

Instruction Manual

PARAMETER LOADER FOR DIGITAL CONTROLLER

TYPE: PXH

PREFACE

Thank you for purchasing the Fuji Digital Controller (Type: PXH).

Read this instruction manual carefully to ensure correct installation and operation.

In addition, please keep this instruction manual within easy reach of the actual person using this instrument.

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Notice

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1. Copyright of software

The copyright of the software belongs to our company. It is prohibited to copy or distribute it without our consent.

The software is provided as communication software sample (free of charge). It is not intended for guaranteeing the operation of the software.

2. Overview

This software is an auxiliary tool for parameter setting and tuning for the digital controller (PXH). Setting conditions can be edited and saved by this software.

Upon parameter setting, editing and saving on PC, settings can be copied to more than one PXH. As an auxiliary tool for PXH, PV, SV and MV trend indication and tuning parameter (P, I, D) setting are available.

3. Recommended environment

Applicable PC	: PC/AT compatible PC				
Applicable OS	: Operation was checked by Windows 2000 (Japanese/English version) and				
	Windows XP (Japanese/English version)				
	Windows 7 (Home Premium, Professional) (Japanese/English version)				
RAM	: 128 M bytes or more				
Free space of hard disk	: 100 M bytes or more				
CD-ROM drive	: Yes				
Display resolution	: 1024 768 dots or more				
* The operation is checked	d with DELL INSPIRON 3800G 750GT (Laptop PC) by us.				

4. Install and uninstall method

Install

Inserting the CD-ROM into the drive automatically displays a top page. Proceed to operation according to indications. If the top page does not start up automatically, execute ¥english¥loader¥setup.exe at [Run] out of start menus.

Uninstall

For the start menu of Windows 2000 or Windows XP or Windows 7, select [Settings (S)] [Control Panel (C)] [Add/Remove Applications (programs)] for executing uninstall.

5. Connection with PXH

(1) Connection by RS-232C



Fig. 5-1 Connection of PC and PXH (RS-232C)

Prepare a loader cable (option). By the loader cable, connect RS-232C port (D-sub 9 pins) of PC and loader interface port of PXH.

Loader cable (option) ... Type: ZZPPXH1*TK4H4563

(2) Connection by RS-485

Prepare RS-232C/RS-485 communication converter. According to the converter's instructions, carry out a connection as illustrated below (Fig. 5-2).



Fig. 5-2 Connection of PC and PXH (RS-485)

Recommended communication converter	
RA Systems make RC-77 (isolated)	http://www.ras.co.jp
Omron make K3SC-10 (isolated)	http://www.omron.co.jp

Activating [PXH Loader] out of start menus displays the Work selection Window (Fig. 6-1). Work selection includes:

- (1) New
- (2) File open
- (3) Upload from PXH

PXH Loader:Work selection Window - [New]	
File(E) Communication(C) Help(H)	
Work selection	7
C New	
C Filmer	
k rile open	
C Upload from PXH	
	ок

Fig. 6-1 Work selection Window

6.1 New

Newly generate parameter setting for digital indicating controller (PXH) as follows.

(1) From Work selection Window, select [New], and click on [OK] button to display the Template selection Window on Fig. 6-2.

PXH Loader:Template selection Window - [New]	
File(E) Communication(C) Help(H)	
_Template selection	
No. Control type name	
010 PID control with Math	
011 SV select PID control with Math	
013 PID control	
014 SV select PID control	
016 Input select PID control with calculation	
030 Motorized valve control with Math	
031 SV select Motorized valve control with Math	
033 Motorized valve control	
034 SV select Motorized valve control	
050 Heating/Cooling control with Math	
051 SV select Heating/Cooling control with Math	
053 Heating/Cooling control	
054 SV select Heating/Cooling control	
Coloritor - etemplate	
Selection a template	
No. j010	
Control type name PID control with Math	
	ок
	Cancel



(2) Click on a desired control type name out of templates of Template selection. The selected template will appear in the lower of the window. Clicking on [OK] button enters the template to use, and displays [Ch. 8 (Input/output definition) Setting Window] Fig. 6-3).

File	PXH Loader:Ch.8 SET (Input/output def.) SettingWindow - [New]							
ſ	Parameter name Value							
	1	PV1F	(PV1 full-scale)	400.0	-			
	2	PV1B	(PV1 base scale)	0.0	-			
	3	PV1D	(PV1 decimal point position)	1	-			
	4	PV1T	(PV1 input type)	3:TC-K 0.0 to 1200.0-C	-			
	- 5	PV1U	(PV1 Input Unit)	0:Degree C (Degree C unit)	-			
	6	PV1Z	(PV1 input zero point adjustment)	0.0	EU(-C)			
	- 7	PV1S	(PV1 input span point adjustment)	0.0	EU(-C)			
	11	P1CU	(PV1 input rooter cut point)	-0.1	%			
	12	P1TF	(PV1 input filter time constant)	0.0	sec			
	13	P1LN	(PV1 Linearize type setting)	0:OFF	-			
	- 14	PV2F	(PV2 full-scale)	400.0	-			
	15	PV2B	(PV2 base scale)	0.0	-			
	- 16	PV2D	(PV2 decimal point position)	1	-			
	17	PV2T	(PV2 input type)	3:TC-K 0.0 to 1200.0-C	-			
	- 18	PV2U	(PV2 Input Unit)	0:Degree C (Degree C unit)	-			
	19	PV2Z	(PV2 input zero point adjustment)	0.0	EU(-C)			
	20	PV2S	(PV2 input span point adjustment)	0.0	EU(-C)			
	24	P2CU	(PV2 input rooter cut point)	-0.1	%			
L	05	DOTE		00				
					ОK	1		
					Cancel			
Se	Setting range : 0.0 To 1200.0 (-)							

Fig. 6-3 Ch. 8 (Input/output definition) Setting Window

- (3) Set the input/output definition as follows.
 Upon double clicking on [Value] in Ch. 8 (Input/output definition), you can change the value by direct input or by selection out of pull-down menus.
- (4) Clicking on [OK] button displays the Menu Window (Fig. 7-1).

6.2 File open

Download existing parameter settings as follows.

(1) From Work selection Window, select [File open], and click on [OK] (Fig. 6-4).

Open					? 🗙
Look jn:	🗀 Data		•	← 🗈 📸 🖬 -	
My Recent Documents	🗐 sample.csv				
Desktop					
My Documents					
S					
My Network Places	File <u>n</u> ame:	*.CSV		▼	<u>O</u> pen
1 10053	Files of type:	CSV file(*.csv)		▼ (Cancel

Fig. 6-4 File selection

- (2) Select an existing setting file, and click on [Open (O)].
- (3) Operating according to messages downloads parameters saved in the file into the loader, and displays the Menu Window (Fig. 7-1).

6.3 Upload from PXH

You can change and save a setting uploaded from PXH.

- (1) From the Work selection Window, select [Upload from PXH], and click on [OK] button.
- (2) Select the Communication condition setting Dialog (Fig. 6-5), and click on [Execution] button. Note: If RS232C loader port is used, set the station No. to "1."

Communication condition se	etting Dialog - Upload			X
Protocol selection RS485/R	S232C Modbus/RTU	•		
	Value		Unit	
Port No.		1	-	
Station No.		1	-	
Baud rate		38400	bps	
Data length		8	Bit	
Stop bit		1	Bit	
Parity		O:Odd	-	
Execution				
		Car	ncel	

Fig. 6-5 Communication condition setting

Operating according to messages uploads PXH parameters, and displays the Menu Window (Fig. 7-1).

7. Menu Window

Menu Window (Fig. 7-1) has functions given below.

- Set and change parameters of each Ch.
 Save parameter settings
- Read parameter settings into file
- 4) Upload parameters (from PXH to PC)
- 5) Download parameters (from PC to PXH)
- 6) Jump to Tuning Dialog
- 7) Preview parameter list
- 8) Print parameter list
- 9) Store print preview in CSV format

📟 PXH Loader:Menu Window - [New]	
File(E) Communication(C) Help(H)	
	Selection a template : 010
Ch.1 OPE (Operation parameter) Ch.8 SET (Input/output def.)	Ch.C LIN (Riniaraiz)
Ch.9 SYS (System definition)	Ch.D CLC (Math. Calculation)
Ch.3 PLT (Control palette)	Ch.E AT (Tuning)
Parameter mask	
Ch.A ALM (Alarm setting)	Ch.G TTL (Total)
Ch.B COM (Communication)	
	Ch.X RCP (Recipe)
Please refer to the instruction manual concerning detail of each parameters. And, refer to the instruction manual and user's manual concerning operation	of PXH.

Fig. 7-1 Menu Window

7.1 Parameter setting

Parameters of each channel of PXH are set and changed.

Example 1: Setting parameters of Ch. 2 (Control parameters)

Clicking on [Ch. 2 (Control parameters)] button in the Menu Window (Fig. 7-1) displays

Ch. 2 Control parameter Setting Dialog below.

Ch.2	PID (Co	ntrol parameter) SettingDialog			×
		Parameter name	Value	Unit	^
1	P1	(Proportional band)	5.0	%	
2	11	(Integral time)	240.0	sec	
3	D1	(Derivative time)	60.0	sec	
- 5	ARH1	(Anti - reset windup Upper limit value)	400.0	EU	
6	ARL1	(Anti - reset windup Lower limit value)	400.0	EU	
- 7	SH1	(SV upper limit)	400.0	EU	
8	SL1	(SV lower limit)	0.0	EU	
9	MVH1	(MV upper limit)	105.0	%	
10	MVL1	(MV lower limit)	-5.0	%	
13	DMV1	(MV change ratio limit)	0.0	%	
14	DT1	(Sampling cycle)	5	*10ms	
- 15	HS1	(Hysteresis setting)	1.2	EU	
18	BAL1	(Operation output convergence value)	0.0	%	
19	TC1	(Cycle time of Control output (MV1))	30	sec	
20	REV1	(Control operation setting)	1:REV (Reverse operation)	-	
22	PMV1	(Preset value for control output)	0.0	%	
23	ALP1	(Alpha)	40.0	%	
- 24	BET1	(Beta)	100.0	%	
0	I DA	105 C 115 C 1 C 1	0		1
OK					
			c	ancel	
etting	range : ().0 To 999.9 (%)			

Fig. 7-2 Ch. 2 (Control parameter) Setting Dialog

Upon double clicking on [Value] in the Setting Dialog, you can change the value by direct input or by selection out of pull-down menus.

Example 2: Setting parameters of Ch. 9 (Parameter mask)

Clicking on [Ch. 9 (Parameter mask)] button in the Menu Window (Fig. 7-1) displays Ch. 9 (Parameter mask) list shown below.

	Parameter name	Value	BIT 16	BIT 15	BIT 14	BIT 13	BIT 12
80 DS00	(Parameter mask setting 00)	8000	1:ON	0:OFF	0:OFF	0:OFF	0:OFF
81 DS01	(Parameter mask setting 01)	002E	0:OFF	0:OFF	0:OFF	0:OFF	0:OFF
82 DS02	(Parameter mask setting 02)	0000	0:OFF	0:OFF	0:OFF	0:OFF	0:OFF
83 DS03	(Parameter mask setting 03)	4622	0:OFF	1:ON	0:OFF	0:OFF	0:OFF
84 DS04	(Parameter mask setting 04)	FFFF	1:ON	1:ON	1:ON	1:ON	1:ON
85 DS05	(Parameter mask setting 05)	FFFF	1:ON	1:ON	1:ON	1:ON	1:ON
86 DS06	(Parameter mask setting 06)	FFFF	1:ON	1:ON	1:ON	1:ON	1:ON
87 DS07	(Parameter mask setting 07)	0002	0:OFF	0:OFF	0:OFF	0:OFF	0:OFF
88 DS08	(Parameter mask setting 08)	0002	0:OFF	0:OFF	0:OFF	0:OFF	0:OFF
89 DS09	(Parameter mask setting 09)	0002	0:OFF	0:OFF	0:OFF	0:OFF	0:OFF
90 DS10	(Parameter mask setting 10)	0002	0:OFF	0:OFF	0:OFF	0:OFF	0:OFF
91 DS11	(Parameter mask setting 11)	0002	0:OFF	0:OFF	0:OFF	0:OFF	0:OFF
92 DS12	(Parameter mask setting 12)	0002	0:OFF	0:OFF	0:OFF	0:OFF	0:OFF
93 DS13	(Parameter mask setting 13)	0002	0:OFF	0:OFF	0:OFF	0:OFF	0:OFF
94 DS14	(Parameter mask setting 14)	0002	0:OFF	0:OFF	0:OFF	0:OFF	0:OFF
95 DS15	(Parameter mask setting 15)	007F	0:OFF	0:OFF	0:OFF	0:OFF	0:OFF
96 DS16	(Parameter mask setting 16)	003F	0:OFF	0:OFF	0:OFF	0:OFF	0:OFF
07 0017	(Decemptor mode patting 17)	0524	0-055	0.000	0.055	0.055	1-ON
							OK
Cancel							

Fig. 7-3 Ch. 9 (Parameter mask) Setting Dialog

Double-click on [Value] in the list window, and you can set or change the values. Double-click on [BIT1] to [BIT16], and you can select on the pull-down menu that appears whether the parameter should be displayed or masked.

Notes)

For parameter masking, refer to "User's Manual."

For some templates, the masking cannot be changed. Inputting unsettable value into [Value] automatically corrects the value.

Example 3: Setting parameters of Ch. X (recipe)

Click on [Ch. X (recipe)] in the menu screen (Fig. 7-1), and the following Ch. X (recipe) list window appears.

	Ch.X	(RCP (Recipe) SettingDialog						×
			Parameter name			Value		Unit	1
	1	RCP0	(Recipe designation 1)				0-00	-	
	2	RCP1	(Recipe designation 2)				0-00	-	
	3	RCP2	(Recipe designation 3)				0-00	-	
	4	RCP3	(Recipe designation 4)				0-00	-	
	- 5	RCP4	(Recipe designation 5)				0-00	-	
	6	RCP5	(Recipe designation 6)				0-00	-	
	- 7	RCP6	(Recipe designation 7)				0-00	-	
	8	RCP7	(Recipe designation 8)				0-00	-	
	9	RCP8	(Recipe designation 9)				0-00	-	
	10	RCP9	(Recipe designation 10)				0-00		
Ì			Recipe Parameter			DO (PLTO)	D1 (PL	.T1)	
	****	****			D*0				0
	****	****		-	D*1	0			0
	****	****	-	-	D*2	0			0
	****	****	,	-	D*3	0			0
	****	****		-	D*4	0			0
	****	****	-	-	D*5	0			0
	****	****	,	-	D*6	0			0
	****	****		-	D*7	0			0
	****	****	,	-	D*8	0			0
	****	****	,	-	D*9	0			0
									>
								ОК	
							c	ancel	
Se	Setting range : 0-00 To R-Z9 (-)								

Fig. 7-4 Ch. X (recipe) setting window

Double-click on [Value] at the top of the list window, and you can set or change the values. Enter the value displayed, without "-" (if "201" is entered, "2-01" is displayed).

When recipe allocation is made, a recipe parameter is displayed at the bottom of the window, allowing you to set data for palette selection [D0_(PLT0) to D7_(PLT7)]. Note)

Do not set parameters whose recipe parameter is not displayed for RCP0 to RCP9.

Note that when using the recipe function, if one from RCP0 to RCP9 is newly allocated, the PXH default parameters are automatically inserted into all the data for palette selection.

Do not set PAS3 (Ch. 9-03) for RCP0 to RCP9. Otherwise loader communication between PC and PXH is disabled.

7.2 Menus

(1)

File (F) New (N) Creates a new setting file. Open (O) Opens an existing setting file. Save (S) Saves a value superseding last one into file. Save As (A) Saves a value into file. Print Preview (V) Indicates relevant page as it appears when printed. Print (P) Prints a value. Exit (X) Exits "PXH Loader."

(2) Communication (C)

Upload (U) Uploads a value of the controller. Download (D) Downloads a value of the controller. Tuning (T) While indicating PV/SV/MV with trends, changes SV value and PID parameters.

(3) Help (H)

Version information (A) Displays version information.

* The same operations as above menus are available by buttons on toolbar.

8. How to upload parameters

Parameters can be uploaded (from PXH to PC) by any of 2 ways below.

- On the Work selection Window (Fig. 6-1), select [Upload from PXH], and click on [OK] button. Making sure of contents on the Communication condition setting Dialog, click on [Execution] button. After parameter settings are uploaded, the Menu Window appears.
- (2) On the Menu Window (Fig. 7-1), select menu [Communication (C)]–[Upload (U)]. Making sure of contents on the Communication condition setting Dialog, click on [Execution] button. After parameter settings are uploaded, the Menu Window appears.

Note: A parameter setting that is under processing will be destroyed.

9. How to download parameters

Parameters can be downloaded (from PC to PXH) in the following procedure.

(1) Set a parameter to download by any of 3 methods below.
Set a parameter by [New] in the Work selection Window (Fig. 6-1).
Upload a parameter setting saved in file by [File open] in the Work selection Window (Fig. 6-1).
Upload a parameter from PXH via communication, and change the parameter setting.

(2) On the Menu Window (Fig. 7-1), select menu [Communication (C)]-[Download (D)] to set the Communication condition setting Dialog (Fig. 9-1), and click on [Execution] button.

	📟 Communication condition setting Dialog - Download						
Protocol selection RS485/RS232C Modbus/RTU							
		Value	Unit				
	Port No.		1 -				
	Station No.		1 -				
	Baud rate	3840	O bps				
	Data length		8 Bit				
	Stop bit		1 Bit				
	Parity	bO:O	d -				
		E×	ecution				

Fig. 9-1 Communication condition setting Dialog

After the end of downloading according to messages, the Menu Window (Fig. 7-1) appears.

10. How to save parameter settings into file

Select [File (F)] — [Save (S)/Save As (A)] on Menu Window (Fig. 7-1), parameter settings can be saved in file.

11. Tuning

While checking the control statuses on trend graphs of PV, SV and MV, P.I.D control parameters can manually be adjusted. SV and PID parameter settings can be changed while displaying PV (process value), SV (set value) and MV (manipulating value) on a currently designated Palet.

From this window, auto tuning (start, stop) operations are also available.

On the Menu Window (Fig. 7-1), select menu [Communication (C)] \longrightarrow [Tuning (T)] to set the Communication condition setting Dialog (Fig. 11-1), and click on [Execution] button.

 📟 Communication condition setting Dialog - Tuning							
Protocol selection RS485/RS232C Modbus/RTU							
	Value		Unit]			
Port No.		1	-				
Station No.		1	-				
Baud rate		38400	bps				
Data length		8	Bit				
Stop bit		1	Bit				
Parity		O:Odd	-				
		Exec	ution				
		Cai	ncel				

Fig. 11-1 Communication condition setting Dialog

After operations according to messages, the Tuning Dialog (Fig. 11-2) appears.

📰 Tuning	Dialo	g											X
PvnF 400.00											100%	SV: PV: MV:	20.00 25.83 -5.0
PvnB 0.00	Ω	I 270	I 240	I 210	1	1	I 120	1	l 100	1			
Delett		zification	240	210		гос Г	120		Value .	11-3			
Palett	te spe	cification	ILUC	AL	-	-	D1		Value 5.0	Unit	-		
Time	axis		Sca	le Fixation	-	ŀ	<u>- 1</u>		40.0	70 Sec	-		
					_	ŀ	D1	2	60.0	sec			
							AT		0:OFF	-2			
							ATP1		0:NRML				
							SV_L1		20.00	EU			
							ALP1	0.	100.0	%		Paramete	er writing
						Ŀ	BEII		0.0	%		Ba	ck
Setting rar													

Fig. 11-2 Tuning Dialog

The graph field displays trend graphs for PV, SV and MV.

The scale of the graph field is automatically set. Either "Scale fixation" mode or "Double" mode can be selected for time axis.

Scale fixation mode:	Displays the time axis (0 to 300 sec.)	After the maximum value is reached,
	the data is forwarded in order.	
Double mode:	When displayed data reaches the left e	nd, display is continued with the time
	axis doubled (max. display: 4800 sec.)	After the maximum value is reached
	the data is forwarded in order.	

The palette specification field displays the palette No. currently selected or local selection status. A desired palette can be selected on the palette specification field.

Double click on [Value] in the window, and you can change the value by direct input or by selection out of pull-down menus.

12. Print

A parameter list will be printed by Menu Window (Fig. 7-1) [File (F)] — [Print (P)].

13. How to save print preview in CSV format

Click "CSV save" in the print preview window (Fig. 13-1), and you can save the contents displayed on the print display window in a CSV-format file.

📟 Print previewDialog		
<u>u (</u> 1 <u>8</u>) <u>u Q (</u> <u>3</u>)		
	CSV save Print	Cancel

Fig. 13-1 Print preview window

Note)

This CSV-format file is different from saved on the menu window (Fig. 7-1). Saved files cannot be opened on the parameter loader.

14. Exit

Select Exit from the [File (F)] menu. Or click the exit button on the upper right-hand corner of the window to exit "PHXLoader."

15. Precautions

- (1) The software is provided free of charge as sample application for communication of digital controller (PXH), and is not intended for us to guarantee the operation of program. Supply of substitute for CD-ROM damaged or otherwise troubled or request for up-version will be with charge. Latest program versions will be reported occasionally on our website.
- (2) This software cannot be used if a template number that cannot be selected by the parameter loader is selected on PXH.
- (3) For details of parameter setting, refer to the User's Manual.
- (4) Input type (PV1T, PV2T) can be selected out of types given in the table below according to the input unit (PV1U, PV2U).

Input unit (PV1U/PV2U) setting	Input type (PV1T/PV2T) indicated as choices
C or F	TC (thermocouple)
	Pt (resistance bulb) only
non	TC (thermocouple)
	Pt (resistance bulb)
	Voltage
	Current

Table 15-1 Input types

- (5) If any parameter of Ch. 8, Ch. 9, Ch. G, Ch. X was changed, PXH must be restarted (reset). On this loader, if downloading is executed after changing any parameter of Ch. 8, Ch. 9, Ch. G, Ch. X, a message appears prompting you to admit resetting and the PXH will automatically be reset.
- (6) While downloading after a change of scale setting, PV reading may be different from a true value temporarily. However, it is not a failure. A correct reading will be resumed after the end of downloading.
- LoC parameter of Ch.1 has a function of inhibiting downloading by communication. If LoC on PXH was set at any of 3 to 5, downloading or uploading automatically changes the LoC value of 0 to 2. If you use LoC at any of 3 to 5, carry out setting manually.
- (8) Changing the setting (SV_L1, SV1 to SV7) on the Tuning Dialog does not change the setting value of Ch. 2 (SV_L1) nor Ch. 3 (SV1 to SV7). Check the settings of Ch. 2 (SV_L1) and Ch. 3 (SV1 to SV7) before you execute "download" after the end of tuning.

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