

ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

**Artisan Technology Group**
(217) 352-9330 | sales@artisantg.com | artisantg.com

**Full-service, independent repair center**
with experienced engineers and technicians on staff.

**We buy your excess, underutilized, and idle equipment**
along with credit for buybacks and trade-ins.

**Custom engineering**
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

**Expert team | Trust guarantee | 100% satisfaction**

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

**Visit our website - *Click HERE***

# HPCI-PPD516A

## User's Manual

NC board series

High-speed 6-axis positioning board

Ltd Hiver Tech

**Page 2**

Note: This product and this manual may be improved or otherwise without notice.
Please note that it is subject to change.

High Bar Tech Co., Ltd.
1-8-11 Shinohashi, Koto-ku, Tokyo
Mitsui Life Shinohashi Building
TEL 03-3846-3801
FAX 03-3846-3373

Version 2.01 Published August 10, 2006

Unauthorized duplication / reproduction

**Page 3**

## Warranty coverage

1. 1. The warranty period of this product is 3 years from the date of purchase. At our discretion during the warranty period
   If more defects are found, we will take the product back to us for repair or replacement.

2. 2. Due to the use, supply (delivery date) or failure of our products, regardless of whether they are within the warranty period or not.
   Direct, indirect, secondary damage or lost profits incurred by the customer and a third party
   Therefore, please note that we do not take any responsibility beyond the selling price of this product.
   when.

## Disclaimer

1. 1. Due to product installation, connection, setting, and operation that do not comply with the contents described in this manual.
   Please note that we are not responsible for any damage caused.

2. 2. This product is for general electronic equipment (machine tools, measuring equipment, FA / OA equipment, communication equipment, etc.)
   Since we use manufactured semiconductor products, their malfunctions and failures are directly life-threatening.
   Equipment that may cause harm to the body, property, etc. (medical equipment, transportation equipment, combustion equipment, etc.)
   It is not designed, intended, approved or guaranteed to be applicable to safety devices, etc.).
   Therefore, regarding the safety, quality and performance of this product, this manual (or catalog)
   There is no warranty, express or implied, other than what is stated in.
   Please note that.

3. 3. Any modifications or repairs made by you that are not approved by us, whether within or outside the warranty period.
   Please note that we are not responsible for any damage caused by the cause.

4. Regarding the contents described in this manual, the patent rights, copyrights, and quotients of our company or a third party
   It does not guarantee the rights of the title or other intellectual property rights or grant the license.
   not. In addition, by using the information described in this manual, the intellectual property rights of a third party
   We are not responsible for any problems related to such rights, so please be forewarned.
   Please accept.

For safe use

Thank you for choosing our NC board series.

This manual describes the handling and precautions when using this product, so be sure to fill it out.
Please read it before using.

This manual is always stored in an easy-to-understand location near the permanent location of the NC board to which this manual is attached.
However, please refer to and confirm as necessary.

## Safety precautions

Before using this product, be sure to read this user's manual and all attached documents carefully.
Please use it correctly after understanding the contents. Knowledge of this product, safety information and precautions
Please use it after familiarizing yourself with everything.

In this user's manual, the ranks of safety precautions are set as "warning" and "caution".
It is divided.

| | |
|---|---|
| warning | If you ignore this indication and handle it incorrectly, you will die.<br>It shows the contents that may be seriously injured. .. |
| caution | If you ignore this indication and handle it incorrectly, you may be injured.<br>Indicates the contents that may be incurred or property damage is expected. .. |

1. 1. Target users

caution

This product and the manual are intended for the following users. ..

- Those who have basic knowledge about expansion board expansion and wiring.
- Those who have basic knowledge about control electronic devices and personal computers.

2. 2. Conformity BUS

warning

This product is in PCI Local Bus Specification Rev.2.1 (+ 5V specification)
It is a suitable board. PCI Local Bus Specification Rev.2.1
Do not use it except in an environment where (+ 5V specification) operates.

3. 3. Environmental condition

caution

Please store and use this product under the following environmental conditions.

- Operating ambient temperature 0 ℃ ~ + 50 ℃
- Operating ambient humidity 20% RH to 85% RH (no condensation)
- Storage ambient temperature -15 ℃ ~ + 75 ℃
- Storage ambient humidity 10% RH to 90% RH (no condensation)
- atmosphere No corrosive gas, flammable gas, oil mist, dust
- Altitude 3000m or less above sea level
  (Use within the range where the upper limit of 2 ° C is lowered every 300m)





4. Transportation / installation

warning

Before touching this product, touch the metal to remove static electricity from your body.
Static electricity can cause the board to malfunction.

Do not wrap this product in a packing material (air cap, etc.) that is easily charged with static electricity.
Please. Static electricity can cause the board to malfunction.

Do not touch the edge connector part of this product.
If the edge connector part becomes dirty, it may cause a malfunction.

Do not place heavy objects on this product. If you put a heavy object on it,
It may damage the parts and cause a malfunction.

Please set the jumper of this product before installing it on a personal computer.
If you set it while the power is on, the setting will not be recognized correctly and it will cause a malfunction.
Will be.

Make sure to set the jumper of this product correctly. If you make a mistake in the settings
It may cause a malfunction.

When installing this product on a personal computer, be sure to turn off the power of the personal computer, etc.
Then, unplug the power cord before starting work.
If you work without unplugging the power cord, it may cause a malfunction. again,
The device may behave unexpectedly.

When attaching this product to a personal computer, etc., make sure that the board is parallel to the connector.
Please insert the edge connector of the gold-plated part deeply into the PCI connector.
stomach. Contact if the board is mounted at an angle or inserted shallowly
It may cause malfunction or failure due to defects.

When mounting this product on a personal computer, etc., attach the mounting bracket to the mounting screw.
Please fix it more securely. Insufficient installation may cause malfunction.
increase.

caution

Do not drop this product or handle it roughly. Shock and vibration are the causes of failure
Become.

Do not touch the solder surface of this product directly by hand.
There is a risk of injury due to protrusions on the parts.



**Page 7**

5. wiring

warning

Wiring work to the external line connector and attachment / detachment of the external line connector are the power supplies for personal computers, etc.
Please turn off and unplug the power cord before proceeding.
If you work without unplugging the power cord, it may cause a malfunction. again,

The device may behave unexpectedly.

For wiring to the connector for external lines, carefully check the connector signal table, etc., and wire correctly.
please do it.
Incorrect wiring may cause malfunction or burning.

Be sure to use the power supplied from the outside within the rating. Used outside the rating
Doing so may cause malfunction, burning, or malfunction.

Be sure to use the circuit connected to the input / output circuit within the rated current and voltage. Samadhi
If it is used for other than the case, it may cause malfunction, burning or malfunction.

Use the recommended connector for the external wiring connector. Non-recommended connections
If it is used, it may cause a malfunction due to poor contact.

Be sure to lock the connector for external wiring before use. Use without locking
If it is done, it may cause a malfunction due to disconnection of the connector or poor contact.
increase.

Do not pull or apply a heavy load to the external wiring cable. Connection
It may cause malfunction due to disconnection of the actuator or poor contact.

Cables for external wiring are noisy, such as motor wiring and AC power cables.
Keep away from many wires as much as possible. Noise causes malfunction when wiring is close
It will be.





6. test run adjustment

warning

When using this product to operate the device, debug the program sufficiently.
Please operate after that. If there is a mistake in the program, it will move unexpectedly
You must to do something before you go on.

When operating the device using the sample program attached to this product,
At first, check the operation at a low speed, and set it according to the mechanical system.
Please. Unexpected movement may occur if the operation is performed with settings that do not match the mechanical system.

I will.

7. waste

warning

When disposing of this product, dispose of it in accordance with relevant laws and regulations.





eye Next

1. 1. Introduction ・・・・・・・・・・・・・・・・・・・・ 1
1.1 About this manual ... 1

2. 2. Terminology between PPD516A board and motor control axis ・・・・・・・・・ 1
2.1 Typical motor control systems and terms ... 1

3. 3. Board settings and connections ... 2
3.1 Board configuration ... 2
3.2 Address in board ・・・・・・・・・・・・・・・・ 3
3.3 Settings in the board ・・・・・・・・・・・・・・・ 5
3.3.1 Encoder input circuit selection ... 5
3.3.2 Board ID selection ... 5
3.4 Setting items of circuit function by software ・・・・・・・・・・・・・・ 6
3.5 External connection ・・・・・・・・・・・・・・・・・ 6

3.6 Connector signal allocation ・・・・・・・・・・・・・・・ 7
3.7 Set to PC ・・・・・・・・・・・・・・ 8

4. Instructions [Initial setting related] ・・・・・・・・・・・・・・ 9
4.1 Overview ・・・・・・・・・・・・・・・・・・・ 9
4.2 Operation type of PCL5014 ... 9
4.3 PCL5014 command explanation ・・・・・・・・・・ 11
4.3.1 Register usage classification ・・・・・・・・・・・・・ 11
4.3.2 Register writing / reading method 12
4.3.3 Input / output of server face signal ・・・・・・・・・・・・・・ 14
4.3.4 Status and interrupt status ・・・・・ 15
4.3.4.1 Status 1 ・・・・・・・・・ 16
4.3.4.2 Status 2 ・・・・・・・・・・ 17
4.3.4.3 Interrupt status ・・・・・・・・・ 17
4.4 Registers to be set in the environment ・・・・・・・・・ 18
4.4.1 Environment register 1 (R6) ・・・・・・・・ 18
4.4.2 Environment register 2 (R7) ・・・・・・・・ 20
4.4.3 Environment register 3 (R8) ・・・・・・・・ 23
4.4.4 Control mode buffer ・・・・・・・・・・ 24

5. Instructions [Operation execution] ・・・・・・・・・・・・・・ 25
5.1 Operation mode buffer ・・・・・・・・・・・・・ 25
5.2 Explanation of operation mode ・・・・・・・・・・・・・ 26
5.3 Command buffer ・・・・・・・・・・・・ 29
5.4 Registers to be set at runtime ・・・・・・・・・・・ 31
5.4.1 Speed registers (PR1, PR2, R1, R2) ・・・・・・・・・ 31
5.4.2 Magnification register (PR4, R4) ... 32
5.4.3 Feed amount register (PR0, R0, PCTR) ・・・・・・・・ 32
5.5 Registers that do not change in principle ・・・・・・ 33
5.5.1 Acceleration register (PR3) And deceleration register (PR15) settings of Register (PR16) ・・・・・・・・・・・・・・・・ 33
5.6 Other registers ・・・・・・・・・・・・・・ 35
5.6.1 Feed amount preset counter (reading PCTR) ・・・・・・・・ 35
5.6.2 UP / DOWN counter (R9) ・・・・・・・・・・・・ 35
5.6.3 Compactor value 1 register (R10) and compactor value 2 register (R11) ・・・・・・・・・ 35
5.6.4 Control mode buffer and environment register 2 (R7) ・・・・・・・・・ 35
5.6.5 Counter monitor (R12) ... 36
5.6.6 Command Monitor 1 (R13) ... 37
5.6.7 Command Monitor 2 (R14) ・・・・・・・ 38

**Page 10**

6. Operation ・・・・・・・・・・・・・・ 40
6.1 How to set the axis sensor ・・・・・・・・・・・・・・ 40
6.2 Concept of server face ・・・・・・・・・・ 41
6.3 Standard control configuration policy ・・・・・・・・・・・・ 42
6.4 Next operation automatic start control ・・・・・・・・・・・・ 43
6.5 Acceleration time and deceleration time are different and linear S-shaped acceleration / deceleration setting ・・・・・・ 44
6.5.1 Acceleration register (PR3) And deceleration register (PR15) settings of ・・・・・・・・・・・・・・ 44
6.5.2 Deceleration point setting (PR5) ・・・・・・・・・ 45

7. Hardware edition ・・・・・・・・・・・・・・・・・・ 47
7.1 Connection of command pulse output circuit and driver ・・・・・・・・・・・・・・・ 47
7.2 Connection with axis sensor and server face input circuit ・・・・・・・・・・・・・・・・ 48
7.3 Encoder Z-phase input circuit and connection ・・・・・・・・・ 49
7.4 Connection with server interface output circuit ・・・・・・・・・・・・・・・ 49

8. Specifications ... 50

See the next section for an overview

(1) 3.1 Board configuration . . . . . 2
(2) 3.5 Connection with the outside . . . . . 6
(3) 4.2 Operation type of PCL5014 . . . . . 9
(4) 4.3.1 Register usage classification . . . . . 11
(5) 5. Instructions [Operation execution] . . . . . 25
(6) 6. Operation . . . . . 40

**Page 11**

1. 1. Introduction

1.1 About this manual

This manual is referred to as the high-speed positioning board "HPCI-PPD516A" (hereinafter referred to as PPD516A). It is an instruction manual about. Equipped with Nippon Pulse Motor Co., Ltd. controller "PCL5014" I am.

2. 2. Terminology between PPD516A board and motor control axis

Explains the meaning of the main terms in this manual.

2.1 Typical motor control system and terminology

(1) Normally, the motor (server motor or pulse motor) controlled by this board is called the "control axis". The control target is expressed separately from other types of motors such as spindle rotation motors. This board controls 6 axes of X, Y, Z, U, V, and W as control axes. (X, Y, Z, U, V, W are just the names associated for the name. Same for CH1, 2, 3, 4, 5, 6 That is)

(2) Command pulse output

The output of this board is called "command pulse output". This pulse train is the server driver or It is given to the pulse motor driver. (Fig. 2.1)

Figure 2.1

Command pulse 1 pulse rotates the motor by one step angle in the case of a pulse motor.

In the case of a server motor, the position detector (encoder) rotates one pulse.

Therefore, one command pulse is the position (movement amount), and the "pulse rate" (frequency) is the speed.

(Movement speed).

(3) Positioning

"Positioning" is an operation that mainly moves from point to point. Therefore, when considering two axes, the X axis

Synchronous movement of the Y-axis is not a problem, and it is an operation that requires quick movement and rest for positioning.

(4) Axis sensor-

A typical example of the motor axis is shown in Fig. 2.2.

( CCW) ( CW)

Figure 2.2

"Axis sensor" The figure shows a typical example of a mechanism that normally drives a motor.

"+ ELS, -ELS, DLS, OLS" in the figure is called an axis sensor.

The shaft has limit sensors at both ends and is called + ELS or -ELS.

When the limit sensor in the moving direction is detected, the command pulse is stopped immediately.

"DLS" (deceleration sensor-) and "OLS" (sensor-origin) are usually used when returning to the origin.

It is used as a sensor.

When high-speed home return is executed, the home returns to the origin in the specified direction and DLS is detected.

Decelerate and stop at the OLS located at the point where the low speed (creep speed) is reached.

The same is true if the Encoder Z phase is used instead of OLS.

(Caution) The operation function of the axis sensor of PPD516A, the installation conditions of the sensor, etc.

Please refer to "Operation axis sensor".



**Page 12**

3. 3. Board settings and connections

3.1 Board configuration

Figure 3.1 shows the PPD516A board block diamond.

The J1 connector is a connector that connects to the outside (motor driver, axis sensor).

The J2 connector is a connector for simultaneous start / stop control between boards.

The board is addressed by the program from the BUS side and performs various operations. The main operating function is

PCL5014 will do it. The address is given as an I / O address.

X

PCI-
BUS

PCI-
LOCAL
BUS I / F

Z

J1

U

V

WINT

Figure 3.1 PPD516A board block diamond



**Page 13**

3.2 Address in board

The I / O addresses are shown in Table 3.1.

| shaft | I / O address (hex) | | reading | write in |
|---|---|---|---|---|
| | BOARD_ADR + 0 | | Status 1 | Command buffer |
| | | +1 | Status 2 | Operation mode buffer |
| | | +2 | Interrupt status | Control mode buffer |
| X | | +3 | Not used | Not used |
| | | +4 | Input / output buffer bit 7-0 | Input / output buffer bit 7-0 |
| | | +5 | Input / output buffer bits 15-8 | Input / output buffer bits 15-8 |
| | | +6 | Input / output buffer bits 23-16 | Input / output buffer bits 23-16 |
| | | +7 | Input / output buffer bits 31 to 24 | Input / output buffer bits 31 to 24 |
| | BOARD_ADR + 10 | | Status 1 | Command buffer |
| | | +11 | Status 2 | Operation mode buffer |
| | | +12 | Interrupt status | Control mode buffer |
| Y | | +13 | Not used | Not used |
| | | + 14 | Input / output buffer bit 7-0 | Input / output buffer bit 7-0 |
| | | +15 | Input / output buffer bits 15-8 | Input / output buffer bits 15-8 |
| | | +16 | Input / output buffer bits 23-16 | Input / output buffer bits 23-16 |
| | | + 17 | Input / output buffer bits 31 to 24 | Input / output buffer bits 31 to 24 |
| | BOARD_ADR + 20 | | Status 1 | Command buffer |
| | | +21 | Status 2 | Operation mode buffer |
| | | +22 | Interrupt status | Control mode buffer |
| Z | | +23 | Not used | Not used |
| | | +24 | Input / output buffer bit 7-0 | Input / output buffer bit 7-0 |
| | | +25 | Input / output buffer bits 15-8 | Input / output buffer bits 15-8 |
| | | +26 | Input / output buffer bits 23-16 | Input / output buffer bits 23-16 |
| | | +27 | Input / output buffer bits 31 to 24 | Input / output buffer bits 31 to 24 |
| | BOARD_ADR + 30 | | Status 1 | Command buffer |
| | | +31 | Status 2 | Operation mode buffer |
| | | +32 | Interrupt status | Control mode buffer |
| U | | +33 | Not used | Not used |
| | | +34 | Input / output buffer bit 7-0 | Input / output buffer bit 7-0 |
| | | +35 | Input / output buffer bits 15-8 | Input / output buffer bits 15-8 |

| | | | | |
|---|---|---|---|---|
| | | +36 | Input / output buffer bits 23-16 | Input / output buffer bits 23-16 |
| | | +37 | Input / output buffer bits 31 to 24 | Input / output buffer bits 31 to 24 |
| | BOARD_ADR + 40 | | Status 1 | Command buffer |
| | | +41 | Status 2 | Operation mode buffer |
| | | +42 | Interrupt status | Control mode buffer |
| V | | +43 | Not used | Not used |
| | | +44 | Input / output buffer bit 7-0 | Input / output buffer bit 7-0 |
| | | +45 | Input / output buffer bits 15-8 | Input / output buffer bits 15-8 |
| | | +46 | Input / output buffer bits 23-16 | Input / output buffer bits 23-16 |
| | | +47 | Input / output buffer bits 31 to 24 | Input / output buffer bits 31 to 24 |
| | BOARD_ADR + 50 | | Status 1 | Command buffer |
| | | +51 | Status 2 | Operation mode buffer |
| | | +52 | Interrupt status | Control mode buffer |
| W | | +53 | Not used | Not used |
| | | +54 | Input / output buffer bit 7-0 | Input / output buffer bit 7-0 |
| | | +55 | Input / output buffer bits 15-8 | Input / output buffer bits 15-8 |
| | | +56 | Input / output buffer bits 23-16 | Input / output buffer bits 23-16 |
| | | +57 | Input / output buffer bits 31 to 24 | Input / output buffer bits 31 to 24 |





| shaft | I / O address (hex) | | reading | write in |
|---|---|---|---|---|
| | BOARD_ADR + 80 | 7 | unused | unused |
| | | 6 | unused | unused |
| | | Five | W axis ± ELS B connection at '0' | W axis ± ELS B connection at '0' |
| | ELS polarity selection | Four | V-axis ± ELS B contact at '0' | V-axis ± ELS B contact at '0' |
| | (Note 2) | 3 | U-axis ± ELS B connection at '0' | U-axis ± ELS B connection at '0' |
| | | 2 | Z-axis ± ELS B connection at '0' | Z-axis ± ELS B connection at '0' |
| | | 1 | Y-axis ± ELS B connection at '0' | Y-axis ± ELS B connection at '0' |
| | | 0 | X-axis ± ELS B connection at '0' | X-axis ± ELS B connection at '0' |
| | BOARD_ADR + 88 | 7 | unused | unused |
| | | 6 | unused | unused |
| | | Five | W-axis match output is possible with '1' | W-axis match output is possible with '1' |
| | Other axes by passing coordinates | Four | V-axis matching output is possible with '1' | V-axis matching output is possible with '1' |
| | (Note 2) | 3 | U-axis match output is possible with '1' | U-axis match output is possible with '1' |
| | | 2 | Z-axis matching output is possible with '1' | Z-axis matching output is possible with '1' |
| | | 1 | Y-axis match output is possible with '1' | Y-axis match output is possible with '1' |
| | | 0 | X-axis match output is possible with '1' | X-axis match output is possible with '1' |
| | BOARD_ADR + 9C | 7 | unused | |
| | | 6 | unused | |
| | | Five | unused | |
| | Read board ID | Four | unused | |
| | | 3 | Board ID '8' | |
| | | 2 | Board ID '4' | |
| | | 1 | Board ID '2' | |
| | | 0 | Board ID '1' | |

Table 3.1 I / O address

Note 1) ELS polarity selection is
B contact input at '0' (normally closed input)
"1" is the A contact input (normal open input).
Note 2) Other axis start function by passing coordinates
This function is disabled by '0'.
When the axis selected in '1' passes through the coordinates, the other axis waiting for simultaneous start starts.
To do.

3.3 Settings in the board

Figure 3.2 shows the setting points on the board.

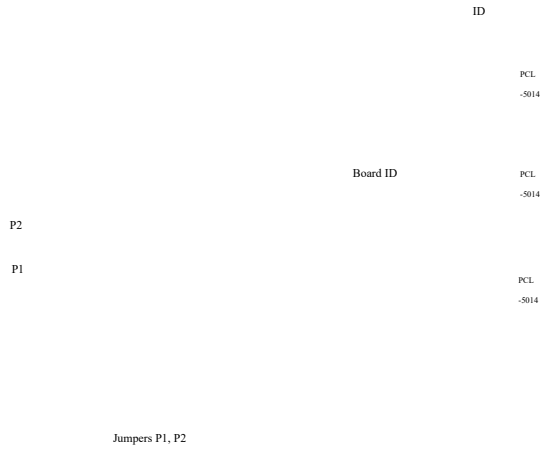



Figure 3.2 Jumper location

3.3.1 Encoder input circuit selection (2 locations)

The input circuit is selected by the output circuit of the encoder (differential output / open collector output).
The factory setting is a differential connection.

| P1 | | P2 | |
|---|---|---|---|
| | Z axis | | W axis |
| | Y-axis | | V-axis |
| | X axis | | U axis |
| 1 2 3 | | 1 2 3 | |

(2-3 jumper) Differential connection
(At 1-2 jump) Open collector connection
(Uses + 5V in the PC)

Figure 3.3

3.3.2 Board ID selection

Set the board ID when using multiple boards (0 to 15 can be set).
At the time of shipment, ID = '0' (all short).

When using multiple boards, set different IDs for each board.

ID

Short: '0'

Open: '1'

8 4 2 1

Figure 3.4

ID ID ID

8 4 2 1 8 4 2 1 8 4 2 1

ID = 0 ID = 1 ID = 5

(Factory setting)

Figure 3.5 ID setting example



**Page 16**

3.4 Software-based circuit function setting items

Among the functions related to the hardware circuit, there is a function to set to PCL5014 by software. increase.

(1) Command pulse output format (CW, CCW / DIR, POUT) and output polarity

Refer to environment register 1 (P.18)

(2) Polarity switching of limit sensor (+ ELS, -ELS) deceleration sensor (DLS) and sensor origin (OLS)

(A contact: normal open, B contact: normal closed)

Refer to the in-board address table (P.3)

Refer to environment register 1 (P.18)

(3) Server interface signal polarity input port definition

Refer to environment register 1 (P.18)

(4) Encoder Z phase polarity, encoder magnification

Refer to environment register 1 (P.18)

3.5 External connection

Figure 3.4 shows a typical connection for the motor 1 axis (X).

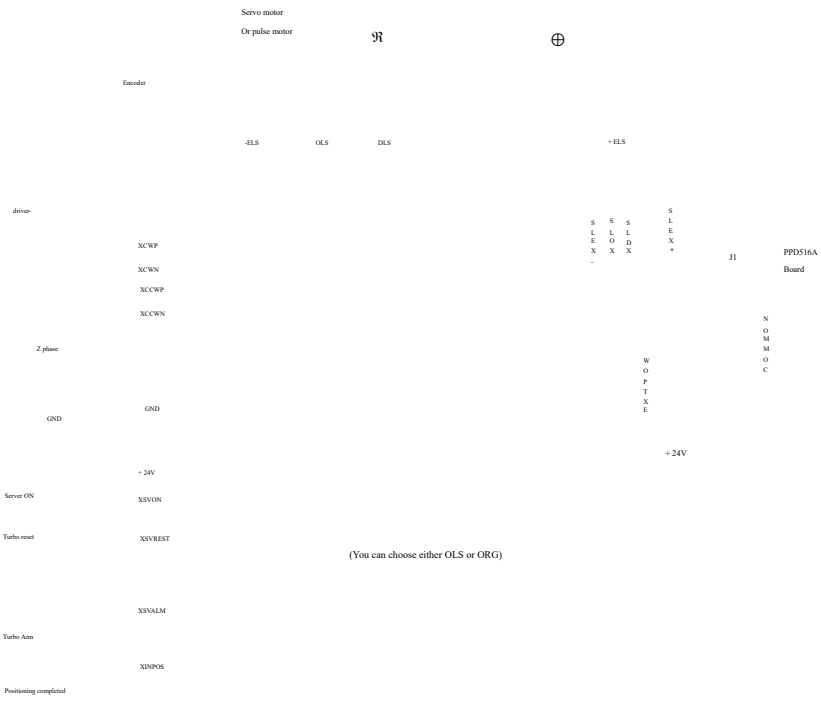


Figure 3.4 Example of server driver connection





3.6 Connector signal assignment

(1) J1 connector (rear panel surface)

The terminal table of the board side connector (J1) is shown in Table 3.2.

| Pin number | Signal name | Pin number | Signal name |
|---|---|---|---|
| 1 | + 5V output | 51 | + 5V output |
| 2 | GND | 52 | GND |
| 3 | XCWP (CW pulse output + / pulse output) | 53 | UCWP (CW pulse output + / pulse output) |
| 4 | XCWN (CW pulse output-/ pulse output) | 54 | UCWN (CW pulse output-/ pulse output) |
| 5 | XCCWP (CCW pulse output +/ direction signal) | 55 | UCCWP (CCW pulse output +/ direction signal) |
| 6 | XCCWN (CCW pulse output-/ directional signal) | 56 | UCCWN (CCW pulse output-/ directional signal) |
| 7 | YCWP (CW pulse output + / pulse output) | 57 | VCWP (CW pulse output + / pulse output) |
| 8 | YCWN (CW pulse output-/ pulse output) | 58 | VCWN (CW pulse output-/ pulse output) |
| 9 | YCCWP (CCW pulse output +/ direction signal) | 59 | VCCWP (CCW pulse output +/ direction signal) |
| 10 | YCCWN (CCW pulse output-/ directional signal) | 60 | VCCWN (CCW pulse output-/ directional signal) |
| 11 | ZCWP (CW pulse output + / pulse output) | 61 | WCWP (CW pulse output + / pulse output) |
| 12 | ZCWN (CW pulse output-/ pulse output) | 62 | WCWN (CW pulse output-/ pulse output) |
| 13 | ZCCWP (CCW pulse output +/ direction signal) | 63 | WCCWP (CCW pulse output +/ direction signal) |
| 14 | ZCCWN (CCW pulse output-/ directional signal) | 64 | WCCWN (CCW pulse output-/ directional signal) |
| 15 | XZP (Encoder Z phase input +) | 65 | UZP (Encoder Z phase input +) |
| 16 | XZN (Encoder Z phase input-) | 66 | UZN (Encoder Z phase input-) |
| 17 | YZP (Encoder Z phase input +) | 67 | VZP (Encoder Z phase input +) |
| 18 | YZN (Encoder Z phase input-) | 68 | VZN (Encoder Z phase input-) |
| 19 | ZZP (Encoder Z phase input +) | 69 | WZP (Encoder Z phase input +) |
| 20 | ZZN (Encoder Z phase input-) | 70 | WZN (Encoder Z phase input-) |
| 21 | GND | 71 | GND |
| 22 | COMMON (Monon for + 24V) | 72 | COMMON (Monon for + 24V) |
| 23 | XSVALM (servo arm input) | 73 | USVALM (servochanism input) |
| 24 | XINPOS (Positioning completion input) | 74 | UINPOS (Positioning completion input) |
| 25 | XSVON (Servon output) | 75 | USVON (Servon output) |
| 26 | XSVRST (servo reset output) | 76 | USVRST (servo reset output) |
| 27 | YSVALM (servochanism input) | 77 | VSVALM (servochanism input) |
| 28 | YINPOS (Positioning completion input) | 78 | VINPOS (Positioning completion input) |
| 29 | YSVON (Servon output) | 79 | VSVON (Servon output) |
| 30 | YSVRST (servo reset output) | 80 | VSVRST (servo reset output) |
| 31 | ZSVALM (servochanism input) | 81 | WSVALM (servochanism input) |
| 32 | ZINPOS (Positioning completion input) | 82 | WINPOS (Positioning completion input) |
| 33 | ZSVON (Servon output) | 83 | WSVON (Servon output) |
| 34 | ZSVRST (servo reset output) | 84 | WSVRST (servo reset output) |
| 35 | COMMON (Monon for + 24V) | 85 | COMMON (Monon for + 24V) |
| 36 | EXTPOW2 (+ 24V input) | 86 | EXTPOW2 (+ 24V input) |
| 37 | + XELS (CW side limit sensor-input) | 87 | + UELS (CW side limit sensor-input) |
| 38 | -XELS (CCW side limit sensor-input) | 88 | -UELS (CCW side limit sensor-input) |
| 39 | XDLS (Deceleration sensor input) | 89 | UDLS (Deceleration sensor input) |
| 40 | XOLS (Origin sensor input) | 90 | UOLS (Origin sensor input) |
| 41 | + YELS (CW side limit sensor-input) | 91 | + VELS (CW side limit sensor-input) |
| 42 | -YELS (CCW side limit sensor-input) | 92 | -VELS (CCW side limit sensor-input) |
| 43 | YDLS (Deceleration sensor input) | 93 | VDLS (Deceleration sensor input) |
| 44 | YOLS (Origin sensor input) | 94 | VOLS (Origin sensor input) |
| 45 | + ZELS (CW side limit sensor-input) | 95 | + WELS (CW side limit sensor-input) |
| 46 | -ZELS (CCW side limit sensor-input) | 96 | -WELS (CCW side limit sensor-input) |
| 47 | ZDLS (Deceleration sensor input) | 97 | WDLS (Deceleration sensor input) |

| | | | |
|---|---|---|---|
| 48 | ZOLS (Origin sensor input) | 98 | WDLS (Origin sensor input) |
| 49 | EXTPOW1 (+ 24V input) | 99 | EXTPOW1 (+ 24V input) |
| 50 | EXTPOW1 (+ 24V input) | 100 | EXTPOW1 (+ 24V input) |

Table 3.2 Connector pin arrangement



**Page 18**

Board side 100PIN MDR connector (half pitch)
Model 102A0-52A2JL (Sumitomo 3M)

Cable side Plug 101A0-6000EL
Shell 103A0-200-00

(Note) A cable connector with one side cut off is available.
(HCL-018 2m sold separately)

3.7 Set to PC

(1) Turn off the power of the computer and disconnect the AC plug.

note Will
If you insert or remove the board without turning off the power,
Failure may occur on the board or computer side.

(2) Remove the computer cover by referring to the computer manual.

(3) Remove the cover of the empty PCI bus expansion slot.

(4) Gently insert the board into the slot.
Insert it until the board stays parallel and goes deep so that the connector part of the board does not become slanted.
Please push it in.

(5) Tighten the screws on the board panel.

(6) Connect the board cable.

(7) Replace the computer cover.

4. Instructions [Initial setting related]

4.1 Overview

In PPD534, the operation blocks from the viewpoint of software for the board are classified as follows.
(See Fig. 3.1 PPD534 board block diamond)

| | | | |
|---|---|---|---|
| X axis | PCL5014 | U axis | PCL5014 |
| Y-axis | PCL5014 | V-axis | PCL5014 |
| Z axis | PCL5014 | W axis | PCL5014 |

Therefore, most of the instructions from the software to the board are for the PCL5014 of each axis.
This section explains the instruction operation for the board.

4.2 Operation type of PCL5014

The operation method of PCL5014 is determined by the "operation mode buffer" and "command buffer" described later.
Start
These operations are outlined in "Table 4.1 PCL5014" operation classification.

| Ward Minutes | Operation name | figure | Solution | command Operation mode | Command Buffer | Equipment Consideration Before issuing a command, set the following At initialization Set the command that should be done is omitted |
|---|---|---|---|---|---|---|
| Pu | speed | | | + Feed 11h | 1. Number of feed pulses | (PR0) |
| Ri | Constant speed preset feed | f | Preset Stop at the amount of movement | 08h | 2. Feed rate FH | (PR2) |
| Se | | | | -Feed | 3. Magnification | (PR4) |
| Tsu | (G01 Constant speed feed) | FH | positioning position | 18h | | |
| door | | | t | (Mode 1) | | |
| Mo | | | | | | |
| \| | | f | Automatic deceleration point | + Feed 13h | 1. Number of feed pulses | (PR0) |
| Do | High-speed preset feed | FH | | 08h | 2. Maximum speed FH | (PR2) |
| 1 | | | Preset | -Feed | 3. Base speed FL | (PR1) |
| ~ | (G00 Fast forward positioning) | FL | Stop at the amount of movement | 18h | 4. Magnification | (PR4) |
| 3 | | | t | (Mode 1) | 5. Acceleration rate | (PR3) |
| same | | f | Send in sync with the handle | | | |
| Up | | FH | | + Feed 11h | 1. Upper limit speed FH | (PR2) |
| Mo | Handle synchronous feed | | | 0ch | 2. Magnification | (PR4) |
| \| | | | | -Feed | | |
| Do | | | t | 1ch | (Operated with FH constant speed feed) | |
| 4 | P1 + P2 + P3 = press amount | | | | | |
| | | f | Immediate stop order | + Feed 11h | 1. Feed speed FH | (PR2) |
| | Constant speed continuous feed | | | 00h | 2. Magnification | (PR4) |
| Communicating | | FH | | -Feed | | |
| Continued | ((Manual JOG) | | t | 10h | | |
| Mo | | | | | | |
| \| | | f | | + Feed 13h | 1. Maximum speed FH | (PR2) |
| Do | High-speed continuous feed | FH | | 00h | 2. Base speed FL | (PR1) |
| 1 | | | Deceleration stop command | -Feed | 3. Magnification | (PR4) |
| | ((Manual RAPID) | FL | Stop when deceleration is completed | 10h | 4. Acceleration rate | (PR3) |
| | | | t | | | |
| Communicating | | f | FH upper limit | | 1. Upper limit speed FH | (PR2) |
| Continued | | | + Feed | 01h 11h | 2. Magnification | (PR4) |
| \| | Manual manual feed | | t | (The direction is | | |
| Do | | -Feed | | Handle) | (Operated with FH constant speed feed) | |
| 2 | | -f | FH upper limit | | | |

(Continued on the next page)

**Page 20**

| Ward Minutes | Operation name | command | figure | Solution | Operation mode | Command Buffer | Equipment Consideration |
|---|---|---|---|---|---|---|---|
| | | | | | | | Before issuing a command At initialization Set the following Check what should be done is omitted |
| | | f | | | + Direction 11h | 1. Feed rate FH | (PR2) |
| | | | | | 02h | 2. Magnification | (PR4) |
| original point Restoration Return | Constant speed origin return | FH | | t origin | -direction 12h (Mode 1) | | |
| Mo \| Do 1,2 | High-speed origin return | f FH FL | | DLS detection t origin | + Direction 13h 02h -direction 12h (Mode 1) | 1. Maximum speed FH 2. Creep speed FL (PR1) 3. Magnification 4. Acceleration rate | (PR2) (PR4) (PR3) |
| Floating Movement original point Restoration Return \| Do | Floating origin return | f FH FL | | △ UP / DOWN counter 0 t point | 0Bh 13h No direction required | 1. Origin return speed FH 2. Creep speed FL (PR1) 3. Magnification 4. Acceleration rate | (PR2) (PR4) (PR3) |
| original point Unplugged Out death | Extracting the origin | f | Extraction start point ▼ OLS t Z phase OLS OFF Or + Z phase count | | + Direction 11h 05h -direction 15h Extraction is completed with Extraction is completed with | 1. Extraction speed FH constant speed 2. Magnification 3. By environment register 2 The extraction method is different. | (PR2) (PR4) |
| . original point SA \| blood | Origin search mode | f FH FL | ⑤ ④ | Search starting point ① ELS OLS ▽ t-direction DLS ③ ② | t Direction 13h 04h 14h | 1. ④ Preset amount 2. Origin return speed 3. Creep speed 4. Magnification 5. Acceleration rate 6. By environment register 2 | (PR0) (PR2) (PR1) (PR4) (PR3) |
| | | | (Note) The starting point is the OLS OFF point (in the figure) If it is on the left), it is normal It will return to the origin. | | | ①②⑤ origin return method, ④ The extraction method is decided. | |
| | | f | | | + Direction 13h | 1. Speed before change FH | (PR2) |
| | | FH | | | 08h | 2. Magnification | (PR4) |
| | Change in speed | FH | | | -direction | 3. Acceleration rate | (PR3) |
| | | FL | △ Changes ① | t | 18h | ① After change speed FH (R2> PR2) | (R2) |
| ancestor of other | Change in speed | f FH FL | ① ▽ Changes | t | + Direction 13h 08h -direction 18h | 1. Speed before change FH 2. Magnification 3. Acceleration rate ① After change speed FH (R2 <PR2) | (PR2) (PR4) (PR3) (R2) |
| | Change in speed (Constant speed FH) | f FH FH | ① ▽ | ② Changes ▽ t | + Direction 11h 00h -direction 10h 09h | 1. Start speed FH 2. Magnification ① After change speed FH ② Speed after change FH | (PR2) (PR4) (R2) (R2) |

Table 4.1 PCL5014 Operation classification

4.3 PCL5014 command explanation

4.3.1 Register usage classification

Figure 4.1 systematically illustrates the register group.

The set of registers and the use of leads are roughly classified as follows in terms of use. (Border distinction in the figure)

① As a general rule, it should be set once at the time of initialization.

(2) Registers set at runtime or registers to be read and used as needed

③ Other

| | | | | | |
|---|---|---|---|---|---|
| | | PCTR (28) | | PCTR: Preset Counter | (P.32) |
| | | | | PR0: PRIREGR0 | (P.32) |
| | PR0 (28) | R0 (28) | | R0: Feed amount register | (P.32) |
| | | | | PR1: FL speed pre-registration | (P.31) |
| | PR1 (15) | R1 (15) | | R1: FL speed register | (P.31) |
| | | | | PR2: FH speed pre-registration | (P.31) |
| | PR2 (15) | R2 (15) | | R2: FH speed register | (P.31) |
| | | | | PR3: Acceleration / deceleration rate register register | (P.33) |
| | PR3 (16) | R3 (16) | | R3: Acceleration / deceleration register | (P.33) |
| | | | | PR4: Magnification register | (P.32) |
| | PR4 (12) | R4 (12) | | R4: Magnification register | (P.32) |
| | | SCTR (24) | | SCTR: Deceleration point counter | (P.33) |
| | | | | PR5: Deceleration point pre-register | (P.33) |
| | PR5 (24) | R5 (24) | | R5: Deceleration point register | (P.33) |
| Input / output buffer | | | | PR15: Deceleration rate register | (P.33) |
| Port | PR15 (16) | R15 (16) | | R15: Deceleration late register | (P.33) |
| 0-7 | | | | PR16: S-shaped section pre-register | (P.33) |
| | PR16 (14) | R16 (14) | | R16: S-shaped section register | (P.33) |
| 8~ | | | | | |
| 15 | | R6 (32) | | R6: Preferences register 1 | (P.18) |
| 16 -16 | | | | | |
| twenty three | | R7 (32) | | R7: 〃 2 | (P.20) |
| twenty four | | | | | (P.35) |
| 31 | | R8 (16) | | R8: 〃 3 | (P.23) |
| | | R9 (28) | | R9: UP / DOWN counter | (P.35) |
| | | R10 (28) | | R10: Complex value 1 register | (P.35) |
| | | R11 (28) | | R11: 〃 2 register | (P.35) |
| | | R12 (32) | | R12: Counter monitor | (P.36) |
| | (P.14) | R13 (24) | | R13: Command monitor 1 | (P.37) |
| | SVON | | | | |
| | SVRESET | R14 (27) | | R14: Command monitor 2 | (P.38) |
| | | Steady 1 | Steady 1 | | |
| | | (8) | Read port | Steady 1 | (P.15) |
| | | Steady 2 | Steady 2 | | |
| | | (8) | Read port | Steady 2 | (P.16) |
| Command buffer | (P.29) | Interruption status | Interruption status | | |
| | | (8) | Read port | Interruption status | (P.17) |
| Operation mode-Dubber (P.25) | | | | | |
| Control mode-Dubber (P.24) (P.35) | | | | | |

Figure 4.1 Register usage system () Is the reference page

4.3.2 Register writing / reading method

Writing to various registers (PR0 to PR5, PR15, PR16, R0 to R16) shown in FIG.
Read as follows.

(1) Register writing

(1) Write the data to the "I / O buffer" port. (Byte order is arbitrary)
(2) Write the register write command (Table 4.2) to the "command buffer" port.
Attention 1. R0 and R4 cannot be written directly. Write only to PR0 and PR4. ▲
2. 2. Writing the PR register during operation is related to the "next operation automatic start function" (P.43).

| Write register | Command (HEX) | Register contents |
|---|---|---|
| PR0 | C0 | Feed amount |
| PR1 | C1 | FL (PR1 x magnification (PR4)) speed |
| PR2 | C2 | FH (PR2 x magnification (PR4)) speed |
| PR3 | C3 | Acceleration / deceleration rate |
| PR4 | C4 | magnification |
| PR5 | C5 | Deceleration point |
| R6 | C6 | Environment setting 1 |
| R7 | C7 | Environment setting 2 |
| R8 | C8 | Environment setting 3 |
| R9 | C9 | Up / down count value |
| R10 | CA | Comparator 1 data |
| R11 | CB | Comparter 2 data |
| R1 | D1 | FL (R1 x magnification) speed change during operation |
| R2 | D2 | Change FH (R2 x magnification) speed during operation |
| R3 | D3 | Change acceleration / deceleration rate during operation |
| R5 | D7 | Change slowdown point during operation |
| PR15 | D8 | Deceleration rate |
| PR16 | D9 | S-shaped section |
| R15 | DA | Change deceleration rate during operation |
| R16 | DB | Change S-shaped section during operation |

Table 4.2 Register write commands





(2) Register read

(1) Write the register read command (Table 4.3) to the "command buffer" port.
(2) Read the data from the "I / O buffer" port.

| Read register | Command (HEX) | Register contents |
|---|---|---|
| R0 | 80 | Feed amount |
| R1 | 81 | FL (R1 x magnification) speed |
| R2 | 82 | FH (R2 x magnification) speed |
| R3 | 83 | Acceleration / deceleration rate |
| R4 | 84 | magnification |
| R5 | 85 | Deceleration point |
| R6 | 86 | Environment setting 1 |
| R7 | 87 | Environment setting 2 |
| R8 | 88 | Environment setting 3 |
| R9 | 89 | Up / down counter |
| R10 | 8A | Comparator 1 data |
| R11 | 8B | Comparter 2 data |
| R12 | 8C | Counter monitor |
| R13 | 8D | Command monitor 1 |
| R14 | 8E | Command monitor 2 |
| PR0 | 90 | Preset amount for next operation |
| PR1 | 91 | FL (PR1 x magnification) speed for next operation |
| PR2 | 92 | FH (PR2 x magnification) speed for next operation |
| PR3 | 93 | Acceleration / deceleration rate for next operation |
| PR4 | 94 | Magnification for next operation |
| PCTR | 95 | Preset counter count value |
| SCTR | 96 | Deceleration point counter Count value |
| PR5 | 97 | Slow down pointer for next action |
| PR15 | 98 | Deceleration rate for next operation |
| PR16 | 99 | S-shaped section for next operation |
| R15 | 9A | Deceleration rate |
| R16 | 9B | S-shaped section |

Table 4.3 Register read command





4.3.3 Input / output of server face signal

(1) Output (SVON, SVRSET)

(1) SVON (servo ON) and SVREST (servo reset) are set to "command buffer port".
Write to. (Table 4.4)

| Signal name | motion | Command buffer port | Record case |
|---|---|---|---|
| SVON | ON | 58h | |

| | | | |
|---|---|---|---|
| | OFF | 48h | As a general-purpose output port |
| SVRSET | ON | 59h | Can be used. |
| | OFF | 49h | |

Table 4.4 Server interface port writing

(2) Input (SVALM, INPOS)

▲

Read the "Status 2" port. For details, refer to “Status 2” (P.16).

| 7 | 4 3 | 0 |
|---|---|---|
| × | × | × |

'1'Compare condition satisfied
'1' SVALM input
Not used
Entering '1' INPOS

During '1' SVON output
'1' SVRSET is being output



**Page 25**

4.3.4 Status and interrupt status

4.3.4.1 Status 1

Read the "Status 1" port directly.

(1) Status 1 format

| 7 | 4 3 | 0 |
|---|---|---|

"Operation completed" when b2 = '1' → '0' change (Note: b2 is the next operation
↓ For automatic start
000 stop Only 1 0 for 10 clocks
010 Start pending Because it does not become soft
101 Accelerating Detects a stop between the next operations
110 During constant speed operation can not)
111 Decelerating

'1' + ELS ON
'1'-ELS ON

'1' DLS ON

'1' OLS ON

(2) Explanation

The status includes "Status 2" shown in the next section. Usually by "Status 1"
Determine the operating status.

| Bit | Name | Name | Inside Yong |
|---|---|---|---|
| b0 ~ b2 | Operating state | | (1) "Operation completed" when b2 = '1' → '0'<br>(2) Meaning of each state<br>② ① ③ ②<br>b2 = '1' b2 = '1'<br>(1) Acceleration / deceleration feed (2) Constant speed feed<br>① Accelerating ② Constant speed operation ③ Decelerating<br>(Note.1) The timer mode (dwell mode) that does not involve the movement of the axis is Shows the same operating state as constant speed feed.<br>(Note.2) While the start is pending, the "Start pending" command (P. 30) indicates the state in which it is issued. ("Simultaneous start" Coordinates such as command (P.29) or comparator match Starts by starting with point detection) |
| b3 | + ELS ON | | 1. ELS detection status<br>2. It does not operate when the ELS in the moving direction is ON immediately before the operation. |
| b4 | -ELS ON | | 3. If the ELS in the moving direction is ON during operation, it will stop immediately.<br>4. ELS becomes invalid while the machine lock is ON. |
| b5 | DLS ON | | 1. DLS detection status<br>2. The status display is not related to the DLS enable / disable of the operation mode. |
| b6 | | | stomach. |
| b7 | OLS ON | | 1. OLS detection status |

Table 4.5 Status 1



**Page 26**

4.3.4.2 Status 2

Read the "Status 2" port directly.

(1) Status 2 format

| 7 | 4 3 | 0 |
|---|---|---|
| × | × | × |

'1'Compare condition satisfied
'1' SVALM input
Not used
Entering '1' INPOS

During '1' SVON output
'1' SVRSET is being output

(2) Explanation

| Bit | Name Name | Inside Yong |
|---|---|---|
| b0 | Completion condition satisfied | See "Comparator" (P.22) |
| b1 | Entering SVALM | 1. Refer to the "Server Face" section of the operation section.<br>2. During operation, if SVALM is detected, it will stop immediately.<br>3. Even if a status command is issued during SVALM detection<br>It is in a stopped state.<br>4. Interrupt output regardless of whether it is operating or stopped.<br>5. Refer to Environment Register 1 (P.18) |
| b2 | Not used | Indefinite |
| b3 | Entering INPOS | |
| b5 | During SVON output | Refer to the "Servant Face" section of the operation section. |
| b6 | SVRSET output in progress | |
| b7 | Not used | Indefinite |

Table 4.6 Status 2



**Page 27**

4.3.4.3 Interrupt status

(Note) Interrupts are not currently supported. The features that will be supported in the future are as follows.
(However, the interrupt status can still be read.)

(1) Read the "Interrupt Status" port directly.

(2) The occurrence of "interrupt status" always occurs for unmasked factors. To CPU
It is necessary to set the I / O port for interruption.

(3) When interrupting the CPU, the interrupt output of each PCL5014 is logically ORed and output.

(4) The PCL5014 interrupt factor for all axes disappears, and the interrupt signal to the CPU is canceled.

(5) There are two ways to cancel the interrupt factor.

(1) The interrupt status has reached 00 hex. (The state where all the factors are read)
(2) When the command "Software Reset" is issued.

(6) “Interruption factor status” is listed in Table 4.7.

(Note) If there are multiple interrupt factors, they are read in descending order of "interrupt status number".
(Not in order of occurrence.)

| Stetus (hex) | Need | Cause | Interrupt valid (mask bit) |
|---|---|---|---|
| 00 | No interrupt factor | | |
| 01 | Deceleration stop command (0Ah) | Stop by writing | R8 b0 = '1' |
| 02 | Stop due to completion of positioning operation | | R8 b1 = '1' |
| 03 | Home return (origin search) | Stop when operation is completed | R8 b2 = '1' |
| 04 | Stop when the origin escape operation is completed | | R8 b2 = '1' |
| 05 | Immediate stop command (09h) | Stop by writing | R8 b0 = '1' |
| 06 | Stop by simultaneous stop command | | Control mode b5 = '1' |
| 07 | -Stop due to ELS signal ON | | |
| 08 | Stop by + ELS signal ON | | |
| 09 | -Deceleration stop due to DLS signal ON | | R6 b29 = '1' |
| 0A | Deceleration stop due to + DLS signal ON | | R6 b29 = '1' |
| 0B | Stop by turning on the SVALM signal | | |
| 0C | Stop due to step-out detection | | R8 b12 to b8 [1] 0 |
| 11 | Current position Encoder input error | | R6 b27 = '1' |
| 12 | Manual pulse encoder input error | | Continuous mode 2 or Preset mode 4 |
| 13 | Step-out detection Encoder input error | | R8 b12 to b8 [1] 0 |
| 14 | Next operation start (pre-register can be changed) | | R8 b14 = '1' |
| 15 | Start deceleration | | R8 b3 = '1' |
| 16 | Completion condition changes from false to true | | R8 b13 = '1' |

Table 4.7 Interrupt status





4.4 Registers to be set at the initial time

4.4.1 Environment register 1 (R6)

(1) Format (4 bytes long)

| | 7 | 4 3 | 0 | |
|---|---|---|---|---|
| 1st byte (LSB) | | | 0 0 | (I / O logical polarity setting) |

Command pulse output (individual command is cw signal) '0' positive logic
Common command direction logic (individual command is ccw signal) '0' positive logic
Command pulse output format '1' individual command '0' common pulse command
INPOS Input polarity '1' A contact (normally open)
DLS Input polarity '1' A contact ( 〃 )
OLS Input polarity '1' A contact ( 〃 )
SVALM input polarity '1' A contact ( 〃 )
Z phase Input polarity '0' positive logic

| | twenty three | 20 19 | 16 16 | |
|---|---|---|---|---|
| 2nd byte | 0 | | 0 | (Not used) |

Not used (00h)

| | twenty three | 20 19 | 16 16 | |
|---|---|---|---|---|
| 3rd byte | 0 | | 0 | (Not used) |

Not used (00h)

| | 31 | 28 27 | twenty four |
|---|---|---|---|
| 4th byte (MSB) | 0 0 | 0 0 1 1 | |

SVON, SVRSET output port.

UP / DOWN counter Count input selection
'0' command output
UP / DOWN counter Count number format
'0' 1 direction (positive number) count, '1' signed count
Operation when DLS is detected
'0' deceleration only, '1' deceleration stop
OLS and DLS signals
Do not latch '0', but use '1' latch input.
(Usually '0')



**Page 29**

(2) Explanation

| Bit | Name | | Inside | Yong |
|---|---|---|---|---|
| | | Output format b2 = '1' | | Pulse column logic level |
| | Command pulse output | Individual pulse directive | b1, b0 = 00 | Positive logic |
| b0 | Pulse column logic | xCWP | | 0V |
| | | xCWN | | · · · · · · · · · · · 0V |
| b1 | Directional logic | | | |
| | | xCCWP | | 0V |
| b2 | Output format setting | xCCWN | | · · 0V |
| | | Output format b2 = '0' | | Directional logic level (all pulse columns are positive logic) |
| | | Common pulse directive | b1, b0 = 00 Positive logic | b1, b0 = 10 Negative logic |
| | | xCWP (POUT) | | 0V |
| | | xCWN (POUT) | | · · 0V |
| | | | Positive direction Negative direction | Positive direction Negative direction |
| | | xCCWP (DIR) | | 0V |
| | | xCCWN (DIR) | | 0V |
| b3 | INPOS input polarity | (1) '1' A contact, (A contact: normal open is ON with current flowing through the terminal) | | |
| b4 | DLS 〃 | '0' B contact, (B contact: normal close is ON when the terminal current is cut off) | | |
| b5 | OLS 〃 | (2) Refer to the port table on page 4 for the polarity switching of ± ELS. | | |
| b6 | SVALM 〃 | | | |
| b7 | Z-phase input polarity | Encoder output Positive logic b7 = '0' | | |
| | | (At the time of positive logic input with differential input, the input photocoupler turns on.) | | |
| b8 | Enco-da filter | Always valid. (B8 = '0') | | |
| b9 | | | | |

| | | |
|---|---|---|
| b15 | Not used | |
| b16 ~ b23 | Not used | |
| b24 | Output port | |
| b25 | Output port | It is assumed that b26, b25, b24 = 011. |
| b26 | Not used | |
| b27 | UP / DOWN counter input | b27 = '0' The command pulse output is used as the input of the UP / DOWN counter R9.<br>b27 = '1' The current position counting encoder input is the R9 input. |
| b28 | UP / DOWN counter format | b28 = '0' 1-way (positive number) count format 0 to 268,435,455<br>b28 = '1' Signed count format -134,217,728 ~ +134,217,727 |
| b29 | DLS detection operation | b29 = '0' During DLS detection, decelerate and operate at FL speed.<br>When DLS is turned off, it accelerates again and heads for FH speed.<br>b29 = '1' DLS is being detected Decelerates to FL and stops. However, FL speed<br>If DLS is turned off before reaching, it will accelerate again. |
| b30 | OLS, DLS signal Latch | b30 = '0' Normal usage. When returning to the origin, DLS is detected, and then the origin is detected.<br>The DLS signal needs to be in the input state.<br>b30 = '1' DLS and OLS signals are held. That is, until the origin is detected<br>It is not necessary to hold the DLS (OLS) signal externally. However,<br>When DLS is detected during high-speed homing, the sensor signal width is<br>A signal width of about 2 ms is required. The holding state is the next operation start,<br>Or it is reset by setting b30 to 0. |

Table 4.8 Environment register 1 (R6)





4.4.2 Environment register 2 (R7)

(1) Format (4 bytes long)

7 4 3 0

1st byte (LSB)

Encoder Z phase count setting when returning to origin
0 (1st time) to 15 (16th time)
Origin return completion condition
Stop at 00 OLS ON
01 Stop at Z-phase count after OLS ON
10 After turning on OLS, deceleration starts and Z-phase count stops.
11 Ban
UP / DOWN counter (R9) when home return is completed
Do not clear '0', but clear '1'.
Machine lock '0', not '1'.

15 12 11 8

2nd byte 0 1 1 0 0

When using the common command output format, the pulse output delay is valid after the direction changes.
Idling pulse number setting 0 to 7

twenty three 20 19 16 16

3rd byte 0

Comparison condition selection
Operation selection for the command pulse when the comparison condition is satisfied
00 do nothing
01 Command pulse output stop
10 Internal operation continues but pulse is not output
11 R2 (FH), R3 (acceleration / deceleration rate) PR2, PR3 contents

To. (Speed change)
Comparison counter selection '0' UP / DOWN counter (R9)
'1' Preset Counter (PCTR)
Not used

31 28 27 twenty four
4th byte (MSB) 0 0

Not used (00h)



## Page 31

(2) Explanation

| Bit | Name | Inside | Yong |
|---|---|---|---|
| b0 ~ | When returning to origin | It is completed by the value set for Z phase + 1st detection. | |
| b3 | Enco-da Z phase | | |
| | b5, b4 | 00 | 01 | 10 |
| | | FH | FH | FH |
| b4 | High-speed origin return | FL | FL | FL |
| | Origin return completion condition | | | |
| b5 | | DLS OLS ▲ | DLS OLS ▲ △ Z phase | OLS Z △ phase |
| | Constant speed origin return | FH | FH | caution OLS until stop Must be ON. |
| | | OLS ▲ | OLS ▲ Z △phase | |
| b6 | When the origin return is completed | The origin is the UP / DOWN counter (R9) as the current position counter. | | |
| | UP / DOWN Counter Clear | Clear when the return is completed. | | |
| b7 | Machine lock | (1) When the machine lock is ON, the command pulse is not output. Other behavior is line Will be. Used for simulated operation with the machine stopped.<br>(2) When used in the common command output mode, the pulse train is output. No, but directional output is output.<br>(3) The count input of the UP / DOWN counter is the environment register 1 (R6). It becomes the command output count regardless of the setting of.<br>(4) In the origin return mode, origin search mode, and origin exit mode, It is completed without outputting even one pulse.<br>(5) ELS, DLS and SVALM signals are ignored.<br>(6) INPOS is ignored. | | |
| b8 ~ b11 | | It is assumed that b11 to b8 = 1100. | | |
| b12 ~ b14 | Idling Pulse number setting (For Palsmotor) | (1) Setting range 0 to 7 pulses However, 0 is the same operation as 1.<br>(2) Idling of the set number when accelerating from FL to FH at the start The pulse is output at the speed of FL and then accelerated.<br>(3) When using the step motor, FL generally close to the upper limit of the self-starting speed. Can be raised. | | |

(Continued on the next page)

| | | | | |
|---|---|---|---|---|
| | | b19 - b16 | Comparison matters | Result |
| | | 0000 R10> (Counter) | | |
| b16 | | 0001 R10 = ( 〃 ) | | (1) Station 2 b0 = '1' |
| ~ | Completion condition selection | 0010 R10 <( 〃 ) | | Confirmation that conditions are met |
| b19 | | 0100 R11> (Counter) | | I can. |
| | | 0101 R11 = ( 〃 ) | | (2) The'=' condition matches |
| | | 0110 R11 <( 〃 ) | | From the counter change |
| | | 1000 R10> (counter) or R11 <(counter) | | It changes immediately. |
| | | 1001 R10 <( 〃 ) or R11> ( 〃 ) | | In this case interrupt |
| | | 1010 R10 = ( 〃 ) or R11 = ( 〃 ) | | Use status |
| | | 1011 R10> (counter) or R11> ( 〃 ) (3) Comparator not used | | |
| | | 1100 R10 <( 〃 ) or R11 <(counter) | | With "1111" |
| | | 1101 R10 <( 〃 ) <R11 | | do |
| | | 1110 R10> ( 〃 )> R11 | | |
| | | (1) The interrupt status (16h) operates when the command pulse output is stopped immediately. | | |
| b20 | Completion conditions | Output when completed. | | |
| b21 | Directive at the time of establishment | (2) "Deceleration check" when selecting speed change by pre-register | | |
| | Against the pulse | When "automatic" (control mode b1) is specified as "output method" | | |
| | Action selection | The acceleration / deceleration rate of PR3 shall not be changed. | | |
| | | (1) When the UP / DOWN counter is selected as the comparison counter | | |
| b22 | Comparison counter selection | R10 and R11 must be combined as the count numerical format. | | |
| | | No. (Environmental register 1 (R6) b28) | | |
| | | (2) When PCTR (Preset Counter) is selected as the comparison counter, | | |
| | | R10 and R11 must be in the numerical format of positive number comparison. | | |
| | | (0-268,435,455) | | |
| b23 | | It is not normally used in this board. | | |
| b24 | | | | |
| ~ | | Same as above (set to 00hex.) | | |
| b31 | | | | |

Table 4.9 Environment register 2 (R7)

4.4.3 Environment register 3 (R8)

(1) Format (2 bytes long)

7 4 3 0

1st byte (LSB) 0 0 0 0 Interrupt status factor permission
Effective '1' Not a factor '0'
Report when command is stopped
Report when preset operation is completed
Report when home return is completed
Report at the start of deceleration
Not used

15 12 11 8

2nd byte (MSB)

Number of step motor step-out detection encoder pulses

Interrupt status factor permission
Effective '1' Not a factor '0'
Report when the comparison conditions are met
Report at the next operation start
Report at the time of stop by simultaneous stop command

(2) Explanation

| Bit | Name | Inside Yong |
|---|---|---|
| | | b0 = '1' Command stop interrupt status report is an immediate stop command |
| b0 ~ | Interrupt status | Reported when stopped by the deceleration stop command. |
| | Interruption factor permissio | b1 = '1' Interrupt status report is preset when preset operation is completed |
| b3 | | Modes 1 to 4, floating homing mode, 1 pulse output mode |
| | | At each stop of the designated pulse output completion of the home origin return mode 2. |
| | | Will be reported. |
| | | b2 = '1' When the home return is completed, the interrupt status report is the home return mode 1. |
| | | Home origin completion in origin return mode 2, origin exit mode, |
| | | It is reported at each stop of the operation of the origin circuit mode. |
| | | b3 = '1' The interrupt status report at the start of deceleration is reported at the start of deceleration. |
| | | Is done. |
| b8 ~ | For step motor Step-out detection | (1) The setting range is 0 to 31 pulses. |
| b12 | Number of Enco-Dupals | (2) The deviation counter (6 bit counter) for step-out detection became larger than this value. If so, consider it a step-out. |
| | | (3) The deviation counter is reset by the command 62h. |
| | | b13 = '1' Interrupt status report when the comparison condition is satisfied |

| | | |
|---|---|---|
| b13 | Interrupt status Against | b14 = '1' Next operation start The next operation is the start of the interrupt status report. It will be reported when it becomes unconfirmed. |
| b15 | Interruption factor permission | b15 = '1' Simultaneous stop command interrupt status report. When bit 5 of the control buffer on the next page is set to '1', is it another axis? Reported by their simultaneous stop output. (When ELS detection is stopped except for the origin monitor, the origin monitor is stopped. When deceleration is stopped due to DLS detection other than, and SVALM Reported in each case when stopped by a signal) |

Table 4.10 Environment register 3





4.4.4 Control mode buffer

The initial setting of the control mode may change the mode during operation due to the environment register.
Writing is done directly to the "Control mode buffer" port.

(1) Control mode format

7 4 3 0

| | | |
|---|---|---|
| PCTR (Preset Counter) Operation | '0' ON | '1' OFF |
| Deceleration point detection method | '0' automatic | '1' manual |
| Acceleration / deceleration method | '0' straight line | '1' S-shaped |
| INPOSITION control '0'do not '1' | | |
| Next operation automatic start control | Do not "0" Do "1" | |
| Simultaneous stop signal input function | '0' OFF '1' ON | |
| Simultaneous stop signal output function | '0' ON | '1' OFF |
| Triangular drive speed correction function | '0' Correct '1' Do not | |

(2) Explanation

| Bit | Name | Inside Yong |
|---|---|---|
| b0 | PCTR operation ON / OFF | The preset counter is a down counter. b0 = '0' is the normal usage. b1 = '1' is a continuous pulse feed and the preset value is down-counted. |
| b1 | Deceleration point detection method | Not done. b1 = '0' Deceleration point automatic detection, R5 (deceleration point register) is normally 0 Set it. b1 = '1' Manual setting, the value of R5 is used as the deceleration point. |
| b2 | Acceleration / deceleration method | b2 = '0' Linear acceleration / deceleration b2 = '1' S-shaped acceleration / deceleration |
| b3 | INPOSITION control | b3 = '0' INPOS control is not performed. The operation is not completed until b3 = '1' INPOS is detected. Stop command when INPOS control is performed (09h) or deceleration stop command (0Ah), simultaneous stop command When (28h) is issued, immediately after confirming the stop in the status, It is necessary to set b3 to '0' once and then set it to '1'. (Note) With INPOSITION, the position of the server is always from the command pulse. Although it is delayed, the delayed pulse reaches within n pulses of the target position. I will tell you when I did. |
| b4 | Next operation automatic Start control | b4 = '0' After the operation is completed, issue the following command and start. b4 = '1' Automatically start with pre-register data after the operation is completed. However, it must be in the "pre-register confirmed state" when the operation is completed. There is no automatic start. The "confirmed state" is as follows. It is a state in which the condition of deviation is satisfied. ① Start command (FL, FH or high speed) during operation Written to the command buffer. |

(2) Confirmed state command (66h) is in the command buffer.
Written.





| Bit | Name | Inside Yong |
|---|---|---|
| b5 | Simultaneous stop signal input function | b5 = '0' Abnormal stop signals from other axes are not accepted.<br>b5 = '1' Same as above, accepts the signal and stops. |
| b6 | Simultaneous stop signal output function | b6 = '1' When an abnormal stop occurs on this axis, a stop signal to the other axis is sent. Do not output.<br>b6 = '0' Same as above, the stop signal to the other axis is output. The axis of b5 = 1 stops do.<br>(Note) Abnormal stop means the next stop.<br>(1) Stop by ± ELS signal except in origin search mode<br>(2) Deceleration stop due to DLS signal other than origin search mode (When b29 = '1' of R6)<br>③ Stop by SVALM (servo alarm) signal<br>④ Stop due to step-out detection<br>⑤ Stop due to comparator match<br>⑥ Stop by simultaneous stop command (28h) |
| b7 | At the time of triangular drive Speed correction function | b7 = '0' Deceleration point automatic detection (control mode buffer b1 = 0) Triangle Reduce drive peak speed. (Take a large FL)<br>b7 = '1' Same, not. (Linear acceleration / deceleration is usually '1'.) |

→

Table 4.11 Control mode buffer

(Note) With INPOSITION, the position of the server is always behind the command pulse, but the pulse is delayed.
However, it means that the target position is within n pulses.

5. Instructions [Operation execution]

The operation execution is specified by the operation mode (operation mode buffer writing), and the command is executed (command buffer).
It is done by writing).

5.1 Operation mode buffer

This buffer has a pre-buffer function, and if it is written during operation, it will be used for the next operation.

(1) Formula

7 4 3 0

| | b3 b0 | Mode | |
|---|---|---|---|
| | 0000 | continuous mode 1 | (Manual feed) |
| | 0001 | 〃 2 | (Handle manual feed) |
| Feed direction | 0010 | Origin return mode 1 | |
| '0' + direction | 0011 | 〃 2 | |
| '1'-direction | 0100 | Origin search mode | |
| | 0101 | Origin extraction mode | |
| DLS function | 0110 | 1 pulse output mode | |
| '0' valid | 0111 | Timer mode | (Dwell) |
| '1' invalid | 1000 | preset mode 1 (direction and feed amount) | |
| | 1001 | 〃 2 (relative value feed) | |
| UP / DOWN counter operation | 1010 | 〃 3 (absolute value feed) | |
| '0' | 1011 | Floating origin return mode | |
| '1' ban | 1100 | preset mode 4 (handle synchronous feed) | |

Operation complete timing

'0' Completed at the end of the last output pulse cycle
'1' The last output pulse is completed immediately after output



**Page 36**

(2) Explanation

| Bit | Name | Inside Yong |
|---|---|---|
| b0 ~ b3 | Operation mode | (1) Continuous mode ... Manual feed<br>Mode 1 continuous feed (JOG, RAPID feed)<br>Mode 2 Manual pulse feed (manual handle feed)<br>Ignore direction (b4)<br>(2) Preset mode ... Positioning<br>Set the mode 1 direction (b4) and feed amount (PR0).<br>Mode 2 Feed amount is set to PR0 with signed data (relative value).<br>Ignore the direction (b4).<br>Mode 3 Set the feed amount to PR0 with signed data (absolute value).<br>Ignore the direction (b4). (Restricted on usage)<br>Mode 4 Preset feed in synchronization with manual pulse.<br>(Synchronous feed of handle)<br>(3) Timer mode (dwell) (restricted on usage)<br>For wait function.<br>(4) 1 pulse output mode ... 1 pulse feed. Direction (b4) setting.<br>(5) Home origin return mode ... Mechanical home origin return (OLS / Z phase)<br>Mode 1 Normal home return (environment register 2) ▲ P.21)<br>Mode 2 Mode 1 function is set to PR0 and the origin return distance is also set.<br>Can be used together. (Completed on a first-come, first-served basis)<br>(6) Floating origin return mode (restricted on usage)<br>It returns to the 0 point of the UP / DOWN counter. Ignore direction (b4).<br>(7) Origin extraction mode<br>Operation to pull out from the origin in the specified direction (b4).<br>The extraction method is determined by the setting of the environment registers 2 b4 and 5.<br>(8) Origin search mode<br>When returning to the origin, the origin extraction mode and preset mode 1 are used together.<br>Home return operation. |
| b4 | Direction of operation | Specify the movement direction. (Continuous mode 2, preset modes 2 and 3, floating source<br>Ignore b4 for point return. ) |
| b5 | DLS function | b5 = '0' is valid. Decelerates to FL speed by DLS detection during high-speed operation.<br>(Caution) Speed change command with acceleration / deceleration during high-speed start command operation<br>After execution, it will be operating at high speed.<br>b5 = '1' is invalid. DLS does not work. (Not related to status 1) |
| b6 | UP / DOWN counter Count operation | b6 = '1' Does not work. Current position cow for backlash correction, etc.<br>I won't let you do it. (In timer mode, regardless of b6<br>It will not count. ) |
| b7 | Operation complete timing | b7 = '0' Completed at the end of the output pulse cycle<br>Frequency cycle<br>→ Opportunity for the next start<br>Last pulse<br>△ Completed status<br>b7 = '1' Completed immediately after output pulse<br>→ Opportunity for the next start<br>△ Completed status<br>When the command pulse speed is slow, b7 = '1' is preferable.<br>(Pulse width, duty cycle is 7. Hardware edition ▲ P.46) |

Table 5.1 Operation mode buffer

**Page 37**

5.2 Explanation of operation mode

| Wards | Inside Yong |
|---|---|
| Continuous mode 1 | (1) Start in the direction of b4 by writing a start command. |
| Manual feed | (2) Operates until an immediate stop or deceleration stop command is written. |
| | (3) The PCTR counts down with the value of PR0 as the initial value. |
| | (1) The number and speed of output pulses are controlled by the manual pulse encoder input. |
| Continuous mode 2 | NS. However, the speed is limited to FH. |
| Manual pulse feed | (2) The direction is determined by the encoder. |
| | (3) PCTR uses the value of PR0 as the initial value (regardless of the steering wheel rotation direction). |
| | The output pulse is down-counted. |
| Preset mode 1 | (1) Specify the number and direction of pulses to perform positioning operation. |
| Positioning | (2) Set the number and direction of feed pulses to PR0 to b4. |
| | (3) The PCTR counts down with the value of PR0 as the initial value. |
| Preset mode 2 | (1) Specify the number of pulses and the direction with signed numerical values, and perform positioning operation. |
| Relative coordinate positioning | (2) PCTR counts down with the absolute value of PR0 as the initial value. |
| | NS. Therefore, it is a relative coordinate feed. |
| | (1) Absolute with the UP / DOWN counter (R9) value as the current position |
| Preset mode 3 | Make a move. |
| Absolute coordinate positioning | (2) Set a target value for PR0. The numerical format matches the numerical format of R9. |
| | Let me. |
| | (3) \| PR0-R9 \| is set in the PCTR, and the PCTR is down count. |
| | do. Even if the value of R9 is changed immediately after the start, the value of PCTR will change. |
| | Not. (The feed does not change) |
| | (4) R9 must use the command pulse as the input count. |
| | (Restrictions on usage) |
| | (1) Positioning is performed in synchronization with the manual pulse encoder. |
| Preset mode 4 | (2) The movement amount and direction settings are the same as in preset mode 1. |
| (Handle synchronous feed) | (3) The operating direction follows b4 regardless of the direction of the handle. |
| | (4) Set the upper speed limit for FH. |
| | (5) The PCTR counts down with the value of PR0 as the initial value. |
| | (6) Pulse is output regardless of the rotation direction of the handle. |
| | (1) Wait time (S) = PR0 (pulse) / (R1 x magnification) (pulse / S) |
| Timer mode | (2) During the timer mode, the command pulse is not output and ELS and DLS are invalid. |
| (Dwell) | The INPOSITION function is disabled. |
| | (3) The UP / DOWN counter (R9) does not operate during the timer mode. |
| | Therefore, R9 should be used as a command pulse input count. |
| | (Usage restrictions) |
| | (4) The PCTR counts down with the value of PR0 as the initial value. |
| 1 pulse output mode | (1) No need to set PR0. Set only the direction. |
| | (2) PCTR counts down with 1 as the initial value. |
| | (1) The origin return direction is set by b4. |
| Origin return mode 1 | (2) UP / DOWN counter when restoration is completed by environment register 2 (R7) b6 = '1' |
| (Return to machine origin) | Is cleared. |
| | (3) The origin return method is a combination of R7 b4, 5 and commands. |
| | 5 ways possible (environmental register 2) P.20) |
| | (1) After starting, it operates like the origin return mode 1, but by the time it reaches the origin. |
| Origin return mode 2 | It stops when the PR0 set value is reached. |
| (Mode 1 and origin | (2) The return direction is set by b4. |
| Plusset return combined) | (3) The cause of the stop is determined by the interrupt status or the contents of the PCTR. |
| | In the case of interrupt status Status 02h Stop at the number of pulses |
| | Status 03h Stop at origin position |

**Page 38**

| Wards | Inside Yong |
|---|---|
| Floating homing mode | (1) Positioning is performed so that the UP / DOWN counter (R9) becomes 0.<br>(2) The PCTR counts down with the absolute value of R9 as the initial value.<br>(Even if the value of R9 is changed immediately after the start, the value of PCTR does not change)<br>(3) R9 shall be the command pulse input count.<br>(Usage restrictions)<br>(1) Extract from the position where the OLS signal is ON in the specified direction (b4). |
| Origin extraction mode | It operates to pull out to the OLS OFF position.<br>(2) There are three methods for environment register 2 (R7) b4, 5 and Z-phase count.<br>be.<br>b4, b5 Movement Written<br>1 0 0 Simply stop with OLS OFF.<br>When starting, OLS is turned off and it is completed immediately. The speed is<br>Set to constant speed feed.<br>The Z-phase count n + 1st time since 201 OLS was turned off.<br>Stopping is completed with Z phase count. However, during this time, OLS is OFF<br>There is. Set the speed to constant speed feed.<br>3 10 FH The point that OLS was turned off while accelerating at the high-speed start.<br>Decelerate at, count the Z phase from that point, and n + 1th Z phase<br>Stop is completed with. During this time, OLS is OFF.<br>PCTR counts down with PR0 as the initial value. |
| Origin search mode | The origin returns in the specified direction, but in preparation for the abnormal termination of the origin return, the next<br>The operation of the procedure is built in.<br>(1) In OLS ON, start from step (3).<br>In OLS OFF, "① Origin return mode 1 in the specified direction Is executed.<br>Origin search ends normally when it ends normally<br>Proceed to the next step (2) at the abnormal end (return direction ELS immediately stop).<br>(2) "② Reverse origin return mode 1 Is executed.<br>For OLS OFF stop (reverse ELS immediate stop), go to step (1).<br>If it stops with OLS ON, go to the next step (3).<br>(3) "③ OLS extraction operation(Stops at the Z-phase count after OLS is turned off)<br>Abnormal stop (ELS immediate stop) causes abnormal termination of origin search<br>For normal stop, go to the next step (4)<br>(4) "④ Reverse preset mode 1 Perform the operation and return to step (1).<br><br>-The operation modes and commands for the directional origin are as follows.<br>(1) Preset amount (absolute value) drawn from OLS to the center, creep speed (FL)<br>, Origin return speed (FH) is set to PR0, PR1 and PR2, respectively.<br>(2) Set the origin return method in the environment registers R7 b5 and b4.<br>(This setting applies to all four types of behavior.)<br>③ Start high-speed homing with operation command B4h and start command 13h.<br>To do. In cases of abnormal termination, the distance between + ELS and OLS is appropriate.<br>If not.<br><br>(Caution) The origin search mode is described in "Operation 6.1 Axis Sensor Setting Method".<br>Of these, it is valid only for categories 1, 2, and 3. |

Table 5.2 Operation mode



**Page 39**

5.3 Command buffer

By writing the command to the "command buffer", the command is executed according to the contents specified in the operation mode.
This buffer has a pre-buffer function, and if it is written during operation, it will be used for the next operation.

(1) Formula

7 4 3 0

command

(2) Command explanation

| Wards | Command name | Code (hex) | Inside Yong |
|---|---|---|---|
| Start command | FL constant speed start | 10 | (1) Writing at stop is a constant speed start at FL speed (PR1 → R1). Then, it is in constant speed operation. (2) If written during operation, it will be the start command for the next operation. |
| | FH constant speed start | 11 | (1) When writing at stop, start at a constant speed at FH speed (PR2 → R2) Then, it is in constant speed operation. (2) Writing during operation is the start command for the next operation. |
| | High speed start | 13 | (1) Write at stop after starting at FL speed (PR1 → R1) Accelerates to FH speed (PR2 → R2) and operates at high speed (2) Writing during operation is for the next operation. |
| | Remaining amount FL start | 14 | (1) After stopping the preset operation halfway, this frame When the input is written, the remaining pulse amount is reached at the FL speed (R1). (PCTR) Works. (During constant speed operation) (2) Writing during operation is invalid. |
| | Remaining amount FH start | 15 | (1) After stopping the preset operation halfway, this frame When the input is written, the remaining pulse amount is reached at the FH speed (R2). (PCTR) Works. (During constant speed operation) (2) Writing during operation is invalid. |
| | Remaining high-speed start | 17 | (1) After stopping the preset operation halfway, this frame When you write the input, after starting at FL speed (R1), FH Accelerate to speed (R2) and operate for remaining pulse (PCTR) do. (During high-speed operation) (2) Writing during operation is invalid. |
| | Simultaneous start | 30 | Axis in start hold state (start hold command is Is issued) will start at the same time. (Simultaneous start signal is output to all PCL5014) |
| Speed register Change command (note) | Instantly Change to R1 speed | 00 | (1) If you write during operation, it will instantly reach FL (R1) speed. If it is operating at high speed, it will be operating at constant speed. (2) Writing is invalid when stopped. |
| | Instantly Change to R2 speed | 01 | (1) If you write during operation, it will instantly reach FH (R2) speed. If it is operating at high speed, it will be operating at constant speed. (2) Writing is invalid when stopped. |
| | Slow down Change to R1 speed | 02 | (1) If you write during operation, it will decelerate to FL (R1 speed). If it is operating at a constant speed, it will be operating at a high speed. (2) Writing is invalid when stopped. |
| | Accelerate Change to R2 speed | 03 | (1) If you write during operation, it will accelerate to FH (R2) speed. If it is operating at a constant speed, it will be operating at a high speed. (2) Writing is invalid when stopped. |

(Note) The speed register change command simply changes the speed register specification.
Therefore, in PR1 or PR2, R1 and R2 for the purpose of change must be set in advance.
not.
Refer to "Normal speed change" (P.31)



**Page 40**

| Wards | Command name | Code (hex) | Inside Yong |
|---|---|---|---|
| Stop command | Immediate stop | 09 | (1) Writing is stopped immediately during operation. (2) Writing is invalid when stopped. |

| | | | |
|---|---|---|---|
| | | | (3) Start command for next operation and simultaneous start wait are canceled. |
| | | | (1) Writing stops immediately during FL constant speed operation. |
| | Deceleration stop | 0A | (2) If you write during FH constant speed operation or high speed operation, |
| | | | Decelerate to FL speed and stop. |
| | | | (3) Writing is invalid when stopped. |
| | | | (4) Start command for next operation and simultaneous start wait are canceled. |
| | Simultaneous stop | 28 | Simultaneous stop function ON (control mode-dubbing b5 = '1') |
| | | | Then, the operating shaft stops immediately at the same time. |
| | FL constant speed start hold | 20 | (1) Writing during stop is waiting for simultaneous start. |
| | | | (2) Writing during operation becomes the start command for the next operation. |
| Start | FH constant speed start hold | 21 | (3) When started at the same time, FL speed (PR1 → R1), FH |
| Hold command | | | Perform constant speed or acceleration at speed (PR2 → R2), |
| | High speed start hold | 23 | They are operating at a constant speed and operating at a high speed, respectively. |
| | | | (4) Cancellation of waiting for simultaneous start is "emergency stop (63h)" |
| | | | (1) Writing during stop is waiting for simultaneous start. |
| | Remaining amount FL | 24 | (2) When started at the same time, the remaining pulse amount at FL constant speed (R1) |
| | Constant speed start hold | | (PCTR) Works. (During constant speed operation) |
| | | | (3) Writing is invalid during operation. |
| | | | (1) Writing during stop is waiting for simultaneous start. |
| | Remaining amount FH | 25 | (2) When started at the same time, the remaining pulse amount at FH constant speed (R2) |
| | Constant speed start hold | | (PCTR) Works. (During constant speed operation) |
| | | | (3) Writing is invalid during operation. |
| | | | (1) Writing during stop is waiting for simultaneous start. |
| | High speed remaining | 27 | (2) When started at the same time, it will start at FL constant speed (R1). |
| | Start hold | | Accelerate to FH speed (R2) and remaining pulse (PCTR) |
| | | | Operate. (During high-speed operation) |
| | | | (3) Writing is invalid during operation. |
| | | | (1) Reset PCL5014. |
| Control | Software reset | 60 | (2) Clear all 0s, which is the same as the hard air reset. |
| command | note | | (3) After this command, perform the initial processing again. |
| | UP / DOWN | 61 | Set the contents of the UP / DOWN counter (R9) to 0. |
| | Counter reset | | |
| | For step-out detection | 62 | Set the content of the deviation counter for step-out detection to 0. |
| | Deviation counter reset | | |
| | | | (1) If you write during operation, it will stop immediately. |
| | emergency stop | 63 | (2) Output the CTRCL signal with a width of 0.2 ms. |
| | | | (3) Cancel the simultaneous start waiting state. |
| | | | (B3 (INPOSITION) of the control mode buffer is '0') |
| | Pre-register | 66 | Set the pre-register to the fixed state. |
| | Confirmed set | | (Refer to the control mode buffer) |
| | Pre-register | 67 | If you write a start command during operation, it will be used for the next operation. |
| | Confirmed reset | | Is confirmed, but the confirmed state is cancelled. |
| | | C0 ~ | 4.3.2 "How to write and read registers" |
| register | Write command | | See (P.13, P.14) |
| command | | DB | Register commands in the same command buffer |
| | | 80 ~ | Write, but write to the (pre) command buffer |
| | Read command | | Even if it is, the register command can be written. |
| | | 9B | |

Table 5.3 Commands

Note) After issuing the software reset command, issuing the command to this board is not possible.
Time interval of 1 μS or more Please open.





5.4 Registers to be set at runtime

5.4.1 Speed register (PR1, PR2, R1, R2)

(1) The normal speed register is operated as follows.

FL (PR1, R1) is set exclusively for the base speed of acceleration / deceleration feed. The setting is made for PR1.

FH (PR2, R2) is used for the actual feed rate. Both constant speed feed and high speed feed are set by FH.

Set to PR2.

(2) Normal speed change

To change the speed in the middle, change R2 directly.

Even if you enter deceleration and change FH (R2), it will be ignored.

| Wards | Machine Noh | Numerical range | Manipulation Written |
|---|---|---|---|
| Speed setting PR1 (FL) (FL = PR1 x magnification) | 1. Run with high-speed start command case Set base speed for FL Set target speed for FH f FH Base speed FL t 2. Execute with constant speed start command Case (FH) f FH t 3. By using the comparator function Change speed at specified position When doing, high speed / FH constant speed Start operation by writing start command Write FH (PR2) after the start f Comparator condition satisfied FH1 (Speed change) FH2 △ FH2 t | 1-32766 (15 bit length) | 1. All to the value of the magnification register (PR4) Therefore, the frequency is determined. (Refer to the magnification register) 2. FL> 0 even when FL is not used Must be. (That is, once PR1 is other than 0 Set the value of. ) 3. For writing, FL is PR1 and FH is Perform for PR2. At the start, PR1 → R1 Moved from PR2 to R2 [Exception] Remaining amount start 4. If the value is the same as the previous setting, write It doesn't have to be. Read as 5.32-bit data Is that the upper 17 bits are all 0 NS. 6. There are two types of constant speed start commands, FH and FL. There is a kind, but FL is a high-speed base speed. Or set the creep speed for homing "FH constant speed start command" to do Recommendation. |
| Speed change R1 (FL) (FL = R1 x magnification) R2 (FH) (FH = R2 x magnification) | 1. Not valid while stopped. 2. 1 to 32766 during operation with high-speed start command When writing to FH (R2) (15 bit length) Speed change with acceleration / deceleration f FH2 FH3 FH1 FH4 FL t 2. Operates with FH constant speed start command Write FH (R2) inside Instant speed change when done f FH2 FH3 FH1 t | However, FH> FL To be | 1. All to the value of the magnification register (R4) Therefore, the frequency is determined. (Magnification register P.32) 2. For writing, FL is R1 and FH is This is done for R2. Read as 3.32-bit data Is that the upper 17 bits are all 0 NS. |

Table 5.4 Speed register





5.4.2 Magnification register (PR4, R4)

Assuming that the actual command pulse frequencies FL and FH are collectively F, the following equation is obtained.

$$F = \frac{RF}{(R4 + 1)} \times 300$$ However, RF is a value of PR1, R1, PR2, R2.

Magnification setting is written for PR4. R4 is a run-time magnification register.

Table 5.5 shows the relationship between the magnification setting value for PR4 and F.

| Double rate | Value of PR4 | F (PPS) | Possible range of command pulse frequency F |
|---|---|---|---|
| 0.1 | 2999 | 0.1RF | 0.1PPS- 3.2766KPPS |
| 0.5 | 599 | 0.5RF | 0.5PPS- 16.3830KPPS |
| 1 | 299 | 1 RF | 1 PPS- 32.766 KPPS |
| 2 | 149 | 2 RF | 2 PPS- 65.532 KPPS |

| | | | | | |
|---|---|---|---|---|---|
| 5 | 59 | 5 | RF | 5 | PPS- 163.830 KPPS |
| 10 | 29 | 10 | RF | 10 | PPS- 327.660 KPPS |
| 20 | 14 | 20 | RF | 20 | PPS- 655.320 KPPS |
| 50 | 5 | 50 | RF | 50 | PPS-1638.300 KPPS |
| 100 | 2 | 100 | RF | 100 | PPS-3276.600 KPPS |
| 150 | 1 | 150 | RF | 150 | PPS-4914.900 KPPS |

Table 5.5 Relationship between command frequency and magnification

5.4.3 Feed amount register (PR0, R0, PCTR)

| Wards | Machine Noh | Numerical range | Manipulation Written |
|---|---|---|---|
| PR0, R0, PCTR connection of | (1) Write the feed amount in PR0.<br>(2) Move from PR0 to R0 at start<br>Will be done. (Excluding the remaining amount start)<br>In addition, the value in the numeric format of R0<br>Is converted to the amount of movement<br>Loaded to PCTR.<br>(3) After starting, PCTR will be down count<br>Will be done. | 28 bit length | 1. PCTR read is an unsigned positive number<br>Indicates the feed amount of the format. 32 bits<br>The top 4 bits at the time of reading are 0.<br>2.R0 is the format content set in PR0<br>keeping.<br>▲ |
| Preset mode 1<br>Origin return mode 2 | The numerical format set for PR0 is from 0 to<br>Unsigned number<br>The numerical format to set to PR0 is | 268,435,455 | Section 5.1 "Operation Mode-Dubber" (P.25) |
| Other<br>Preset mode | Select the following three methods.<br>(1) No sign | 0 ~<br>268,435,455 | PCTR is controlled by the control mode buff b0.<br>Down count can be prohibited.<br>In this case, the preset amount cannot be fed. |
| | (2) Signed numerical relative value feed | -134,217,728 ~ | stomach. However, although PCTR does not work,<br>The command pulse output is continuous pulse feed. |
| | (3) Signed numerical value absolute value feed | +134,217,727 | NS. |
| Continuous mode | (1) Basically, the feed amount is PR0.<br>There is no need to set.<br>(2) Set the value to PR0 in advance<br>When you start, PCTR<br>Value subtracted by the amount of movement<br>Is showing. | | ▲<br>PCTR reading method (P.35) |

Table 5.6 Relationship between PR0, R0 and PCTR





5.5 Registers that do not change in principle

The important register that operates without change is related to acceleration / deceleration.

■ Adjustment time

Control with acceleration rate register (PR3), deceleration rate register (PR15), deceleration point register (PR5)

It is the relationship of b1 of the mode buffer. Follow the steps below to set.

(1) When the acceleration time and deceleration time are the same (explained in this section)

The conditions are PR15 = 0, PR5 = 0, control mode buffer b1 = 0, and the acceleration / deceleration gradient is the acceleration rate.

Set and operate only in the register (PR3). Automatic acceleration / deceleration is possible, and there is no need to set a deceleration point.

(Triangle drive is also automatic.)

The same is true for all acceleration / deceleration curves.

▲

(2) When the acceleration time and deceleration time are different (explained in Section 6.5. P.44)

■ Acceleration / deceleration curve

The acceleration / deceleration curve can be a straight line, an S-shape, or a straight S-shape (S-shaped sections at both ends of the straight line).

The related registers are the control mode buffer b2 and the S-shaped section register PR16.

(1) Linear acceleration / deceleration (explained in this section) Control mode buffer b2 = 0.

(2) S-shaped acceleration / deceleration (explained in this section) Control mode buffer b2 = 1 and PR16 = 0.

▲

(3) Straight S-shaped acceleration / deceleration (explained in Section 6.5. P.44)

5.5.1 Addition (decrease) speed rate register (PR3) and S-shaped section register (PR16)

| Wards | Inside Yong | remarks |
|---|---|---|
| | (1) Setting of linear acceleration / deceleration time T | |
| Acceleration / deceleration rate setting | $T = \frac{(PR2-PR1) \times (PR3 + 1) \times 4}{19,660,800}$ [S] | Control mode buffer<br>b2, b1 = 00 |
| | FH (PR2 x Magnification) is the target speed (PPS)<br>FL (PR1 x Magnification) is base speed (PPS)<br>Acceleration / deceleration rate is 1 ≤ PR3 ≤ 65535 | Linear automatic acceleration / deceleration,<br>Same acceleration / deceleration time |
| | | PR5 = 0<br>PR15 = 0 |
| | Acceleration / deceleration time T = Deceleration time T | |
| | (2) Setting of S-shaped acceleration / deceleration time T | |
| | $T = \frac{(PR2-PR1) \times (PR3 + 1) \times 8}{19,660,800}$ [S] | Control mode buffer<br>b2, b1 = 10 |
| | FH, FL, PR3 are the same as (1) | S-shaped automatic acceleration / deceleration<br>Acceleration / deceleration same time |
| | | PR5 = 0<br>PR15 = 0<br>PR16 = 0 |
| | $T = T_D$ | |
| Acceleration / deceleration pattern example | Base speed 10PPS, target speed 50KPPS<br>Acceleration / deceleration time 300ms | |
| | (1) 50KPPS output is Magnification 2x mode, Magnification<br>The register value is PR4 = 149<br>(2) Base speed FL is 10PPS in double mode.<br>PR1 = 5 to do<br>③ Target speed FH is double mode and 50KPPS is<br>PR2 = 25000 | |

(Continued on the next page)



**Page 44**

| Wards | Inside Yong | remarks |
|---|---|---|
| | (1) Linear acceleration / deceleration | Control mode buffer |
| Acceleration / deceleration pattern example | $0.3 = \frac{(25000-5) \times (PR3 + 1) \times 4}{19,660,800}$<br>PR3 ≒ 58 | b2, b1 = 00<br>PR5 = 0<br>PR15 = 0 |
| | (2) S-shaped acceleration / deceleration | Control mode buffer |
| | $0.3 = \frac{(25000-5) \times (PR3 + 1) \times 8}{19,660,800}$<br>PR3 ≒ 29 | b2, b1 = 10<br>PR5 = 0<br>PR15 = 0<br>PR16 = 0 |

| | |
|---|---|
| In operation | Preset mode |
| Speed change example | Then acceleration / deceleration on the way |
| | Change rate (R3) |
| | Do not do. |

① If you reduce the FH during S-shaped acceleration, it will be up to that point.
Changed with acceleration pattern and symmetric pattern in
Decelerate to speed. For a complete S-shaped pattern
It will not be.
② If you increase FH during S-shaped acceleration, the beginning
S-accelerate to FH and then S-accelerate again
And accelerate to the changed speed. Twice
It becomes an S-shaped pattern.
③ If you change the FH after accelerating, the speed will be changed.
Accelerate and decelerate with an S-shaped pattern.

| | |
|---|---|
| Deceleration point | |
| For automatic detection | |
| Example of deceleration pattern | Control mode buffer |
| | b2, b1 = 10 |
| | PR5 = 0 |
| | PR15 = 0 |
| | PR16 = 0 |

① When the deceleration point is reached during S-shaped acceleration, until then
Acceleration pattern Decelerates to FL with a symmetrical pattern
② Reach the deceleration point during deceleration by changing the speed
And once S-shaped deceleration to the speed change point
S-deceleration from to FL again.
③ When reaching the deceleration point during acceleration due to speed change
Is rounded in speed just before the deceleration point
Decelerate.

Table 5.7





5.6 Other registers

5.6.1 Reading of feed amount preset counter (PCTR)

Normally, the UP / DOWN counter (R9) should be used to read the current position, but R9 should be used.
You may want to use the encoder for counting and take a separate command position. (R9 is a command pulse or
It can only be used to count one of the feedback pulses. )
In such a case, PCTR can be used as a command counter. However, PCTR is a down counter
is. To use it for this purpose, follow the procedure below.

(1) In the case of preset feed
When the absolute amount of the feed pulse is issued, it is set in the PCTR and for each pulse output.
It will be -1. PCTR becomes 0 and this feed ends. Status b2-b0 = 000
I will. Please remember the direction softly and judge.

(2) In the case of continuous feed and home return mode
Set the maximum feed amount 268,435,455 (FFFFFFFh) to PR0. Start on that
Issue a command. PR0 is decremented by -1 for each pulse output from this maximum value. The direction is
Since the software sets the operation mode buffer b4, remember the direction in the software and judge.
Please. Note that if the maximum value is not set, the content of the previous PR0 is an absolute value and PCT.
It is set to R. From count 0, it becomes the maximum value.

(3) In timer mode Do not read for the current position.

(4) Pulse output mode PCTR counts down with 1 as the initial value.

5.6.2 UP / DOWN counter (R9)

(1) Current position management application 28-bit length

(2) The upper 4 bits when reading 32 bits are in the count format specified by the environment register 1 (R6) b28.
The sign is expanded according to.

(3) Positive number count format 0-268,435,455

Signed count format -134,217,728 to +134,217,727

5.6.3 Compatator value 1 register (R10) and comparer value 2 register (R11)

(1) Set the comparison data.

(2) When the comparison counter is an UP / DOWN counter (R9), it is given in a numerical format corresponding to the numerical format.

Yes.

(3) If the comparison counter is PCTR, give it in positive count format.

(4) The contents when reading 32-bit are the same as 5.6.2 (2) and (3) in the previous section.

5.6.4 Control mode buffer and environment register 2 (R7)

Both the control mode buffer and the environment register 2 are "registers that should be set at the initial time".

For some of the registers, you may want to change the settings during operation (when stopped).

(1) Change control mode buffer settings (when stopped)

If you want to change the following state even by 1 bit, write to a new control mode buffer while stopped.

to hold.

Next operation When using the automatic start function, the control mode buffer cannot be written.

7 4 3 0

0 0

| | | |
|---|---|---|
| PCTR (Preset Counter) Operation '0' ON | | '1' OFF |
| Deceleration point detection method | '0' automatic | '1' manual |
| Acceleration / deceleration method | '0' straight line | '1' S-shaped |
| INPOSITION control '0'do not '1' | | |
| Next operation automatic start | Do not "0" Do "1" | |
| Simultaneous stop function | '0' OFF '1' ON | |

(2) Environment register 2 (R7)

Whether or not the comparator can be used in each operation and whether or not the machine lock can be used is registered while the operation is stopped.

Write.

Be sure to change the machine lock status while the machine is stopped.

Comparator writing is possible even during operation, but it is done when it is stopped as much as possible.



**Page 46**

31 24 23 16 15 8 7 0

4th byte 3rd byte 2nd byte 1st byte

twenty three 20 19 16 16 7 4 3 0

0

Machine lock '0', not '1'.

Comparison condition selection

Operation selection when the comparison condition is satisfied

00 Do nothing (interrupt occurs when interrupt is enabled)

01 Command pulse output stop (immediate stop)

10 Internal operation continues but pulse is not output

11 R2 (FH), R3 (acceleration / deceleration rate) PR2, PR3 contents

To. (Speed change)

Comparison counter selection '0' UP / DOWN counter (R9)

'1' Preset Counter (PCTR)

5.6.5 Counter monitor (R12)

By reading, you can monitor certain contents.

(1) Formula

7 0

1st byte (LSB)

Current speed (lower)

15 8

2nd byte 0

Current speed (higher)

23 22 20 19 16 16

3rd byte 0

Z-phase counter
Idling control counter

31 29 28 27 twenty four
4th byte (MSB) 0 0

Step-out detection counter

(2) Explanation

| Bit | Name | Inside Yong |
|---|---|---|
| b0 ~ b14 | Current speed | (1) The current speed can be read out as the same unit as the set numerical format of R1 and R2.<br>(2) When stopped, it becomes the set value of R1 (FL). |
| b16 ~ b19 | Z-phase counter | (1) The value of the Z-phase counter used for home return can be read.<br>(2) Until the count condition is satisfied, it will be the same as the set value of the number of times, and the condition After setting, it counts down according to the Z phase.<br>(3) It stops at count 0, but the initial value is loaded immediately. |
| b20 ~ b22 | Idling Control counter | (1) The value of the idling control counter can be read.<br>(2) When stopped, it is a set value and counts down for each pulse output after starting. do.<br>(3) Acceleration starts at a count value of 0. |
| b24 ~ b29 | Step-out detection counter | (1) The current count of the step-out detection counter can be read.<br>(2) Negative number is 2's complement, counter is 6 bits, but read is 8 bits. Sign extension with.<br>(3) When the motor is in the (-) direction from the integrated position by the output pulse. It becomes a positive number. |

Table 5.8 Counter monitor



**Page 47**

5.6.6 Command monitor 1 (R13)

(1) Formula

7 5 4 3 0
1st byte (LSB)

Command (command written when stopped)
Simultaneous start terminal '0': OFF '1': ON
Simultaneous stop terminal '0': OFF '1': ON

15 12 11 8
2nd byte

Operation mode

twenty three 20 19 16 16
3rd byte (MSB)

Control mode

(2) Explanation

| Bit | Name | Inside Yong |
|---|---|---|
| b0 ~ b5 | command | Under the last command of the commands (00h to 30h) written at the time of stop 6 bits can be read. |
| b6 | Simultaneous start terminal | Terminal status monitor |
| b7 | Simultaneous stop terminal | |
| b8 ~ | Operation mode | Monitor the current operating mode |

| | | |
|---|---|---|
| b15 ~ b16 | Control mode | Current control mode monitor |
| b23 | | |

Table 5.9 Command monitor 1





5.6.7 Command monitor 2 (R14)

(1) Formula

7 5 4 3 0

1st byte (LSB)

Precommand
'1' Start pending
'1' Z phase signal ON

15 12 11 8

2nd byte

Pre-operation mode

twenty three 20 19 16 16

3rd byte (MSB)

'1' PR0 written
'1' PR1 〃
'1' PR2 〃
'1' PR3 〃
'1' PR4 〃
'1' pre-operation mode written
'1' Pre-register confirmed state
'1' Start command written

(2) Explanation

| Bit | Name | Inside Yong |
|---|---|---|
| b0 ~ b5 | Precommand | Read the lower 6 bits of the start command for the next operation |
| b6 | Start pending | After the start hold command is set, the simultaneous start command is issued. It will be '1' until it is issued. |
| b7 | Z-phase signal | ON / OFF state of Z-phase signal |
| b8 ~ | | |

| | | |
|---|---|---|
| b15 | Pre-operation mode | The operation mode for the next operation can be read. |
| b16 ~ | PR0-PR4 | Writing to pre-register '1' |
| | Written | It will be '0' at the next start. |
| b20 | | |
| b21 | Pre-operation mode | If you write the operation mode, it will be '1' |
| | Written | It will be '0' at the next start. |
| b22 | pre-register | (1) In the state of control mode buffer b4 = '1' (next operation automatic start), If you write a start command or a confirmation command during operation, it will be "1". Become. |
| | Confirmed state | (2) Stop frame at the next start or when writing a confirmed cancel command When writing (09h, 0Ah), it becomes '0' at the time of emergency stop. (3) When the current operation is completed with this bit set to '1', the next operation is performed. Automatically start. (However, control mode b4 = '1') |
| b23 | Start command | (1) '1' for writing a start command and '0' for stopping operation |
| | Write status | (2) The difference from status 1b2 (operation completion bit) is that status 1b2 is This b23'1'(start command) for b2 = '0' in the start hold state Written). |

Table 5.10 Command monitor 2



**Page 49**

| | twenty three | 20 19 | 16 16 |
|---|---|---|---|
| 3rd byte (MSB) | 0 0 0 0 0 | | |

'1' PR5 written
'1' PR15 〃
'1' PR16 〃

(2) Explanation

| Bit | Name | Inside | Yong |
|---|---|---|---|
| b24 ~ | PR5, PR15 PR16 written | Writing to pre-register '1' It will be '0' at the next start. | |
| b26 | | | |

Table 5.11 Command monitor 2

**Page 50**

6. Operation

In this section, the operation of PCL5014 is classified so as to be a guideline for use as a PPD516A board.
There is.

6.1 How to set the axis sensor

A typical method is shown according to the number of sensors. Both Z-phase origins can be used together.

| Wards | Inside Yong | Record case |
|---|---|---|
| | + ELS -ELS<br>▽ ▽ | 1. ELS will stop immediately. |
| 1. 4 sensors<br>(+ Z phase count)<br>composition | Effective stroke<br>OLS<br>((The origin can)be ± DLS<br>FH<br>○ High-speed origin return<br>FL<br>t<br>△<br>(+ Z) phase | 2. DLS and OLS will continue until completed<br>And it must be ON.<br>3.R6 b29 = 0'(DLS deceleration)<br>R7 b5.4 = 00'dr 01' '<br>Operation mode b5 = 0'(DLS enabled)<br>Return to origin with high-speed start (13h) |
| 2. 3 sensors<br>Z phase required | + ELS -ELS<br>▽ ▽<br>Effective stroke<br>OLS<br>FH<br>○ High-speed origin return<br>FL<br>t<br>△<br>Stop at Z phase | 1.ELS Same as the previous section<br>2. OLS becomes a deceleration sensor<br>(No DLS input required)<br>OLS is continuously ON until it is completed<br>To be.<br>3.R6 b29 = 0'(DLS deceleration)<br>R7 b5.4 = 10'(OLS + Z phase)<br>Operation mode b5 = 1''<br>Return to origin with high-speed start (13h) |
| 3. 3 sensors<br>(+ Z phase)<br>・ DLS instead of ELS<br>・ Stroke-Quend<br>Deceleration stop | Å Â<br>Effective stroke<br>DLS DLS<br>OLS<br>FH<br>○ During normal operation<br>Stroke-Quend detection FL<br>t<br>FH<br>○ High-speed origin return<br>FL | 1. Set DLS as a stroke end during normal operation<br>Slow down and stop at the stroke.<br>However, the cause of ± DLS is a sense.<br>Can not.<br>R6 b29 = '1' (DLS deceleration stop)<br>Operation mode-do b5 = '0' (DLS enabled)<br>(FL is always used for constant speed feed)<br>The pull-out operation at the time of stroke is in operation mode.<br>Perform with b5 = '1' (DLS disabled).<br>2. The ON conditions for DLS and OLS are the same as above. |

t
△ In Z phase 3. When returning to origin
(Note) ± DLS is an OR connection Stop R6 b29 = '0' (DLS deceleration)
Then input to the DLS terminal. R7 b5,4 = '00' or '01'
Operation mode b5 = '0' (DLS enabled)
Return to origin with high-speed start (13h)

(Continued on the next page)



**Page 51**

| Wards | Inside | Yong | Record case |
|---|---|---|---|
| | Å | Â | 1. OR connection of 3 sensors of DLS and OLS<br>And to both the DLS and OLS terminals of the board input. |
| 4. Two sensors (+ Z phase)<br>・ DLS instead of ELS<br>・ Stroke-Quend Deceleration stop | Effective stroke<br>DLS | DLS<br>OLS | 2. During normal operation, the same as 1 in Category 3. |
| | FH | | 3. DLS should remain ON until stopped |
| | ○ During normal operation<br>Stroke-Quend detection | | 4. Return to origin is divided into ① and ②.<br>① High-speed continuous feed<br>・ R6 b29 = 1'(DLS deceleration stop)<br>・ According to R7 b5.4 = ② |
| | | FL t | |
| | FH | | ・ Operation mode b5 = 0'and b3-b0 = '0000' (continuous mode 1) |
| | ○ High-speed origin return ① | | ・ High-speed start (13h) |
| | Z phase ▽ | FL t | (2) Origin extraction feed (origin detection process)<br>・ R7 b5,4 = Method selection |
| | | ② | ・ Operation mode-Do feed direction (b4) in the opposite direction And b3-b0 = '0101' (origin extraction mode)<br>・ FL constant speed feed. |

Table 6.1 Axis sensor-configuration method

6.2 Concept of server interface

As these I / F inputs and outputs, this board has 2 inputs and 2 outputs per axis.
As a general system, the following are the distinctions between these usages.

| Wards | | Inside | Yong | Record case |
|---|---|---|---|---|
| | | | | 1.SVON and SVRESET are general-purpose port output is. ㄱ -ON / OFF with the program |
| Sub-Bo-Mo-Tad Driver | PPD516A<br>EXTPOW2<br>COMMON | + 24V | Server driver | 2.SVALM selects polarity with R6 b6<br>(When using, b6 = '0' B contact input) |
| | SVON<br>SVRESET | | Support ON<br>Reset | 3.INPOS is polar selection with R6 b3<br>(When using, b3 = '0' B contact input) |
| | SVALM<br>INPOS | | All-am<br>Counter Zero | |
| Palsmo-Tad Driver | PPD516A<br>EXTPOW2<br>COMMON | + 24V<br>(+ 5V Note) | Server driver | 1. When using excitation ON / OFF,<br>Connect with SVON.<br>However, in this case, SVON is excited OFF. |
| | SVON<br>SVRESET | | Excitation OFF | become. (SVON is a general-purpose port output<br>Therefore, it is done in the program. ) |
| | SVALM<br>INPOS | | All-am | 2.SVALM is R6 b6 with polarity selection<br>(When using, b6 = '0' B contact input) |
| | | | | 3. Set INPOS to R6 b3 = '0'.<br>(Non-use polarity) |

(Note) Depending on the driver, in the case of + 5V power supply,

Changes in some ICs and circuit constants depending on the option
We can handle even more, so our sales department

Please contact

Table 6.2 Server Face





6.3 Standard control configuration policy

By combining the board specifications and PCL5014, several in-axis system configurations can be made.

In particular, the configuration is divided around the UP / DOWN counter and encoder input. (Encoder is now
It is an alternative use for position feedback, manual pulse, and pulse motor step-out detection. )

| Wards | Inside | Yong | | Record case |
|---|---|---|---|---|
| 1. Encoder No input | PCTR | | Command output | (1) R9 can be used correctly for coordinate management |
| | UP / DOWN | | | (2) There are no restrictions on how to use the operation mode. (See Section 5.1 P.25) |
| | Composer | | | (3) Composers are usually used for software. |
| 2. Position confirmation Encode input | PCTR | | Command output | (1) Normally, the server makes a slight movement of ± 1 pulse. doing. Therefore, the exact coordinates Management reads the command output (PCTR) It is necessary. |
| | UP / DOWN | M | Enco-da | (2) The restricted mode described in the operation mode is Please note that there is. |
| | Composer | M (Magnification × | × | (5.1 Restrictions on usage P.25) |
| | | | | (3) The processor is software with a tolerance of ± 1 pulse. Can be used as a limit. |
| 3. Manual pulse input | PCTR | | Command output | Same as Category 1 |
| | Control | M | ○ ○ | |
| | UP / DOWN | | Manual pulse | |
| | Composer | | | |
| 4. Palsmotor Step-out detection Encode input | PCTR | | Command output | Encoder input for pulse motor axis To R9 to count the current position |
| | Control | M | Step-out enco-da | It is possible. Therefore, the power of R9 Unto input (* 1) is alternative. |
| | UP / DOWN | M * 1 | | |
| | Composer | | | |

Table 6.3 System structure

**Page 53**

6.4 Next operation automatic start control

During operation, the next operation data is written to the pre-register, and after the operation is completed, the pre-register data is automatically used. It is a function to start.

(1) Effective when the control mode buffer b4 = '1'.

(2) If the data for the next operation is written during the operation, the next data will be displayed immediately after the data block is completed. You can move to the block. (The command pulse moves to the next start at that frequency interval.)

(3) If the current operation is stopped before the end of writing all the data for the next operation (remains in the pre-registration) Management of confirmed / unconfirmed state of next operation data to prevent the next operation from starting in the old data If the pre-register is not confirmed when the operation is completed, the automatic start will not be performed.

(4) Next operation Start or writing the pre-register confirmation cancel command will result in an unconfirmed state.

(5) The confirmed state is the state in which one of the following conditions is satisfied.
(1) The start command for the next operation has been written.
(2) The confirmed status command has been written (P.29).

(6) The following 10 types have pre-register and pre-buffer functions.
R0 (PR0), R1 (PR1), R2 (PR2), R3 (PR3), R4 (PR4), R5 (PR5), R15 (PR15), R16 (PR16), operation mode buffer, command buffer (Start command only)

(7) If the current operation is stopped due to an abnormal stop or command writing, the next operation will not be automatically continued. Therefore, the pre-register function cannot be used when the modes are continuous mode 1 and 2.
Abnormal stop or stop by command writing has the following contents.
(1) When stopped due to ELS detection other than the origin search mode
(2) Deceleration stop due to DLS detection other than origin search mode
③ Stop by turning on the SVALM signal
④ Stop due to step-out detection
⑤ Stop due to fulfillment of compare conditions
⑥ Simultaneous stop command (09h)
⑦ Immediate stop command (0Ah)
⑧ Emergency stop command (63h)

(8) The confirmed status of the next operation can be confirmed by reading Command Monitor 2 R14. (P.38)

(9) If the next operation data has the same contents as the setting currently in operation, it is necessary to write to the pre-register. I don't. However, it is necessary to write the start command for the next operation.

(10) If the environment register (R8) b14 = l'is set, interrupt output is performed at the start of the next operation, and the interrupt status is set. You can know by (14h). (P.17, P.23)

(11) Next operation In the automatic start, the command pulse interval is from the last pulse of the previous block to the next first pulse. The pulse interval is the interval according to the frequency of PR2.

Command pulse

Previous block FH Next block FH

6.5 Acceleration time and deceleration time are different and linear S-shaped acceleration / deceleration setting

■ When acceleration and deceleration are different

Automatic acceleration / deceleration is not possible. Therefore, set the control mode buffer b1 = 1 (manual acceleration / deceleration).

This is the same for straight line acceleration / deceleration, S-shaped acceleration / deceleration, and straight line S-shaped acceleration / deceleration.

(1) Set the acceleration rate in PR3 and set a value other than 0 in the deceleration rate register PR15.

(2) In the case of preset feed (feed in operation mode buffer preset modes 1 to 3 P.26)

The deceleration point is calculated and set in the deceleration point register (PR5).

■ Straight S-shaped acceleration / deceleration

The rising part of the linear acceleration / deceleration is the speed section at the beginning of the S-shape, and the part at the end of acceleration is the end of the S-shape.

Apply the speed section. The central part of acceleration is a straight line method. Control mode buffer

Set b2 = 1 (S-shaped acceleration / deceleration). Furthermore, set the S-shaped section speed to PR16 as follows.

PR16 = (maximum value of PR2-PR1) / 2 However, PR2 sets the maximum speed of use of the system.

6.5.1 Setting of acceleration rate register (PR3) and deceleration rate register (PR15)

| Wards | Inside Yong | remarks |
|---|---|---|
| | (1) Setting of linear acceleration / deceleration time | |
| Acceleration rate<br>Deceleration rate<br>Configuration | Acceleration time T, deceleration time T<br>$T_A = \frac{(PR2-PR1) \times (PR3 + 1) \times 4}{19,660,800}$ [S]<br>$T_D = \frac{(PR2-PR1) \times (PR15 + 1) \times 4}{19,660,800}$ [S]<br>FH (PR2 x Magnification) is the target speed (PPS) (P.45)<br>FL (PR1 x Magnification) is base speed (PPS)<br>The range of PR3 and PR15 is<br>1 ≤ PR3, PR15 ≤ 65535 | Control mode buffer<br>b2, b1 = 01<br>Preset feed<br>Deceleration point PR5<br>Requires settings |

(2) S-shaped acceleration / deceleration time (no linear acceleration / deceleration part)

| T, T setting | | Control mode buffer |
|---|---|---|
| $T_A = \frac{(PR2-R1) \times (PR3 + 1) \times 8}{19,660,800}$ | [S] | b2, b1 = 11<br>Preset feed |
| $T_D = \frac{(PR2-PR1) \times (PR15 + 1) \times 8}{19,660,800}$ | [S] | Deceleration point PR5<br>Requires settings |
| FH, FL, PR3, PR15 are the same as (1) | | (P.45) |

PR3, PR15 and acceleration A, deceleration A [PPS / SEC]

The relationship of is as follows.

However, A is an absolute value.

$$PR3 = \frac{(\text{Magnification}) \times 19,660,800}{4 \times A_A} - 1$$

$$PR15 = \frac{(\text{Magnification}) \times 19,660,800}{4 \times A_D} - 1$$

(Continued on the next page)

| Wards | Inside Yong | remarks |
|---|---|---|
| (3) Straight S-shaped acceleration / deceleration (with straight acceleration / deceleration part) | | |
| T, T setting<br>$T_A = \frac{(PR2-PR1+PR16\ 2)\times(PR3+1)\times 4}{19,660,800}$<br>$T_B = \frac{(PR2-PR1+PR16\ 2)\times(PR15+1)\times 4}{19,660,800}$<br>FH, FL, PR3, PR15 are the same as (1)<br>The range of S-shaped section speed is<br>1 ≦ PR16 ≦ 16383 | | Straight line S-shaped automatic acceleration / deceleration<br>(Same acceleration / deceleration)<br>[S] Control mode buffer<br>b2, b1 = 10<br>[S] and PR5 = 0, PR15 = 0<br>Straight S-shaped manual acceleration / deceleration<br>(Acceleration / deceleration time<br>Is different)<br>Control mode buffer<br>b2, b1 = 11<br>Preset feed<br>Deceleration point PR5 needs to be set |

Table 6.4

6.5.2 Deceleration point setting (PR5)

This section describes how to set the deceleration point manually.

(1) PR5 sets the deceleration start point when performing high-speed preset feed.

(2) For manual acceleration / deceleration, set bit 1 of the control mode buffer (P.24).

(3) For manual acceleration / deceleration, follow the procedure below to obtain the PR5 set value. In addition, the triangular drive also has a deceleration point.
Calculated and set to PR5.

| Wards | Inside Yong | remarks |
|---|---|---|
| Deceleration point setting<br>Linear acceleration / deceleration<br>in the case of | (1) Confirmation of trapezoidal drive<br>When the amount of movement is small, it becomes a triangular drive.<br>increase. Determined by the following formula.<br>Trapezoidal drive minimum number of pulses $\frac{(PR2-PR1)\times(PR3+PR15+2)}{(PR4+1)\times 32768}$<br>(2) Change of PR2 set value<br>When (PR0) ≤ (minimum number of trapezoidal drive pulses)<br>It will be a triangular drive. For trapezoidal drive,<br>Change PR2 to the calculated value below.<br>New PR2 ≦ $\frac{PR0\times(PR4+1)\times 32768}{PR3+PR15+2}+PR1$<br>(3) PR5 (slow down point) setting<br>When driven by a trapezoid<br>$PR5 = \frac{(PR2-PR1)\times(PR15+1)}{(PR4+1)\times 32768}$<br>At the time of triangular drive<br>$PR5 = \frac{PR0\times(PR15+1)}{PR3+PR15+2}$ | PR5, R5<br>Numerical range<br>1-16,777,215<br>(24 bit length) |

(Continued on the next page)

Wards Inside Yong remarks

(1) Confirmation of trapezoidal drive

Deceleration point setting When the amount of movement is small, it becomes a triangular drive.

increase. Determined by the following formula.

In the case of S-shaped acceleration / deceleration $\frac{(PR2^2 - PR1) \times (PR3 + PR15 + 2)}{(PR4 + 1) \times 16384}$

Trapezoidal drive minimum number

(2) Change of PR2 set value

When (PR0) ≤ (minimum number of trapezoidal drive pulses)

It will be a triangular drive. For trapezoidal drive,

Change PR2 to the calculated value below.

$$\text{New PR2} \leqq \frac{PR0 \times (PR4 + 1) \times 16384}{PR3 + PR15 + 2} + PR1^2$$

(3) PR5 (deceleration point) setting

$$PR5 = \frac{(PR2^2 - PR1) \times (PR15 + 1)}{(PR4 + 1) \times 16384}$$

(1) Confirmation of trapezoidal drive

Deceleration point setting When the amount of movement is small, the drive is triangular.

Determined by the following formula.

Straight S-shaped acceleration / deceleration in the case of $\frac{(PR1 + PR2) \{(PR16 \times 4) + (PR2 - PR1 - PR16 \times 2)\} (PR3 + PR15 + 2)}{(PR4 + 1) \times 32768} \times \times$

Trapezoidal drive minimum number

(2) Confirmation of the presence or absence of a linear acceleration / deceleration part

When (PR0) ≤ (minimum number of trapezoidal drive pulses), linear adjustment is performed by the following equation.

Check for the presence of the speed part.

There is a straight part and the lowest $\frac{(PR1 + PR16) PR16 (PR3 + PR15 + 2)}{(PR4 + 1) \times 4096}$

(3) Change of PR2 set value

(Minimum number of pulses with straight line part) <(PR0) ≤ (Minimum number of trapezoidal drive pulses)

At this time, change PR2 so that it does not become triangular drive.

$$\text{New PR2} \leq -PR16 + PR1 + PR16 \times 2\ PR0\ PR16 + \times \times \frac{PR0 \times (PR4 + 1) \times 32768}{PR3 + PR15 + 2} \times$$

When (PR0) ≤ (minimum number of pulses with straight line portion), PR16 = 0

Then, process in S-shaped acceleration / deceleration mode without straight line part.

(2) PR5 (deceleration point) setting

$$PR5 = \frac{(PR1 + PR2) \{(PR16 \times 4) + (PR2 - PR1 - PR16 \times 2)\} (PR15 + 1)}{(PR4 + 1) \times 32768} \times \times$$

Table 6.5



7. Hardwear edition

7.1 Connection of command pulse output circuit and driver

The output circuit conditions are shown in Table 7.1.

| Term | Term eye | Inside | Yong |
|---|---|---|---|
| | Den | | |
| 1 | air Output driver | Differential driver (26LS31) | |
| | Target pulse width | Approximately 50% duty width of command pulse frequency | |
| | Article | However, when it is 2.4Kpps or less, the width is 208μs. 0.2 μs width at a magnification of 150 | |
| | subject | | |
| | | xCWP terminal 0V | |
| | Individual pulse output method | xCWN terminal · · · 0V | |
| | Shin (Set in environment setting register 1) | xCCWP terminal | 0V |
| | issue | xCCWN terminal | · · · 0V |
| 2 | shape | | |
| | formula | Pulse column output x CWP terminal | 0V |
| | Direction and pulse train method | xCWN terminal | · · · 0V |
| | (Direction output logic is | | |
| | Set in environment register 1) | Directional output xCCWP terminal CW | · · · · · · · · · · · · 0V |
| | | xCCWN terminal | 0V |
| | Differential receiver driver- | PPD516A xCWP xCWN | driver- |
| | Connection with | | |
| | Cable length = within 10m | xCCWP xCCWN | |
| | Mo | | |
| | rice paddy | PPD516A + 5V | |
| 3 | Do Driver for Kapla- | xCWP xCWN | |
| | a Connection with | GND | driver- |
| | stomach (note) | xCCWP xCCWN | |
| | Ba | GND | |
| | When The driver side | | |
| | of Guaranteed differential reception | P PD 5 1 6 A xCWP xCWN | driver- |
| | Contact If you are | (Display only on one side) | |
| | Continued Cable length = within 10m | | |
| | (1Mpps) | | |
| | TTL receiver driver | P PD5 1 6 A | |
| | Connection with | | driver- |
| | (note) | (Display only on one side) | |

Table 7.1 Command pulse output conditions

(Note) When the motor driver is other than the differential input, pay attention to the speed and cable length.
500Kpps (cable length 3m) for coupler receiver, 250Kpps (1m) for TTL receiver
Please use the degree as a guide.
Please also check the specifications of the motor driver receiving circuit before use.



**Page 58**

7.2 Connection with axis sensor and server interface input circuit
The input circuit conditions are shown in Table 7.2.

| Term | Term eye | Inside | Yong |
|---|---|---|---|
| | times | | |
| 1 | Road ±xELS, xDLS, xOLS | | |

shape common
formula Input terminal : 5mA ≤ Is ≤ 10mA
1 EXTPOW terminal 1: External power supply standard 24V input terminal
When using + 12V
Add a resistance module on the user side.
(4 elements, 8 pins)

When + 12V is supplied RM30,32,34,36,38,40 3.9KΩ

times
2 Road Common to xINPOS and xSVALM
shape
formula Input terminal : 5mA ≤ Is ≤ 10mA
2 EXTPOW terminal 2: External power supply standard 24V input terminal
When using + 12V
Add a resistance module on the user side.
(4 elements, 8 pins)

When + 12V is supplied RM24,26,28 3.9KΩ

very
3 sex Polarity setting is soft Port '1' at the time of A contact input
Setting ▲ according to
Samadhi (P.17)

Photo sensor input
Outside
Department
When
4 of
Contact
Continued Limit switch
input

Table 7.2 Axis sensor and server interface input conditions





7.3 Connection with encoder Z-phase input circuit

The input circuit conditions are shown in Table 7.3.

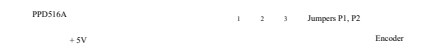
Term Term eye Inside Yong

Encoder Z phase input
Circuit type




1

Workman Differential connection



Hmm
unit

Da

2

When Open collector connection
(Use internal + 5V
Contact If you do)
Continued (+ 5V supply from outside)
Time is a jumper
Please open it. )

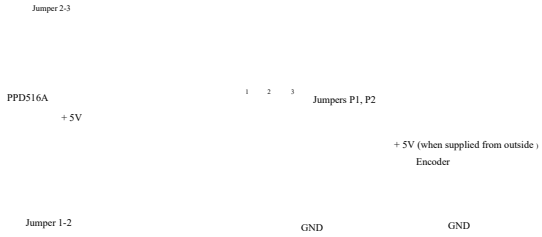



Table 7.3 Encoder input circuit conditions

7.4 Connected to the server interface output circuit

The output circuit conditions are shown in Table 7.4.

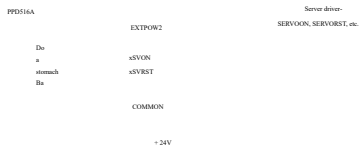
| Term | Term eye | Inside | Yong |
|---|---|---|---|
| 1 | Driver circuit type<br>xSVON<br>xSVRST | EXTPOW2 + 24V standard (can be used up to + 12V)<br>Load current 80mA MAX. (0.6V / 80mA when ON) | |
| 2 | Output logic level<br>(( Polarity cannot be changed ) | When the port output is '1', xSVON and xSVRST are ON. | |
| 3 | External connection |  | |



Table 7.4 Server face output conditions

Note) When using the servo interface circuit at 5V, it is available as an option.
Please contact our sales department.



**Page 60**

8. specification

- Control axis 1 to 6 axis linear positioning (PPD516A)
- Control LSI PCL5014 (Made by Pa usmo Japan Japan)
- Movement amount 268,435,445 pulses
  Or -134,217,728 to +134,217,727 pulses
- Feed speed

| | | | | |
|---|---|---|---|---|
| 0 1x mode | 0 1.pps | ~ | 3 27.66Kpps | |
| 1x mode | 1 pps | ~ | 32 766.Kpps | |
| 10 times mode | 10 pps | ~ 327 66 | .. | Kpps |
| 20 times mode | 20 pps | ~ 655 30 | .. | Kpps |
| 150 times mode 150 | pps | ~ 4914 90 | .. | Kpps |

  However, in the case of combined use with an encoder input, 1000 Kpps MAX.

- Acceleration / deceleration distance setting range 0 to 16,777,215 pulses ,,

● Acceleration / deceleration time setting range 6.7ms-436s (straight line) 13.3ms-872s (S-shaped)

● Command pulse output format CW, CCW or DIRECTION and POUT output (differential signal output)

● Next block automatic execution function After the end of the current block, the next block is automatically executed

● Soft limit function 2 sets of 28-bit compressors available

● Machine lock function Command pulse output can be prohibited

● Idling pulse output function 1 to 6 pulses can be output at startup
(For pulse motor, improved step-out performance at start)

● Operation command Immediate stop, deceleration stop, high-speed preset operation (with acceleration / deceleration) (G00 fast-forward positioning), Constant speed preset (G01 constant speed positioning), high speed continuous feed (RAPID), constant speed continuous feed (JOG), speed change, manual pulse feed, deceleration sensor stop feed, soft origin
6 types of return / machine origin return, simultaneous start / stop (possible between boards), dwell

● Axis sensor signal input (per axis) (photocoupler insulation)

| | | | |
|---|---|---|---|
| Stroke end input ± ELS | | Sensor origin input | OLS |
| Origin deceleration sensor input | DLS | Encoder origin input Z phase | |

● Origin return method
Sensor origin return (DLS + OLS)
Encoder origin return (with Z phase offset) (DLS + OLS + Z phase)
Encoder origin return (with Z phase offset) (OLS + Z phase)
Soft origin return (Current position counter origin)
Origin extraction function, origin search function

● Server interface signal (per axis) (photocoupler insulation)

| | |
|---|---|
| Input server arm | (SVALM) |
| Positioning completed | (INPOS) |
| Output server ON | (SVON) (General-purpose output can be used) |
| Turbo reset | (SVRST) ( 〃 ) |

● Encoder input Z phase

● Supply power source + 5V ± 5%, 950mA (MAX)

● Dynamic temperature 0-50 ° C

● Dynamic humidity 20-85% (however, no condensation)

● Bare board size
Horizontal dimension 211 mm Vertical dimension 107 mm

**Artisan Technology Group** is an independent supplier of quality pre-owned equipment

## Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

## We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

## Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP