



Instruction Manual

**PARAMETER LOADER
FOR PAPERLESS
RECORDER**

TYPE: PHL / PHU / PHF

WARNING

- If an error or improper operation occurs in our product, or customer-made programs should be found defective, protection and safety circuits, etc should be provided for safety of the system to be used. In addition, safety measures should be taken against personal injury or fatal accident to the system.
- A part or all of the information contained herein is prohibited from duplication without Fuji's written consent.
- This manual is subject to change without previous notice.
- Although we always keep track of the information contained herein to assure accuracy, Fuji will not be responsible for any damage to the system due to mistakes, skip or misuse in writing
- Be sure to read the Readme.text file included in CD-ROM.
- Depending on the environment to be used and the usage, it may not operate normally.
- Please note that operation except the Personal Computer which made by maker, such as self-assembled PC and so on, cannot be guaranteed.

(Note) Windows 2000/XP are registered trademarks of Microsoft Corporation.

Request

- It is prohibited to transfer part or all of this manual without Fuji Electric's permission in written format.
- Description in this manual will be changed without prior notice for further improvement.

©Fuji Electric Systems Co., Ltd. 2004

Issued in March, 2004
Rev. 1st edition February, 2005
Rev. 2nd edition December, 2005
Rev. 3rd edition January, 2007

CONTENTS

1.	OUTLINE.....	1
1.1	Foreword.....	1
1.2	Parameter loader for paperless recorder.....	1
1.3	Contents of package.....	1
1.4	Recommended operating environment.....	1
1.5	Installing the parameter loader for paperless recorder.....	2
1.6	Installing USB communication driver.....	2
1.7	Uninstalling the parameter loader software for paperless recorder.....	7
1.8	Cautions.....	7
2.	BASIC OPERATION.....	8
2.1	Start.....	8
2.2	Table of setting channel display.....	9
2.3	Setting channels.....	14
2.3.1	Copying the channel set.....	19
2.4	Setting math channels.....	21
2.4.1	Formula setting.....	22
2.4.2	Copying the math channel set.....	23
2.5	Setting the main unit.....	24
2.5.1	DI function setting (option).....	25
2.6	Display setting.....	26
2.6.1	Display setting.....	26
2.6.2	Setting channels.....	27
2.6.3	Setting message.....	27
2.6.4	Unit coding.....	28
2.7	Ethernet communication setting.....	29
2.8	E-mail communication setting.....	30
2.8.1	E-mail trigger setting.....	31
Appendix.1	Example of setting parameters to be printed out.....	33

1. OUTLINE

1.1 Foreword

This instruction manual describes installation and operation for the parameter loader of the paperless recorder. Read it carefully before use.

1.2 Parameter loader for paperless recorder

Connect the parameter loader (hereafter referred to as loader) to the paperless recorder using commercially available USB cable or LAN cable, and referencing (uploading), editing, and setting (downloading) of each parameter of the paperless recorder can be made. Connect USB miniB type male connector to the paperless recorder.

Note: When program version of PHL is V07L to V10L, available dedicated cable (optional) is required to use the loader.

1.3 Contents of package

The following items are packaged with the product.

- CD-ROM for installation: 1
- Instruction manual which is installed to above CD-ROM

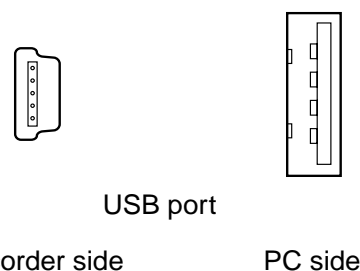
1.4 Recommended operating environment

- Microsoft Windows 2000 or XP.
- Hard disk with a free capacity of 30MB or more
- RAM with 64MB or more
- USB port
- USB cable (USB miniB)
- LAN port (when provided with Ethernet option)
- LAN cable (when provided with Ethernet option)

Note: 1) Operation by the self-made AT compatible machine and the remodeling machine is not secured.

Trouble might be caused in operation in a part of AT compatible machine or OS.

- 2) Operation by Windows 95/98/Me/NT is not secured.
- 3) When program version of PHL is V07L to V10L, the hardware requirements of the loader are as follows.
 - RS-232C serial port (D-sub 9 pin)
 - Communication cable dedicated to parameter loader (Option: PHZP0201)



1.5 Installing the parameter loader for paperless recorder

- 1) If other application software programs are open, terminate all of them.
- 2) If the programming loader has been already installed, open “Add/Remove Programs” on Control Panel and delete the parameter loader.
- 3) Set CD-ROM in the personal computer drive.
- 4) Execute “top_page.html” saved at root folder in the CD-ROM
- 5) Follow the prompts displayed on the screen.
- 6) Please install the main body of the parameter loader.

A message is displayed, prompting you to verify that “Parameter loader setup is complete”.

Now, the Parameter Loader installation is completed.

1.6 Installing USB communication driver

The driver can be installed on Windows XP as follows for example.

- 1) Connect the USB port of the paperless recorder whose power has been turned on and a running PC with a USB cable.
- 2) The message “Found New Hardware” and then the driver installation wizard appear on the computer. Click the [Next] button.



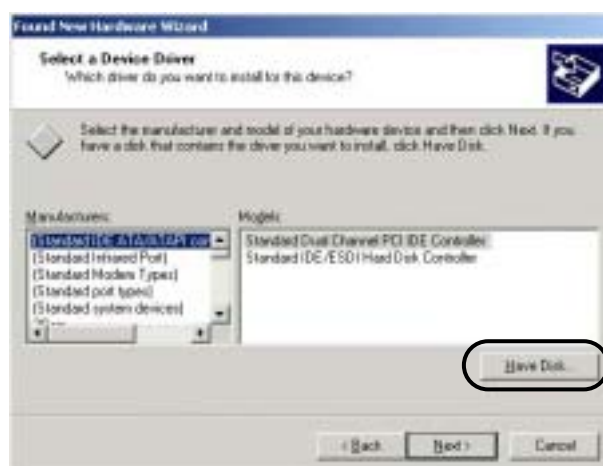
- 3) When the dialog box below is displayed, select [Display a list of the known drivers for this device so that I can choose a specific driver] and click the [Next] button.



- 4) The dialog box below is displayed. Select [Other Devices] and click the [Next] button.



- 5) The dialog box below is displayed. Click [Have Disk].



- 6) The [Install From Disk] dialog box is displayed. Click the [Browse] button.



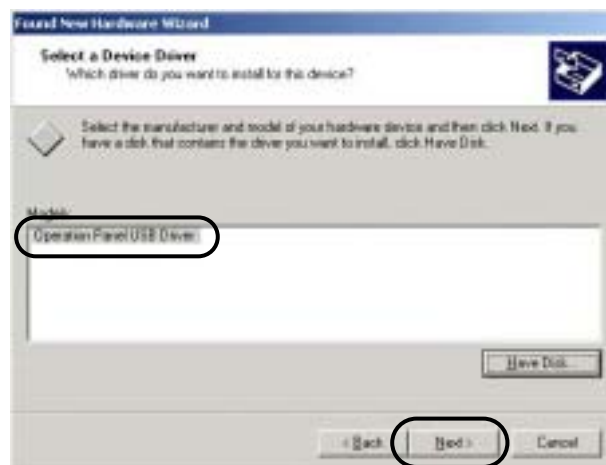
- 7) The USB driver "OP-U.inf" is automatically stored in the "inf" folder within the install folder ("ParameterLoader" for example) of the parameter loader. Select the "OP-U.inf" file and then click "Open."



- 8) The previous dialog box is displayed again. Check the path shown under [Copy Manufacturer's Files From:] and click the [OK] button.



- 9) The dialog box below is displayed. Check that [Operation Panel USB Driver] is shown under [Models:]. Click the [Next] button.



10) The driver installation starts.

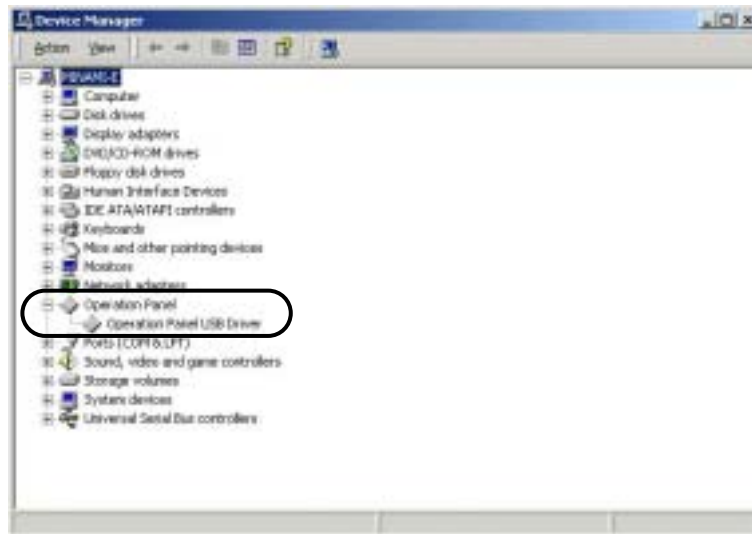


11) The dialog box below is displayed on completion of installation. Click the [Finish] button.



Recognition of USB Driver

When the driver has been installed successfully and the paperless recorder and the computer are connected with a USB cable, the [Device Manager] window shows “Operation Panel - Operation Panel USB Driver.”



This will disappear when the paperless recorder and the computer are disconnected.

If [Other Device] or [?] is shown even while their connection via USB is maintained, the USB driver may not be recognized. If this happens, uninstall the USB driver once and reinstall it.

1.7 Uninstalling the parameter loader software for paperless recorder

Follow Windows operation.

In case of installation of new loader software, you should delete current loader software which you use before installation of new loader software.

1.8 Cautions

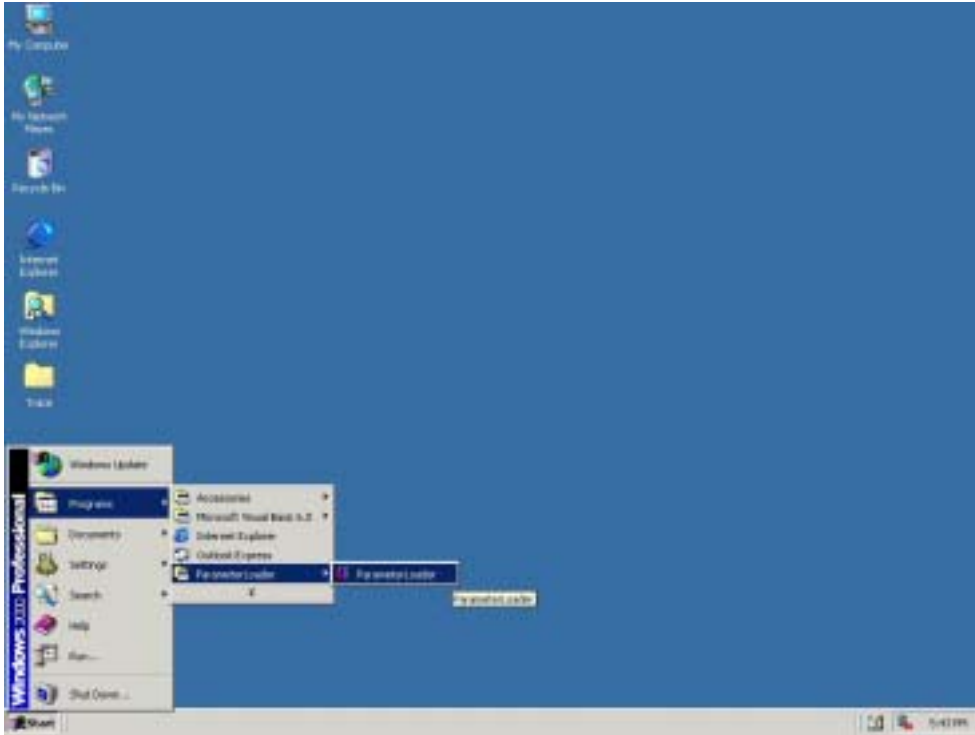
When operating the Loader, be careful of the following items:

- Before starting the paperless recorder, be sure to assure that the Loader setting is reflected to the paperless recorder.
- For the communication setting for the paperless recorder (“Main Unit Set” → “System Setting”), the MODBUS communication function should be set to ON. After the MODBUS communication function has been switched from OFF to ON, turn OFF the power once, and then turn it ON.
- The Loader cannot use more than 1 window at the same time.
If more than 1 window is open, leave only a single window open and close all of other windows (this can be checked on the Window menu).
- The Loader is used for the paperless recorder only.
- Initial values on each Loader screen may be different from those of the paperless recorder main unit.
- Whenever you want to write the setting data on parameter loader into paperless recorder, please return the display of paperless recorder to Display Mode such as Real Time Trend Screen. Don't display Parameter Setting Screen, or this loader software may miss to write into the paperless recorder.
- At this loader, some parameters which do not exist on paperless recorder may be displayed. But the parameter which doesn't exist in the paperless recorder isn't written.
- **During paperless recorder is recording or totalizing, it is impossible to write into paperless recorder from this parameter loader.**

2. BASIC OPERATION

2.1 Start

Click “Programs” ⇒ “Parameter Loader” ⇒ “Parameter Loader” from the Start menu.



It is displayed such as following screen.

Note: Whenever, this screen is for 18th inputs. It doesn't depend on the input points.

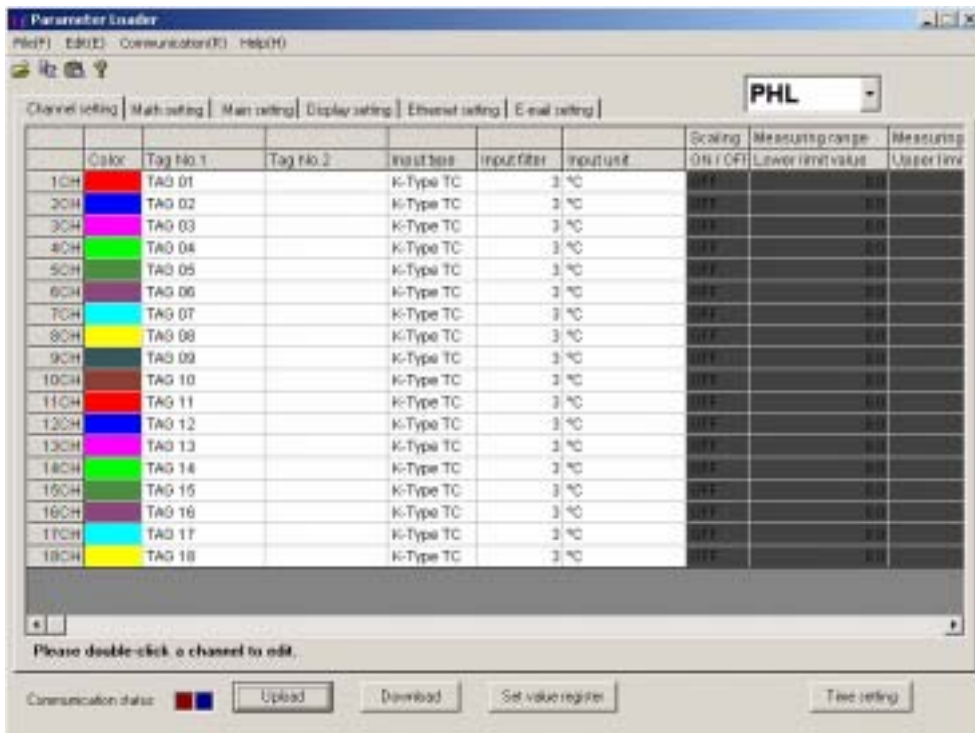


Table of setting channel display

2.2 Table of setting channel display

The following is the screen when PHL is selected.

(7) File menu
 (8) Copy the setting value
 (2) Communication setting
 (1) Selection the model setting

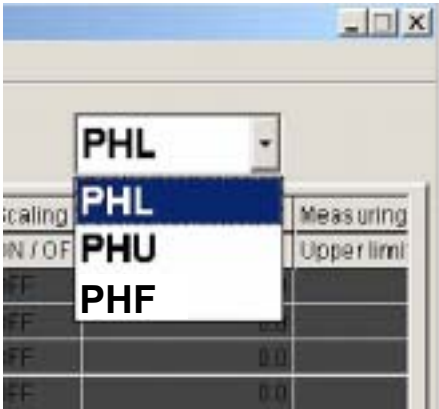
Color	Tag No.1	Tag No.2	Input type	Input filter	Input unit	Scaling ON / OFF	Measuring range Lower limit value	Measuring range Upper limit
1CH	TAG 01		K-Type TC	3	°C	OFF	0.0	0.0
2CH	TAG 02		K-Type TC	3	°C	OFF	0.0	0.0
3CH	TAG 03		K-Type TC	3	°C	OFF	0.0	0.0
4CH	TAG 04		K-Type TC	3	°C	OFF	0.0	0.0
5CH	TAG 05		K-Type TC	3	°C	OFF	0.0	0.0
6CH	TAG 06		K-Type TC	3	°C	OFF	0.0	0.0
7CH	TAG 07		K-Type TC	3	°C	OFF	0.0	0.0
8CH	TAG 08		K-Type TC	3	°C	OFF	0.0	0.0
9CH	TAG 09		K-Type TC	3	°C	OFF	0.0	0.0
10CH	TAG 10		K-Type TC	3	°C	OFF	0.0	0.0
11CH	TAG 11		K-Type TC	3	°C	OFF	0.0	0.0
12CH	TAG 12		K-Type TC	3	°C	OFF	0.0	0.0
13CH	TAG 13		K-Type TC	3	°C	OFF	0.0	0.0
14CH	TAG 14		K-Type TC	3	°C	OFF	0.0	0.0
15CH	TAG 15		K-Type TC	3	°C	OFF	0.0	0.0
16CH	TAG 16		K-Type TC	3	°C	OFF	0.0	0.0
17CH	TAG 17		K-Type TC	3	°C	OFF	0.0	0.0
18CH	TAG 18		K-Type TC	3	°C	OFF	0.0	0.0

Please double-click a channel to edit.

Communication status: ■ ■

(3) Upload setting value from recorder
 (4) Download setting value to recorder
 (5) Register setting value
 (6) Time setting to recorder

(1) Selection the model setting
 Model to be set by parameter loader can be selected.



Display contents and setting range of each model are as tabled below.

Model	PHL	PHU	PHF
Channel setting	18 channels (ch 1 to 18)	36 channels (ch 1 to 36)	6 channels (ch 1 to 6)
Math channel setting	12 channels (ch 19 to 30)	36 channels (ch 37 to 72)	0 channels (None)
DI setting	10	16	5
DO setting	28	38	10
Display group setting	4 groups	8 groups	1 group
Channel color setting	Provided	Provided	Not provided
Bar graph / analog meter selection	Provided	Provided	Not provided
Message setting	Provided	Provided	Not provided
Totalize setting	Provided	Provided	Not provided
F value calculation setting	Provided	Provided	Not provided
Modbus communication setting	Provided	Provided	Not provided

(2) Communication setting

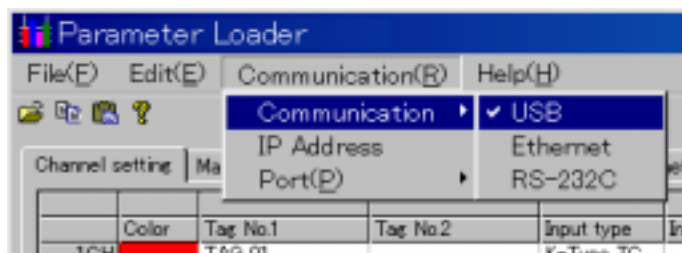
The setting on the communication with the paperless recorder can be made.

a) Communication

The communication method with the paperless recorder can be selected from USB, Ethernet, and RS-232C.

Note:

- 1) USB or Ethernet communications cannot be conducted if the program version of PHL is V07L to V10L.
- 2) RS-232C communications cannot be conducted if the program version of PHL is V16L or later. Note that to conduct Ethernet communications, optional Ethernet communication board is necessary.



b) IP Address

Setting is necessary to conduct Ethernet communications with the paperless recorder.

IP Address and Station No. of the paperless recorder can be set.

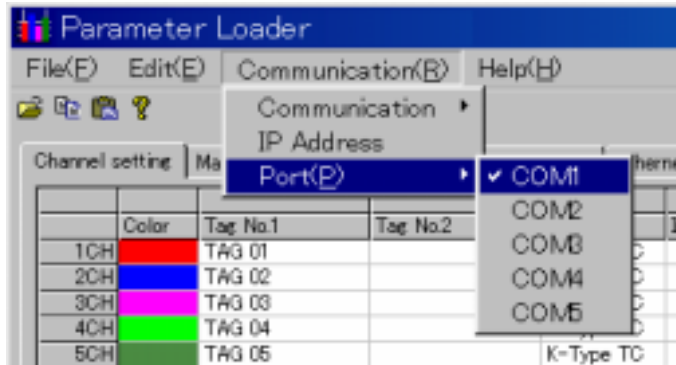


c) Port

Setting is necessary to conduct RS-232C communications with the paperless recorder.

The communication port of the PC used to communicate with the paperless recorder can be set. This function can change communication port of PC which communicates with paperless recorder. At starting of this loader, COM1 is selected as communication port. Set the port number that you want to use at first.

At the executing screen, click [Com(R)] — [Port(P)] and select using port. Normally, COM1 is selected.



(3) Upload setting value from paperless recorder

It is available to upload all the setting such as channel setting, math channel setting, main setting, display setting and so on from paperless recorder.

(4) Download setting value to paperless recorder

It is available to download all the setting such as channel setting, math channel setting, main setting, display setting and so on to paperless recorder.

Note: 1) Download prohibit during recording or totalizing.

2) Be careful that if you don't register set value, your setting isn't registered, so when you turn off and on the paperless recorder, setting value returns before you change.

(5) Register setting value

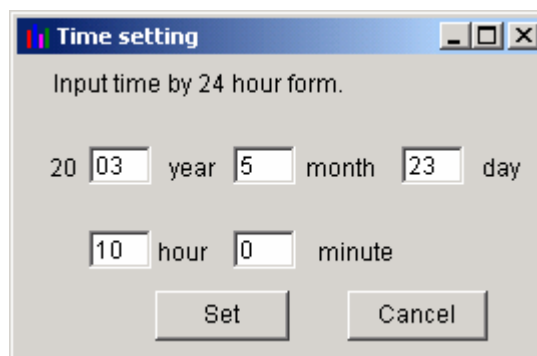
It is available to register setting value to Flash ROM.

(6) Time setting to paperless recorder

It is available to change time setting of paperless recorder. Press [Time setting] button, and screen as shown below appears. Set the time that you want to change. And then press [Change] button.

Note: 1) This setting prohibit during recording or totalizing.

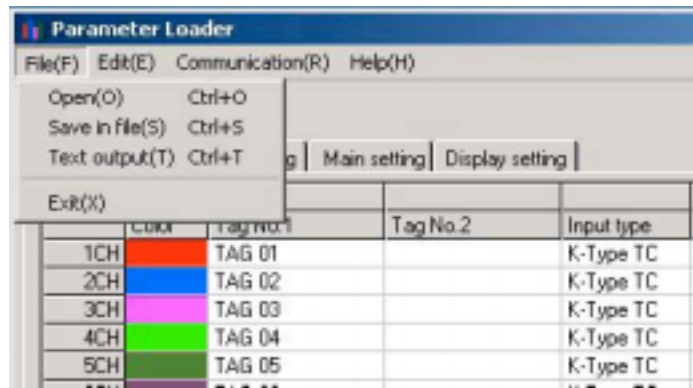
2) This setting is not necessary to register set value.



Screen of time setting

(7) File menu

This menu, you can use functions as shown below.



a) Open

Paperless recorder parameter setting files stored in your PC can be opened.
Parameter setting files stored in the paperless recorder can also be opened.

b) Save

Parameters currently being set can be stored in your PC.

Extension for parameter setting file to be created differs according to model setting.

When PHL is selected: *****.PHL

When PHU is selected: *****.PHU

When PHF is selected: *****.PHF

Substitute ***** with an arbitrary name. Select a file name consisting of alphanumeric characters with 7 uppercase characters or less when a parameter setting file is to be read from a compact flash card to the paperless recorder.

Example:

OK: PARA00.PHL, P123456.PHL NG: Para00.PHL, P1234567.PHL

c) Text output

Output setting value as text data..

Please refer to attached “Appendix. 1: Example of setting parameters to be printed out.”

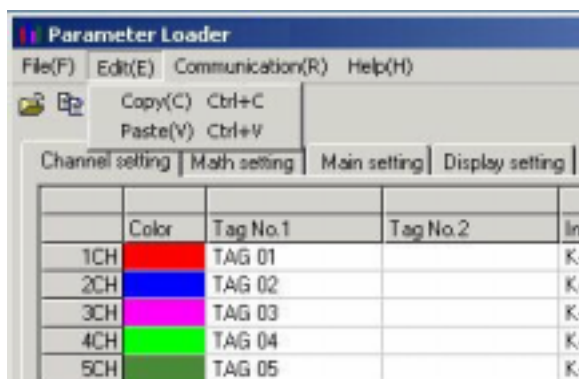
d) Exit

Exit this menu.

Note: 1) If you change setting value of recorder, press [Set value register] before exit this software, or your setting isn't registered, so when you turn off and on the recorder, setting value returns before you change.

2) If you want to use setting value on another day, it is recommended to save the setting value file of recorder before exit this software.

-
- (8) Copy the setting value
Copy the setting value such as channel setting, main setting, display setting and so on.
Click in line of original data and press [Copy]. Click in line that you want to copy., and then press [Paste].

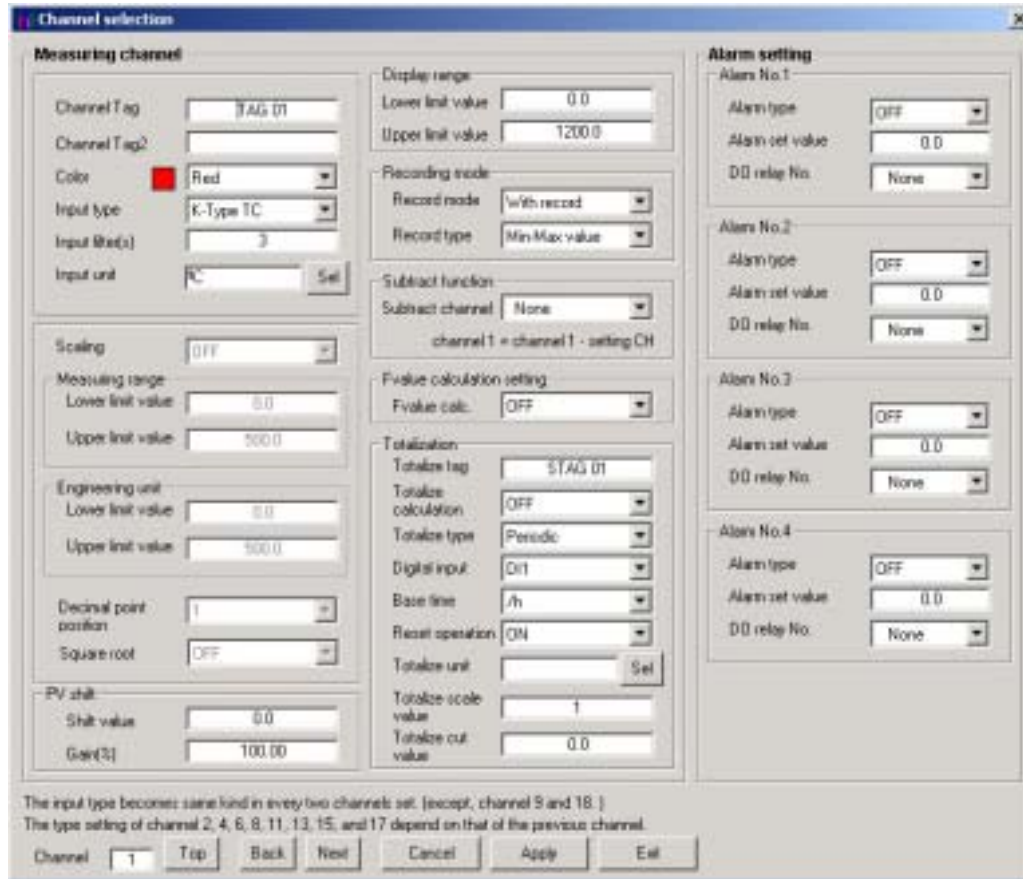


2.3 Setting channels

Set the parameter regarding to input, calculation, alarm, display and record of each channel.

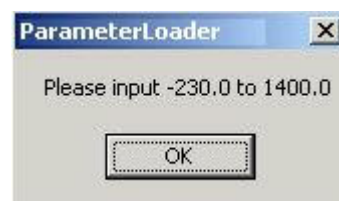
On “Table of setting channel display”, double-click the channel you want to change.

The following is the screen when PHL is selected for model setting.



And then channel setting display appears.

- * Items that can be set differ according to model setting.
(The above is the screen when PHL is selected for model setting.)
- * Number of channels differs according to model setting.
It is available to set till 18ch whichever PHL is 9 or 18 input points.
It is available to set till 36ch whichever PHU is 9, 18, 27 or 36 input points.
It is available to set till 6ch whichever PHF is 3 or 6 input points.
- * There are some screen to be able to display up to 7 characters as channel tag in spite of setting is available up to 8 characters. So don't set 8 characters as channel tag.
- * When you set out of the range, message as shown below appears.



Message in recording range

- * Press [Apply] after changing channel setting, or your setting isn't registered, so when you turn off and on the recorder, setting value returns before you change.
 - * When setting model is PHF, channel color setting item is not displayed.
 - * Basically input type setting is the same for every two channels.
- (1) When changing the input type of channel, setting may be limited by the input type of channel just before the selected channel.

When PHL is selected:

When PHL is selected, only the same input type as that of the channel just before the selected channel can be set for channels 2, 4, 6, 8, 11, 13, 15 and 17.

However, input type can be selected regardless of other channels for only channels 9 and 18.

When PHU is selected:

When PHU is selected, only the same input type as that of the channel just before the selected channel can be set for channels 2, 4, 6, 8, 11, 13, 15, 17, 20, 22, 24, 26, 29, 31, 33 and 35.

However, input type can be selected regardless of the other channels for only channels 9, 18, 27 and 36.

When PHF is selected:

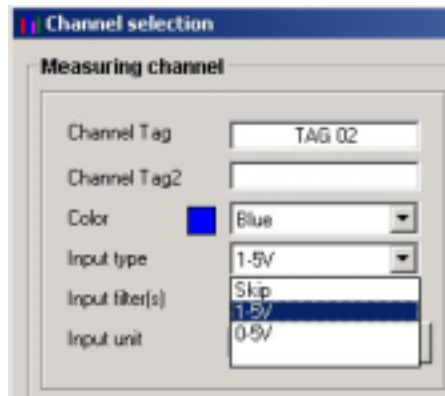
When PHF is selected, only the same input type as that of the channel just before the selected channel can be set for channel 5.

Input type can be selected regardless of other channels for the channels other than channel 5.

Input type is shown as follows:

Input category	Input type
Thermocouple, 50mV	K-Type TC, E-Type TC, J-Type TC, T-Type TC, R-Type TC, S-Type TC, B-Type TC, N-Type TC, W-Type TC, L-Type TC, U-Type TC, PN-Type TC, 50mV
Resistance bulb	Pt100Ω, JPt100Ω, Ni100Ω, Pt50Ω, Cu50Ω
500mV	500mV
5V	1 to 5Vdc, 0 to 5Vdc

For example, when 1-5V is selected as input type of channel 1 in PHL, only 1-5V, 0-5V or Skip can be selected as input type for channel 2 as follows.



Example: Setting input type of each channel

	Input type	Input group	Explanation
Channel 1	K-Type TC	Thermocouple, 50mV	It is available to set any type of TC or 50mV.
Channel 2	T-Type TC		
Channel 3	1 to 5V	5V	
Channel 4	0 to 5V		
Channel 5	Pt100	Resistance bulb	It is available to set Pt100Ω or JPt100Ω.
Channel 6	JPt100		
Channel 7	500mV		
Channel 8	500mV		
Channel 9	J-Type TC	Thermocouple, 50mV	It is available to set any input type to channel 9.
Channel 10	K-Type TC	Thermocouple, 50mV	It is available to set any type of TC or 50mV.
Channel 11	50mV		
Channel 12	Skip	5V	It is available to set skip under any input type.
Channel 13	1 to 5V		
Channel 14	Pt100	Resistance bulb	
Channel 15	Skip		
Channel 16	Skip	500mV	
Channel 17	500mV		
Channel 18	50mV	Thermocouple, 50mV	It is available to set any input type to channel 18.

(2) When input type of channel is changed, initialization of next channel may be required:

When PHL is selected:

If PHL is selected, initialization of next channel input type may be required when changing the input type for channels 1, 3, 5, 7, 10, 12, 14 and 16.

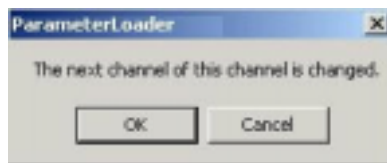
When PHU is selected:

If PHU is selected, initialization of next channel input type may be required when changing the input type for channels 1, 3, 5, 7, 10, 12, 14, 16, 19, 21, 23, 25, 27, 30, 32 and 34.

When PHF is selected:

If PHF is selected, initialization of next channel input type may be required when changing the input type for channel 4.

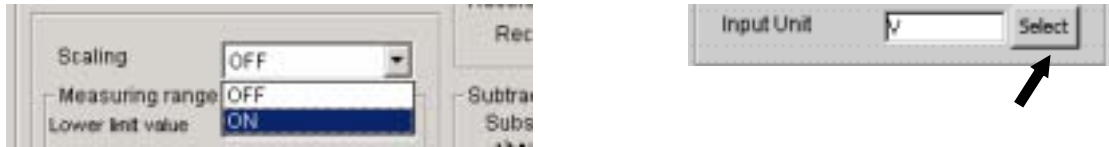
When initialization of next channel is required, push “Apply” button to display the next message screen.



At this screen, if you press [OK] button, the input type of next channel is initialized to the same input type of current displayed channel. In case of 50mV, the next channel becomes K-type TC.

In case of resistance bulb, the next becomes Pt100Ω.

- * When you set input unit, set ON the “Scaling” at first. And then press “SELECT” key. In case of Thermocouple or Resistance bulb input, it is available to select either Celsius or Fahrenheit. And the others unit are not displayed.



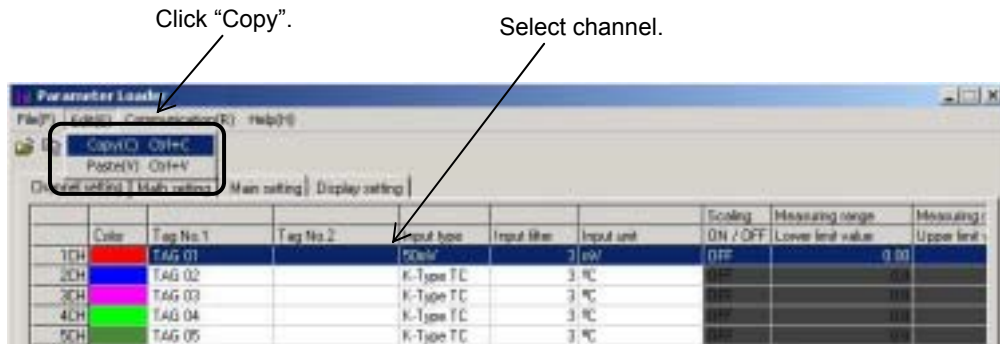
The Unit Select screen appears. On the screen that is displayed, click a unit and press the “Apply” button. Note that the unit cannot be selected without pressing the “Apply” button.



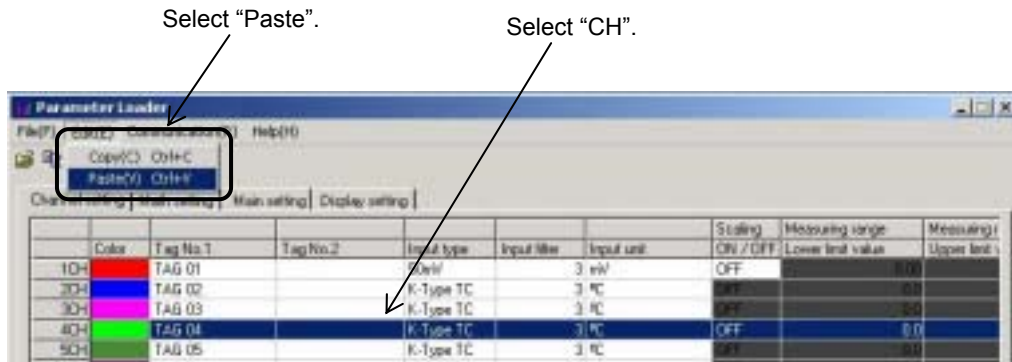
Example: At voltage input and scaling ON

2.3.1 Copying the channel set

This screen allows you to copy one or more set values from one channel to another. Move the cursor to CH on the Table of Setting Channel display, and click it (channel selection). Click “Edit” ⇒ “Copy”.



Move the cursor to CH where you want to paste channel settings and click it (Channel selection). Click “Edit” ⇒ “Paste”.



Next, the following message appears, prompting you to select the option.

Click “OK” when you want to copy the channel setting.

If the input type is different between current type and new one, paperless recorder works such as below.

(1) Copying of channel setting in PHL

1) When copying is made to 1 to 8, and 10 to 17 channels in PHL:

The same input type (*2) is used for the pair channel (*1).

(*1: 1ch and 2ch, 3ch and 4ch, 5ch and 6ch, 7ch and 8ch, 10ch and 11ch, 12ch and 13ch, 14ch and 15ch, and 16ch and 17ch are the pair channels.)

2) When copying is made to 9ch and 18ch:

Channels other than 9ch and 18ch do not change.

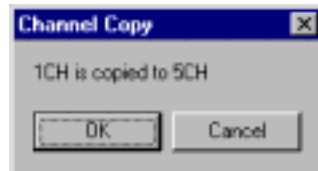
(2) Copying of channel setting in PHU

1) When copying is made to 1 to 8, 10 to 17, 19 to 26, and 28 to 35 channels:

The same input type (*2) is used for the pair channel (*1).

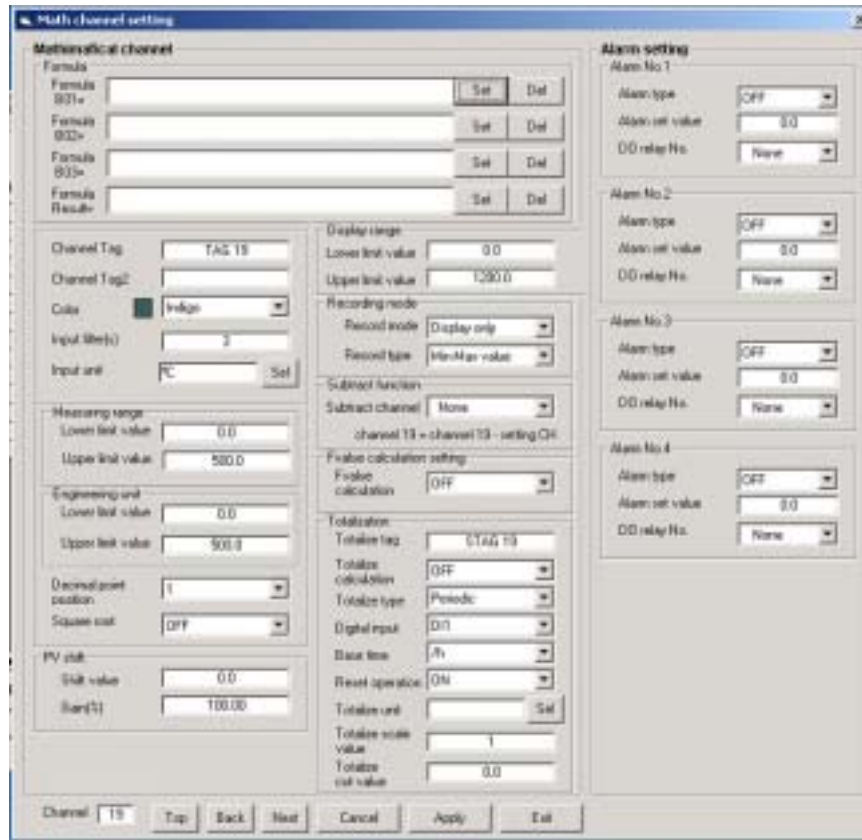
(*1: 1ch and 2ch, 3ch and 4ch, 5ch and 6ch, 7ch and 8ch, 10ch and 11ch, 12ch and 13ch, 14ch and 15ch, 16ch and 17ch, 19ch and 20ch, 21ch and 22ch, 23ch and 24ch, 25ch and 26ch, 28ch and 29ch, 30 and 31ch, 32ch and 33ch, and 34ch and 35ch are the pair channels.)

-
- 2) When copying is made to 9ch, 18ch, 27ch and 36ch:
Channels other than 9ch, 18ch, 27ch and 36ch do not change.
- (3) Copying of channel setting in PHF
- 1) When copying is made to 4ch and 5ch:
The same input type is used for both 4ch and 5ch.
- 2) When copying is made to 1, 2, 3 and 6ch:
Channels other than 1ch, 2ch, 3ch and 6ch do not change.



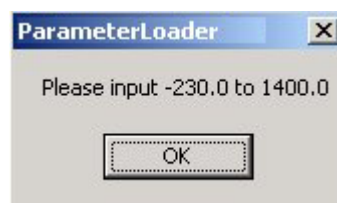
2.4 Setting math channels

Set the parameter regarding to formula, calculation, alarm, display and record of each math channel. On “Table of setting math channel display”, double click the channel you want to change.



And then math channel setting display appears.

- * When setting model is PHF, math channel setting screen is not displayed.
- * Number of math channels differs according to model setting.
When PHL is selected : It is available to set till 12 channels between ch19 and ch30.
When PHU is selected : It is available to set till 36 channels between ch37 and ch72.
- * There are some screen to be able to display up to 7 characters as channel tag in spite of setting is available up to 8 characters. So don't set 8 characters as channel tag.
- * When you set out of the range, message as shown below appears.

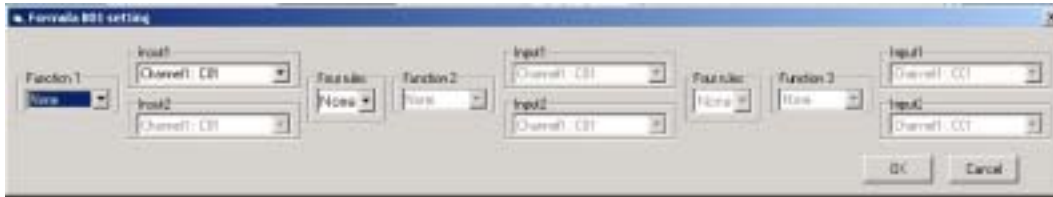


Message in recording range

- * Press [Apply] after changing channel setting, or your setting isn't registered, so when you turn off and on the recorder, setting value returns before you change.

2.4.1 Formula setting

Please click the [Set] button in the column of formula of Math channel setting to set the formula.



The Formula setting screen appears.

* Please select the operational expression and the value respectively, push the [OK] button, and fix it.

<List of functions that can be used for Formula setting>

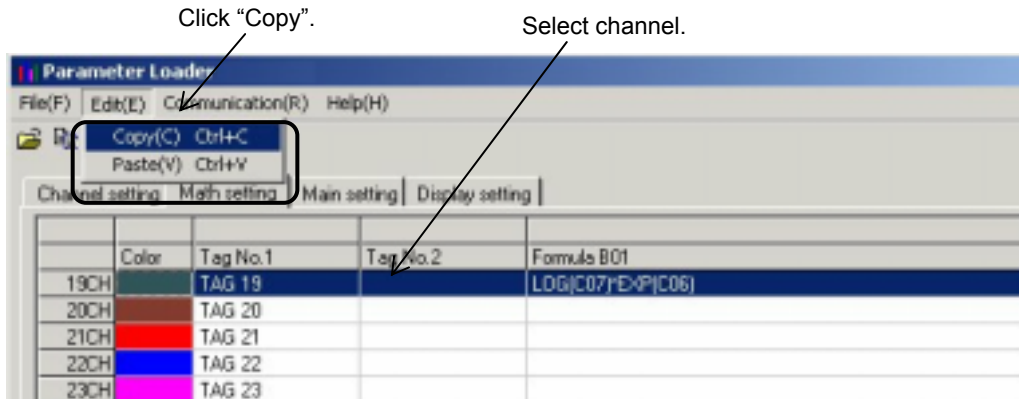
Grammar	Operation	Explanation
None	No operation	Argument is used with no operation performed.
ABS(A)	Absolute value	Finds the absolute value of input A.
POW(A,B)	Power	Finds the value of input A to "input B"th power.
SQR(A)	Square root	Finds the square root of the value of input A.
LOG(A)	Common logarithm	Finds the common logarithm of the value of input A.
LN(A)	Natural logarithm	Finds the natural logarithm of the value of input A.
EXP(A)	EXP	Finds the exponentiation of the value of input A with base "e."
RH(A,B)	Humidity	Finds the relative humidity with input A assumed to represent dry-bulb temperature and input B wet-bulb temperature.
MAX(A,B)	Maximum (between channels)	Compares input A and B and finds the larger value.
MIN(A,B)	Minimum (between channels)	Compares input A and B and finds the smaller value.
H-P(A)	Maximum (time)	Finds the maximum value of input A within a certain period of time.
L-P(A)	Minimum (time)	Finds the minimum value of input A within a certain period of time.
AVG(A)	Average	Finds the average value of input A within a certain period of time.
SUM(A)	Summation	Finds the sum of input A within a certain period of time.

<List of arguments (input) value that can be used for Formula setting>

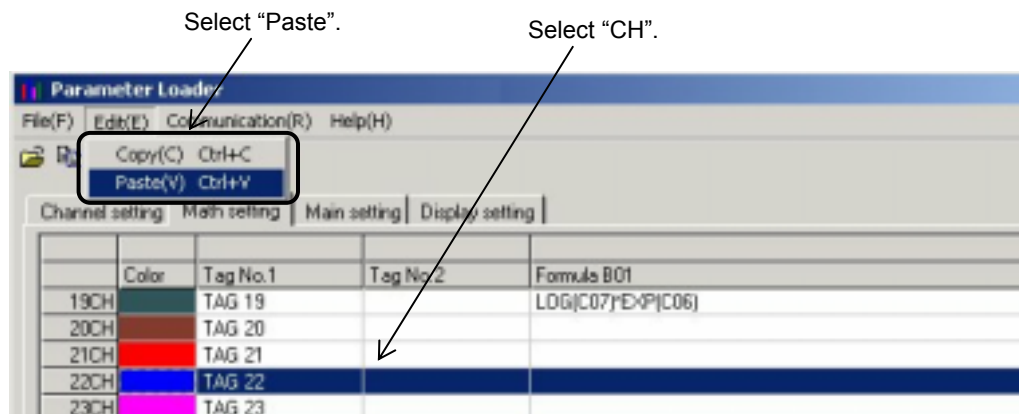
Argument	Explanation	Example
Channel	Input channel	C01
Totalize	Totalize channel	T01
DI	Digital input	D01
Communication	Communication input	M01
Constant	Constant	K01
Temporary data	Result of previous operation	B01

2.4.2 Copying the math channel set

This screen allows you to copy one or more set values from one channel to another. Move the cursor to CH on the Table of Setting Channel display, and click it (channel selection). Click “Edit” ⇒ “Copy”.



Move the cursor to CH where you want to paste channel settings and click it (Channel selection). Click “Edit” ⇒ “Paste”.

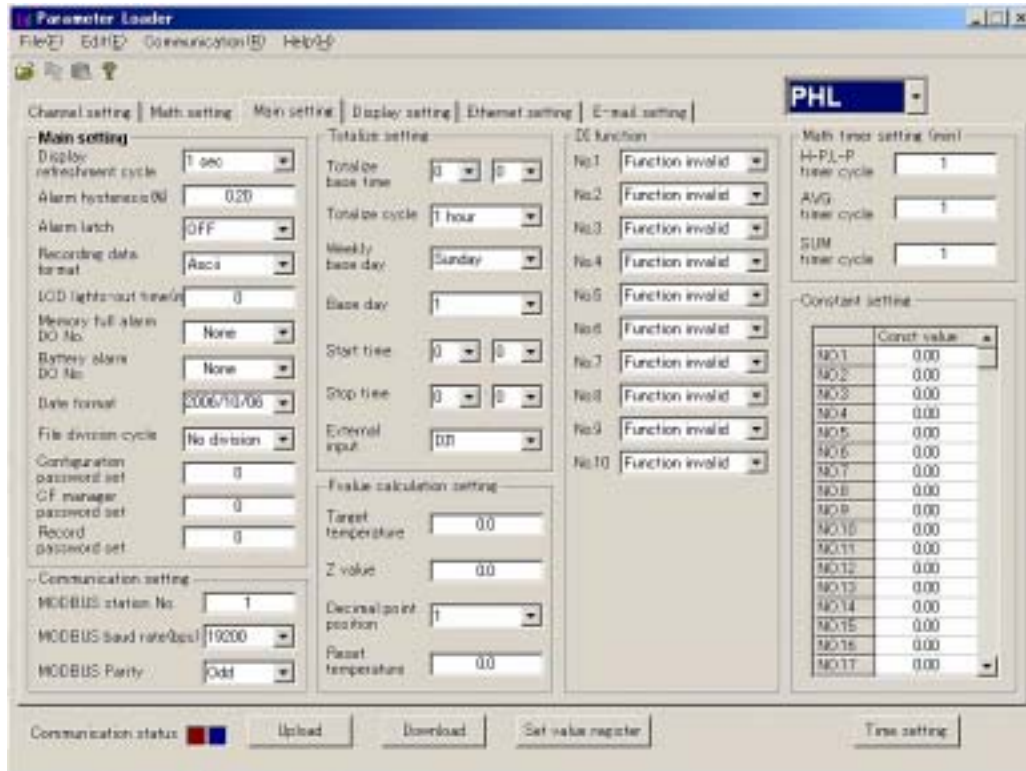


Next, the following message appears, prompting you to select the option. Click “OK” when you want to copy the channel setting.

2.5 Setting the main unit

This screen allows you to set the recorder main unit.

Move the cursor to MAIN UNIT on the Table of Setting Channel display, and click it.



The Main unit set screen appears.

- * Items that can be set differ according to model setting. (The above is the screen when PHL is selected for model setting.)
- * If values are entered over the specified range, the following message appears.



Alarm Hysteresis message

2.5.1 DI function setting (option)

The DI function allows you to accept the ON/OFF input from external devices connected to external terminals. Number of DI input points differ according to model setting.

When PHL is selected: DI1 to DI10 (10 points)

When PHU is selected: DI1 to DI16 (16 points)

When PHF is selected: DI1 to DI5 (5 points)



Note:

When PHL is selected:

DI1-DI5 cannot be used because DI (external control unit) option cannot be provided when the input point is 18 points.

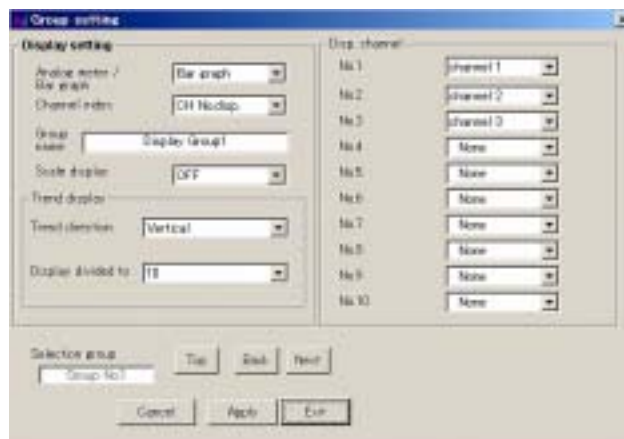
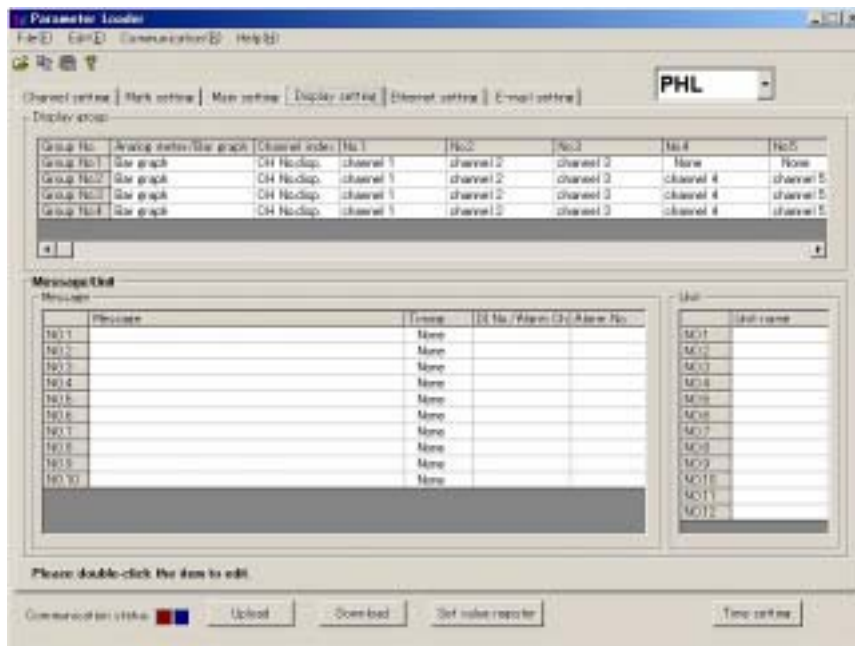
Without the communication function, DI6-DI10 cannot be used.

When PHU or PHF is selected:

DI cannot be used if DI (external control unit) option is not provided.

2.6 Display setting

At this screen, you can see or set regarding to screen setting such as structure of screen, trend display screen and so on. Click “Display setting” tab of [Structure of setting channel display].



Setting screen appears and you can see status about screen setting.

- * Items that can be set differ according to model setting. (The above is the screen when PHL is selected for model setting.)
- * When PHF is selected for model setting, “Analog meter / Bar graph” setting item in “Group setting” screen is not displayed.

2.6.1 Display setting

At this screen, you can set regarding to screen setting such as structure of screen, trend display screen and so on. Double click the group No. at “Display group” column on Display setting screen,

- * Edit the displayed group on “Selected group No.”.
- * Screen name can set to recorder up to 16 characters.
- * If scale display is ON, trend screen is divided in accordance with the scale, not the setting of “Display divided”.

2.6.2 Setting channels

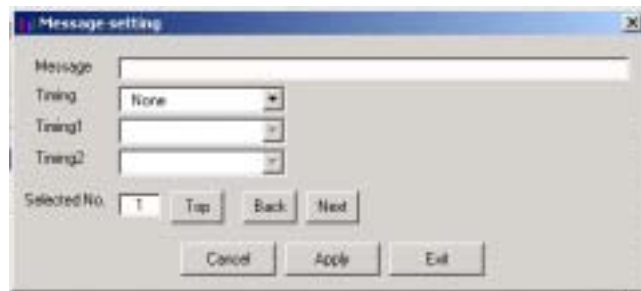
Set the structure of screen.

No.1 at this screen equals to data 1 of “display setting” of recorder, No.2 equals to data 2. Following is the same as above until No.10.

2.6.3 Setting message

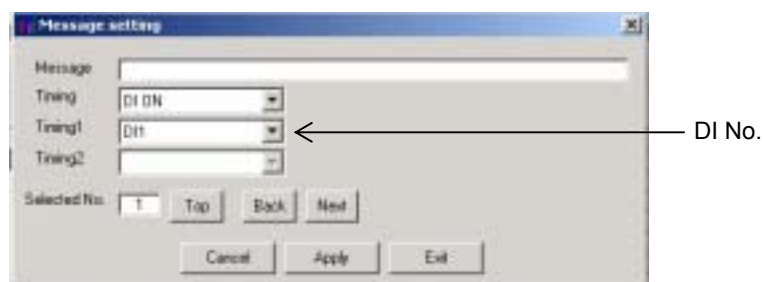
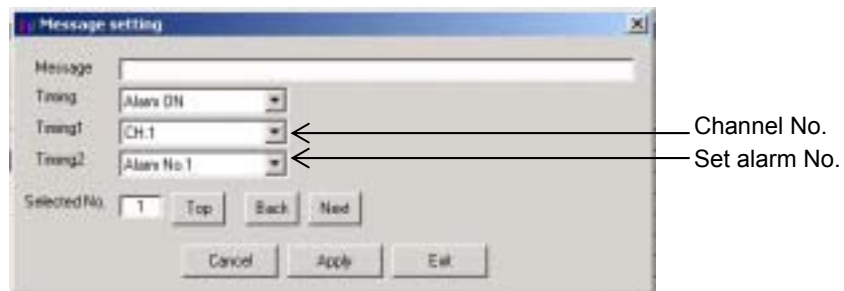
The screen allows you to set messages to be displayed when an event occurs.

Move the cursor to No. of the Message box on the Main Unit Set screen and double-click it.



The Message Setting screen appears.

- * When PHF is selected for model setting, setting cannot be made as message function is not available.
- * Up to 32 characters is available for the message. The characters exceeding 32 cannot be displayed on the recorder main unit.
- * After the input of message set data, be sure to press the “Apply” button, or the message cannot be registered.
- * Message timing is allocated as follows:



2.6.4 Unit coding

Units can be made in alphanumerical characters. This unit can be registered in the input unit when scaling is set to ON on the Channel Setting screen.

Move the cursor to No. of the Unit box on the Main Unit Set screen and double-click it.



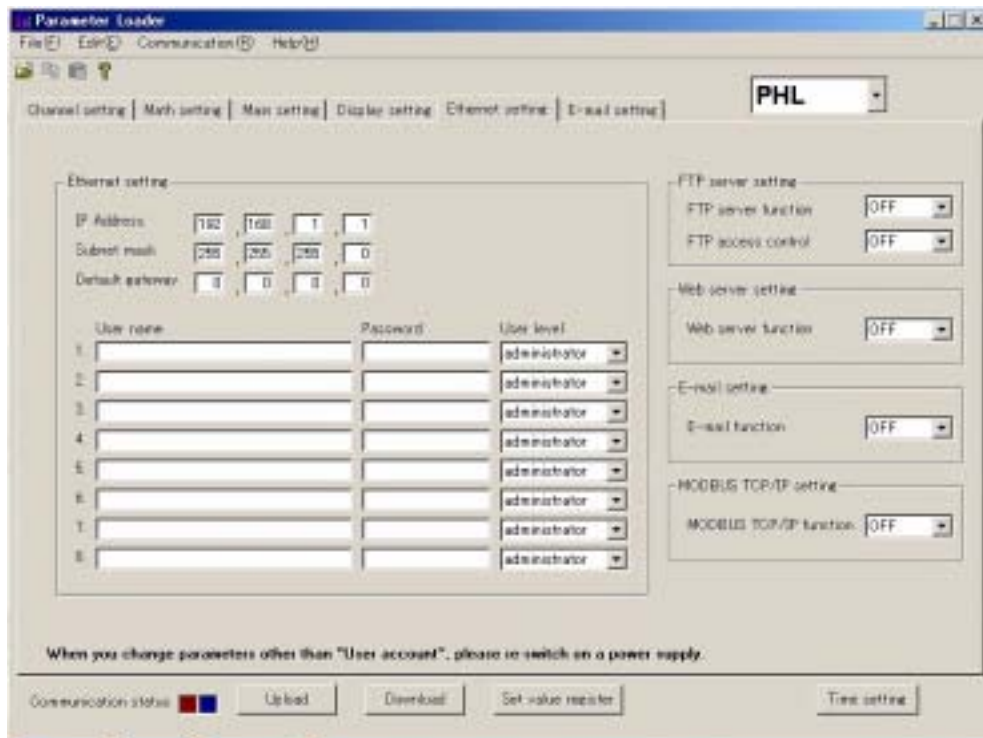
The Unit Setting screen appears.

- * A message (unit) consisting of up to 7 characters is available for the recording main unit.
- * After the input of unit set data, be sure to press the “Apply” button, or the unit cannot be registered.

2.7 Ethernet communication setting

Settings related to Ethernet communications such as IP address, user name, operation setting of each Ethernet communication function of the paperless recorder can be checked or made.

- * Ethernet communication function cannot be used unless the paperless recorder main unit is provided with Ethernet communication option.

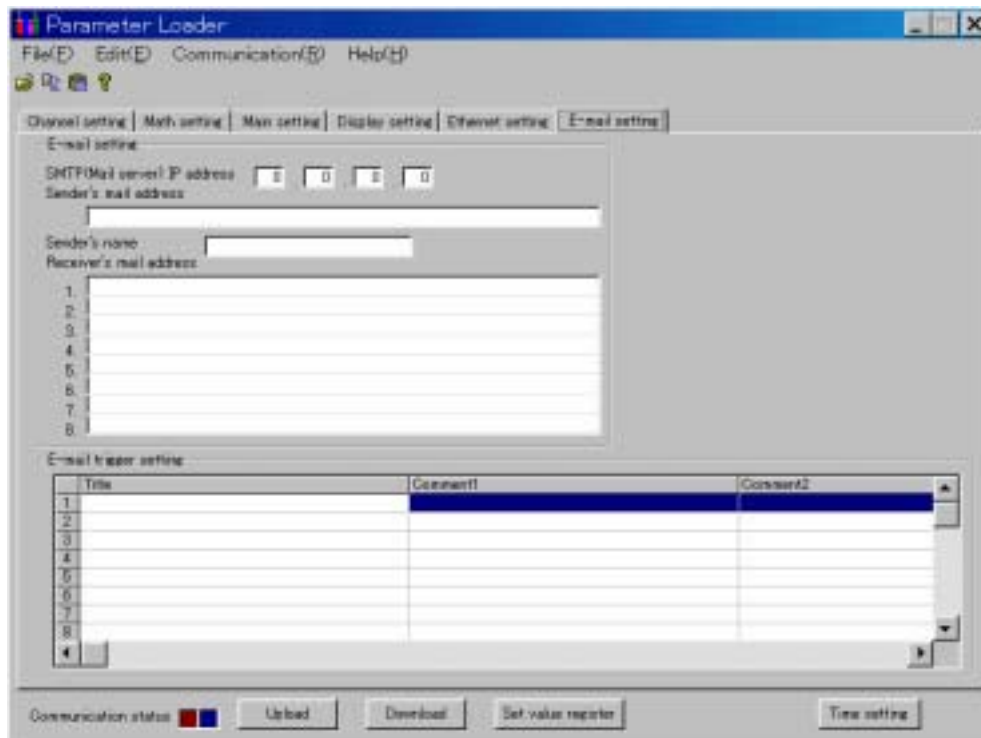


- * Up to 16 characters can be entered as user name.
- * Up to 8 characters can be entered as password.
- * Items that can be set in user level differ according to model setting.
When PHL or PHF is selected: "Administrator", "Guest"
When PHU is selected: "Administrator", "Engineer", "Operator", "Guest"

2.8 E-mail communication setting

Settings related to E-mail communications such as send/receive address and send trigger can be made.

- * E-mail communication function cannot be used unless the paperless recorder main unit is provided with Ethernet communication option.



- * Up to 64 characters can be entered as send/receive address.
- * Up to 32 characters can be entered as sender name.

2.8.1 E-mail trigger setting

Other conditions for E-mail transmission can be selected as follows.

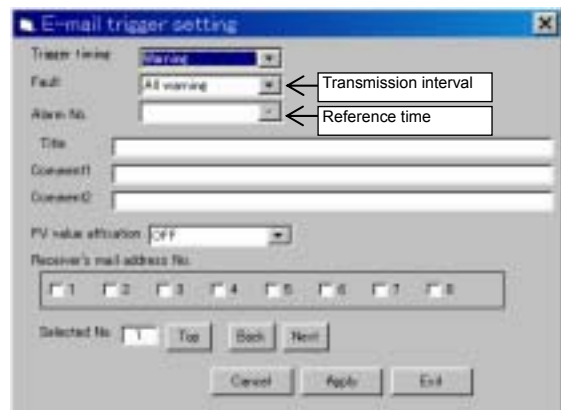
Move the cursor to “E-mail trigger” on the E-mail setting screen and double-click it.

- * Up to 32 characters can be entered as the title of E-mail and comments 1 and 2.
- * Be sure to press the [Apply] button to confirm the E-mail trigger setting data that has been entered.
- * E-mail trigger timing is allocated as shown below.

- When sending E-mail by DI operation

- When sending E-mail by alarm operation

- When sending E-mail by alarm operation of the main unit
- When sending E-mail at fixed intervals



APPENDIX.1 EXAMPLE OF SETTING PARAMETERS TO BE PRINTED OUT

2005/11/19 11:01:32

PILC : PHL21B11-E10YY
 Ser.No.: LYT0006T
 Ver. : V05L

*****Channel setting*****

Input type	Color	Tag No.1	Tag No.2	Input unit	Scaling ON/OFF	Measuring range Start	Measuring range End	Engineering unit Start	Engineering unit End	Square rooter	
CH1	K-Type TC	Sky blue	Tag 01	Tag 2-01	°C	OFF	0.0	500.0	0.0	500.0	OFF
CH2	T-Type TC	Yellowish green	Tag 02	Tag 2-02	°F	OFF	0.0	500.0	0.0	500.0	OFF
CH3	Pt100	Violet	Tag 03	Tag 2-03	°F	OFF	0.0	500.0	0.0	500.0	OFF
CH4	JPt100	Green	Tag 04	Tag 2-04	°C	OFF	0.0	500.0	0.0	500.0	OFF
CH5	500mV	Deep green	Tag 05	Tag 2-05	mV	ON	2.0	522.0	-500.0	550.0	OFF
CH6	500mV	Purple	Tag 06	Tag 2-06	mV	OFF	0.0	500.0	0.0	500.0	OFF
CH7	500mV	Red	Tag 07	Tag 2-07	mV	OFF	0.0	500.0	0.0	500.0	OFF
CH8	500mV	Yellow	Tag 08	Tag 2-08	mV	OFF	0.0	500.0	0.0	500.0	OFF
CH9	0-5V	Indigo	Tag 09	Tag 2-09	V	ON	0.123	5.123	1.900	5.900	ON
CH10	B-Type TC	Dark red	Tag 10	Tag 2-10	°C	OFF	0.0	500.0	0.0	500.0	OFF
CH11	50mV	Red	Tag 11	Tag 2-11	mV	OFF	0.00	50.00	0.00	50.00	OFF
CH12	500mV	Blue	Tag 12	Tag 2-12	mV	ON	10.0	502.0	0.5200	0.0000	ON
CH13	500mV	Violet	Tag 13	Tag 2-13	mV	OFF	0.0	500.0	0.0	500.0	OFF
CH14	JPt100	Purple	Tag 14	Tag 2-14	°F	OFF	0.0	500.0	0.0	500.0	OFF
CH15	Pt100	Deep green	Tag 15	Tag 2-15	°F	OFF	0.0	500.0	0.0	500.0	OFF
CH16	0-5V	Purple	Tag 16	Tag 2-16	V	OFF	0.000	5.000	0.000	5.000	OFF
CH17	0-5V	Pale blue	Tag 17	Tag 2-17	V	OFF	0.000	5.000	0.000	5.000	OFF
CH18	1-5V	Blue	Tag 18	Tag 2-18	V	ON	2.000	4.000	80	5008	ON

Input filter	PV shift	PV gain	Subtract channel	Fvalue calc.	Recording mode	Recording type	Display range Start	Display range End
CH1	3	1.0	100.01	None	OFF	With record	Min-Max value	0.0 1200.0
CH2	0	0.2	100.02	None	OFF	With record	Point value	32.0 572.0
CH3	3	0.3	100.03	channel2	OFF	With record	Average value	32.0 932.0
CH4	4	400.0	140.00	channel9	ON	With record	Min-Max value	4.000 5.004
CH5	5	-50.0	50.00	channel4	OFF	With record	Point value	0.5 500.0
CH6	6	0.6	100.00	channel5	OFF	With record	Average value	0.6 500.6
CH7	7	0.0	100.00	None	OFF	With record	Min-Max value	0.0 500.0
CH8	8	0.0	100.00	None	OFF	With record	Point value	0.0 500.0
CH9	0	9.000	109.00	channel2	ON	With record	Average value	0.900 5.090
CH10	3	1.0	101.00	None	OFF	With record	Min-Max value	600.0 1700.0
CH11	3	0.00	100.00	None	OFF	With record	Point value	0.00 50.00
CH12	90	0.1000	100.00	channel18	ON	With record	Average value	5.000 0.000
CH13	3	0.0	100.00	None	OFF	With record	Min-Max value	0.0 500.0
CH14	10	10.0	90.00	channel18	ON	With record	Point value	0.000 5.000
CH15	5	0.0	100.00	channel3	OFF	With record	Average value	0.0 500.0
CH16	3	0.000	100.00	None	OFF	With record	Min-Max value	0.000 5.000
CH17	3	0.000	100.00	None	OFF	With record	Point value	0.000 5.000
CH18	20	0	0.00	None	OFF	With record	Point value	1 10

*****Totalize setting*****

Totalize Tag	Totalize calc.	Totalize Type	Digital input	Totalize Base time	Reset operation	Totalize Unit	Totalize Cut value	Totalize Scale value
CH1	STAG 01	Totalizer Daily	DI3	/h	ON	ppmCO	10.0	2
CH2	STAG 02	Counter Weekly	Ch1 Alarm2	/min	OFF	rps	0.0	3
CH3	STAG 03	Counter Periodic	DI1	/h	ON	SEC	0.0	4
CH4	STAG 04	Totalizer Periodic	DI1	/h	ON	m/s2	0.010	3600
CH5	STAG 05	Timer Periodic	DI3	/min	OFF	uGy/h	50.0	9999
CH6	STAG 06	Totalizer Monthly	Ch6 Alarm3	/day	OFF	dB	60.0	160
CH7	STAG 07	Counter Annual	DI1	/h	ON	%NaCl	0.0	32767
CH8	STAG 08	Totalizer Periodic	DI1	/h	ON		0.0	1
CH9	STAG 09	Totalizer Daily	Ch13 Alarm3	/day	ON	m/min	0.090	19
CH10	STAG 10	Counter External	DI1	/min	ON	mol	370.0	32
CH11	STAG 11	Totalizer Periodic	DI1	/h	ON		0.00	100
CH12	STAG 12	Totalizer Daily(Time set)	DI9	/s	OFF	km/h	1.200	54
CH13	STAG 13	Counter Periodic	DI1	/h	ON		0.0	3
CH14	STAG 14	Totalizer Periodic	DI1	/h	ON	min	1.100	1
CH15	STAG 15	Timer Annual	Ch30 Alarm4	/min	OFF	mm/min	-10.0	15
CH16	STAG 16	Counter Periodic	DI1	/h	ON		0.000	65
CH17	STAG 17	Totalizer Weekly	Ch29 Alarm2	/s	ON	uGy/h	0.170	17
CH18	STAG 18	Totalizer Periodic	DI1	/h	ON		0	18

*****Alarm setting*****

Alarm No.1				Alarm No.2				Alarm No.3				Alarm No.4			
Alarm type	Alarm set value	DO	relay No.	Alarm type	Alarm set value	DO	relay No.	Alarm type	Alarm set value	DO	relay No.	Alarm type	Alarm set value	DO	relay No.
CH1	H	100.0	1	H	100.0	2	H	H	100.0	3	H	H	100.0	4	H
CH2	H	800.0	None	OFF	0.0	None	OFF	L	0.0	None	L	L	200.0	None	L
CH3	OFF	0.0	None	OFF	0.0	None	OFF	L	0.0	None	OFF	L	0.0	None	OFF
CH4	H	0.400	1	OFF	0.040	2	L	L	0.004	5	OFF	L	4.000	3	OFF
CH5	H	50.0	28	L	50.0	27	H	L	50.0	26	L	L	50.0	25	L
CH6	H	500.0	1	OFF	0.0	None	OFF	L	0.0	None	OFF	L	0.0	None	OFF
CH7	OFF	0.0	None	OFF	0.0	None	OFF	L	0.0	None	OFF	L	0.0	None	OFF
CH8	OFF	0.0	None	OFF	0.0	None	OFF	L	0.0	None	OFF	L	0.0	None	OFF
CH9	L	0.900	3	H	0.900	5	L	L	0.900	6	H	L	0.900	28	L
CH10	OFF	600.0	5	H	600.0	None	L	L	600.0	22	H	L	600.0	None	L
CH11	OFF	0.00	None	OFF	0.00	None	OFF	L	0.00	None	OFF	L	0.00	None	OFF
CH12	L	0.100	4	H	0.200	6	OFF	L	0.300	None	OFF	L	0.400	27	L
CH13	OFF	0.0	None	OFF	0.0	None	OFF	L	0.0	None	OFF	L	0.0	None	OFF
CH14	H	0.000	None	L	0.000	None	OFF	L	0.300	None	OFF	L	0.500	None	L
CH15	L	40.0	None	H	30.0	5	H	L	20.0	27	OFF	L	10.0	4	L
CH16	OFF	0.000	None	OFF	0.000	None	OFF	L	0.000	None	OFF	L	0.000	None	L
CH17	OFF	0.000	None	OFF	0.000	None	OFF	L	0.000	None	OFF	L	0.000	None	L
CH18	OFF	1000	None	H	1000	None	L	L	1000	None	H	L	1000	None	L

****Math channel setting****

Formula		Formula	
CH19	B01 = LN(C01)+SQR(C06)	CH25	B01 = C25
	B02 = C01+C01+C01		B02 =
	B03 = C01/C01/D10		B03 =
	Result = SUM(K14,K15)		Result =
CH20	B01 = ABS(B03)-ABS(C06)*ABS(C07)	CH26	B01 = C26
	B02 = C01		B02 =
	B03 = T16*M04-LOG(T08)		B03 =
	Result = SUM(C01,C06)-MIN(C01,C06)+POW(T11,C07)		Result =
CH21	B01 = C21	CH27	B01 = C27
	B02 = C01		B02 =
	B03 = C01		B03 =
	Result = C01		Result =
CH22	B01 = C22	CH28	B01 = C28
	B02 = C01		B02 =
	B03 = C01		B03 =
	Result = C01		Result =
CH23	B01 = C23	CH29	B01 = C29
	B02 =		B02 =
	B03 =		B03 =
	Result =		Result =
CH24	B01 = C24	CH30	B01 = C30
	B02 =		B02 =
	B03 =		B03 =
	Result =		Result =

Color	Tag No.1	Tag No.2	Input unit	Measuring range		Engineering unit		Square rooter
				Start	End	Start	End	
CH19 Indigo	TAG19	Tag 2-19	t/d	11.9	501.9	11.9	501.9	ON
CH20 Dark red	TAG20	Tag 2-20		0.0120	0.5200	0.0112	0.5200	OFF
CH21 Red	TAG21	Tag 2-21	m/s	121	5210	121	5210	OFF
CH22 Blue	TAG22	Tag 2-22	ppmH2S	22.0	22.0	22.0	22.0	OFF
CH23 Violet	TAG23	Tag 2-23	%Ar	0.123	5.023	0.123	5.023	OFF
CH24 Green	TAG24	Tag 2-24	ppmCO	0.240	5.240	0.240	5.240	ON
CH25 Deep green	TAG25	Tag 2-25	m3/h	1.25	50.25	1.25	50.25	ON
CH26 Purple	TAG26	Tag 2-26	%NaCl	1.26	50.26	1.26	50.26	OFF
CH27 Sky blue	TAG27	Tag 2-27	us	0.127	5.027	0.270	5.027	ON
CH28 Yellow	TAG28	Tag 2-28	l/min	0.0280	0.5280	0.0280	0.5028	OFF
CH29 Indigo	TAG29	Tag 2-29	pH	0.290	5.029	0.129	5.029	OFF
CH30 Dark red	TAG30	Tag 2-30	rps	30.0	300.0	30.0	300.0	OFF

Input filter	PV shift	PV gain	Subtract channel	Fvalue calc.	Recording mode	Recording type	Display range	
							Start	End
CH19	5	101.9	100.19	None	OFF	With record	Point value	19.0 1019.1
CH20	10	0.0020	100.20	None	OFF	With record	Average value	0.0200 1.0200
CH21	21	210	210.00	channel11	OFF	With record	Min-Max value	210 10210
CH22	22	22.0	22.00	channel5	OFF	With record	Point value	220.0 122.0
CH23	10	0.023	100.23	channel24	OFF	With record	Point value	0.230 23.000
CH24	24	0.240	124.00	channel11	ON	With record	Min-Max value	2.400 10.240
CH25	25	2.50	25.00	channel27	OFF	With record	Point value	25.00 101.25
CH26	26	26.00	26.00	channel11	OFF	With record	Average value	26.00 101.26
CH27	27	0.270	100.27	channel5	ON	With record	Point value	0.270 10.270
CH28	28	0.2800	100.28	channel5	ON	With record	Point value	0.280 0.280
CH29	29	0.290	100.29	None	OFF	With record	Point value	2.900 10.290
CH30	30	30.0	130.00	channel30	OFF	With record	Min-Max value	30.0 1030.1

****Totalize setting****

Tag	Totalize calc.	Totalize Type	Digital input	Totalize Base time	Reset operation	Totalize Unit	Totalize Cut value	Totalize Scale value
CH19 STAG 19	Totalizer	Periodic	DI1	/day	OFF	g/ml	1190.0	19
CH20 STAG 20	Counter	Daily	DI6	/min	ON	%CO2	0.0020	20
CH21 STAG 21	Totalizer	Weekly	DI1	/h	OFF	ppmNH3	210	210
CH22 STAG 22	Totalizer	Monthly	DI1	/h	ON	VA	22.0	22
CH23 STAG 23	Timer	Annual	DI6	/min	ON		0.230	23
CH24 STAG 24	Counter	Daily(Time set)	DI6	/s	ON		0.240	24
CH25 STAG 25	Timer	External	DI6	/day	ON		0.00	1
CH26 STAG 26	Totalizer	Periodic	DI1	/s	ON	ohm	2.60	26
CH27 STAG 27	Totalizer	Periodic	DI1	/min	ON		0.270	27
CH28 STAG 28	Totalizer	Periodic	DI1	/h	ON	Pa	0.280	28
CH29 STAG 29	Totalizer	Periodic	DI1	/day	ON	k ohm	0.290	29
CH30 STAG 30	Totalizer	Periodic	DI1	/s	ON	cd/m2	30.0	30

****Alarm setting****

Alarm No.1				Alarm No.2				Alarm No.3				Alarm No.4			
Alarm type	Alarm set value	DO relay No.		Alarm type	Alarm set value	DO relay No.		Alarm type	Alarm set value	DO relay No.		Alarm type	Alarm set value	DO relay No.	
CH19 H	159.0	28	L	319.0	4	H		219.0	20	H		189.0	4		
CH20 H	0.4200	28	H	0.3200	8	L		0.2200	23	OFF		0.1200	7		
CH21 H	4210	None	OFF	321	9	OFF		221	26	OFF		21	18		
CH22 OFF	22.0	22	OFF	22.0	22	OFF		22.0	22	OFF		22.0	22		
CH23 H	4.230	27	H	3.123	8	L		2.230	22	OFF		1.230	6		
CH24 H	4.240	None	OFF	3.240	1	H		2.240	27	L		1.240	7		
CH25 L	25.00	25	L	325.00	10	L		225.00	25	L		125.00	3		
CH26 H	41.26	26	OFF	326.00	9	OFF		226.00	19	L		126.00	1		
CH27 H	0.270	12	H	3.270	10	H		2.270	26	H		1.270	4		
CH28 H	4.280	28	L	3.280	4	H		2.280	20	L		1.280	4		
CH29 L	4.290	22	OFF	3.290	8	L		2.290	26	L		1.290	3		
CH30 H	430.0	27	OFF	330.0	28	OFF		230.0	26	OFF		130.0	25		

****Basic setting****

Display refreshment cycle 10 sec
 LCD lights-out time 0 min
 Data Format Nov-19-05
 MODBUS Station No. 1
 Recording data format Binary
 Configuration password 1

Alarm hysteresis 1.32 (%)
 Memory full alarm DO relay No. 5
 Alarm latch OFF
 Battery alarm DO relay No. 4

MODBUS baud rate 19200 bps
 MODBUS parity Odd
 File division cycle No division
 CF manager password 2
 REC key password 1

```

*****Fvalue calculation setting*****
Target temperature 100.0 °C Z value 200.0 °C Decimal point position 3
Fvalue reset temperature 10.0 °C

*****Totalize setting*****
Totalize base time 04:31 Totalize recording cycle 12 hour
Weekly base day Saturday Monthly base day 31
Totalize start time 23:06 stop time 22:59
Extrnal input Ch19 Alarm1

*****Math timer setting*****
H-P/L-P operation 2 min AVG operation 4 min SUM operation 2 min

*****Display setting*****
Content of screen composition
No.1 No.2 No.3 No.4 No.5 No.6 No.7 No.8 No.9 No.10
Display group1 channel1 channel2 channel3 channel4 channel5 channel6 channel7 channel8 channel9 channel10
Display group2 channel11 channel12 channel13 channel14 None None None None None None
Display group3 channel15 channel16 channel17 channel18 None None None None None None
Display group4 channel19 channel20 channel21 channel22 channel23 channel24 channel25 channel26 channel27 channel28

Display name Trend Display Scale Bar graph/ Color bar
direction division No. display Analog meter display selection
Display group1 1.Display Group1 Vertical 20 ON Bar graph Tag No.
Display group2 2.Display Group2 Horizontal 13 ON Analog meter Channel No.
Display group3 3. Display Group3 Vertical 7 OFF Bar graph Unit
Display group4 4.Display Group4 Horizontal 10 OFF Analog meter Tag No.

*****Message setting*****
Message Timing1 DI NO./ Alarm Channel Alarm NO.
No.1 Message DI1 ON DI ON DI1
No.2 Message DI5 OFF DI OFF DI5
No.3 Message Channel19 Alarm No.1 ON Alarm ON CH.19 Alarm No.1
No.4 Message Channel19 Alarm No.1 OF Alarm OFF CH.19 Alarm No.1
No.5 Message DI4 ON DI ON DI4
No.6 Message Channel19 Alarm No.3 OFF Alarm OFF CH.19 Alarm No.3
No.7 Message Channel19 Alarm No.2 ON Alarm ON CH.19 Alarm No.2
No.8 Message DI4 OFF DI OFF DI4
No.9 Message Channel05 Alarm No.4 OFF Alarm OFF CH.5 Alarm No.4
No.10 Message Channel04 Alarm No.2 ON Alarm ON CH.4 Alarm No.2

*****Original Unit definition*****
No.1 No.2 No.3 No.4 No.5 No.6
Unit mPa SEC
Unit No.7 No.8 No.9 No.10 No.11 No.12

*****DI function setting*****
DI-1 Rec start/stop DI-6 Rec start/stop
DI-2 Fvalue calc. reset DI-7 Rec start/stop
DI-3 Totalize start/stop DI-8 Fvalue calc. reset
DI-4 Function invalid DI-9 Totalize start/stop
DI-5 Rec start/stop DI-10 Totalize reset

*****Constant setting*****
Constant1 1 Constant11 0.002
Constant2 2 Constant12 0.0003
Constant3 3.0 Constant13 0
Constant4 4.00 Constant14 100
Constant5 5.000 Constant15 120
Constant6 60 Constant16 0
Constant7 700 Constant17 0
Constant8 8000 Constant18 0
Constant9 0.9 Constant19 99.3
Constant10 0.01 Constant20 10

*****Ethernet setting*****
Ethernet setting
IP Address 192 . 168 . 0 . 2
Subnet mask 255 . 255 . 255 . 0
Default gateway 0 . 0 . 0 . 0

Password setting
User name Password User level
No.1 SystemTaro a19b23 administrator
No.2 KirokuKeiko 65790 administrator
No.3 administrator
No.4 administrator
No.5 administrator
No.6 administrator
No.7 administrator
No.8 administrator

```

```

FTP server setting
FTP server function      ON          Access control  ON

Web Server setting
Web server function      ON

E-mail setting
E-mail function          ON

MODBUS TCP/IP setting
MODBUS TCP/IP function  ON

*****E-mail setting*****
SMTP(Mail server) IP address  192 . 198 . 0 . 1
Sender's mail address        boiler035@test.co.jp
Sender's name                 Boiler035

Receiver's mail address
No.1 System-Taro@test.co.jp
No.2 Kiroku-Keiko@test.co.jp
No.3
No.4
No.5
No.6
No.7
No.8

E-mail trigger setting
Title                      Comment1                      Comment2
No.1 Product1 manufacturing beginning  Product1 manufacturing beginning  Boiler035
No.2 Boiler035 report at regular time  Report at regular time           Boiler035
No.3 The temperature is abnormal!      The temperature is abnormal!     Boiler035
No.4
No.5
No.6
No.7
No.8
No.9
No.10

Trigger timing Timming1 Timming2 PV Value No1 No2 No3 No4 No5 No6 No7 No8
No.1 DI ON DI2 - ON ON ON OFF OFF OFF OFF OFF OFF OFF
No.2 Timer cycle 12hour - ON ON OFF OFF OFF OFF OFF OFF OFF OFF
No.3 Alarm ON channell1 No.4 ON ON ON OFF OFF OFF OFF OFF OFF OFF
No.4 None - - OFF OFF OFF OFF OFF OFF OFF OFF OFF OFF
No.5 None - - OFF OFF OFF OFF OFF OFF OFF OFF OFF OFF
No.6 None - - OFF OFF OFF OFF OFF OFF OFF OFF OFF OFF
No.7 None - - OFF OFF OFF OFF OFF OFF OFF OFF OFF OFF
No.8 None - - OFF OFF OFF OFF OFF OFF OFF OFF OFF OFF
No.9 None - - OFF OFF OFF OFF OFF OFF OFF OFF OFF OFF
No.10 None - - OFF OFF OFF OFF OFF OFF OFF OFF OFF OFF

```

Fuji Electric Systems Co., Ltd.

Head Office

Gate City Ohsaki, East Tower, 11-2, Osaki 1-chome,
Shinagawa-ku, Tokyo 141-0032, Japan
<http://www.fesys.co.jp/eng>

Instrumentation Div. International Sales Dept.

No.1, Fuji-machi, Hino-city, Tokyo 191-8502, Japan
Phone: 81-42-585-6201, 6202 Fax: 81-42-585-6187
<http://www.fic-net.jp/eng>
