*Paperless Recorder*

VGR-A100∗A

Instruction Manual
[USB type]

Thank you for purchasing this RKC instrument. In order to achieve maximum performance and ensure proper operation of your new instrument, carefully read all the instructions in this manual. Please place this manual in a convenient location for easy reference.

NOTICE

● This manual assumes that the reader has a fundamental knowledge of the principles of electricity, process control, computer technology and communications.

● The figures, diagrams and numeric values used in this manual are only for purpose of illustration.

● RKC is not responsible for any damage or injury that is caused as a result of using this instrument, instrument failure or indirect damage.

● RKC is not responsible for any damage and/or injury resulting from the use of instruments made by imitating this instrument.

● Periodic maintenance is required for safe and proper operation of this instrument. Some components have a limited service life, or characteristics that change over time.

● Every effort has been made to ensure accuracy of all information contained herein. RKC makes no warranty expressed or implied, with respect to the accuracy of the information. The information in this manual is subject to change without prior notice.

● No portion of this document may be reprinted, modified, copied, transmitted, digitized, stored, processed or retrieved through any mechanical, electronic, optical or other means without prior written approval from RKC.

⚠ Warning
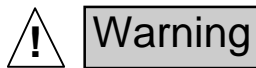
· An external protection device must be installed if failure of this instrument could result in damage to the instrument, equipment or injury to personnel.

· All wiring must be completed before power is turned on to prevent electric shock, fire or damage to instrument and equipment.

· This instrument must be used in accordance with the specifications to prevent fire or damage to instrument and equipment.

· This instrument is not intended for use in locations subject to flammable or explosive gases.

· Do not touch high-voltage connections such as power supply terminals, etc. to avoid electric shock.

· RKC is not responsible if this instrument is repaired, modified or disassembled by other than factory-approved personnel. Malfunction can occur and warranty is void under these conditions.
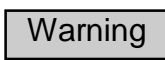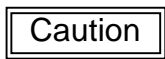

Caution

- This is a Class A instrument. In a domestic environment, this instrument may cause radio interference, in which case the user may be required to take adequate measures.

- This instrument is protected from electric shock by reinforced insulation. Provide reinforced insulation between the wire for the input signal and the wires for instrument power supply, source of power and loads.

- Be sure to provide an appropriate surge control circuit respectively for the following:

  - If input/output or signal lines within the building are longer than 30 meters.

  - If input/output or signal lines leave the building, regardless the length.

- This instrument is designed for installation in an enclosed instrumentation panel. All high-voltage connections such as power supply terminals must be enclosed in the instrumentation panel to avoid electric shock by operating personnel.

- All precautions described in this manual should be taken to avoid damage to the instrument or equipment.

- All wiring must be in accordance with local codes and regulations.

- All wiring must be completed before power is turned on to prevent electric shock, instrument failure, or incorrect action.

- The power must be turned off before repairing work for input break and output failure including replacement of sensor, contactor or SSR, and all wiring must be completed before power is turned on again.

- To prevent instrument damage or failure, protect the power line and the input/output lines from high currents with a protection device such as fuse, circuit breaker, etc.

- Prevent metal fragments or lead wire scraps from falling inside instrument case to avoid electric shock, fire or malfunction.

- Tighten each terminal screw to the specified torque found in the manual to avoid electric shock, fire or malfunction.

- For proper operation of this instrument, provide adequate ventilation for heat dispensation.

- Do not connect wires to unused terminals as this will interfere with proper operation of the instrument.

- Turn off the power supply before cleaning the instrument.

- Do not use a volatile solvent such as paint thinner to clean the instrument. Deformation or discoloration will occur. Use a soft, dry cloth to remove stains from the instrument.

- To avoid damage to instrument display, do not rub with an abrasive material or push front panel with a hard object.

FOR PROPER DISPOSAL

- When disposing of each part used for this instrument, always follows the procedure for disposing of industrial wastes stipulated by the respective local community.

Symbols used in this manual

| Warning | : | This mark indicates precautions that must be taken if there is danger of electric shock, fire, etc., which could result in loss of life or injury. |

| Caution | : | This mark indicates that if these precautions and operating procedures are not taken, damage to the instrument may result. |

⚠ : This mark indicates that all precautions should be taken for safe usage.

📖 : This mark indicates important information on installation, handling and operating procedures.

📖 : This mark indicates supplemental information on installation, handling and operating procedures.

☞ : This mark indicates where additional information may be located.

To protect your data

● The data recorded with this product can be stored in a CF card and a USB memory.

● It is recommended to use our standard CF card (256MB, industrial grade) fore reliability. You can also use CF cards commercially available at electronic shops, although reliability may be lower.

● You can use USB memory media up to 4GB. Some memory media may not be properly recognized on this product, especially those that are extended in specifications by the manufacturer in their own way.

● The data in CF cards and USB memory media should be also properly backed up.

DOCUMENT CONFIGURATION

As for the document related to this product, there are six manuals including this one. According to application of a customer, please read a manual related together. When you do not have a necessary manual, please contact RKC sales office or the agent.

The following manuals can be download from our website shown below.

Official web: http://www.rkcinst.com/english/manual_load.htm
VGR support (Japanese only) : http://www.rkcinst.net/

Name	Reference No.	Contents
VGR-A100∗A Instruction Manual [USB type]	IMX01L05-E[]	This manual. Supplied with the delivery of the recorder. This manual describes installation, wiring The manual supplied with the product packed is divided into two booklets. • VGR-A100∗A Instruction Manual [USB type] Part 1: IMX01L05A-J1 • VGR-A100∗A Instruction Manual [USB type] Part 2: IMX01L05B-J1
Setup software PSU Instruction Manual	IMT01G01-E□	This software is available in CD-ROM or from our web site. This software is used for setting up VGR-A100.
Data transfer software PCC Instruction Manual	IMT01G02-E□	This software is available in CD-ROM or from our web site. This software transfers the data from VGR-A100 to a PC via Ethernet or USB.
Data evaluation software PCA3000 Instruction Manual	IMT01G03-E□	This software is available in CD-ROM or from our web site. This software is used for evaluation of the data from VGR-A100.

Read this manual carefully before operating the instrument. Please place this manual in a convenient location for easy reference.

Contents

MEMO

1. General Description

This manual describes installation, wiring, basic operations, menus, and specifications of a paperless recorder VGR-A100.

1.1 Features of VGR-A100

This paperless recorder VGR-A100 [USB type](hereinafter called VGR-A100) has the following features.

■ Easy operation with a control knob

All operation can be made with rotating and pressing the control knob.

■ Up to 18 analog inputs + up to 24 external analog inputs

■ Up to 24 binary inputs/outputs and up to 24 external binary inputs

■ Data management with up to 9 groups

Up to 6 analog inputs and six binary inputs/outputs per group. *

■ Powerful display

Shows diagram display, bargraph display, text image display, process image display, binary diagram, historical display, event list and more!

■ Fast sampling (125ms for all analog channels)

■ Data storage to compact flash card and USB memory.

■ Data setting and transfer via USB interface

■ Supplied as standard with Ethernet and RS-232C/485 (Option includes Profibus interface)

■ Data setting, transfer, and evaluation by powerful software tools.

PSU/Setup software
PCC/Data transfer software
PCA3000/evaluation software

■ Other features

Batch:	Suitable for repeated non-continuous data recording.
	Up to three independently settable batches are available.
Counters/Integrators:	27 channels (including six hardware counters)
Report:	Shows reports (whole, daily, weekly, monthly, yearly, cycle, external)
	Displayed data: maximum value, minimum value, average value
Audit trail:	Records up to 150 major important operations and status (power on/off status, login/logout, configuration, CF card, etc)
Math/Logic (option:	Math operation and logic operation (max. 18 per recorder)

1.2 Check Received Item

Upon receipt of the product, make sure the received product is correct and the following items are supplied with the product.

- Check the model code
- Check external appearance for any damages (housing, front plate, rear terminals) during transit.
- Check accessories the against following table.

Accessories	Quantity	Remarks
☐ Mounting brackets	4	
☐ Connectors for wiring	Max.8	Depends on specifications
☐ Rubber sealing (for IP65)	1	
☐ VGR-A100 Operation Manual [USB type] (IMX01L05-E[])	1	This manual Two A5 size manuals are attached (Part 1: IMX01L05A-E[] Part 2: IMX01L05B-E[])
☐ CD-ROM for software and documents	1	Contains documents in PDF and trial version of the following software* PSU/Setup software PCC/Data transfer software PCA3000/Evaluation software

  * The software can be used as a product version for 30 days after installation. If you wish to keep using the software after the trial period, you need to purchase and install the license number.

📖　　If any of the above is missing, please contact the nearest distributor or RKC.

- Name plate

The name plate found on the internal side of the front cover has the following information.

[Example]

```
        VGR SERIES RECORDER
MODEL  VGR-A106
SUFFIX A-C4A-NN/JE*A

SUPPLY 100-240V AC

FREQUENCY  50/60Hz
No.        AJW Z00005

CONFORMITY STANDARDS

        CE   c U US      G

F-Nr.

VARTN 70/00434088  F-Nr. 0086418801004460001
        RKC INSTRUMENT INC.
            MADE IN GERMANY
```
(on the housing case)

```
MODEL  VGR-A106
SUFFIX A-C4A-NN/JE*A
No.    AJW Z00005
VARTN  70/00434088
```
(on the internal side of front cover)

MODEL:	Model name
SUFFIX:	Suffix code
SUPPLY:	Supply voltage
FREQUENCY:	Supply voltage frequency
No.:	Recorder No.
CONFORMITY STANDARDS:	
	Conformity standards
VARTN:	Internal use
F-Nr:	Production code and it barcode

It would be quite helpful if we could get the information shown in blue.

📖　Production code (F No.)can also be checked in [device information] in [device menu].

● Accessories (sold separately)
 − CompactFlash (CF) card: 256MB (industrial grade)
                              P/N: VGRP-M02
 − Mounting brackets*1   P/N: VGRP-B01
 − Rubber sealing*1   P/N: VGRP-B02
 − Wiring connector (Phoenix type)*1
   ・Power supply (4 poles)   P/N: VGRP-C01
   ・Analog/Binary inputs (12 poles)
                               P/N: VGRP-C02
   ・Relay output (small, 3 poles) P/N: VGRP-C03
   ・Relay output (large, 18 poles) P/N: VGRP-C04
 − VGR-A100 carrying case
   Contact RKC or our distributor for details.

*1 These parts are supplied with the recorder at the time of delivery. You can purchase additional ones as maintenance purposes, etc.

1.3 Check Model Code

Upon receipt of the product, please check the model code against the following table.

If you find any discrepancies, please contact RKC or the nearest distributor referring to the information mentioned in [When you contact us] at the end of this manual.

VGR- A□□□□ **-** □ □ □ **-** □ □ **/** □□∗**A**
    (1)   **(2) (3) (4)** **(5) (6)** **(7)** **(8)**

(1) Number of Analog inputs/Binary I/Os

103A: 3 analog inputs + 8 binary I/Os
106N: 6 analog inputs
106B: 6 analog inputs + 16 binary I/Os
109A: 9 analog inputs + 8 binary I/Os
109C: 9 analog inputs + 24 binary I/Os
112N: 12 analog inputs
112B: 12 analog inputs + 16 binary I/Os
115A: 15 analog inputs + 8 binary I/Os
118N: 18 analog inputs

(2) Wiring method

C: Phoenix connector type
T: Screw terminal (not available yet)

(3) Supply voltage

3: AC/DC 20～30 V
4: AC 100～240 V

(4) Relay output

N: 1 (as standard)
A: 7 (above + extra 6 relays)
 (Available if analog input is 12 or less)

(5) PROFIBUS interface

N: None
1: Supplied

(6) Math/Logic function

N: None
A: Supplied

(7) Language

JE: 1st: Japanese
   2nd: English
EJ: 1st: English
   2nd: Japanese

(8) Additional code

∗A: USB type

📖 You can check the hardware and software version of VGR-A100 by specifying [Device menu] and [Device information].

☞ VGR-A100 has three types of boards (analog input board, analog input + binary I/O board, and relay output board). Combinations of these boards have some restrictions. See 4.2.2 Input/Output Boards and Number of Inputs/Outputs (P.13) for details.

                  IMX01L05-E1

## 1.4 Name of Parts

When front cover is open
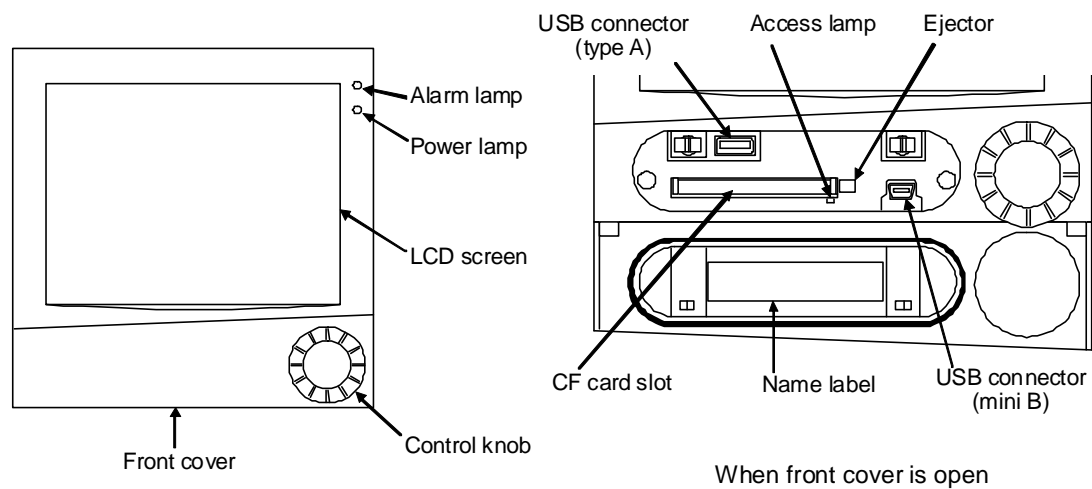
Alarm lamp [red]	Lights when alarm is active. Check alarm/event list when this lamp is on. Alarm information may be given also on the status bar.
Power lamp [green]	Lights on after power has been applied.
LCD screen	Used for data display and various setting 5.5inch TFT color LCD (320 × 240 dots)
Control knob	Use for setting and selecting. All operations are possible with rotating and pressing this control knob.
Front cover	USB connectors and CF card slot are behind this cover.
USB connector (type mini B)	Used for connection to a PC with PSU/Setup tool and/or PCC/Data transfer software via USB cable. The USB cable comes with PSU/Setup software. (Interface : USB2.0)
CF card slot	Used for CompactFlash (CF) card for data storage. Standard CF card can be used, but it is recommended to use our standard CF card (VGRP-M02, industrial grade) for reliable operation.
Access lamp	This lamp lights while the CompactFlash (CF) card is accessed. Please do not remove the card while this lamp is on. Data may be damaged.
Ejector	Press this ejector to take out the card from the slot.
USB connector (type A)	Used for USB memory media. (Interface: USB2.0) Up to 4GB memory can be used. Some memory media may not be properly recognized. Do not connect any item other than USB memory media.
Name plate	Shows model/suffix code and product number.

1.5 Open Front Cover

The front cover may be a little tight at firs because of IP65 structure. Below are figures showing how to open this cover.

1. Place side of your index fingers on both side of the front cover (to hollow part on each side) and your thumbs on the front cover.

Hollow part
(on both sides)
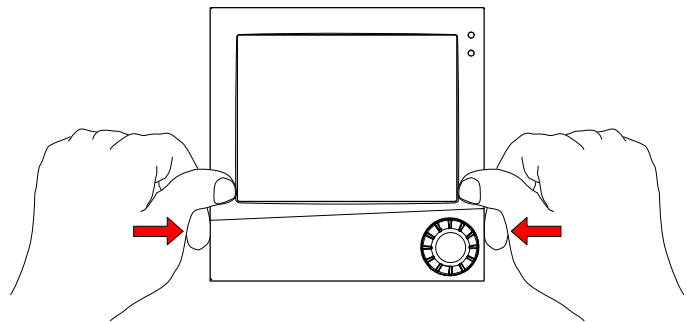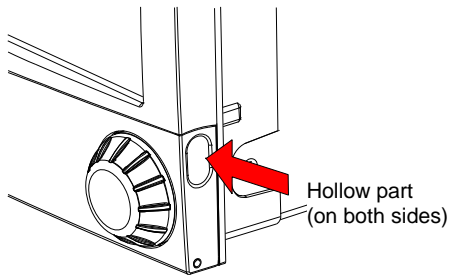
2. With your thumbs as fulcrums (as if you are pressing the front cover with thumbs), pull the cover toward you with your index fingers firmly pressing the cover from both sides.
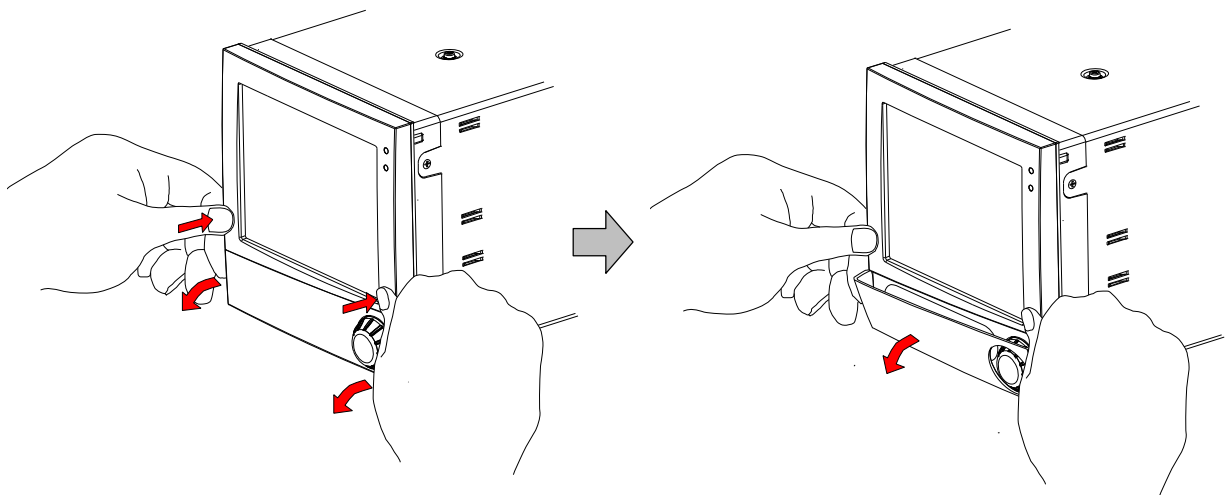
2. Operating Procedures

This chapter describes the operating procedures from installation to data storage.

| Installation | Install VGR-A100 according to the instructions in:
☞ 3. Mounting (P. 8) |

| Wiring | Attempt wiring of VGR-A100 according to the instructions in:
☞ 4. Wiring (P. 11) |

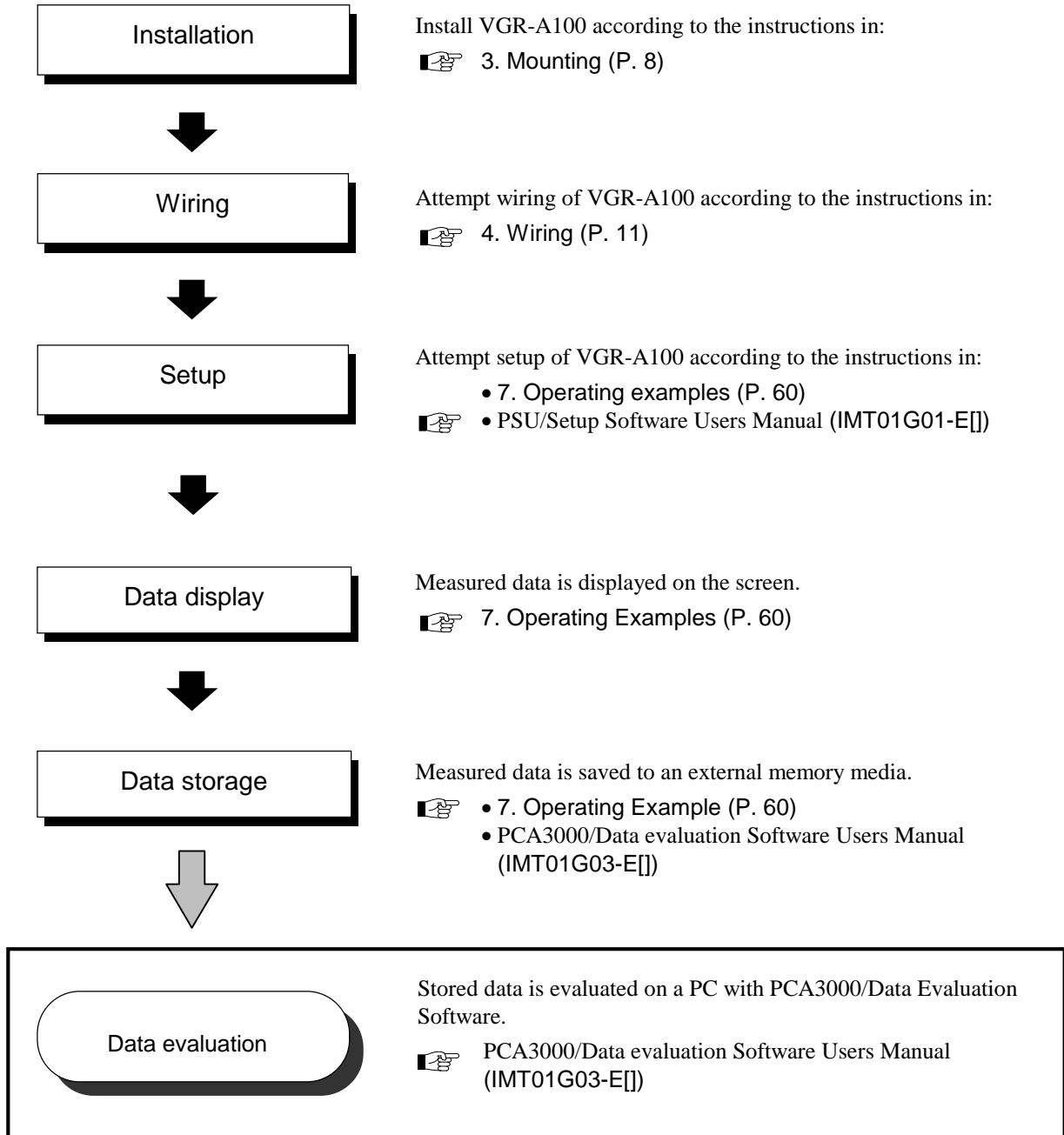| Setup | Attempt setup of VGR-A100 according to the instructions in:
• 7. Operating examples (P. 60)
☞ • PSU/Setup Software Users Manual (IMT01G01-E[]) |

| Data display | Measured data is displayed on the screen.
☞ 7. Operating Examples (P. 60) |

| Data storage | Measured data is saved to an external memory media.
☞ • 7. Operating Example (P. 60)
• PCA3000/Data evaluation Software Users Manual (IMT01G03-E[]) |

| Data evaluation | Stored data is evaluated on a PC with PCA3000/Data Evaluation Software.
☞ PCA3000/Data evaluation Software Users Manual (IMT01G03-E[]) |

3. Mounting

This chapter describes mounting, caution in mounting and external dimensions.

> ⚠ **Warning**
>
> Be sure to power off the instrument before attempting any work on the instrument to prevent electrical shock and damage to the instrument.

3.1 Caution in Mounting

(1) This instrument is designed for use in the following environmental specifications.
   (IEC61010-1)　〔Overvoltage category II, Pollution degree 2〕

(2) Use the instrument within the following environmental conditions.
   • Ambient temperature:　　　0～+50 °C
   • Ambient humidity: less than 75 % RH(no dews)

(3) Install the instrument in such a location where the instrument is not affected by vibration and electrical influences. Install the instrument as away as possible from motors and transformers.

(4) There is no specific instruction for mounting angle, but observe the viewing angle when installing the instrument.
   • Horizontal: ±65°
   • Vertical:　 +40°～−65°

(5) Front cover must be opened to have an access to the external memory (CF card and USB memory) and the USB cable. Attempt installation considering the space required for working with such devices.
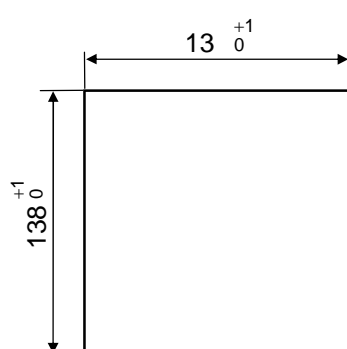

Front cover is open
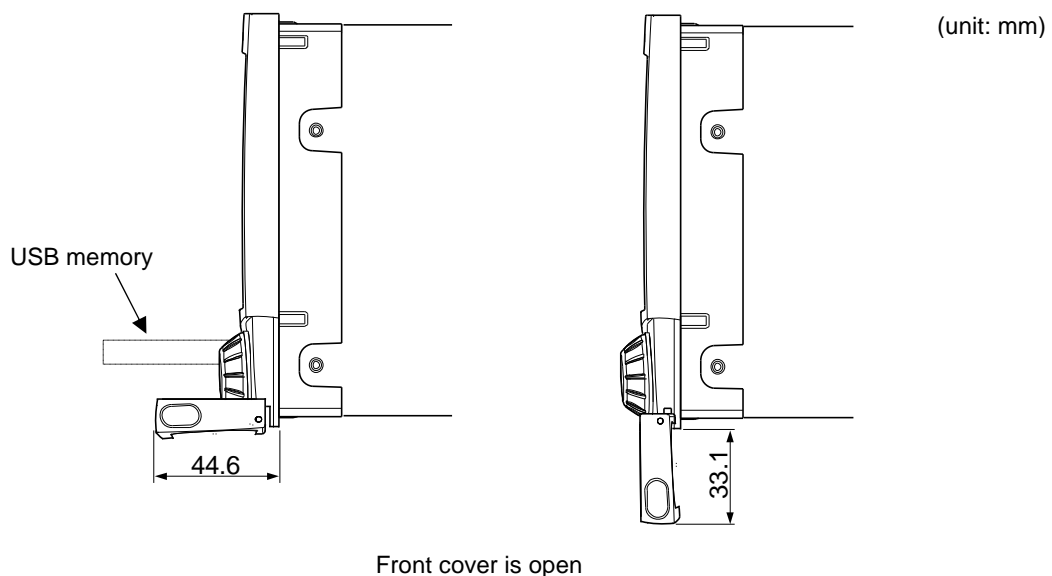
3.2 External Dimensions

■ Phoenix connector type
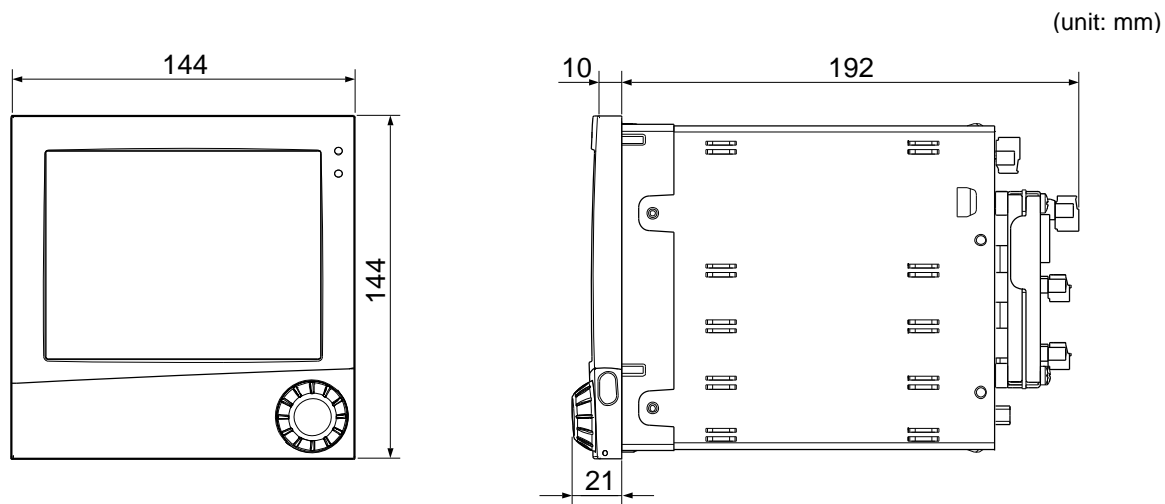
(unit: mm)

■ Panel cutout

(unit: mm)

$13 \, {}^{+1}_{0}$

$138 \, {}^{+1}_{0}$

Panel thickness: 2～40 mm

3.3 Mounting in a Panel

1. Make a cutout in the panel (thickness 2～40 mm).

☞ See panel cutout details (P. 9)

2. Insert the rubber sealing from the rear of the instrument. (figure 3-1)

3. Install the instrument into the cutout from the front of the panel.

4. Attach hook of the mounting bracket to the hold on the housing (figure 3-2)

5. Tighten the screw with a screwdriver until the top of the mounting bracket touches the panel. (figure 3-3)

6. Attach the rest of the mounting brackets in the same way at four positions. Tighten screws equally among four brackets. (figure 3-4)
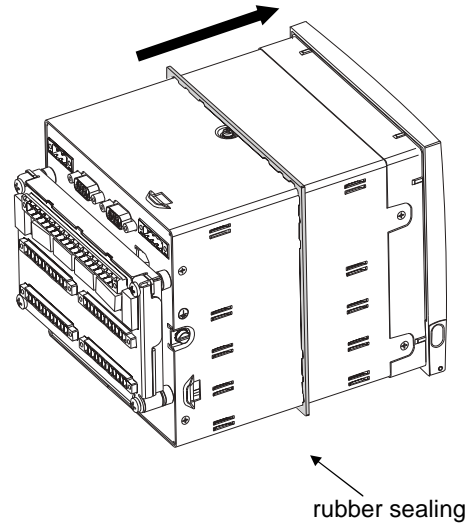

rubber sealing

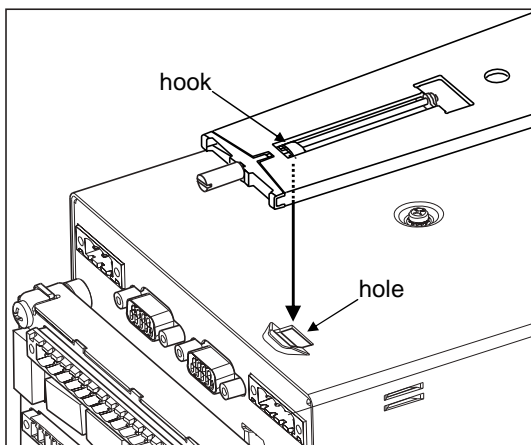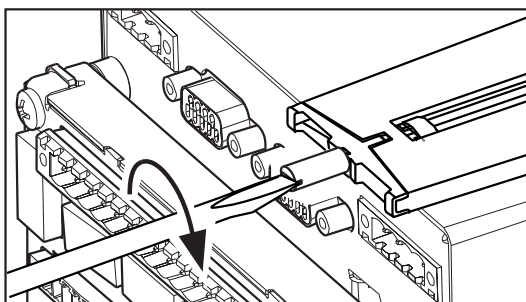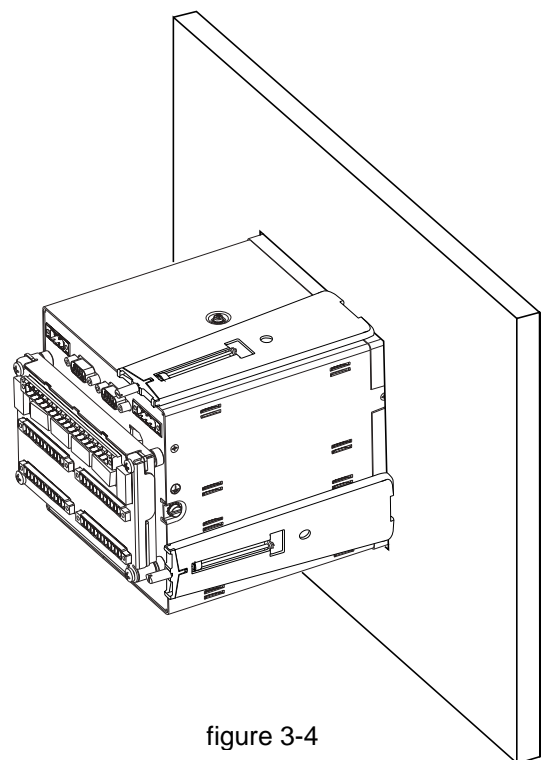figure 3-1

hook

hole

figure 3-2

figure 3-3

figure 3-4

📖 This instrument satisfies IP65 when it is installed with four mounting brackets and a rubber sealing. To effectively use this structure, make sure there is no spaces and gap between the rubber sealing and the instrument/panel.

Contact RKC or the nearest distributor for a new rubber sealing if it is deteriorated and to be replaced.

4. Wiring

This chapter describes wiring, caution in wiring and terminal layout.

4.1 Caution in Wiring

⚠ **Warning**

Be sure to power off the instrument before attempting any work on the instrument to prevent electrical shock and damage to the instrument.

- Wiring shall be made by authorized personnel within the limit of the instructions given in this manual.

- Power off the instrument if there is a possibility of touching live part during the wiring.

- This instrument satisfies EMC (Electromagnetic compatibility) requirements described in 9.6 General specifications　(P. 104).

- Wire input, output and power cables separately. Do not wire them close to each other.

- All input/output cables shall be stranded or shield except power cable. Earth the shield to the same potential as the instrument.

- Ground the protection earth (PE) to the protected grounding conductor. The sectional area of this cable must be equal to that of the cable used for power supply. The cable earth shall be made in the star connection to the common earth connected to the protected grounding conductor for the power. Ground cables shall be wired separately and do not use common connections among instruments.

- Do not connect any loads to the power supply of this instrument.

- Do not install/use this instrument in such an area where explosion proof specification is required.

- Install an RC module to prevent interferences if any inductive loads such as contactors or solenoid valves are near instrument.

- This instrument has no power switch nor fuse. Install an external fuse to the instrument power supply. Fuse rating depends on the supply voltage.
  AC 100～240 V +10/-15%、48～63 Hz : 　fuse rating：1 A (slow blow fuse)
  AC/DC 20～30 V、48～63 Hz : 　　　　　fuse rating：2 A (slow blow fuse)

- Wiring material for Phoenix connector
  [for power supply and relay outputs]
  – Thickness (sectional area):　　　0.2～2.5 mm^2、24～12AWG
  – Length of stripped part:　7 mm
  – Tightening torque:　0.5～0.6 N·m

  [for analog inputs and binary inputs/outputs]
  – Thickness (sectional area)):　　　0.08～1.5 mm^2、28～16AWG
  – Length of stripped part:　7 mm
  – Tightening torque:　0.22～0.25 N·m

4.2 Input/Output boards and Terminal Layout

4.2.1 Rear terminal layout

The following figures illustrate rear terminals when no connectors are attached.

No relay outputs

with relay output board
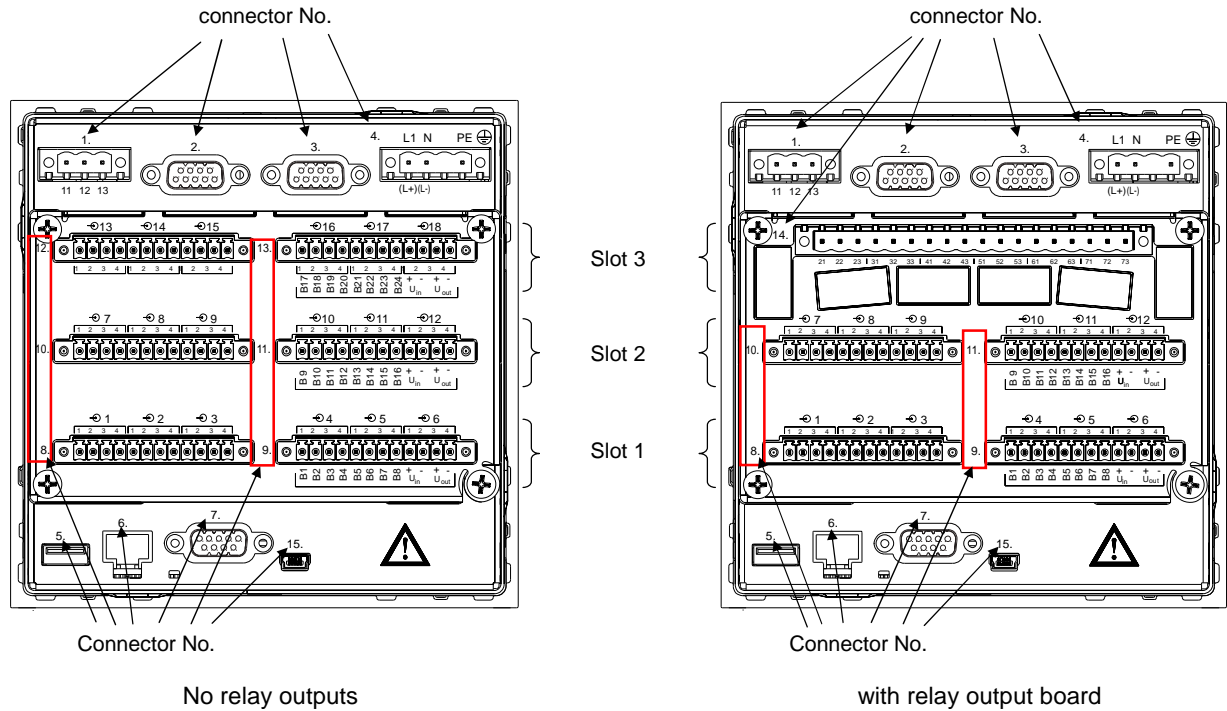
Connectors	Functions
1	Relay output (overall alarm, etc)
2	Barcode reader (RS-232)
3	PROFIBUS interface [optional]
4	Power supply
5	USB connector　(type A) for U　USB memory media
6	Ethernet interface
7	Serial interface (RS-232C or RS-485)
8	Analog inputs (AI1、AI2、AI3)
9	Analog inputs (AI4、AI5、AI6) または Binary inputs/outputs (BIO1～BIO8)
10	Analog inputs (AI7、AI8、AI9)
11	Analog inputs (AI10、AI11、AI12) または Binary inputs/outputs (DIO9～DIO16)
12	Analog inputs　(AI13、AI14、AI15)
13	Analog inputs (AI16、AI17、AI18) または Binary inputs/outputs (DIO17～DIO24)
14	Relay outputs (6 outputs)
15	USB connector (mini B) for interface to a PC

Slot 1 spans connectors 8, 9. Slot 2 spans connectors 10, 11. Slot 3 spans connectors 12, 13.

* Slot 3 is used either analog inputs (Nos.12, 13) or relay outputs (No.14).

4.2.2 Types of input/output boards and number of inputs/outputs

The number of available inputs/outputs depends on the input/output board installed in the slots.

● Available boards
• Analog input board (analog inputs; 6 inputs)
• Analog inputs/Binary input/output board (analog input: 3 inputs, binary input/output; 8)
• Relay output board (6 relay outputs)

● Boards and slots
Slot 1:   Analog board, Analog/Binary I/O board
Slot 2:   Analog board, Analog/Binary I/O board
Slot 3:   Analog board, Analog/Binary I/O board, Relay output board

Board types and number of available inputs/outputs

Slot	Board type*	Combination pattern No.													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Slot 1	AI	—	—	O	O	—	—	O	O	—	O	O	O	O	O
	AI/BIO	O	O	—	—	O	O	—	—	O	—	—	—	—	—
Slot 2	AI	▨	▨	▨	▨	—	—	—	—	—	O	O	—	O	O
	AI/BIO	▨	▨	▨	▨	O	O	O	O	O	—	—	O	—	—
Slot 3	AI	▨	—	▨	—	▨	—	▨	—	—	▨	—	—	—	O
	AI/BIO	▨	—	▨	—	▨	—	▨	—	O	▨	—	O	O	—
	Relays	▨	O	▨	O	▨	O	▨	O	—	▨	O	—	—	—
No of I/Os	Analog inputs	3	3	6	6	6	6	9	9	9	12	12	12	15	18
	Binary I/Os	8	8	—	—	16	16	8	8	24	—	—	16	8	—
	Relays	—	6	—	6	—	6	—	6	—	—	6	—	—	—

* AI: Analog input board   ▨ : Not used
  AI/BIO: Analog input board/Binary I/O board
  Relays: Relay output board

📖   Above combinations of boards are possible in relation to slots.

    [Basic rules]

    −Use slot 1 first.

    −When one analog input board and one analog input/binary I/O board are used or when one analog input board and two analog input/binary I/O boards are used, use the analog input board to slot 1.

    −When two analog input boards and one analog input/binary I/O board are used, use the analog input boards to slot 1 and slot 2.

4.2.3 Input/output Channel Numbers

Input and output channel numbers are fixed on this instrument. Observe the following information.

● Slot 1
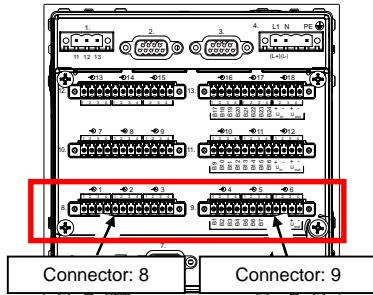
[Analog input board]
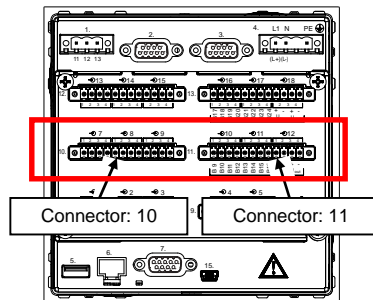   Connector No.8:   Analog inputs (AI) CH 1～3
    Connector No.9:   Analog inputs (AI) CH 4～6

[Analog input/Binary I/O board]
    Connector No.8:   Analog inputs (AI) CH 1～3
    Connector No.9:   Binary I/Os (BIO) CH 1～8

● Slot 2

[Analog input board]
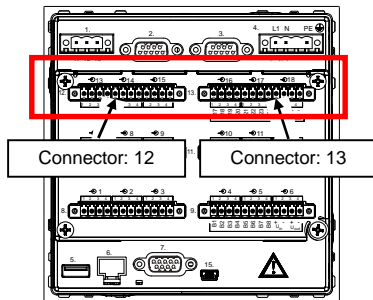   Connector No.10:   Analog inputs (AI) CH 7～9
    Connector No.11:   Analog inputs (AI) CH 10～12

[Analog input/Binary I/O board]
    Connector No.10: Analog inputs (AI) CH 7～9
    Connector No.11: Binary I/Os (BIO) CH 9～16

● Slot 3

[Analog input board]
    Connector No.12: Analog inputs (AI) CH 13～15
    Connector No.13: Analog inputs AI) CH 16～18

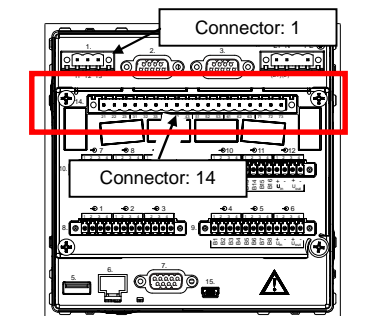[Analog input/Binary I/O board]
    Connector No.12: Analog inputs (AI) CH 13～15
    Connector No.13: Binary I/Os (BIO) CH 19～24

[Relay output board]
    Connector No.14: Relay output CH 2～7
    (Relay output: Connector No.1)

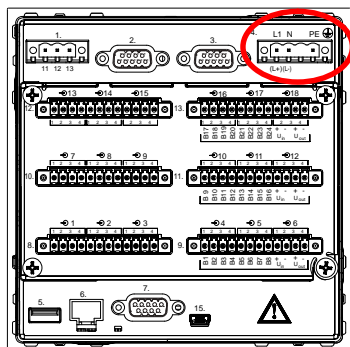[Example]9 x analog inputs and 8 binary I/Os
        Slot 1: Analog input board
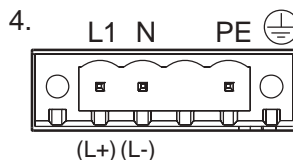   Slot 2: Analog input/Binary I/Os board
        Slot 3: Not used
        Channel Nos.:   Analog inputs (AI) CH 1～9
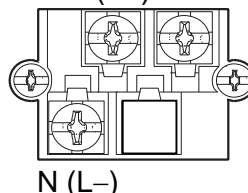   Binary I/Os (BIO) CH 9～16
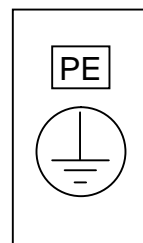
4.3 Wiring to Connector

4.3.1 Power

Power connector

L1 N PE ⏚

(L+) (L-)
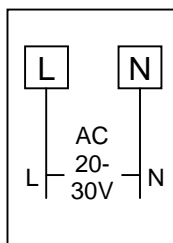
For screw terminal

L1 (L+) PE

N (L−)

Not available yet

L	N
	AC 100-240V	

L	N
	AC 20-30V	

L+	L−
+	DC 20-30V	−

PE
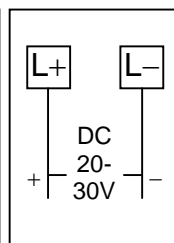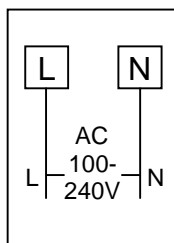
Power supply

Protection earth

- ● Power supply
- ・ 85～264 V AC (including supply voltage fluctuation)
  48～63 Hz (50/60 Hz)
  Rating 100～240 V AC
- ・ 20～30 V AC/DC
  48～63 Hz (50/60 Hz)

- ● Protection earth
- ・ Connect the protection earth terminal (PE) of this instrument to the protected ground.
- ・ The cross section of the cable must be the same as that of power cable.
- ・ The ground of the cable must be made in star-connection at the common ground that is connected to the protected earth conductor.
- ・ The ground cable must be individually wired. Do not make common wiring between plural instruments.

4.3.2 Analog Inputs
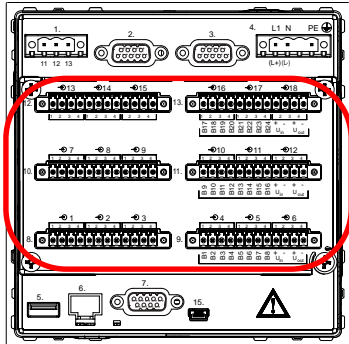
Analog input connector
(Connector Nos. 8～13)

In case of screw terminal
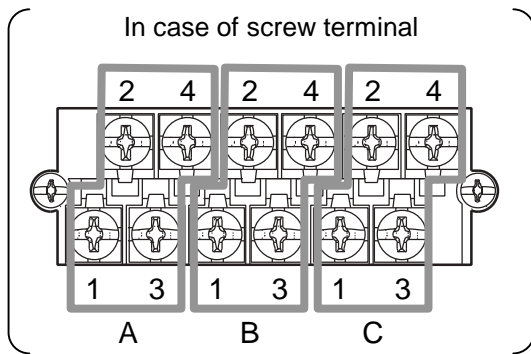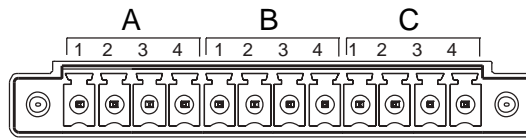
Relation between connector number and channel number.

Connector No.	Analog input channel No.		
	A	B	C
8	1	2	3
9	4	5	6
10	7	8	9
11	10	11	12
12	13	14	15
13	16	17	18

Three (3) channels per connector
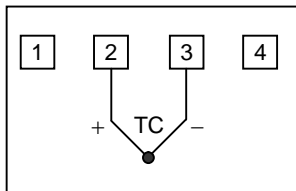
Thermocouple
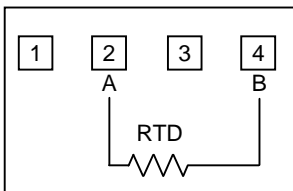
2-wire RTD
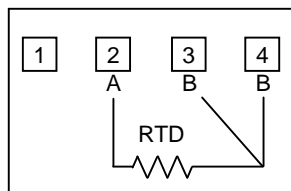
3-wireRTD
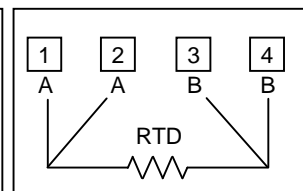
4-wire RTD

Resistance transmitter

E: エンド
S: スライダ
A: スタート
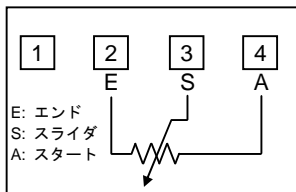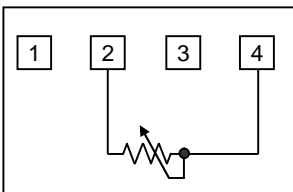
2-wire potentiometer
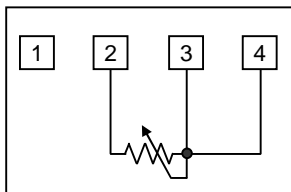
3-wire potentiometer
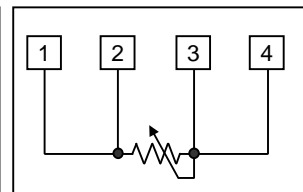
4-wire potentiometer
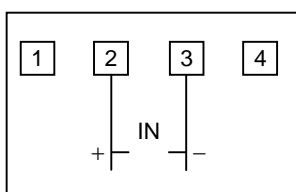
Voltage input (low)
(0～200 mV、0～1 V、−1～+1 V)
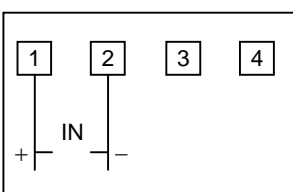
Voltage input (high)
(0～10 V、−10～+10 V)
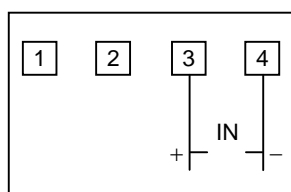
Current input

4.3.3 Binary Input/Output
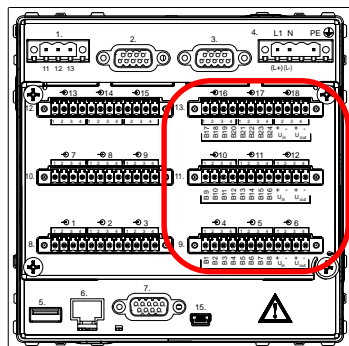
Binary I/O connector
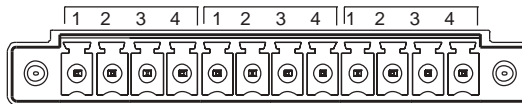
	Connector No.13	B17 B18 B19 B20 B21 B22 B23 B24 U_{in} $+$ $-$ U_{out} $+$ $-$
Connector No.11	B9 B10 B11 B12 B13 B14 B15 B16 U_{in} $+$ $-$ U_{out} $+$ $-$
Connector No. 9	B1 B2 B3 B4 B5 B6 B7 B8 U_{in} $+$ $-$ U_{out} $+$ $-$

In case of screw terminal

2 4 6 8 $U_{in}-$ $U_{out}-$

1 3 5 7 $U_{in}+$ $U_{out}+$

The example shows the wiring with connector 9, but wiring with connectors 11 and 13 is the same.
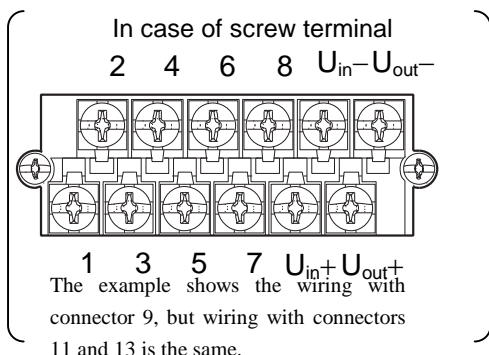
| Connector No.			Function
9	11	13	
1	9	17	Max. 8 binary inputs (BI), or
⋮	⋮	⋮	max. 8 binary outputs (BO)
8	16	24	Input/Output selectable at each channel
$U_{in}+$			External power supply (+)
$U_{in}-$			External power supply GND
$U_{out}+$			Power supply output +24 V
$U_{out}-$			Power supply output GND

(I/O Number)

● Binary input (BI)

| Pin No. | B1 | B2 | B3 | B4 | B5 | B6 | B7 | B8 | Uin | Uin | Uout | Uout |
| Terminal No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | + | − | + | − |

BI1 BI2 BI3 BI4 BI5 BI6 BI7 BI8
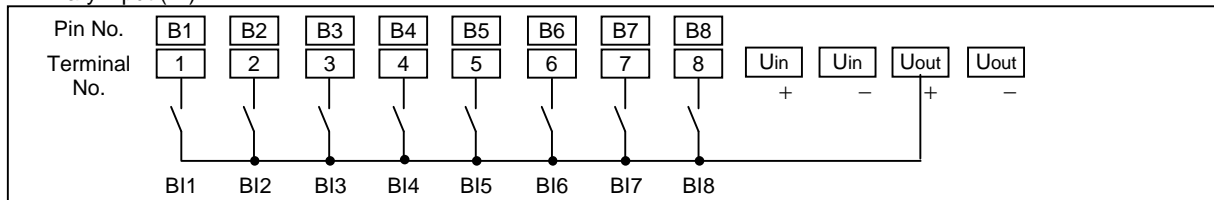
● Binary output (BO): with internal power supply

| Pin No. | B1 | B2 | B3 | B4 | B5 | B6 | B7 | B8 | Uin | Uin | Uout | Uout |
| Terminal No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | + | − | + | − |

BO1 BO2 BO3 BO4 BO5 BO6 BO7 BO8

Internal power supply can drive up to DC 24 V、7.5 mA/point
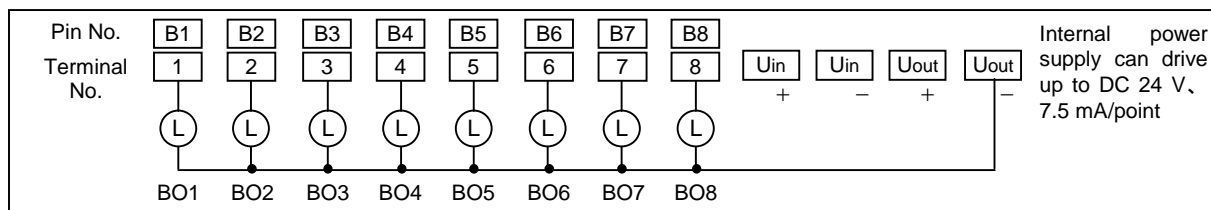
● Binary output (BO): with external power supply

| Pin No. | B1 | B2 | B3 | B4 | B5 | B6 | B7 | B8 | Uin | Uin | Uout | Uout |
| Terminal No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | + | − | + | − |

BO1 BO2 BO3 BO4 BO5 BO6 BO7 BO8

DC 24 V (Ext. P/S)

If DC 24 V、7.5 mA/point exceeds (max.50mA), use external power supply.
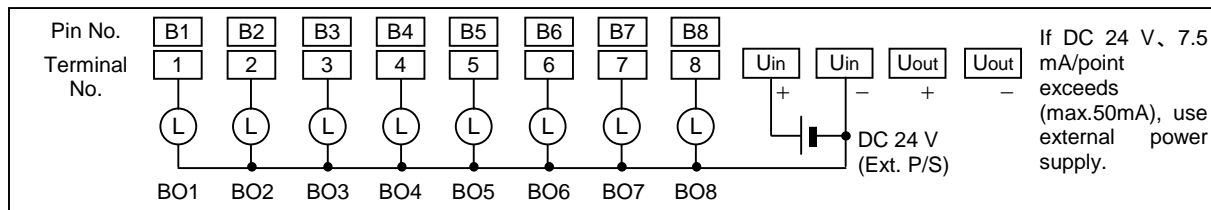
📖 The above pictures show wiring examples of binary inputs (BI) and binary outputs (BO).

The example shows the wiring with connector 9, but wiring with connectors 11 and 13 is the same.

📖 Internal circuit of binary input/output.
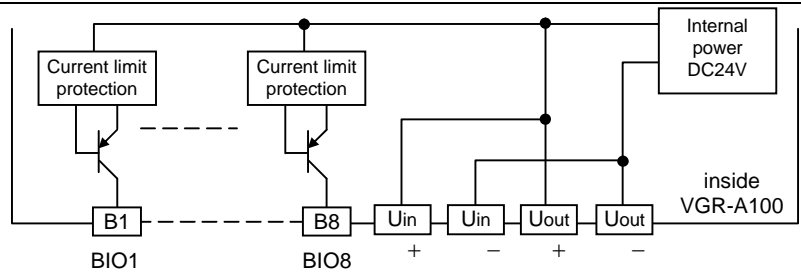
4.3.4 Relay Output

Relay output connector

Connector 1

11 12 13

Relay 1

Connector 14

21 22 23 31 32 33 41 42 43 51 52 53 61 62 63 71 72 73
Relay 2   Relay 3   Relay 4   Relay 5   Relay 6   Relay 7

In case of screw terminal

Terminal No.

NO: Normally open
NC: Normally close
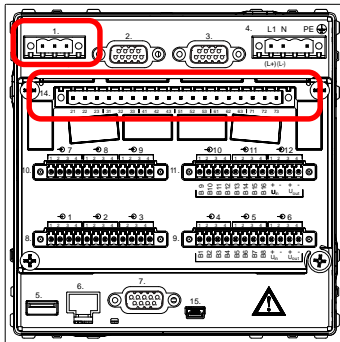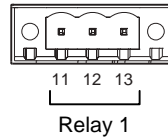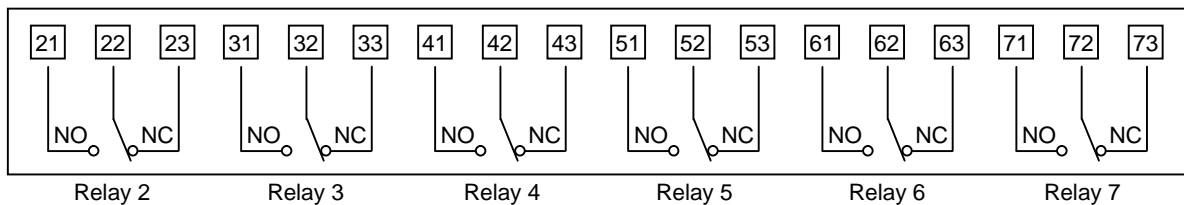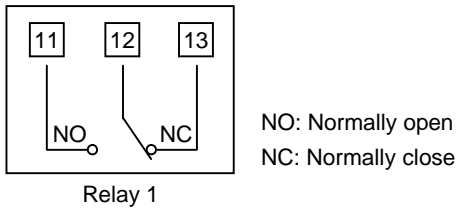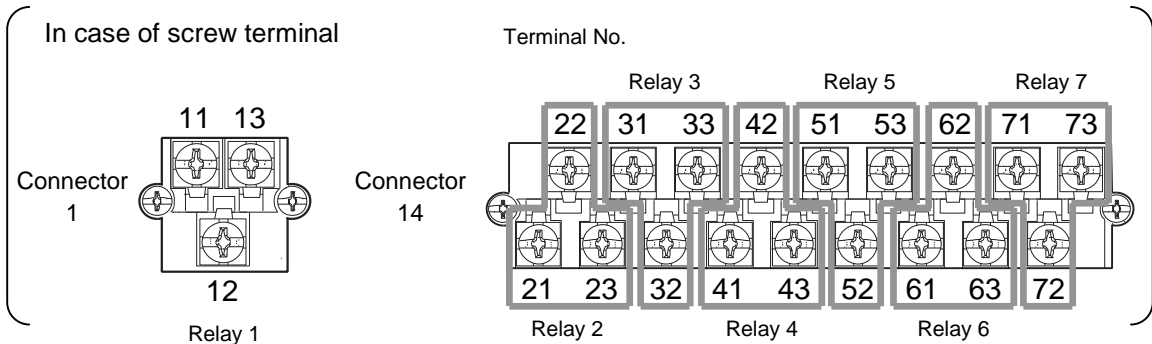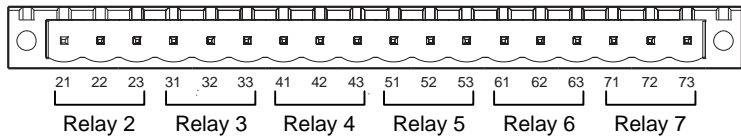
📖 Connector 14 is supplied when optional relay output (7 outputs) is specified for slot 3.

IMX01L05-E1
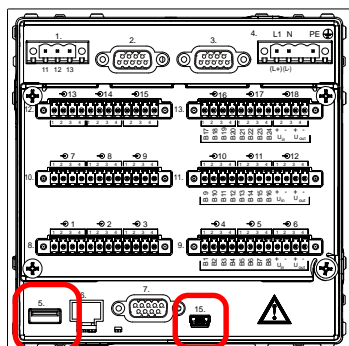
4.3.5 USB Connector

USB connector
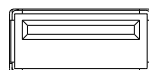
Connector 5   type A

Connector 15   type mini B

For :   USB connector (type A)

         USB memory

         USB connector (type mini B)

         Connected to a PC via cable

Interface: USB2.0

📖   USB connectors at rear are of the same type as those on the front panel. Two USB connectors of the same type cannot be used simultaneously.

4.3.6 Ethernet Interface
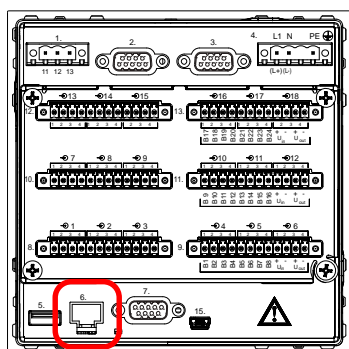
Ethernet connector

1 – – – 8
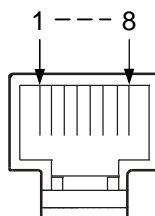
Connector 6

Connector type: RJ-45

Interface: Ethernet

Pin No.	Signal	Symbol
1	Send data +	TX+
2	Send data −	TX−
3	Receive data +	RX+
4	Not used	—
5	Not used	—
6	Receive data −	RX−
7	Not used	—
8	Not used	—

4.3.7 Serial Communication
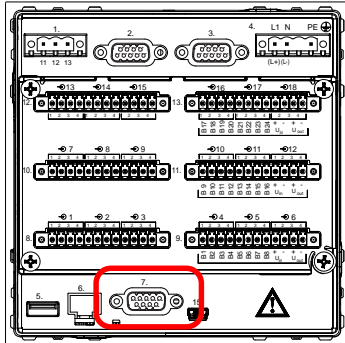
Serial communication

Connector 7
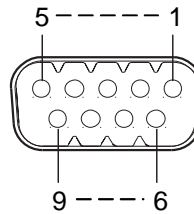
Type: D-Sub 9-pin connector (female)

Interface: EIA RS-232C or

                EIA RS-485

RS-232C

Pin No.	Signal	Symbol
1	—	Not used
2	Receive data	RD (RXD)
3	Send data	SD (TXD)
4	—	Not used
5	Signal ground	SG
6	—	Not used
7	—	Not used
8	—	Not used
9	—	Not used

RS-485

Pin No.	Signal	Symbol
1	—	Not used
2	—	Not used
3	Send/Receive data	T/R (B) (TXD+/RXD+)
4	—	Not used
5	Signal ground	SG
6	—	Not used
7	—	Not used
8	Send/Receive data	T/R (A) (TXD−/RXD−)
9	—	Not used

4.3.8 Barcode Reader Input
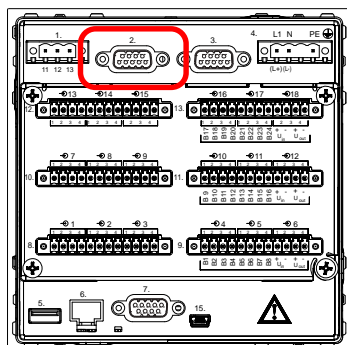
Barcode reader connector

Connector 2
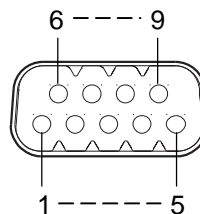
Connector type: D-Sub 9-pin connector (female)
Interface: EIA RS-232C

Pin No.	Signal	Symbol
1	—	Not used
2	Receive データ	RD (RXD)
3	Send データ	SD (TXD)
4	—	Not used
5	Signal ground	SG
6	—	Not used
7	—	Not used
8	—	Not used
9	—	Not used

When a barcode reader is connected, a gender changer may be required.

Connector: D-sub 9-pin, Male-Male connector, straight, all connected

Recommended: D9S-MM from Sanwa Supply

4.3.9 PROFIBUS Interface (Option)
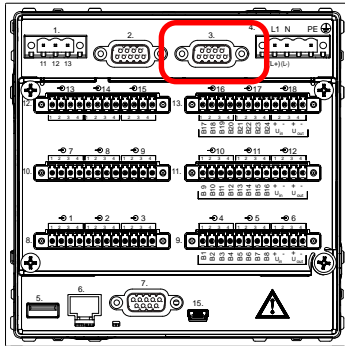
PROFIBUS Interface

Connector 3
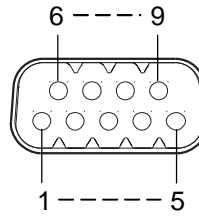
Connector type: D-Sub 9-pin connector (female)
Interface: PROFIBUS-DP

Pin No.	Signal	Symbol
1	—	Not used
2	—	Not used
3	Data receive/Data send (+)	RxD/TxD-P
4	—	Not used
5	Signal ground	DGND
6	Supply voltage for terminating resistor (5 V)	VP
7	—	Not used
8	Data receive/Data send (-)	RxD/TxD-N
9	—	Not used

5. Basic Operations

This chapter describes basic operations of VGR-A100.
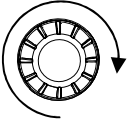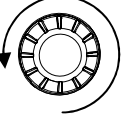
5.1 Operating with a Control Knob

All operations are performed with the front control knob.
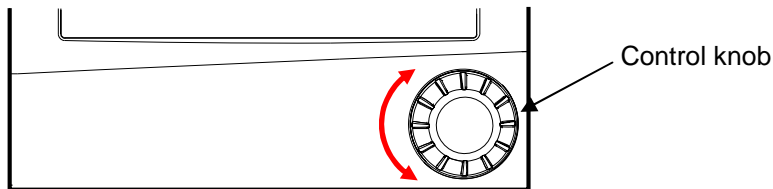
Control knob

- **Cursor shift**

Rotate the control knob left/right to shift the cursor (blue highlighted part) position.

Direction	Cursor movement
right	right or down → ↓
left	left or up ← ↑

[Example] Cursor (blue part)

Rotate control knob right.

Cursor moves right.
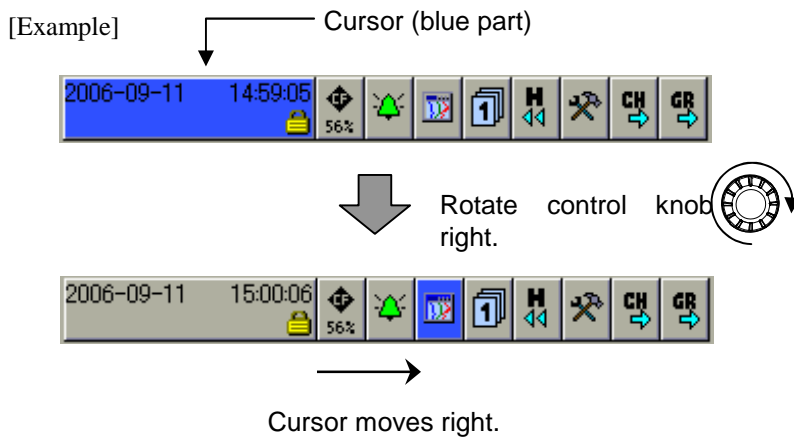
- **Accepting selected item**

When a cursor comes to the item to be selected, press the control knob.

Repeat this procedure if further selection is required.

Press the control knob to accept.
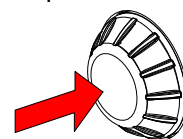
5.2 Selecting and Setting Data

5.2.1 Selecting Data

Data can be selected by moving the cursor to the item to be selected and pressing the knob. This procedure is the same when data is selected from plural selections.

[Example]   Disabling binary channels while an analog graph is displayed.

1. Rotate the control knob right $\curvearrowright$ to move the cursor to graph setting.
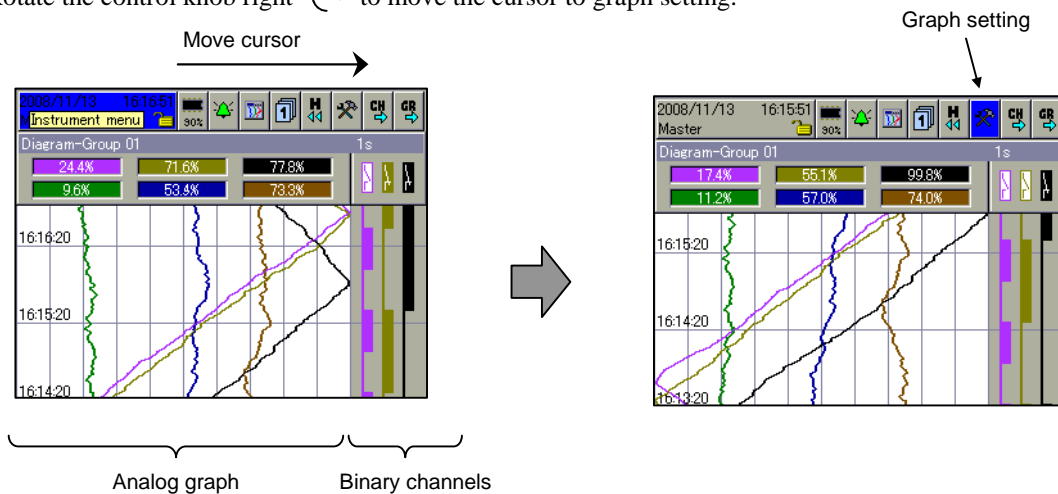
2. When a control knob is pressed at [Graph setting], a graph setting window is popped up.
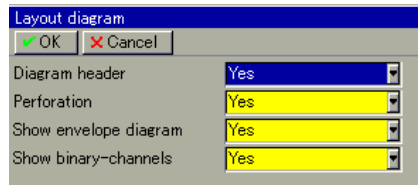
3. Rotate the knob to move the cursor to [Show binary channels], and press for further selection.
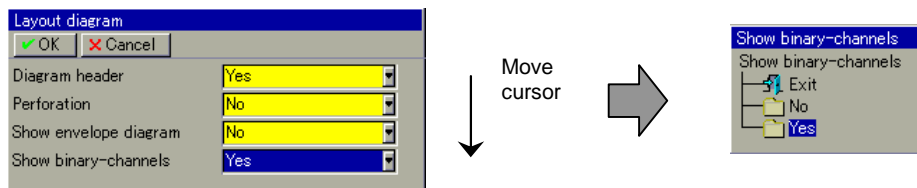
4. Rotate the knob to move the cursor [No] and press the knob. Then, the contents of [Show binary channels] becomes [No].
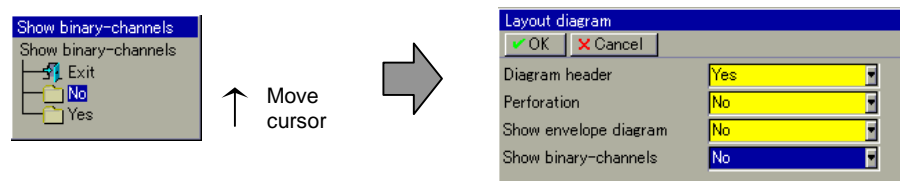
5. Move the cursor to [OK] and press the knob. The binary diagram disappears from the analog graph.

Move cursor
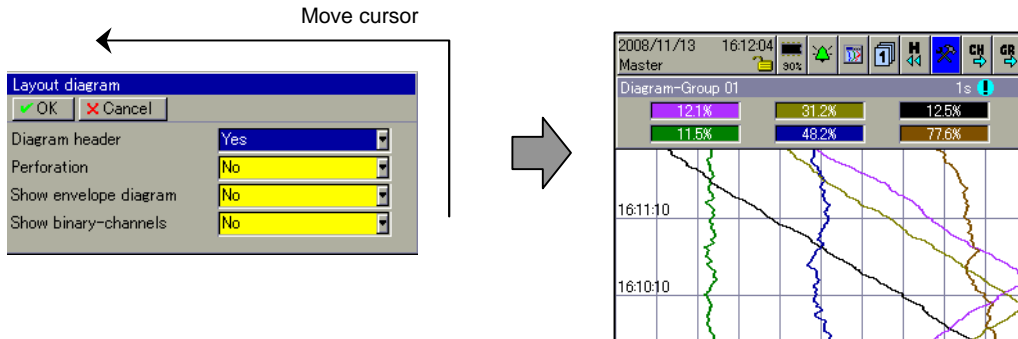
A symbol as shown below (downward triangle) means there are selection items.

This symbol means there are selections.
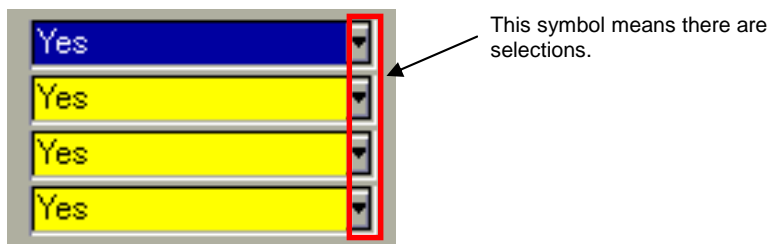
5.2.2 Entering Numerical Data

To enter numerical data, there are two ways; data setting window without a decimal point and a data setting window with a decimal point.

■ Data setting window without a decimal point

There are two ways to enter data without a decimal point; increase/decrease the data digit by digit and increase/decrease the data continuously.

● Set data digit by digit

Rotate the control knob to move the cursor to the digit to be changed.
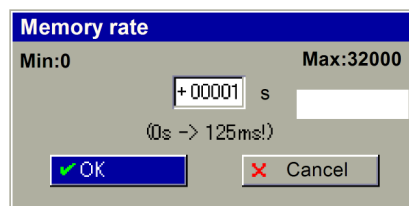
[Example] Change the set value to 10 seconds in the above setting.

1. Move the cursor to the tens digit (+00001), and press the control knob. The cursor becomes red. (+00001)

2. Rotate the control knob to increase/decrease the digit at which the cursor stays. In this example, select 1 by rotating the control knob. When the data is entered, the cursor becomes blue again.(+00011)

3. Similarly set the ones digit. (+00010)

4. Move the cursor to [OK] and press the control knob to accept the set value [10].

● Set data by incrementing/decrementing

In this dialog box you can set the value by rotating the control knob for increment/decrement.
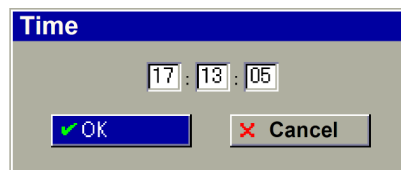
[Example] Change the time 17:13:05 to 16:13:05

1. Move the cursor to (17) and press the control knob to turn the figure in to red (17).

2. Rotate the control knob when the figure is shown in red to select [16] and press the knob to confirm. After the value has been fixed it turns into blue (16) again.

3. Finally, move the cursor to [OK] and press it. Now, the time has been changed to [16:13:05」.

■ Setting numerals with a decimal point

To set a numeral data with a decimal point, a dialog as shown below is used.

Name of setting item

Minimum settable
value *

Maximum settable
value *

Scale / range start

Min: −99999   Max: +9999

+0.0000

Input field

+/- sign

Decimal point

Delete (left of cursor)

✔ OK   ✗ Cancel

Move cursor inside input field
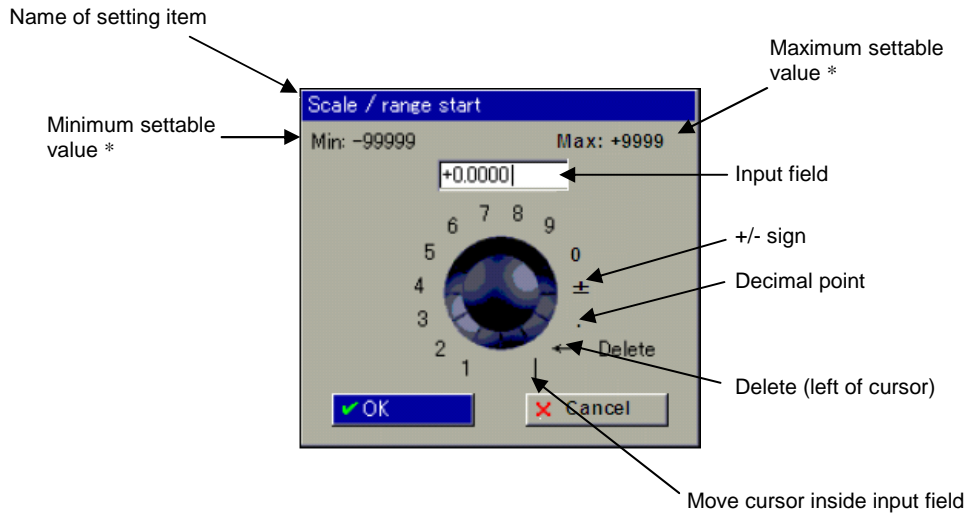
* Maximum and minimum settable values are not necessary the minimum and the maximum values of set item.

● Setting procedures
[Example] Change set value 「0.0」 to 「−200.0」

1. Rotate the control knob to ,[<- delete]. Each press of this symbol deletes one numeral left of the cursor.

2. Keep deleting numerals until nothing is left in the input field (except + sign).

3. Move the cursor to the sign [±]. Each press of this symbol changes the sign [+] and [-] alternatively.

4. Press the control knob to select [-] sign.

5. Rotate the control knob to [2] and press it once to set [2] in the input field.

6. Set [0] [0] [.][0] in the same way to get [-200.0].

7. At the end move the cursor to [OK] and press it. Now, the data has been set.

📖   When this dialog is opened, the value in the input field is always shown in five digits. For example, if
the set value is [0.0], it is shown as [0.0000]. However, to enter the data, just enter effective digits.

● Modify the set value

[Example] Modify [1500] to [1600]

1. Rotate the control knob to [cursor].

2. Press the control knob to make the input field highlighted in blue.

3. Rotate the control knob to move the cursor [|] between [5] and [6].

4. Press the control knob to confirm the cursor position.

5. Rotate the control knob to bring the cursor (blue) to [← delete].

6. Press the control knob to delete [5].

7. Rotate the control knob to [6].

8. Press the control knob at [6] to bring [6] into the input field. The figure in the input box is [1600] now.

9. Finally rotate the control knob to [OK] and press it to complete the setting.

5.3 Entering Text

To enter text, move the cursor to the text editing field and the text editing window appears.

[Text editing window]

Cursor position

Text editing field

Text selection buttons

Space

Move text cursor inside the text editing field

Text list

Delete   End edit

Cancel edit
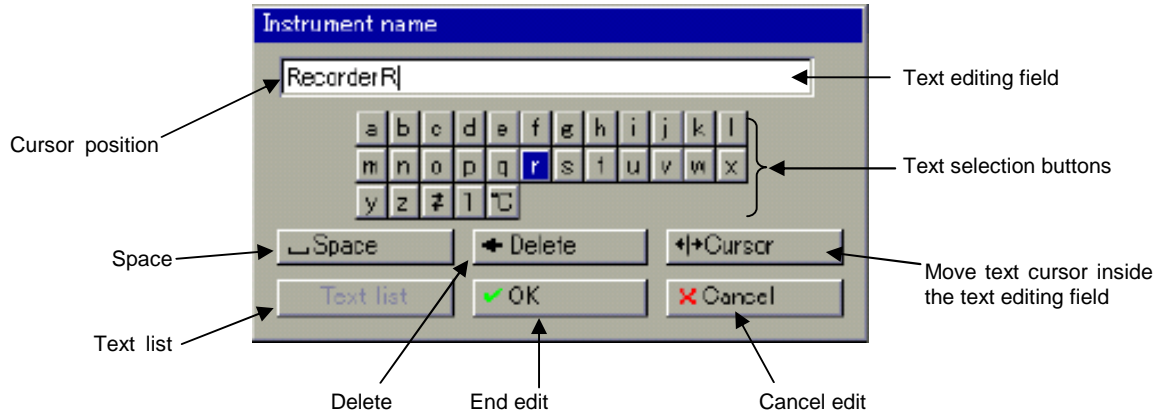
Text editing field:

Used for text edit. A selected character is entered to the left of the cursor.

Text selection buttons:

29 buttons* are provided. If you move the cursor (blue part) to a desired button (index) followed by pressing the control knob, you will have a selection of characters under the index. Rotate the control knob to move the cursor left and right to select the desired character. Press the control knob to have the selected character in the text editing field. To end the editing mode without selection, press the control knob at [↑]

📖   You can only select characters listed here. If you want to add different characters, you have to use PSU/Setup tool.

☞   See appending for a character table showing available characters. The contents depend on the language.

[Example] Entering text and popup selection box for selection
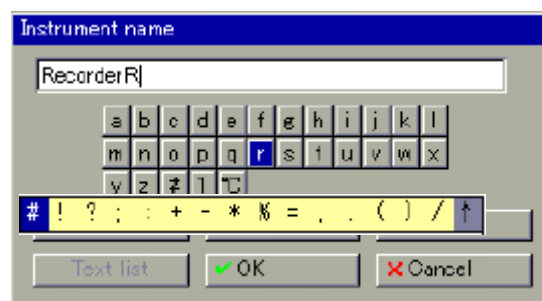
* Number of keys depends on language

	Space:	Inserts a space to the text editing field (to the left of the text cursor)

Delete: Deletes a character in the text editing field.

Move the cursor to [Delete] and press the control knob. A character to the left of the text cursor is deleted.

Cursor: Used to move the text cursor inside the text editing field.

Move the cursor to [cursor] and press the control knob. The text editing field is reversed (blue highlighted). Rotate the control knob to move the text input cursor inside the field. Press the control knob where the cursor should be fixed.

Text list: Texts previously entered are stored and can be re-used by selection.

Move the cursor to [Text list] and press the control knob. Previously entered texts are listed. Move the cursor to select the desired text. Press the control knob to transfer the selected text to the text editing field.

O K: Press [OK] if edited text is acceptable. This completes text editing.

Cancel: To abort text editing, move the cursor to [Cancel] and press the control knob. Text being is aborted and the text before edit remains valid.

                            IMX01L05-E1

■ Table of Selectable Text

Maximum 16 characters are registered per index. The content of the table is replaced when a language is changed.

Index	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
a	a	A	ä	Ä												
b	b	B														
c	c	C														
d	d	D														
e	e	E														
f	f	F														
g	g	G														
h	h	H														
i	i	I														
j	j	J														
k	k	K													°	
l	l	L														
m	m	M														
n	n	N														
o	o	O	ö	Ö												
p	p	P														
q	q	Q														
r	r	R														
s	s	S														
t	t	T														
u	u	U	ü	Ü												
v	v	V														
w	w	W														
x	x	X														
y	y	Y														
z	z	Z														
#	!	?	;	:	+	-	*	%	=	,	.	(	)	/		
1	1	2	3	4	5	6	7	8	9	0						
℃	℃	°F														

📖 Characters in the table can be edited with PSU/Setup tool. Upward arrow cannot be used as it is a reserved as "back to index".

6. Basic Screens

6.1 Display with Recorded Data
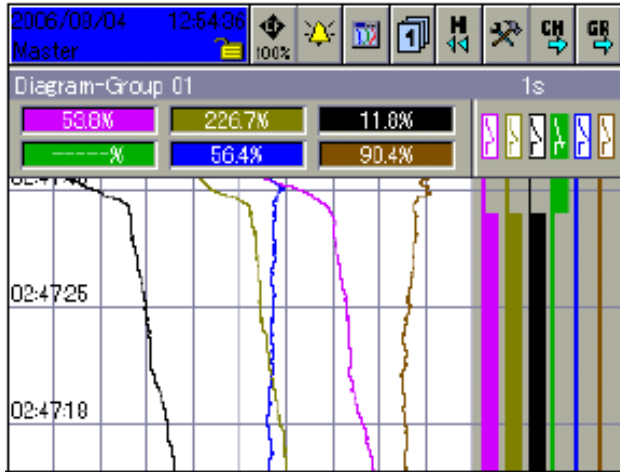
- Menu bar (header)
- Status display
- Graph header
- Graph area

Menu bar: Used for setting and switching displays. Move the cursor by rotating the control knob. The content of the menu depends on the mode.

Fixed area   Variable area

Cursor (blue part)

- Instrument menu
- Memory Manager
- Alarm/Event list
- Visualization
- Group
- Historical trend
- Layout diagram
- Next channel
- Next group
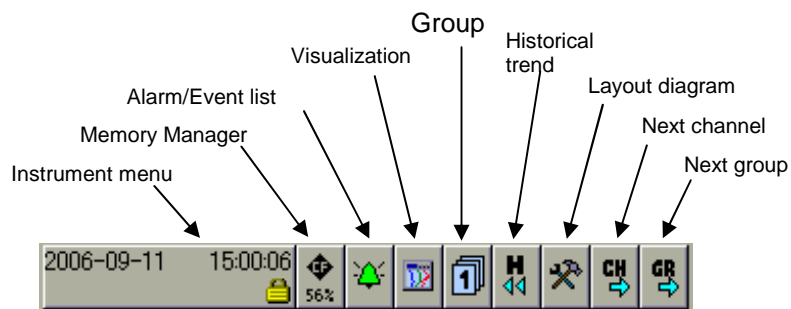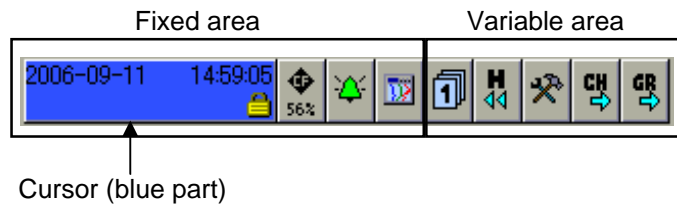
Example of header menu bar (for diagram)

Status bar: Shows selected menus, group name, storage cycle, operation model as well as alarm messages. In case of alarm state this bar starts flashing in red with an alarm message. If two or more alarms are valid, only the last (latest) alarm is displayed. You can see all valid alarms in the alarm list (P.50) and previous alarms (which are no longer active) in the event list.

Normal state

Diagram Group 01   1s

Selected   Group name   Storage cycle

Alarm state

This is a alarm text   1s

Alarm text*   Storage cycle
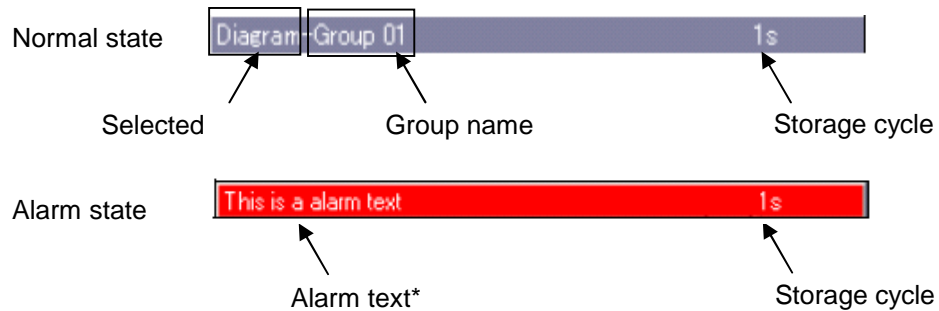
* Alarm text is configurable in configuration (P.69)

Graph header: While a diagram (analog graph) is selected, measured values are displayed in numerals as well as signal status (if supplied and configured). While the binary diagram (binary graph) is selected, the binary signal state (open or close) is displayed.

Alarm is on this channel
(background turns into red)

While diagram (analog graph) is selected

| 31.8℃ | 34.6℃ | -----℃ |
| -----℃ | -----℃ | -----℃ |

Measured values   binary signal status

While binary diagram (binary graph is selected

DIO 02   ⟋‾   DIO 04   ⟋‾   DIO 06
⟋‾   DIO 03   ⟋‾   DIO 05   ⟋‾

Binary signal status
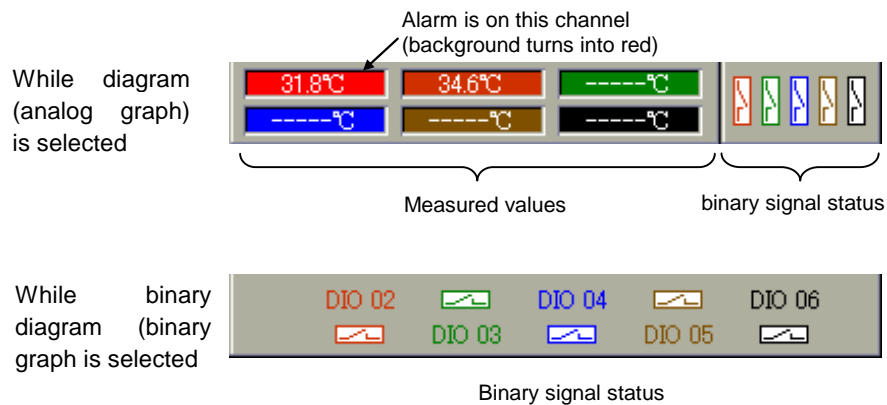
Graph area: Measured values are graphically displayed in analog graph. Various operation screens and lists are also displayed in this area.

When alarm occurs, the alarm part of the analog graph in alarm state turns into red for high alarm and orange for low alarm for easy recognition.

Symbols used in graph

🖊 : Comment entered

❗ : Event happened

🔔 : Alarm OFF

🔔 : Alarm ON
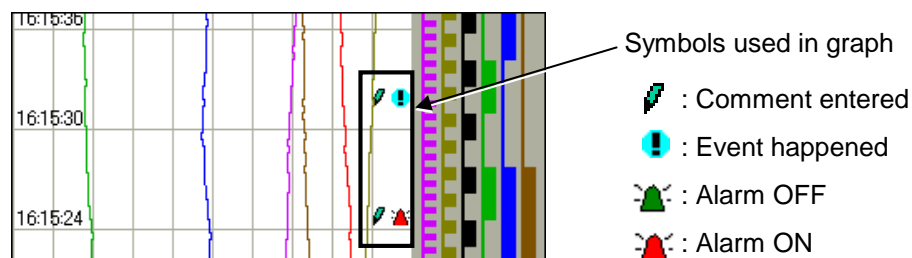
6.2 Visualization Menu

In the visualization menu, you can select display mode of measured data, display of report (summary), batch status, and comment.

This menu is shown when the display menu, 4th from the left, is pressed by the control knob.
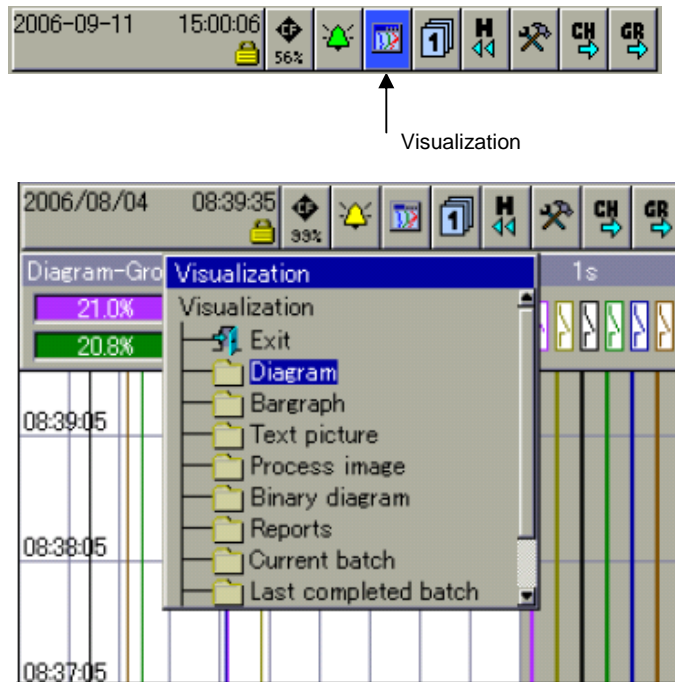
Visualization

■ Visualization Menu

Diagram:	Displays measured values in analog graph. The data is also shown in numerals.	☞ See P. 35
Bargraph:	Displays measured values in bargraph. The data is also shown in numerals. If binary signal is supplied, on/off state of each channel is shown.	☞ See P. 37
Text picture:	Shows measured values (analog inputs) in numerals. If binary signal is supplied, on/off state of each channel is shown.	☞ See P. 38
Process image:	Measured values and inary signal status are displayed in customized screen. (option)	☞ See P. 39 ☞ See P. 40
Binary diagram:	Displays binary signal status (on/off)	
Reports:	Displays various reports (Sum, Daily, Weekly, Monthly, Yearly, Periodic, External).	☞ See P. 41
Current batch:	Batch start/stop and edit are possible.	☞ See P. 42
Last completed batch:	Shows the last completed batch information.	☞ See P. 44
Counters/Integrators:	Shows current status of counters/integrators.	☞ See P. 45
Comment:	Comment can be entered at any desired time.	☞ See P. 46

📖 Display menus are configurable in [Screen] in [Configuration].

6.2.1 Diagram (Analog Graph)

In the analog graph, measured data are shown in vertical lines.

■ See also (P.82).
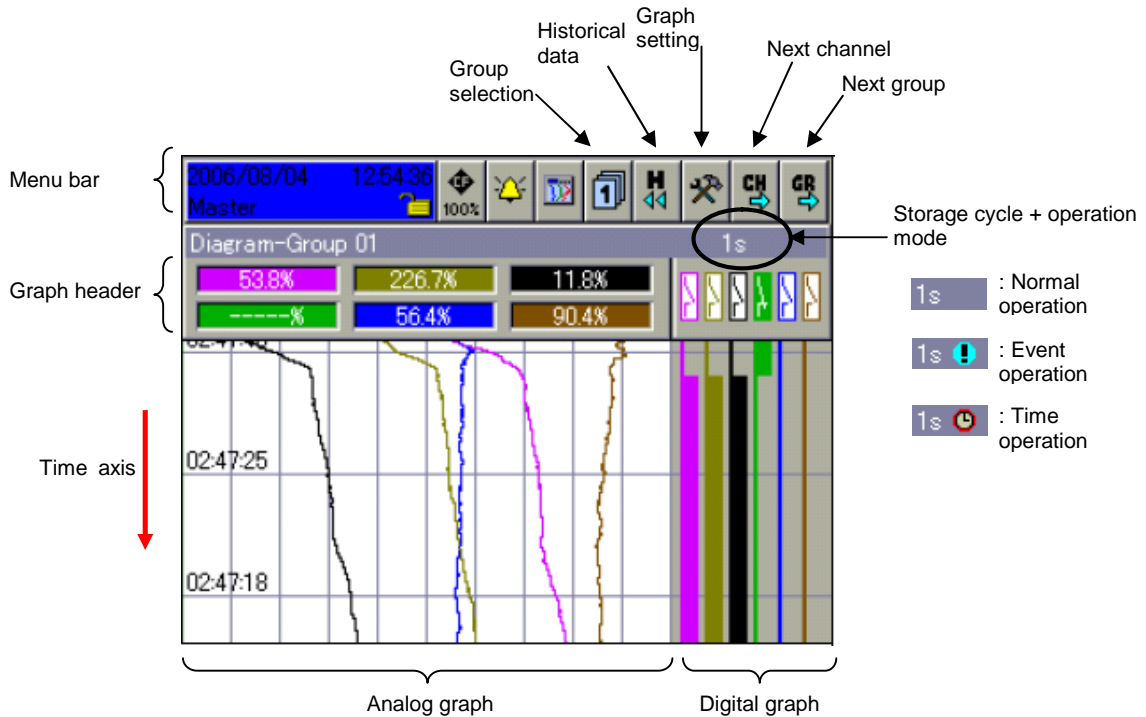
● Menu bar

Group: A desired group can be directly selected. This item is not shown if two or more groups are not used

☞   See [7.6.5. Group Setting] (P.75) for group setting.

Historical display: Previously recorded data can be viewed in this mode.

☞   See 6.3 Historical Data (P.47)

Graph setting: In this mode you can select display on/off of graph header, perforation, min/max line, and binary graph.
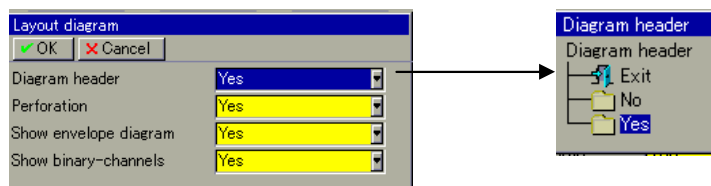
📖   Perforation is selectable when binary graph is not displayed.

See [Switching Graph Setting (P/84)] for details of min/max lines.

Next channel: When this is selected, an analog scale plate is displayed. Every press of the control knob advances the channels within the same group. If four ore more channels are assigned in the group, the initial display without the scale plate is shown after all channels are viewed. This item is not selectable when a graph header is set to "No display".

Low limit of scale
High limit of scale
Alarm setpoint (low)
Analog input
Alarm setpoint (high)
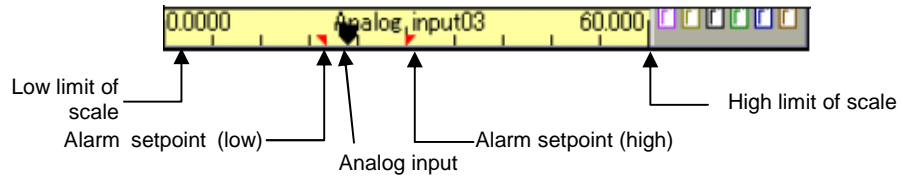
📖 Scale limits (high/low) and alarm set values are to be set in the [Configuration] mode of the recorder of in the PSU/Setup tool.

Next group: Each press of the control knob on this item advances the group one after another.

● Storage cycle + Operation Mode

On the VGR recorder, all channels are constantly scanned in 125ms in spite of storage cycle which can be set to125ms or between 1 and 32000 seconds.

The VGR provides selections of operation mode as follows.

• Normal : This is the normal operation mode.

No symbol appears next to the storage cycle on the status display.

• Event: This mode is triggered by a specific event (e.g. binary input).

In the event mode, a different storage cycle and a different type of storage data can be specified in addition to the normal mode. During the event mode, an event operation symbol appears next to the storage cycle on the status bar.

• Time: You can set start/end time of this mode. In the time mode, a different storage cycle and a different type of storage data can be specified in addition to the normal mode. During the time mode, a time operation symbol appears next to the storage cycle on the status bar.

📖 Setting of operation modes (storage cycle and type of storage data) can be made in Configuration mode of Instrument menu or via PSU/Setup tool.

📖 Priority of operation modes; Event > Time > Normal

● Graph header

Analog input values and binary signal status (open/close) are displayed. The header can be set to be displayed or not displayed in graph setting. When analog input(s) is (are) in alarm state, the background color of analog inputs are turned into red (high alarm) or orange (low alarm).

● Diagram (analog graph)

Shows analog input in analog graph. Alarm part of the graph is shown in red (high alarm) or orange (low alarm).

● Binary diagram

Shows the binary signal status in the graph. This item can be set to be displayed or not to be displayed in the graph setting of the menu bar.

6.2.2 Bargraph

Bargraph shows analog inputs in bargraph and numeric values. Binary signal status (if supplied and configured) is also displayed.

☞   ■ See also bargraph (P.85)
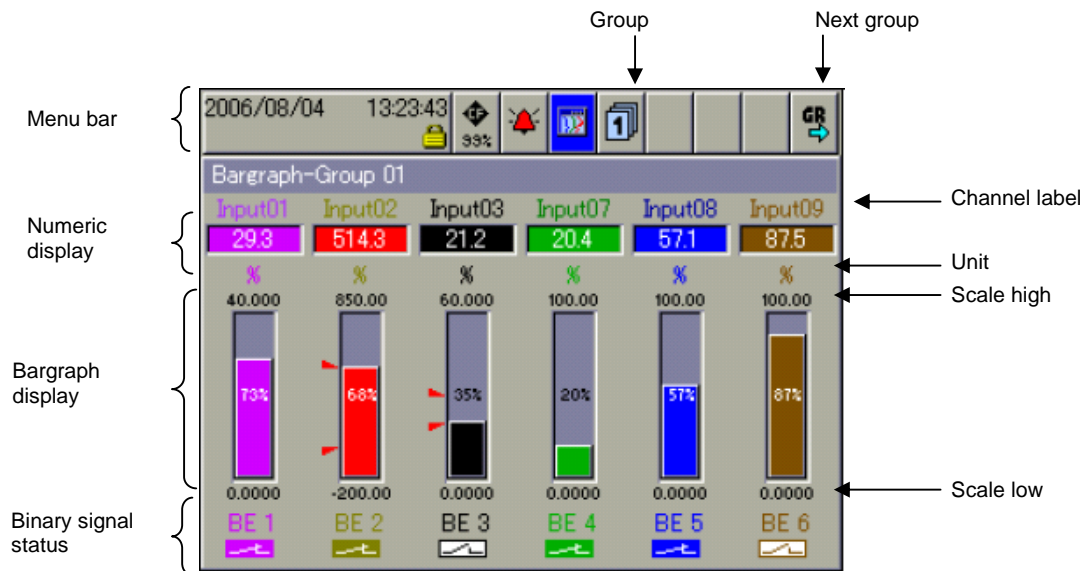
📖   Channel label, unit, high and low limits of scale range etc can be set in configuration mode of the recorder or via PSU/Setup tool.

● Menu bar

Group: A desired group can be directly selected.

Next group: Every press of the control knob advances the group one after another.

● Numerical display of analog inputs

Shows analog input values in numerals. When analog input is in alarm state, the background color of numeric display turns into red (high alarm) or orange (low alarm).

● Bargraph display of analog inputs

Shows analog input values in bargraph. When analog input is in alarm state, the background color of the bargraph display turns into red (high alarm) or orange (low alarm).

● Binary signal status

Shows binary input open/close state. When the signal is open, the background is white, and when the signal is closed, the background color is filled with the colored specified for the channel.

6.2.3 Text Image (Numerical Display)

Text image shows the analog inputs in numerical values. The binary signal state is also displayed. Normally a whole group is displayed, but detailed individual display by channel is also possible.

☞ ■ See also Text image (P.86).

[Group display (Normal display)]

Channel label (short/long) — Analog inputs in numerals. — Digital signal state
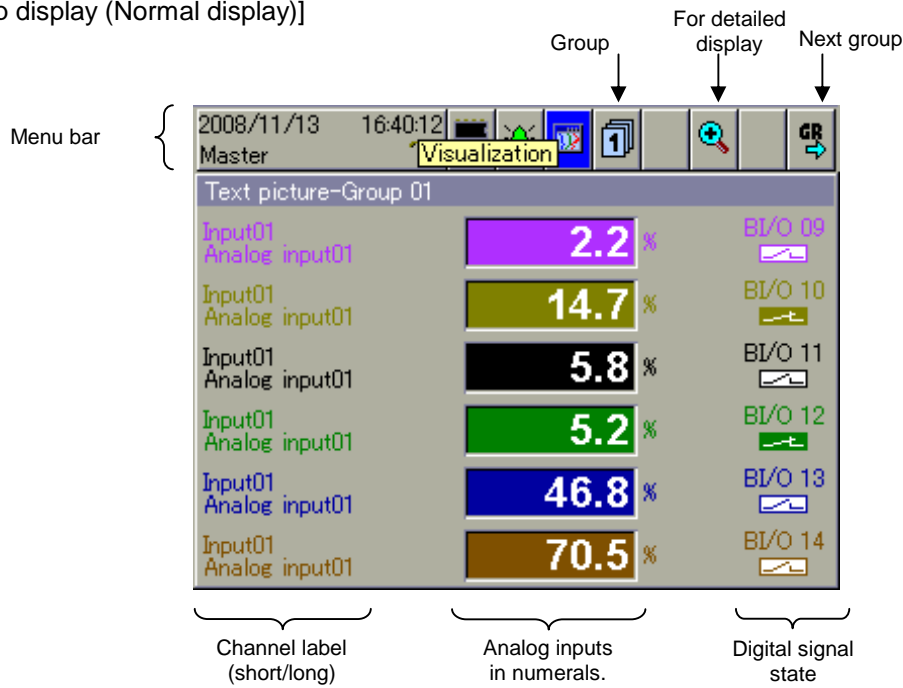
[Channel display (Detailed display)]
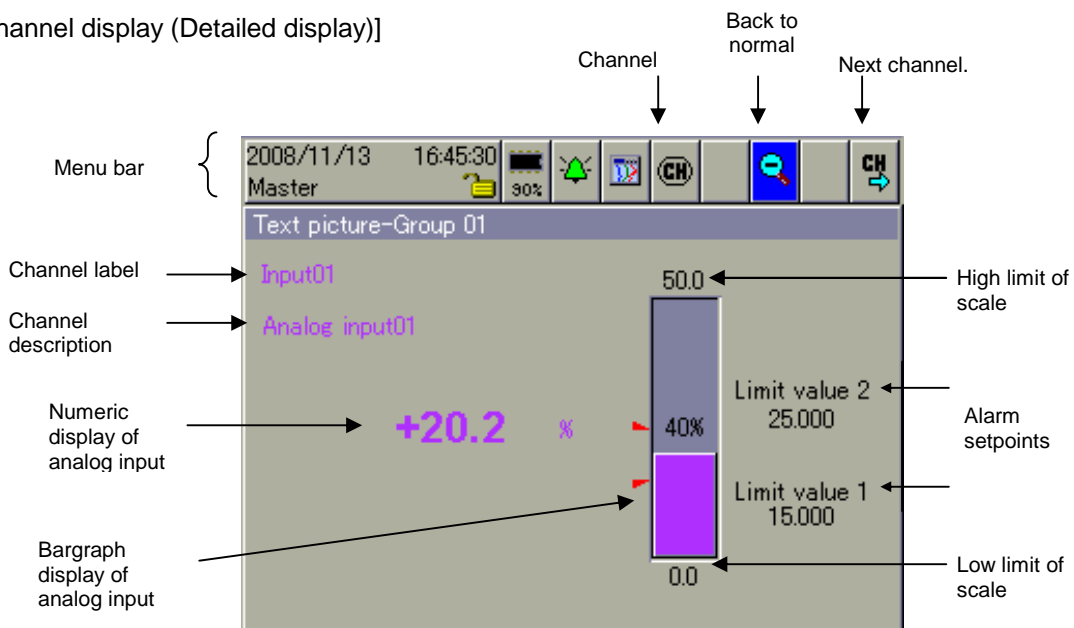
📖 Channel label/description, unit, scale limit (high/low), alarm setpoints are set in Configuration mod of the recorder or via PSU/Setup tool.

● Menu bar

[Group display]

Group:　　　　　　A desired group can be directly selected.

Detailed display:　Select the display mode by channel.

Next group:　　　 A press of the control knob advances the group one after another.

[Channel display]

Channel:　　　　　A desired channel can be directly selected.

Normal display:　 Select the display mode by group.

Next channel:　　 A press of the control knob advances the channel one after another.

● Numeric display of analog input

Shows analog inputs in numeric values. When analog input is in alarm state, the background color of the measured data turns into red (high alarm) or orange (low alarm).

● Binary signal open/close state display (by group only)

Shows binary signals open/close status. Background color of binary signal is white when signal is open. When signal is closed, the background color is filled with the color specified for the binary channel.

● Bargraph display of analog inputs (when channel mode is selected)

Display the analog input in bargraph. When analog input is in alarm state, the bargraph turns into red (high alarm) or orange (low alarm).

6.2.4 Process Image (Option)

In the process image, analog inputs and binary signals are freely placed as objects.

The process image is group-oriented. Customization of process graph requires PSU/Setup tool (version 2.0 or later).

Maximum nine graphs (one per group) can be created with up to 25 objects per graph.

☞　　See a separate manual for more details of the process graph

[Example]

Job status is shown by digital signal.

Stopped or in action

Door opens/closes by digital signal on/off state.

6.2.5 Binary Diagram

The binary diagram shows open and close status of binary inputs and outputs.
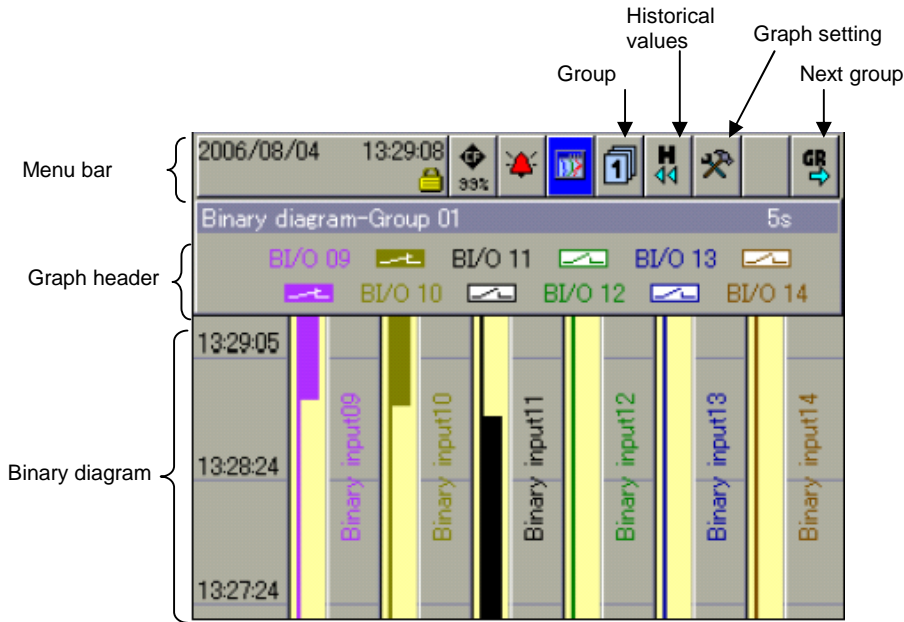
● Menu bar

Group: A desired group can be directly set.

Historical display: Data previously stored can be viewed.

☞   See 6.3 Historical data display (P. 47) .

Graph setting: Graph header and perforation can be selected from display or non-display.

📖   Perforation is only selectable when analog graph is selected.

📖   The content of graph setting here affect the graph setting in the analog graph mode.

Next group: Each press of the control knob advances the group No.

● Graph header

Shows binary diagram input/output state. The background color of the binary signal is white while the signal is open. While the signal is closed, the background is filled with color specified in configuration.

The graph display on or off can be selected in graph setting in menu bar.

BI/O 9 is off/open.
BI/10 is on/closed.

● Binary diagram

Shows the binary signal in bargraph.

6.2.6 Reports (Summary Reports)

The report (summary report) shows the contents of report by groups. The report type can be selected from sum, daily, weekly, monthly, periodic, and external. The report contains all analog channels in the group.
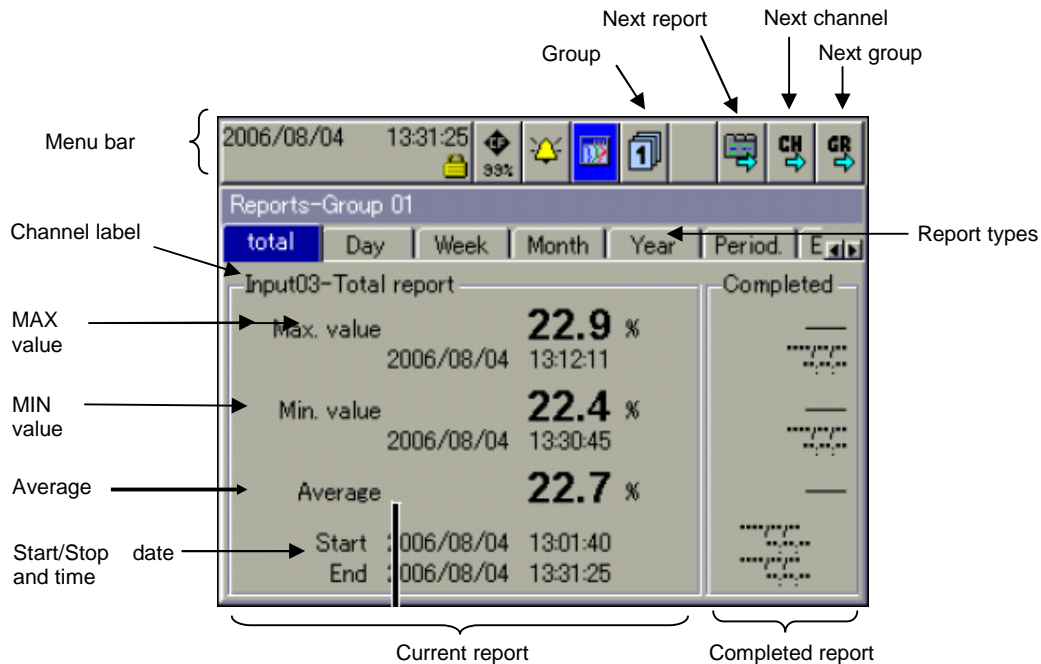
● Menu bar

Group: A desired group can be directly selected.

Next report: Each press of the control knob changes the report types.

Next channel: Each press of the control knob changes the channel in the current group.

Next group: Each press of the control knob changes the group one after another.

● Reports

Total: Report on the whole period of the current configuration.

Day: Report of a day (24 hours).

Week: Report of a week.

Month: Report of a month.

Periodic: Report of specified period.

External: Report of a period started/ended by external signal.

● Current report

Shows current report which include maximum value, minimum value, average value and start /stop date and time.

● Completed report

Shows the last completed report. In case of a sum report, this is not shown.

> If configuration is changed, the recording period is reset an a new report starts. In this case, the completed report will not be shown until the recording period is over.

📖   Report setting is done in configuration mode of the recorder or via PSU/Setup tool.

6.2.7 Batch

There are two types of batches shown in the menu; current batch and last completed batch.

On the VGR up to three batches can be used simultaneously.

Relation between the number of batch and the group

No. of batch	Group	Batch No.
0	—	None
1	1〜9	1
2	1〜3	1
	4〜6	2
	7〜9	None
3	1〜3	1
	4〜6	2
	7〜9	3

If batch is set to 0: Batch function is not available.

If batch is set to 1: Batch 1 is common to all groups.

If batch is set to 2: Batch 1 is common to groups 1-3.
Batch 2 is common to groups 4-6.
Batch 3 is not available.

If batch is set to 3: Batch 1 is common to groups 1-3.
Batch 2 is common to groups 4-6.
Batch 3 is common to groups 7-9.

📖   Batch can be set in the configuration mode of the recorder or via PSU/Setup tool.

■ Current Batch

Shows the batch currently available.
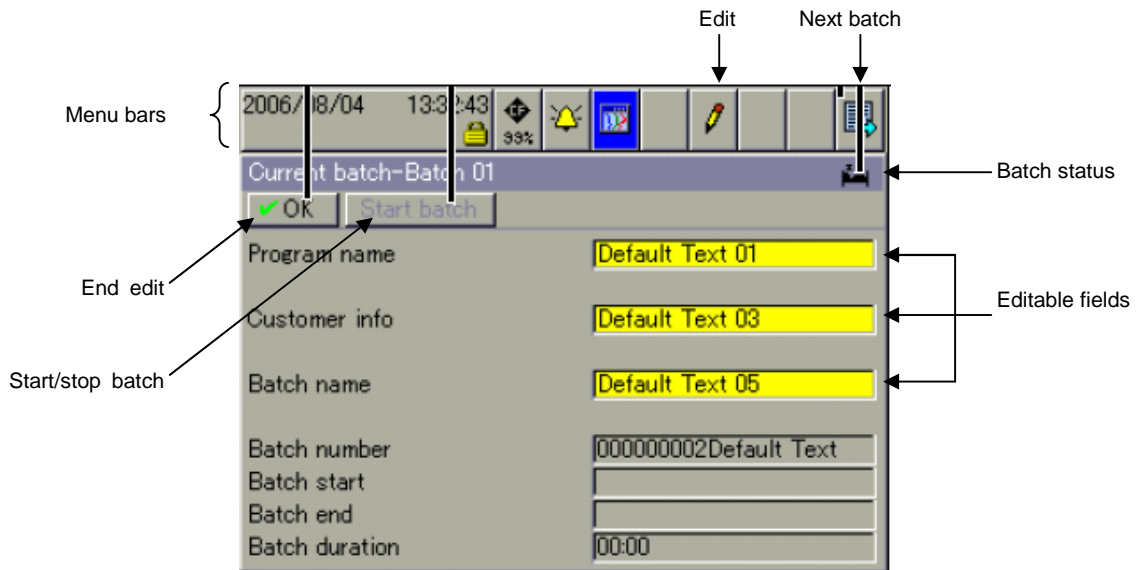
● Menu bar

Edit: Enables the screen editable.

Next batch: Each press of the control knob changes the batch.

● Batch status
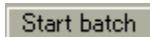
🏃 :   Batch is running

🛏 :   Batch is stopped

● Edit batch

You can edit batch texts and start/stop the batch.

OK (End Edit):   If you press the control knob on this button in the edit mode, the edit mode ends.

Start/Stop batch: To start/stop the batch, move the cursor to this position and press the control knob.

        Start batch   : Start batch (shown while batch is stopped)

        Stop batch   : Stop batch (shown while batch is running)

      📖   Batch can be started/stopped by binary signal and barcode in addition to manual operation with the control knob.

Editable fields:

Move the cursor to where text is to be edited and press the control knob. A text edit window pops up for text editing.
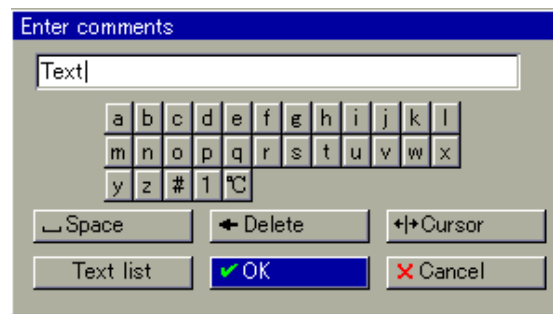
      📖   In the text list of the current batch, batch texts set with PSU/Setup tool can be selected.

      ☞   For details of text editing, refer to 5.3 Editing Text (P.29).

● Start batch/Stop batch/Batch length

As soon as batch is started, date and time are shown at Start batch. When the batch is stopped, batch stop date and time will be shown at Stop batch. Additionally the batch length will be calculated and shown at Batch length.

      📖   With the PSU/Setup tool, you can customize the screen (rename of field, add and delete of fields)

■ Last Completed Batch

Shows the last completed batch. If the same batch is repeated, batch No. of the last completed one is shown.

Details of batch   Next batch

Menu bar

| 2006/08/04 | 13:35:26 | | | | | | | |

Last completed batch-Batch 01

Program name	Default Text 01
Customer info	Default Text 03
Batch name	Default Text 05
Batch number	000000001 Default Text
Batch start	13:29:03
Batch end	13:29:18
Batch duration	00:15
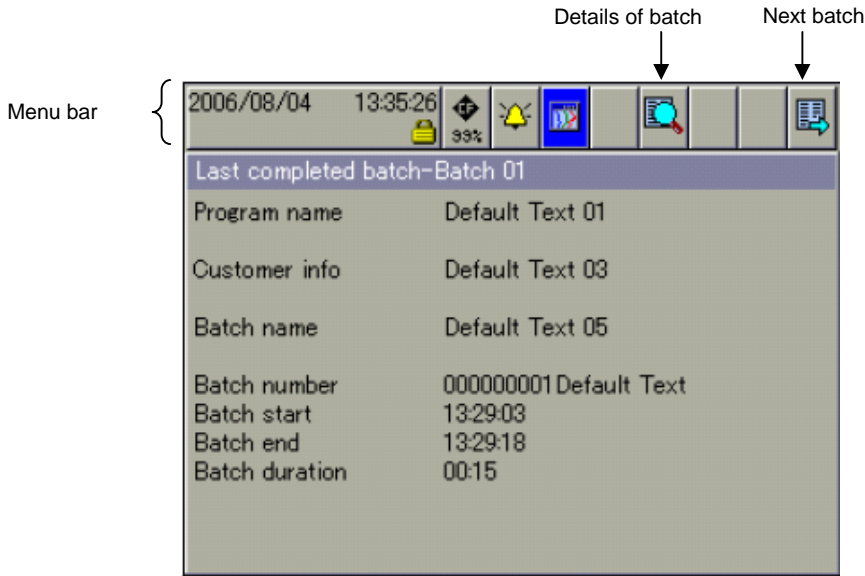
● Menu bar

Details of batch: You can see details of completed batch.

・Analog graph

You can see the historical display of analog data from batch start to end.

☞   See 6.3 historical display (P.47)

・Report

Shows maximum, minimum and average values of each group and channel.

・Comment

Shows a comment entered with the PSU/Setup tool.

When batch analyze is selected, a menu as shown right is displayed. Select a desired function from the menu. In case of an analog graph, choose the group No. too.
To end this mode, select the exit mode ⇥ shown in the menu bar.

Analyze batch data
Analyze batch data
├─ Exit
├─ Diagram
├─ Reports
└─ Enclosure
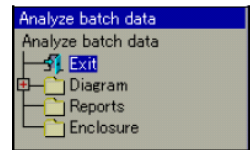
Next batch: Each time the control knob is pressed, batch is switched.

6.2.8 Counter/Integrator

With this function, you can use counter, integrator, and operating time. Up to nine counters/timers can be displayed on a single screen (which is called counter group). A maximum of 27 counters/integrators can be handled. Each group can handle up to 4 counters.

[Counter Group Display]
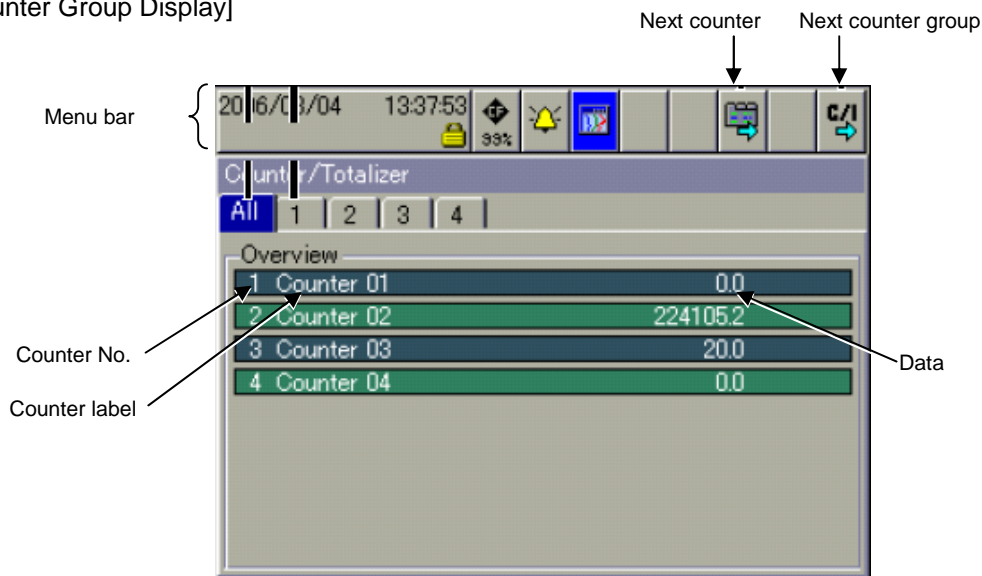
[Counter Display (Individual)]
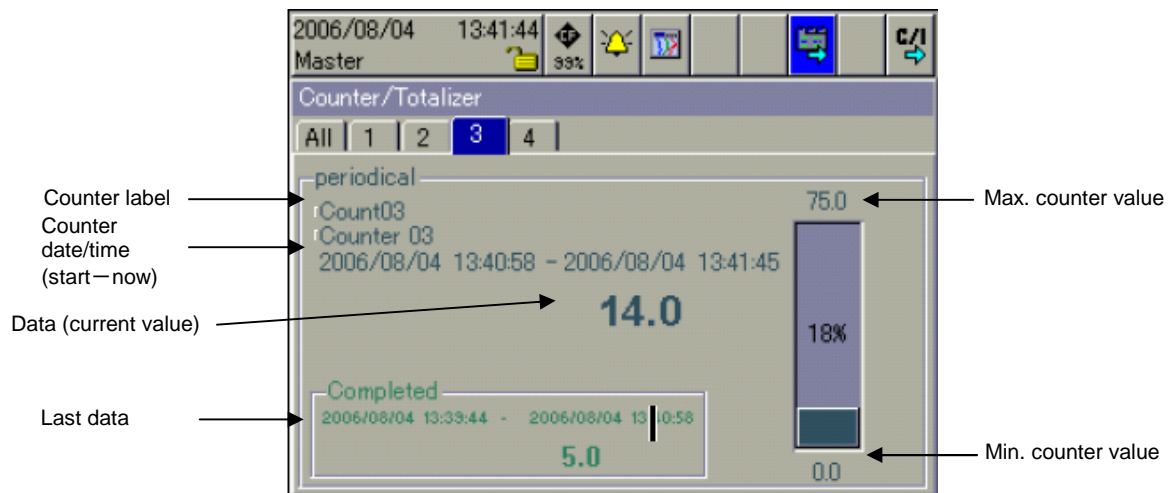
● Menu bar

Next counter: Each press of the control knob changes the display of counters in the same counter group. After one cycle the first screen the cursor is back to [All].

Next counter group: Each press of the control knob changes the counter group.

📖 Counter setting (as well as integrators) can be done in the configuration mode of the recorder or via PSU/Setup tool.

6.2.9 Comments

You can enter comment up to 31 characters at any time. The entered comment is written into the event list. On the analog graph, a pencil mark is shown.
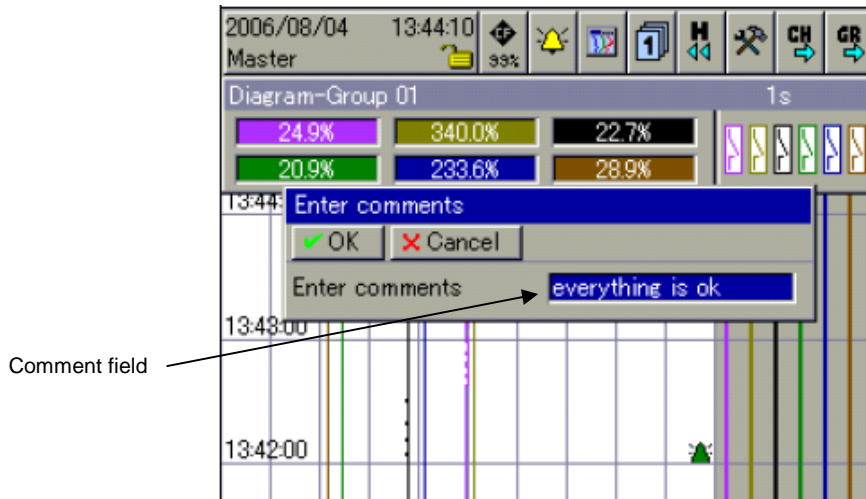
Comment field

Comment field: When the cursor is at this position, press the control knob to enter the comment editing mode.

☞   See 5.3 Entering Text (P.29) for details of text editing.

After the comment has been entered, press the control knob at OK. The comment is written into the event list. Also, a comment symbol (pencil) is shown on the analog graph.

Comment mark
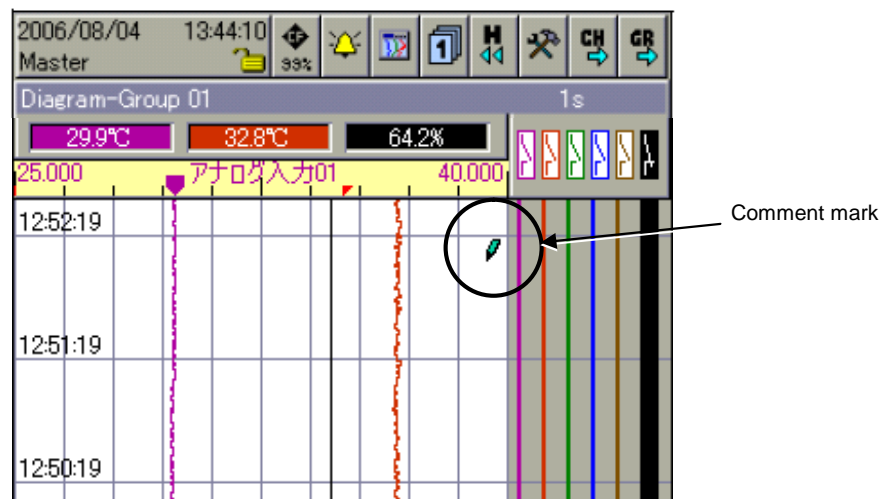
☞   See 6.4. Alarm List/Event List (P.50) for details.

6.3 Display of Historical Data

With this function, a historical data stored in the historical data memory is displayed. In other words, you can see the previously recorded data.

This display can be used while [diagram] or [binary diagram] display is selected. The last completed batch can also be shown.

📖   The historical data only covers the data of the current configuration. To see the historical data made with the previous configuration, PCA3000 evaluation software is required.

📖   Memory size for the historical data can be selected from 2MB, 4MB and 8MB in the configuration mode of the recorder or via PSU/Setup tool.

● Switching the mode to historical display

Move the cursor to the historical display (marked with H) in either diagram (analog graph) or binary diagram mode, and press the control knob.
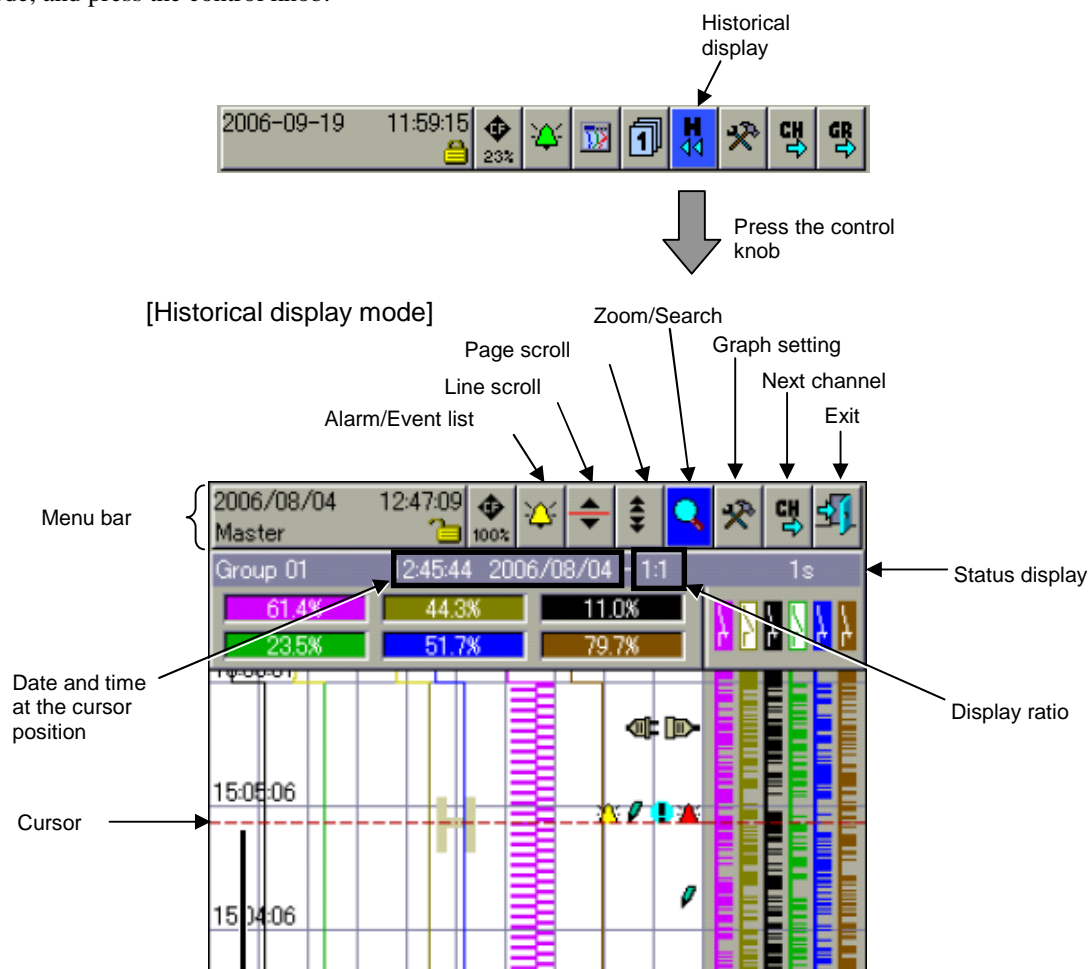
📖   The historical data is shown by the group. To see the historical data in different group, exit once to normal analog graph or binary graph display mode. Then, change the group to a desired one and enter the historical data display mode.

● Menu bar

Alarm/Event list: Shows alarm and event list in the historical data.

☞   See 6.4 Alarm/Event list (P.50) for details.

Line scroll: After selecting this mode, rotate the control knob to move up and down the cursor on the screen. The data at the cursor is shown in the graph header and the date with time is shown in the status display. Line scroll mode can be ended by pressing the control knob again.

Page scroll: In this mode, a whole page (screen) is moved up and down by rotating the control knob. The data at the cursor is shown in the graph header and the date with time is shown in the status display. Page scroll mode can be ended by pressing the control knob again.

Zoom/Search: [Zoom]

With the zoom function, the displayed graph can be reduced [1:1] is the default value and means the data is displayed as it is. [1:2] means that one data out of each two is reduced (skipped) for displayed. Similarly [1:100] means only one data is taken for display out of 100. Thus, data is shortened for the outline display.
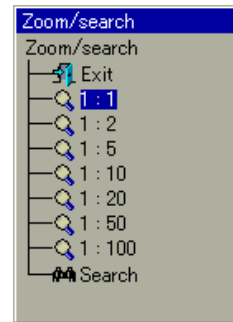
[Search]

Shows the data in the historical data specified by date and time.

Enter date and time for search. If data exists at the specified time, the cursor moves to that time and the data is displayed.
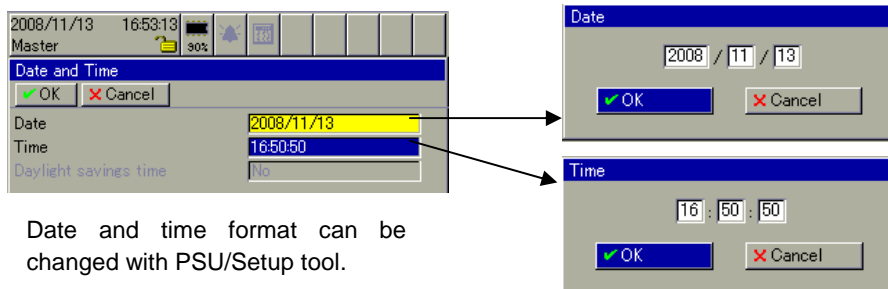
Date and time format can be changed with PSU/Setup tool.

Graph setting: You can select the type of the measured value (Max or Min) and display/non-display

(history mode)   of analog input by channels.
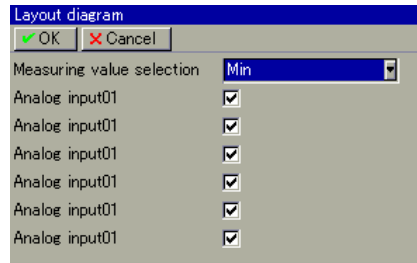
   To use Max (or Min) display, the storage data must be set to Max, Min. or
Max/Min in the operation mode (Normal, Event or Time). In case of display
mode other than Max, Min, and Max/Min, the data is shown in the mode
selected for storage data. (See P.78)

   Operation mode setting can be made in configuration in instrument menu or
via PSU/Setup tool.

Next channel: Each press of the control knob on this item changes the channel one after another in
the same group.
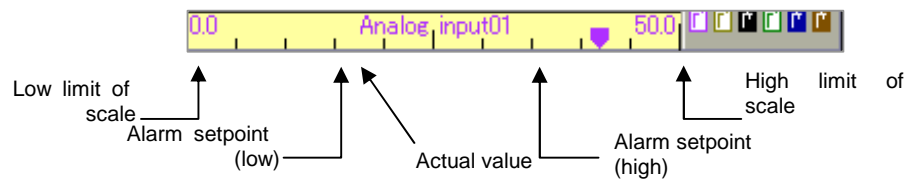
Exit: Exits the historical data mode.

The historical mode ends automatically if no operation is taken for two minutes.

● Status display

Date and time of displayed data (at cursor position):

    Shows the date and time of the cursor position

Data ratio: Shows the display ratio in the historical data set in the zoom function.

6.4 Alarm/Event List

When alarm has been generated, an alarm text is displayed in the status bar, the alarm icon turns into red (normally green). If two or more alarms have occurred, the latest alarm only is displayed in the status bar. Details of other alarms can be checked in the alarm list.
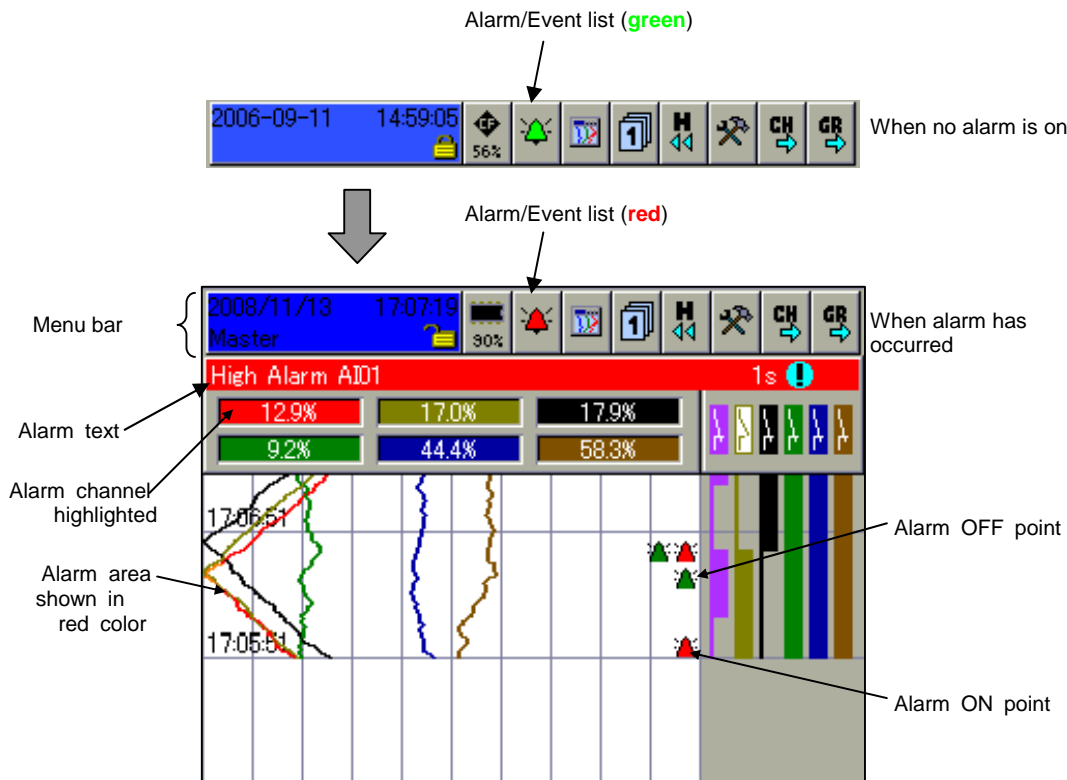
Alarm list: Shows only valid alarms which are currently active. When alarm state has gone, the alarm is removed from the list (however, the history remains in the event list).

    📖   The alarm list is not updated while the alarm list is displayed.

Event list: Shows all events and alarms that have occurred up to 150 entries. Older data will be erased from the list if the entries exceed 150. However, the data remains in the file. If configuration has been changed, the previous list is deleted and a new list is created.

    📖   The list content before the configuration change and that erased because of entries over 150 remain as event data in the file, which can be seen with PCA3000 Evaluation software.

📖   When alarm is suppressed by alarm suppress function (See page 71), the status is not written into the alarm and the event list.

☞   Also, refer to "Read the Analog Graph (P.83)" and "7.8.2. Reading Alarm/Event List (P.87)"

Alarm and event lists can be called up in the following ways.

- Call up from the normal operation screens.

- Call up from the historical trend screen.

■ Calling from the normal operation screens

Rotate the control knob to bring the cursor to the alarm/event list icon (🔺) and press it. A list menu is displayed. Select a desired list.

● Open alarm list

Rotate the control knob to select a desired list and press it. The alarm list only shows alarms which are valid at that time. Alarms that have gone are not displayed. Open event list to see previous alarms that were active.
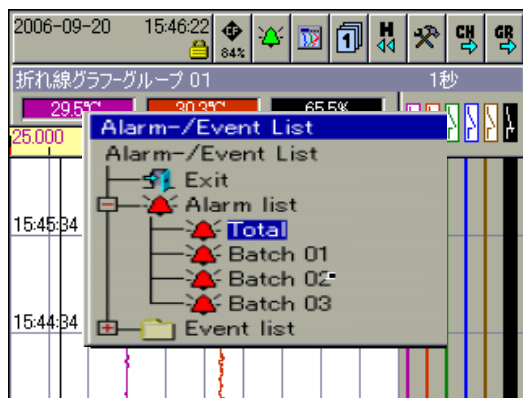
[Example of alarm list]

● Open event list

Rotate the control knob to select a desired list and press it.

[Example of event list]

● Close list(s)

To close the list, press the control knob while the list is displayed. The screen before the alarm/event list was opened will be displayed.

■ Call from historical data

To see the event list in historical trend, rotate the control knob to event list shown with ( ) and press the control knob. In the historical mode, the event list of the same group at the time of display switching is displayed.

Alarm/Event list

Menu bar in case of alarm/event list
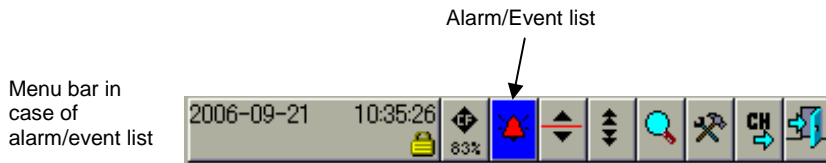
● Close the event list

If you press the control knob while the event list is displayed, the list is closed, and the historical screen before the event list was opened will be shown.

■ Symbols used in the list

Symbols	Desciption
	Alarm is ON
	Alarm is OFF
(Y)	Error occurred (Yellow)
(G)	Alarm is released (Green
(R)	Alarm occurred (alarm status, Red)
	Comment was entered
	Event has started (Example: Batch has started)
	Event has ended (Example: Batch has ended)
No symbol	Other messages

6.5 Memory Manager

There are four types of display modes in Memory Manager in the menu bar. ✕

Memory manager

Shows one of the following icons.

[icon] [icon] : Displayed when a CF card is inserted into a CF card slot behind the front cover, or a USB memory is inserted.

The numeric value in % shows the available memory in the CF card or the USB memory.

Pressing the control knob on this item shows the memory manager menu.

[icon] : Displays when CF card is inserted.

[icon] : Displays when USB memory is inserted.

[icon] [icon] : Displayed when a CF card is not inserted into a CF card slot behind the front cover, or a USB memory is not inserted. In this case the numeric value in % shows the available capacity of the internal memory. When this icon is displayed, a cursor cannot stop this.

[icon] : Select this when data is normally sent to the PC via CF card.

[icon] : Select this when data is normally sent to the PC via interface (RS-232C/485 or Ethernet).

📖   When external memory (CF card or USB memory) is not inserted in the slot, one of these two icons ([icon] or [icon]) will be displayed. You can set in the configuration which icon to be displayed.

📖   If you insert an external memory (CF card or USB memory) while the operation menu is displayed, a memory manager menu is automatically displayed.

📖   While data is being transferred to the external memory (CF card or USB memory), the following symbol is shown on the status bar. While this symbol is shown, DO NOT remove the external memory, otherwise data will be damaged.

Diagram-Group 01   1s 🔵   ← DO NOT take out memory while this symbol is displayed

📖   A CF card and a USB memory cannot be used simultaneously. Two USB memories cannot be inserted simultaneously either; one on the front and the other at the rear.

A USB memory is available for manual readout only. If automatic readout is required, use a CF card (data is recorded into the CF card for every 20Kbytes or every 10 minutes)

☞   Refer to "Remove Hardware Safely (P.54)" for how to remove memories from the recorder.

■ Memory Manager when External Memory is inserted

A memory manager menu is displayed when:

● A CF card is inserted into the slot behind the front cover.

● A USB memory is inserted into the USB connector (large) behind the front cover or at the rear.

● The control knob has been pressed on the memory manager menu. This menu is not selectable while no CF card is in the slot.

Some menus may not be displayed due to the access level. To have an access to all of the menus, log in as a Master in the login menu of the recorder (P.59)

☞ Refer to "6.6 Instrument Menu" (P.57) for login and logout.

	Menu after logged in as Master	Menu after logged in as User	Menu when no login is done (logout mode)
When CF card is used	Memory manager Memory manager Exit Secure remove of hardware CF-Card update Write all data to CF card Write config. data to CF-Card Read config. data from CF-Card Store all + update of CF-card Write service data to CF-card Software update	Memory manager Memory manager Exit Secure remove of hardware CF-Card update Write all data to CF card Write config. data to CF-Card Store all + update of CF-card	Memory manager Memory manager Exit Secure remove of hardware Write config. data to CF-Card
When USB memory is used	Memory manager Memory manager Secure remove of hardware Update USB stick Backup -> USB stick Config. data -> USB stick USB stick -> Config. data Store all + update USB Service data -> USB stick Software update USB stick -> user list	Memory manager Memory manager Secure remove of hardware Update USB stick Backup -> USB stick Config. data -> USB stick Store all + update USB	Memory manager Memory manager Secure remove of hardware Config. data -> USB stick
	A USB memory remains on the screen until the memory is removed. No other operation is possible while the USB memory is connected. Be sure to remove the USB memory after data transfer. If you would like to save the data constantly into the external memory, use a CF card.		

Return: [Shown only when CF card is inserted]

Memory manager is closed, and the screen before the memory manager was opened is displayed.

Remove hardware safely:

Use this menu whenever the USB memory is removed from the recorder. Remove the memory only after a message "The hardware can be safely removed"

Memory manager
Secure remove of hardware
Config. data -> USB stick

Memory manager
⚠ Hardware can be removed!

CF card updates:

Data not yet saved is written into the CF card (or USB memory).

Write all data to CF card:

>   Writes all the data in the memory of the recorder (data taken into the recorder) into the CF card (or USB memory).

Write config to CF card:

>   Writes the configuration data of the recorder and user list (password management) into the CF card (USB memory). This can be used as a backup of the configuration data.

Read config from CF card:

>   Reads configuration data from the CF card (or USB memory) into the recorder. This replaces the configuration data in the recorder and the recording is started with a new configuration. This is used to transfer the configuration data set on the PC with the PSU/Setup tool into the recorder.

Store all + update of CF card:

>   Closes all active reports and writes into the CF card (or USB memory) those reports as well as data not yet saved. The current counter/integrator/timer values are a;lso stored.

Write service data to CF card:

>   Used for maintenance. Use this menu **only when you are requested by RKC.**

Update software: Used to updated the software. Use this menu **only when you are requested by RKC.**

Read user-list from CF card:

>   Reads user list into the recorder from the CF card (or USB memory).

📖   When executing [CF card update/Update USB stick], [Write all data to CF card/Backup -> USB stick], a data position of the writing is stored in the internal memory. In the next update, only new data after the last data position is written into the CF card (or USB memory).

📖   Two memories (CF card and USB memory, two USB memories; one on front and one at rear) cannot be used simultaneously. The following message appears. Remove one of the memories

Memory manager
⚠ Only one memory medium possible! Please remove one memory medium!
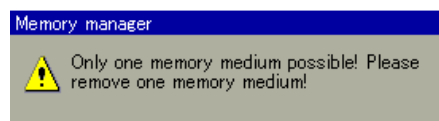
📖   Automatic writing to CF card
While the CF card is placed in the slot, data is automatically written into the CF card for every 10 minutes or every 20Kbyte of new data. This function is not available with the USB memory.

📖 If an external memory (CF card or USB) memory has not been properly recognized, an error message may be shown with an error icon (⚠) to inform you that the inserted memory is not available. If this message appears, the memory does not conform to the standards of the recorder. Use another memory. If error repeats, it is recommended to use our recommended CF card (VGRP-M02, 256MB, industrial grade).

[Message example]

メモリ管理メニュー

⚠ USBメモリをサポートしていません
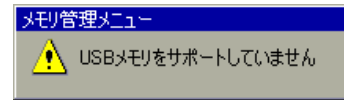
📖 The following picture shows the structure of the internal memory (CF card or USB memory) and the data that can be stored in the external memory.

Mark   current

| Configuration data ⓐ | User list ⓑ | Read out ⓒ | Not read ⓓ |

Measurement data

Measurement data includes:
・ analog inputs
・ binary inputs/outputs
・ alarm/event
・ counters/integrators
・ reports
・ batches
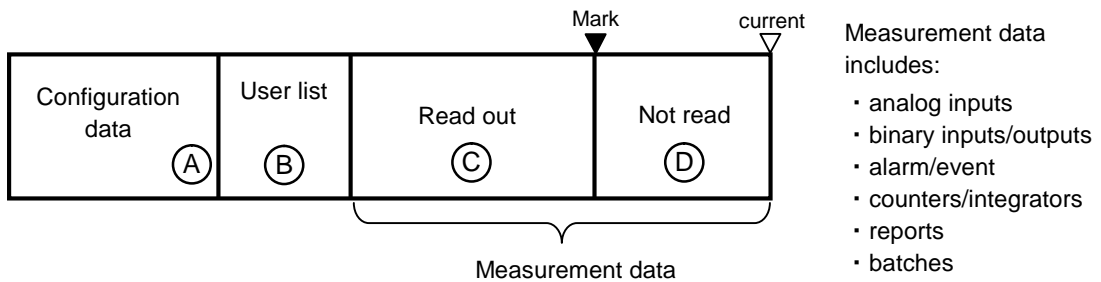
Data that can be handled in Memory Manager are marked with A to D and explained below.

CF card updates:

Ⓓ is written into external memory.
(Int. memory ⟶ Ext. memory)

Write all data to CF card:

Ⓒ + Ⓓ are written into external memory.
(Int. memory ⟶ Ext. memory)

Write config data to CF card:

Ⓐ + Ⓑ are written into external memory.
(Int. memory ⟶ Ext. memory)

Read config data from CF card:

Read Ⓐ from external memory.
(Int. memory ⟵ Ext. memory)

Store all + update CF card:

Closes active reports, counters/integrators and store those data as well as data into Ⓓ e external memory.
(Int. memory ⟶ Ext. memory)

Read user-list from CF card:

Read Ⓑ from the external memory.
(Int. memory ⟵ Ext. memory)

📖 The configuration data is stored in a file "**konf187.set**". If this file already exists in the CF card (or USB memory), execution of writing configuration into the CF card (or USB memory) overwrites this file. To avoid an overwriting, rename the file to a proper name on the PC side.

       IMX01L05-E1

6.6 Device Manger

In this menu you can have displays and setting of login/logout, instrument information, audit trail, configuration, user menu, as well as service.

☞   Refer to the manual of PSU/Setup software (IMT01G01-E[]) for the details of the instrument menu.

■ Differences in menu display modes

Rotate the control knob to the instrument menu and press it to show the instrument menu. The display content of the menu depends on the access level and with/without login.

[Menu shown when logged in as Master]

Device Menu section

2006-09-25   13:27:25
Master

shows logged   shows logged
in as a Master   in mode

Instrument menu
Instrument menu
├─ Exit
├─ Log in
├─ Instrument info
├─ Audit Trail
├─ Configuration
├─ Parameterization
└─ Service

[Menu logged in as a User]

Instrument Menu section

2006-09-25   13:26:05
User

shows logged   shows logged
in as a user   in mode

Instrument menu
Instrument menu
├─ Exit
├─ Log in
├─ Instrument info
└─ Parameterization

[Menu when not logged in]

Instrument Menu section

2006-09-25   13:24:33

shows logout
mode

Instrument menu
Instrument menu
├─ Exit
├─ Log in
├─ Instrument info
└─ Parameterization

📖   The difference of user login mode and no login mode can be seen in the contents of user setting menu.

■ Menu Contents

Exit: Closes instrument menu and returns to the display before the instrument menu was selected.

Login/Logout:

You can have an access to the configuration and other setting items by logging in with a password. Logout is also done in this menu.

☞   Refer to ■ Loging/Logout (P.59) for details.

☞   Access level (contents) can be changed with the PSU/Setup tool.

Instrument Info: Shows hardware and software information of the recorder. You can also see all inputs and outputs status of both internal and external data in this menu.

Rotate the control knob to select the tab. Press the control knob to close this menu.

Log monitor (Audit trail):

Displays important operation history of the recorder (example: power on/off, update of configuration, etc) . This information is shown only when an operator has logged in as a Master.

Pressing the control knob while this menu is displayed closes the function.

Configuration

Setting and display of configuration data (basic setting data) can be made.

This information is shown only when an operator has logged in as a Master.

📖   Note that when a configuration data has been modified, the recording before the modification is closed and not displayed on the recorder. The change of the configuration closes the data before the change and starts recording with a new configuration.

📖   The closed data can be seen on a PC with the evaluation software PCA3000.

User setting menu:

The display contents depends on the access level and with or without login.

"Batch number" is accessible and settable in both Master and User mode. Other modes such as fine calibration, counters/integrators, date and time have different contents depending on the access level and with or without login.

📖   Changing date and time also closes the recording data and the data before the change is not displayed on the recorder. A change of data and time closes the data and starts new recording with the new data.

📖   The closed data can be seen on a PC with the evaluation software PCA3000.

Service: Used for maintenance.

Displayed only when logged in as a Master.

📖   DO NOT enter this mode unless you are instructed by RKC. Improper operation may result in loss of data.

■ Login/Logout

By logging into the recorder, you can have an access to the setting items of the recorder.

To log in, rotate the control knob the instrument menu, send select login. Then a menu as shown below will come up.

● Login

Press the control knob to select login mode. You can move cursor and press the control knob on the desired mode.
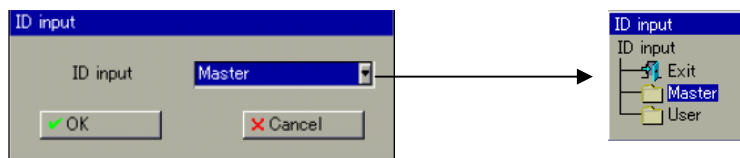
After selecting the login mode, press the control knob at return. Then, a password window will pop up. Enter the password number by rotating and pressing the control knob. The entered password characters are shown as "*".

Default passwords are set as follows.

User 1:　　Master　(password: 9200)

User 2:　　User　(password: 0)

After the password has been entered, press the control knob at OK. This completes the login procedure and the key symbol in the instrument menu shows a login status (key is released).

shows login status.

With PSU/Setup tool, you can modify user name, password and access level.

7. Operation Example (Please read this chapter before operation)

This chapters describes operating examples.

7.1 Hardware Configuration Example

It is assumed here that the recorder has the following specifications.

Model code: VGR-A109A-C4N-NN/JE∗A

Analog inputs:	9 inputs
Binary I/O:	8 points
Connection:	Phoenix connector
Supply voltage:	100～240 V AC
Relay output:	1 point
PROFIBUS I/F:	None
Math function:	None
Language:	1st language: Japanese
	2nd language: English

Slot configuration: Slot 1: Analog input board (6 analog inputs)
Slot 2: Analog inputs (3 inputs)/Binary I/O (8 points) board
Slot 3: Not used

Channel numbers: Analog inputs (AI) 1 to 9
Binary I/O (BIO) 9 to 16 *
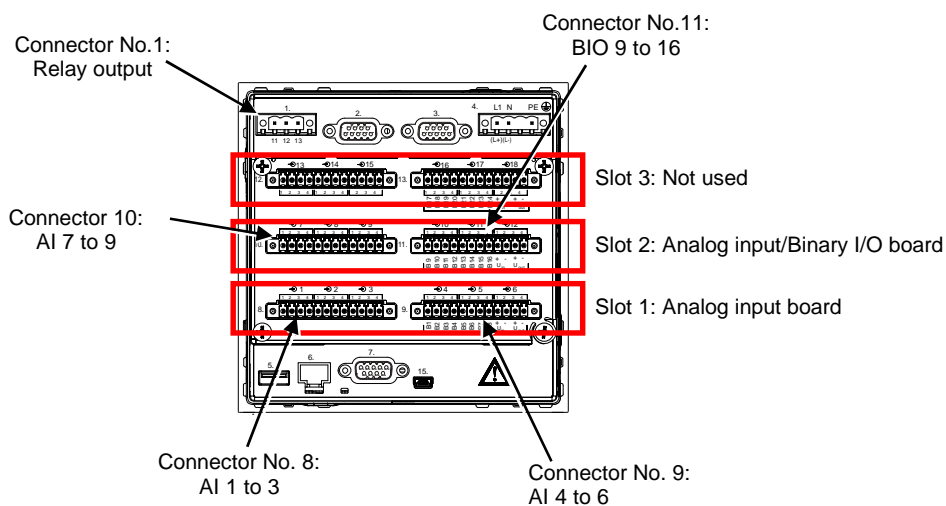
BIOs have fixed numbers. If the board is inserted into slot No.1, the BIOs are named as BIO1 to BIO8. If inserted into slot No.2, they are named as BIO9 to BIO16. In case of slot No.3, they are named as BIO17 to BIO24.

7. Operation Example (Please read this chapter before operation)

)

7.2 Setting Conditions in this Example

In this setting example, we set the recorder to satisfy the following conditions.

- Analog input (AI) 1should have thermocouple (K) input. (Range: 0.0 to 400.0 °C)
- Analog input (AI) 1 should have two alarms.
  Alarm 1: Low alarm, setpoint: 50.0 °C
  Alarm 2: High alarm, setpoint: 100.0 °C
- When alarm 1 of analog input (AI) 1 is active, output is produced from binary I/O (BIO) 9.
- The output signal from binary I/O (BIO9) should remain in the event list.
- When a signal is entered to binary I/O (BIO10), batch 1 should start.

[Setting summary]
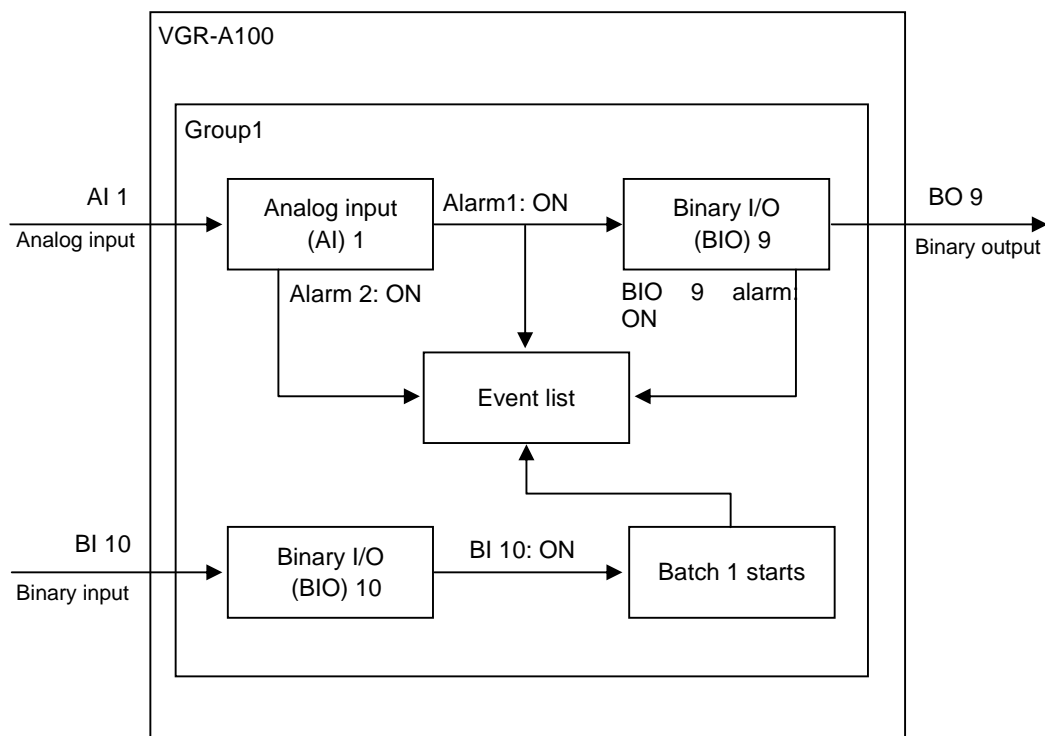
This picture shows a basic setting example for learning. Additional features should be added depending on the requirements.

7.3 Procedure of Initial Setup

This process shows hot to make an initial setup.

Log in the recorder	Log in the recorder as a Master to open configuration for initial setup. ☞ See P. 63
↓	
Date and time adjustment	Set date and time if the recorder is used for the first time. ☞ See P. 64
↓	
Open configuration	Open configuration in the instrument menu. ☞ See P. 66
↓	
Check supply voltage frequency	Select instrument data and make sure that the supply voltage is set to suit in your location. If not, select a proper one. ☞ See P. 67
↓	
Set analog inputs	Set analog input type, measuring range, unit, decimal point position, and alarm. ☞ See P. 68
↓	
Set binary I/Os	Set functions of binary I/Os (signal type, alarm, etc) ☞ See P. 72
↓	
Set group(s)	Select group No. and set action in the group, assignment of analog and binary signals, and so on. ☞ See P. 75
↓	
Set batch(es)	Set trigger action for the batch start. ☞ See P. 79
↓	
Close configuration	After setting is over, close the configuration. The recorder resets and re-start with the new configuration. ☞ See P. 80
↓	
Log out	Log out from the recorder so that modification is not allowed. ☞ See P. 81

7.4 Log in

To perform initial setup, log in the recorder.

1. Select the instrument menu in the menu bar. Details are shown.

[Menu bar]

Instrument menu   Logout status

2. Select [Login/Logout] in the instrument menu, and the login dialog box appears.

3. Press the control knob on　[Login] so that the user selection is displayed.
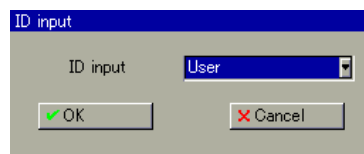
4. Select [Master] followed by OK. A password dialog box is displayed.

5. Enter Master password「9200」(default value) followed by OK. Now, you are in login mode.

☞　See 6.6 Instrument Menu Screens (P.57) for details.

7.5 Set Date and Time

Before using the recorder, make sure a correct date and time have been set.

Change of date and time closes the previous recording and it is no longer possible to see the data on the recorder. To see the closed data, use PCA3000/Evaluation software.

1. Select [Instrument Menu], then the menu for Master level is displayed.

Menu part in instrument menu

2006-09-25   13:27:25
Master

Login as master

Shows log in status

Instrument menu
Instrument menu
— Exit
— Log in
— Instrument info
— Audit Trail
— Configuration
— Parameterization
— Service
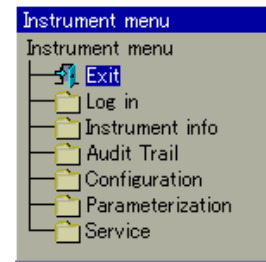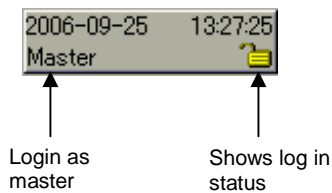
2. Select [Parameterization] in the instrument menu.

Parameterization
Parameterization
— Exit
— Fine adjustment
— Counters/Totalizers
— Date and Time
— Batches
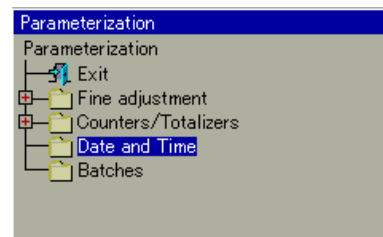
3. Select [Date and Time] in [User Menu]. Date and time setting dialog box appears.

2008/11/13   17:48:00
Master   42%
Date and Time
✔ OK   ✗ Cancel
Date   2008/11/13
Time   17:47:54
Daylight savings time   No
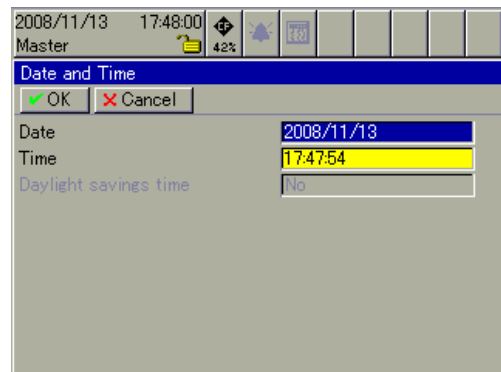
4. Check date and time, and correct them if necessary. To change, move the cursor to the part to be modified, press the control knob so that date and time are adjustable.

☞ See 5.2.2. Set numerical data (P.26)

Date
2008 / 11 / 13
✔ OK   ✗ Cancel

Time
16 : 50 : 50
✔ OK   ✗ Cancel
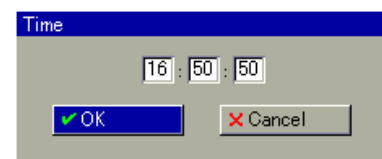
5. Press [Cancel] to abort or if no change is made. If you have adjusted date and time, press [OK]. The recorder is reset and starts from the screen after reset as set in configuration (default: analog graph).

In case of [Cancel] , recording continues as it did before. In case of [OK], recording starts with the new configuration.

There are other date and time setting; [time synchronization], [synchronization by batch], [difference from GMT], [daylight saving time (summer time)]. These items can be set in configuration of the recorder or PSU/Setup tool.

Time synch.: Adjusts the clock with the specified binary input.

This may be effective to adjust the clock of two or more VGR-A100 to the same time.

Time synchronization can have +/- 30 seconds adjustment.

[Example] Execute synchronization at 12:55:29 $\rightarrow$ it is 12:55:00

Execute synchronization at 12:55:30 $\rightarrow$ it is 12:56:00

Synch by batch: Select if time synchronization is made when batch is active.

Time from GMT: Enter time difference from the GMT (Greenwich mean time). Japan has 540 minutes (9 hours) difference from the GMT. This setting is for display and does not affect the clock setting.

DST (summer time):You can select Daylight Saving Time (summer time) to be used. You can set starting and ending conditions in details separately.

7.6 Set Configuration

Note that if configuration has been modified, the recorder closes the previous data and starts a new recording with the modified configuration. To see the data before the configuration change, use PCA3000 evaluation software.

7.6.1 Open Configuration

1. Select [Instrument Menu] in the menu bar, then instrument menu for logged in master is shown.

Instrument menu in menu bar

| 2006-09-25 | 13:27:25 |
| Master | 🔒 |

Login as a Master   Login status

```
Instrument menu
Instrument menu
  ├─ ⬛ Exit
  ├─ 📁 Log in
  ├─ 📁 Instrument info
  ├─ 📁 Audit Trail
  ├─ 📁 Configuration
  ├─ 📁 Parameterization
  └─ 📁 Service
```
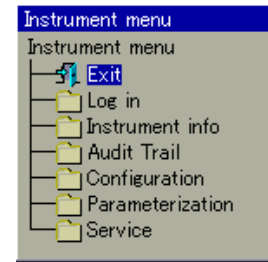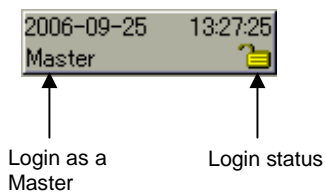
2. Select [Configuration] in the instrument menu, then further selection menu is displayed.

```
Configuration
Configuration
  ├─ ⬛ Exit
  ├─ 📁 Instrument data
  ├─ 📁 Screen
  ├─⊞ 📁 Analog inputs
  ├─⊞ 📁 Digital inputs/outputs
  ├─⊞ 📁 Relay
  ├─⊞ 📁 External analog inputs
  ├─⊞ 📁 External binary inputs
  └─⊞ 📁 Groups
```
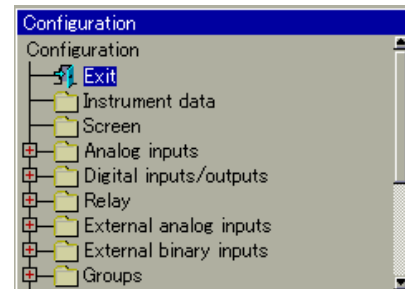
7.6.2 Check Power Supply Frequency

1. Select [Instrument Data] in the configuration, an instrument data screen is shown.

2. Check if power supply frequency is correct in the location where the recorder is used. If it is not correct, select a correct one.
Selection: 50 Hz
                    60 Hz

3. Press at [Cancel] if no modification is done, and press at [OK] if modification has been made. The screen shows the configuration menu again.
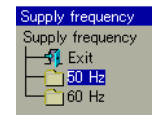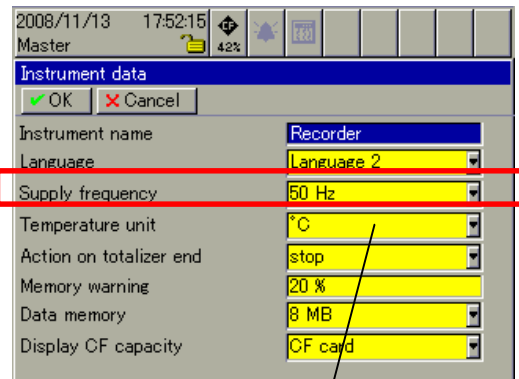
📖   Other setting (in Instrument Data)

Instrument name: Enter instrument name here. The name is used in other modes too.

Language: Select one language from the two. (Default: Japanese and English)

Temperature unit: Select temperature unit (deg. C or deg. F). The Fahrenheit selection may be shown as "----" on the standard instrument. This changes the temperature measuring unit between deg.C and deg.F.
Display unit is to be set in each channel of [analog input setting].

Integrator out of range:

Specify the action when analog signal for the integrator is out of the range.
Stop: Stops integration.
Invalid: Integral value becomes invalid ("----" is shown).

Memory alarm: Enter minimum memory level. If remaining memory capacity goes below this level, alarm is triggered.
While an external memory (CF card or USB memory) is inserted, the memory capacity of the external memory is displayed. If no external memory is used, the remaining capacity of the internal memory is displayed.

History memory: Enter the reserved memory area for the historical trend graph from 2, 4 and (in the previous model without *A, the maximum is 4MB regardless of setting.

☞   See 7.8.3. Read Historical Data (P. 88)

Data readout via: Set the icon while the external memory (CF card or USB memory) is not inserted.

☞   See 6.5 Memory Manager (P. 53)

7.6.3 Set Analog Input

Set analog input (AI) 1 as follows:

- Thermocouple type K (Measurement range: 0.0～400.0 °C)

- Set two alarms

  Alarm 1: Low alarm, alarm setpoint at 50.0 °C

  Alarm2: High alarm, alarm setpoint at 100.0 °C

1. Select [analog input] in the configuration menu. Available analog inputs (1 to 9 in this case) are shown in the tree.
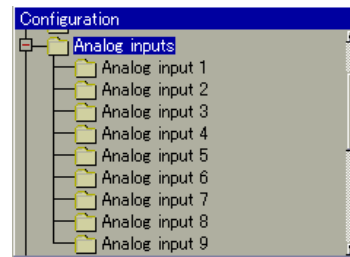
2. Select [analog input 1] to set.

Here you set input type, measurement range, display unit, decimal point position and alarm.
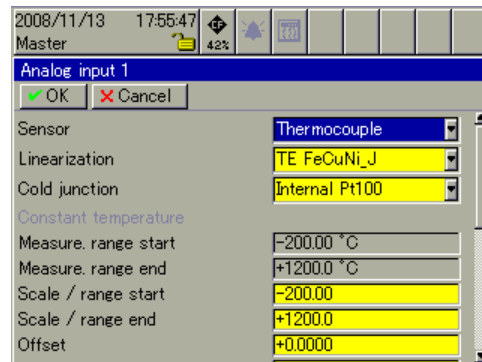
3. Select [thermocouple] from the list of [Sensor].
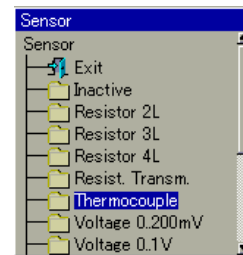
4. Select [K: NiCr-Ni] from the list of linearization.

📖 If input type other than [thermocouple] and[RTD] is specified at sensor, [linearization] is fixed at [linear].
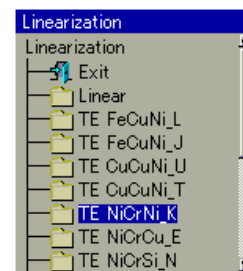
5. Select [measurement range start] to enter [+0]. The decimal point position is set in other parameter. 「

☞ See 5.2.2 Set Numerical Data (P. 26).

6. Similarly set [measurement range end] as [+400]. Again, you can just set 400.

7. Select [unit] to enter display unit in the text edit window. In this example, enter [°C].
The unit entered here is a unit for analog input 1.

📖 The unit entered here is for display only and will not affect the scaling.

☞ See 5.3. Enter Text (P.29) for how to enter text.

8. Select [comma format] for decimal point position and select [xxxx.x] (1 digit below decimal point).

9. Select [alarms] to set alarms for analog input 1.

[Status]:	on (use alarm)
[Alarm type 1]:	min. alarm (low alarm)
[Alarm type 2]:	max. alarm (high alarm)
[Limit value 1]:	+50.000
	(Just enter 50)
[Limit value 2]:	+100.00
	(Just enter 100)

☞ Refer to 5.2.2 Set Numerical Data (P26) for how to set data.
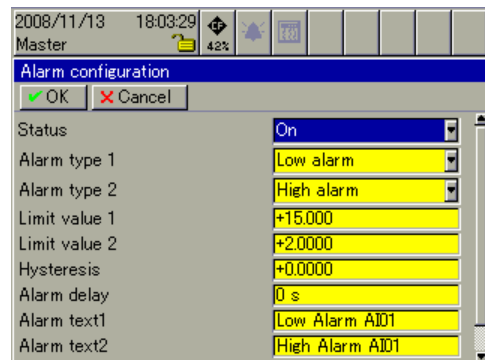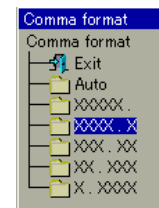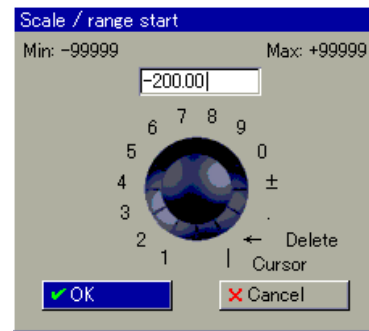
About alarms

Alarm 1:   Alarm 1 becomes active when analog input 1 goes below 50.0 deg.C.

Alarm 2:   Alarm 2 becomes active when analog input 1 exceeds 100.0 deg. C.

10. After alarms have been set, press [OK] to enter the analog input 1 setting screen.

11. This completes analog input 1 setting. Press [OK] to return to the configuration menu.

When you try to set [voltage input] or [current input] at [Sensor], and your desired range is now in the list, adjust the high and low limits at [Measuring range start] and [Measuring range end].

[Example]

To use 1 to 5 V

- Select [voltage 0-10V] at [Sensor].

- Set [+1.0000V] for [measurement range start] and [+5.0000V] for [measurement range end].

- Enter actual data range for [scale range start] and [scale range end].
  For example, to set 0.0-100% scale range against 1-5V input, set [+0.0000] at [scale range start] and [+100.00] at [scale range end].
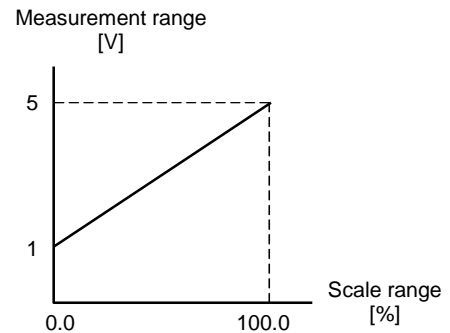
Other setting items (in analog input setting)

Offset: An offset against the input can be set. Often referred as [PV bias].

Filter constant: This is a second-delay digital filter constant.
                      This action is off at [0.0].

Resistor Ra, Rs, Re: Selectable when [Resistance transmitter] is selected at [Sensor].
                      Set resistance values between terminals.

Resistor RO, Rp: Selectable when [Potentiometer] is selected at [Sensor].
                      Set resistance between terminals.

Channel name, channel description:

                      You can freely enter characters. The channel name is used in most of displays and the channel description (longer name) is used in detailed display mode (for example, single channel display of a bargraph).

                      Maximum characters: 7 for channel name and 20 for channel description.

📖 Other setting (in alarms)

Hysteresis: Set alarm hysteresis to avoid chattering (frequent on/off) around alarm setpoint. This setting is common to alarm 1 and alarm 2.
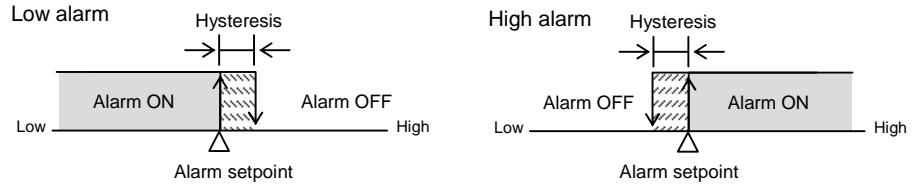
Alarm delay: Set time in seconds when alarm is generated after the measurement value has entered the alarm area. If the measurement value goes out of the alarm area during the alarm delay, alarm is not generated. This setting is common to alarm 1 and alarm 2.

Alarm rejection: Alarm generation is suppressed by binary signal. For example, if low alarm may be generated during the startup, while the set binary signal (BIO9 here) is closed, the alarm will not be generated.

• Alarm rejection is on with DIO9 (while it is closed)
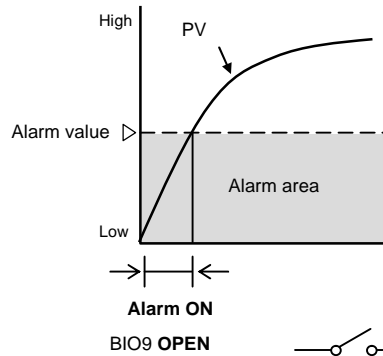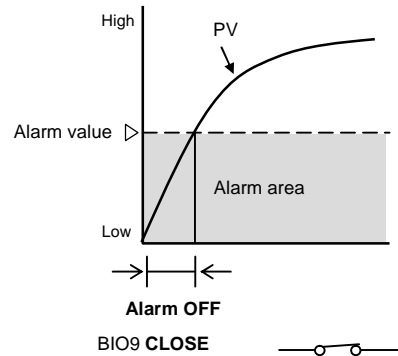
Alarm text: You can freely modify alarm texts within 20 characters.

7.6.4 Setting Binary Input/Output

In this example we set binary input/output (BIO) as follows.

- Signal is provided from binary output 9 (BIO9) when analog input (AI) 1 is turned on.
- The output of binary output (BIO9) is listed in the event list.
- When signal is applied to BIO10, batch 1 starts.

1. Select [Binary input/output] in the configuration menu and a list of binary input/output is displayed.

    ☞   The input and output numbers depend on the number of the inputs/outputs. Refer to pages 13, 14 and 60 for details.
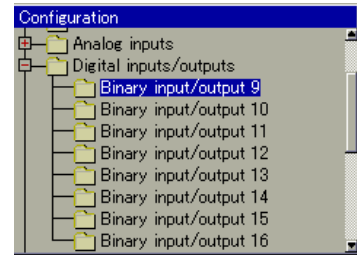
2. When [binary input/output 9] is selected, a dialog box for DIO9 is shown.
We set here functions (input or output), switching action (behavior), and alarms.
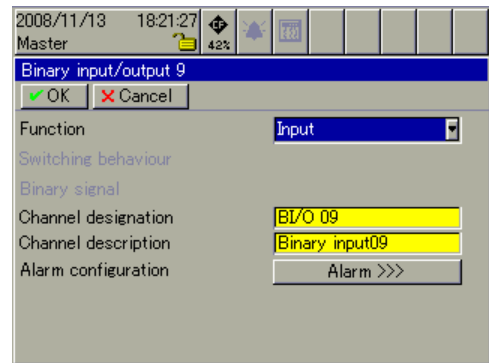
3. Each binary signal is selectable for input or output. A selection menu (input or output) is displayed when function is selected. Select [output] from the list.
The output also requires setting [switching action (behavior)] and [binary signal].
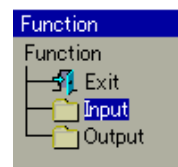
4. When [switching action (behavior)] is selected, another menu for contact status at the time of output on, select shutter (MAKE-NO).

    shutter Make-NO: Close at output ON
    opener Break-NC: Open at output ON
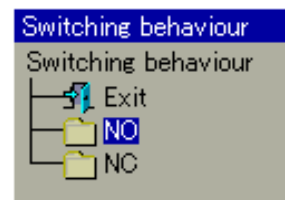
[Explanation of switching actions]

shutter - Make-NO	opener - Break-NC
contact open contact close	contact close contact open
output ON → time	output ON → time
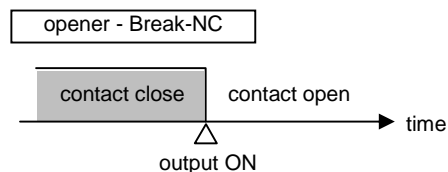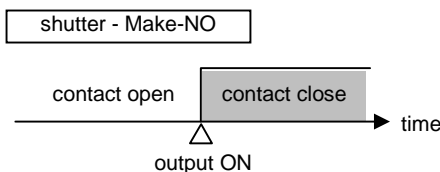
5. When [Binary signal] is selected, another menu for output trigger is displayed.

In the example, you should set BIO9 to produce output when alarm 1 of analog input (AI) 1 turns on. To do this, select [Alarm analog value] and then [Alarm 1 (AI1)].
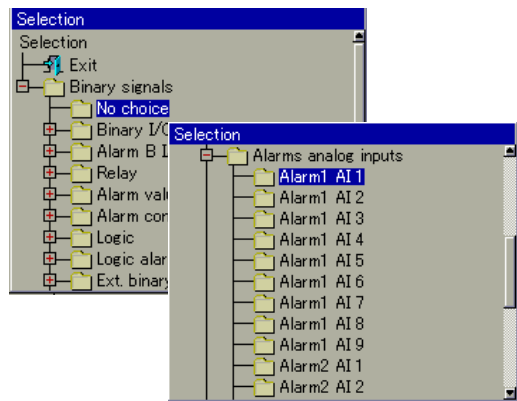
6. If you select [Alarms] in analog input 1, a dialog for alarm setting of DIO9 is shown. To record the output status of DIO9 in the event list, set as follows.

[Alarm status]:	on (use)
[Alarm type]:	event
[Alarm active at]:	High (1)
[Alarm text]:	Binary I/O 9 output
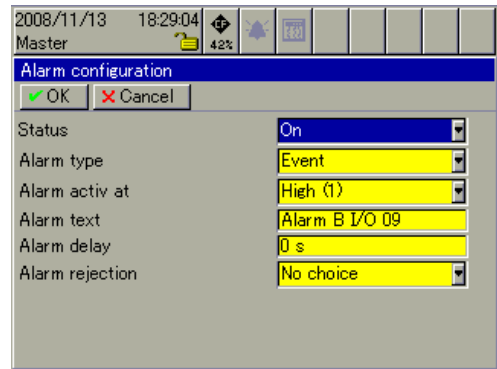
☞ Refer to 5.3. Enter Text (P.29) for how to enter text.

📖 Alarm type

Event: Alarm text is written into the event list. No alarm message appears on the display.

Alarm: Alarm text is written into the alarm and event lists. the alarm icon in the menu bar turn into red, and the alarm text appears on the status bar flashing. The analog graph in the alarm area is displayed in red and a alarm symbol is also shown on the display.

☞ See 6.4 Alarm/Event List Screen (P.50).

📖 Alarm active at

High (1): When BI or BO is ON*, alarm is ON.

Low (0): When BI or BO is ON*, alarm is OFF.

* Contact status at alarm ON is selected at [switching action (behavior)], alarm state may be reversed depending on the set contact actions.

[Input ON/OFF and alarm state by "alarm active at"]

Alarm active at	Binary input		Binary output			
	Input ON (close)	Input OFF (open)	Shutter - Make-NO		Opener - Break-NC	
			Output ON (close)	Output OFF (open)	Output ON (open)	Output OFF (close)
High (1)	Alarm ON	Alarm OFF	Alarm ON	Alarm OFF	Alarm OFF	Alarm ON
Low (0)	Alarm OFF	Alarm ON	Alarm OFF	Alarm ON	Alarm ON	Alarm OFF

7. Having set alarms, press [OK]. Binary input/output 9 setting is displayed again.
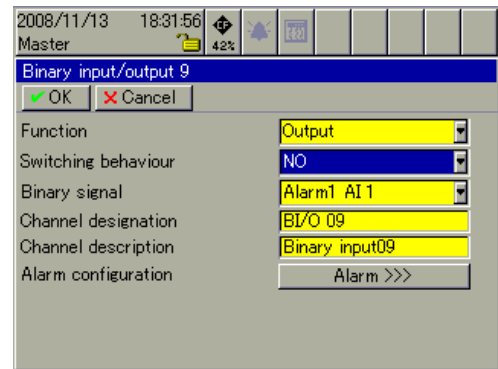
8. This completes setting binary input/output 9. Select [OK] to return to the configuration menu.

9. Then, select [binary input/output 10]. The setting screen for binary input/output 10 is displayed.
   Here, set only functions (input or output).
   You need to set binary input/output 10 to [input] so that batch 1 start when signal is received at binary input/output 10.
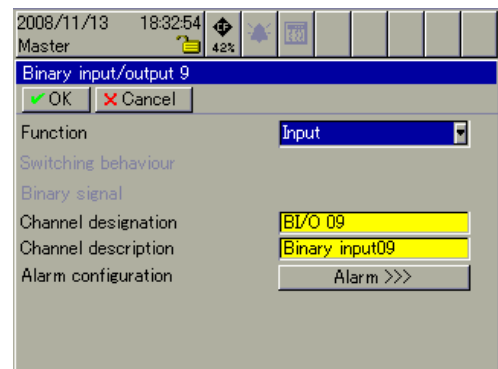
10. This completes setting binary input/output 10. Press [OK] and the configuration menu is displayed again.

📖 Other setting
   Channel name, channel description:

   You can freely enter characters. The channel name is used in most of displays and the channel description (longer name) is used in detailed display mode (for example, single channel display of a bargraph).
   Maximum characters: 7 for channel name and 20 for channel description.

7.6.5 Setting Group(s)

To actually record data, you need to assign inputs to group(s). Set as follows to assign inputs to group(s).

- Assign each input to one of the groups (at analog channels).

- Select status at parameter for data recording.

1. Select [Groups] and group1 1 to 9 are displayed.
   Group 1 must be always used.
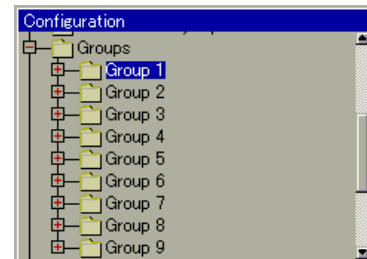
2. Select [group 1] and further menus are displayed below group 1.
   You need to set [parameter], [analog channels], [binary channels], and [standard operation].
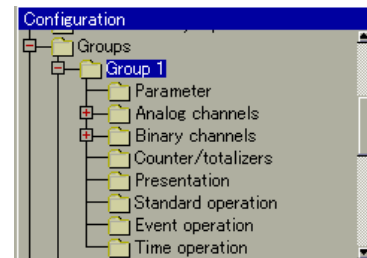
3. Select [Parameter] for setting [Status] and [Name (group name)]. The status is selectable from [inactive], [display only], and [display/save]. The group 1 cannot be set to [inactive].
   The group name can be set within 20 characters abd is shown on the status bar.
   This completes setting of the group. Press [OK] to return to the configuration menu.

   📖 Group name:
       Enter text within 20 characters. This is shown on the status bar. (Default: group 01)
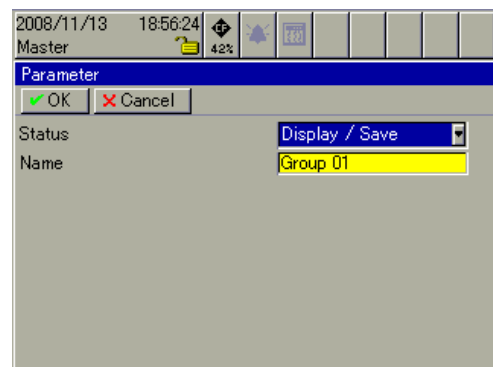
4. When you select [analog channels], channels 1 to 6 are displayed in the tree. You can assign up to six (6) analog inputs to a single group.

   If you have seven (7) analog inputs, you have to use at least two (2) groups (6 +1, 5+2, 4+3 …..etc).
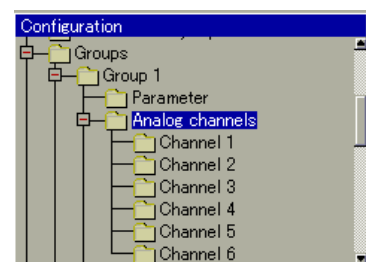
5. Select [channel 1] to assign [analog input (AI)1] to channel 1. Input signal may be set [inactive] when channel is opened.
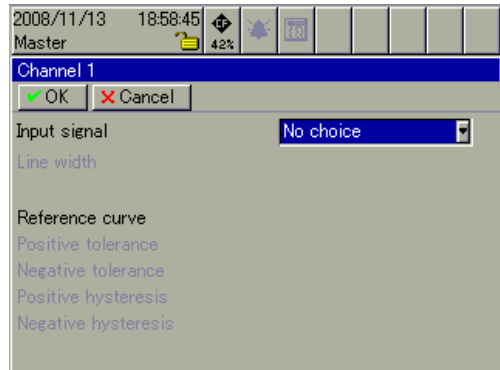
6. Select [input signal] and the menu that can be assigned to channel 1 is displayed. Select [analog input 1] from the list.

This completes setting of this screen. Press [OK] to return to the configuration menu.

 📖 To effectively use screens and memory, it is recommended to disable unnecessary channels.

Input channels set inactive are not displayed in the graph.

 📖 Reference alarm text:

Channel 1 can be used as a reference channel and if other channels in the same group deviate from the reference channel over the set tolerance (positive or negative), the preset alarm text may be displayed.

The reference channel is always channel 1. This setting is ignored as long as other channels are not set for the reference curve (check for [tolerance band active]). The reference curve can have positive and negative hysteresis.
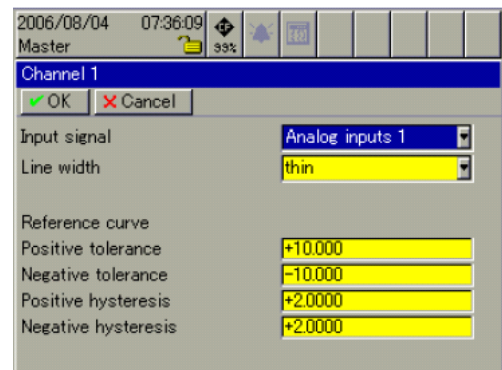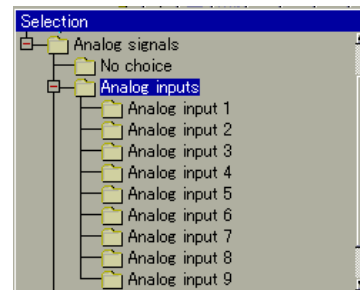
7. When you select [binary channels], channels 1 to 6 are displayed in the tree. You can assign up to six (6) binary inputs to a single group. The not assigned binary signals also work.
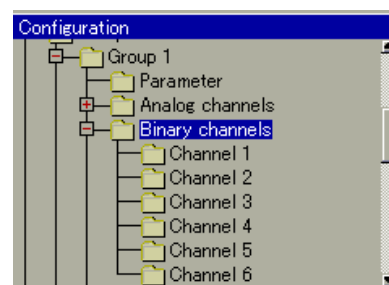
8. Select [channel 1] to assign binary input/output (DIO) 9 to show setting screen of channel 1.
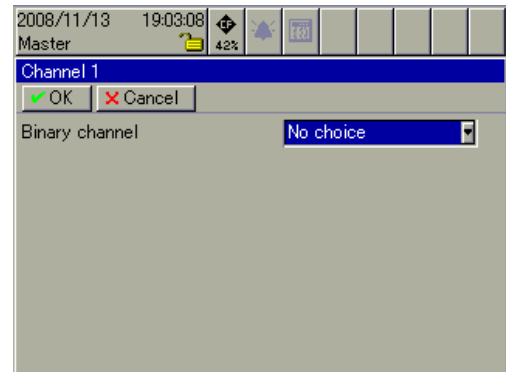
9. Select [binary channels] and the signal menu is displayed. Assign [binary signal 09] for channel 1. This completes setting in this screen. Press [OK] to return to the configuration menu.
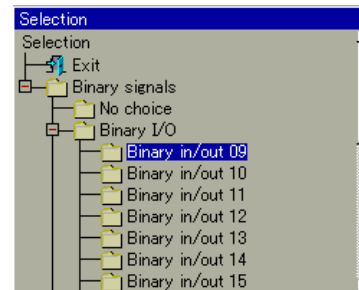
📖 To effectively use screens and memory, it is recommended to disable unnecessary channels.
Input channels set inactive are not displayed in the graph.
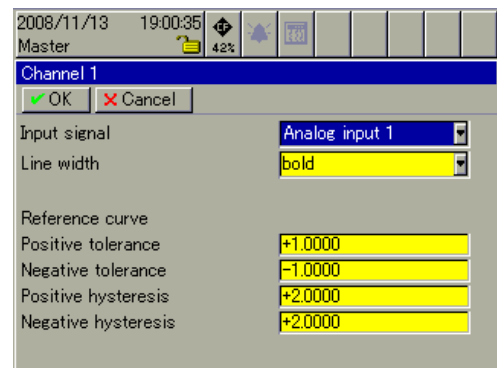
10. When you select [standard operation], a setting screen for standard operation is shown. We set here memory status, memory values, and memory rate.
Standard operation is one of three operation modes available with VGR.

Refer to [memory rate and operation] in 6.2.1 Analog Graph (P.36) for operation modes.
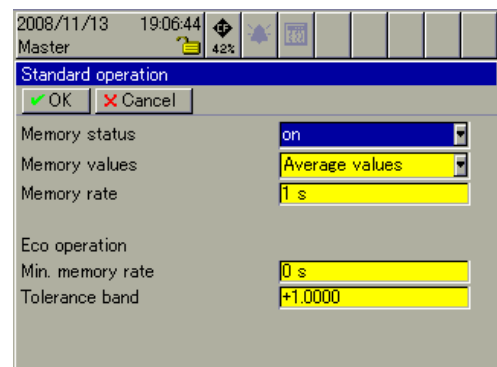
11. When you select [memory status], you have a selection of [on] and [off]. Select [on] for data storage.

12. When you select [memory value], you have a list of selectable items. Select [average value] here. ⌈

    📖   Memory value (type of storage data)

Average:	Default. Average value the within memory rate or storage cycle is saved.
Current:	Value at the time of memory rate (storage cycle) is saved.
Min:	Minimum value within the memory rate or storage cycle is saved.
Max:	Maximum value within the memory rate or storage cycle is saved.
Min/Max:	Both minimum and maximum values within the memory rate or storage cycle are saved.
Eco mode:	If measured values change within the preset range (tolerance band of eco operation), data is saved at minimum memory rate of eco operation regardless of memory rate of standard operation.

    📖   Sampling time of analog input is 125ms in spite of the number of inputs. This is constant when a single input is used and when 18 inputs are used. Sampling time is different from memory rate (storage cycle).
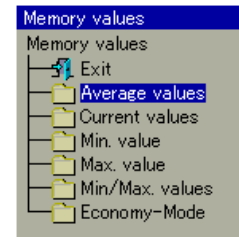
13. When you select [memory rage], data setting dialog is shown. Enter 1 (second) here.

    📖   Setting memory rate to "0" means saving data at every 125ms. Actually eight data (=1s) is stored at a time. Up to three (3) groups can be used with this memory rate.

    ☞   Refer to 5.2.2 Set Numerical Data for details.
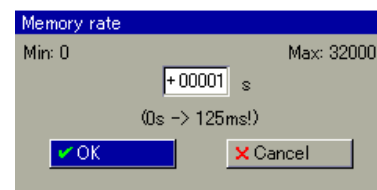
14. This completes standard operation setting. Press [OK] to return to the configuration men.
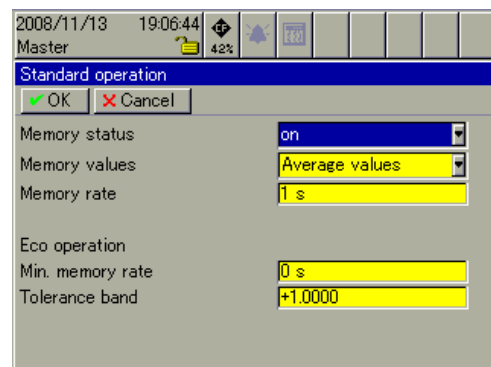
7.6.6 Use Batch(es)

Set as follows to use batch(es).

• In this example, batch is set to start when binary input (DIO10) is received.

1. Select [batches/plants] from the configuration menu and a batch setting menu is displayed in the tree.
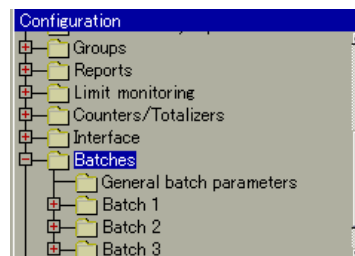
2. Select [batch 1] and the setting items for batch 1 will be displayed.
   We set [General] in this menu.
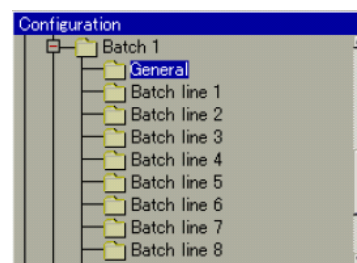
3. When you select [General] further setting items for batch 1 will be displayed. Set here [batch start] and [control signal].
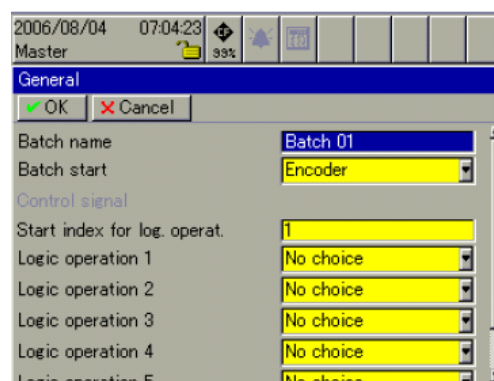
4. When you select [batch start], you have a selection menu of batch start and stop. Select binary signal in this example.

   📖 To manually start and stop batch, select [control knob].
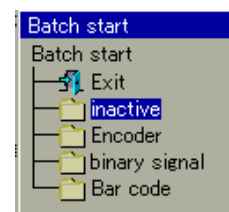
5. When you select [binary signal], you have a menu of binary signals for triggering the batch start. In this example, you should set the recorder to start batch 1 when signal is received at binary input (DIO) 10.
So, select [binary signal] and then [binary signal 10].
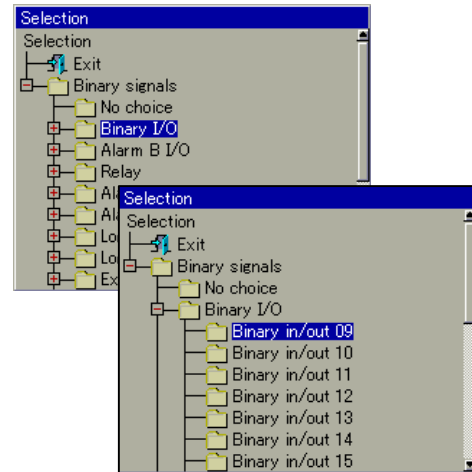
6. This completes setting. Press [OK] to return to the configuration.

7.6.7 Close Configuration

This completes setting configuration.
Select [return] in the configuration menu. The recorder starts recording with the new configuration.
The screen is the one before configuration (or you can set to which group and which screen should appear after reset). See [Screens].
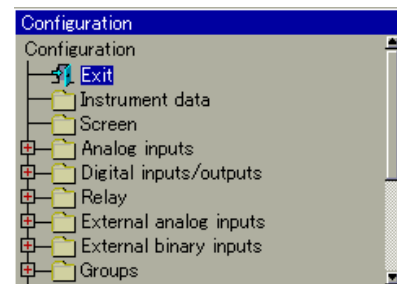
> When a configuration has been changed, the recorder starts recording with the new configuration, and the data before the configuration change is closed and cannot be viewed any longer on the screen. To see closed data, use a PC and PCA3000 evaluation software.

📖 If you have modified configurations many times (like initial testing), the history of the changes are shown in PCA3000 when the data is accessed and may be bothersome.
If previous history of modifications are no longer necessary, you can erase the internal memory with PSU/Setup tool. This procedure erases the recorded data also. If there is necessary data inside the recorder, back up the data before attempting deleting the internal memory.

7.7 Logout

If the recorder is left in the login state, configuration may be changed accidentally. It is recommended to log out after the configuration has been set.

1. Select [Device Menu] in the menu bar and the further selection of the device menu is displayed.

[Menu bar]

Device menu

Log in as Master   shows login status

Instrument menu
Instrument menu
  Exit
  Log in
  Instrument info
  Audit Trail
  Configuration
  Parameterization
  Service
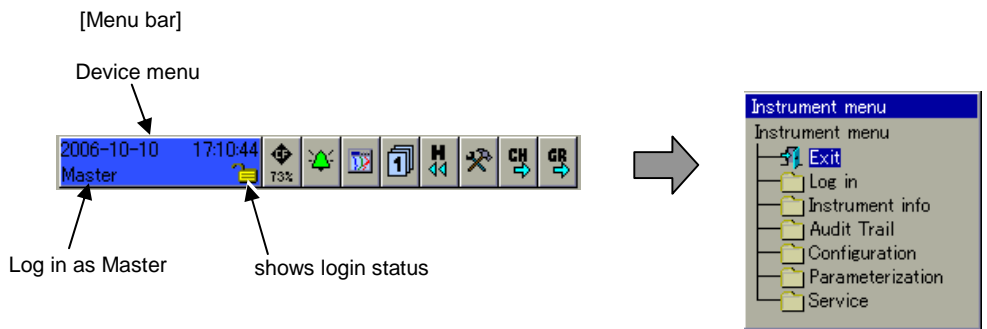
2. Select [login/logout] in the device menu and the login dialog is displayed.

Log in
  Log-in
  Log-out
  Change password
  Exit

3. Select [logout] to execute log out. The dialog disappears and the login status symbol changes to "locked" (logout) status.

[Menu bar]

Logout status (locked)
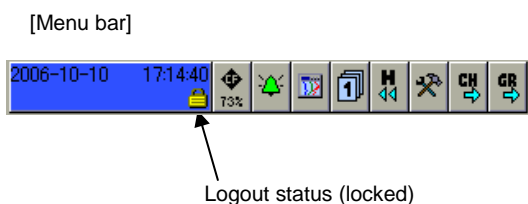
7.8 Viewing Data

7.8.1 Switching Display Mode

To view the data, [analog graph] (show diagrams), [bargraph] (show bargraph) and [numerical display] (show text images) are basically used.

■ Analog Graph (show diagrams)

Select [Visualization] in the menu bar and then [analog graph (show diagrams)].

Visualization menu

Unnecessary menus can be disabled in the configuration.

[Analog graph (show diagrams)

graph header
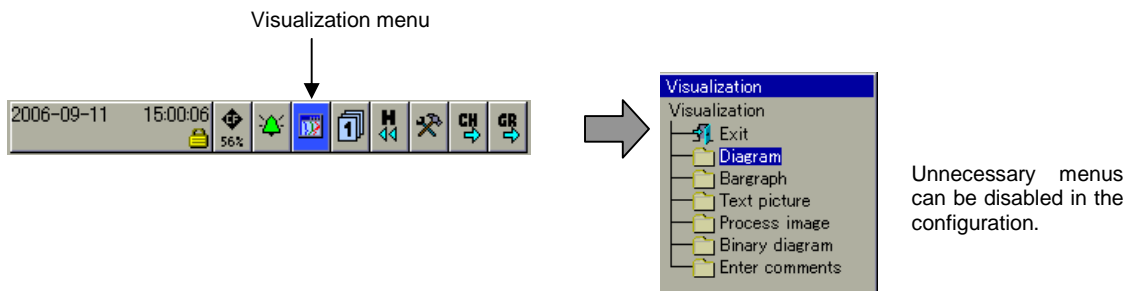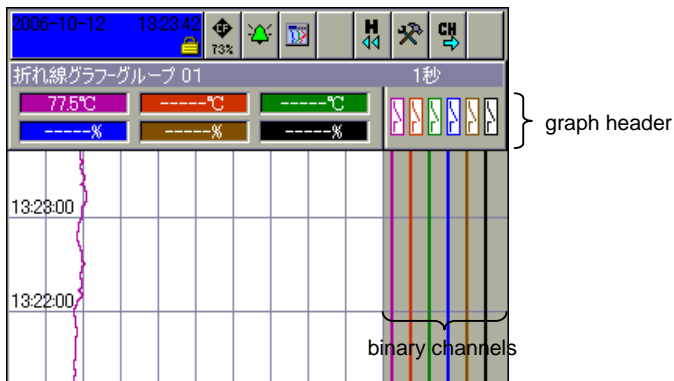
binary channels

Set to display six analog and six binary channels.
(Unused channels are also shown)
As only group 1 is used, group selection menu is not displayed.

graph header
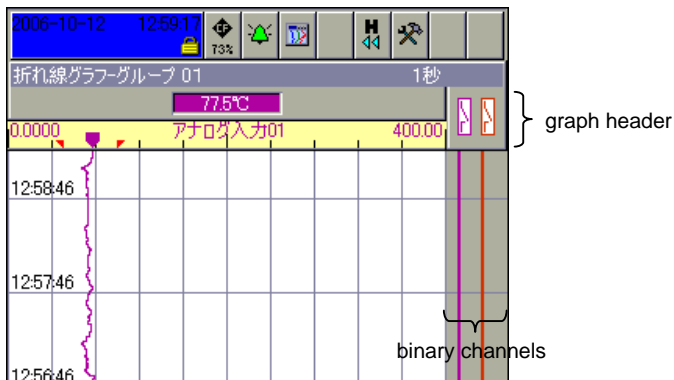
binary channels

Set to display one analog and two binary channels.
(Only necessary channels are shown)
As only group 1 is used, group selection menu is not displayed.

● Analog graph (show diagrams)

Next channel

When BIO is on, background is filled and the contact symbol is closed.

[example]

Scaling display

2006-10-12 18:11:58 73%

折れ線グラフグループ 01   1秒

71.1℃   -----℃   -----℃

0.0000   アナログ入力01   400.00

BIO 10 ON
Batch 1 starts

18:08:36

BIO 9 output ON
Low alarm of analog input 1 ON

Analog input 1
low alarm on area

18:07:36

Graphs are recorded in orange (alarm 1) and red (alarm 2).

Event: BIO9 ON
Alarm: Low alarm ON

Event: BIO9 OFF
Alarm: Low alarm OFF

Event: Batch 1 end
Event: Batch 1 starts

Symbols of BIO10 are overlapped as ON time is too close.

[Scaling display]

Each time [Next channel] is pressed, channel is switched inside the same group.

0.0000   アナログ入力01   400.00

Scale low limit

Alarm setpoint (low)

Actual value

Alarm setpoint (high)

Scale high limit

[Alarm display]

In alarm state, the alarm/event list icon turns into red and the status bar starts flashing with alarm texts. Numerical displays also turn into orange (alarm 1) and red (alarm 2). Recorded lines are also in these colors in the alarm area.

Alarm/Event list

2008/11/13   17:05:51
Master   90%

High Alarm AI01   1s

Status bar

Alarm text

9.0%   14.0%   25.3%

Background turns into orange (alarm 1) and red (alarm 2)
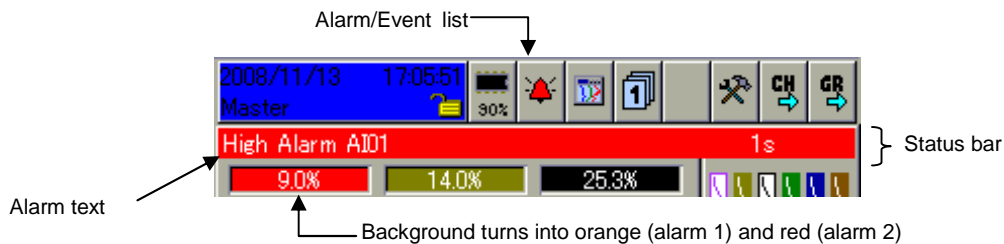
● Switching graph setting mode

With [Measurement display] in the menu bar, you can set [graph header on/off], [perforation on/off], [binary diagram on/off].

Measurement display
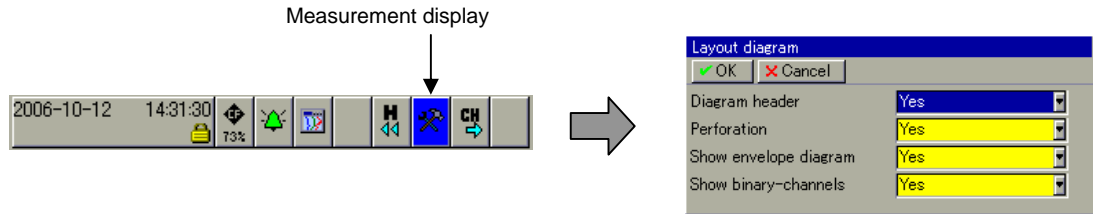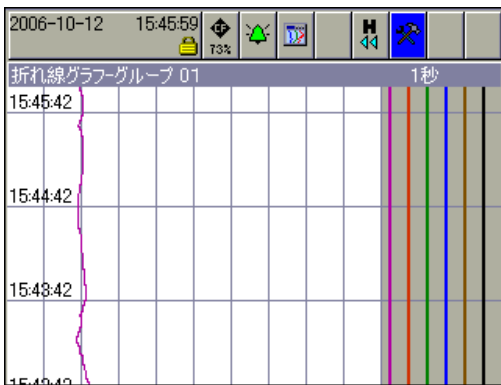
[No graph header]

[No binary channels]
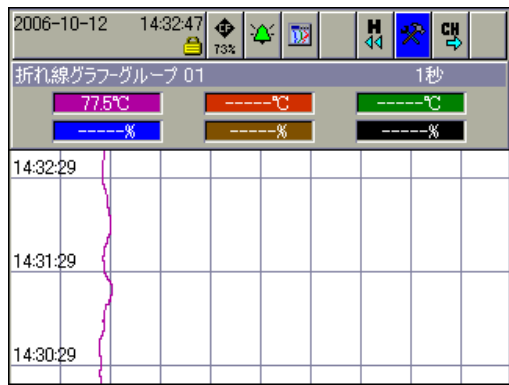
[With perforation]
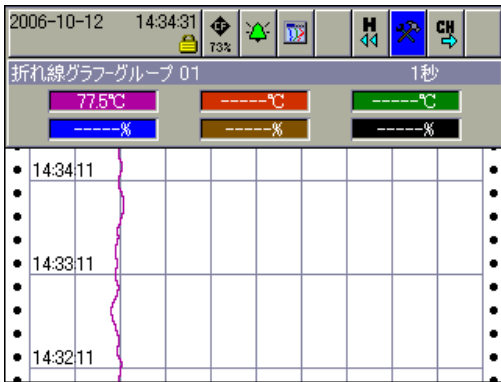
(Available only when digital graph is not shown)

[No graph header and no binary channels]

📖 Max/Min line can be shown only when the store date type is [Max/Min]. If this option is selected, maximum and minimum data saved within the storage cycle will be shown with two lines. If this option is not selected, area between two lines are filled. Select storage type by [configuration], [group], [group 1 to 9], [normal operation].

■ Bargraph (show bargraphs)

When you select [visualization] in the menu bar, visualization menu is displayed. Select [Bargraph].

Visualization menu
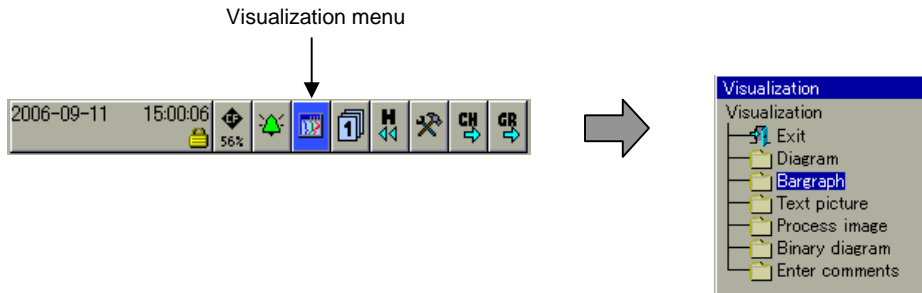
[Bargraph]
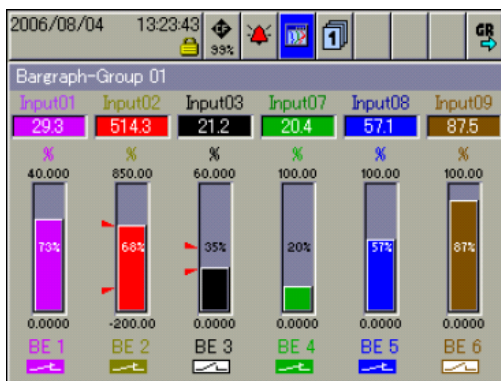
The screen is set to show six (6) analog channels and six (6) binary channels.
(In this example unused channels are also displayed)

In this example, only group 1 is set active, a [group selection] is not displayed in the menu bar.
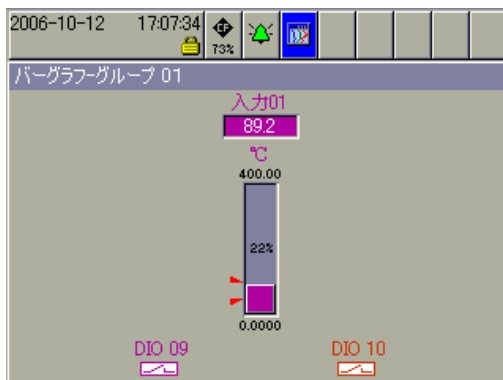
This screen is set to show one (1) analog channel and two (2) binary channels.
(In this example, only used channels are shown).(

In this example, only group 1 is set active, a [group selection] is not displayed in the menu bar.

■ Numerical Display (show text images)

When you select [show text images] in the menu bar, the menu is shown. Select [show text images].

Visualization menu
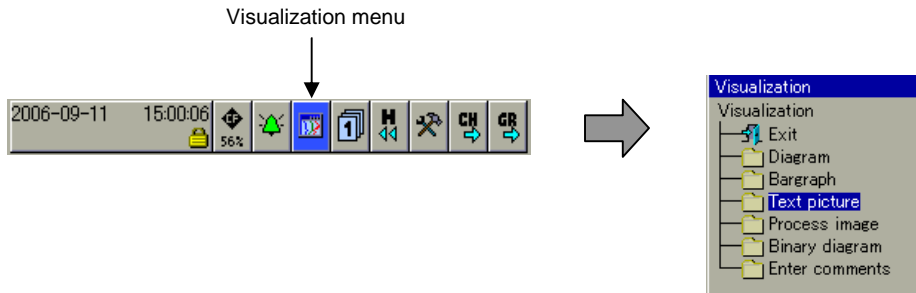
[show text images screen]
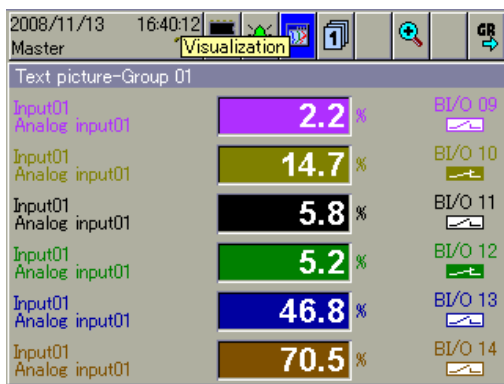
The screen is set to show six (6) each of analog and binary channels.
(Unused channels are also displayed).

If only group 1 is set active, a [group selection] is not displayed in the menu bar.

BI/O are not displayed if they are not supplied or if the are not configured.
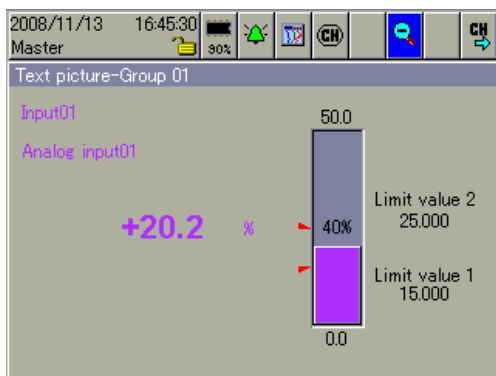
The screen is set to show one (1) analog channel and two (2) binary channels.
(Only used channels are displayed)

In this example, only group 1 is set active, a [group selection] is not displayed in the menu bar.

When you select 1-channel display, you can see more detailed channel information on the screen.

[Detailed display mode]

1-channel display
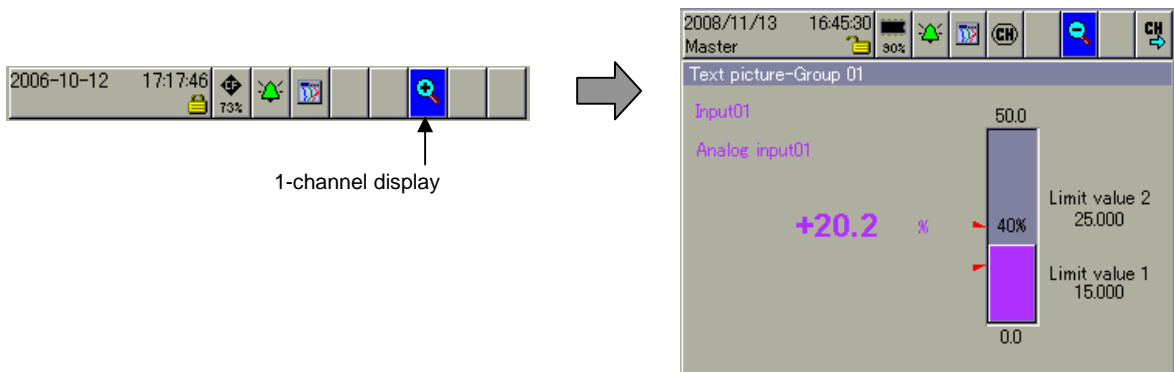
7.8.2 View Alarm/Event Lists

To view alarm and event status, open alarm list/event list.

In this example, we open event list to see if the event has been generated as set.

Select the alarm/event list in the menu line, then [event list], and [all events].

[Event list contents]   [Event status]
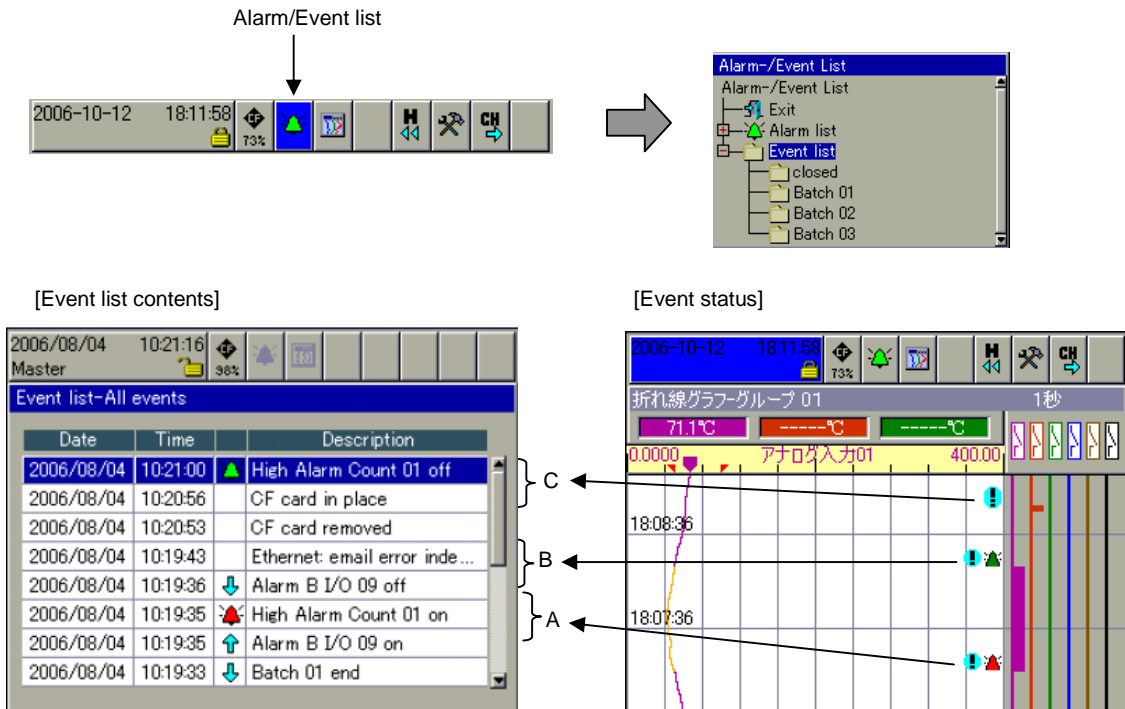
A: Shows alarm 1 (high alarm) of count 01 input turns on and binary output (BIO9) is also on. The alarm part of a drawing line of analog input is shown in red (high alarm) or in orange (low alarm).

B: Shows alarm of binary signal BI/O9 turned off.

C: Shows high alarm of count 01 has ended.

When you have changed the configuration, the recorder will start recording with the new configuration. The previous data before the configuration change is closed and cannot be seen on the recorder. Use PCA3000 evaluation software to see the closed data.

7.8.3 View Historical Data

In the historical data display (memory presentation) you can see the previous record and alarm/event status.
Select [Memory Presentation] marked with [H] in the analog graph or binary graph to enter the memory presentation mode.

📖   This mode is only selectable when the visualization mode is [analog graph] or [binary diagram]. The last completed batch can also be viewed.

Memory presentation

[Historical display]

Page scroll   Zoom/Search

Line scroll   Exit

Data at cursor position (date and time)

Zoom rate

Cursor
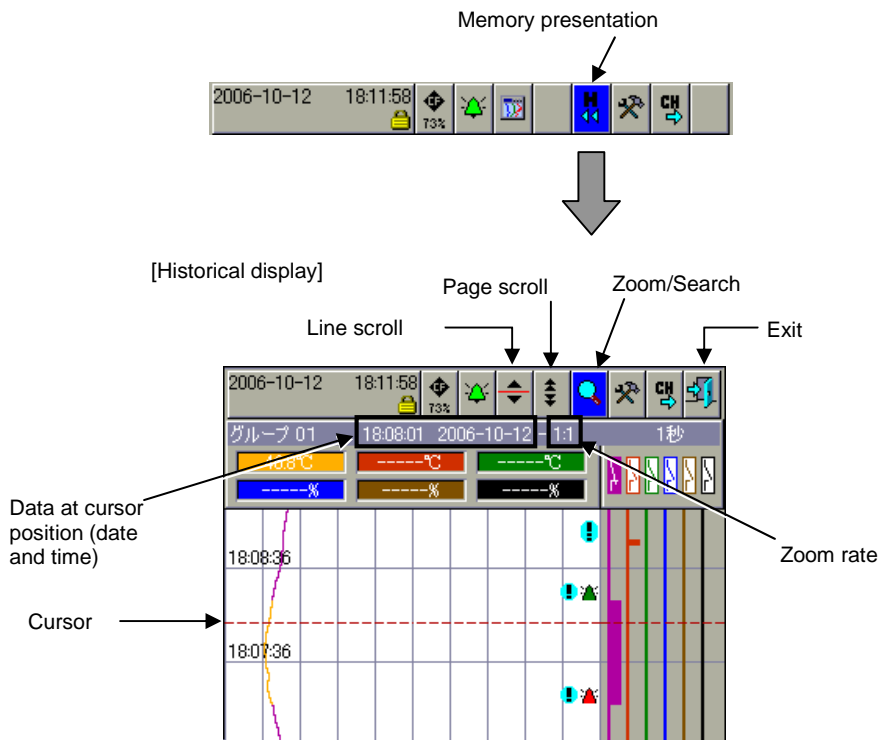
📖   In the [Screen] setting in the configuration, you can select the memory for the memory presentation (2MB, 4MB, and 8MB).
Time period by memory size (approximate): Memory size 8MB

Analog channels by 6 (Save at 30 sec.)	approx. 2 months (4.1MB/month)
Analog channels by 6 (Save at 1 sec.)	approx. 2 days (4.1MB/day)

☞   ■ See also Data and memory (P. 92)

The above time period is just for reference in case of a single group. No consideration is made for alarm, batch and reports. Actual data may be larger (shorter time period) than the calculation.
When data in the memory presentation exceeds the memory size, data is erased from the older one.

☞   Refer to 6.3 Memory Presentation Screen (P. 47) for details.

7.9 Save Data

Recorded data can be saved via external memory (CF card or USB memory) or via communication. In this section we describe how to use external memory to save data.

📖 It is recommended to use our standard CF card (VGRP-M02, 256MB, industrial grade) for reliable storage. Commercially available products can also be used, but complete test is not made for reliability. Some cards may not be properly recognized on the recorder.

Up to 4GB memory (CF card or USB memory) can be used on the recorder, but some USB memory are modified by the manufacturer to enhance some features and such types may not work properly on the recorder. In any case it is strongly recommended to save data into a PC or duplicate the data in the storage media.

7.9.1 Preparation for Saving Data

■ Memory Manager

Memory Manager is accessible while a CF card is placed in a card slot behind the front cover or a USB memory is inserted into a memory connector. When a storage media is inserted while the cursor is somewhere on the header, the Memory Manager pops up automatically.
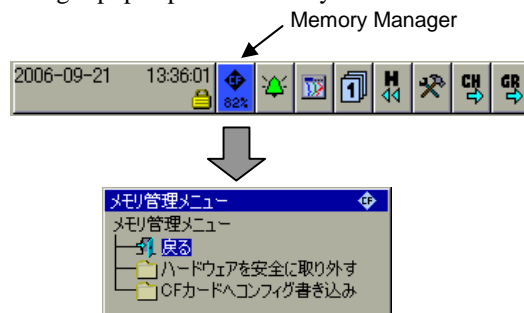
■ Login

Accessible menus and operations dependent on the login status and the user level of login.

To show all available contents, login the recorder as a Master in the login dialog in the device menu.

	Menu shown when logged in as a master	Menu shown when logged in as a user	Menu without login
When CF card is used			

	Menu shown when logged in as a master	Menu shown when logged in as a user	Menu without login
When USB memory is used	Memory manager Memory manager — Secure remove of hardware — Update USB stick — Backup -> USB stick — Config. data -> USB stick — USB stick -> Config. data — Store all + update USB — Service data -> USB stick — Software update — USB stick -> user list	Memory manager Memory manager — Secure remove of hardware — Update USB stick — Backup -> USB stick — Config. data -> USB stick — Store all + update USB	Memory manager Memory manager — Secure remove of hardware — Config. data -> USB stick
	The USB memory menu stays displayed until the USB memory is removed. This means you are unable to attempt other operations while the USB memory is inserted. Remove the USB memory after the use. Use a CF card if data needs to be saved automatically and constantly.		

☞ Refer to 6.6 Device Menu (P.57) for login and logout.

7.9.2 Data Contents of Saved Data

■ Data Structure

The data structure of the internal memory of VGR-A100 is outlined below. Measurement data includes analog data, binary inputs/outputs, alarm/event data, counter/integrator data, reports and batches.
The internal memory also stores some of the program used for the recorder (system files).
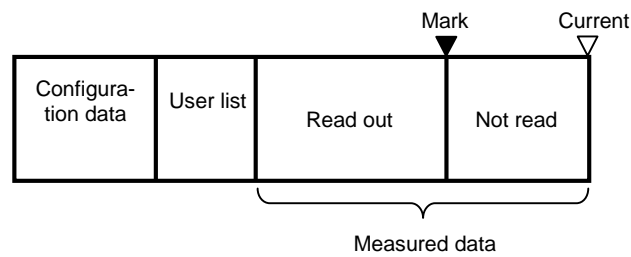
● CF card update/USB memory update

Writes data not yet read into an external memory device. After data has been written into the external memory, a mark is moved to the position until which data has been read out. In the next update the data is read out from the mark or only newly added data is read out.
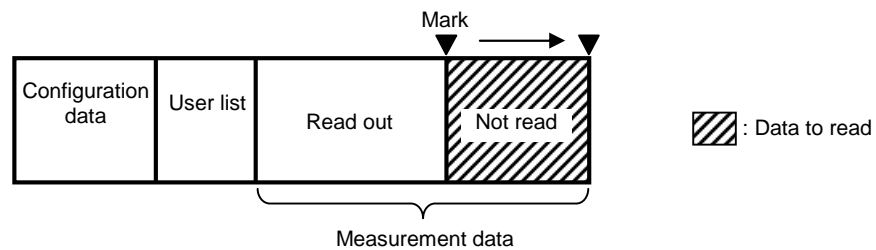
● Write all data to CF card/USB memory

This executes writing all measurement data in the memory including that already read out before to be written into the external memory. After this operation, the mark is moved to the current position.
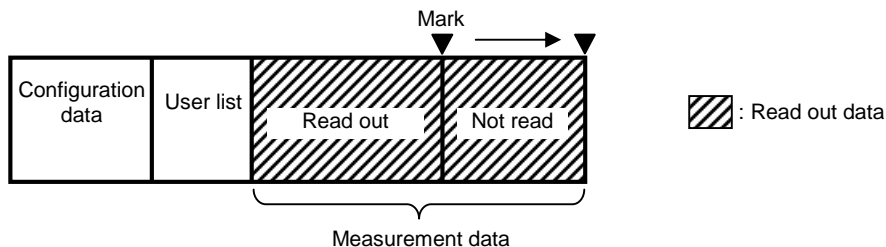
● Write config data into CF card/USB memory

This writes configuration data of the recorder and user list (password management) into the external memory. This is used to back up the setup data (configuration).
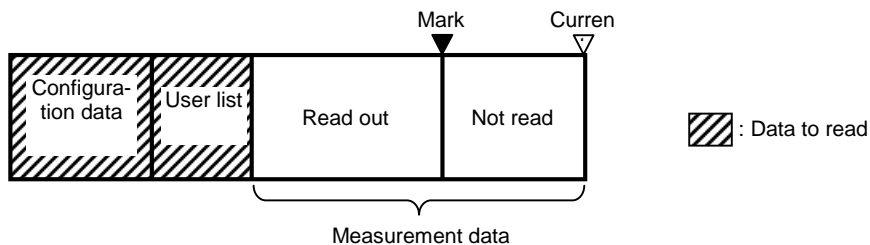
User list can be edited with the PSU/Setup software.

● Store all + update of CF card/USB memory

This closes all active reports, counters and integrators and save the data into the external memory in the same way as in CF card update above.
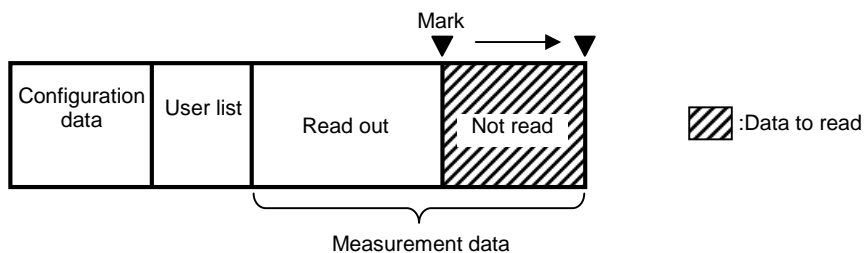
☞   See 6.5. Memory Manager (P.53) for other menus.

■ Memory Consumption

Recorded data is stored in the internal memory and approximate data size is outlined before.

- Memory size per group (six analog channels, six binary channels) and storage rate

  [Storage rate: 1 second or faster]:   48 bytes (max)

- Memory size per group (six analog channels and six binary channels) with storage rate of 1 second.*

  [Storage rate: 125 ms]:   225 bytes

    * Data is saved at one second intervals (8 data per saving) when storage rate is 125ms.

- Memory size per report: 151 bytes
- Memory size of counters/integrators: 25 bytes
- Memory size per batch: 2K bytes
- Memory size per alarm/event message: 6 bytes
- Memory size per message in audit trail: 100 bytes

[Example]

Analog channels	Storage rate	Memory per storage rate	Memory size per day	Memory size per month (30 days)
	30 seconds	48 bytes	0.13M bytes	4.1M bytes
6 channels	1 second	48 bytes	4.1M bytes	124M bytes
	125 ms	225 bytes *	19.4M bytes	583.2M bytes

* Memory size per second (eight storage cycles)

📖   The memory size shown above does not include data from alarm generation and other functions.
The internal memory was supposed to have 200MB free for the data because other data such as the configuration and the program for the recorder are also stored in the internal memory.

8. Header and Menu List

This chapter shows menus accessible from the header.

Instrument Menu
Memory Manager
Alarm/Event list
Visualization
Historical display
Layout diagram

2006-09-11   15:00:06   56%
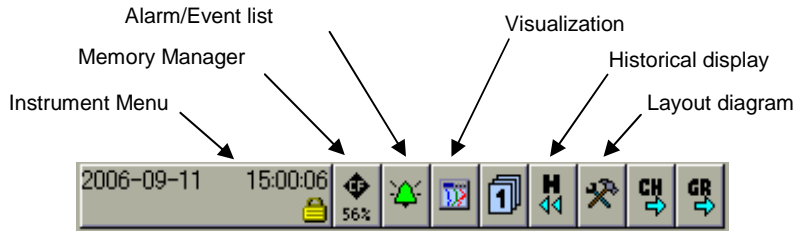
Example of header (when analog graph is used)

■ Visualization

- Diagram (analog graph)
- Bargraph
- Text picture
- Process image
- Binary diagram
- Reports
- Current batch
- Last completed batch
- Counters/Integrators
- Comment

■ Alarm/Event list

- Alarm list
  - All alarms
  - Batch 01
  - Batch 02
  - Batch 03
- Event list
  - All events
  - Batch 01
  - Batch 02
  - Batch 03

■ Historical display

- Alarm/Event list
- Scroll lines
- Scroll pages
- Zoom and search
  - 1 : 1
  - 1 : 2
  - 1 : 5
  - 1 : 10
  - 1 : 20
  - 1 : 50
  - 1 : 100
  - Search
- Measurement display
  - Selection of inputs
  - Analog input 01
  - Analog input 02
  - Analog input 03
  - Analog input 04
  - Analog input 05
  - Analog input 06

■ Diagram view

- Perforation
- Diagram header
- Show envelope diagram
- Show binary channels

■ Memory Manager

- Remove hardware safely
- CF card updates [1]
- Write all data to CF card/USB memory [1]
- Write config data to CF card/USB memory
- Read config data from CF card/USB memory [2]
- Store all + update CF card/USB memory [1]
- Write service data to CF card/USB memory [2]
- Update software [2]
- Read user list from CF card/USB memory [2]

[1] Displayed when logged as Master or User
[2] Displayed when logged in as Master

■ Device Menu

```
├── Login
│    ├── Login
│    ├── Logout
│    └── Password change
├── Device information
│    ├── Version
│    ├── Information
│    ├── Hardware
│    ├── Module 1
│    ├── Module 2
│    ├── Module 3
│    ├── External AI 01
│    ├── External AI 02
│    ├── External DI
│    ├── External text
│    ├── Ethernet 1
│    ├── Ethernet 2
│    ├── USB information
│    └── Interface
├── Audit trail *
├── Configuration *
     ├── Device data
     │    ├── Device name
     │    ├── Language
     │    ├── Supply frequency
     │    ├── Temperature unit
     │    ├── Integrator out of range
     │    ├── Memory alarm
     │    ├── Data readout via
     │    └── History memory
     └── Screen
          ├── Brightness
          ├── Switch off screen
          ├── Time to switch off
          ├── Binary signal
          ├── Lock control knob
          ├── Simulation inputs
          ├── Show diagrams
          ├── Show bargraph
          ├── Show text image
          ├── Show process image
          ├── Show binary image
          ├── Show reports
          ├── Show alarms
          ├── Display after reset
          ├── Group after reset
          ├── Thousand separator
          └── Barcode -> current batch
```

* Shown when logged in as Master

Ⓑ

Ⓐ → to P. 98

Ⓑ
```
├── Analog inputs
│    ├── Analog input 1
│    │    ├── Sensor
│    │    ├── Linearization
│    │    ├── Reference junction
│    │    ├── Constant
│    │    ├── Measuring range start
│    │    ├── Measuring range end
│    │    ├── Scale range start
│    │    ├── Scale range end
│    │    ├── Offset
│    │    ├── Filter constant
│    │    ├── Resistor Ra
│    │    ├── Resistor Rs
│    │    ├── Resistor Re
│    │    ├── Resistor R0
│    │    ├── Resistor Rp
│    │    ├── Channel name
│    │    ├── Channel description
│    │    ├── Unit
│    │    ├── Decimal point position
│    │    └── Alarms
│    │         ├── Status
│    │         ├── Alarm type 1
│    │         ├── Alarm type 2
│    │         ├── Limit value 1
│    │         ├── Limit value 2
│    │         ├── Hysteresis
│    │         ├── Alarm delay
│    │         ├── Alarm text 1
│    │         ├── Alarm text 2
│    │         └── Alarm rejection
│    ├── Analog input 2
│    │    ┊
│    └── Analog input18
└── Binary inputs/outputs
     ├── Binary input/output 1
          ├── Function
          ├── Switching behavior
          ├── Binary signal
          ├── Channel name
          ├── Channel description
          └── Alarms
               ├── Status
               ├── Alarm type
               ├── Alarm active at
               ├── Alarm text
               ├── Alarm delay time
               └── Alarm rejection
```

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IMX01L05-E1

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└── Binary input/output 1
      ⋮
└── Binary input/output 24

Relays
└── Relay 1
      ├── Binary signal
      ├── Channel name
      └── Channel description
└── Relay 2
      ⋮
└── Relay 7

External analog input
└── External analog input 1
      ├── Range start
      ├── Range end
      ├── Channel name
      ├── Channel description
      ├── Unit
      ├── Comma format
      └── Alarms
            ├── Status
            ├── Alarm type 1
            ├── Alarm type 2
            ├── Limit value 1
            ├── Limit value 2
            ├── Hysteresis
            ├── Alarm delay time
            ├── Alarm text 1
            ├── Alarm text 2
            └── Alarm rejection
└── External analog input 2
      ⋮
└── External analog input 24

External binary inputs
└── External binary input
      ├── Channel name
      ├── Channel description
      └── Alarms
            ├── Status
            ├── Alarm type
            ├── Alarm active at
            ├── Alarm text
            ├── Alarm delay
            └── Alarm rejection

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└── External binary input 1
      ⋮
└── External binary input 24

Groups
└── Group 1
      ├── Parameter
      │   ├── Status
      │   └── Name
      ├── Analog channel
      │   └── Channel 1
      │   ├── Input signal
      │   ├── Line width
      │   └── Tolerance band
      │   └── Channel 2
      │   ⋮
      │   └── Channel 6
      ├── Binary channel
      │   └── Channel 1
      │   └── Binary signal
      │   └── Channel 2
      │   ⋮
      │   └── Channel 6
      ├── Counters/Integrators
      │   ├── Counter/Integrator 1
      │   ├── Counter/Integrator 2
      │   ├── Counter/Integrator 3
      │   └── Counter/Integrator 4
      ├── Diagram view
      │   ├── Perforation
      │   ├── Diagram header
      │   ├── M'ment value selection
      │   ├── Show envelop diagram
      │   └── Show binary channels
      ├── Standard operation
      │   ├── Memory status
      │   ├── Memory values
      │   ├── Memory rate
      │   └── Eco operation
      └── Event operation
            ├── Binary signal
            ├── Memory values
            └── Memory rate

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(G) (H) (I)

— Timed operation
  — Start
  — End
  — Memory values
  — Memory rate

— Group 2
  ⋮
— Group 9

— Reports
  — Report 1
    — Total
    — Daily
    — Weekly
    — Weekday
    — Monthly
    — Yearly
    — Periodically
    — Period
    — External
    — External start
    — Synchronization time
    — Out of range
  — Group 2
    ⋮
  — Group 9

— Limit monitoring
  — Limit 1
    — Function
    — Analog value
    — Limit value
    — Hysteresis
    — Switch-on delay
    — Behavior upon probe break
    — Channel name
    — Channel description
    — Alarms
      — Status
      — Alarm type
      — Alarm active at
      — Alarm delay
      — Alarm text
      — Alarm rejection
  — Limit 2
    ⋮
  — Limit 9

(J)

(J)

— Counters/Integrators
  — General setting
    — Synchronization time
    — Start
    — End
    — Period
    — Weekday
    — Reset signal
  — Counter/Integrator 1
    — Function
    — Type
    — Input signal
    — Evaluation
    — Time base
    — Threshold
    — External control signal
    — Channel name
    — Channel description
    — Unit
    — Comma format
    — Range start
    — Range end
    — Alarms
      — Status
      — Alarm type 1
      — Alarm type 2
      — Limit value 1
      — Limit value 2
      — Alarm delay
      — Alarm text 1
      — Alarm text 2
      — Alarm rejection
  — Counter/Integrator 1
    ⋮
  — Counter/Integrator 27

— Interface
  — Ethernet
    — DHCP
    — IP address
    — Subnet mask
    — Standard gateway
    — MODBUS/TCP port
    — DNS device name
    — DNS server
    — Transfer speed

(L)

(L)

RS232/RS485
- General
  - Device address
  - Type
  - Report
  - Baud rate
  - Data format
  - Min. response time
- Modbus Master *
  - General
    - Timeout
    - Scanning cycle
  - Addr. ext. analog values
    - Ext. analog value 1
      - Device address
      - Modbus address
      - Number of values
      - Data format
    - Ext. analog value 2
      ⋮
    - Ext. analog value 24
  - Addr. ext. binary values
    - Ext. binary value 1
      - Device address
      - Modbus address
      - Bit No.
      - Number of bit values
    - Ext. binary value 2
      ⋮
    - Ext. binary value 24
  - Address external text
    - External text 1
      - Device address
      - Modbus address
      - Number of words
    - External text 2
      ⋮
    - External text 9

(M)

(M)

RS232 for barcode reader
- General
  - Device address
  - Report
  - Baud rate
  - Data format
  - Min. response time
- Modbus Master *
  - General
    - Timeout
    - Scanning cycle
  - Addr. ext. analog values
    - Ext. analog value 1
      - Device address
      - Modbus address
      - Number of values
      - Data format
    - Ext. analog value 2
      ⋮
    - Ext. analog value 24
  - Addr. ext. binary values
    - Ext. binary value 1
      - Device address
      - Modbus address
      - Bit No.
      - Number of bit values
    - Ext. binary value 2
      ⋮
    - Ext. binary value 24
  - Address external text
    - External text 1
      - Device address
      - Modbus address
      - Number of words
    - External text 2
      ⋮
    - External text 9

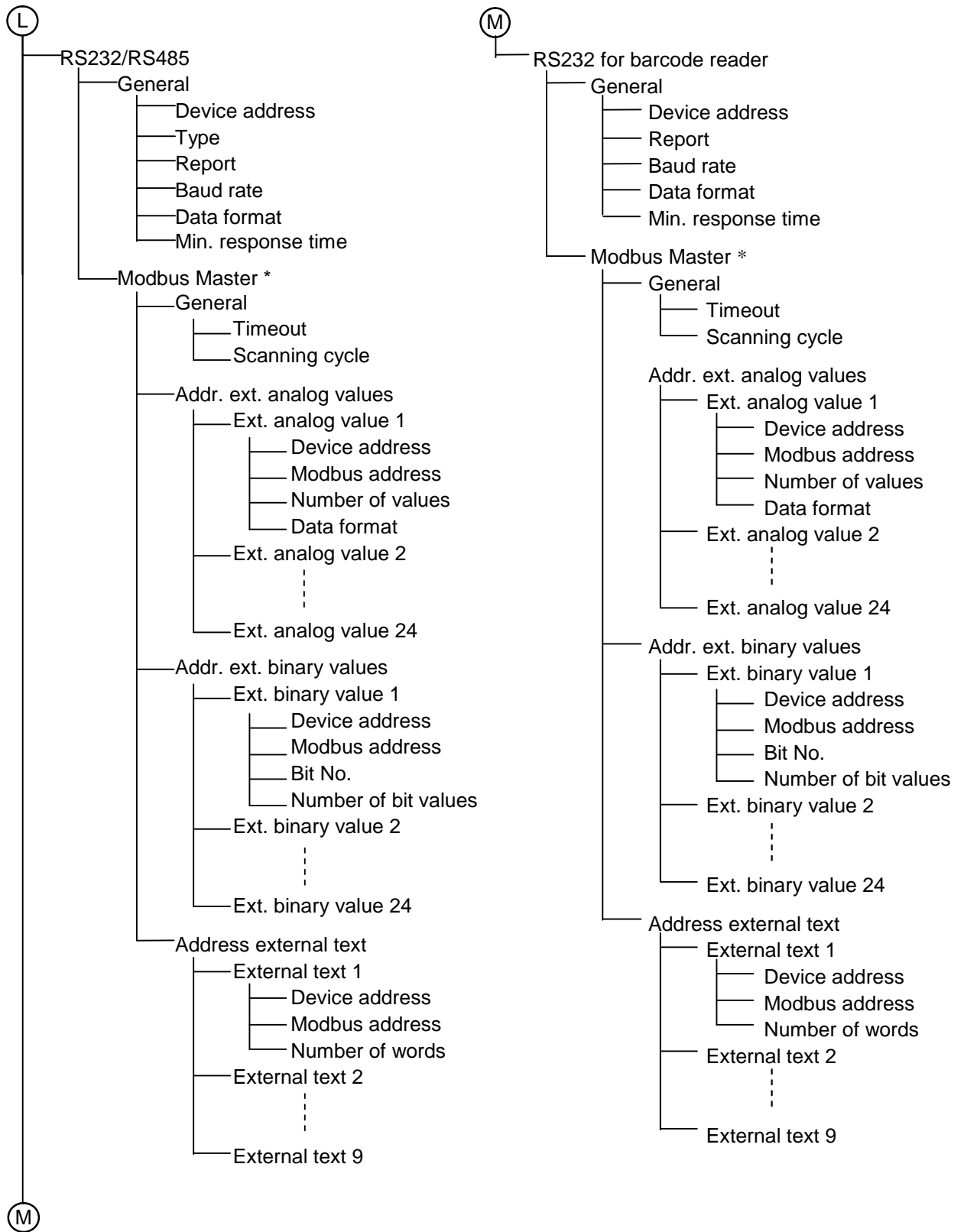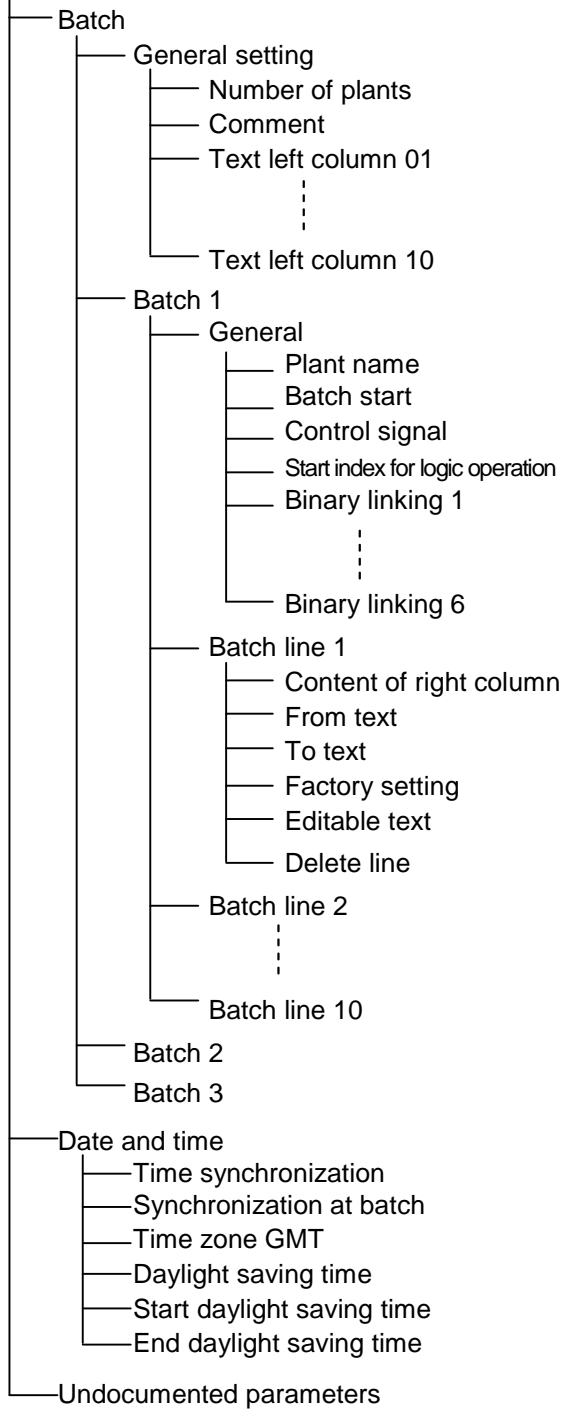∗ Shown when the protocol in [S232/RS485] or [RS232 for barcode reader] is set to Modbus Master.

from P. 96

(K)

— Batch
  — General setting
    — Number of plants
    — Comment
    — Text left column 01
      ⋮
    — Text left column 10
  — Batch 1
    — General
      — Plant name
      — Batch start
      — Control signal
      — Start index for logic operation
      — Binary linking 1
        ⋮
      — Binary linking 6
    — Batch line 1
      — Content of right column
      — From text
      — To text
      — Factory setting
      — Editable text
      — Delete line
    — Batch line 2
      ⋮
    — Batch line 10
  — Batch 2
  — Batch 3
— Date and time
  — Time synchronization
  — Synchronization at batch
  — Time zone GMT
  — Daylight saving time
  — Start daylight saving time
  — End daylight saving time
— Undocumented parameters

from P. 94

(A)

— Parameterization
  — Fine adjustment [1]
    — Analog input 1
      — Status
      — Real start value
      — Setpoint start value
      — Real end value
      — Setpoint end value
    — Analog input 2
      ⋮
    — Analog input 18
  — Counters/Integrators [2]
    — Counter/Integrator 1
      — Current value
      — Start value
    — Counter/Integrator 2
      ⋮
    — Counter/Integrator 27
  — Date and time [1]
    — Date
    — Time
    — Daylight saving time
  — Batch
    — Batch No. 1
    — Batch No. 2
    — Batch No. 3
— Service [1]
  — Set curr. settings as default
  — Restore factory setting
  — Debug window

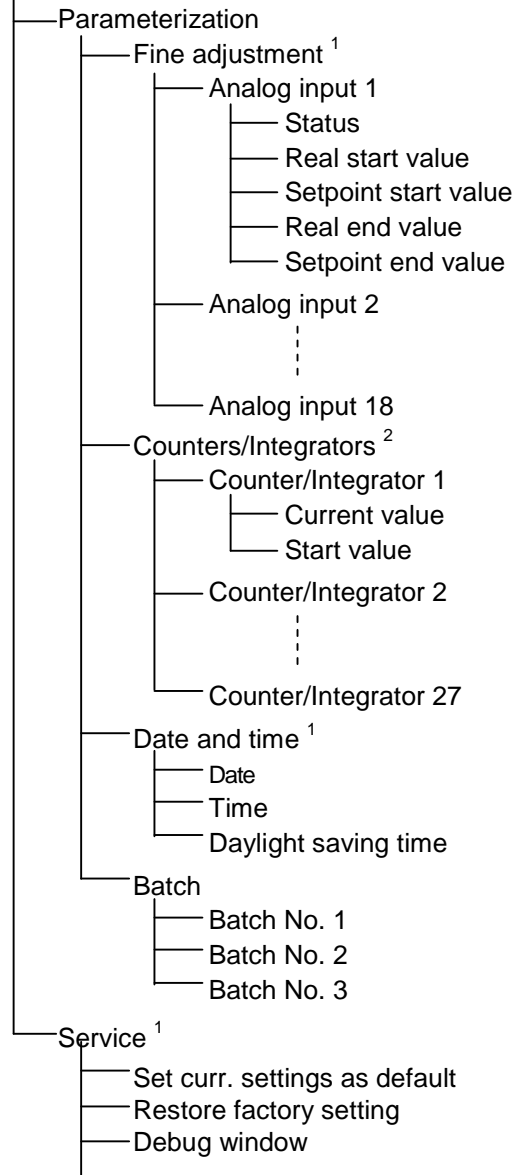[1] Displayed only when logged in as a Master
[2] Displayed when logged in as a Master or a User

9. Specifications

9.1 Analog inputs

Number of inputs: 3、6、9、12、15、18 inputs (to be specified at the time of ordering)

Input types:
- Thermocouple:K、J、T、S、R、E、B、N (JIS-C1602-1995、EN60584)
  U、L (DIN43710)
  PLII (NBS)
  W3Re/W25Re、W5Re/W26Re (ASTM-E988-96)
  Chromel-alumel、Chromel-copel (GOST R 8.585-2001)
  W3Re/W26Re
- RTD: 2 wires, 3 wires and 4 wires
  Pt100 (JIS-C1604-1997、EN60751)
  JPt100 (JIS-C1604-1989、JIS-C1604-1981 の Pt100)
  Pt100、Cu 100 (GOST 6651-94 A.1)
  Pt500、Pt1000 (EN60751)
  Ni100 (DIN43760)
  Pt50 (ST RGW 1057 1985)
  Cu 50
- Voltage (low): DC 0 to 200 mV、DC 0 to 1 V、DC −1 to +1 V
- Voltage (high): DC 0 to 10 V、DC −10 to +10 V
- Current: DC 0 to 20 mA、DC −20 to +20 mA
- Resistance transmitter: 3wires
- Potentiometer: 2wires, 3 wires, 4 wires

Measuring range/accuracy:
- Thermocouple

Input type	Measuring range	Measuring accuracy *
K	−200.0～+1372.0 °C	±0.1 % (over −80 °C)
J	−200.0～+1200.0 °C	±0.1 % (over −100 °C)
T	−270.0～+400.0 °C	±0.1 % (over −150 °C)
S	0.0～1768.0 °C	±0.15 %
R	0.0～1768.0 °C	±0.15 %
B	0.0～1820.0 °C	±0.15 % (over 400 °C)
N	−100.0～+1300.0 °C	±0.1 % (over −80 °C)
U	−200.0～+600.0 °C	±0.1 % (over −150 °C)
L	−200.0～+900.0 °C	±0.1 %
PLII	0.0～1395.0 °C	±0.15 %
W3Re/W25Re	0.0～2495.0 °C	±0.15 % (over 500 °C)
W5Re/W26Re	0.0～2320.0 °C	±0.15 % (over 500 °C)
W3Re/W26Re	0.0～2400.0 °C	±0.15 % (over 500 °C)
Chromel-alumel	−200.0～+1372.0 °C	±0.1 % (over −80 °C)
Chromel-copel	−200.0～+800.0 °C	±0.15 % (over −80 °C)

* Value for the maximum measuring range. With a smaller span the accuracy may be deteriorated.

• RTD (Resistance Temperature Detector)

Input type		Measuring range	Measuring accuracy *
Pt100	2/3 wire	−200.0～+100.0 °C	±0.5 °C
		−200.0～+850.0 °C	±0.8 °C
	4 wires	−200.0～+850.0 °C	±0.5 °C
JPt100	2/3 wire	−200.0～+100.0 °C	±0.5 °C
		−200.0～+650.0 °C	±0.8 °C
	4 wires	−200.0～+650.0 °C	±0.5 °C
Pt100 (GOST)	2/3/4 wires	−200.0～+100.0 °C	±0.5 °C
		−200.0～+850.0 °C	±0.8 °C
Pt500	2/3/4 wires	−200.0～+100.0 °C	±0.5 °C
		−200.0～+850.0 °C	±0.9 °C
Pt1000	2/3 wire	−200.0～+100.0 °C	±0.5 °C
		−200.0～+850.0 °C	±0.8 °C
	4 wires	−200.0～+850.0 °C	±0.5 °C
Pt50	2/3 wire	−200.0～+100.0 °C	±0.5 °C
		−200.0～+1100.0 °C	±0.9 °C
	4 wires	−200.0～+100.0 °C	±0.5 °C
		−200.0～+1100.0 °C	±0.6 °C
Ni100	2/3/4 wires	−60.0～+180.0 °C	±0.4 °C
Cu50	2/3 wire	−50.0～+100.0 °C	±0.5 °C
		−50.0～+200.0 °C	±0.9 °C
	4 wires	−50.0～+100.0 °C	±0.5 °C
		−50.0～+200.0 °C	±0.7 °C
Cu100	2/3 wire	−50.0～+100.0 °C	±0.5 °C
		−50.0～+200.0 °C	±0.9 °C
	4 wires	−50.0～+100.0 °C	±0.5 °C
		−50.0～+200.0 °C	±0.6 °C

* Value for the maximum measuring range. With a smaller span the accuracy may be deteriorated.

• DC voltage/DC current

Input type		Measuring range	Measuring accuracy *
Voltage (low)	DC 0～200 mV	DC −12～+112 mV	±240 μV
	DC 0～1 V	DC −0.12～+1.12 V	±1 mV
	DC −1～+1 V	DC −1.2～+1.2 V	±2 mV
Voltage (high)	DC 0～10 V	DC −1.5～+11.5 V	±6 mV
	DC −10～+10 V	DC −11～+12 V	±12 mV
Current	DC 0～20 mA	DC −1.3～+22 mA	±20 μA
	DC −20～+20 mA	DC −22～+22 mA	±44 μA

* Value for the maximum measuring range. With a smaller span the accuracy may be deteriorated.

• Resistance transmitter, potentiometer

Input type	Measuring range	Measuring accuracy *
Resistance transmitter	4000 Ω or less	±4 Ω
Potentiometer	Less than 400 Ω	±400 mΩ
	400～4000 Ω	±4 Ω

* Value for the maximum measuring range. With a smaller span the accuracy may be deteriorated.

Minimum span:
- Thermocouple: 100 °C (K、J、T、E、N、U、L、PLII、Chromel-alumel)
  500 °C (S、R、B、W3Re/W25Re、W5Re/W26Re、W3Re/W26Re、Chromel-copel)
- RTD: 15 °C
- Voltage: 5 mV
- Current: 0.5 mA
- Resistance transmitter, potentiometer: 60 Ω

Min/Max of scale range:
- Thermocouple, RTD: within measuring range (0.1 °C unit setting)
- Voltage: Programmable range (0.01 mV unit setting)
- Current: Programmable range (0.01 mA unit setting)
- Resistance transmitter and potentiometer: Programmable range (0.1 Ω unit setting)

Reference junction accuracy (for thermocouple input only):
  Internal Pt100: ±0.1 °C
  External: −50〜+150 °C (adjustable)

RTD Sensor current (for RTD input only):
  approx.250 μA (Pt100、JPt100、Pt100 (GOST)、Pt50、Ni100、Cu 50、Cu 100)
  approx.100 μA (Pt500、Pt1000)

Effect by input leadwire resistance (RTD, resistance transmitter, potentiometer):
  less than 10 Ω per lead (for 2-wire type)
  less than 30 Ω (for 3-wire and 4 wire types)

Sampling time: 125 ms (for all channels)

Input filter: Secondary delay digital filter
  Filter constant: 0.0〜10.0 sec

Resolution: 14 bit or more

Detection of input short-circuit/input break: See the table below.

	Input short-circuit	Input break
Thermocouple	Not detected	Detected
RTD	Detected	Detected
Voltage ≤ ±210 mV	Not detected	Detected
Voltage > ±210 mV	Not detected	Not detected
Current	Not detected	Not detected
Resistance transmitter	Not detected	Detected
Potentiometer	Not detected	Detected

9.2 Binary Inputs/Outputs

Number of inputs/outputs:	8、16、24 inputs/outputs (Please specify at the time of ordering)
	Maximum number depends on the number of analog inputs.
	Each point can be configures as input or output.

Input:
	Type:	Voltageless contact input
	Level:	Logic 0: $-3\sim+5$ V (Max. input current: ±1 mA)
		Logic 1: $12\sim30$ V (Input current: $2.5\sim5$ mA)
	Sampling cycle:	8 Hz

High speed input:
	First two channels at each binary input/output board	
	Sampling time:	10 kHz

Output:
	type:	Open collector	
	Level:	Logic 0: OFF	Max. voltage:	30 V
			Max.. leakage:	0.1 mA
		Logic 1: ON	Max. voltage:	1.6 V
			Max. current:	50 mA
	Output updating cycle:1 sec (1 Hz) or faster		

Internal power supply:
DC 24 V, max. 60 mA/8 points (7.5 mA per point)
If a load is connected over the above limit, use an external power supply (max. 50mA per point).

9.3 Relay Output

Number of outputs:
1 point: Supplied as standard
6 points*:   Please specify at the time of ordering (availability subject to the number of analog channels)

* Do not mix the power supplied to the load wired to this relay with the   power wires from SELV circuit.

Contact capacity:	230V AC, 3A (resistive load)
Contact type:	1c contact (SPDT)

9.4 Communication Interface

■ RS-232C/RS-485

Number of interface:	1 (Selectable between RS-232C/RS-485) and 1 for barcode reader
Protocol:	MODBUS master, MODBUS slave, barcode reader
Communication speed:	9600 bps、19200 bps、38400 bps
Connector type:	D-sub 9 pin type
External input:	24 points of analog inputs and 24 points of binary inputs (via MODBUS protocol)

■ Ethernet

Number of interface:	1 point
Protocol:	TCP、IP、HTTP、DHCP、SMTP、MODBUS/TCP
Communication speed:	10M bit/sec、100M bit/sec
Connector type:	RJ-45
Data format:	HTML

9.5 USB Interface

■ USB Host Communication

Number of interface:	2 points* (front and rear) * Not accessible simultaneously
Standards:	USB2.0
Connector:	type A connector
Purpose:	Connection of USB flash memory
	USB memory: Max. 4GB
	Some USB memory may not be properly recognized.

■ USB Device Function

Number of interface:	2 points* (front and rear) * Not accessible simultaneously
Standards:	USB2.0
Connector:	mini B connector
Purpose:	Used for PSU/Setup software and PCC/Data transfer software

9.6 Screen

Screen size/type:	5.5 inch, TFT color screen
Screen resolution:	320×240 dots
Colors:	256 colors
Refresh rate:	150 Hz or more
Brightness control:	Adjustable on VGR-A100
Screen saver:	Screen off after the set time or by external control signal.

9.7 General Specifications

Power supply:
Supply voltage: 100-240 V AC or
                  24V AC/DC
Supply voltage variation range: 85-264 V AC (for 100-240 V AC)
                                  20-30 V AC/DC (for 24 V DC/AC)
Supply voltage frequency: 48-63 Hz

Effect by supply voltage: Less than 0.1% of measuring range

Power consumption: approx. 40 VA

Dielectric strength:
between power and input circuit: AC 100-240 V: 2.3 kV/50 Hz, one minute
                                 AC/DC 24 V: 510 V/50 Hz, one minute
between power and housing: AC 100～240 V: 2.3 kV/50 Hz, one minute
                               AC/DC 24 V: 510 V/50 Hz, one minute
Input current circuit – input current circuit and housing: 500 V/50 Hz, one minute
Electrical isolation between analog inputs: Less than AC 30 V
                                                Less than DC 50 V

Data backup:
• External memory
  Compact Flash (CF) card: max. 4GB,
                  Recommended media: VGRP-M02, 256 MB (industrial grade)
• Internal memory
  Internal memory size: 256 MB
  Set data and clock protection by lithium battery
  Life of lithium battery: approx. 10 years (at ambient temperature 15-25 °C)

Electrical connection:
• Power supply and relay output
  Phoenix type: Pitch: 5.08 mm、
                      Max. conductor sectional area: 2.5 mm^2 or 1.5
  mm$^2 \times 2$ pieces
                      Bare part length: 7 mm
• Analog inputs   and binary inputs/outputs
  Phoenix type: Pitch: 3.81 mm、
                      Max. conductor sectional area: 1.5 mm^2
                      Bare part length: 7 mm

Electrical safety:	EN61010-1 [Overvoltage category II, pollution degree 2]
	Protection class I: PE terminal
Ambient temperature:	0 to 50 °C
Effect by ambient temperature:	0.03 %/°C
Storage temperature:	−20 to +60 °C
Ambient humidity:	Les than 75% (without dews)
EMC directives:	EN61326: Class A (industrial use)
UL/CSA standards:	Certification No. (UL File No.): E312536
	Category: UL 61010B-1, CAN/CSA C22.2 No.1010.1-92

9.8 Mounting and Structure

Mounting:	Panel mounting type
Materials:	Case front: zinc diecast
	Case: Stainless steel
Front bezel size:	144 mm × 144 mm
Depth behind panel:	192 mm (including Phoenix terminals)
Panel cutout size:	$138^{+1.0}$ mm × $138^{+1.0}$ mm
Panel thickness:	2∼40 mm
Mounting angle:	No restriction
	View angle as follows:
	Horizontal: ±65°
	Vertical: +40° to −65°
Dust- and water protection:	EN60529 category 2
	Front: IP65
	Rear: IP20
Weight:	approx.3.5 kg

10. FAQ (Frequently Asked Questions)

This chapter describes frequently asked questions and answers.

📖　　Some answers may be given briefly. For further details, please contact RKC.

10.1 List of Questions

■ Memory related questions (P. 108)

- How is the data stored inside VGR-A100?
- What happens if the internal memory is full?
- Can the CompactFlash card (herein after just called "CF card") be left in the slot?
- Can I use a CF card bought from a shop?
- Can I use a USB flash memory (herein after just called "USB memory") bought from a shop?
- I know I have to log in the recorder to write the data into the CF card, but I do not want people to adjust settings. What can I do?

■ Recording related questions (P. 110)

- Can I use the recorded data in Excel?
- Can I see the data at a remote location while the VGR-A100 is installed on a machine.
- Can I add the data from temperature controllers already installed?
- There is no start/stop button for recording. Can I start/stop the recording?
- I have inputs that should be recorded at fast sampling rate and other inputs that can be stored at slower rate. If I record all inputs at fast rate, the memory will be full soon. Do you have any suggestions?
- The channel name of the VGR-A100 is "analog input 01". Can I change the name?
- I tried to change the name, but characters I need are not in the list.

■ Questions on functions, etc (P. 113)

- Does VGR-A10 0have any safety standards?
- I do not understand how to use counters/integrators.
- Can I see counted values only on the counter screen? Can I draw the graph on the same screen with other analog inputs?
- What is the report function?
- What is batch function?
- Can I provide plural alarm OR output from the standard relay?
- How can I use a barcode reader?
- I have changed settings many times during the test operations and many historical data of changes were created inside the recorder. This is a bit mess. Can I clear the precious data?
- I have a new version (USB type) of VGR-A100 and an old version (non-USB type) in my factory. Do I have to use two different versions of software on my PC?
- I bought my VGR-A100 with Japanese/English languages. Can I change the language to Japanese and Chinese (simplified)?

■ Before thinking it has a problem (P. 116)

- I have set all analog inputs, but they are not on the display.

- I bought six input type, but the display shows only three.

- The clock needs adjustment (date and/or time).

- I have bought a Japanese version, but the screen is in English.

- The displayed values seemed to be wrong.

- Sometimes I can adjust with a control knob, but some other time I cannot. The control knob is not operative.

- Power is applied to VGR-A100, but nothing is displayed on the screen. It seems that the screen saver is working, but I cannot turn it off with the front control knob.

- I am trying to establish a connection to the VGR-A100 with PSU/Setup software, but I cannot make it.

- I want to connect VGR-A100 to my PC directly over Ethernet. I have set parameters properly, but I cannot make them connected.

- I use external binary signal to switch operation modes (standard to event mode), but when the binary signal is given, the operation results in unexpected way.

- I can see the data on the screen of VGR-A100, but I cannot see any data on PCA3000/Evaluation software.

- I want to copy data files of VGR-A100 manually, but I have no ideas about file extensions.

- I have copied the data into a USB memory from the VGR-A100. Can I directly open the file with some kinds of software?

- I tried to see the data with PCA3000 evaluation software, but I cannot find the archive. I am sure I made it before.

- I am using nine (9) analog inputs. Currently they are displayed on two screens (six and three) in two different groups. Can I see them all on the same screen of VGR-A100?

- I have made a process image on my PC, but some characters (texts) are not displayed on the VGR-A100.

10.2 Questions and Answers

■ Memory related questions

● How is the data stored inside VGR-A100?

[Answer]

There is an industrial grade CF card (256MB) inside the VGR-A100 which is called "internal memory". Measured data is saved in this memory via buffers in proprietary binary format. This is to save the space and protect data from manipulation.

● What happens if the internal memory is full?

[Answer]

- After the internal memory is full, data is overwritten from the older one.
- Take out the data regularly with a CF card, a USB memory, or via communication.
  For example, if the internal memory is 80% on the display, after reading out the data with a CF card, the display shows 100% available. The read data is marked as "read out", but it remains in the memory until it is overwritten.
- There is a memory alarm with aVGR-A100, and when the remaining memory capacity reaches 20% (default value), an alarm is generated.

  ☞ See [Device Data] in [Configuration] (P.67).

● Can the CompactFlash card (CF card) be left in the slot?

[Answer]

- There is no need to set a CF card always placed in the slot of VGR-A100 as the recorder has internal 256 MB memory. To prevent data from unauthorized reading, it is recommended to take out the CF card when it is not in use.
- When a CF card is placed in the slot, data is automatically saved every 10 minutes or every 20KB of new data. This feature is not available with the USB memory. The memory manager menu remains on the screen while the USB memory is inserted and other operation is not possible.
- The internal memory size is 256MB, but it is also used for storing programs like a hard disk of a PC. Please calculate that the user area is 200MB for data storage.

● Can I use a CF card bought from a shop?

[Answer]

- You can use up to 4GB of CF cards available at an electrical shop. You can use up to 2GB for the older version without *A code at the end of the model code. However, some CF cards may not be recognized on VGR-A100, especially high speed types for digital cameras. For reliable storage, please use our standard media (VGRP-M02, 256MB, industrial grade).
- Please note that the CF card is solely a media to transfer the data from VGR-A100 to PCA3000 on the PC. It is not a permanent storage media. It is recommended to make regular backups even after the data has been transferred to the PC.

● Can I use a USB flash memory bought from a shop?

[Answer]

- You can use up to 4GB. However, like the case with the CF card, some USB memories may not be properly recognized, especially those with extended features or those not conforming to USB specifications.

- Please consider that the USB memory is just a media to transfer the data to the PC from VGR-A100.

● Can I use the USB memory and the CF card simultaneously?

[Answer]

- You cannot use the USB memory and the CF card simultaneously. Remove one of them. For example, if a USB memory is inserted while the CF card is in the slot, a message as shown right appears. To use a USB memory, remove the CF card first.

- Please remove the USB memory from the recorder after the use as the memory manager menu remains on the screen while the memory is being inserted. Also, it may cause damage to the connector by accidental hit.

- Two USB memory slots are available on VGR-A100, one on the front and one on the back. They are not either accessible simultaneously.
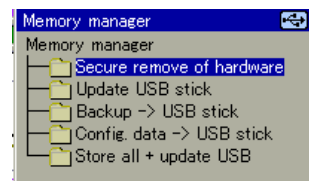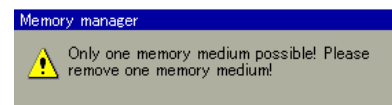
● I know I have to log in the recorder to write the data into the CF card, but I do not want people to adjust settings. What can I do?

[Answer]

- With the PSU/Setup software you can change the right of Master, User with login and User without login. For example, you can setup the access right so that the user without login is allowed to save data into the CF card.

■ Recording related questions

● Can I use the recorded data in Excel?

[Answer]

- The easiest way is to use a clipboard. You can copy the analog data in the PCA3000 and past it into Excel. This may be slower if the data is larger. In such a case it is recommended to use export function into an external file.

    ☞   Refer to the user manual of PCA3000 evaluation software (IMT01G03-E[]).

● Can I see the data at a remote location while the VGR-A100 is installed on a machine?

[Answer]

- Web server function will suit. If you type the IP address of the VGR-A100 in the Internet Explorer, VGR-A100 connected to the network over Ethernet can be monitored. (Ethernet setting is required on VGR-A100).

- In this feature you can see the same image of the VGR-A100 on the PC screen. The operation is similar to that on VGR-A100. A mouse is used instead of a control knob. You need to set up the screen configuration before use.

- Up to four VGR-A100 or four screens from a single VGR-A100 can be viewed. If two Internet Explorers are started, up to eight VGR-A100 can be monitored. (This depends on the performance of the PC and the network).

Field

LAN

VGR-A100

Same screens on the PC with Internet Explorer

- You can also create your own screens in HTML. Sample is included in the PSU/Setup software and the recorder. You need to assign tags for variables. For creation of screens with tags, a skill of Java script is required.
    Tag example: analog input 1 `<rpdv name="169.0.0.0">0</rpdv>`

● Can I add the data from temperature controllers already installed?

[Answer]

- If the controllers are near the VGR-A100, the easiest way is to get parallel connections from the inputs of the controllers. (You need to use compensating cable for thermocouple inputs).

- If controllers are installed away from the recorder and if the controllers are with serial interface, you can connect the controllers to the VGR-A100 via Modbus as <u>external analog inputs</u>. Maximum 24 external analog inputs can be handled on the VGR-A100 in similar ways as analog inputs in addition to the maximum 18 direct analog inputs (total: 42 analog inputs).

Temperature controller

direct inputs

VGR-A100

Ext. analog input

serial I/F

Temperature controllers

over MODBUS (RS-422A, RS-458, Ethernet)

Sensor
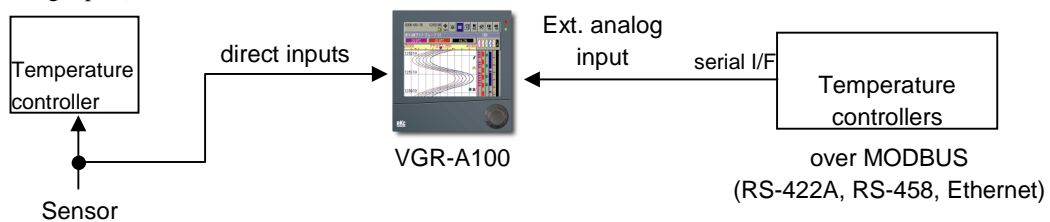
- There is no start/stop button for recording. Can I start/stop the recording?

  [Answer]
  - VGR-A100 has no recording start/stop buttons. However, with binary inputs we can offer similar function. Standard mode should be set to "no recording" and the recording mode at event state (event mode) should be set to "recording". In this case, as long as the event signal is applied, VGR-A100 keeps recording. It is also possible to assign two different recording rate (fast and slow) instead of no recording and recording.
  - Another recording mode can also be used (timed operation mode). For example, storage rate may be slower during night time.
  - You can use these three modes combined; normal speed during operation, slower speed at night, faster speed at event occurrence.

- I have inputs that should be recorded at fast sampling rate and other inputs that can be stored at slower rate. If I record all inputs at fast rate, the memory will be full soon. Do you have any suggestions?

  [Answer]
  - VGR-A100 manages inputs in the unit of [group]. All inputs belong to a group. Storage rate (memory rate) is set at each group independently. So, group 1 may be set for storage rate 1 second and group 2 with a storage rate of 30 seconds.
  - If you have channels not necessary to record, you can make a group with [display] only.
  - You can also specify at each group how the data should be taken in. Standard mode is [average]. Regardless of storage rate data is measured at every 125m and the average value for the storage rate is saved. You can also choose from [current value] (value at the time of storage), [max], [min], and [max][min].
  - The right picture illustrates how inputs are different among Average (green), Current (red) and Max/Min (blue).

  Max (blue)   Average (green)

  Min (blue)   Current (red)
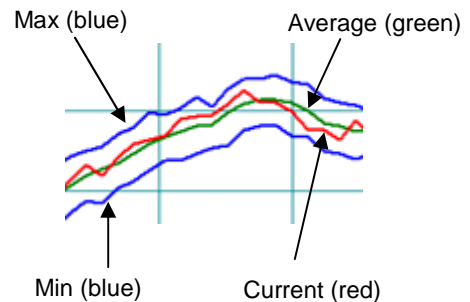
- The channel name of the VGR-A100 is "Input 01". Can I change the name?

  [Answer]
  The name [input01] is a default name and can be freely changed in [Analog inputs] in the [Configuration]. A shorter name (7 characters) is used in many screens, and a longer one (20 characters) is used in case of detailed display.

  [Text image screen]

  Configuration
  [Analog inputs]

  [Text entry field]

- I tried to change the name, but characters I need (e.g.Æ) are not in the list.

  [Answer]

  VGR-A100 uses Unicode. Any language can be entered as long as it can be expressed in Unicode. On the contrary, entering special characters via the virtual keyboard of the VGR-A100 has a physical restriction. Only preset characters can be handled. With the PC (PSU/Setup software), any characters and symbols which can be expressed in Unicode can be entered.
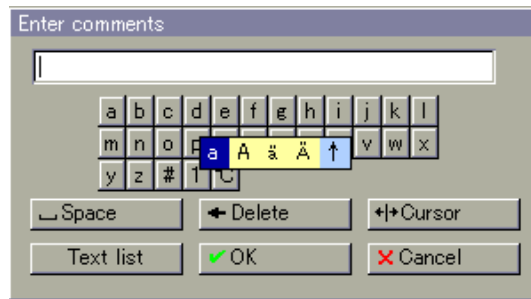
Each key has assigned characters. This depends on the language

■ Questions on functions, etc

● Does VGR-A100 have any safety standards?

[Answer]

• VGR-A100 meets the requirements for the following safety standards. VGR-A100 also comply with RoHS directives.

CE:	Low voltage directive:	EN61010-1 [Overvoltage category II, pollution degree II]
		Protection class I: PE terminal
	EMC directive:	EN61326: Class A (industrial)
UL/CSA:	Certificate No. (UL File No.): E312536	
	Applicable standards:	UL 61010B-1、CAN/CSA C22.2 No.1010.1-92

● I do not understand how to use counters/integrators.

[Answer]

• Counter is a function to count signals from external devices. Alarm can be set to the counter function and signal can be provided when the preset count value is reached.

• You can also set a factor. For example, if you set [6], for each input, counting is done with six count increment. This may be good to count boxes containing six bottles inside.

• If count function is set as time, accumulated time can be measured. For example, operating time may be measured while the binary input is closed.

• For integration, there are two ways; data may be reset when the signal is off, or data is accumulated until it is reset.

● Can I see counted values only on the counter screen? Can I draw the graph on the same screen with other analog inputs?

[Answer]

With the math function (option) you can convert the count value into numeric which can be used for graphs.

● What is the report function?

[Answer]

• The report provides the summary report of the record in the period of day, week, month, year, or for external signals. Maximum, minimum and average values are recorded. Min/Max values as well as average value in the specified time period can be obtained by [external report] which calculates the data while the specified binary signal is valid. The same signal can be used to start/stop a batch.

• Two or more reports can be set; for example, daily report, weekly report, ….and so on.
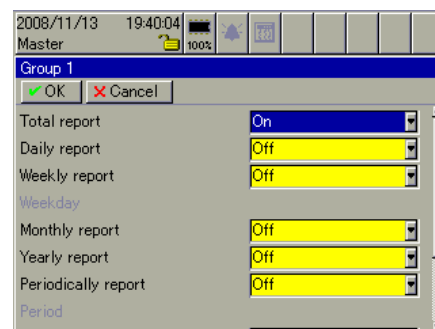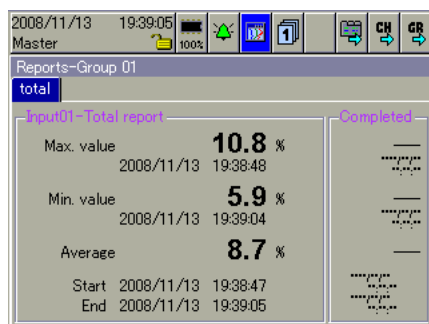
- What is the batch function?

  [Answer]
  - In short, a batch function is the function to store the data with the start/end date and time together with other information..
  - If data is saved as a batch, it is easier to search the necessary data at a later time. You can filter the data using date, keywords, etc.
  - Batch numbers are automatically assigned when a batch is started. You can create your own field (e.g. customer name) for recording.
  - Barcode may be used together for handling batch function. (start, stop, data entry)

- Can I provide plural alarm OR output from the standard relay?

  [Answer]

  If the signal to be assigned to the relay is a group alarm, output can be obtained if any alarm in the group (alarm1or alarm 2) of analog inputs is valid. With logic function (option) you can also define alarms (e.g. alarm 1 + alarm 2 + ….) so that alarm is generated if any one alarm of the group is active.

- How can I use a barcode reader?

  [Answer]
  - A barcode reader may often be used with batch function. For example, batch start/stop as well as data (batch name, materials, etc) can be entered via the barcode reader.
  - The barcode reader used with VGR-A100 must be able to handle code 39 which can only use alphanumerics.

- I have changed settings many times during the test operations and many historical data of changes were created inside the recorder. This is a bit mess. Can I clear the precious data?

  [Answer]
  - To prevent manipulation, the current data (dataset) is closed and no more data can be added to this dataset. If you repeat many parameter changes, many datasets are created in the file. To clear these unnecessary datasets, you can erase the whole data in the memory of VGR-A100 with the PSU/Setup software.
  - It is recommended to make a backup before executing this command.

● I have a new version (USB type) of VGR-A100 and an old version (non-USB type) in my factory. Do I have to use two different versions of software on my PC?

[Answer]

- The newer version (VGR-A100*A with USB) has some newly added features. You need to use the updated software for this version.

	Previous version	Newer version (with USB)
PCA3000 evaluation software	Version 2.xx	Version 3.xx
PCC data transfer software		
PSU/Setup software	Version 1.02	Version 2.xx

- The new software can be also used for VGR-A100 without USB (previous version).

- The setup file made with the previous version will be automatically converted into a new format if the new version (2.0 or later for PSU) is used.

● I bought my VGR-A100 with Japanese/English languages. Can I change the language to Japanese and Chinese (simplified)?

[Answer]

- If you use PSU/Setup software, you can pick up any two languages supplied with the software.
  If you do not have PSU/Setup software, please consult with RKC.

- You can change the language while keeping the recorded data inside, but the current recording data is closed.

- You can also change the language of PSU/Setup software and other software in "default setting".

- Available manuals are either in Japanese or in English regardless of the display language.

■ Before thinking it has a problem

● I have set all analog inputs, but they are not on the display.
[Answer]
Have you set [group(s)] in [Configuration]? VGR-A100 requires analog inputs to be assigned to groups after they have been defined in analog inputs.

● I bought six (6) input type, but the display shows only three (3).
[Answer]
• Check analog inputs 4-6 to see if they are set "valid".
• Have you assigned configured analog inputs to a group?
• Have you assigned analog inputs to a proper configuration group? Not in other group that is not used?

● The clock needs adjustment (date and/or time).
[Answer]
• Have you performed the initial setting? If not, the recorder may use default value).
• In case the data is correct but the time is different, [Daylight saving time] may be valid. Turn it off.

● I have bought an English version, but the screen is in Japanese.
[Answer]
VGR-A100 can store two languages and starts up with the language. Standard setting is Japanese and English.
You can transfer two languages to VGR-A100 with the PSU/setup software. On the standard recorder, Japanese is set to language 1 and English to language 2. Change the language in configuration mode of VGR-A100 or replace the language table using PSU/Setup software.

● The displayed values seem to be wrong.
[Answer]
• Haven't you assigned math result by mistake? The math channel (calculated result) can be assigned in groups, but you need the PSU/Setup software for creation/modification of math channels.
• Isn't the input biased in analog input definition?
• Is the wiring correct? (polarity of thermocouples, wiring terminal numbers)
• Have you assigned a proper input to a proper position?
• Is the scaling for the input proper? (e.g. 0-14 pH, 0-100%, etc. for 0-10V input signal)

● Sometimes I can adjust with a control knob, but some other time I cannot. The control knob is not operative.
[Answer]
Don't you have any binary signal for setting lock? If this signal is valid, control knob is disabled. Release this function or turn off the binary signal.

● Power is applied to VGR-A100, but nothing is displayed on the screen. It seems that the screen saver is working, but I cannot turn it off with the front control knob.

[Answer]

Screen saver (screen protection) may be driven with an external binary signal. Check binary inputs and turn off the input assigned for screen off.

● I am trying to establish a connection to the VGR-A100 with PSU/Setup software, but I cannot make it

[Answer]

- Have you set up the interface (IP address and how to obtain it) prior to the connection? The IP address of VGR-A100 must be done on the recorder. ([Interface] in [Configuration])
- If you have two or more connections (e.g. Ethernet 1, 2 or Ethernet and USB), haven't you tried to connect via a wrong connection?

● I want to connect VGR-A100 to my PC directly over Ethernet. I have set parameters properly, but I cannot make them connected.

[Answer]

If you try to connect VGR-A100 to a PC directly over Ethernet, you have to use a crossover cable or an adaptor. Standard cables used in LAN are straight. Do you use a correct type of cable?

● I use external binary signal to switch operation modes (standard to event mode), but when the binary signal is given, the operation results in unexpected way.

[Answer]

- Haven't you assigned the signal (e.g. DIO 01) somewhere else?
  (For example, it is used for alarm rejection, setting lock, screen off , event operation…. and so on).
- If alarm rejection is used, alarm will not be generated even inside the alarm range while the signal is valid.
- If setting lock is used, no operation is possible from the control knob.
- If screen off (screen saver) function is used, the screen is switched off.
- If event operation is used, operation mode (storage rate, etc) will be changed while the signal is valid.

● I can see the data on the screen of VGR-A100, but I cannot see any data on PCA3000/Evaluation software.

[Answer]

- Is the setting in the group for display/storage? Isn't it set for display only?
- If an archive file is not found, data path setting in the [default setting] may be different and data might have been appended to a different archive. Search files with an extension 177.
- If the storage mode in the basic operation of the standard operation is set to [no record] and the storage mode in the event operation is set to [display/storage], you can take out basic data (name, etc) via communication or external memory devices. However, when you open the file with PCA3000 evaluation software, no data is saved unless the VGR-A100 was in the event mode.

- I want to copy data files of VGR-A100 manually, but I have no ideas about file extensions.
  [Answer]
    - The archive file (data file of PCA3000 evaluation software) has an extension of 177. Other files are also created, but these are index files and temporary files.
    - The PSU/Setup software handles data files with extension of 187. When it is output for the use on the VGR-A100, it has a file name of konf187.set. VGR-A100 will not recognize files other than this. For example, if you save the file with PSU/Setup software as "Test Device A", the saved file is "Test Device A.187". When this is output to a CF card, it is always "konf187.set".

- I have copied the data into a USB memory from the VGR-A100. Can I directly open the file with some kinds of software?
  [Answer]
  The data of VGR-A100 is stored in proprietary binary format and cannot be read with software other than PCA3000 evaluation software. If you want to use the data with other software, please convert the data into a proper format with the PCA3000. Even in this case the original file (archive) is not modified.

- I tried to see the data with PCA3000 evaluation software, but I cannot find the archive. I am sure I made it before.
  [Answer]
  Please check the [data path] in [default setting]. If an archive is created in other locations (e.g. on the desktop), the file may not be found from the software. You can find archive files by file search for extensions "177".In some cases the updated data will be added to this file, and the file in the original path may seem not to be updated. Please return the file into the original path or modify the path. (default setting, data path of PCA3000)

- I am using nine (9) analog inputs. Currently they are displayed on two screens (six and three) in two different groups. Can I have them all on the same screen of VGR-A100?
  [Answer]
  VGR-A100 handles the data by the unit of group. In the standard screen maximum six analog inputs are shown. From the USB type (VGR-A100*A), a process image function is added, and with this feature, you can create your own screen with more analog inputs on the same screen. Sample may be supplied in the recorder. On the PC you can make a PC group more than six channels and create a PC group with inputs from different device groups.

- I have made a process image on my PC, but some characters (texts) are not displayed on the VGR-A100.
  [Answer]
  In the process image, except alphanumeric characters, you can only select the character size of "normal (unicode)". If other modes are specified for Japanese or other 2-byte characters, blank is shown on VGR-A100, although you can see the image on your PC.

10.3 When you contact us

When you contact us, please inform the model code/suffix code, serial number of the recorder which are shown on the name plate on the internal side of the front cover.

If you use software for PC, please supply version of the software and the OS of your PC together with the license number which can be shown in [INFO] on the main menu.

[Name plate example]

VGR SERIES RECORDER	
MODEL	VGR-A106
SUFFIX	A-C4A-NN/JE*A
SUPPLY	100-240V AC
FREQUENCY	50/60Hz
No.	AJW Z00005

CONFORMITY STANDARDS

CE cꓤ𝐍us G

F-Nr.

VARTN 70/00434088	**F-Nr.** 0086418801004460001

RKC INSTRUMENT INC.
MADE IN GERMANY

(on the housing case)

MODEL	VGR-A106
SUFFIX	A-C4A-NN/JE*A
No.	AJW Z00005
VARTN	70/00434088

(on the internal side of front cover)

The large label is on the housing.

The smaller label is inside the front cover.

MODEL: Model name

SUFFIX: Suffix code

SUPPLY: Supply voltage

FREQUENCY: Supply voltage frequency

No.: Recorder No.

CONFORMITY STANDARDS:
  Conformity standards

VARTN: Internal use

F-Nr: Production code and it barcode

It would be quite helpful if we could get the information shown in blue.

📖 Production code (F No.)can also be checked in [device information] in [device menu].

MEMO

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