaded program, and then a folder is created.

Note: Please refer to "4.1.1 Installation of Device Driver Software," page 13, for more details.

• Utility disk

This disk contains the Readme, Help, sample programs, utility, and so on.

Downloading procedure

>> Download the Utility Disk of GPF-7400 from our Web site.

>> Execute the downloaded program, and then [SETUP] folder is created.

>> Run the SETUP.EXE file on the [SETUP] folder. The programs will be installed to the drive you specify.

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4.1.1 Installation of Device Driver Software

■ Windows Vista

The driver may only be installed by a member of the System Administrators group.

1. When you log on to Windows Vista, the device driver wizard will start automatically. If you are prompted for an administrator password or confirmation, select **Continue**.

2. The **Found New Hardware** dialog box will appear, select **Locate and install driver software (recommended)**.

3. Select **Don't search online**.

4. Click **I don't have the disc. Show me other options**.

5. Click **Browse my computer for driver software (advanced)**.

6. Click **Browse** and specify the Win2000 driver folder downloaded from our Web site, and then click **Next**.

7. Installation will start automatically.

8. Follow further instructions on your screen.

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■ Windows XP Embedded, Windows XP, or Windows Server 2003

The driver may only be installed by a member of the System Administrators group.

1. When you log on to Windows XP Embedded, Windows XP, or Windows Server 2003, the device driver wizard will start automatically.
2. The **Found New Hardware Wizard** dialog box will appear, select **Install from a list or specific location [Advanced]**, and then click **Next**.
3. Select **Search for the best driver in these locations**, and select **Include this location in the search:**. Then click **Next**.
4. Click **Browse** and specify the Win2000 driver folder downloaded from our Web site, and then click **Next**.
5. Installation will start automatically.
6. Follow further instructions on your screen.

Make sure that there are no conflicts in setting up the computer resources, such as I/O addresses and interrupt request levels. After installing the device driver software, the **Found New Hardware Wizard** dialog box will not appear as described above in procedure 2 when the computer is turned on. After the installation of device driver software is completed, please install the utility disk.

- When importing the hardware information file for Windows XP Embedded

  >> How to download the driver

  1. Download the Driver Disk [Windows Vista, XPe, XP, 2003, 2000] of GPF-7400 from our Web site.
  2. Execute the downloaded program, and then [Win2000] folder is created.

  >> How to install the driver

  1. Start up the Component Database Manager of Windows XP Embedded development environment.
  2. Import our hardware information file. Follow further instructions on your screen to import the file whose extension is SLD in the [Win2000] folder.

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■ Windows 2000

The driver may only be installed by a member of the System Administrators group.

1. When you log on to Windows 2000, the device driver wizard will start automatically.
2. In the **Found New Hardware Wizard** dialog box, click **Next**.
3. Select **Search for a suitable driver for my device [recommended]**, and then click **Next**.
4. Select **Specify a location** check box, and then click **Next**.
5. Click **Browse** and specify the Win2000 driver folder downloaded from our Web site, and then click **OK**.
6. To install the driver Windows found, click **Next**.
7. Follow further instructions on your screen.

Make sure that there are no conflicts in setting up the computer resources, such as I/O addresses and interrupt request levels. After installing the device driver software, the **Found New Hardware Wizard** dialog box will not appear as described above in procedure 2 when the computer is turned on. After the installation of device driver software is completed, please install the utility disk.

■ Windows NT 4.0

The driver may only be installed by a member of the System Administrators group.

1. Log on to Windows NT 4.0.
2. Right-click on the GPF7400.INF file in the WinNT driver folder downloaded from our Web site, and then click **Install** on the shortcut menu.
3. Follow further instructions on your screen.

Make sure that there are no conflicts in setting up the computer resources, such as I/O addresses and interrupt request levels. After the installation of device driver software is completed, please install the utility disk.

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■ Windows Millennium Edition

1. When you log on to Windows Millennium Edition, the device wizard will start automatically.

2. In the **Add New Hardware Wizard** dialog box, select **Specify the location of the driver (Advanced)**, and then click **Next**.

3. Select **Specify a location** check box, and then click **Browse** to locate the file.

4. Specify the Win95 driver folder downloaded from our Web site, and then click **Next**.

5. Follow further instructions on your screen.

Make sure that there are no conflicts in setting up the computer resources, such as I/O addresses and interrupt request levels. After installing the device driver software, the **Add New Hardware Wizard** dialog box will not appear as described above in procedure 2 when the computer is turned on. After the installation of device driver software is completed, please install the utility disk.

■ Windows 98

1. When you log on to Windows 98, the device wizard will start automatically.

2. In the **Add New Hardware Wizard** dialog box, select **Search for the best driver for your device [Recommended]**, and then click **Next**.

3. Select **Specify a location** check box, and then click **Browse** to locate the file.

4. Specify the Win95 driver folder downloaded from our Web site, and then click **Next**.

5. Follow further instructions on your screen.

Make sure that there are no conflicts in setting up the computer resources, such as I/O addresses and interrupt request levels. After installing the device driver software, the **Found New Hardware Wizard** dialog box will not appear as described above in procedure 2 when the computer is turned on. After the installation of device driver software is completed, please install the utility disk.

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■ Windows 95

1. When you log on to Windows 95, the device driver wizard will start automatically.

2. **Update Device Driver Wizard** dialog box will appear, and then click **Next**.

3. Select **Search for the best driver for your device**, and then click **Next**.

4. If Windows does not find the adapter, select **Other Locations**, and then click **Browse**.

5. Specify the Win95 driver folder downloaded from our Web site, and then click **Finish**.

6. Follow further instructions on your screen.

Make sure that there are no conflicts in setting up the computer resources, such as I/O addresses and interrupt request levels. After installing the device driver software, the **Update Device Driver Wizard** dialog box will not appear as described above in procedure 2 when the computer is turned on. After the installation of device driver software is completed, please install the utility disk.

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4.1.2 Installation of Utility Disk

1. Decompress* the compression file downloaded from our Web site and run the SETUP.EXE file on the decompression folder. The README, Help, and sample programs will be installed to the drive you specify.

2. Follow further instructions on your screen.

3. To verify that you have successfully installed the software package, check that **GPF-7400** is registered in the **Interface** folder of the **Program Files** folder.

* Decompress procedure

A. Create a directory with an appropriate name in a hard disk.
B. Copy each downloaded file to the directory created in Procedure A.
C. Run each file copied in Procedure B to decompress the file. Then a folder and file will be created.

4.1.3 Uninstallation of Utility Disk

- Windows Vista

1. Click the **Start** button and **Control Panel**.
2. Click the **Programs**, **Programs and Features**, and then **Uninstall or Change a program**.
3. Click **Interface GPF-7400** in the list, and then click **Uninstall**.
4. Follow further instructions on your screen.

- Windows XP Embedded, Windows XP, or Windows Server 2003

1. Click the **Start** button, point to **Settings**, and then click **Control Panel**.
2. Double-click **Add/Remove Programs**, and then click the **Change or Remove Programs** tab.
3. Click **Interface GPF-7400** in the list, and then click **Change/Remove**.
4. Follow further instructions on your screen.

- Windows 2000, Windows NT 4.0, Windows Me, Windows 98, or Windows 95

1. Click the **Start** button, point to **Settings**, and then click **Control Panel**.
2. Double-click **Add/Remove Programs**, and then click the **Install/Uninstall** tab.
3. Click **Interface GPF-7400** in the list, and then click **Add/Remove**.
4. Follow further instructions on your screen.

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4.2 Linux

The Interface device driver software is composed as follows.

• Driver disk

This disk contains the necessary files to run the software.

Downloading procedure

>> Download the Driver Disk [Linux/RTLinux] of GPH-7400 from our Web site.

>> If you use the CPU of SH, download the Driver Disk [SHLinux/SH-RTLinux] of GPH-7400 from our Web site.

>> The file you downloaded from our Web site is an archive file. You need to decompress the downloaded file before using it. Please install the file whose time stamp is the latest.

4.2.1 Installation

1. Login to your Linux system as a super user.

```
%su
Password:-------------Password of root
```

2. Change the current directory to where you downloaded the file and then decompress the file.

```
#cd /tmp
#tar xvzf gph7400_<architecture name>*1_(version)*2.tgz
```

3. The command will extract the following files in the directory.

>> lgph7400.<architecture name*1>.tgz	Driver software archive for Linux
>> rgph7400.<architecture name*1>.tgz	Driver software archive for RTLinux
>> common.tgz	Common module archive
>> readme.txt	Latest information file
>> install	Shell script for installation
>> product.txt	Additional file for installation
>> sh4.txt	Additional file for installation*3

4. Run the installer.

```
#sh install
```

5. Follow further instructions displayed on your screen.

Notes:

- *1 Write “i386” or “sh4” depending on the architecture of your computer.
- *2 Write the latest version.
- *3 Not included in platforms of IBM PC/AT compatible.

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■ Loading a Driver Module and Making a Device Node

1. Login to your Linux system as a super user.

```
%su
Password:-------------Passward of root
```

Load a Real-Time module for RTLinux.

```
#rtlinux start
```

2. Load common and driver modules. Run a shell script for loading the modules.

Example: Assume that the installation directory is the default. (for Linux)

```
#cd /usr/src/interface/gph7400/<architecture name>*1/linux/drivers
#sh insmtn.sh
```

Example: Assume that the installation directory is the default. (for RTLinux)

```
#cd /usr/src/interface/gph7400/<architecture name>*1/rtl/drivers
#sh insmtn.sh
```

To create a device node, run the device number setting utility dpg0101. Refer to Help how to use dpg0101.

```
#sh setup.sh
```

Note: To load a new device into a system, prepare a new device node for the device with the device number configuration program. Do not change the loading order of the device driver. The *xxx*Open function returns one of the error codes when the major number of the device node and the major number of the device driver assigned at loading are not the same. If the loading order of the device driver needs to be changed, reconfigure the loading order with the device number configuration program.

3. Create your own program and control the device.

4. To release the loaded driver module, run an appropriate shell script for it.

Example: Assume that the installation directory is the default. (for Linux)

```
#cd /usr/src/interface/gph7400/<architecture name>*1/linux/drivers
#sh rmmtn.sh
```

Example: Assume that the installation directory is the default. (for RTLinux)

```
#cd /usr/src/interface/gph7400/<architecture name>*1/rtl/drivers
#sh rmmtn.sh
```

Note: *1 Write “i386” or “sh4” depending on the architecture of your computer.

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■ Kernel Version

You may need to recompile the driver module if you upgrade to a new kernel version or change a kernel version. Refer to the following instructions.

1. Compile all modules in the install directory/common directory and install them.

   <dpg0100>

```
#cd /usr/src/interface/common/dpg0100/src
#make
#make install
```

   <dpg0101>

```
#cd /usr/src/interface/common/dpg0101/src
#make
#make install
```

   <dpg0102> for RTLinux

```
#cd /usr/src/interface/common/dpg0102/src
#make
#make install
```

2. Go to the src directory of Linux drivers. Then compile and install the modules.

```
#cd /usr/src/interface/gph7400/<architecture name>*1 /
(OS name)*2/drivers/src
#make
#make install
```

3. Run the insmtn.sh shell script to load the drivers.

Notes:

- *1 Write “i386” or “sh4” depending on the architecture of your computer.
- *2 Write “linux” for Linux and “rtl” for RTLinux.

4.2.2 Uninstallation

1. To remove the modules, run the shell script.

2. Run uninstall located in the gph7400/<architecture name> directory under the installation directory.

   Example: Assume that the installation directory is the default.

```
#cd /usr/src/interface/gph7400/<architecture name>*
#sh uninstall
```

3. Follow further instructions displayed on your screen.

   Note: * Write “i386” or “sh4” depending on the architecture of your computer.

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Chapter 5 Uninstallation

5.1 Interface Module Uninstallation

1. Make sure that your computer is turned off, and unplug the power cord from the AC outlet. Remove the PC case cover.
2. Remove the screw from the interface module.
3. Remove the interface module from the slot gently.

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Chapter 6 Hardware Description

6.1 Hardware Specifications

Basic Specifications

Parameter	Specification
Bus requirements	PCI local bus (Rev. 2.1 or later), 32 bits, 33 MHz 5 V or 3.3 V signaling environment
Number of slots required	1 slot
Data transfer mode	I/O transfer (I/O mapped I/O, memory mapped I/O)
Memory size	16,384 bytes (automatically assigned)
Number of I/O ports	16 ports x 1 + 32 ports x 1 (automatically assigned)
Interface module dimensions	174.63 (D) × 106.68 (H) [mm]
Weight	135 g
Power consumption	+5 Vdc (+/-5%): 1.0 A (all inputs/outputs and control signals active) (typ.)
Environmental conditions	Operating temperature: 0 degrees C to 50 degrees C Relative humidity: 20% to 90% (non-condensing)
Connector	CN1: 100-pin half-pitch female connector On-board connector: CN1: DX10A-100S (HIROSE ELECTRIC Co., Ltd.) or equivalent Acceptable cable connector: CN1: DX31A-100P (connector) plus DX-100-CV1 (cover) (HIROSE ELECTRIC Co., Ltd.) or equivalent
Isolation	GMR isolation, photo isolation
Withstand voltage	+500 Vdc
Withstand resistance	+500 Vdc: 10 MΩ or greater
Timer	-
Interrupt sources	Occupancy interruption: 1 3 sources: controller interrupt, external reset interrupt, interlock interrupt

Motor Driving Pulse Circuits

Parameter	Specification
Controller	PCL6045 (Nippon Pulse Motor Co., Ltd.) or equivalent
Input clock frequency	19.6608 MHz
Number of axes	4 axes
Pulse output rate	Approximately 0.073 pps to 6.5535 Mpps[*1]
Number of output pulses	-134,217,728 to +134,217,727
Acceleration and deceleration	Linear and S-curve (Sinusoidal and Parabolic)
Interpolation	Linear interpolation: 2 axes through 4 axes (Up to 32 axes can be controlled in parallel configuration.) Circular interpolation: 2 axes
Pulse output mode	Up/down pulse output (CW/CCW mode) Step/direction output (Step/Dir mode)
Output configurations	Differential line driver output (RS-422 standard) Differential line driver output (RS-422 standard)
Motor configuration	Driver activation (pulse train input positioning control)

Note: [*1] Available range of pulse output rates varies according to the velocity scale factors.

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Control Signal Input Circuits/Digital Input Circuits

Parameter	Specification	
Input signals	1+EL to 4+EL	Forward direction end limit signal: 1 point/axis
	1-EL to 4-EL	Reverse direction end limit signal: 1 point/axis
	1SD to 4SD	Slow down limit signal: 1 point/axis
	1ORG to 4ORG	Origin signal: 1 point/axis
	1ALM to 4ALM	Alarm signal: 1 point/axis
	1INP to 4INP	Positioning completion signal: 1 point/axis
	1PCS to 4PCS*2	Positioning start signal: 1 point/axis
	1CLR to 4CLR*2	Counter clear signal: 1 point/axis
	1LTC to 4LTC*2	Counter latch signal: 1 point/axis
	DI1 to DI12*2	Digital input signal: 12 points
	RESET	External reset signal: 1 point
Input configurations	Photo-isolated high-voltage input (Source type)	
Maximum voltage rating	+50 Vdc	
Supply voltage range	+5 Vdc to +48 Vdc	
Input impedance (protection function)	Current limiting resistor: 680 Ω (Reverse bias protection diode and leakage current reduction shunt resistor: 1.5 kΩ)	
Low-level input current	I_{IL} = -4.7 mA (typ.)	
Threshold current (shut-off guaranteed)	-0.5 mA (max.)	
Threshold current	-0.6 mA to -1.4 mA (voltage level conversion: +1.8 V to +3.3 V)	
Input response time	Short-circuit → release = 8 μs (typ.) Release → short-circuit = 60 μs (typ.) (only external reset signal = 20 ms (typ.))	

Note: *2 The following pins are common each;

- 1LTC through 4LTC and DI1 through DI4,
- 1PCS through 4PCS and DI15 through DI8,
- 1CLR through 4CLR and DI9 through DI12.

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Interlock Circuits

Parameter	Specification
Interlock function	INTLOCK pin (short-circuit): pulse output enabled INTLOCK pin (short-circuit → open): interface module reset INTLOCK pin (open): pulse output disabled
Input configurations	Photo-isolated high-voltage input (Source type)
Maximum voltage rating	+50 Vdc
Supply voltage range	+5 Vdc to +48 Vdc
Input impedance (protection function)	Current limiting resistor: 680 Ω (Reverse bias protection diode and leakage current reduction shunt resistor: 1.5 kΩ)
Low-level input current	I_{IL} = -4.7 mA (typ.)
Threshold current (shut-off guaranteed)	-0.5 mA (max.)
Threshold current	-0.6 mA to -1.4 mA (voltage level conversion: +1.8 V to +3.3 V)
Input response time	20 ms (typ.)

Encoder Input Circuits

Parameter	Specification
Encoder type	Incremental encoder
Counter length	28 bits
Input signals	Encoder input signal (phase A) × 1 point/axis Encoder input signal (phase B) × 1 point/axis Encoder input signal (phase Z) × 1 point/axis
Input configuration	High-speed photo-isolated input (HCPL-063L or equivalent)
Threshold current (shut-off guaranteed)	-1.0 mA (max.)
Threshold current	-1.2 mA to -7.3 mA
Maximum input frequency	1 MHz (Encoder counter counts by 4 MHz at quad-edge evaluation.)

Encoder Output Circuits

Parameter	Specification
Output signals	Digital output: 4 points (DO1 through DO4) Servo driver deviation counter clear: 4 points (1ERC to 4ERC)
Output configurations	High-current drive open-collector output (Source type)
Maximum voltage rating	+50 Vdc
Applied voltage range	+5 Vdc to +48 Vdc
Maximum output current	I_{OL} = +100 mA (max.)
Low-level output voltage	V_{OL} = +1.3 V (max.), +0.9 V (typ.) (I_{OL} = +100 mA) V_{OL} = +0.25 V (max.), +0.15 V (typ.) (I_{OL} = +100 mA)
Threshold current (shut-off guaranteed)	I_{CE} = +10 μA (max.)
Output response time	T_{RON} (short-circuit): 5 μs (typ.) (with the maximum load) T_{ROFF} (open): 65 μs (typ.) (with the maximum load) (Low-to-high transmission time depends on the load impedance.)

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Chapter 7 Functional Description

7.1 Parallel Configuration (CN2, CN3)

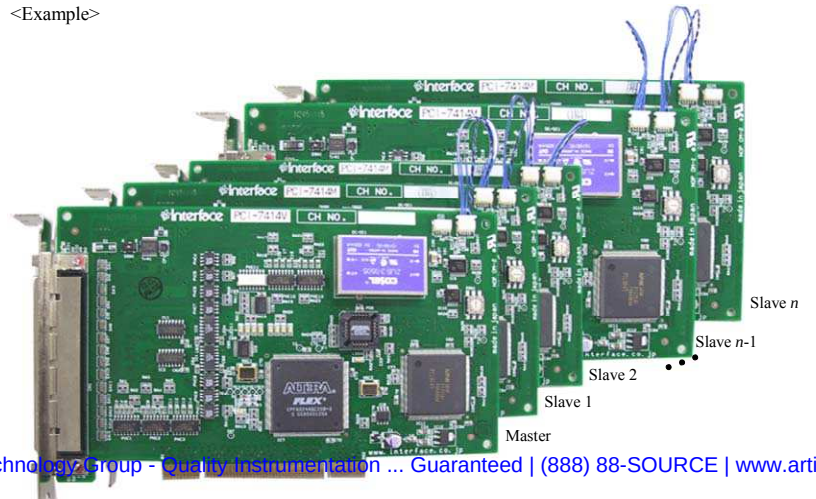
To use the interface modules in the parallel configuration, you must connect your interface modules with the synchronous cable (COP-3701 or COP-3704). In the clock synchronization, a master and one or more slaves exist in the system. (Master/slave configuration is software selectable.)

Function	Description
Master	Distributes its clock synchronous signal to the connected slaves. The controller LSI on the PCI-7414Malso acquires the clock synchronous signal. Only one master is configured for interface modules connected to the system.
Slave	Acquires clock synchronous signal from a master.

The following steps are the setup procedure for the parallel operating configuration.

1. Set up the interface module ID with the rotary switch RSW1 for PCI interface module identification. Refer to "2.1 Factory Default Settings," page 9, for more details.
2. Make sure that your computer is turned off, and unplug the power cord from the AC outlet. Remove the PC case cover and necessary slot covers.
3. Insert each PCI-7414M into an open PCI slot in your system.
4. Screw in each bracket.
5. Connect CN3 (OUT) of the master and CN2 (IN) of the first slave to the connector of a synchronous cable.
6. When you use three or more slaves (PCI-7404M, PCI-7404V, PCI-7414M, and PCI-7414V), connect the first slave to the second slave, and the second to the third according to the following figure.
7. Replace the covers, and plug the power cord to an AC outlet. Turn on the computer.
8. Start your Windows operating system and install the correct driver software corresponding to your system.

<Example>

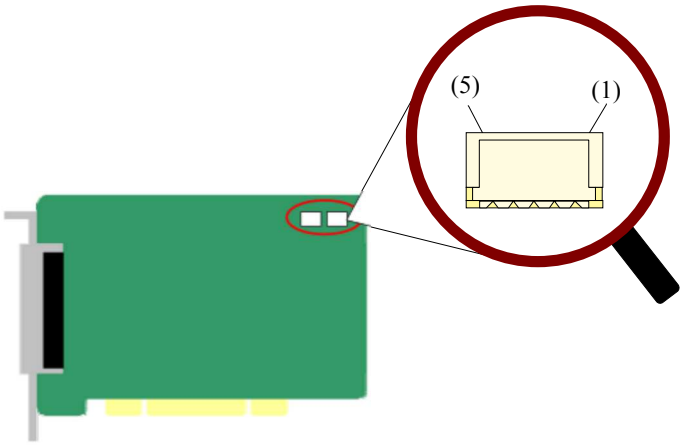


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Caution

	Connect each synchronous cable between adjacent interface modules as shown in the picture on the previous page.
	Up to eight interface modules are available in parallel operation. The actual number of available interface modules depends on the system configuration and the number of open PCI slots.
	Configure only one interface module as a master.
	Parallel operation is applicable to the PCI-7404M, PCI-7404V, PCI-7414M, and PCI-7414V. Do not connect different types of interface modules.

7.1.1 Synchronous Connector Pin Assignments



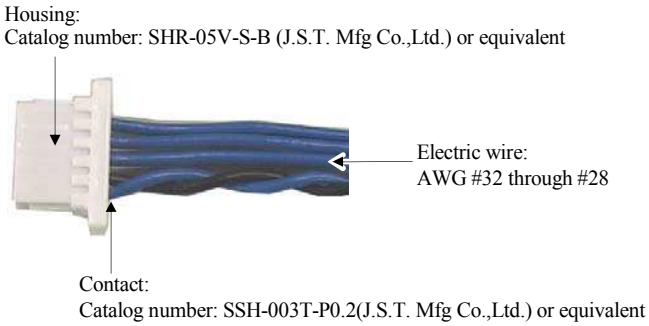
CN2

Signal	Pin Number	Direction	Description
SYCLK1	1	Input	Clock synchronous input
SYCLKGND1	2	—	Ground for clock synchronous input
SYSTA1	3	Input	Simultaneous start input
SYSTP1	4		Simultaneous stop input
SYGND1	5	—	Ground

CN3

Signal	Pin Number	Direction	Description
SYCLK2	1	Output	Clock synchronous output
SYCLKGND2	2	—	Ground for clock synchronous output
SYSTA2	3	Output	Simultaneous start output
SYSTP2	4		Simultaneous stop output
SYGND2	5	—	Ground

7.1.2 Acceptable Synchronous Cable Connector



7.2 Interrupt Sources

This product generates interrupts to the computer with the following sources.

- Controller interrupt
- External reset interrupt
- Ineterlock interrupt

Interrupt requests are cleared under the following conditions:

- When the power supply is turned on.
- When the PCI bus reset occurs.
- When the software deasserts the request explicitly. (for every interface module)

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Chapter 8 External Connections

8.1 External Connections

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

⚠ Caution

Pulse output	
	**Never connect an output signal on the interface module to any other output signals on the interface module and/or external equipment.**
	**Never short-circuit output signals to external power supply anodes.**
	**The maximum output current is +/-20 mA per channel.**
	**Before starting to control motions, make sure that there are no incorrect wiring connections.**
	**We recommend you to use twist-pair cables (shielded) to eliminate interference caused by noises. Moreover, move the noise sources away.**
Encoder input	
	**The maximum input signal voltage rating in encoder input circuit is +24 Vdc.**
Control signal input, Digital input	
	**The maximum input signal voltage rating is +50 Vdc.**
	**Connect control signal pins with external equipment for safety.**

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Interlock, External reset

	**The maximum input signal voltage rating is +50 Vdc.**
	**To release the interlock, set the INTLOCK pin to low level.**
	**The interlock should be set/released by mechanical switches, such as toggle switches. Electric control of the interlock by output signals of our digital input/output products is possible, but in that case, the interlock cannot be controlled if a malfunction occurs in the computer.**
	**Before releasing the interlock, make sure that all connections are correct.**
	**Before starting the motor, make sure that the interlock is released.**
	**You can configure the controller with the interlock asserted.**

+5 Vdc power supply output, ERCCOM output



Do not exceed the maximum load current when using the power rails of +5 Vdc or ERCCOM to supply powers to external circuits. To short-circuit a power output may damage the product.

Signal	Pin Number	Maximum Load Current	
		Per Channel	4 Channels Total
+5Vdc	16, 32, 66, 82	+100 mA*	+100 mA*
ERCCOM	21, 37, 71, 87	+20 mA	+80 mA

*** The maximum load current of +5 Vdc should be set to +100 mA per channel and even in total of 4 channels.**



Never short-circuit the power supply output to avoid malfunction of internal circuit.

Others



We recommend you to confirm the motor rotation and control signal in the state of separating motor from external equipment.

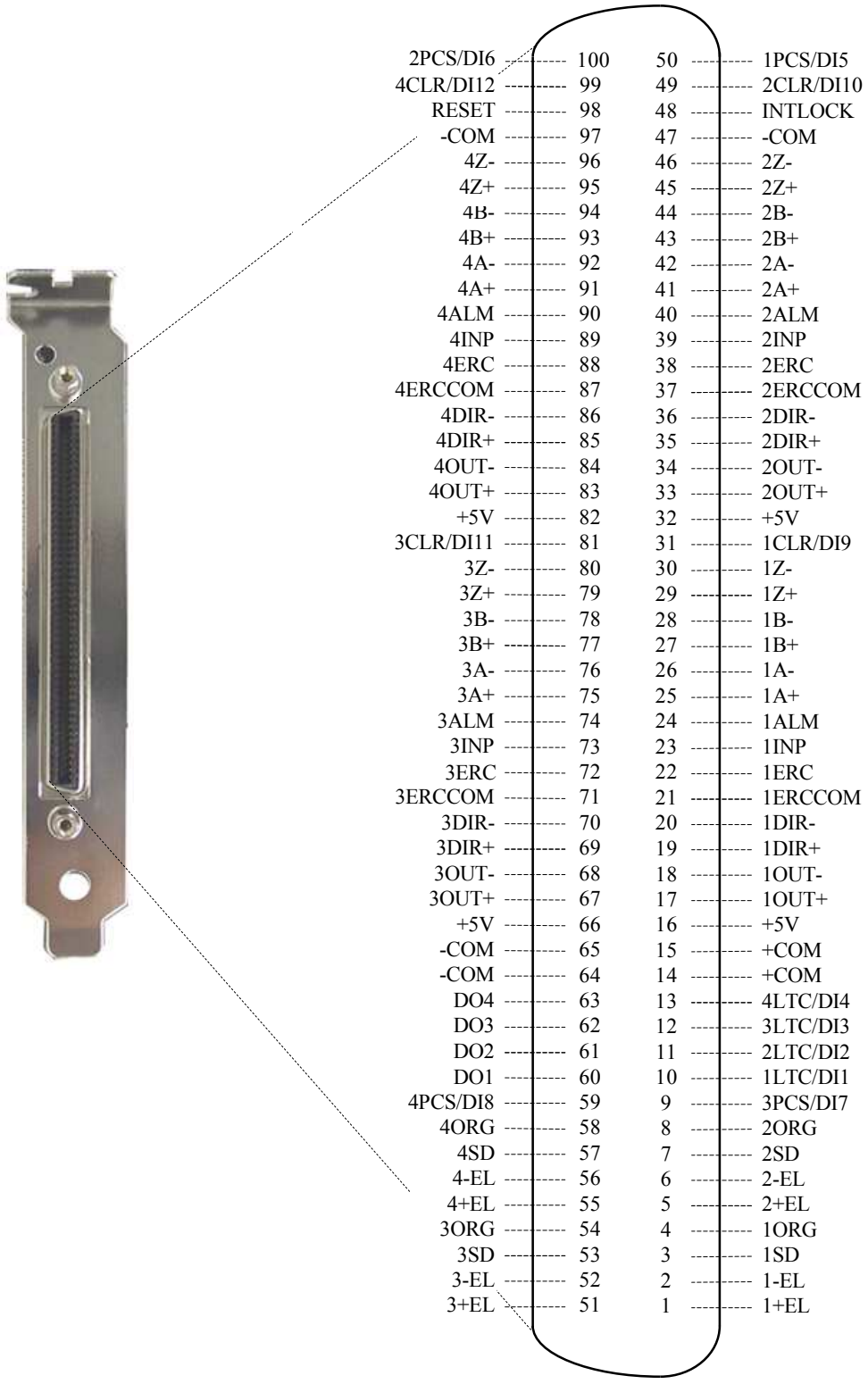


Protect this product from voltage surges.

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8.2 Interface Product Pin Assignments

Connector catalog number:
DX10A-100S (HIROSE ELECTRIC CO., LTD.) or equivalent



8.3 Signals

Signal Descriptions

Signal	Pin Number	Direction	Description
+COM	14, 15	–	Common (+)
-COM	47, 64, 65, 97		Common (-)
+5V	16, 32, 66, 82	Output	+5 Vdc output
1ERCCOM through 4ERCCOM	21, 37, 71, 87		Current output for 1ERC through 4 ERC
1+EL through 4+EL	1, 5, 51, 55	Input	Forward direction end limit input
1-EL through 4-EL	2, 6, 52, 56		Reverse direction end limit input
1SD through 4SD	3, 7, 53, 57		Slow down limit input
1ORG through 4ORG	4, 8, 54, 58		Origin input
1ALM through 4ALM	24, 40, 74, 90		Alarm input
1INP through 4INP	23, 39, 73, 89		Positioning completion input
1PCS through 4PCS	9, 50, 59, 100		Positioning start input
1CLR through 4CLR	31, 49, 81, 99		Counter clear input
1LTC through 4LTC	10, 11, 12, 13		Counter latch input
1ERC through 4ERC	22, 38, 72, 88	Output	Servo driver deviation counter clear output
1A+ through 4A+	25, 41, 75, 91	Input	Encoder input (phase A+)
1A- through 4A-	26, 42, 76, 92		Encoder input (phase A-)
1B+ through 4B+	27, 43, 77, 93		Encoder input (phase B+)
1B- through 4B-	28, 44, 78, 94		Encoder input (phase B-)
1Z+ through 4Z+	29, 45, 79, 95		Encoder input (phase Z+)
1Z- through 4Z-	30, 46, 80, 96		Encoder input (phase Z-)
1OUT+ through 4OUT+	17, 33, 67, 83	Output	Pulse output (+) for motor driving
1OUT- through 4OUT-	18, 34, 68, 84		Pulse output (-) for motor driving
1DIR+ through 4DIR+	19, 35, 69, 85		Direction output (+) for motor driving
1DIR- through 4DIR-	20, 36, 70, 86		Direction output (-) for motor driving
DI1 through DI12	9, 10, 11, 12, 13, 31, 49, 50, 59, 81, 99, 100	Input	Digital input
DO1 through DO4	60, 61, 62, 63	Output	Digital output
INTLOCK	48	Input	Interlock control input
RESET	98		External reset input

Note: The following pins are common each;

- 1LTC through 4LTC and DI1 through DI4,
- 1PCS through 4PCS and DI15 through DI8,
- 1CLR through 4CLR and DI9 through DI12.

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- Correspondence of the interface module connector signals to motion controller signals

  Correspondence between the connector signals for the PCI-7414M and the motion controller LSI's (PCL6045) signals is as follows.

Signals and Motion Controller's Signals

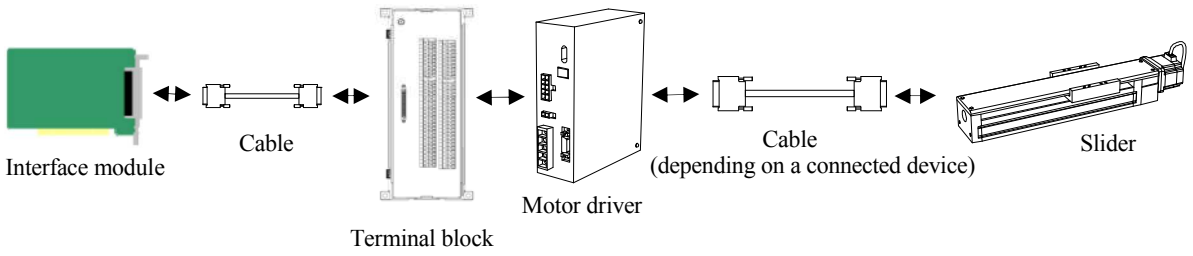
Interface Module Signal	Pin Number	Controller Signal	Interface Module Signal	Pin Number	Controller Signal
1+EL	1	+ELx	3+EL	51	+ELz
1-EL	2	-ELx	3-EL	52	-ELz
1SD	3	SDx	3SD	53	SDz
1ORG	4	ORGx	3ORG	54	ORGz
2+EL	5	+ELy	4+EL	55	+ELu
2-EL	6	-ELy	4-EL	56	-ELu
2SD	7	SDy	4SD	57	SDu
2ORG	8	ORGy	4ORG	58	ORGu
3PCS	9	PCSz	4PCS	59	PCSu
1LTC	10	LTCx	DO1	60	
2LTC	11	LTCy	DO2	61	
3LTC	12	LTCz	DO3	62	
4LTC	13	LTCu	DO4	63	—
+COM	14		-COM	64	
+COM	15	—	-COM	65	
+5V	16		+5V	66	
1OUT+	17	OUTx	3OUT+	67	OUTz
1OUT-	18		3OUT-	68	
1DIR+	19	DIRx	3DIR+	69	DIRz
1DIR-	20		3DIR-	70	
1ERCCOM	21	—	3ERCCOM	71	—
1ERC	22	ERCx	3ERC	72	ERCz
1INP	23	INPx	3INP	73	INPz
1ALM	24	ALMx	3ALM	74	ALMz
1A+	25	EAx	3A+	75	EAz
1A-	26		3A-	76	
1B+	27	EBx	3B+	77	EBz
1B-	28		3B-	78	
1Z+	29	EZx	3Z+	79	EZz
1Z-	30		3Z-	80	
1CLR	31	CLRx	3CLR	81	CLRz
+5V	32	—	+5V	82	—
2OUT+	33	OUTy	4OUT+	83	OUTu
2OUT-	34		4OUT-	84	
2DIR+	35	DIRy	4DIR+	85	DIRu
2DIR-	36		4DIR-	86	
2ERCCOM	37	—	4ERCCOM	87	—
2ERC	38	ERCy	4ERC	88	ERCu
2INP	39	INPy	4INP	89	INPu
2ALM	40	ALMy	4ALM	90	ALMu
2A+	41	EAy	4A+	91	EAu
2A-	42		4A-	92	
2B+	43	EBy	4B+	93	EBu
2B-	44		4B-	94	
2Z+	45	EZy	4Z+	95	EZu
2Z-	46		4Z-	96	
-COM	47	—	-COM	97	—
INTLOCK	48		RESET	98	/RST
2CLR	49	CLRy	4CLR	99	CLRu
1PCS	50	PCSx	2PCS	100	PCSy

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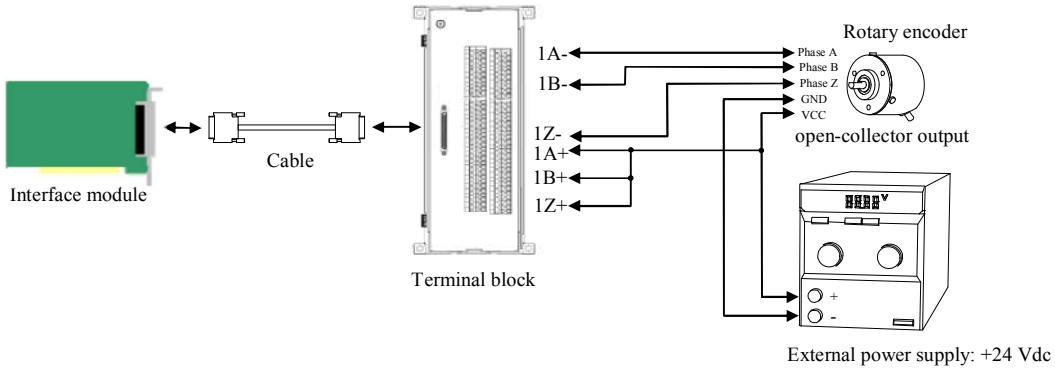
8.4 Connection Diagrams

By using our optional products, the connection to the external circuit can be easily achieved. Refer to "8.2 Interface Product Pin Assignments," page 31, and "8.5 Example Connections," page 35, before connecting this product to the external circuit.

8.4.1 Motor Driving Pulse Output



8.4.2 Encoder Input



8.5 Example Connections

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

8.5.1 Motor Driving Pulse Output Circuit

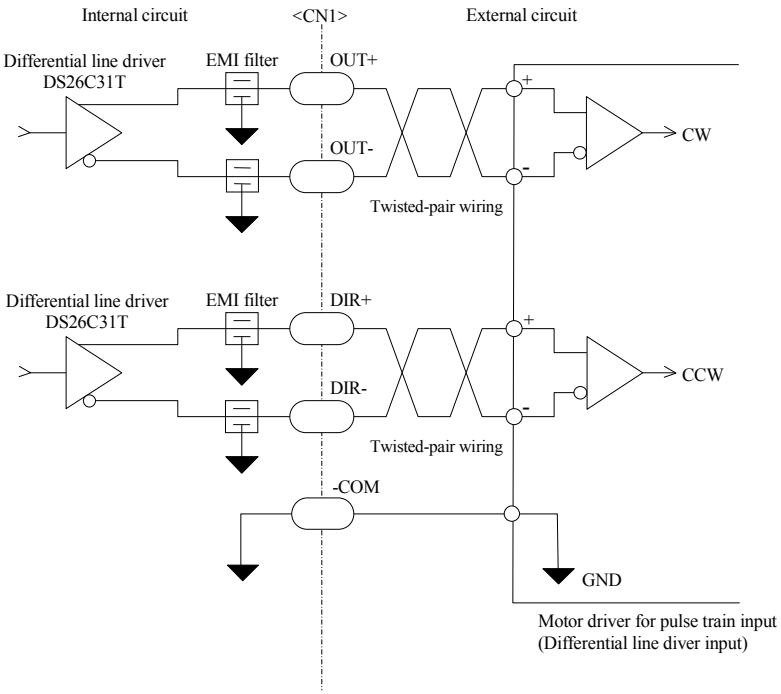
The output configuration of motor driving pulse is differential line driver output (RS-422 standard). The signal level is +5 Vdc. When you connect the PCI-7414M with the motor driver, we recommend you to use a twisted-pair cable to eliminate interference caused by noises.

⚠ Caution

	**While the interlock is asserted, the PCI-7414M cannot output any motor driving pulses. Before the pulse output, make sure that the interlock is deasserted. Before releasing the interlock, make sure that all connections are correct. Refer to "8.5.4 Hardware Interlock Circuit," page 43, for more details.**

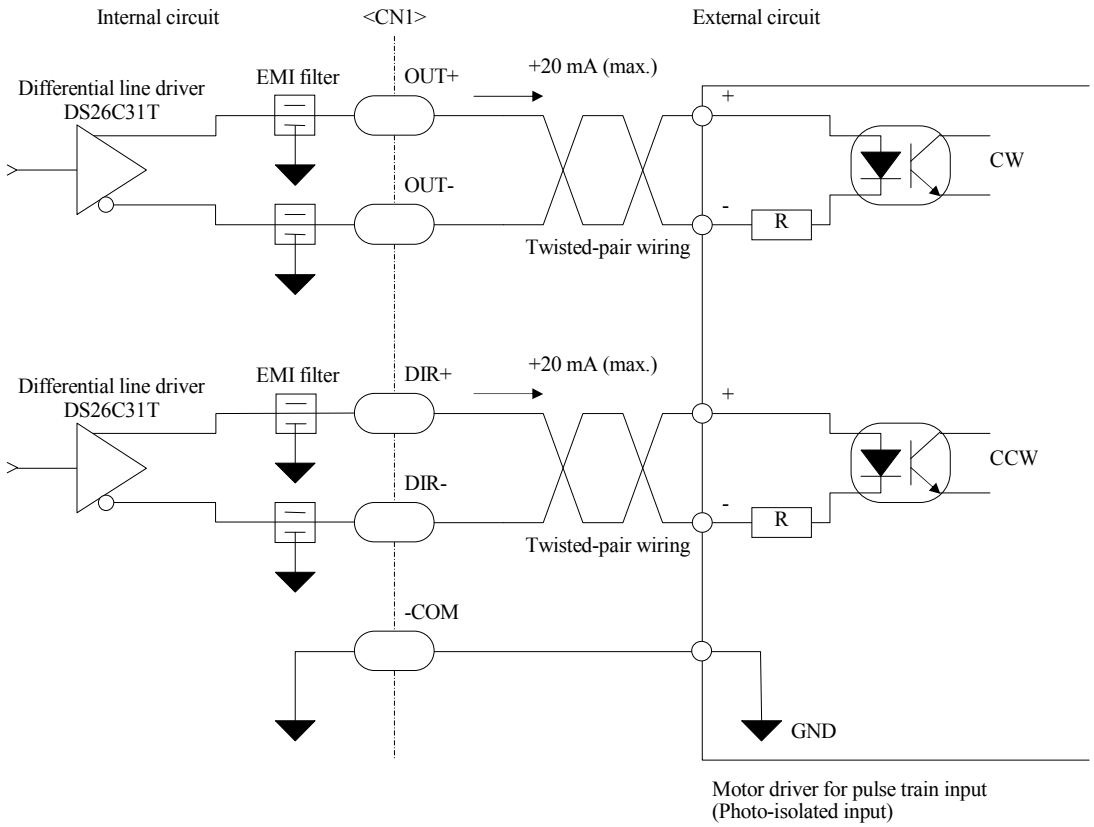
The following figures show example connections. Before connecting this product, confirm the specifications of motor driver.

● Connection with motor driver for differential line driver input

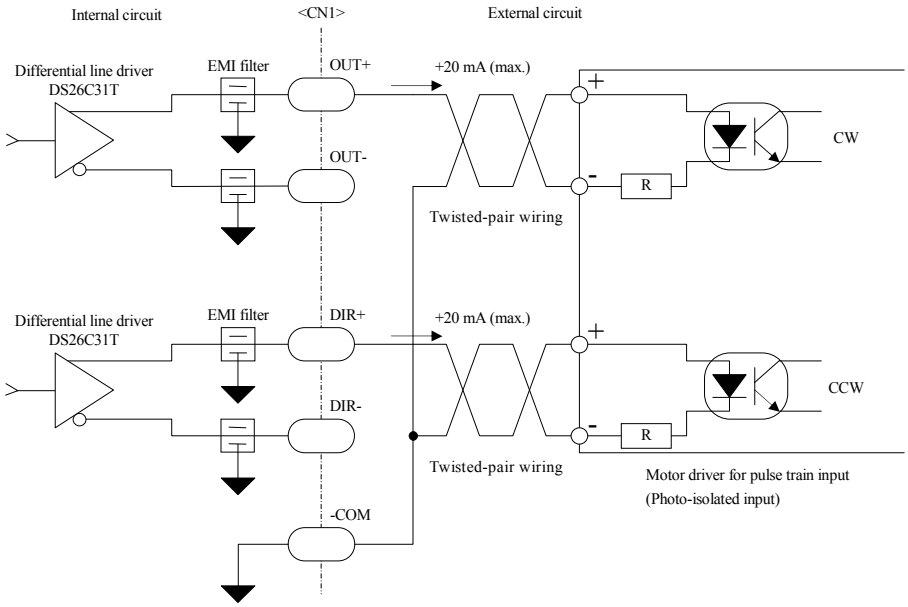


● Connection with motor driver for photo-isolated input

<Example 1>

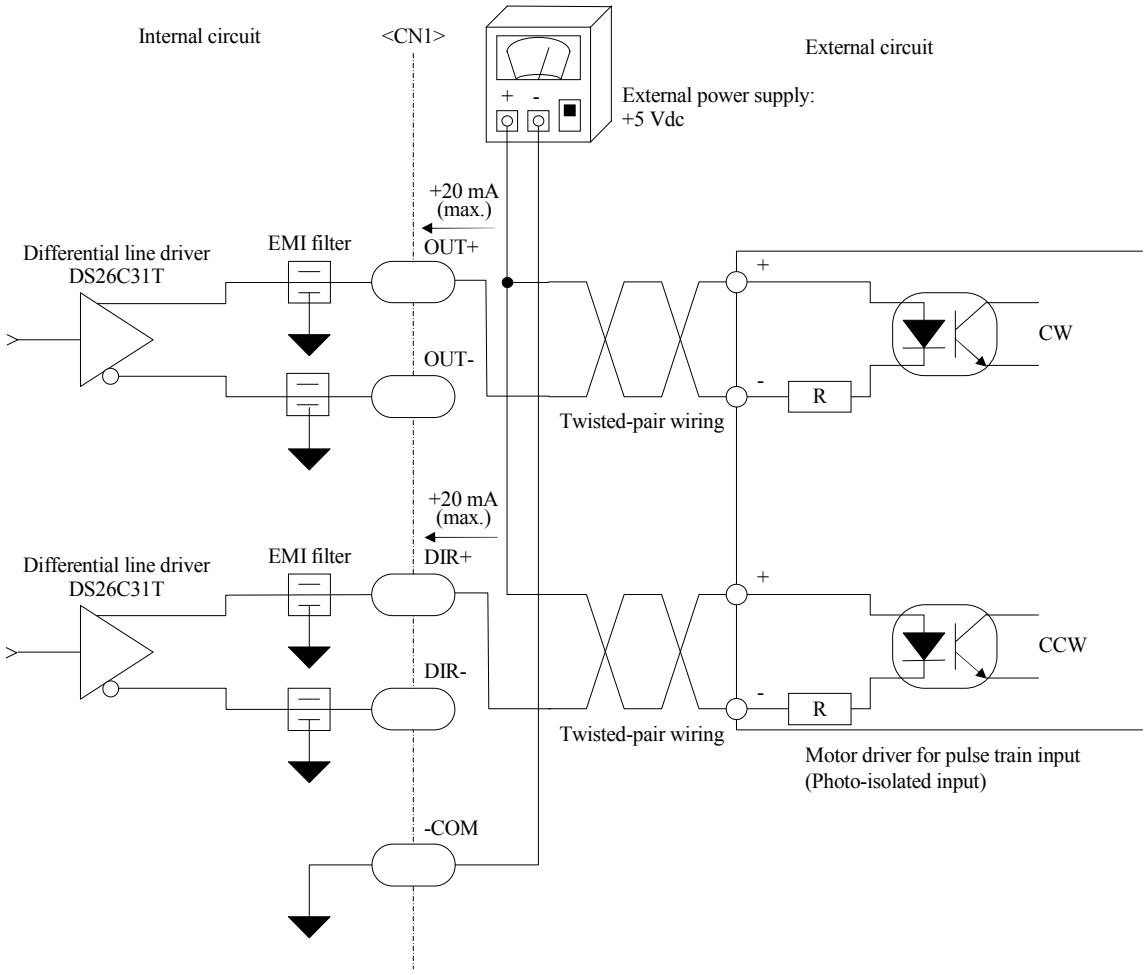


<Example 2>



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<Example 3>

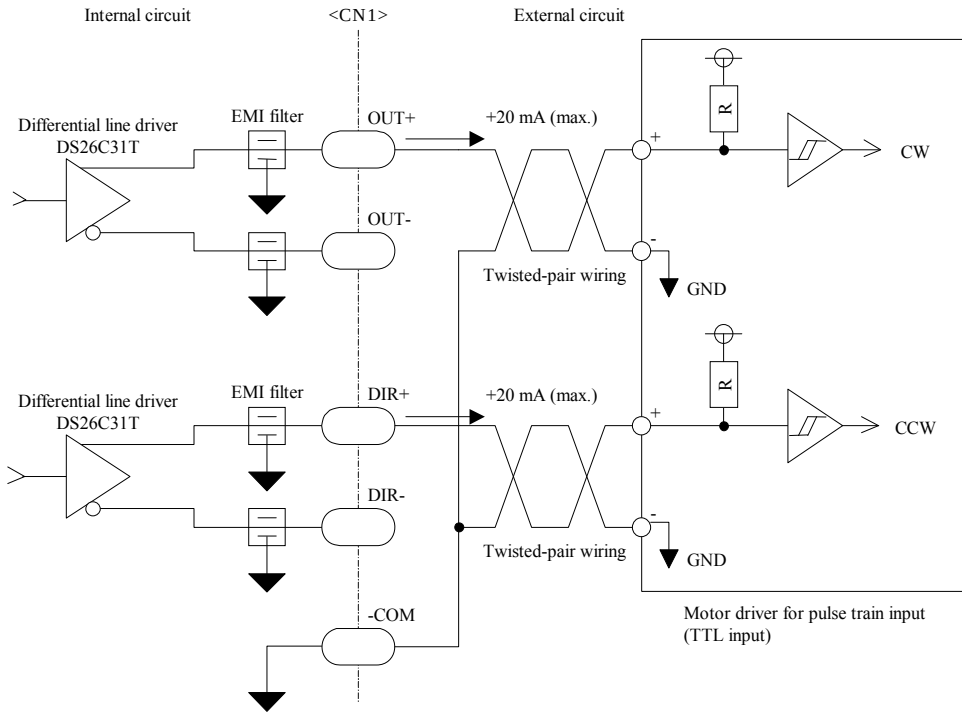


⚠ Caution

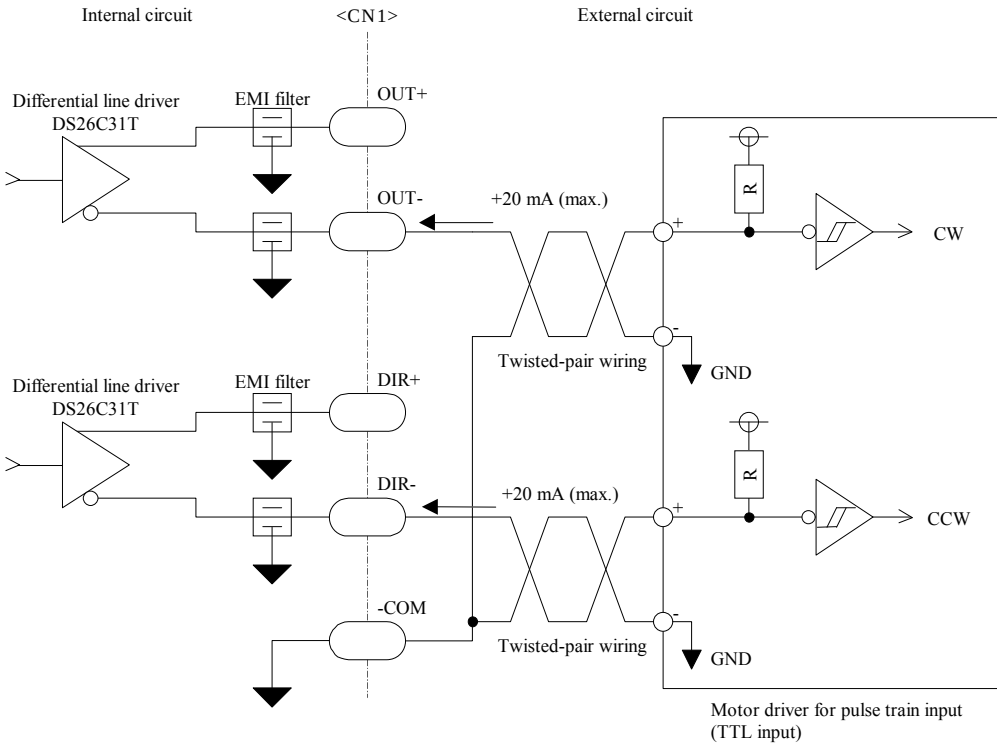
!	**This product operates on +5 Vdc external power supply.**

● Connection with motor driver for TTL input

<Example 1>



<Example 2>

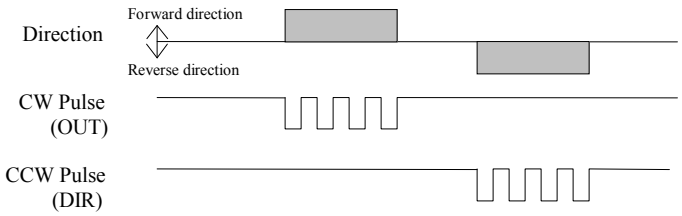


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The pulse output circuit can connect with a motor driver that supports differential line driver input, photo-isolated input, or TTL input. Select either up/down pulse output configuration (CW/CCW mode) or step/direction output configuration (Step/Dir mode), referring to the figures below.

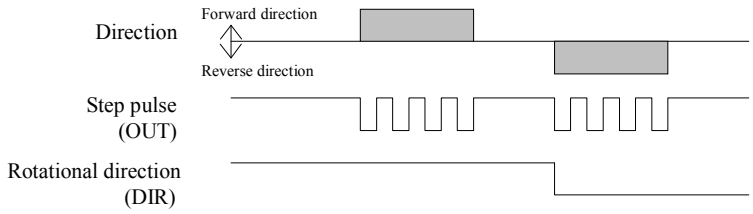
● Up/down pulse output configuration (CW/CCW mode)

This configuration uses the CW pulse and the CCW pulse. If the forward direction is indicated, the CW pulse is output from the OUT pin. If the reverse direction is indicated, the CCW pulse is output from the DIR pin.



● Step/direction output configuration (Step/Dir mode)

This configuration uses the pulse output signal and the rotational direction signal. If the forward direction is indicated, the rotational direction signal is high level. If the reverse direction is indicated, the level is low level.



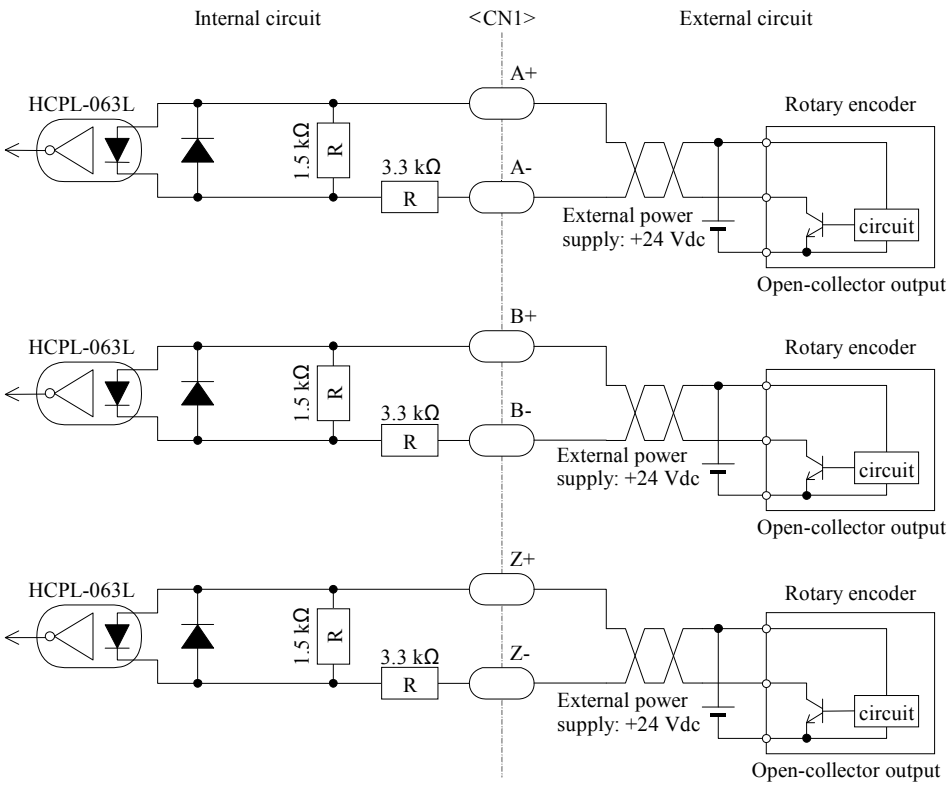
Note: Logic levels (active-high or active-low) of the 1DIR, 2DIR, 1OUT, and 2OUT pins are software programmable.

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8.5.2 Encoder Input Circuit

This circuit is composed of photocouplers. The maximum input frequency is 1 MHz. The PCI-7414M can be connected with devices for open-collector output. The following table shows the LED current with photocoupler.

LED	Current
On	7.3 mA to 16 mA
Off	0 mA to 1.2 mA

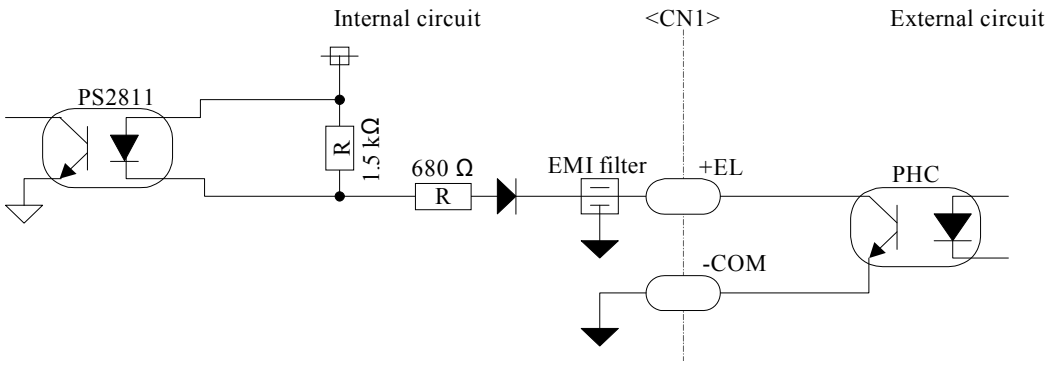


8.5.3 Control Signal Input/Digital Input

The table below shows control signal input in detail. The CLR, LTC, and PCS signals can read the states simultaneously as digital input signal.

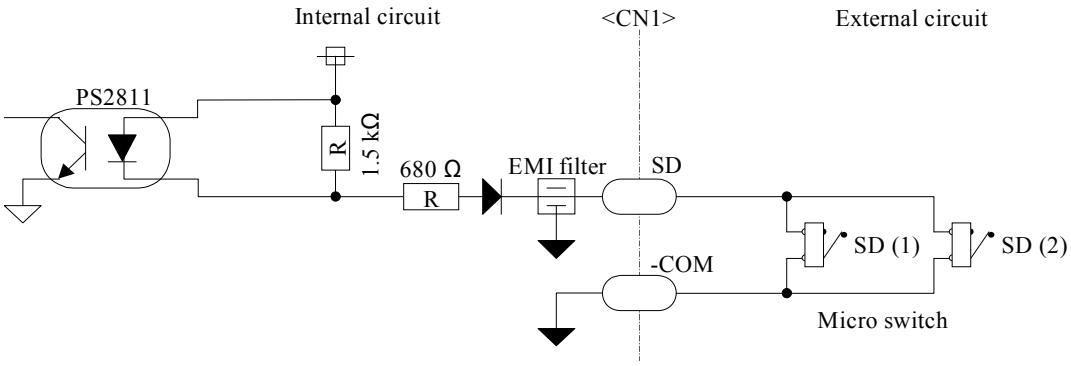
Signal	Signal Name	Description
1+EL through 4+EL	Forward direction end limit input	These signals stop the forward direction motion immediately.
1-EL through 4-EL	Reverse direction end limit input	These signals stop the reverse direction motion immediately.
1SD through 4SD	Slow down limit input	These signals decelerate or stop the forward direction motion.
1ORG through 4ORG	Origin input	These signals stop the homing immediately.
1ALM through 4ALM	Alarm input	Controller LSI allows pulse output to stop immediately or stop with deceleration, when ALM signals are asserted during operation (pulse output).
1INP through 4INP	Positioning completion input	These signals are for positioning completion input from servo driver.
1LTC through 4LTC (DI1 through DI4)	Counter latch input (digital input 1 through digital input 4)	These signals are latch signals for counter built in controller LSI (1 through 4).
1PCS through 4PCS (D15 through D18)	Positioning start input (digital input 5 through digital input 8)	These signals can be used for the target position override 2 function of controller LSI, and as start signals for every axis.
1CLR through 4CLR (DI9 through DI12)	Counter clear input (digital input 9 through digital input 12)	These signals are clear signals for counter built in controller LSI (1 through 4).
RESET	External reset input	This signal resets the controller LSI at falling edge (open → short-circuit) of the external reset pin. To prevent the malfunction by the noise and so on, the filter (approximately 20 ms) is set for the external reset input pin.

<Example 1>

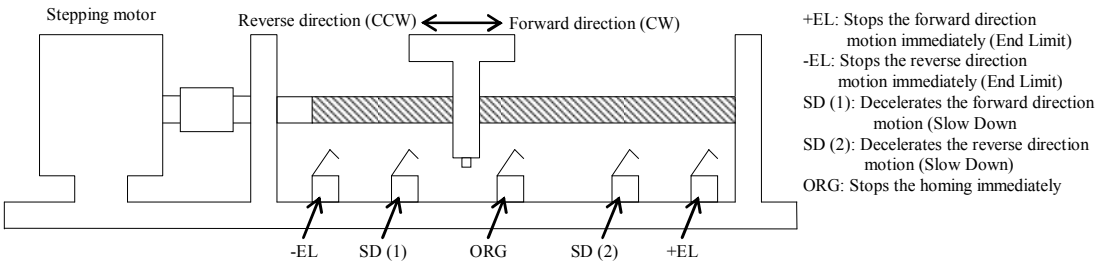


<Example 2>

Each input configuration is photo-isolated high-voltage input in the range from +5 Vdc to +48 Vdc. This circuit requires no external power supply because the PCI-7414M is on-board power supply.



The following figure shows an example for an arrangement of switches.



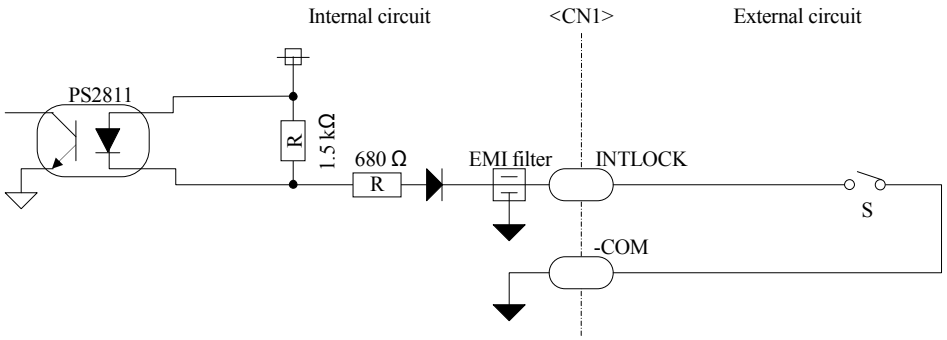
To stop all motions immediately, assert the ALM signal.

⚠ Caution

	**For your safety, locate each limit switch at the corresponding correct position and connect it with the corresponding limit input of this product.**
	**Before starting to control motions, make sure that there are no incorrect wiring connections. Then, make sure that the motor rotates and limit switches are functioning correctly before connecting the motor to the equipment.**

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8.5.4 Hardware Interlock Circuit



Interlock	INTLOCK	External Circuit
Asserted	Not short-circuit to -COM or high	Open (*S*: off)
Deasserted	Short-circuit to -COM or low	Closed (*S*: on)

Interlock signal input is a function to stop the motor driving pulse by force when the computer on which the interface module is installed goes out-of-control or hangs up, or the motor connected to this interface module runs away. Usually the interlock is asserted, or on standby, the LED2 shows the interlock status is on. In that case, motor driving pulses are inhibited. Short-circuit the interlock pin (INTLOCK) to the -COM pin to release this function. When the LED2 is turned off, the motor driving pulses are enabled. When the interlock is asserted, the pulse output is stopped and the controller LSI is reset by software setting.

⚠ Warning

	**Double-check all connections before releasing the interlock. Before starting the motor, make sure that the interlock is released.**
	**The interlock should be set/released by mechanical switches such as toggle switches. Electric control of the interlock by output signals of our digital input/output products is possible, but in that case, the interlock cannot be controlled if a malfunction occurs in the computer.**

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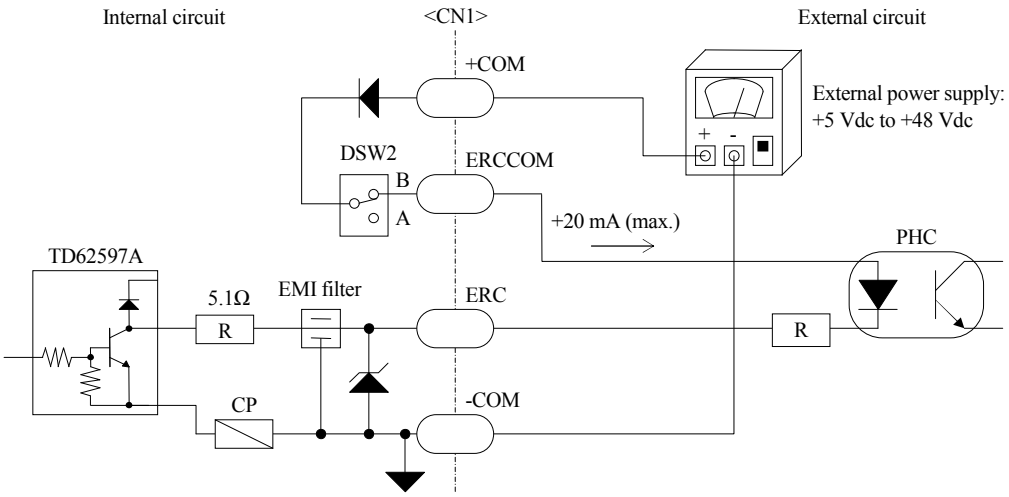
8.5.5 Digital Output/Servo Driver Deviation Counter Clear Signal Output

These output configurations are transistor output. The controllable signal level is +5 Vdc to +48 Vdc. ERCCOM is an electric power supply for servo driver deviation counter clear output.

⚠ Warning

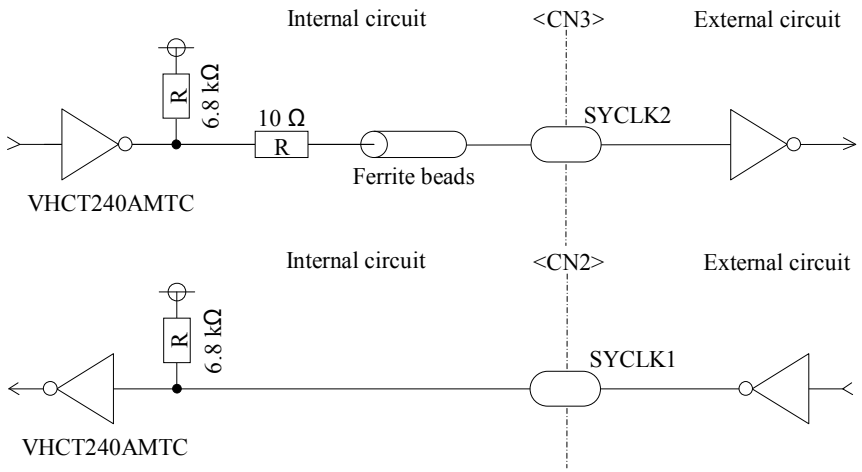
!	**The maximum voltage rating in output circuit is +50 Vdc.**
!	**The maximum output current is +100 mA.**
!	**The maximum current from ERCCOM per channel is +20 mA.**
⊘	**When using ERCCOM output, set the DSW2 DIP switch to B side.**

<Example>



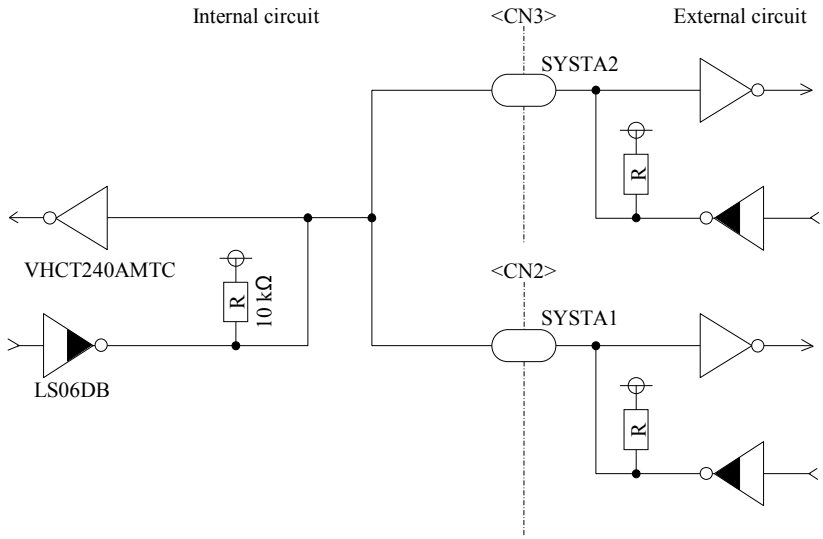
8.5.6 Clock Synchronous Signal Input/Output

The following figure shows an example of clock synchronous signal input/output connection.



8.5.7 Synchronous Start/Stop Signal

The following figure shows an example of synchronous start/stop signal connection.



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Chapter 9 Optional Products

9.1 Accessories

Refer to our Web site (www.interface.co.jp), for more details.

Cables

Model	Description
ECO-3610	Motion Controller Conversion Cable (1.0 m, 3.28 ft.)
ECO-3620	Motion Controller Conversion Cable (2.0 m, 6.56 ft.)
ECO-3630	Motion Controller Conversion Cable (3.0 m, 9.84 ft.)
ECO-3650	Motion Controller Conversion Cable (5.0 m, 16.40 ft.)
ECO-3710	Motion Controller One End Cable (1.0 m, 3.28 ft.)
ECO-3910	Motion Controller Cable (1.0 m, 3.28 ft.)
ECO-3920	Motion Controller Cable (2.0 m, 6.56 ft.)
ECO-3930	Motion Controller Cable (3.0 m, 9.84 ft.)
ECO-3950	Motion Controller Cable (5.0 m, 16.40 ft.)
ECO-3720	Motion Controller One End Cable (2.0 m, 6.56 ft.)
ECO-3730	Motion Controller One End Cable (3.0 m, 9.84 ft.)
ECO-3730Y	Motion Controller Fusion Cable (3.0 m, 9.84 ft.)
ECO-3720Y	Motion Controller Fusion Cable (2.0 m, 6.56 ft.)
ECO-3710Y	Motion Controller Fusion Cable (1.0 m, 3.28 ft.)

Terminal Blocks

Model	Description
TNS-9600	96-pin M3 Screw Terminal Block with 96-pin Half-Pitch Male Connector
TNS-9601	100-pin Screw Terminal Block with 96-pin Half-Pitch Male Connector
TNS-9602	96-pin Screwless Terminal Block with 96-pin Half-Pitch Male Connector
TNS-9603	50-pin MIL Connector x 2 Terminal Block with 96-pin Half-Pitch Male Connector
TNS-9606	37-pin D-sub Female Connector x 4 Terminal Block with 96-pin Half-Pitch Male Connector

Connector Packs

Model	Description
COP-3701	A Pack of 5-Pin Synchronous Cable
COP-3704	A Pack of 5-Pin Synchronous Cable

Software

Model	Description
GPF-7400	Motion Controller Driver Software for Windows
GPH-7400	Motion Controller Driver Software for Linux/RT

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Chapter 10 Information Service

10.1 How to Get Information

We have a lot of valuable information on our Web site. Please visit our Web site and get your necessary information.

Japan: www.interface.co.jp
International: www.interface-world.com

To download user's manuals and device driver software, a registered user ID is required.

Technical Support	Frequently asked questions, white papers. glossary, and so on.
Product Information	What's new, specifications, product selection guides, and so on
Useful Information	Price information, rental information, distributors
Download Service	Drivers, technical documents like sample programs and user's manual data

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

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Revision History

Version	Date	Comments
1.2	July, 2009	Windows Vista, Windows XP Embedded, Windows Server 2003 supported. Manual revised: Section 1.1 Packing List deleted. Chapter 3 Setup changed. Section 4.2 Linux added. Chapter 7 Troubleshooting deleted. Chapter 8 Version Considerations deleted. Section 8.3 Signals Signals of pin 64 and pin 65 changed. Section 8.5.1 Motor Driving Pulse Output Circuit - Connection with Motor Driver for Photo-isolated Input Example 3 changed. Chapter 9 Optional Products changed. Chapter 10 Information Service added. Chapter construction changed. Format revised.
1.1	November, 2003	Manual revised. The following specifications added. Counter length: 28 bits, Isolation: GMR isolation Supply voltage range in control signal input circuits/general purpose digital input circuits fixed: +50 Vdc to +48 Vdc → +5 Vdc to +48 Vdc.
1.0	October, 2003	First Release

Due to constant product improvements, the information in this USER'S MANUAL is subject to change without prior notice.

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Interface Corporation provides only the exchange maintenance service outside Japan. The technical support shall be limited to e-mail only.

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- Please refer to the insertion about repair, replace, and export of Interface products.

In principle, we do not charge for repair during the warranty period. (Customer is responsible for all shipping charges.)
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This warranty is applied only when this product is used in Japan.
All repairs are accepted at your expense after the warranty period.
Rerepair is warranted only if the same components are broken within six months from the last repair. (Rerepair is limited to repairable components.) When you request rerepair, please make sure to attach the previous repair report. If the report is not attached, we treat the request as a new repair request.

Export

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 government of Japan.

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■ **Repair and Maintenance**

We provide repair and maintenance service for your damaged product. If you need this service, please follow the procedures for repair and maintenance applications. You can also download a user's manual of Japanese version from our Web site below.

URL: www.interface.co.jp

■ **For Assistance**

If you would like to inquire our products, please contact below.

Customer Support Center (for Assistance)	Phone: 0120-447213 (in Japan) (Available from 9:00 a.m. to 5:00 p.m. Monday to Friday except for holidays and company holidays)
	FAX: 0120-458257 (in Japan) E-mail: support@interface.co.jp
Sales Information Center (for Repair and Maintenance)	Phone: 082-262-1630 (in Japan) (Available from 9:00 a.m. to 5:00 p.m. Monday to Friday except for holidays and company holidays)
	Fax: 082-262-1552 (in Japan)

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