PCL6115 Starter Kit

PCL6115-EV

User's Manual

Application Software

File (F)	Tool (T) Othe	er (O)					
			Х-	axis			
MSTSW	0000 h	SSTSW	0000 h	RENV1	00000002 h	RIRQ	00000000 h
DM0 (0004		0004	RENV2	80001D40 h	RLTC1	0
RMV	2304	PRMV	2304	RENV3	00000000 h	RLTC2	0
RFL	400	PRFL	400	RENV4	00000000 h	RLTC3	0
RFH	1500	PRFH	1500	RCUN1	0	RLTC4	0
RUR	1227	PRUR	1227	RCUN2	0	RSTS	0000BD00 h
RDR	0	PRDR	0	RCMP1	0	REST	00000000 h
RMG	1199	PRMG	1199	RCMP2	0	RIST	00000000 h
RDP	0	PRDP	0	RCMP3		RPLS	0
RMD	00000041 h	PRMD	00000041 h	RCMP4		RSPD	0
RIP	0	PRIP	0	1001014		RSDC	0
RUS	0	PRUS	0			1000	
RDS	0	PRDS	0				
Command	Data						



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1. Introduction

Thank you for considering our PCL6115-EV Starter Kit Application software.

This manual describes specifications, functions of our PCL6115-EV Starter Kit Application software and how to connect and use it. In order to use this product safely, please read this manual thoroughly and keep it.

1.1 How to use this manual

- 1. Reproduction of this manual in whole or in part without permission is prohibited by the Copyright Act.
- 2. The contents of this manual are subject to change without the prior notice along with the improvement of performance and quality.
- 3. Although this manual is produced with the utmost care, please contact our sales representative if there are any questions, errors or omissions.

1.1.1 Symbol description

1.1.1.1 Physical damage level

In this manual, the physical damage level is defined as follows.

Serious injury

Those that might cause aftereffects such as loss of sight, wound, burn, electric shock, fracture, poisoning, or those requiring hospitalization or long-term outpatient treatment.

Minor injury

Those not requiring hospitalization or long-term outpatient treatment. (Other than "serious injury" above)

1.1.1.2 Hazardous level

The product is designed with the top priority for the safety of operators. However, due to the nature of the product, there are risks that cannot be eliminated. In this manual, the seriousness and level of these risks are divided into three categories: "Danger," "Warning," and "Caution." Be sure to read and understand the symbols descriptions thoroughly before operating or performing maintenance work on the product.

"Danger", "Warning", and "Caution" are indicated in the order of severity of hazard: (danger > warning > caution), and the meanings are described underneath.

🥼 Danger

"Danger" indicates that it might cause an imminent risk that could result in the death or serious injury of the operator during operations of this product.

🚺 Warning

"Warning" indicates that it may result in the death or serious injury of the operator during operations of this product.



"Caution" indicates that it may result in minor injury of the operator during operations of this product.

Caution

"Caution" without warning symbol indicates that the operator is not likely to be injured, but it can cause damage or result in a malfunction to this product, your equipment, or your instruments.

In addition to the hazardous level classifications described above, the following notations are also used.

l m p o r t a n c e

"Importance" indicates the information and contents that must be known particularly in operations and maintenance works of this product.

Remarks

"Remarks" initiates the useful information or contents for operations and maintenance works of this product.

1.1.1.3 Warning symbol

In this manual, the following symbols are added along with the notations "Danger," "Warning," "Caution," and "Importance" to indicate the warning contents in an easy-to-understand manner.



This symbol indicates that a high voltage may be applied. Failure to confirm safety or mishandling of this product might cause a risk of electric shock, burn, or death.



This symbol indicates that some parts have a high surface temperature, and the mishandling can cause a risk of burns.



This symbol indicates that mishandling may cause a fire.



This symbol indicates "prohibited" actions that must not be performed in the operation and the maintenance work of this product.



This symbol indicates "mandatory" actions that must be performed in the operation and the maintenance work of this product.

1.2 Production warranty

This content is the warranty of the product purchased from Nippon Pulse Motor.

When the product is purchased from a supplier other than NPM, please contact that supplier regarding the product's warranty.

1.2.1 Warranty period

The warranty period is one year from the data of the delivery to an assigned place.

1.2.2 Warranty scope

If any defect is found in a product during the warranty period under the normal use following this document, NPM will repair or replace the product without charge.

However, the following cases are not covered by the warranty even during the warranty period.

- 1) Products modified or repaired by anyone other than NPM or a person authorized by NPM.
- 2) Defects that result from dropping after the delivery or mishandling in transit.
- 3) Natural deterioration, wearing, and fatigue of components.
- 4) Defects result from any usage other than the original described in this manual.
- 5) Defects result from natural disaster or force majeure such as fires, earthquakes, lightning strikes, winds, floods, salts or electrical surges.
- 6) Defects or damages result from a cause that is not the fault of NPM.

Free repairs will only be conducted at NPM locations; no repairs will be made by business trips.

Warranty period of repaired product is the same as the warranty period before repair.

This warranty covers the product itself. The detriments or damages induced by the product failure etc. will not be covered by the warranty.

1.3 Notice

This document aims to describe the details of functions of the product. It does not warrant fitness for a particular purpose of the customer. Also, the examples of applications and circuit diagrams in this manual are included only for your reference. Please confirm the features and the safety of device or equipment before use.

1.4 Confirmation

Please do not use this product in the following conditions. If you need to use in the following conditions, please contact our sales representatives:

- 1. Any equipment that may require a high reliability or a safety, such as nuclear facilities, electricity or gas supply systems, transportation facilities, vehicles, various safety systems, medical equipment, etc.
- 2. Any equipment that may directly affect human survival or property.
- 3. Usages under conditions or circumstances that are not specified in the catalog, manual, etc.

For applications that may cause serious damages to a human life or property due to failure of this product, ensure high reliability and safety by redundant design.



(x: revision)

2. Introduction

This manual is the operation manual of the application software that operates a control board. By using this software and PCL6115-EV Starter Kit, you can learn motor control functions with pulse control LSI PCL6115.

Please refer to the following manuals along with this manual.

				(x: revision)
	Manual Name [Outline]	Document File name	Software File name	Document No.
	PCL6115 Starter Kit	PCL6115-EV	-	
	User's Manual	_Hardware Manual		TA600021-ENx/x
Hardware	(Hardware)	_VerxE.pdf		
Manual	PCL6115 Starter Kit	PCL6115-EV	-	
	User's Manual	_Simple Manual		TA600020-ENx/x
	(Simple Manual)	_VerxJE.pdf		
	PCL6115 Starter Kit	PCL6115-EV	PCL6115-EV	
	User's Manual	_Application Manual	_Application	
	(Application Software)	_VerxE.pdf	_VxxxJE.zip	TA600018-ENx/x
	[Setting			(This document)
	acceleration/deceleration			
	pattern and register display]			
Application	PCL6115 Starter Kit	PCL6115-EV	PCL6115-EV	
Software	User's Manual	_Application Language	_Application	TA COOOD7 EN. /.
Manual	(Language File Creation Rule)	File Manual_VerxE.pdf	Language File	TA600007-ENx/x
Wallaa	[Multi-language]		_VxxxE.zip	
	PCL6115 Starter Kit	PCL6115-EV	PCL6115-EV	
	User's Manual	_Application Sample	_Application Sample	
	(Sample program)	Manual_VerxE.pdf	_VxxxE.zip	TA600022-ENx/x
	[Check and add motion			IAUUUUZZ-EINX/X
	pattern on development			
	environment]			



				(x: revision)
	Manual Name [Outline]	Document File name	Software File name	Document No.
	PCL6115 Starter Kit User's Manual (Motion Pattern Builder Application Software) [To describe function to perform axis control visually with a flowchart]	PCL6115-EV _Motion Builder Manual_VerxE.pdf	PCL6115-EV _Motion Builder _VxxxJE.zip	TA600023-ENx/x
Motion Pattern Builder Manual	PCL6115 Starter Kit User's Manual (Motion Pattern Builder Language File Creation Rule) [Motion Pattern Builder in Multi-language]	PCL6115-EV _Motion Builder Language File Manual _VerxE.pdf	PCL6115-EV _Motion Builder Language File _VxxxE.zip	TA600008-ENx/x
	PCL6115 Starter Kit User's Manual (Motion Pattern Builder Sample Project) [Check and add motion pattern created by Motion Pattern Builder on development environment]	PCL6115-EV _Motion Builder Sample Manual_VerxE.pdf	PCL6115-EV _Motion Builder Sample_VxxxE.zip	TA600024-ENx/x
Reference	PCL6115/6125/6145 User's Manual		-	DA70152-0/xE

Please download application software and related materials from our NPM website.

2.1 Operating environment

We checked this software operation on Windows 7 and Windows10 (both 32-bit and 64-bit).

(We do not check it on OS other than the above.)

Please change power saving setting so as not to operate sleep mode during operation.



3. Install the device driver

3.1 Folder structure

When unzipping the compressed file (PCL6115-EV_Application_V370JE.zip), the following folders are generated.



"PCL6115EV.exe" is an executable file of the software and "CDM21226_Setup.exe" is a device driver installer.

"PCL6115.ini", "menu_text2.ini" is a text file for PCL6115EV.

"PCL6115EV_Data100" is the setting data file for PCL6115EV.

"menu_text2_EV_***.lng" is a multilingual text file for PCL6115EV.

This file is not included at the time of decompressing the compressed file.

As an example, unzip the compressed file (PCL6115-EV_ApplicationLanguageFile_V370JE.zip) and place Chinese (traditional) and German in this folder and check it.

If you need multiple languages, create a multilingual text file and put it in this folder.

3.2 Install

Double-click "CDM21226_Setup.exe" to launch the installer and follow the instructions on the screen to complete the installation.

If you have already installed it, you do not need to install it again.

	FTDI CDM Drivers
2	
~~~	Click 'Extract' to unpack version 2.12.26 of FTDI's Windows driver package and launch the installer.
I C	
	www.ftdichip.com
	< Back Extract Cancel

Note: There is the latest version of the device driver on FTDI's website (http://www.ftdichip.com/Drivers/D2XX.htm). If the version you have is not the latest one, download from the above website.



# 4. Basic operation method of software

# 4.1 Startup software

Please make sure that PCL6115-EV is connected to a PC.



Double-click on the executable file "PCL6115EV.exe". The following main screen appears.

ile (F)	Tool (T) Oth	er (O)					
			<b>X</b> -	axis			
MSTSW	0000 h	SSTSW	00F8 h	RENV1	00000000 h	RIRQ	00000000 h
DM0 (		DDM(	0	RENV2	80000000 h	RLTC1	0
RMV	0	PRMV	0	RENV3	00000000 h	RLTC2	0
RFL	0	PRFL	0	RENV4	00000000 h	RLTC3	0
RFH	0	PRFH	0	RCUN1	0	RLTC4	0
RUR	0	PRUR	0	RCUN2	0	RSTS	0000B900 h
RDR	0	PRDR	0	RCMP1	0	REST	00000000 h
RMG	0	PRMG	0	RCMP2		RIST	00000000 h
RDP	0	PRDP	0	RCMP3		RPLS	0
RMD	00000000 h	PRMD	00000000 h	RCMP4		RSPD	
RIP	0	PRIP	0	100001 4	· · ·	RSDC	
RUS	0	PRUS	0			1000	
RDS	0	PRDS	0				

This screen shows contents that are read regularly from the registers of the PCL6115.

If a value is zero, it is displayed in black letters, and values other than zero are displayed in red letters. PCL6115 can control one axis and all registers that can be set are displayed.



If the PCL6115-EV is not connected or there is a hardware problem, the following figure will be displayed.



If communication between the PCL6115-EV and the PC is lost, the following screen will be displayed.

Error	×
Connection with [PCL6115-StarterKit] is lost	
ОК	

#### 4.1.1 Changing radix of register

You can switch notation between decimal and hexadecimal by right-clicking on columns where a register value is displayed. Radix can be changed individually for each register.

However, registers having meaning in bit units (such as RENV1) are fixed to hexadecimal and cannot be switched.

#### 4.1.2 Writing data to register

By double clicking on a column where a value of a register is displayed, the data column is highlighted in yellow as follows and the cursor moves to the column for inputting data (Data). In the column "Command", a register write command is set.

PCL6115 S	itarter Kit			
File (F)	Tool (T) Othe	er (O)		
			X-a	axi
MSTSW	0000 h	SSTSW	0000 h	Ę
RMV	00000000 h	PRMV	00000000 h	L
RFL	0000 h	PRFL	0000 h	
RFH	0000 h	PRFH	0000 h	Ļ
RUR	0000 h	PRUR	0000 h	Ļ

Command Data	

Enter a data you want to write to the column "Data" and click the "Write" button. Radix of the data to be written is the same as the setting in "4.1.1 Changing radix of register". Read-only registers cannot be written.

### 4.1.3 Detailed setting of register data

Registers (such as RENV1) having meanings in bit unit can be set in detail.

If you select a column of such register, the "Detail setting" button is enabled.

By clicking the "Detail setting" button, the detailed setting screen is displayed. Please refer to the sections from "4.3.6 PRMD (operation mode) menu" to "4.3.12 PRMG (speed magnification rate) menu".



File (F)	Tool (T) Othe	er (O)					
			Х-	axis			
MSTSW	0000 h	SSTSW	0000 h	RENV1	00000002 h	RIRQ	00000000 h
<b>D</b> 107		DDM (	0004	RENV2	80001D40 h	RLTC1	0
RMV	2304	PRMV	2304	RENV3	00000000 h	RLTC2	0
RFL	400	PRFL	400	RENV4	00000000 h	RLTC3	0
RFH	1500	PRFH	1500	RCUN1	0	RLTC4	0
RUR	1227	PRUR	1227	RCUN2	0	RSTS	0000BD00 h
RDR	0	PRDR	0	RCMP1		REST	00000000 h
RMG	1199	PRMG	1199	RCMP2		RIST	00000000 h
RDP	0	PRDP	0	RCMP3		RPLS	0
RMD	00000041 h	PRMD	00000041 h	RCMP4		RSPD	0
RIP	0	PRIP	0	1000014		RSDC	0
RUS	0	PRUS	0				
RDS	0	PRDS	0				

Right-click on each register name to display the register contents. After confirming the contents, press the "OK" button or press the close mark on the upper right to clear the display screen.

File (F)	Tool (T) Othe	er (O)					
			X−a	axis			
MSTSW	0000 h	SSTSW 0	000 h	RENV1	00000002 h	RIRQ	00000000 h
RMV	2304		2304	RENV2	80001D40 h	RLTC1	0
RFL	400	PRFL	400	RENV3	00000000 h	RLTC2	0
RFH	1500	PRFH	Pre-regist	er contents		× TC3	0
RUR	1227	PRUR				STS	0000BD00 h
RDR	0	PRDR				EST	00008000 h
RMG	1199	PRMG	PRMV:			UST	00000000 h
RDP	0	PRDP	Feeding amount(Target position)Setting Read/Write			(PLS	00000007
RMD	00000041 h	PRMD 000				SPD	0
RIP	0	PRIP				SDC	0
RUS	0	PRUS			ОК		
RDS	0	PRDS					

#### 4.1.4 Write command

Please write PCL6115 operation command, general-purpose output bit control command, and control command in the column "Command" directly.

RMD	00000041 h		PRMD	00000041 h	RCMP4
RIP	00000000 h		PRIP	00000000 h	
RUS	0000 h		PRUS	0000 h	
RDS	0000 h		PRDS	0000 h	
Command	Data				
53  h	4AF	h		Write	

Do not use a register readout command.

Click the cursor on "Command" to display the command contents. After confirming the contents, press the "OK" button or press the close mark on the upper right to clear the display screen.

In addition, please refer to the PCL6115/6125/6145 User's Manual, because not all commands are displayed.

If the end limit signal and alarm signal are ON when you enter the start command and click the "Write" button, the device will not operate and will display an error message. Turn off the end limit signal and alarm signal and click again.

Command contents	×	
Command: 50h: (STAFL)FL constant speed srart 51h: (STAFH)FH constant speed srar 52h: (STAD)High-speed start 1 53h: (STAUD)High-speed start 2		
49h: (STOP)Stops an axis immediately 4Ah: (SDSTP)Decelerater and stops		Error
10h-17h: (PORST-P7RST)P0-P7 terminal L-leve 18h-1Fh: (POSET-P7SET)P0-P7 terminal H-leve 20h: (CUN1R)Clear Counter 1 21h: (CUN2R)Clear Counter 2		Axis Error Check the status and extended status information!
OK		ОК

### 4.2 File menu

Click "File" to display the file menu.





### 4.2.1 Load menu

Register status saved by "Save" menu (refer to "4.2.2 Save menu") can be written to PCL6115".

organize 🔻 New folder			:::::::::::::::::::::::::::::::::::::::	- 🔟 🕐
🕌 Local Disk (C:)	Name *	Date modified	Туре	Size
PCL6115-EV Circuit_diagram	\rm Driver	3/19/2018 1:25 PM	File folder	
Excel	FTD2XX_NET.dll	6/23/2016 3:44 PM	Application extension	69 K
NPM_PCL6115EV_20	🗿 menu_text.ini	11/9/2017 11:37 AM	Configuration settings	25 K
PCL6115EV	PCL6115.ini	3/14/2018 11:15 AM	Configuration settings	1 K
Driver	FILS PCL6115EV.exe	3/14/2018 10:05 AM	Application	2,767 1
PCL6115EV_Sample PDF	PCL6115EV_Data001	6/16/2017 10:15 AM	File	1 K
Word				
PerfLogs				
🍌 Program Files				
Program Files (x86)				
Program Files (x86) Users				
<ul> <li>Program Files (x86)</li> <li>Users</li> <li>Windows</li> </ul>				
Program Files (x86)				
Program Files (x86) Users Windows WORK (6-4E) Ca Local Disk (D:)				
Program Files (x86)	<u>.</u>			

Please select a saved file name and click the "Open" button.

"PCL6115EV_Data100" is the setting data file for PCL6115EV.

Registers you can write data are as follows.

PRMV, PRFL, PRFH, PRUR, PRDR, PRMG, PRDP, PRMD, PRIP, PRUS, PRDS, RENV1, RENV2, RENV3, RENV4, RCUN1, RCUN2, RCMP1, RCMP2, RCMP3, RCMP4, RIRQ

#### 4.2.2 Save menu

You can save values (including status values) of registers displayed on the main screen in a text file.

rganize 🔻 New folder					2
🚢 Local Disk (C:) 🔺 N	ame *	Date modified	Туре	Size	1
NPM_PCL6115      PCL6115EV	Driver           FTD2XX_NET.dll           menu_text.ini           PCL6115.ini           PCL6115EV.exe           PCL6115EV_Data001	3/19/2018 1:25 PM 6/23/2016 3:44 PM 11/9/2017 11:37 AM 3/14/2018 11:15 AM 3/14/2018 10:05 AM 6/16/2017 10:15 AM	Application	69 KB 25 KB 1 KB 2,767 KB 1 KB	
Users Windows WORK (64E)	'_Data002				

Please write a file name and click the "Save" button.

#### 4.2.3 End menu

Quit the application software.

### 4.3 Tool menu

Click "Tool" to display the Tool menu.

PCL6115 S	tarter Kit
File (F)	Tool (T) Other (O)
	Status (A)
	RSTS (Extension status) (B)
MSTSW	REST (Error interrupt factor) (C)
RMV	RIST (Event interrupt factor) (D)
RFL	RSPD (EZ count value and current speed) (E)
RFH RUR	PRMD (Operation mode setting) (F)
RDR	RENV1 (Environment setting 1) (G)
RMG	RENV2 (Environment setting 2) (H)
RDP	RENV3 (Environment setting 3) (I)
RMD	RENV4 (Environment setting 4) (J)
RUS	RIRQ (Event interrupt factor setting) (K)
RDS	PRMG (Speed magnification rate setting) (L)
	Simple control (M)
Comman 9E h	Initialization (N)

#### 4.3.1 Status menu

By clicking this menu, the following screen appears. You can check detailed status of each status and sub-status bit.

Main stat	tus ()	0 = 0000 h
	X	
SSCM		Operating
SRUN		Pulse output starts
SENI		Stop interrupt occurred
SEND		Stopping
SERR		Error interrupt occurred
SINT		Event interrupt occurred
SSC	0	Sequence number
SCP1		Comparator1 condition is met
SCP2		Comparator2 condition is met
SCP3		Comparator3 condition is met
SCP4		Comparator4 condition is met
SEOR		Target position override failed
SPRF		Pre-register is full
		- 0000 h
Sub statu	x	-
IOP		General-purpose port
IOP SFU	x	General-purpose port Accelerating
IOP SFU SFD	x	General-purpose port Accelerating Decelerating
IOP SFU SFD SFC	x	General-purpose port Accelerating Decelerating In constant speed operation
IOP SFU SFD SFC SALM	x	General-purpose port Accelerating Decelerating In constant speed operation ALM input signal ON
IOP SFU SFD SFC SALM SPEL	x	General-purpose port Accelerating Decelerating In constant speed operation
IOP SFU SFD SFC SALM SPEL SMEL	x	General-purpose port Accelerating Decelerating In constant speed operation ALM input signal ON
IOP SFU SFD SFC SALM SPEL	x	General-purpose port Accelerating Decelerating In constant speed operation ALM input signal ON PEL input signal ON

Bit items that are set to "1" in registers are displayed in blue. Close the "Status" menu screen by pressing the "Close" button.



### 4.3.2 RSTS (extension status) menu

When you click on this menu, the following screen appears, and you can check the details of each bit of RSTS register.

RSTS (Ext	ensio	n status)
RSTS ()	×) = X	0000BD00 h
CND	0	Stopping
SCD	1	State of CSD input signal
SSTA		State of CSTA input signal
SSTP		State of CSTP input signal
SEMG		State of CEMG input signal
SPCS		State of PCS input signal
SERC		State of ERC output signal
SEZ		State of EZ input signal
SDRP		State of PDR(PA) input signal
SDRM		State of MDR(PB) input signal
SLTC		State of LTC input signal
SDIN		State of SD input signal
SINP		State of INP input signal
SDIR		Operation direction (OFF: + direction, ON: - direction)
SL3E		Monitoring state of trigger signal for RLTC3 register latch
SL3C		State of latch with RLTC3 register
SL3F		State of toggle change when RLTC3 register value is changed
SL4E		Monitoring state of trigger signal for RLTC4 register latch
SL4C		State of latch with RLTC4 register
SL4F		State of toggle change when RLTC4 register value is changed
		Close

Bit items that are set to "1" in RSTS register are displayed in blue. Close "RSTS (Extension status)" menu screen by pressing the "Close" button.

### 4.3.3 REST (error interrupt factor) menu

By clicking on this menu, the following screen appears. You can check details of each bit of REST register.

REST (X) =	00000000 h
х	
ESPL	Stopped by PEL input signal ON
ESML	Stopped by MEL input signal ON
ESAL	Stopped by ALM input signal ON
ESSP	Stopped by CSTP input signal ON
ESEM	Stopped by CEMG input signal ON
ESSD	Stopped by SD input signal ON
ESPO	Stopped due to PA/PB buffer overflow
ESEE	EA/EB input error occurred (Does not stop)
ESPE	PA/PB input error occurred (Does not stop)
ESPS	Stopped by (+) software limit
ESMS	Stopped by (-) software limit

Bit items that are set to "1" in REST register are displayed in red.

Close "REST (Error interrupt factor)" menu screen by pressing the "Close" button.

Since PCL6115-EV is serial bus I / F, write from the main screen and clear the bit which is "1".

### 4.3.4 RIST (event interrupt factor) menu

By clicking on this menu, the following screen appears. You can check details of each bit of RIST register.

RIST (Eve	nt interrupt factor) ×
RIST ()	0 = 00000000 h
	х
ISEN	Stopped normally
ISNM	Writing to pre-register is enabled
ISUS	Acceleration starts
ISUE	Acceleration ends
ISDS	Deceleration starts
ISDE	Deceleration ends
ISC1	Comparator1 condition is met
ISC2	Comparator2 condition is met
ISLT	Latching the count value by LTC input signal
ISOL	ORG input signal ON
ISSD	SD input signal ON
ISPD	Input of PDR(PA) signal is changed
ISMD	Input of MDR(PB) signal is changed
ISSA	CSTA input signal ON
ISPS	(+) software limit is detected
ISMS	(-) software limit is detected
ISEZ	Stopped during deceleration with "RENV2.ORM = 1"
ISBY	Started
ISL3	Count value is latched in RLTC3 register
ISL4	Count value is latched in RLTC4 register
	Close

Bit items that are set to "1" in RIST register are displayed in red.

Close "RIST (Event interrupt factor)" menu screen by pressing the "Close" button.

Since PCL6115-EV is serial bus I / F, write from the main screen and clear the bit which is "1".

### 4.3.5 RSPD (EZ counter value and current speed) menu

By clicking on this menu, the following screen will show. You can check details of each bit of RSPD register.

RSPD	RSPD (EZ count value and current speed) ×			
RSPE	$0 (\times) = 00000000 h$			
		х		
	Current speed	0	d	
	EZ count value	0	d	
	Clos	е		

Close "RSPD (EZ counter value and current speed)" menu screen by pressing the "Close" button.

### 4.3.6 PRMD (operation mode) menu

By clicking on this menu, the following screen appears, detailed for each bit of PRMD register can be set and the set data can be written.

BBMB	-
	00000041h
MOD6-0	Selection of operating mode Positioning operation (Sets the target incremental position)
MSDE	Decelerates (deceleration stop) by SD input ON
MINP	Operation completed by INP input ON
MSMD	Selects acceleration/deceleration operation
	Linear acceleration/deceleration 🗸 🗸
MCCE	Stop counting of COUNTER1 and COUNTER2 by output pulses
METM	Selects the operation complete timing
	Cycle completion 🗸
MSDP	Select the slow-down point
	Automatic setting 🗸 🗸
MPCS	Starts control the number of pulses after PCS input ON
MSN1-0	Sequence number of the operation (No effect on operation)
	0
MSY1-0	Select the start command function
	Start immediately 🗸
	Specify the axis to confirm stops
	🗌 X axis 📄 Y axis 📄 Z axis 📄 U axis
MSPE	Deceleration stop or immediate stop by CSTP input signal
MSPO	Outputs CSTP signal due to abnormal stops
MADJ	FH correction function is not used
MODE	Decelerates when CSD pin is Low level
MCDO	Outputs Low level from CSD pin when decelerating or running at FL constant speed
	Write & Close Close

Select a desired setting state from the pull-down menu, check menu, and click the "Write & Close" button. Write to PRMD (or RMD) register and close "PRMD (Operation mode)" menu screen.

You can also display this screen by clicking the "Detail setting" button when writing PRMD (or RMD) register.

PRMD (Op	eration mode setting) x
PRMD =	00000041 h
MOD6-0	Selection of operating mode
	Positioning operation (Sets the target incremental position)
MSDE	Continuous (+) rotation by command control Continuous (-) rotation by command control
MINP	Continuous movement by (PA/PB) input Continuous movement by external (PDR/MDR) input
MSMD	(+) direction origin return operation (-) direction origin return operation
	Positioning operation (Sets the target incremental position) Timer operation
MCCE	Positioning operation by (PA/PB) input Positioning operation by (PDR/MDR) input
METM	Continuous linear interpolation Linear interpolation
MSDP	Select the slow-down point
	Automatic setting 🗸 🗸
MPCS	Starts control the number of pulses after PCS input ON

Click the down arrow on the right side of the combo box to display the selected item and click the item. Close "PRMD (Operation mode)" menu screen by clicking the "Close" button.



### 4.3.7 RENV1 (environment setting 1) menu

By clicking on this menu, the following screen appears. Detailed for each bit of RENV1 register can be set and the data can be written.

RENV1 =	0000002 h		
PMD2-0	Sets the output pulse specification	ETW1-0	Sets the ERC output signal OFF timer time
	(+) (-)		0us 🗸
		STAM	CSTA signal input specification is Edge trigger (Level trigger when not checked)
ELM	Sets the process when PEL or MEL input signal turns ON	STPM	Sets the stop method by CSTP input signal
ELIM	Immediate stop		Immediate stop 🗸 🗸
CDM		FTM1-0	Selects the noise-filter characteristics of PEL, MEL, SD, ORG, ALM, INP input
SDM	Sets the process when SD input signal turns ON Deceleration only		Ignores inputs with pulse widths of 3.2us or less $\sim$
SDLT	Latch SD input signal	INPL	INP input signal is in positive logic (Negative logic when not checked)
SDL	SD input signal is in positive logic (Negative logic when not checked)	LTCL	LTC input signal is at rising edge trigger (Falling edge trigger when not checked)
ORGL	ORG input signal is in positive logic (Negative logic when not checked)	PCSL	PCS input signal is in positive logic (Negative logic when not checked)
		DRL	DR input signal is in positive logic (Negative logic when not checked)
ALMM	Sets the process when ALM input signal turns ON Immediate stop	FLTR	☐ Insert the filter set in FTM1-0 to PEL, MEL, SD, ORG, ALM, INP input signals
ALML	ALM input signal is in positive logic (Negative logic when not checked)	DRF	☐ Insert noise-filters in PDR, MDR, PE input signals
EROE	Outputs ERC signal when stopped immediately by EL,ALM,CEMG input signals	DTMF	Turn off the direction change timer (0.2ms)
EROR	Outputs ERC signal when origin return is completed	INTM	Mask the INT signal output
	Sets the output pulse width of ERC signal	PCSM	Set PCS input signal to CSTA signal for own axis only
EFW2-0	11 13us	PMSK	Mask the output pulses
ERCL	ERC output signal is in positive logic (Negative logic when not checked)		-

Select the desired setting state from the pull-down menu and check menu and click the "Write & Close" button.

Write to RENV1 register and close "RENV1 (Environment setting 1)" menu screen.

You can also display this screen by clicking the "Detail setting" button when writing RENV1 register.



Click the down arrow on the right side of the combo box to display the selected item and click the item. Close "RENV1 (Environment setting 1)" menu screen by clicking the "Close" button.



### 4.3.8 RENV2 (environment setting 2) menu

By clicking on this menu, the following screen appears. Detailed for each bit of RENV2 register can be set and the data can be written.

RENV2 =	80001D40 h				
P0M1-0	Sets the specification of P0/FUP pins		EOFF	Disables EA/EB input (Input error detection is also disabled)	
	General-purpose input	$\sim$	POFF	Disables PA/PB input (Input error detection is also disabled)	
P1M1-0	Sets the specification of P1/FDW pin		EIM1-0	Sets the EA/EB input specification	
	General-purpose input	$\sim$		Multiplies the 90-degree phase difference by 1	~
P2M1-0	Sets the specification of P2/MVC pin		EINF	Insert a noise filter to EA/EB/EZ inputs	
	General-purpose input	$\sim$	EDIR	Reverses the counting direction of EA/EB inputs	
P3M1-0	Sets the specification of P3/CP1 pin		PIM1-0	Sets the PA/PB input specification	
	General-purpose output	$\sim$		Multiplies the 90-degree phase difference by 1	_
P4M1-0	Sets the specification of P4/CP2 pin		PINF	Insert a noise filter to PA/PB inputs	
	General-purpose output	$\sim$	PDIR	Reverses the counting direction of PA/PB inputs	
P5M	Sets the specification of P5 pin		EZD3-0	Sets the EZ count value used for origin return	
	General-purpose output	$\sim$		up 0 Times down	
P6M	Sets the specification of P6 pin		EZL	EZ input signal is at rising edge (Falling edge when not checked)	
	General-purpose output	$\sim$	ORM	Selects the origin return method	
P7M	Sets the specification of P7 pin			Origin return operation0	_
	General-purpose output	$\sim$	IEND	Outputs INT signal when stopped	_
CSPO	Outputs CSTA signal when command stops (when RMD.MSPO = 1)		MRST	Auto reset function of MSTSW, REST, RIST is not used	

Select the desired setting state from the pull-down menu and check menu and click the "Write & Close" button. Write to RENV2 register and close "RENV2 (Environment setting 2)" menu screen.

You can also display this screen by clicking the "Detail setting" button when writing to RENV2 register.

80001D40 h		
Sets the specification of P0/FUP pins		1000
General-purpose input	~	
General-purpose input General-purpose output Outputs FUP (Accelerating) signal with negative logic Outputs FUP (Accelerating) signal with positive logic		
Sets the specification of P2/MVC pin		
General-purpose input	~	
Sets the specification of P3/CP1 pin		1000
General-purpose output	$\sim$	ľ
Sets the specification of P4/CP2 pin		
General-purpose output	$\sim$	
Sets the specification of P5 pin		
General-purpose output	~	P
	Sets the specification of P0/FUP pins General-purpose input General-purpose output Outputs FUP (Accelerating) signal with negative logic Outputs FUP (Accelerating) signal with positive logic Sets the specification of P2/MVC pin General-purpose input Sets the specification of P3/CP1 pin General-purpose output Sets the specification of P4/CP2 pin General-purpose output Sets the specification of P5 pin	Sets the specification of P0/FUP pins          General-purpose input          General-purpose output          Outputs FUP (Accelerating) signal with negative logic          Outputs FUP (Accelerating) signal with positive logic          Outputs FUP (Accelerating) signal with positive logic          Sets the specification of P2/MVC pin          General-purpose input          Sets the specification of P3/CP1 pin          General-purpose output          Sets the specification of P4/CP2 pin          General-purpose output          Sets the specification of P4/CP2 pin          General-purpose output

Click the down arrow on the right side of the combo box to display the selected item and click the item.

Close "RENV2 (Environment setting 2)" menu screen by clicking the "Close" button.

Because PCL6115-EV is serial bus I/F, the RENV2.MRST bit is fixed to 1.

Г

In PCL6115-EV, the P3 and P4 terminals are used for the excitation mode output circuit, and the P5, P6 and P7 terminals are used for the operation mode output circuit.



### 4.3.9 RENV3 (environment setting 3) menu

By clicking on this menu, the following screen appears. Detailed for each bit of RENV3 register can be set and the data can be written.

RENV3 =	= 00000000 h		
CIS1	Selects the input counted by COUNTER1	C1S1-0	Selects the comparison method of Comparator1
	Output pulse	~	Turn off the comparator function
CIS2	Selects the input counted by COUNTER2	C2S1-0	Selects the comparison method of Comparator2
	EA/EB inputs	-	Turn off the comparator function
CU1H	Stops counting in COUNTER1	SY03-0	Selects the output timing of internal synchronous signals
CU2H	Stops counting in COUNTER2		Internal synchronous signal output OFF 🗸 🗸 🗸
CU1L	Resets COUNTER1 when COUNTER1 is latched	SYI1-0	Selects the input for start with an internal synchronous signal
LOF1	Latching COUNTER1 by LTC signal input is disabled		Internal synchronous signal output by X axis 🗸 🗸
CU1R	Latches COUNTER1 when the origin return operation is completed	SLM1-0	Controls the software limit
C1RM	Uses Comparator1 to set COUNTER1 for ring counter operation		Stops the software limit 🗸 🗸
CU2L	Resets COUNTER2 when COUNTER2 is latched	SLOU	Selects the counter to control software limit
LOF2	Latching COUNTER2 by LTC input signal is disabled		COUNTER1 ~
CU2R	Latches COUNTER2 when the origin return operation is completed		
C2RM	Uses Comparator2 to set COUNTER2 for ring counter operation		

Select the desired setting state from the pull-down menu, check menu, and click the "Write & Close" button.

Write to RENV3 register and close "RENV3 (Environment setting 3)" menu screen.

You can also display this screen by clicking the "Detail setting" button when writing to RENV3 register.

RENV3 (E	Environment setting 3)	
RENV3 =	= 00000000 h	
CIS1	Selects the input counted by COUNTER1	
	Output pulse	~
CIS2	Selects the input counted by COUNTER2	
	EA/EB inputs	$\sim$
CU1H	EA/EB inputs Output pulse	
CU2H	Stops counting in COUNTER2	
CU1L	Resets COUNTER1 when COUNTER1 is latched	
LOF1	Latching COUNTER1 by LTC signal input is disabled	
CU1R	Latches COUNTER1 when the origin return operation is completed	

Click the down arrow on the right side of the combo box to display the selected item and click the item. Close "RENV3 (Environment setting 3)" menu screen by clicking the "Close" button.



### 4.3.10 RENV4 (environment setting 4) menu

By clicking on this menu, the following screen appears. Detailed for each bit of RENV4 register can be set and the data can be written.

RENV4 (E	nvironment setting 4) ×
RENV4 =	00000000 h
L3T2-0	Selects the input pin of a trigger signal latched in RLTC3 register
	Disable
L3TL	Selects the input specification of a trigger signal latched in RLTC3 register
L3DT	Selects the counter latched in RLTC3 register
L3MD	Selects the latch operation specification of RLTC3 register
L3F1-0	Selects the input noise filter characteristic of a trigger signal latched in RLTC3 register No filter (Input pulse width > CLK frequency)
L4T2-0	Selects the input pin of a trigger signal latched in RLTC4 register V
L4TL	Selects the input specification of a trigger signal latched in RLTC4 register
L4DT	Selects the counter latched in RLTC4 register
L4MD	Selects the latch operation specification of RLTC4 register
L4F1-0	Selects the input noise filter characteristic of the trigger signal latched in RLTC4 register No filter (Input pulse width > OLK frequency)
	Write & Close Close

Select the desired setting state from the pull-down menu, check menu, and click the "Write & Close" button. Write to RENV4 register and close "RENV4 (Environment setting 4)" menu screen.

You can also display this screen by clicking the "Detail setting" button when writing to RENV4 register.

RENV4 (E	invironment setting 4) x	
RENV4 =	00000000 h	
L3T2-0	Selects the input pin of a trigger signal latched in RLTC3 register	
	Disable 🗸	
L3TL	Disable LTC pin	
L3DT	ORGipin	
	EZ pin P4 pin	
L3MD	P5 pin	
L3F1-0	P6 pin P7 pin	
	No filter (Input pulse width > CLK frequency)	
L4T2-0	Selects the input pin of a trigger signal latched in RLTC4 register	
	Disable v	
L4TL	Selects the input specification of a trigger signal latched in RLTC4 register	
L4DT	Selects the counter latched in RLTC4 register	
L4MD	Selects the latch operation specification of RLTC4 register	

Click the down arrow on the right side of the combo box to display the selected item and click the item. Close "RENV4 (Environment setting 4)" menu screen by clicking the "Close" button.



### 4.3.11 RIRQ (event interrupt factor setting) menu

By clicking on this menu, the following screen appears. Detailed for each bit of RIRQ register can be set and the data can be written.

RIRQ (Ev	rent interrupt factor setting)
RIRQ =	00000000 h
Sets the	bit corresponding to the event interrupts to "1"
IREN	Stops normally
IRNM	Writing to pre-register is enabled
IRUS	Acceleration starts
IRUE	Acceleration ends
IRDS	Deceleration starts
IRDE	Deceleration ends
IRC1	Comparator 1 condition is met
IRC2	Comparator2 condition is met
IRLT	Latching the count value by LTC input signal
IROL	ORG input signal ON
IRSD	SD input signal ON
IRDR	PDR(PA) and MDR(PB) input signals are changed
IRSA	CSTA input signal ON
IREZ	Stopped during deceleration with "RENV2. ORM = 1"
IRBY	Starts
IRL3	Latches the count value to RLTC3 register
IRL4	Latches the count value to RLTC4 register
	Write & Close Close

Select the desired setting state from the pull-down menu, check menu, and click the "Write & Close" button.

Write to RIRQ register and close "RIRQ (Event interrupt factor setting)" menu screen.

You can also display this screen by clicking the "Detail setting" button when writing RIRQ register.

Close "RIRQ (event interrupt factor)" menu screen by clicking the "Close" button.

### 4.3.12 PRMG (speed magnification rate) menu

By clicking on this menu, the following screen appears. You can set PRMG register by entering speed magnification rate you want to set.

PRMG (Speed mag	nification rate setting)	×
PRMG = 000004A	Fh	
19.6608 MHz	Magnification 1	X
Value set in the re	egister and the actual	
PRMG = 1199		1 X
	Write & Close	Close

Please enter magnification you want to set in decimal number (You can set value that is not an integer).

The value of PRMG is calculated and displayed so that the magnification is realized based on the input. In addition, an actual magnification with this value is recalculated and displayed.

You can write a value by clicking the "Write & Close" button.

Write to PRMG register and close "PRMG (Speed magnification rate)" menu screen.

You can also display this screen by clicking the "Detail setting" button when writing to PRMG register.

Close "PRMG (Speed magnification rate)" menu screen by clicking the "Close" button.



### 4.3.13 Simple control menu



Click the "Simple control (M)" menu to display Axis in the following screen. You can set an operation pattern to perform a simple motion control.

When a value (other than 0) is input to RFH, RFL, RMV, RUR, and (RDR) on the main screen, its value is displayed.



After the software is started (register values are not set), when the "Simple control (M)" menu is executed, the values shown below are displayed.

Start speed=100pps, Operation speed=1000pps, Feeding amount=2000pulse, Acceleration time=1000ms,

Deceleration time=1000ms, operation mode=+ direction continuous operation, linear acceleration/deceleration mode



By clicking the "Execute" button, data will be written to each register and operation will begin.

Close the "Simple control (M)" menu screen by clicking the "Close" button or close mark at the upper right corner.



#### 4.3.13.1 Setting speed

You can set a frequency of control pulses to operate a stepping motor. Please set start speed and an operation speed as decimal numbers respectively.



#### 4.3.13.2 Setting acceleration/deceleration time

Acceleration time and deceleration time can be set in milliseconds and decimal number.

When the acceleration time and deceleration time are the same value, the selection of the slowdown point is automatically set.

If the acceleration time and the deceleration time are different values, the selection of the slow-down point becomes manual setting.

Calculate the slow-down point value and write it in the slow-down point register (PRDP) and display it.



#### 4.3.13.3 Set the feeding amount

You can set numbers of how many times to output control pulses.

1500pps	Feeding amount 2304	pulse	19.6608 MHz	Constant speed
1500				S-curve speed
pps				PRMV = 00000900 h

#### 4.3.13.4 Setting Acceleration/Deceleration characteristics

As acceleration/deceleration characteristics, you can select constant speed control, linear acceleration/deceleration control, or S-curve acceleration/deceleration control.



When you select constant speed control, the screen shows as follows.



#### When you select S-curve control, the screen shows as follows.



#### 4.3.13.5 Check of the value to be written to Register

The following screen shows values to be written to the registers to realize a set value.

PRMV = 00000900       h         PRFL = 0190       h         PRFH = 05DC       h         PRUR = 22E7       h         PRDR = 0000       h         PRMG = 04AF       h	LL	S-curv	/e accel/de	cel	
PRFH = 05DC         h           PRUR = 22E7         h           PRDR = 0000         h           PRMG = 04AF         h	$\left[ \right]$	PRMV =	00000900	h	
PRUR = 22E7         h           PRDR = 0000         h           PRMG = 04AF         h		PRFL =	0190	h	
PRDR = 0000 h PRMG = 04AF h		PRFH =	05DC	h	
PRMG = 04AF h		PRUR =	22E7	h	
		PRDR =	0000	h	
	1	PRMG =	04AF	h	
PRDP = 00000000 h		PRDP =	00000000	h	
PRMD = 00000041 h		PRMD =	00000041	h	

Please refer the above when you create a program to control PCL6115.

#### **4.3.13.6** Display recalculation of operation time with value set to register

Depending on a value set in register, a result of recalculating motion profile is displayed.



Pulses are calculated by integers, so a motion profile may not be realized as specified values. Also, if you set an impossible value, an error will be displayed.



#### 4.3.13.7 Perform a set operation

You can select the settings for "MOVE MODE" and "STOP". "EXECUTE" is determined by "4.3.13.4Acceleration/Deceleration characteristics settings".

MOVE MODE	
Positioning op	eration 🗸
· · · · · · · · · · · · · · · · · · ·	
execute	STOP

" MOVE MODE " can be selected from 5 operations "Positioning operation", "+ direction continuous operation", "- direction continuous operation", "+ direction origin return operation", and "- direction origin return operation". "STOP" can be selected from two actions "STOP" and "SDSTP".

MOVE MODE	MOVE MODE
Positioning operation	Positioning operation
Positioning operation + direction continuous opera - direction continuous opera	execute STOP
<ul> <li>direction continuous opera</li> <li>direction origin return oper</li> <li>direction origin return oper</li> </ul>	STAUD V STOP
	SDSTP

After setting the operation pattern, when you click the "EXECUTE" button, the value of each register is written to PCL6115, and the set operation is performed once. At this time, "FH high speed start" (STAUD: 53h) is written to PCL6115 as a start command for linear control and S-curve control, and "FL constant speed start" (STAFL: 50h) is written to PCL6115 for constant speed control.

If you click the "STOP" button during operation, operation will stop immediately by selecting "STOP". At this time, a command "immediate stop" (STOP: 49h) is written to PCL6115.

Operation stop after slow down by selecting "SDSTP". At this time, a command "Slow down stop" (SDSTP: 4Ah) is written to PCL6115.

If the end limit signal and alarm signal are ON when you click the "EXECUTE" button, it will not operate, and an error message will be displayed. Turn off the end limit signal and alarm signal and click again.

Error	×
Axis Error Check the status and extended status information!	
OK	

Close the "Simple Control" menu screen by clicking the end mark on the upper right.

#### 4.3.14 Reset menu

PCL6115 is initialized by writing a software reset command.



## 4.4 Other menus

By clicking "Other", you can check the multi-language notation switching and the software version.

PCL6115 Starter Kit					
File (F) Tool (T)	Other (O)				
Language (L)			Japanese (J)		
Version (V)		<b>~</b>	English (E)		
MSTSW 0000 h SSTSW 0000			Traditional Chinese (2)		
RMV 2304 PRMV 2304			German (3)		
RFL    400	PRFL 400	_			

### 4.4.1 Language menu

Two languages of Japanese and English can be selected by default.

Up to 18 different languages can be added by creating a multilingual text file ("menu_text2 _ ***.lng").

A check mark is displayed in front of the selected language.

(The example displays that traditional Chinese, and German are added.)

For details, refer to "PCL6115-EV_Application Language File Manual".

### 4.4.2 Version menu

You can check a software version.



# 5. PCL6115-EV setting and operation

The following shows a setting for operating a stepping motor PFCU30-24V4GM (1/12) attached to PCL6115-EV. When you connect PCL6115-EV to a PC for the first time, install the device driver.

Installing device driver software * × Click here for status.

It may take several minutes to install the device driver.

our device is ready to use		
JSB Composite Device	Ready to use	
JSB Serial Converter A	Ready to use	
JSB Serial Converter B	Ready to use	
		1.0

CAUTION: The above screen may not be displayed according to PC's OS (Windows8, Windows10).

# 5.1 Startup software

Please make sure that PCL6115-EV is connected to a PC.

By double-click on the executable file "PCL6115EV.exe", the following main screen appears.

			Х-	axis			
MSTSW	0000 h	SSTSW	00F8 h	RENV1	00000000 h	RIRQ	00000000 h
DM0 (				RENV2	80000000 h	RLTC1	0
RMV		PRMV	0	RENV3	00000000 h	RLTC2	0
RFL	0	PRFL	0	RENV4	00000000 h	RLTC3	0
RFH	0	PRFH	0	RCUN1	0	RLTC4	0
RUR	0	PRUR	0	RCUN2	0	RSTS	0000B900 h
RDR		PRDR	0	RCMP1		REST	00000000 h
RMG		PRMG	0	RCMP2		RIST	00000000 h
RDP	0	PRDP	0	RCMP3		RPLS	0
RMD	00000000 h	PRMD	00000000 h	RCMP4		RSPD	0
RIP	0	PRIP	0			RSDC	0
RUS	0	PRUS	0			1000	JL
RDS	0	PRDS	0				

By loading the setting data file "PCL6115EV_Data100" for PCL6115EV, the output pulse specifications of environment setting 1 (RENV1) can be set to the clock input and direction input of the stepping motor driver IC (TB6608FNG) mounted on the PCL6115-EV board. It is set to signal specifications.

RENV1 =	00000002 h		
PMD2-0	Sets the output pulse specification	ETW1-0	Sets the ERC output signal OFF timer time
	(+) (-) <u>Low</u> <u>High</u> Y	STAM STPM	Ous         CSTA signal input specification is Edge trigger (Level trigger when not checked)           Sets the stop method by CSTP input signal
ELM	Sets the process when PEL or MEL input signal turns ON	SIFM	Immediate stop
	Immediate stop	FTM1-0	
SDM	Sets the process when SD input signal turns ON Deceleration only	FTMI-0	Ignores inputs with pulse widths of 3.2us or less
SDLT	Latch SD input signal	INPL	INP input signal is in positive logic (Negative logic when not checked)
SDL	SD input signal is in positive logic (Negative logic when not checked)	LTOL	LTC input signal is at rising edge trigger (Falling edge trigger when not checked)
ORGL	ORG input signal is in positive logic (Negative logic when not checked)	POSL	PCS input signal is in positive logic (Negative logic when not checked)
ALMM	Sets the process when ALM input signal turns ON	DRL	DR input signal is in positive logic (Negative logic when not checked)
1120101	Immediate stop	FLTR	☐ Insert the filter set in FTM1-0 to PEL, MEL, SD, ORG, ALM, INP input signals
ALML	ALM input signal is in positive logic (Negative logic when not checked)	DRF	☐ Insert noise-filters in PDR, MDR, PE input signals
EROE	Outputs ERC signal when stopped immediately by EL,ALM,CEMG input signals	DTMF	Turn off the direction change timer (0.2ms)
EROR	Outputs ERC signal when origin return is completed	INTM	Mask the INT signal output
EPW2-0	Sets the output pulse width of ERC signal	PCSM	Set PCS input signal to CSTA signal for own axis only
21 112 0	11 13us	PMSK	Mask the output pulses
ERCL	ERC output signal is in positive logic (Negative logic when not checked)		

OUT	DIR	Output pulse specification
<b>V</b>	L	CW
	Н	CCW

CW: Output shaft of the stepping motor PFCU30-24V4GM (1/12) rotates clockwise The direction is CW when you select "(+) direction constant operation by command control", "(+) direction origin return operation", and "positioning operation with positive PRMV" as an operation mode of PRMD.MOD.

#### CCW: Output shaft of the stepping motor PFCU30-24V4 GM (1/12) rotates counterclockwise

The direction is CCW when you select "(-) direction constant operation by command control", "(-) direction origin return operation", and "positioning operation with negative PRMV" as an operation mode of PRMD.MOD.



By loading the setting data file "PCL6115EV_Data100" for PCL6115EV, the P3-P7 terminal specifications of environment setting 2 (RENV2) can be changed to general-purpose output settings since they are connected to each input terminal of the stepping motor driver IC (TB6608FNG). I am. The MRST setting is enabled (does not automatically reset).

RENV2 =	80001D40 h			
P0M1-0	Sets the specification of P0/FUP pins		EOFF	Disables EA/EB input (Input error detection is also disabled)
	General-purpose input	~	POFF	Disables PA/PB input (Input error detection is also disabled)
P1M1-0	Sets the specification of P1/FDW pin		EIM1-0	Sets the EA/EB input specification
	General-purpose input	~		Multiplies the 90-degree phase difference by 1
P2M1-0	Sets the specification of P2/MVC pin		EINF	☐ Insert a noise filter to EA/EB/EZ inputs
	General-purpose input	~	EDIR	Reverses the counting direction of EA/EB inputs
P3M1-0	Sets the specification of P3/CP1 pin		PIM1-0	Sets the PA/PB input specification
	General-purpose output	$\sim$		Multiplies the 90-degree phase difference by 1
P4M1-0	Sets the specification of P4/CP2 pin		PINE	Insert a noise filter to PA/PB inputs
	General-purpose output	$\sim$	PDIR	Reverses the counting direction of PA/PB inputs
P5M	Sets the specification of P5 pin		EZD3-0	Sets the EZ count value used for origin return
	General-purpose output	$\sim$		up 0 Times down
P6M	Sets the specification of P6 pin		EZL	EZ input signal is at rising edge (Falling edge when not checked)
	General-purpose output	$\sim$	ORM	Selects the origin return method
P7M	Sets the specification of P7 pin			Origin return operation0
	General-purpose output	~	IEND	Outputs INT signal when stopped
CSPO	Outputs CSTA signal when command stops (when RMD.MSPO = 1)		MRST	Auto reset function of MSTSW, REST, RIST is not used

P4	P3	Excitation mode
L	Н	1-2 phase
Н	L	W1-2 phase
L	L	2W1-2 phase

The default setting is 2W1-2 phase excitation mode.

P6	P7	P5	Mode
L	L	L	operable mode
н	L	L	initial mode
×	Н	L	enable standby mode
×	×	Н	standby mode

The default setting is operable mode.

To change settings, refer to general-purpose output bit control commands in "PCL6115/6125/6145 User's Manual" and write corresponding commands.

Evolution mode	Command V	Vrite Value	Setting Status Display	
Excitation mode	P4	P3	(SSTSW) *	
1-2 phase	<mark>14</mark> (L Level)	<mark>1B</mark> (H Level)	0008h	
W1-2 phase	<mark>1C</mark> (H Level)	<mark>13</mark> (L Level)	0010h	
2W1-2 phase	<mark>14</mark> (L Level)	<mark>13</mark> (L Level)	0000h	

* The written content display is in the operation enabled mode (P5 to P7 are all L).

# 5.2 Setting for each register

To set the value of register, decimal input is used. Refer to "4.1.1 Changing radix of register".

			Х-	axis			
MSTSW	0000 h	SSTSW	0000 h	RENV1	00000002 h	RIRQ	00000000 h
5107		DDM0/		RENV2	80001D40 h	RLTC1	0
RMV	0	PRMV		RENV3	00000000 h	RLTC2	0
RFL	0	PRFL	0	RENV4	00000000 h	RLTC3	0
RFH	0	PRFH	0	RCUN1	0	RLTC4	0
RUR	0	PRUR	0	RCUN2	0	RSTS	0000BD00 h
RDR	0	PRDR	0	RCMP1	0	REST	00000000 h
RMG	0	PRMG	0	RCMP2		RIST	00000000 h
RDP	0	PRDP	0	RCMP3		RPLS	0
RMD	00000000 h	PRMD	00000000 h	RCMP4		RSPD	0
RIP		PRIP	0			RSDC	0
RUS	0	PRUS	0				J
RDS	0	PRDS	0				

For PRMV setting value, write a value that an output shaft of a stepping motor PFCU30-24V4GM (1/12) rotates once. When stepping motor is in 1-2 phase excitation, a shaft rotates once with 48 pulses. With 1/12 gear and 2W1-2 phase excitation mode, Data =  $48 \times 12 \times 4 = 2304$ .

Set start speed PRFL = 400, operation speed PRFH = 1500, acceleration rate PRUR = 4467 (500 ms), speed magnification PRMG = 1199, operation mode PRMD = 00000041h.

File (F) Tool (T) Other (O)							
	X–axis						
MSTSW	0000 h	SSTSW	0000 h	RENV1	00000002 h	RIRQ	00000000 h
DM0 (	2204		2204	RENV2	80001D40 h	RLTC1	0
RMV	2304	PRMV	2304	RENV3	00000000 h	RLTC2	0
RFL	400	PRFL	400	RENV4	00000000 h	RLTC3	0
RFH	1500	PRFH	1500	RCUN1	0	RLTC4	0
RUR	1227	PRUR	1227	RCUN2	0	RSTS	0000BD00 h
RDR		PRDR	0	RCMP1		REST	00000000 h
RMG	1199	PRMG	1199	RCMP2	0	RIST	00000000 h
RDP		PRDP	0	RCMP3		RPLS	0
RMD	00000041 h	PRMD	00000041 h	RCMP4	0	RSPD	0
RIP	0	PRIP	0	1000114		RSDC	0
RUS	0	PRUS	0			1000	
RDS	0	PRDS	0				
Command	Data						

To set a value to PRMG, the setting menu is displayed by clicking the "Detail setting" button. Set a magnification rate to 1 and click the "Write & Close" button.



For details, refer to "4.3.12 PRMG (speed magnification rate) menu" menu.

PRMG =	000004AF k	1		
19.6608	MHz	Magnification 1	X	
Value set	t in the regis	ster and the actual		

To set a value to PRMD, the setting menu is displayed by clicking the "Detail setting" button.

Select "Positioning operation (specifies target position)" as an operation mode, and select "Automatic setting" as slow-down point. Click the "Write & Close" button.

For details, refer to "4.3.6 PRMD (operation mode) menu" menu.

PRMD (Op	eration mode setting) ×				
PRMD =	00000041 h				
MOD6-0	Selection of operating mode				
	Positioning operation (Sets the target incremental position) $\sim$				
MSDE	Decelerates (deceleration stop) by SD input ON				
MINP	Operation completed by INP input ON				
MSMD	Selects acceleration/deceleration operation				
	Linear acceleration/deceleration				
MCCE	Stop counting of COUNTER1 and COUNTER2 by output pulses				
METM	Selects the operation complete timing				
	Cycle completion 🗸				
MSDP	Select the slow-down point				
	Automatic setting 🗸 🗸				
MPCS	Starts control the number of pulses after PCS input ON				
MSN1-0	Sequence number of the operation (No effect on operation)				
	0 ~				
MSY1-0	Select the start command function				
	Start immediately 🗸				
	Specify the axis to confirm stops				
	Xaxis Yaxis Zaxis Uaxis				
MSPE	Deceleration stop or immediate stop by CSTP input signal				
MSPO	Outputs CSTP signal due to abnormal stops				
MADJ	FH correction function is not used				
MODE	Decelerates when CSD pin is Low level				
MCDO	Outputs Low level from CSD pin when decelerating or running at FL constant speed				
	Write & Close Close				

### 5.3 Operation

File (F) Tool (T) Other (O)							
	X–axis						
MSTSW	0000 h	SSTSW	0000 h	RENV1	00000002 h	RIRQ	00000000 h
DM0 (	0004		0004	RENV2	80001D40 h	RLTC1	0
RMV	2304	PRMV	2304	RENV3	00000000 h	RLTC2	0
RFL	400	PRFL	400	RENV4	00000000 h	RLTC3	0
RFH	1500	PRFH	1500	RCUN1	0	RLTC4	0
RUR	1227	PRUR	1227	RCUN2	0	RSTS	0000BD00 h
RDR	0	PRDR		RCMP1	0	REST	00000000 h
RMG	1199	PRMG	1199	RCMP2		RIST	00000000 h
RDP	0	PRDP	0	RCMP3	0	RPLS	0
RMD	00000041 h	PRMD	00000041 h	RCMP4	0	RSPD	0
RIP	0	PRIP	0	1000014		RSDC	0
RUS	0	PRUS	0			1000	0
RDS	0	PRDS	0				

Write a start command 53h in the column "Command" and click the "Write button.

The output shaft of the stepping motor PFCU30-24V4GM (1/12) rotates once in the clockwise direction.

If you change the values of RMV/PRMV, RFL/PRFL, RFH/PRFH, RUR/PRUR, RDR/PRDR, or RMD/PRMD, movement amount, start speed, operation speed, acceleration time, deceleration time, linear acceleration/deceleration mode/S-curve acceleration/deceleration mode of the simple control operation will be set again.

These will also be set again when the setting data file is loaded.

## 5.4 Simple control operation

Simple control menu is displayed by clicking "Tools (T)"  $\rightarrow$  "Simple control (L)".

For details, refer to "4.3.13 Simple control menu".

Set feeding amount (PRMV = 2304), frequency (PRFL = 400/PRFH = 1500), acceleration / deceleration time (500 ms), and click the "execute" button. The output shaft of the stepping motor PFCU30-24V4GM (1/12) rotates once in the clockwise direction.





# 5.5 Other setting and notes

By changing selection of operation mode, you can check operation mode such as continuous operation, return to origin, etc.

PRMD =	00000041 h			
MOD6-0	Selection of operating mode			
	Positioning operation (Sets the target incremental position) $\sim$			
MSDE	Continuous (+) rotation by command control Continuous (-) rotation by command control			
MINP	Continuous movement by (PA/PB) input			
	Continuous movement by external (PDR/MDR) input (+) direction origin return operation			
MSMD	<ul> <li>direction origin return operation</li> <li>Positioning operation (Sets the target incremental position)</li> </ul>			
	Timer operation			
MCCE	Positioning operation by (PA/PB) input Positioning operation by (PDR/MDR) input			
METM	Continuous linear interpolation			
	Linear interpolation			
MSDP	Select the slow-down point			
	Automatic setting			
MPCS	Starts control the number of pulses after PCS input ON			
MSN1-0	Sequence number of the operation (No effect on operation)			
	0			
MSY1-0	Select the start command function			
	Start immediately 🗸			
	Specify the axis to confirm stops			
	🗌 X axis 📄 Y axis 📄 U axis			
MSPE	Deceleration stop or immediate stop by CSTP input signal			
MSPO	Outputs CSTP signal due to abnormal stops			
MADJ	FH correction function is not used			
MCDE	Decelerates when CSD pin is Low level			
MCDO	Outputs Low level from CSD pin when decelerating or running at FL constant speed			

The following 8 types of operation modes can be selected. There are five operation modes to choose from in "Simple control" (1. to 5.).

- 1. Continuous (+) rotation controlled by command control
- 2. Continuous (-) rotation controlled by command control
- 3. (+) rotation origin return operation
- 4. (-) rotation origin return operation
- 5. Positioning operation (specifies target position)
- 6. Timer operation
- 7. Continuous linear interpolation

(The sign of PRMV register value specifies the direction of movement)

8. Linear interpolation (PRMV register value = PRIP register value)

The maximum speed of the stepping motor PFCU30-24V4GM (1/12) is the value listed in the table below. If bigger values are set, step-out will occur.

P4	Р3	Excitation mode	Maximum speed	Feeding amount per rotation
L	Н	1-2 phase	375 pps	576
Н	L	W1-2 phase	750 pps	1152
L	L	2W1-2 phase	1500 pps	2304

#### Revision

Revision	Date	Contents
1st	April 4, 2018	Initial Release
1st 2nd	April 4, 2018 Dec 10, 2018	Change Operation speed to 1500 pps Cover 4.1 Startup software 5.2 Setting for each register 5.3 Operation 5.4 Simple control operation 5.5 Other setting and notes Delete M614 of RENV3(environment setting 3) 4.3.9 RENV3(environment setting 3) menu Multi-legalization 3.1 Folder structure 4.2 File menu
		4.3 Tool menu 4.4 Other menus
		4.4.1 Language menu
Зrd	April 23,2019	RENV4: Environment setting 4 register and RLTC3: latch data 3 register andRLTC4: latch data 4 register are added         Cover         4.1 Startup software         4.1.3 Detailed setting of register data         4.3 Tool menu         4.3.10 RENV4 (environment setting 4) menu         5.1 Startup software         5.2 Setting for each register         5.3 Operation         Add Bit 17-22 of RSTS: Extension Status Register         4.3.2 RSTS (extension status) menu         Add Bit 16-19 of RIST: Event Interrupt Factor Register         4.3.11 RIRQ (event interrupt factor) menu         Add Bit 13,14,16 and 17 of RIRQ: Event Interrupt Factor Setting Register         4.3.11 RIRQ (event interrupt factor setting) menu         Display changed to P5M, P6M, P7M of RENV2: Environment Setting 2 register         4.3.8 RENV2 (environment setting 2) menu         Changed Document No. from YA7258-0 to TA600018-EN0/0
4th	July 16, 2019	Change cover. Add the manual list
5th	April 20,2023	Add the manual list         Added and corrected "Simple control" menu         1. Added "Constant speed" check, "MOVE MODE" selection, "EXECUTE" (STAUD/STAFL), "STOP" (STOP/SDSTP)         2. Added "Constant speed" screen         3. Fixed a bug that the rise time and fall time changed every time the "simple control" menu screen was started.         Corrected language files

Deviation	Dete	Contorte
Revision	Date	Contents
6th	December 13, 2023	Added error display when end limit signal and alarm signal are ON during operation
		P9. Enter the start command and click the "Write" button
		P25. Click the "EXECUTE" button
		Corrected language files
7th	July 16, 2024	P6. PCL6115-EV_Application_V360JE $\rightarrow$ PCL6115-EV_Application_V370JE
		P6.P28.P29. PCL6115EV_Data020 $\rightarrow$ PCL6115EV_Data100
		P7. P27. Change the main screen when starting the software
		P8. Added trouble display screen
		P10. "PCL6115EV_Data100" is the setting data file for PCL6115EV.
		P21. After the software is started (register values are not set), when the "Simple
		Control (M)" menu is executed
		P28.P29. Explanation correction for environment settings 1 (RENV1) and environment settings 2 (RENV2)
		P30.P31. Acceleration rate PRUR = 1786 (200msec) → Acceleration rate PRUR = 4467 (500msec)
		P32. Added "If you change the values of RMV/PRMV, RFL/PRFL, RFH/PRFH, RUR/PRUR,
		RDR/PRDR, or RMD/PRMD, movement amount, start speed, operation speed,
		acceleration time, deceleration time, linear acceleration/deceleration
		mode/S-curve acceleration/deceleration mode of the simple control operation will
		be set again. These will also be set again when the setting data file is loaded.
		P33. There are five operation modes to choose from in "Simple control" (1. to 5.).





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