

# **PAPERLESS RECORDER**

**(color LCD display)**

## **Model: 71VR1**

### **Software Operation**

# **Users Manual**

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# 1. BEFORE USE ....

Thank you for choosing us. Before use, please check contents of the package you received as outlined below.

If you have any problems or questions with the product, please contact our sales office or representatives.

If you intend to use the 71VR1 in the following environments or conditions, redundant and/or failsafe system designs should be used to ensure the proper degree of reliability and safety.

- This product is for use in general industrial environments, therefore may not be suitable for applications which require higher level of safety (e.g. safety or accident prevention systems) or of reliability (e.g. vehicle control or combustion control systems).
- For safety, installation and maintenance of this product must be conducted by qualified personnel.

## ■ PACKAGE INCLUDES:

- Paperless recorder (body + watertight packing).....(1)
- Mounting bracket.....(1) pair
- CJC sensor (for 71VR1-E501-x).....(3)
- Plug conversion adapter.....(1)

## ■ MODEL NO.

Confirm Model No. marking on the product to be exactly what you ordered.

## ■ MEMORY CARD

Prepare the following model numbers:

Available for purchase from us. Consult us.

- Manufacturer: Hagiwara Solutions
  - Model: NSD6-002GT (discontinued)
  - Capacity: 2 GB
- Manufacturer: Hagiwara Solutions
  - Model: NSD6-004GH(A00SDI (discontinued),NSDA-004GT (discontinued), NSDA-004GL (discontinued), NSD6-004GH (B21SEI
  - Capacity: 4 GB
- Manufacturer: Apacer Technology
  - Model: AP-ISD04GIS4B-T (discontinued), AP-ISD04GIS4B-3T
  - Capacity: 4 GB

## ■ APPLICABLE FIRMWARE VERSION

This Users Manual conforms to major version 2, minor version 1.01 or higher of 71VR1-E001 and 71VR1-E101's firmware and major version 2, minor version 1.01 or higher of 71VR1-E501's firmware. In this manual these abbreviations are used, 71VR1-E001 = x001, 71VR1-E101 = x101 and 71VR1-E501 = x501 and descriptions given with the following symbols are applied only to the firmware versions.

SYMBOL	APPLICABLE FIRMWARE VERSION
<b><u>1.4</u></b>	Major version 1, minor version 4.01 or higher
<b><u>1.6</u></b>	Major version 1, minor version 6.01 or higher
<b><u>2.1</u></b>	Major version 2, minor version 1.01 or higher

## 2. POINTS OF CAUTION

### ■ CONFORMITY WITH EU DIRECTIVES

- This equipment is suitable for Pollution Degree 2, Installation Category II (transient voltage 2500V) and Measurement Category II (contact output, transient voltage 2500V). Reinforced insulation (analog input or contact input or contact output or network interface to power to FE: 300V) and basic insulation (analog input each other or contact input or network interface to contact output each other: 300V) are maintained. Prior to installation, check that the insulation class of this unit satisfies the system requirements.
- Altitude up to 2000 meters.
- Do not share the grounding point of PE (Protective Earth) of other devices with FE (Functional Earth). Handle as signal ground.
- The equipment must be installed such that appropriate clearance and creepage distances are maintained to conform to CE requirements. Failure to observe these requirements may invalidate the CE conformance.
- The actual installation environments such as panel configurations, connected devices, connected wires, may affect the protection level of this unit when it is integrated in a panel system. The user may have to review the CE requirements in regard to the whole system and employ additional protective measures\* to ensure the CE conformity.  
\* For example, installation of noise filters and clamp filters for the power source, input and output connected to the unit, etc.
- In order to enable the operator to turn off the power input immediately, install a switch or a circuit breaker according to the relevant requirements in IEC 60947-2 and properly indicate it.

### ■ POWER INPUT RATING & OPERATIONAL RANGE

- Locate the power input rating marked on the product and confirm its operational range as indicated below:  
100 – 240V AC rating: 85 – 264V, 50/60 Hz, approx. 7VA at 100V AC  
approx. 10VA at 240V AC  
24V DC rating: 24V ±10%, approx. 6W  
110V DC rating: 85 – 150V, approx. 6W
- Supplying any level of power other than specified above can damage the 71VR1 or the power source.
- Power supply start-up characteristics must reach within 5 seconds to the operational voltage range of the 71VR1.
- Power cables and signal I/O cables for the 71VR1 must be located separately.
- Power cables, signal I/O cables and communication cables for the 71VR1 should not be bundled together.
- To increase noise resistance of the power input wires, twist the strands before connecting.

### ■ GENERAL PRECAUTIONS

- Before you remove the 71VR1, turn off the power supply and I/O signals for safety.
- Do not disassemble or modify the 71VR1 in any way. Doing so may result in a fire or an electrical shock.
- Do not block the 71VR1's ventilation openings or use it in areas where heat accumulates.  
Additionally, do not store or use it under high-temperature conditions.
- Do not use this 71VR1 in an environment where flammable/corrosive gases are present.
- Do not store or use this 71VR1 in locations subject to direct sunlight, or where excessive dust, dirt or metal particles are present.
- This 71VR1 is a precision instrument. Do not store or use it where large shocks or excessive vibration can occur.
- Do not store or use this 71VR1 in environments subject to chemical evaporation (such as that of organic solvents), or where there are chemicals and/or acids present in the environment.
- Do not use paint thinner or organic solvents to clean this 71VR1.
- Observe the environmental conditions when using this 71VR1.
- Wait at least 15 seconds before turning on the power supply after it was turned off.

### ■ ENVIRONMENT

- Indoor use.
- This 71VR1 is designed to be mounted on a vertical panel. It is not suitable for a slanted or a horizontal panel surface.



- Environmental temperature must be within -5 to +55°C (23 to 131°F) with relative humidity within 30 to 90% RH in order to ensure adequate life span and operation.

#### ■ GROUNDING

- Be sure to determine in advance the most stable grounding point in the environment and earth the 71VR1's FE terminal and that of connected devices to it in order to protect the devices from dielectric breakdown.
- Grounding is also effective to eliminate noise that could cause errors in the 71VR1's operation.

#### ■ MEMORY CARD

- Do not turn off the power supply to the 71VR1 or reset it during data recording or alarm history recording. The memory card may be destroyed. (Refer to section "18.3.7 REMOVE MEMORY CARD")
- Observe the described procedure when you need to replace the memory card during recording.
- Confirm the sides and the connector position of the memory card when inserting one to the card slot.
- Do not touch the metal terminal with your hands or metallic tools.
- Memory cards have a life span. Back up your important data.

#### ■ LCD PANEL

- The LCD panel's liquid contains an irritant. If the panel is damaged and the liquid contacts your skin, rinse immediately the contact area with running water for at least 15 minutes. If the liquid gets in your eyes, rinse immediately your eyes with running water for at least 15 minutes and consult a doctor.
- The following phenomena are LCD characteristics, and NOT a product defect:
  - LCD screen may show uneven brightness depending upon displayed images or contrast settings.
  - The LCD screen pixels may contain minute black-and-white-colored spots.
  - The color displayed on the LCD screen may appear different when seen from outside the specified viewing angle.
  - When the same image is displayed on the screen for a long time period, an afterimage may appear when the image is changed. If this happens, turn off the 71VR1 and wait for a while before restarting it.
- To prevent an afterimage:
  - Set the screensaver when you plan to display the same image for a long time period.
  - Plan to change the screen image periodically so that the same image does not remain for the long time period.

#### ■ MINIMIZING NOISE INTERFERENCE TO ANALOG SIGNAL CABLES

- Noise entering through the analog signal cables may cause irregular measurement values, degradation of overall accuracy, and malfunction of the product. We recommend that you would conduct wiring to the 71VR1 with the following points of caution.
- Do not install cables close to noise sources (high frequency line, etc.).
- Do not bind the analog input cables together with those in which noises are present. Do not install them in the same duct.

#### ■ DO NOT APPLY OVERRANGE INPUT

- Do not apply voltages exceeding  $\pm 15V$  to terminals V – COM, A – C and B – C to prevent damage. Do not apply currents exceeding  $\pm 30mA$  to terminals I – COM and B – C to prevent damage.

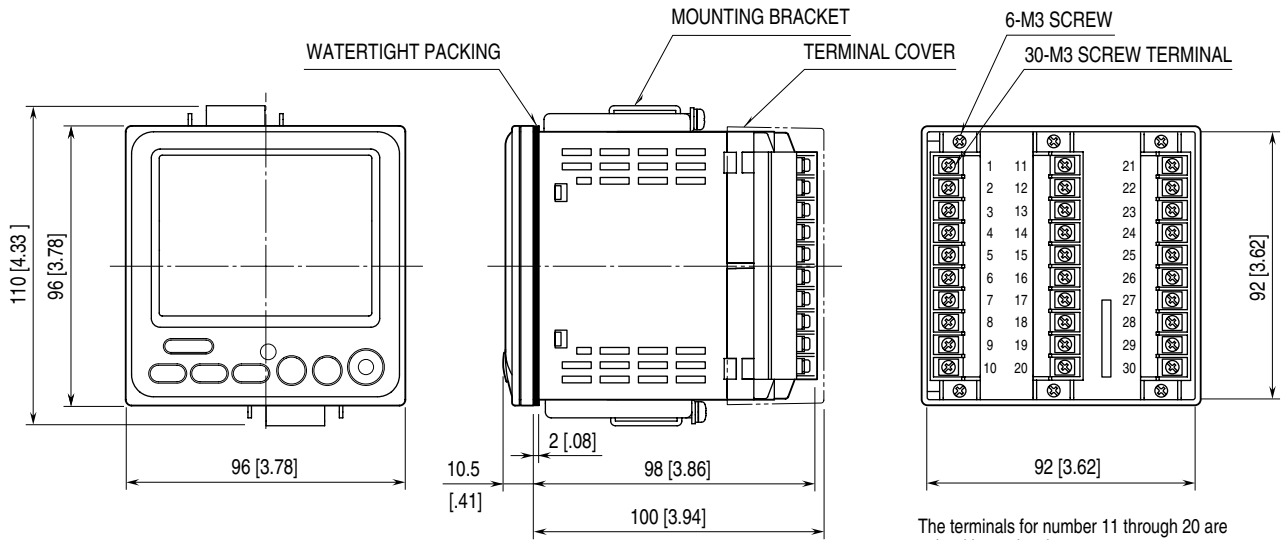
#### ■ INTERNAL CLOCK

- The internal clock data is stored in memory powered by a backup battery while the 71VR1 is without external power supply.
- The data will be reset to its default status when the battery is used up while the 71VR1 is left without power supply for a long time period. The clock adjustment will be necessary once the power is restored.
- Once the power is restored, the 71VR1 starts recharging the battery. It will be full in approximately in 36 to 48 hours.
- Battery backup: approx. one month

#### ■ AND ....

- We recommend use of an UPS to supply power backups.
- The 71VR1 is designed to function as soon as power is supplied, however, a warm up for 10 minutes is required for satisfying complete performance described in the data sheet.

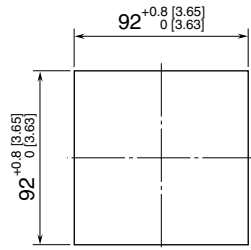
### 3. EXTERNAL DIMENSIONS unit: mm [inch]



## 4. INSTALLATION

### ■ MOUNTING REQUIREMENTS

- PANEL CUTOUT unit: mm [inch]



Usable panel thickness: 0.5 – 10 mm [0.02 to 0.39 inch]

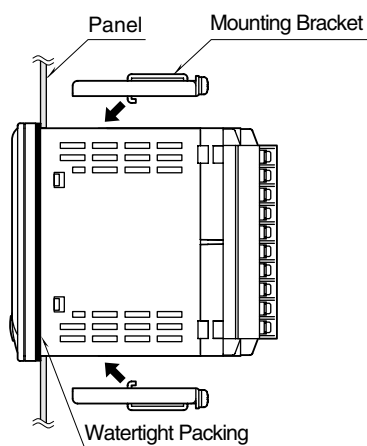
### ■ CAUTION

- Degree of protection, IP65 is applicable to the front panel of the recorder with single mounting according to the specified panel cutout. Not applicable in case of re-mounting. After installation ensure waterproof of the mounting.
- Install the recorder to vertical panel so that its function buttons are at the bottom side. Installing by other direction will cause degradation of life span or performance due to rise of the internal temperature.
- Ensure that there is sufficient space for ventilation inside a panel. Do not install above the devices that generate high heat such as heaters, transformers or resistors. Observe at the minimum of 30 mm [1.2"] in all directions for maintenance purpose.

### ■ HOW TO MOUNT THE RECORDER ON A PANEL

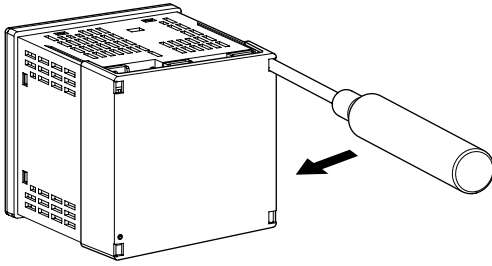
- 1) Remove the mounting brackets.
- 2) Remove the terminal cover and insert it into the panel cutout prior to insertion of the recorder.
- 3) Insert the recorder into the panel cutout. The watertight packing must be in place to conform degree of protection, IP65. Do not remove it.
- 4) Hang the hooks of the mounting brackets at the square holes on the upper and bottom side of the recorder. Tighten screws of the brackets until the recorder is fixed to the panel.

(torque 0.5 N·m)



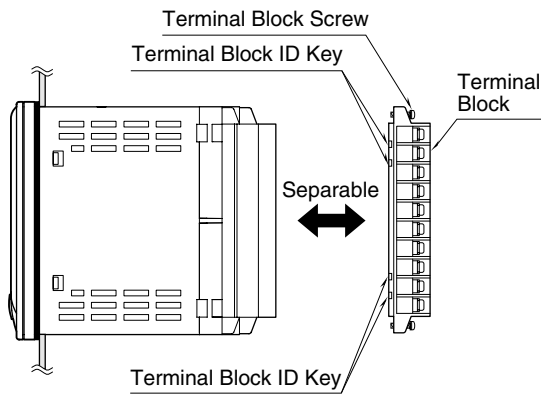
### ■ HOW TO REMOVE THE TERMINAL COVER

Insert the minus tip of a screwdriver into each hole at the four corners of the cover and pull it to the direction as indicated below to separate the terminal cover.



### ■ HOW TO REMOVE THE TERMINAL BLOCK

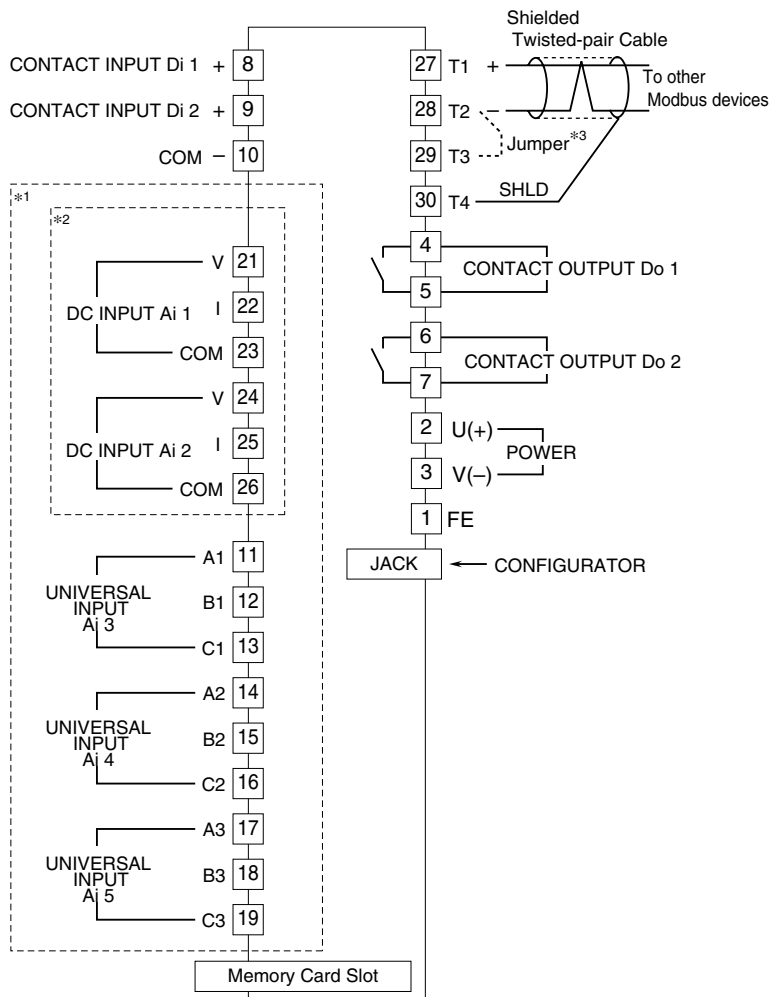
- The terminal block is separable in two pieces. Loosen two screws on top and bottom of the terminal block to separate.
- Be sure to turn off the power supply, input/output signal and communication signal before separating the terminal block.
- Each terminal block has ID keys so that it can be inserted to applicable terminal socket only.



## 5. TERMINAL CONNECTIONS

Note: In order to improve EMC performance, bond the FE terminal to ground.

Caution: FE terminal is NOT a protective conductor terminal.



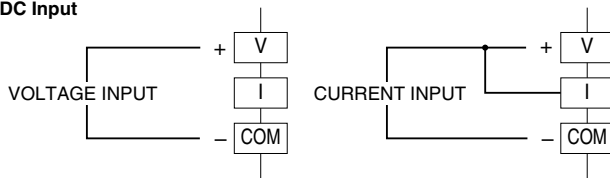
\*1. Only with 5-points input

\*2. Only with 2-points DC input

\*3. When the device is located at the end of a transmission line via twisted-pair cable, (when there is no cross-wiring), close across the terminals T2 – T3 with a leadwire.

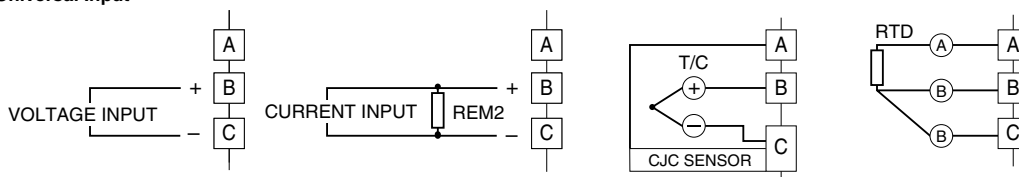
### ■ Input Connection e.g.

#### • DC Input



Note: Short across the terminals V and I for Current Input.

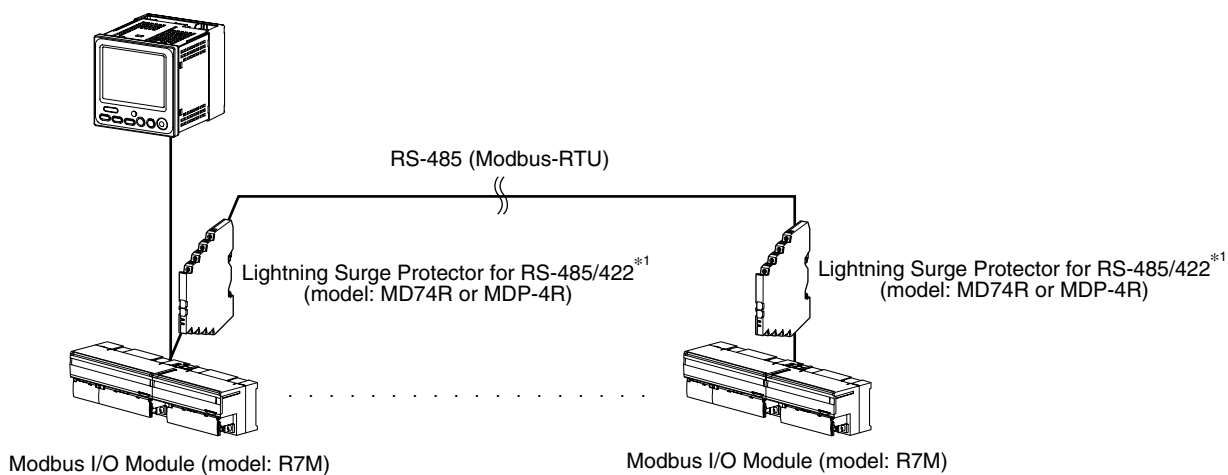
#### • Universal Input



Note: For mA input, a REM2 is required.

## 6. SYSTEM CONFIGURATION EXAMPLE

Paperless Recorder (model: 71VR1)



\*1. Insert lightning surge protectors recommended in this example if necessary.

## 7. CABLE WIRING

### 7.1 WIRING

- Power supply

Confirm the power input rating marked on the product.

- 1) Remove the terminal cover.
- 2) Loosen three screws on the power supply terminals.
- 3) Connect the power cables and the earth cable to the power supply terminals.
- 4) Replace the terminal cover.

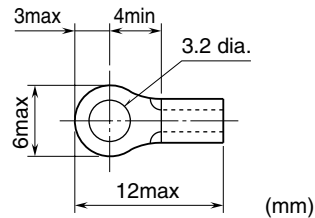
- Input/Output

Follow the procedure shown below when a DC signal is connected to DC Input Ai 1. For other input/output connections, similar procedure should be followed.

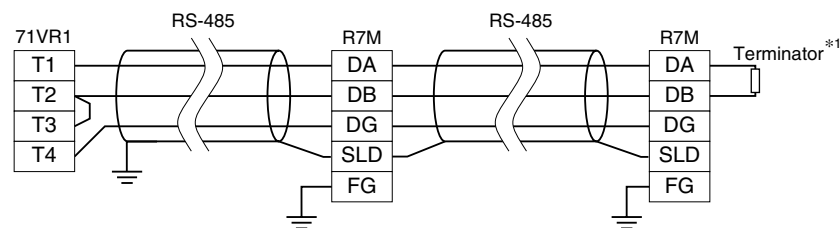
- 1) Turn the power off.
- 2) Remove the terminal cover.
- 3) Connect the (+) side of a signal source to V (21), connect the (-) side to COM (23).
- 4) Replace the terminal cover.

Please choose appropriate solderless terminals for the input/output terminals and the power terminals, referring to the figure shown below. Appropriate tightening torque is 0.5 N·m.

- Terminal block: M3 screw terminal connection
- Screw terminal material: Nickel plated steel
- Appropriate wire size: 0.3 to 0.75 mm<sup>2</sup>



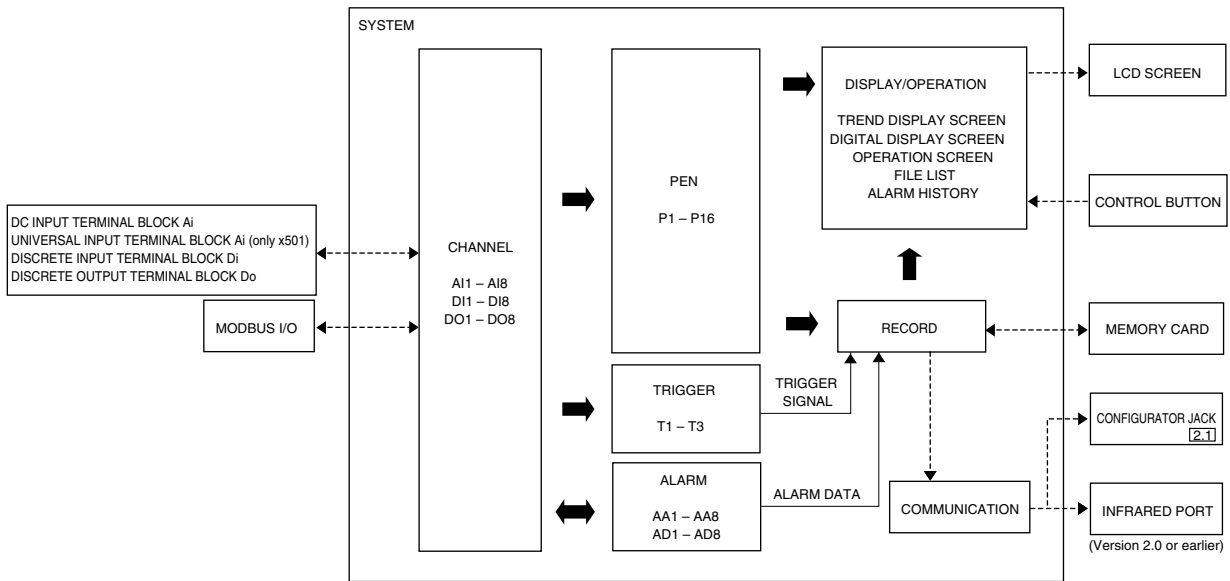
### 7.2 COMMUNICATION CABLE CONNECTIONS



\*1. Use a terminating resistor when the device is at the extreme end of a transmission line.

## 8. SCHEMATIC CIRCUITRY

The following diagram shows the internal function block of the 71VR1. As each setting is based on the block unit, the setting menu is very simple and easy to understand.





## 9. SYSTEM

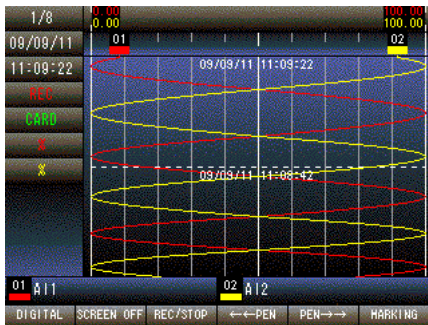
### 9.1 DESCRIPTION

The specific settings for the device are made in the SYSTEM block. There are following settings. Please go through these settings before other settings.

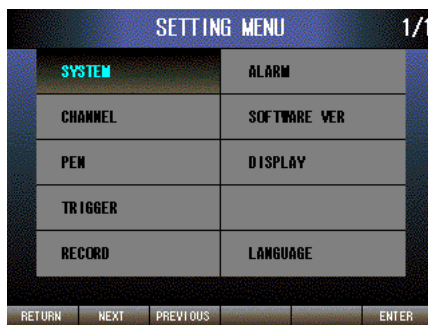
### 9.2 SYSTEM SETTING

#### 9.2.1 DEVICE

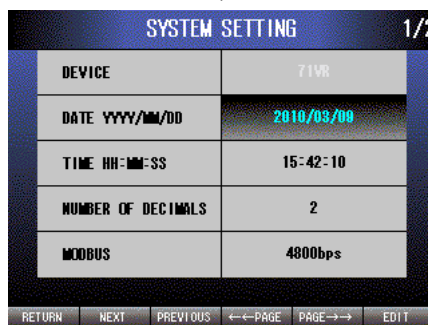
Use the 71VRCFG to set DEVICE name of the 71VR1 within 16 characters. Using the buttons on the 71VR1 can display DEVICE name you set, but can not edit DEVICE name.



Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



SYSTEM is selected. Press [ENTER] (F6) button to display SYSTEM SETTING menu.



The DEVICE name which was set by using the 71VRCFG is displayed on the item of DEVICE.

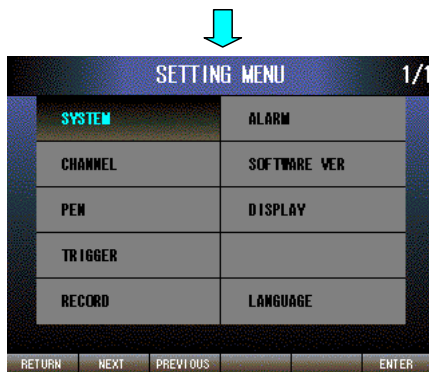
DEVICE name can not be edited on the 71VR1.

## 9.2.2 DATE

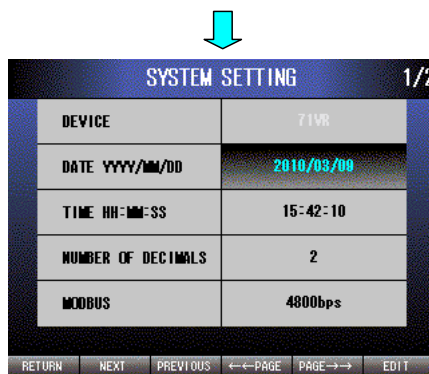
A battery backup clock is built in the 71VR1. Set the clock's date (year, month, day).



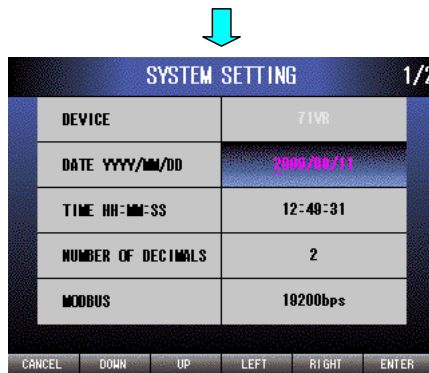
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



SYSTEM is selected. Press [ENTER] (F6) button to display SYSTEM SETTING menu.



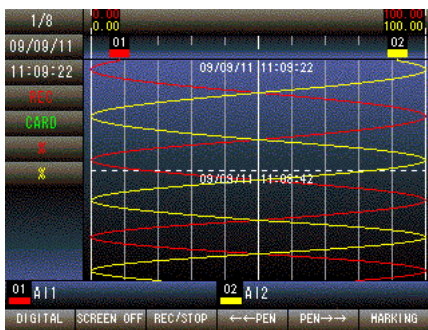
DATE is selected. Press [EDIT] (F6) button to enable editing. The text color changes to magenta.



Press [LEFT] (F4) button to move the cursor to the left digit.  
 Press [RIGHT] (F5) button to move the cursor to the right digit.  
 Press [DOWN] (F2) button to decrease the value of the selected digit.  
 Press [UP] (F3) button to increase the value of the selected digit.  
 Press [CANCEL] (F1) button to disable editing without saving DATE.  
 Press [ENTER] (F6) button to disable editing with saving DATE.

### 9.2.3 TIME

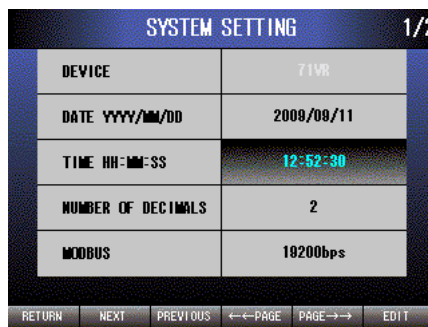
A battery backup clock is built in the 71VR1. Set the clock's time (hour, minute, second).



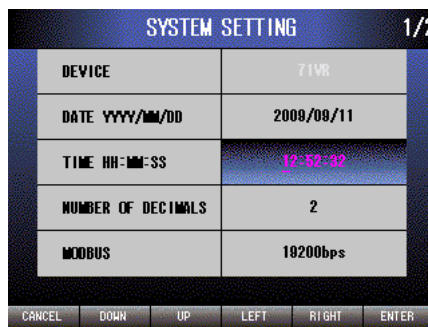
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



SYSTEM is selected. Press [ENTER] (F6) button to display SYSTEM SETTING menu.



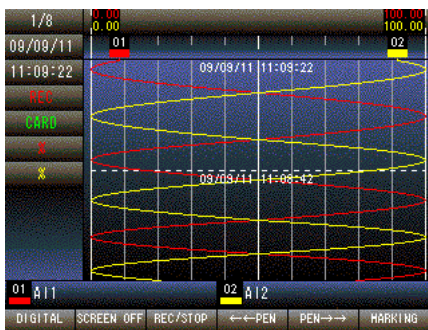
Press [NEXT] (F2) button to select TIME. Press [EDIT] (F6) button to enable editing. The text color changes to magenta.



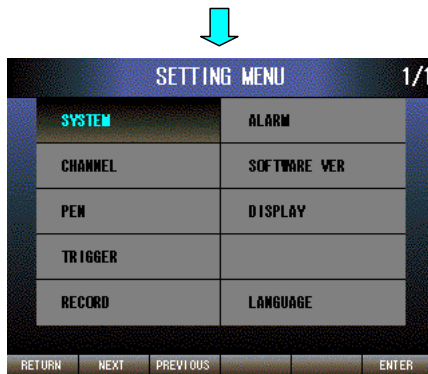
Press [LEFT] (F4) button to move the cursor to the left digit.  
 Press [RIGHT] (F5) button to move the cursor to the right digit.  
 Press [DOWN] (F2) button to decrease the value of the selected digit.  
 Press [UP] (F3) button to increase the value of the selected digit.  
 Press [CANCEL] (F1) button to disable editing without saving TIME.  
 Press [ENTER] (F6) button to disable editing with saving TIME.

## 9.2.4 NUMBER OF DECIMALS (0 – 3)

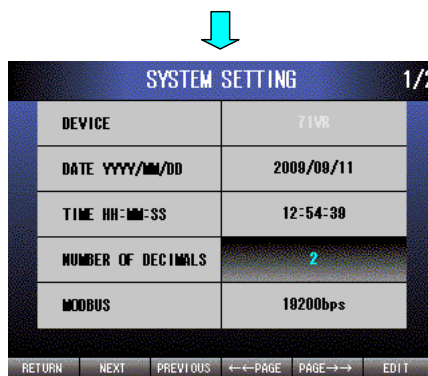
Set the decimal places for the number displayed in the DIGITAL display screen.



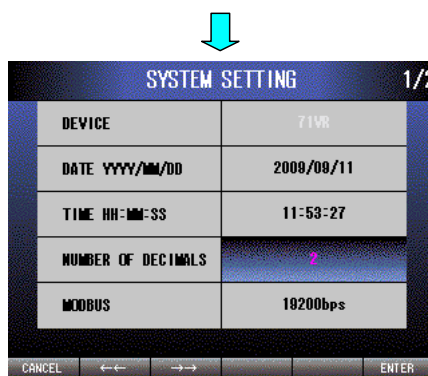
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



SYSTEM is selected. Press [ENTER] (F6) button to display SYSTEM SETTING menu.



Press [NEXT] (F2) button to select NUMBER OF DECIMALS. Press [EDIT] (F6) button to enable editing. The text color changes to magenta.



Press [←←] (F2) button to set 3 → 2 → 1 → 0.

Press [→→] (F3) button to set 0 → 1 → 2 → 3.

Press [CANCEL] (F1) button to disable editing without saving NUMBER OF DECIMALS.

Press [ENTER] (F6) button to disable editing with saving NUMBER OF DECIMALS.

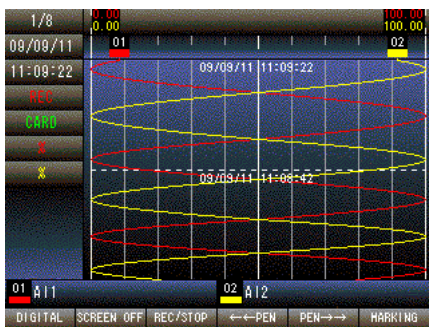
### NOTE

In case of x501, when the number of decimal places is set to 2 or 3, the value not more than the number of significant digits for T/C or RTD is displayed as "0." The number of significant digits for T/C or RTD is one decimal place when temperature unit is Celsius or Kelvin, integral number when temperature unit is Fahrenheit.

SENSOR TYPE	NUMBER OF DECIMALS	TEMPERATURE UNIT	ENGINEERING UNIT VALUE	DISPLAY VALUE
T/C (K)	2	Celsius	10.5	10.50
T/C (K)	3	Fahrenheit	51	51.000

### 9.2.5 MODBUS (Baud rate: 4800bps/9600bps/19200bps/38400bps)

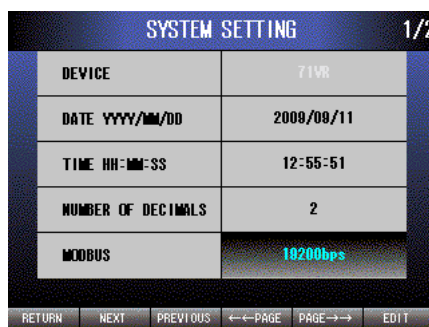
Set the baud rate for MODBUS communication.



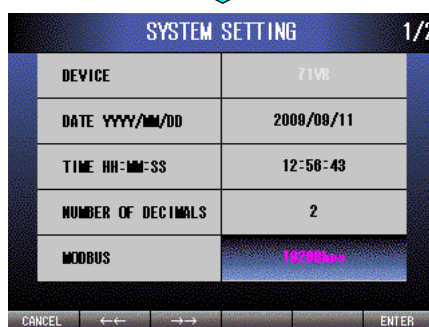
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



SYSTEM is selected. Press [ENTER] (F6) button to display SYSTEM SETTING menu.



Press [NEXT] (F2) button to select MODBUS. Press [EDIT] (F6) button to enable editing. The text color changes to magenta.



Press [←←] (F2) button to set 38400bps → 19200bps → 9600bps → 4800bps.

Press [→→] (F3) button to set 4800bps → 9600bps → 19200bps → 38400bps.

Press [CANCEL] (F1) button to disable editing without saving MODBUS.

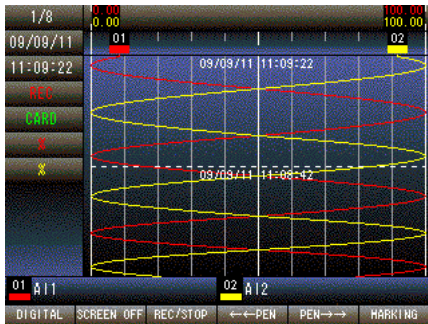
Press [ENTER] (F6) button to disable editing with saving MODBUS.

## 9.2.6 TEMPERATURE UNIT (Celsius / Fahrenheit / Kelvin, Only x501)

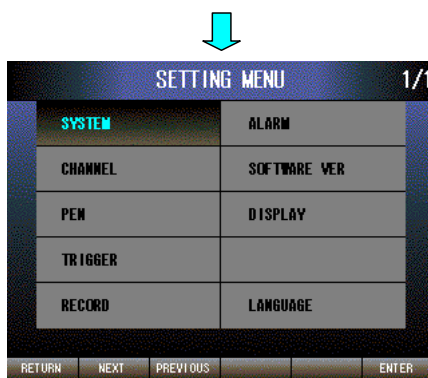
Select a temperature unit for the device. Data setting and display will be based on the selected temperature unit when ANALOG INPUT CHANNEL (Ai3 – Ai5) is defined as T/C or RTD.

### NOTE

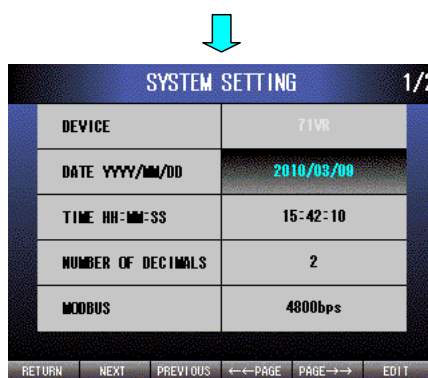
Changing the temperature unit impacts ZERO/SPAN adjustment of the channel which is used for T/C or RTD, therefore make sure that the TEMPERATURE UNIT is correct.



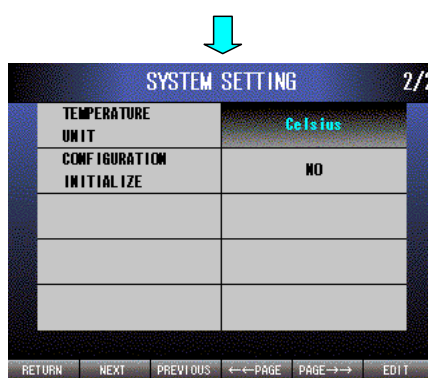
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



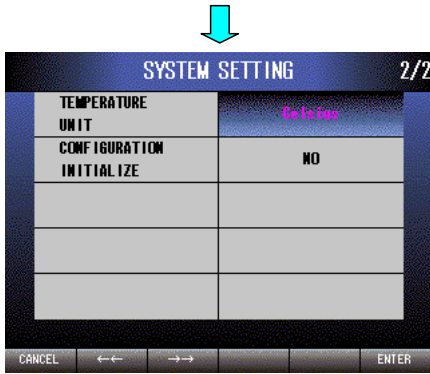
SYSTEM is selected. Press [ENTER] (F6) button to display SYSTEM SETTING menu.



Press [PAGE →] (F5) button.



TEMPERATURE UNIT is selected. Press [EDIT] (F6) button to enable editing. The text color changes to magenta.



Press [←←] (F2) button to set Kelvin → Fahrenheit → Celsius.

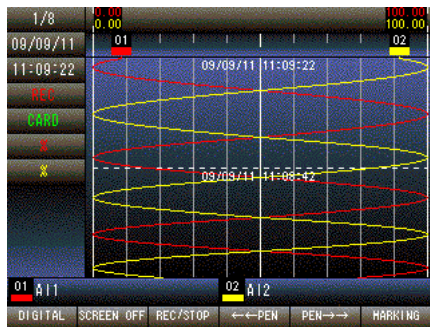
Press [→→] (F3) button to set Celsius → Fahrenheit → Kelvin.

Press [CANCEL] (F1) button to disable editing without saving TEMPERATURE UNIT.

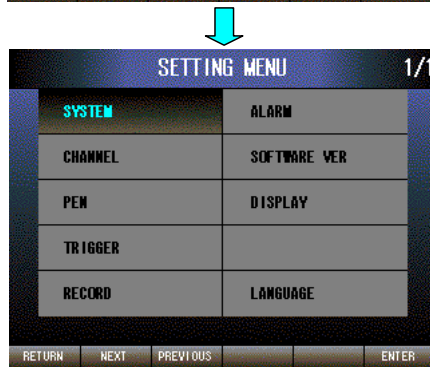
Press [ENTER] (F6) button to disable editing with saving TEMPERATURE UNIT.

## 9.2.7 CONFIGURATION INITIALIZE

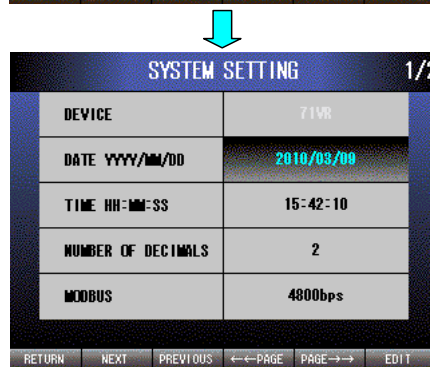
The setting data can be initialized to the factory setting.



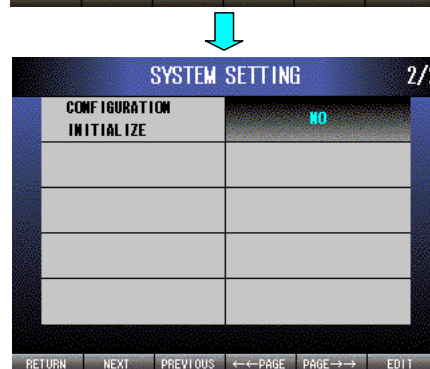
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



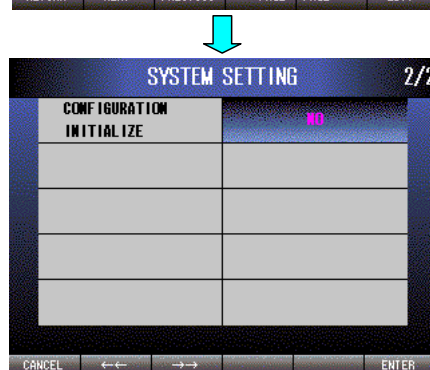
SYSTEM is selected. Press [ENTER] (F6) button to display SYSTEM SETTING menu.



Press [PAGE →→] (F5) button.



CONFIGURATION INITIALIZE is selected. Press [EDIT] (F6) button to enable editing. The text color changes to magenta.



Press [←←] (F2) button to set NO → YES.

Press [→→] (F3) button to set YES → NO.

Press [CANCEL] (F1) button to disable editing without saving CONFIGURATION INITIALIZE.

Press [ENTER] (F6) button to disable editing with saving CONFIGURATION INITIALIZE.

### NOTE

These are x001/x101 screens.



# 10. CHANNEL

## 10.1 DESCRIPTION

### 10.1.1 GENERAL DESCRIPTION

After basic setting is complete in SYSTEM block, configure I/O channels.

### 10.1.2 CHANNEL DEFINITION (x001 / x101)

The 71VR1 can handle analog input and discrete I/O data, provided through the built-in terminals of the 71VR1 and through remote I/O via Modbus. All data must be mapped to logical channels (AI, DI and DO) before they can be used on the recorder.

LOGICAL CHANNEL	PARAMETERS
AI1 – AI8	DC input terminal block (Ai1, Ai2) or MODBUS (Node Number, Address) Engineering UNIT value's conversion parameters (Range, Scale) Input adjustment parameters (Zero/Span: only for terminal block)
DI1 – DI8	Discrete input terminal block (Di1, Di2) or MODBUS (Node Number, Address)

### 10.1.3 CHANNEL DEFINITION (x501)

LOGICAL CHANNEL	PARAMETERS
AI1 – AI8	DC input terminal block (Ai1, Ai2) or Universal input terminal block (Ai3, Ai4, Ai5) or MODBUS (Node Number, Address) Engineering UNIT value's conversion parameters (Range, Scale) Input adjustment parameters (Zero/Span: only for terminal block)
DI1 – DI8	Discrete input terminal block (Di1, Di2) or MODBUS (Node Number, Address)
DO1 – DO8	Discrete output terminal block (Do1, Do2) or MODBUS (Node Number, Address)

### 10.1.4 SAMPLE RATE

As the 71VR1 is a digital recorder, analog input signals are needed conversion into digital data at a fixed interval (A/D conversion). The interval is called SAMPLE RATE.

Analog inputs supplied through the built-in terminals (Ai1 and Ai2) are sampled and converted by the 71VR1. Those supplied through remote I/O are already converted into digital data at the field devices. The 71VR1 reads the data from Modbus in the sample rate.

The sampling process runs in the CHANNEL block. The following table shows selectable rates depending on the number of Modbus channels assigned to both inputs and outputs.

	MODBUS CHANNEL NUMBER	AVAILABLE SAMPLE RATE
Sample Rate	0	100ms, 200ms, 500ms, 1s, 2s, 5s, 10s
	1 – 2	200ms, 500ms, 1s, 2s, 5s, 10s
	3 – 5	500ms, 1s, 2s, 5s, 10s
	6 – 10	1s, 2s, 5s, 10s
	11 – 20	2s, 5s, 10s
	21 – 24	5s, 10s, 20s, 30s, 1min, 5min, 10min, 20min, 30min, 1 hour

20 sec. or longer sampling rate is available with firmware of major version 1, minor version 4.01 or higher.

#### NOTE

Discrete outputs are also controlled by the sample rate. The Modbus communication timeout setting for the remote I/O to receive these outputs must be longer than the sample rate.

When sample rate is set longer than 10 seconds, the recording is performed at sample rate. However, detecting of alarm and updating of Trend Display Screen and Digital Display Screen are performed at 10 seconds interval.

## 10.1.5 DC INPUT TERMINAL BLOCK

### 10.1.5.1 TYPE

Set input TYPE for ANALOG INPUT (Ai1, Ai2) from DC input terminal block. Choose proper TYPE based on the signal you want to measure.

TYPE: -10 – 10V / - 5 – 5V / -1 – 1V / -20 – 20mA

### 10.1.5.2 ZERO/SPAN ADJUSTMENT

ZERO/SPAN adjustment for ANALOG INPUT (Ai1, Ai2) from the terminal block is available. ZERO adjustment is equivalent to the offset, SPAN adjustment is equivalent to the gain. SPAN can be adjusted both in positive and negative side individually.

Though ZERO/SPAN adjustment is made before the factory shipment, it is still available for adjustment and revision when you want.

## 10.1.6 UNIVERSAL INPUT TERMINAL BLOCK (x501)

### 10.1.6.1 SENSOR TYPE

Select input TYPE for ANALOG INPUT (Ai3, Ai4 and Ai5) from the universal input terminal block. Make sure the TYPE you selected is fit for the signal you want to measure.

SENSOR TYPE	TYPE
DC	-10 – 10V / -5 – 5V / -1 – 1V / -20 – 20mA
T/C	K / E / J / T / B / R / S / C / N / U / L / P / PR
RTD	Pt 100 (JIS '97, IEC) / Pt 100 (JIS '89) / JPt 100 (JIS '89) / Pt 50 (JIS '81) / Ni 100 / Cu 10 / Cu 50

#### NOTE

When T/C or RTD is selected, Sample Rate should be set to 500ms or more.

### 10.1.6.2 ZERO/SPAN ADJUSTMENT (DC)

When DC is selected, ZERO/SPAN adjustment for ANALOG INPUT (Ai3, Ai4 and Ai5) is available. ZERO adjustment is equivalent to the offset, SPAN adjustment is equivalent to the gain. SPAN can be adjusted both in positive and negative side individually.

Though ZERO/SPAN adjustment is made before the factory shipment, it is still available for adjustment and revision when you want.

### 10.1.6.3 ZERO/SPAN ADJUSTMENT (T/C, RTD)

When T/C or RTD is selected, ZERO/SPAN adjustment for ANALOG INPUT (Ai3, Ai4 and Ai5) is available. ZERO adjustment is equivalent to the offset, SPAN adjustment is equivalent to the gain. SPAN can only be adjusted in positive side.

Though ZERO/SPAN adjustment is made before the factory shipment, it is still available for adjustment and revision when you want.

## 10.1.7 MODBUS

Use MODBUS commands as shown below, a query is sent for each point.

DATA	MODBUS FUNCTION
AI	Read Input Register (04) / Read Holding Register (03) <b>1.4</b>
DI	Read Input Status (02) / Read Coil Status (01) <b>1.4</b>
DO	Force Single Coil (05)

The communication specification of RS-485 is as shown below. Make the setting in the remote I/O side according to the following data.

Baud rate: 4800bps, 9600bps, 19200bps, 38400bps

Parity: Odd

Data: 8 bits

Stop bit: 1 bit

#### NOTE

Only integer data (signed 16 bit data) as the analog data can be processed via MODBUS.

## 10.1.8 ANALOG DATA CONVERSION (x001 / x101)

### 10.1.8.1 ANALOG DATA CONVERSION FROM RANGE TO BIN DATA

The 71VR1-E001 and E101 handles two types of analog data, one from the built-in terminals, another from Modbus network. When analog input signals are provided to the 71VR1 in these varied forms, it converts them to a standard format called BIN data, ranging 0 to 10000.

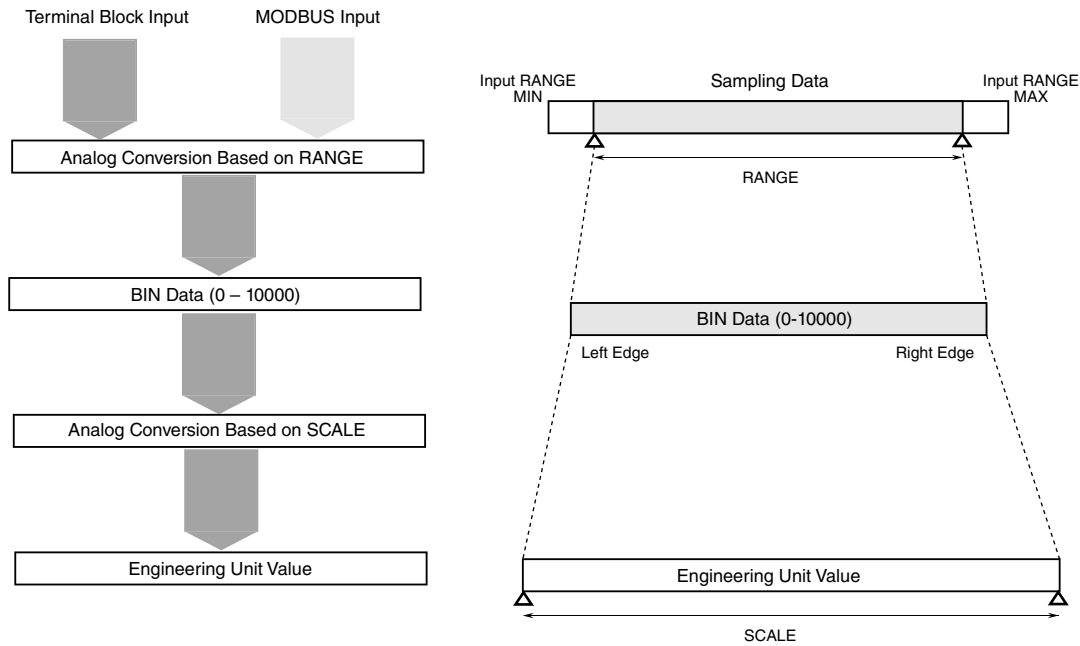
RANGE setting determines the lower and upper limits of input signal converted respectively to 0 and 10000.

On the trend graph screen, 0 and 10000 is respectively shown at the left and right edges of the graph.

### 10.1.8.2 ANALOG DATA CONVERSION FROM BIN DATA TO SCALE

The next step is setting SCALE to convert the BIN data into actual engineering unit values, which are used on the digital display screen.

All settings in the TRIGGER and ALARM blocks are performed in the engineering unit values based on the SCALE range.



DATA TYPE	DETAILS		PURPOSE
Sampling Data	DC input terminal block	Internal A/D converter's value	Internal processing
	MODBUS	Signed 16-bit data which is read out from the slave device.	
BIN Data	Based on the sampling data's RANGE setting, the value within the selected range is converted to the BIN data within 0 – 10000 (valid range: -2000 to 12000). NOTE: When the data exceeds 0 – 10000, it is displayed as MIN or MAX in the TREND graph display.		Internal processing (save, judge, display)
Engineering Unit Value	Based on the sampling data RANGE setting, the selected range value is converted to a primary value, engineering unit value.		DIGITAL display, ALARM setting, TRIGGER setting

#### ● INSTANCE

[Step1]

First, set RANGE to choose a valid range.

Example) When the input signal is -10 – +10V from the terminal block and needs to be full-screen displayed to 0 – 10V, the settings are as follows.

RANGE setting: 0.00 (corresponding to BIN data 0) – 10.00 (corresponding to BIN data 10000)

0V is on the left edge of the screen and 10V is on the right edge of the screen.

[Step2]

Second, set SCALE to choose primary values corresponding to the left edge and the right edge of your display screen.

Example) When you want to set 0[V] → 1[A], 10[V] → 64[A], set the SCALE as follows.

SCALE: 1.000 – 64.000

1[A] is on the left edge, and 64[A] is on the right edge of the screen.

**NOTE**

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Use the 71VRCFG to set the ENGINEERING UNIT.

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### 10.1.9 ANALOG DATA CONVERSION (x501)

x501 can process 3 types of analog data (DC input terminal block, universal input terminal block, MODBUS). The conversion method of DC input terminal block, universal input terminal block (DC) or MODBUS is different from the one of universal input terminal block (T/C, RTD).

#### 10.1.9.1 ANALOG DATA CONVERSION ACCORDING TO THE RANGE (→ BIN data)

In order to absorb the difference among the physical inputs from DC input terminal block, universal input terminal block (DC) and MODBUS, all data is converted to 0 to 10000 which is called BIN data (DC).

In order to convert the sampled raw data (sampling data) to BIN data (DC) correctly, Range setting is required.

MIN corresponds to 0, MAX corresponds to 10000. BIN data (DC) 0 is shown on the left edge, 10000 is shown on the right edge of its TREND graph.

Sampling data is processed as BIN data (Temperature) for universal input terminal block (T/C, RTD). The accuracy of the sampling data is based on TEMPERATURE UNIT.

When TEMPERATURE UNIT is set to Celsius (°C) or Kelvin (K), sampling data is 10 times of input temperature (°C, K).

Example) When input temperature is 27.1°C, sampling data is 271.

When TEMPERATURE UNIT is set to Fahrenheit (°F), sampling data is equal to the input temperature.

Example) When input temperature is 451°F, sampling data is 451.

In the case of universal input terminal block (T/C, RTD), the RANGE setting is only used for the TREND graph's display. MIN of the selected RANGE is shown on the left edge, MAX of the selected RANGE is shown on the right edge.

**NOTE**

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When a burnout occurs, sampling data is 0x7FFF.

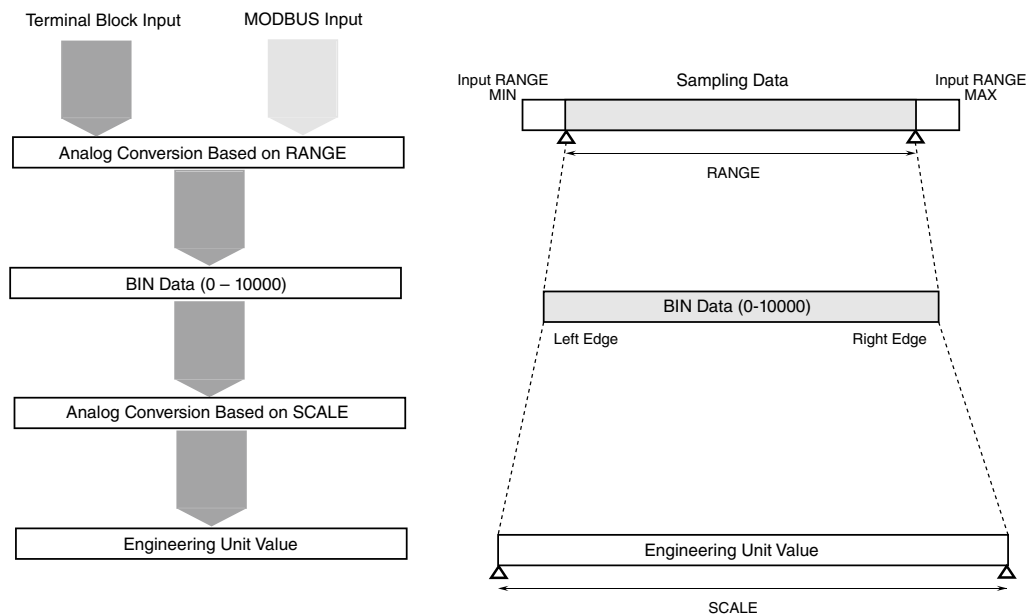
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### 10.1.9.2 ANALOG DATA CONVERSION ACCORDING TO THE SCALE (→ engineering unit value)

Set the SCALE to make the BIN data to the actual data values. SCALE setting is used to convert the BIN data (DC) to the engineering unit values, and indicated in the digital display.

Therefore, in order to display the correct engineering unit values, correct SCALE setting is required.

In TRIGGER block and ALARM block, all settings are based on the engineering unit values.



DATA TYPE	DETAILS		PURPOSE
Sampling Data	DC input terminal block	Internal A/D converter's value	Internal processing
	Universal input terminal block (DC)	Internal D/A converter's value	
	MODBUS	Signed 16-bit data which is read out from the slave device.	
BIN Data (DC)	Based on the sampling data's RANGE setting, the value within the selected range is converted to the BIN data within 0 – 10000 (valid range: -2000 to 12000). NOTE: When the data exceeds 0 – 10000, it is displayed as MIN or MAX in the TREND graph display.		Internal processing (save, judge, display)
Engineering Unit Value	Based on the sampling data RANGE setting, the selected range value is converted to a primary value, engineering unit value.		DIGITAL display, ALARM setting, TRIGGER setting

#### ● INSTANCE

[Step1]

First, set RANGE to choose a valid range.

Example) When the input signal is -10 – +10V from the terminal block and needs to be full-screen displayed to 0 – 10V, the settings are as follows.

RANGE setting: 0.00 (corresponding to BIN data 0) – 10.00 (corresponding to BIN data 10000)

0V is on the left edge of the screen and 10V is on the right edge of the screen.

[Step2]

Second, set SCALE to choose primary values corresponding to the left edge and the right edge of your display screen.

Example) When you want to set 0[V] → 1[A], 10[V] → 64[A], set the SCALE as follows.

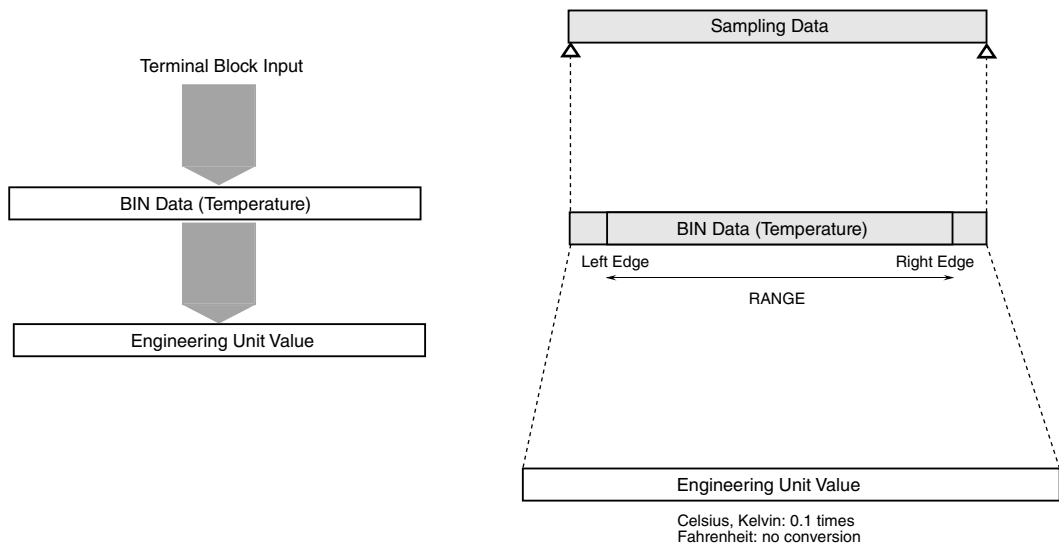
SCALE: 1.000 – 64.000

1[A] is on the left edge, and 64[A] is on the right edge of the screen.

- Use the 71VRCFG to set the ENGINEERING UNIT.

SCALE setting for BIN data (Temperature) is not required as its conversion is not available.

- When a burnout occurs, sampling data is 0x7FFF.



DATA TYPE	DETAILS		PURPOSE
Sampling Data	Universal input terminal block (T/C, RTD)	Celsius, Kelvin: 10 times of input temperature (°C, K) Fahrenheit: input temperature (°F) Burnout: 0x7FFF	Internal processing
BIN Data (Temperature)	Sampling data NOTE: When the data exceeds the selected RANGE, it is displayed as MIN or MAX in the TREND graph display.		Internal processing (save, judge, display)
Engineering Unit Value	[Celsius, Kelvin] 0.1 times of BIN data (temperature) e.g., BIN data (temperature) 271 → engineering unit value 27.1 [Fahrenheit] BIN data (temperature) e.g., BIN data (temperature) 411 → engineering unit value 411 [Burnout] 0x7FFFFFFF NOTE: SCALE conversion of BIN data (temperature) is not available.		DIGITAL display, ALARM setting, TRIGGER setting

### 10.1.9.3 AVAILABLE RANGE

[DC]

DC	MIN	MAX
-10 – 10V	-10.000	10.000
-5 – 5V	-5.000	5.000
-1 – 1V	-1.000	1.000
-20 – 20mA	-20.000	20.000

[T/C]

T/C	TEMPERATURE UNIT : Celsius (°C)	
	MIN	MAX
K	-272.000	1472.000
E	-272.000	1100.000
J	-260.000	1300.000
T	-272.000	500.000
B	24.000	1920.000
R	-100.000	1860.000
S	-100.000	1860.000
C	-52.000	2416.000
N	-272.000	1400.000
U	-252.000	700.000
L	-252.000	1000.000
P	-52.000	1496.000
PR	-52.000	1860.000

[RTD]

RTD	TEMPERATURE UNIT : Celsius (°C)	
	MIN	MAX
Pt 100 (JIS '97, IEC)	-240.000	900.000
Pt 100 (JIS '89)	-240.000	900.000
JPt 100 (JIS '89)	-236.000	560.000
Pt 50 (JIS '81)	-236.000	700.000
Ni 100	-100.000	252.000
Cu 10	-212.000	312.000
Cu 50	-100.000	200.000

#### NOTE

The RANGE of T/C or RTD is based on the TEMPERATURE UNIT.

When temperature is set to Fahrenheit, RANGE value is the same as the temperature. Refer to the equations in the following table.

TEMPERATURE UNIT	EQUATION
Fahrenheit (°F)	$^{\circ}\text{F} = (^{\circ}\text{C} \times (9/5)) + 32$
Kelvin (K)	$\text{K} = ^{\circ}\text{C} + 273.15$

### 10.1.10 ENGINEERING UNIT, TAG NAME

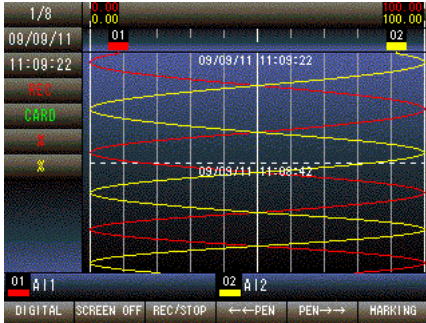
Use the 71VRCFG to set the ENGINEERING UNIT (AI only), TAG NAME (AI, DI) for the defined logical channels.

## 10.2 SETTING

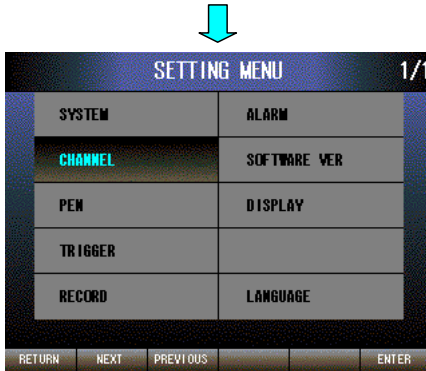
### 10.2.1 OPERATING MODE

#### 10.2.1.1 SAMPLE RATE (100ms/200ms/500ms/1s/2s/5s/10s/20s/30s/1min/5min/10min/20min/30min/1 hour)

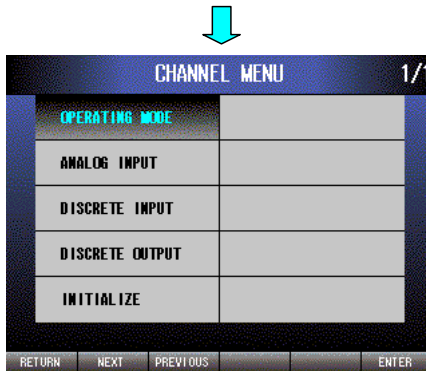
The setting data can be initialized to the factory setting.



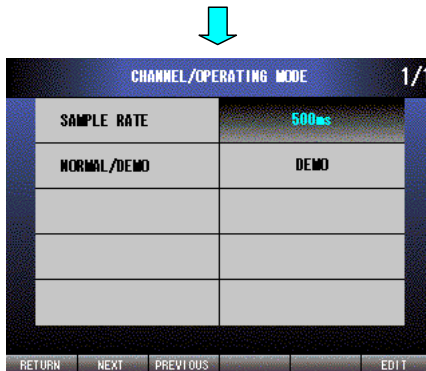
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display CHANNEL MENU.

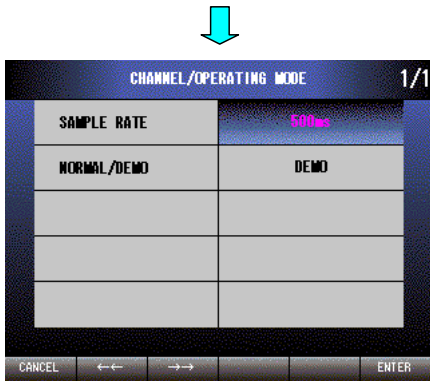


OPERATING MODE is selected. Press [ENTER] (F6) button to display CHANNEL/OPERATING MODE menu.



SAMPLE RATE is selected. Press [EDIT] (F6) button to enable editing. The text color changes to magenta.





Press [←←] (F2) button to set 1 hour → 30min → 20min → 10min → 5min → 1min → 30s → 20s → 10s → 5s → 2s → 1s → 500ms → 200ms → 100ms.

Press [→→] (F3) button to set 100ms → 200ms → 500ms → 1s → 2s → 5s → 10s → 20s → 30s → 1min → 5min → 10min → 20min → 30min → 1 hour.

Press [CANCEL] (F1) button to disable editing without saving SAMPLE RATE.

Press [ENTER] (F6) button to disable editing with saving SAMPLE RATE.

20 sec. or longer sampling rate is available with firmware of major version 1, minor version 4.01 or higher.

#### NOTE

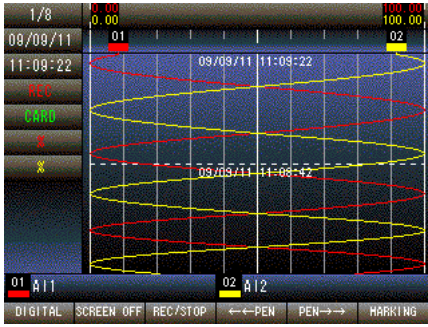
---

In case of x501, when T/C or RTD of universal input terminal block is selected, SAMPLE RATE should be set to 500 ms or more.

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### 10.2.1.2 NORMAL/DEMO (OPERATING MODE)

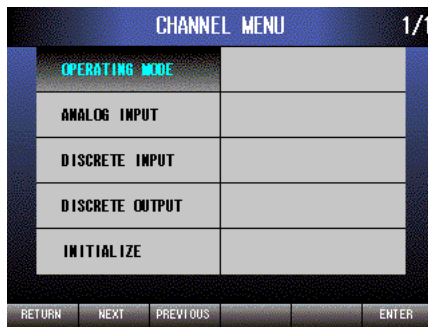
Select OPERATING MODE for normal operating. The graphs can be displayed even in DEMO mode.



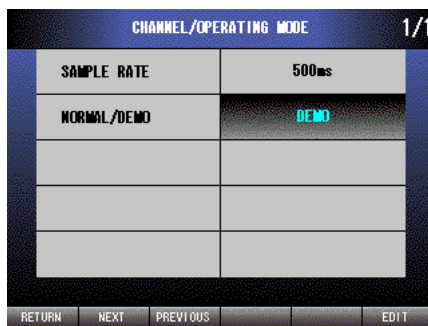
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display the CHANNEL MENU.

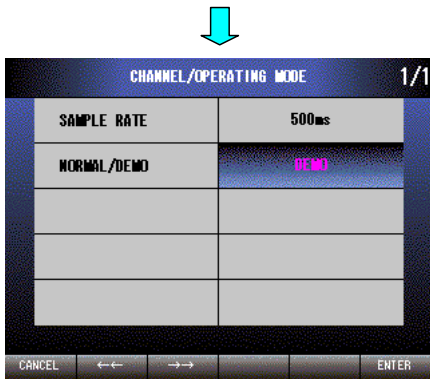


OPERATING MODE is selected. Press [ENTER] (F6) button to display CHANNEL/OPERATING MODE menu.



Press [NEXT] (F2) button to select NORMAL/DEMO. Press [EDIT] (F6) button to enable editing. The text color changes to magenta.





Press [←←] (F2) button to set DEMO → NORMAL.

Press [→→] (F3) button to set NORMAL → DEMO.

Press [CANCEL] (F1) button to disable editing without saving NORMAL/DEMO.

Press [ENTER] (F6) button to disable editing with saving NORMAL/DEMO.

## 10.2.2 ANALOG INPUT (AI1 – AI8)

### 10.2.2.1 FIELD CHANNEL (DC input terminal block / MODBUS, x001/x101)

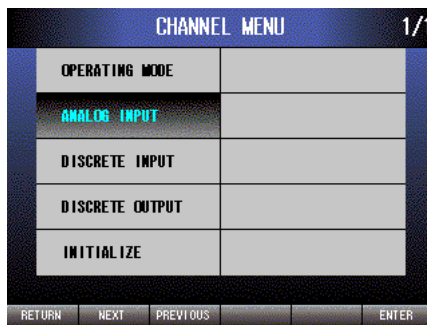
Set FIELD CHANNEL (Terminal block or MODBUS) which is assigned to AI1 – AI8.



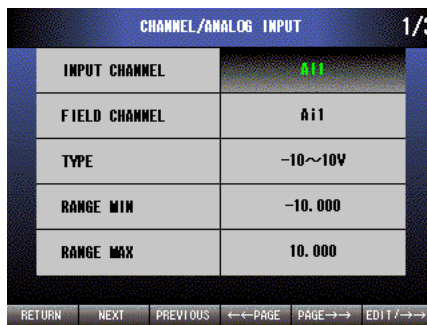
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display CHANNEL MENU.

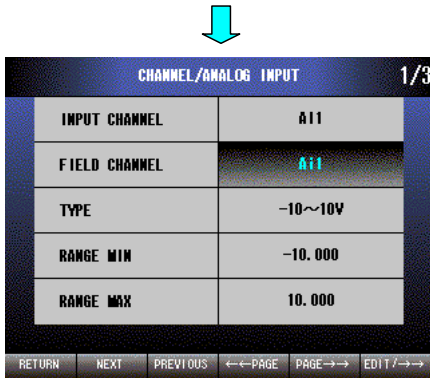


Press [NEXT] (F2) button to select ANALOG INPUT, press [ENTER] (F6) button to display CHANNEL/ANALOG INPUT menu.

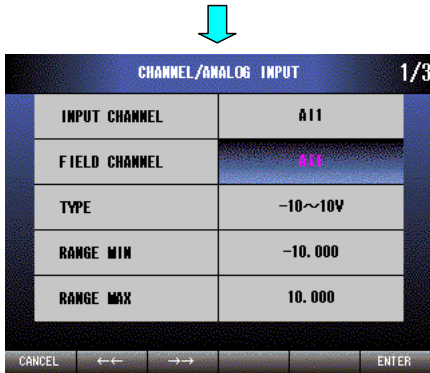


Press [EDIT/→→] (F6) button, choose an INPUT CHANNEL from AI1 to AI8.





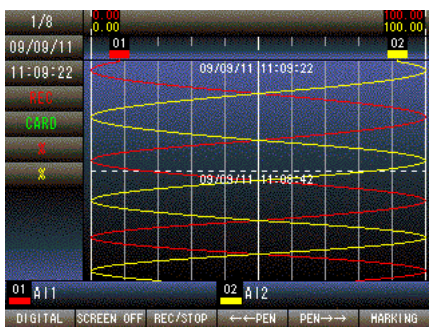
Press [NEXT] (F2) button to select FIELD CHANNEL. Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.



Press [←←] (F2) button to set NONE → MODBUS → Ai2 → Ai1.  
 Press [→→] (F3) button to set Ai1 → Ai2 → MODBUS → NONE.  
 Press [CANCEL] (F1) button to disable editing without saving FIELD CHANNEL.  
 Press [ENTER] (F6) button to disable editing with saving FIELD CHANNEL.

### 10.2.2.2 FIELD CHANNEL (DC input terminal block / universal input terminal block / MODBUS, x501)

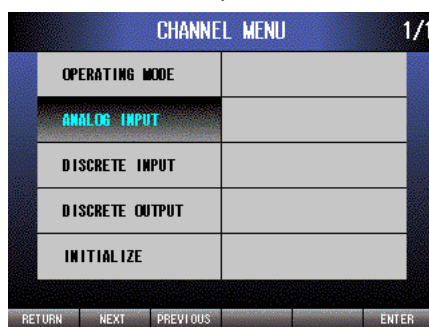
Set FIELD CHANNEL (Terminal block or MODBUS) which is assigned to AI1 – AI8.



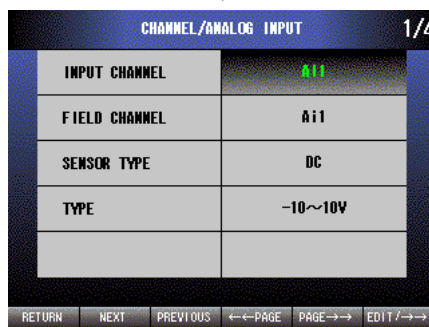
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display CHANNEL MENU.

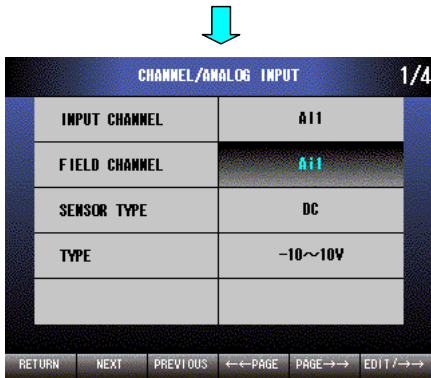


Press [NEXT] (F2) button to select ANALOG INPUT, press [ENTER] (F6) button to display CHANNEL/ANALOG INPUT menu.

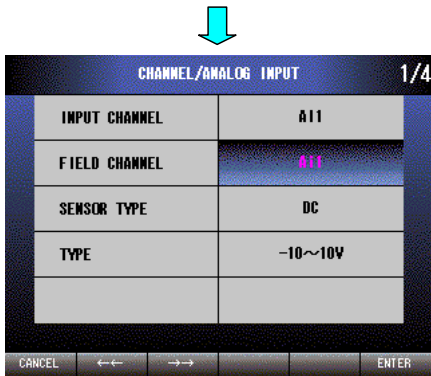


Press [EDIT/→→] (F6) button, choose an INPUT CHANNEL from AI1 to AI8.





Press [NEXT] (F2) button to select FIELD CHANNEL. Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.



Press [←←] (F2) button to set NONE → MODBUS → Ai5 → Ai4 → Ai3 → Ai2 → Ai1.

Press [→→] (F3) button to set Ai1 → Ai2 → Ai3 → Ai4 → Ai5 → MODBUS → NONE.

Press [CANCEL] (F1) button to disable editing without saving FIELD CHANNEL.

Press [ENTER] (F6) button to disable editing with saving FIELD CHANNEL.

### 10.2.2.3 TYPE (DC input terminal block: -10 – 10V / -5 – 5V / -1 – 1V / -20 – 20mA)

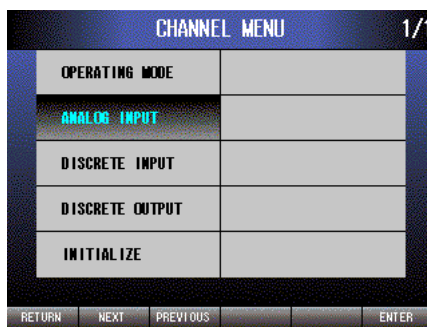
Choose a TYPE when the DC input terminal block (Ai1 or Ai2) is selected as a FIELD CHANNEL.



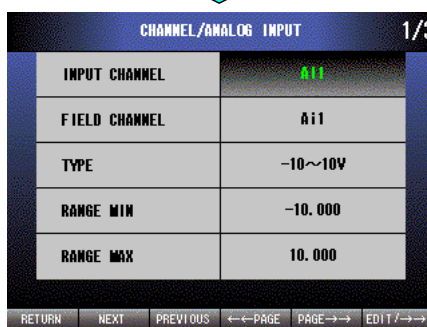
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display CHANNEL MENU.



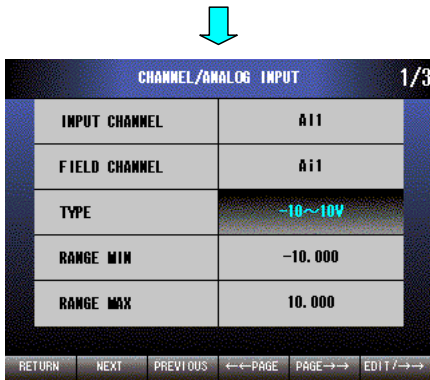
Press [NEXT] (F2) button to select ANALOG INPUT, press [ENTER] (F6) button to display CHANNEL/ANALOG INPUT menu.



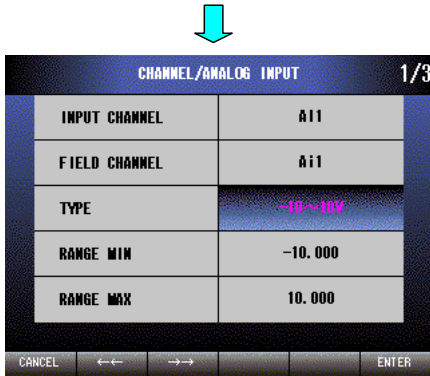
Press [EDIT/→→] (F6) button, choose an INPUT CHANNEL you want to set.







Press [NEXT] (F2) button to select TYPE. Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.



Press [←←] (F2) button to set -5 – 5V → -1 – 1V → -10 – 10V → -20 – 20mA.

Press [→→] (F3) button to set -20 – 20mA → -10 – 10V → -1 – 1V → -5 – 5V.

Press [CANCEL] (F1) button to disable editing without saving TYPE.

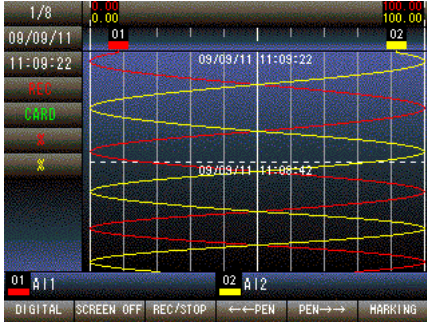
Press [ENTER] (F6) button to disable editing with saving TYPE.

**NOTE**

These are screens of x001/x101.

### 10.2.2.4 SENSOR TYPE (Universal input terminal block, x501)

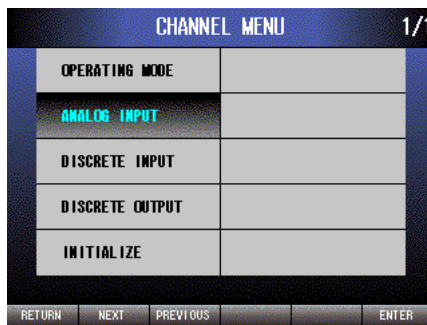
When universal input terminal block (Ai3, Ai4 or Ai5) is selected as FIELD CHANNEL, choose input SENSOR TYPE.



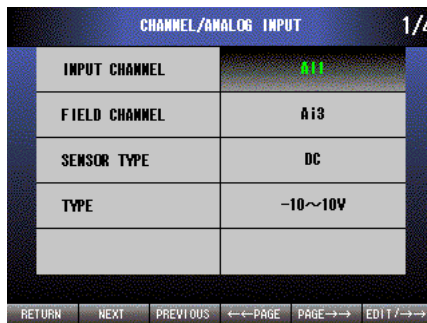
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display CHANNEL MENU.

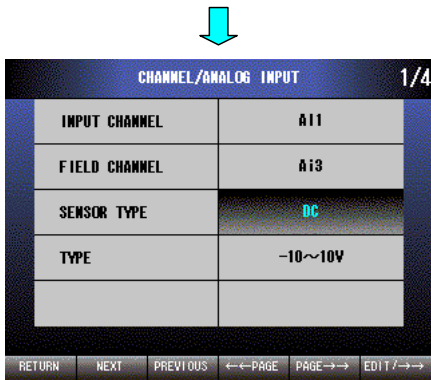


Press [NEXT] (F2) button to select ANALOG INPUT, press [ENTER] (F6) button to display CHANNEL/ANALOG INPUT menu.

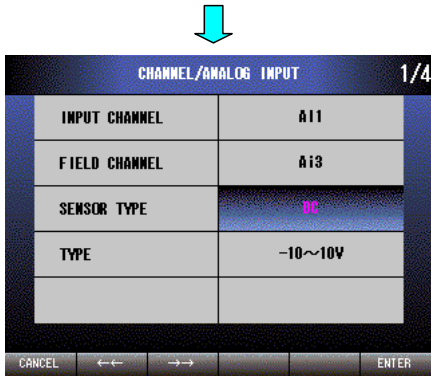


Press [EDIT/→→] (F6) button, choose an INPUT CHANNEL you want to set.





Press [NEXT] (F2) button to select SENSOR TYPE. Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.



Press [←←] (F2) button to set RTD → T/C → DC.

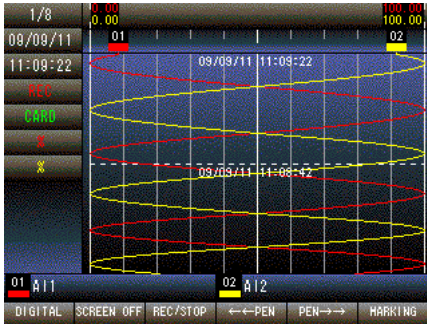
Press [→→] (F3) button to set DC → T/C → RTD.

Press [CANCEL] (F1) button to disable editing without saving SENSOR TYPE.

Press [ENTER] (F6) button to disable editing with saving SENSOR TYPE.

### 10.2.2.5 TYPE (DC: -10 – 10V / -5 – 5V / -1 – 1V / -20 – 20mA, x501)

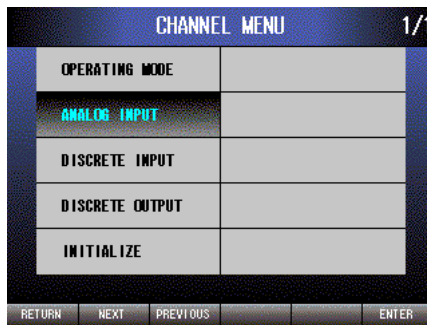
When universal terminal block (Ai3, Ai4 or Ai5) is selected as FIELD CHANNEL and input SENSOR TYPE is set to DC, TYPE setting is required.



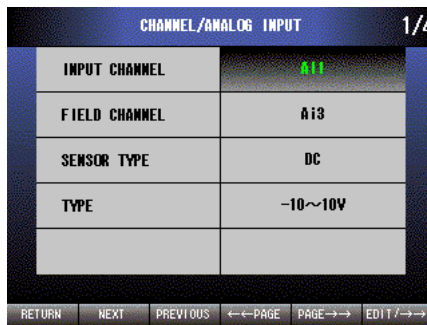
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display CHANNEL MENU.

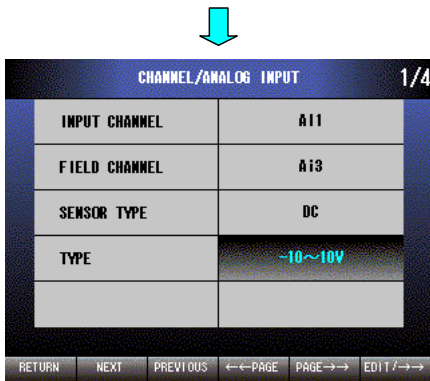


Press [NEXT] (F2) button to select ANALOG INPUT, press [ENTER] (F6) button to display CHANNEL/ANALOG INPUT menu.

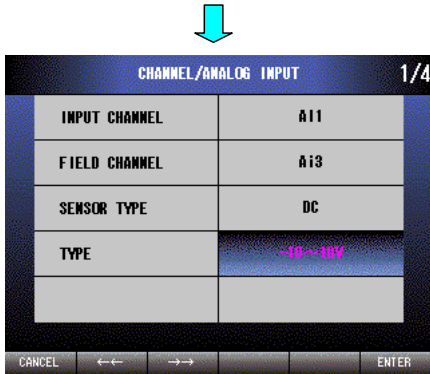


Press [EDIT/→→] (F6) button, choose an INPUT CHANNEL you want to set.





Press [NEXT] (F2) button to select TYPE. Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.



Press [←←] (F2) button to set -5 – 5V → -1 – 1V → -10 – 10V → -20 – 20mA.

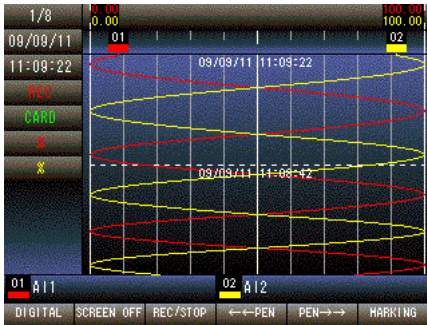
Press [→→] (F3) button to set -20 – 20mA → -10 – 10V → -1 – 1V → -5 – 5V.

Press [CANCEL] (F1) button to disable editing without saving TYPE.

Press [ENTER] (F6) button to disable editing with saving TYPE.

**10.2.2.6 TYPE (T/C: K/E/J/T/B/R/S/C/N/U/L/P/PR, x501)**

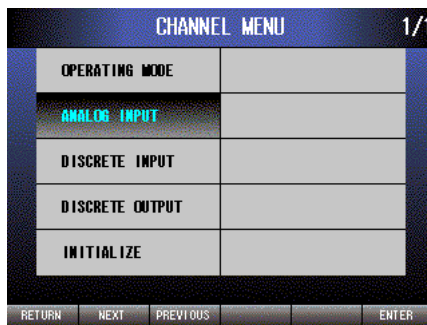
When universal terminal block (Ai3, Ai4 or Ai5) is selected and input SENSOR TYPE is set to T/C, TYPE setting is required.



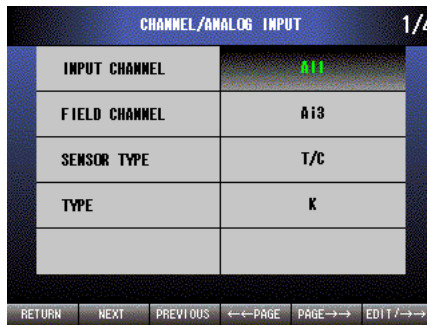
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display CHANNEL MENU.

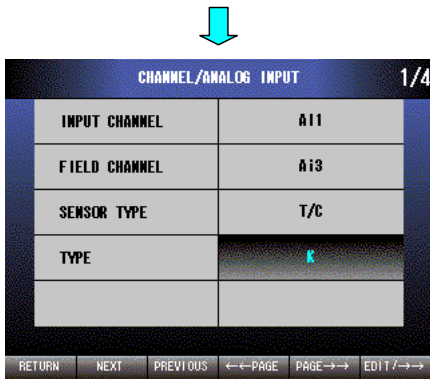


Press [NEXT] (F2) button to select ANALOG INPUT, press [ENTER] (F6) button to display CHANNEL/ANALOG INPUT menu.

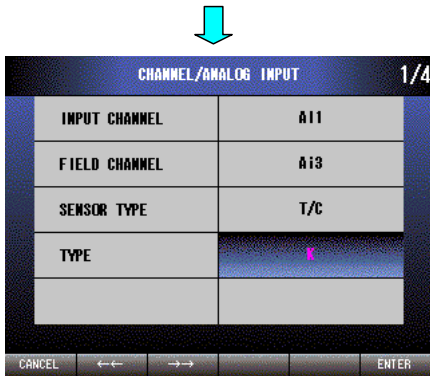


Press [EDIT/→→] (F6) button, choose an INPUT CHANNEL you want to set.





Press [NEXT] (F2) button to select TYPE. Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.



Press [←←] (F2) button to set PR → P → L → U → N → C → S → R → B → T → J → E → K.

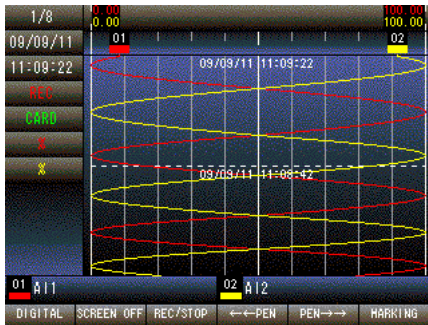
Press [→→] (F3) button to set K → E → J → T → B → R → S → C → N → U → L → P → PR.

Press [CANCEL] (F1) button to disable editing without saving TYPE.

Press [ENTER] (F6) button to disable editing with saving TYPE.

### 10.2.2.7 CJC (T/C: OFF/ON, x501)

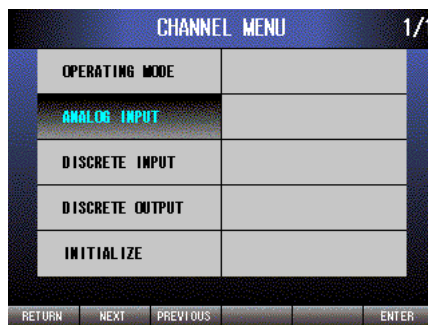
When universal terminal block (Ai3, Ai4 or Ai5) is selected and input SENSOR TYPE is set to T/C, CJC setting is required.



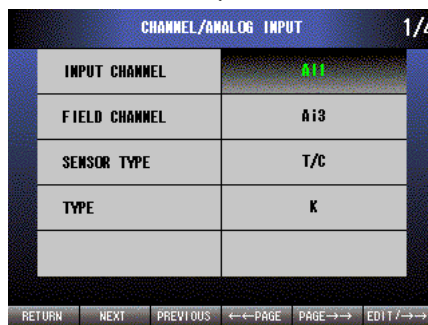
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display CHANNEL MENU.



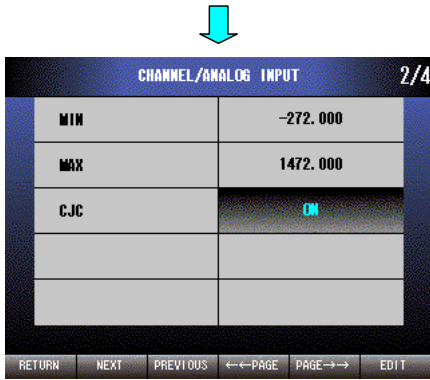
Press [NEXT] (F2) button to select ANALOG INPUT, press [ENTER] (F6) button to display CHANNEL/ANALOG INPUT menu.



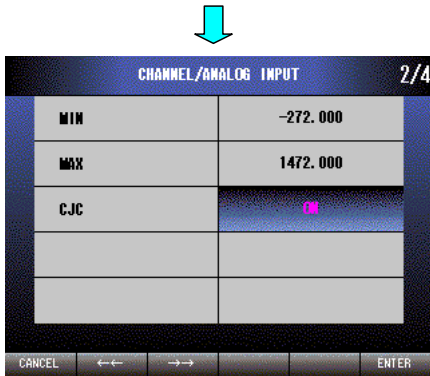
Press [EDIT/→] (F6) button, choose an INPUT CHANNEL from AI1 to AI8, and then press [PAGE→] (F5) button.







Press [NEXT] (F2) button to select CJC. Press [EDIT] (F6) button to enable editing. The text color changes to magenta.



Press [<-<-] (F2) button to set ON → OFF.

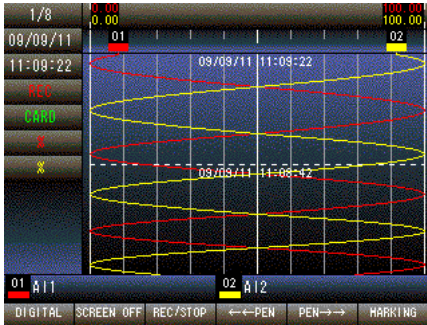
Press [→→] (F3) button to set OFF → ON.

Press [CANCEL] (F1) button to disable editing without saving CJC.

Press [ENTER] (F6) button to disable editing with saving CJC.

**10.2.2.8 TYPE (RTD: Pt100 (JIS'97, IEC) / Pt100 (JIS'89) / JPt100 (JIS'89) / Pt50 (JIS'81) / Ni100 / Cu10 / Cu50, x501)**

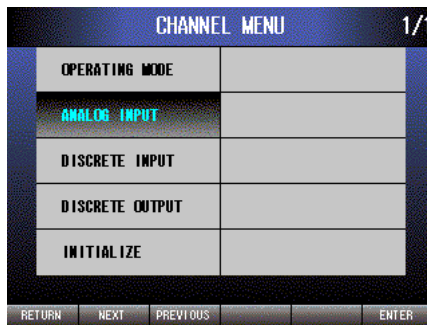
When universal terminal block (Ai3, Ai4 or Ai5) is selected as FIELD CHANNEL and input SENSOR TYPE is set to RTD, TYPE setting is required.



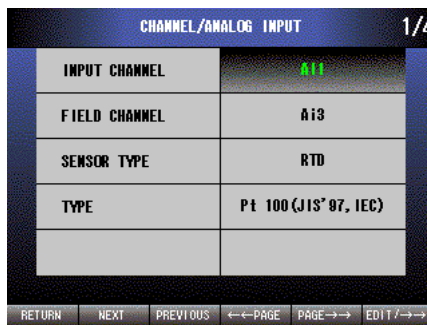
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display CHANNEL MENU.

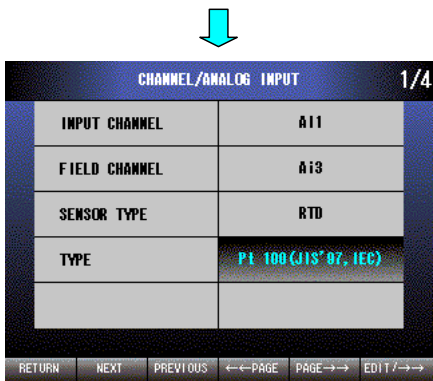


Press [NEXT] (F2) button to select ANALOG INPUT, press [ENTER] (F6) button to display CHANNEL/ANALOG INPUT menu.

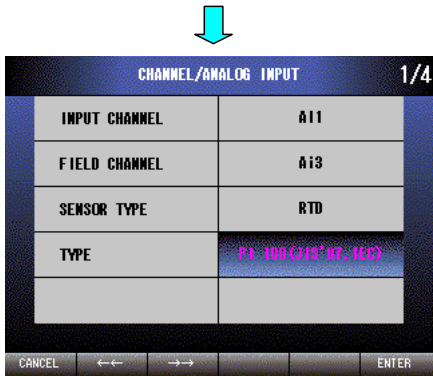


Press [EDIT/→] (F6) button, choose an INPUT CHANNEL you want to set.





Press [NEXT] (F2) button to select TYPE. Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.



Press [←←] (F2) button to set Cu 50 → Cu 10 → Ni 100 → Pt 50 (JIS '81) → JPt 100 (JIS '89) → Pt 100 (JIS '89) → Pt 100 (JIS '97, IEC).

Press [→→] (F3) button to set Pt 100 (JIS '97, IEC) → Pt 100 (JIS '89) → JPt 100 (JIS '89) → Pt 50 (JIS '81) → Ni 100 → Cu 10 → Cu 50.

Press [CANCEL] (F1) button to disable editing without saving TYPE.

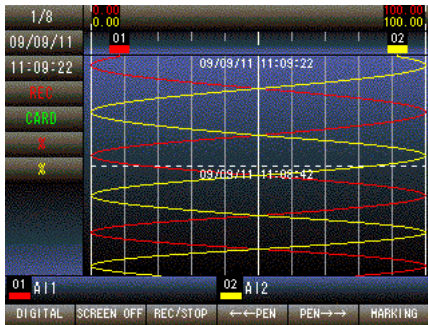
Press [ENTER] (F6) button to disable editing with saving TYPE.

### 10.2.2.9 NODE (MODBUS: 1 – 247)

Set the remote I/O NODE number when FIELD CHANNEL is selected to MODBUS. The available setting range is 1 – 247.

**CAUTION !**

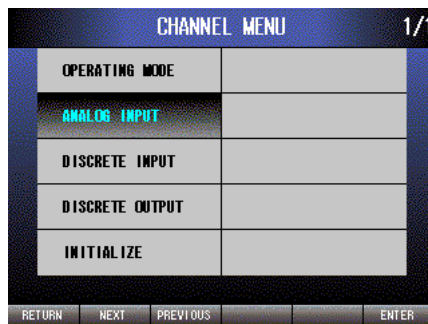
MODBUS Node number 247 of x501 is used for internal processing, therefore the setting is not available.



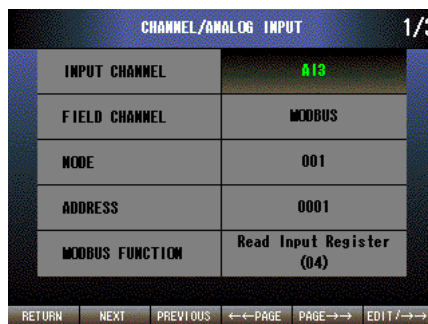
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display CHANNEL MENU.

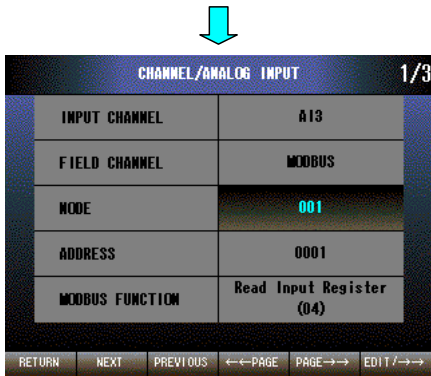


Press [NEXT] (F2) button to select ANALOG INPUT, press [ENTER] (F6) button to display CHANNEL/ANALOG INPUT menu.

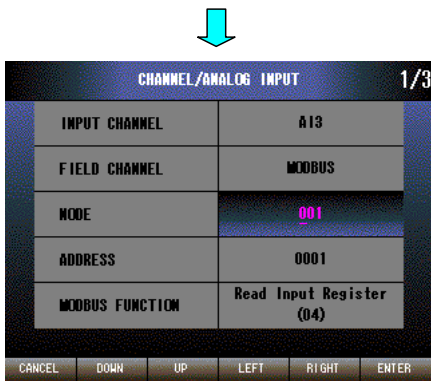


Press [EDIT/→→] (F6) button, choose an INPUT CHANNEL you want to set.





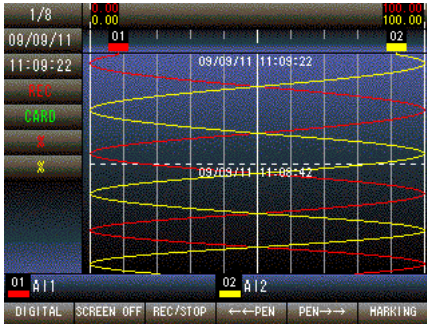
Press [NEXT] (F2) button to select NODE. Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.



Press [LEFT] (F4) button to move the cursor to the left digit.  
 Press [RIGHT] (F5) button to move the cursor to the right digit.  
 Press [DOWN] (F2) button to decrease the value of the selected digit.  
 Press [UP] (F3) button to increase the value of the selected digit.  
 Press [CANCEL] (F1) button to disable editing without saving NODE.  
 Press [ENTER] (F6) button to disable editing with saving NODE.

### 10.2.2.10 ADDRESS (MODBUS: 1 – 9999)

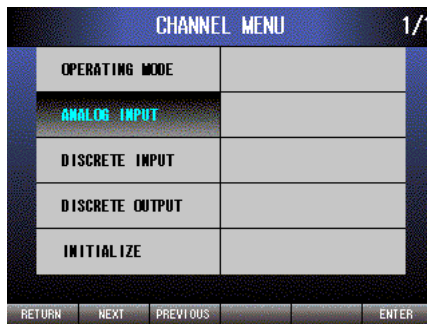
Set the assigned channel's remote I/O address when selecting MODBUS as the FIELD CHANNEL. The available setting range is 1 – 9999.



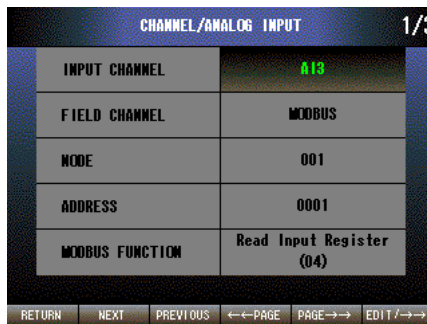
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display CHANNEL MENU.

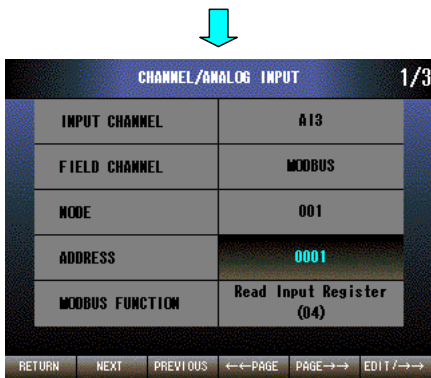


Press [NEXT] (F2) button to select ANALOG INPUT, press [ENTER] (F6) button to display CHANNEL/ANALOG INPUT menu.

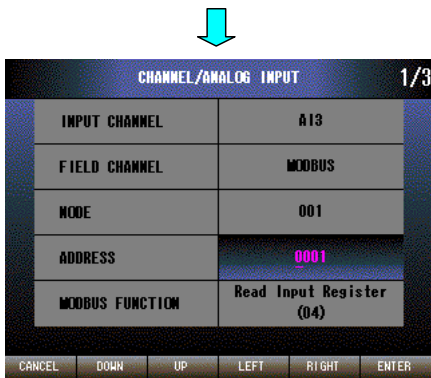


Press [EDIT/→→] (F6) button, choose an INPUT CHANNEL you want to set.





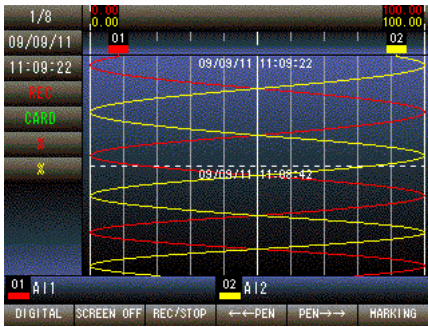
Press [NEXT] (F2) button to select ADDRESS. Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.



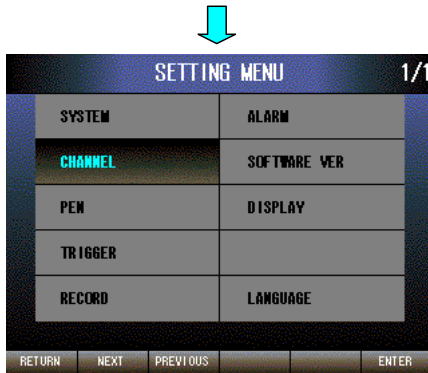
Press [LEFT] (F4) button to move the cursor to the left digit.  
 Press [RIGHT] (F5) button to move the cursor to the right digit.  
 Press [DOWN] (F2) button to decrease the value of the selected digit.  
 Press [UP] (F3) button to increase the value of the selected digit.  
 Press [CANCEL] (F1) button to disable editing without saving ADDRESS.  
 Press [ENTER] (F6) button to disable editing with saving ADDRESS.

### 10.2.2.11 MODBUS FUNCTION (For Modbus: Read Input Register (04) / Read Holding Register (03)) 1.4

Set the assigned channel's MODBUS FUNCTION when selecting MODBUS as the FIELD CHANNEL.



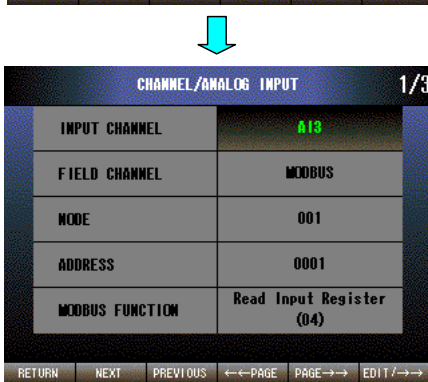
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display CHANNEL MENU.



Press [NEXT] (F2) button to select ANALOG INPUT, press [ENTER] (F6) button to display CHANNEL/ANALOG INPUT menu.



Press [EDIT/ENTER] (F6) button, choose an INPUT CHANNEL you want to set.





CHANNEL/ANALOG INPUT		1/3
INPUT CHANNEL	A13	
FIELD CHANNEL	MODBUS	
MODE	001	
ADDRESS	0001	
MODBUS FUNCTION	Read Input Register (04)	

RETURN    NEXT    PREVIOUS    ←←PAGE    PAGE→→    EDIT/→→

Press [NEXT] (F2) button to select MODBUS FUNCTION. Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.



CHANNEL/ANALOG INPUT		1/3
INPUT CHANNEL	A13	
FIELD CHANNEL	MODBUS	
MODE	001	
ADDRESS	0001	
MODBUS FUNCTION	Read Input Register (04)	

CANCEL    ←←    →→    ENTER

Press [←←] (F2) button to set Read Holding Register (03) → Read Input Register (04).

Press [→→] (F3) button to set Read Input Register (04) → Read Holding Register (03).

Press [CANCEL] (F1) button to disable editing without saving MODBUS FUNCTION.

Press [ENTER] (F6) button to disable editing with saving MODBUS FUNCTION.

#### NOTE

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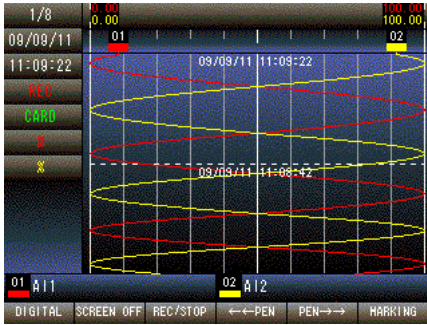
Set Read Holding Register (03), only when the 71VR1 communicates with SC200 or SC210.

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### 10.2.2.12 RANGE

Set a RANGE. RANGE MIN is the value you want to show on the left edge of the TREND graph, RANGE MAX is the value you want to show on the right edge of the TREND graph.

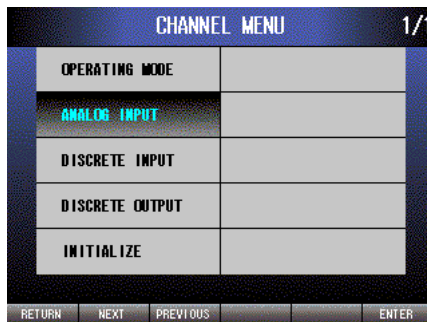
[Case of the DC input terminal block (Ai1, Ai2)]



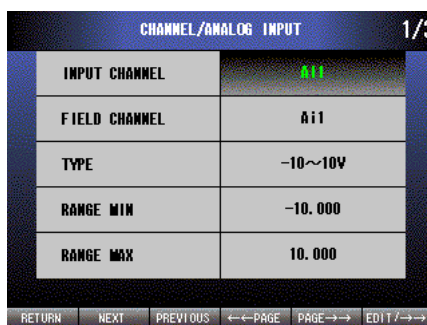
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display CHANNEL MENU.

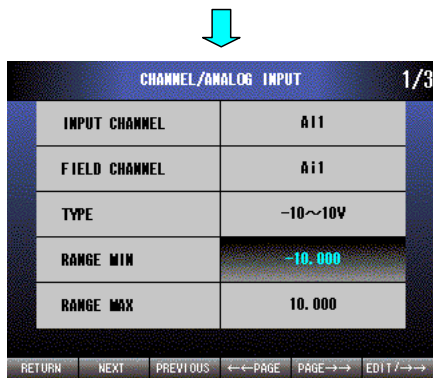


Press [NEXT] (F2) button to select ANALOG INPUT, press [ENTER] (F6) button to display CHANNEL/ANALOG INPUT menu.

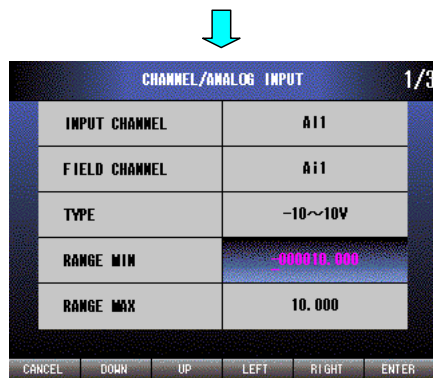


Press [EDIT/→→] (F6) button, choose an INPUT CHANNEL you want to set.





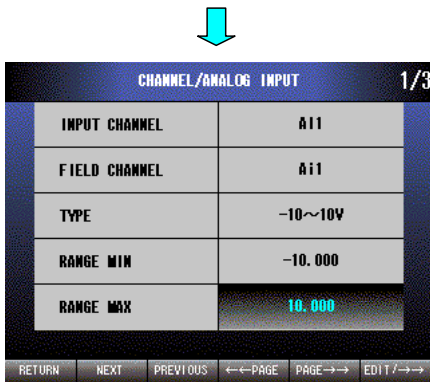
Press [NEXT] (F2) button to select RANGE MIN. Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.



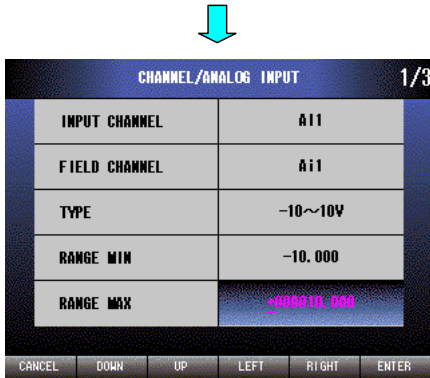
Press [LEFT] (F4) button to move the cursor to the left digit.  
 Press [RIGHT] (F5) button to move the cursor to the right digit.  
 Press [DOWN] (F2) button to decrease the value of the selected digit, or reverse the sign for + or -.  
 Press [UP] (F3) button to increase the value of the selected digit, or reverse the sign for + or -.  
 Press [CANCEL] (F1) button to disable editing without saving RANGE MIN.  
 Press [ENTER] (F6) button to disable editing with saving RANGE MIN.

● Setting range

TYPE	RANGE
-10 – 10V	-10.000 – +10.000
-5 – 5V	-5.000 – +5.000
-1 – 1V	-1.000 – +1.000
-20 – 20mA	-20.000 – +20.000



Press [NEXT] (F2) button to select RANGE MAX. Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.



Press [LEFT] (F4) button to move the cursor to the left digit.  
 Press [RIGHT] (F5) button to move the cursor to the right digit.  
 Press [DOWN] (F2) button to decrease the value of the selected digit, or reverse the sign for + or -.  
 Press [UP] (F3) button to increase the value of the selected digit, or reverse the sign for + or -.  
 Press [CANCEL] (F1) button to disable editing without saving RANGE MAX.  
 Press [ENTER] (F6) button to disable editing with saving RANGE MAX.

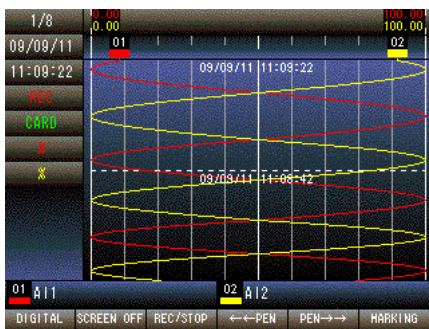
● Setting range

TYPE	RANGE
-10 – 10V	-10.000 – +10.000
-5 – 5V	-5.000 – +5.000
-1 – 1V	-1.000 – +1.000
-20 – 20mA	-20.000 – +20.000

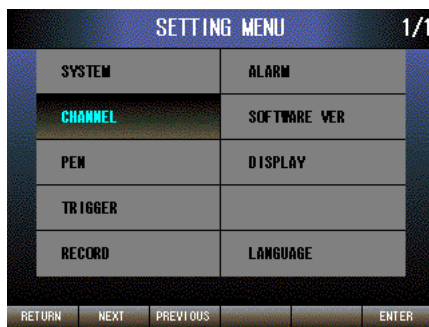
**NOTE**

These are screens of x001/x101.

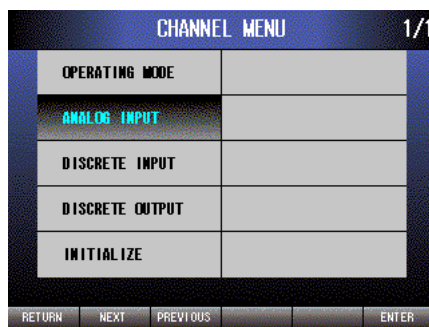
[Case of universal input terminal block (Ai3, Ai4 and Ai5), x501]



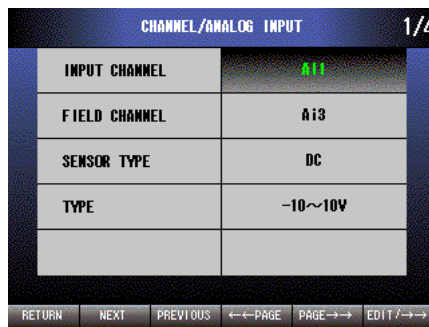
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display CHANNEL MENU.

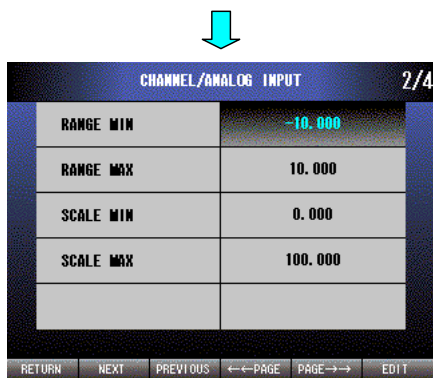


Press [NEXT] (F2) button to select ANALOG INPUT, press [ENTER] (F6) button to display CHANNEL/ANALOG INPUT menu.

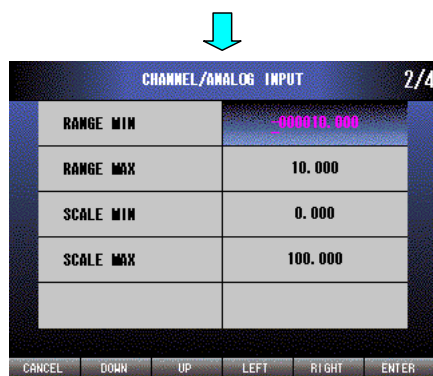


Press [EDIT/→] (F6) button, choose an INPUT CHANNEL you want to set, press [PAGE→] (F5) button.

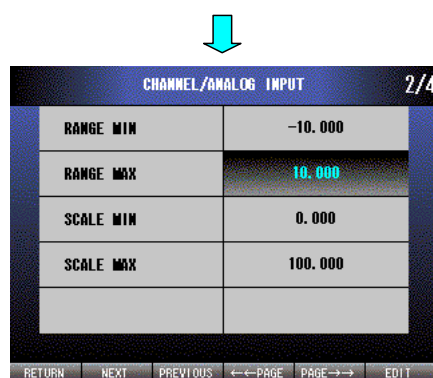




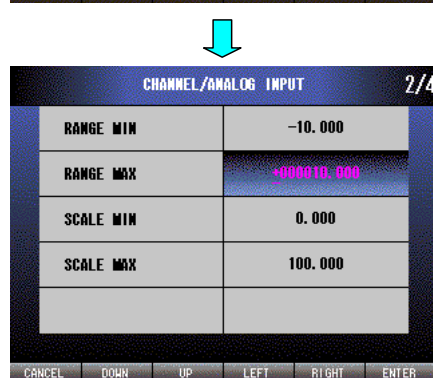
RANGE MIN is selected. Press [EDIT] (F6) to enable editing. The text color changes to magenta.



Press [LEFT] (F4) button to move the cursor to the left digit.  
 Press [RIGHT] (F5) button to move the cursor to the right digit.  
 Press [DOWN] (F2) button to decrease the value of the selected digit, or reverse the sign for + or -.  
 Press [UP] (F3) button to increase the value of the selected digit, or reverse the sign for + or -.



Press [CANCEL] (F1) button to disable editing without saving RANGE MIN.  
 Press [ENTER] (F6) button to disable editing with saving RANGE MIN.

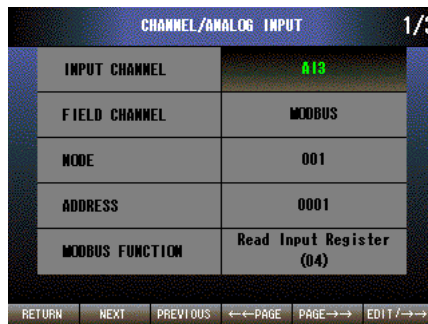
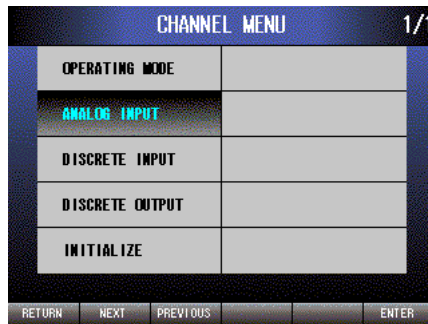
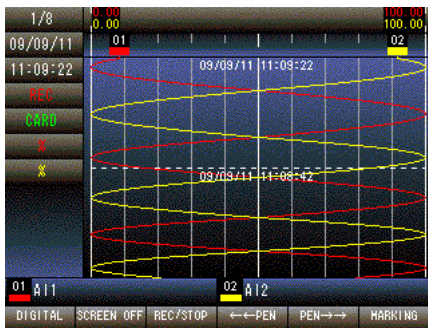


Press [NEXT] (F2) button to select RANGE MAX. Press [EDIT] (F6) button to enable editing. The text color changes to magenta.

Press [LEFT] (F4) button to move the cursor to the left digit.  
 Press [RIGHT] (F5) button to move the cursor to the right digit.  
 Press [DOWN] (F2) button to decrease the value of the selected digit, or reverse the sign for + or -.  
 Press [UP] (F3) button to increase the value of the selected digit, or reverse the sign for + or -.

Press [CANCEL] (F1) button to disable editing without saving RANGE MAX.  
 Press [ENTER] (F6) button to disable editing with saving RANGE MAX.

[Case of MODBUS input]

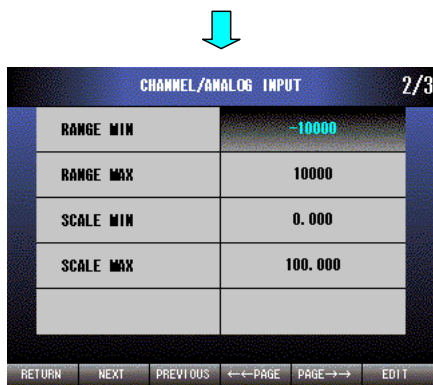


Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.

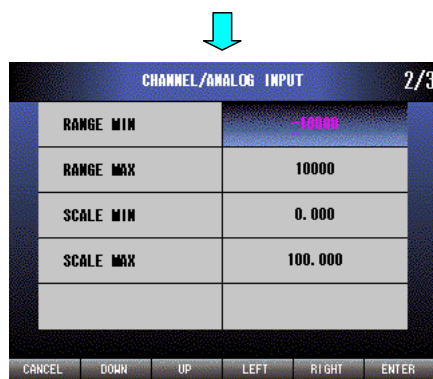
Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display CHANNEL MENU.

Press [NEXT] (F2) button to select ANALOG INPUT, press [ENTER] (F6) button to display CHANNEL/ANALOG INPUT menu.

Press [EDIT/->] (F6) button, choose an INPUT CHANNEL you want to set, press [PAGE->] (F5) button.



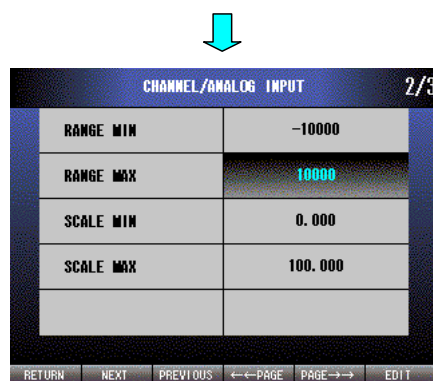
RANGE MIN is selected. Press [EDIT] (F6) button to enable editing. The text color changes to magenta.



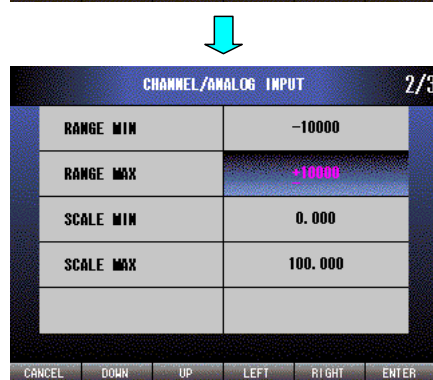
Press [LEFT] (F4) button to move the cursor to the left digit.  
 Press [RIGHT] (F5) button to move the cursor to the right digit.  
 Press [DOWN] (F2) button to decrease the value of the selected digit, or reverse the sign for + or -.  
 Press [UP] (F3) button to increase the value of the selected digit, or reverse the sign for + or -.  
 Press [CANCEL] (F1) button to disable editing without saving RANGE MIN.  
 Press [ENTER] (F6) button to disable editing with saving RANGE MIN.

**NOTE**

Refer to the remote I/O specification for the setting range.



Press [NEXT] (F2) button to select RANGE MAX. Press [EDIT] (F6) button to enable editing. The text color changes to magenta.



Press [LEFT] (F4) button to move the cursor to the left digit.  
 Press [RIGHT] (F5) button to move the cursor to the right digit.  
 Press [DOWN] (F2) button to decrease the value of the selected digit, or reverse the sign for + or -.  
 Press [UP] (F3) button to increase the value of the selected digit, or reverse the sign for + or -.  
 Press [CANCEL] (F1) button to disable editing without saving RANGE MAX.  
 Press [ENTER] (F6) button to disable editing with saving RANGE MAX.

**NOTE**

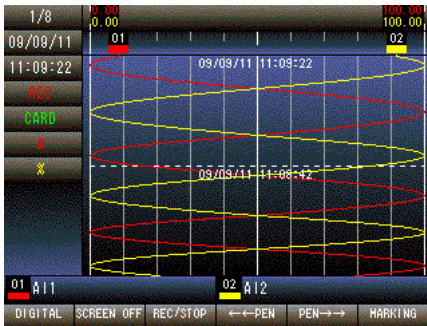
Refer to the remote I/O specification for the setting range.



### 10.2.2.13 SCALE

Set a SCALE. SCALE MIN corresponds to the range MIN, SCALE MAX corresponds to the range MAX.

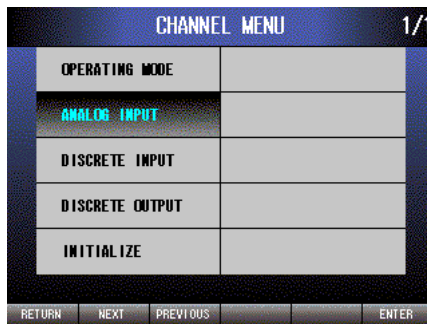
[Case of the DC input terminal block (Ai1, Ai2)]



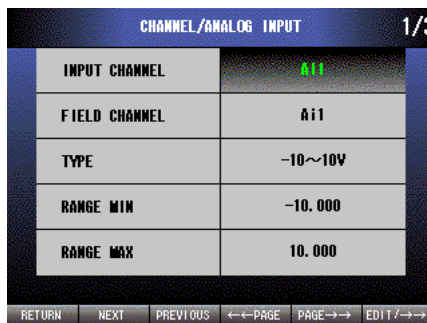
Press and hold F1 button on TREND display screen, DIGITAL display screen or CONTROL MENU, SETTING MENU is displayed.



Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display CHANNEL MENU.

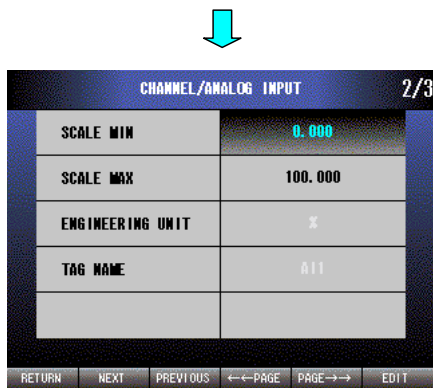


Press [NEXT] (F2) button to select ANALOG INPUT, press [ENTER] (F6) button to display CHANNEL/ANALOG INPUT menu.

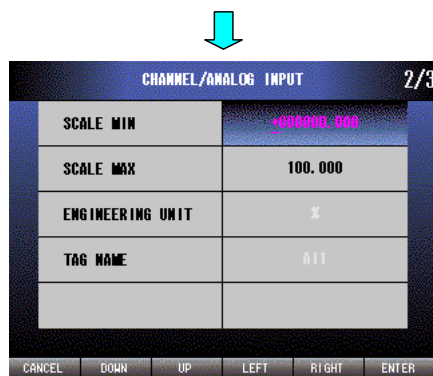


Press [EDIT/→→] (F6) button, choose an INPUT CHANNEL you want to set, press [PAGE→→] (F5) button.





SCALE MIN is selected. Press [EDIT] (F6) button to enable editing. The text color changes to magenta.



Press [LEFT] (F4) button to move the cursor to the left digit.

Press [RIGHT] (F5) button to move the cursor to the right digit.

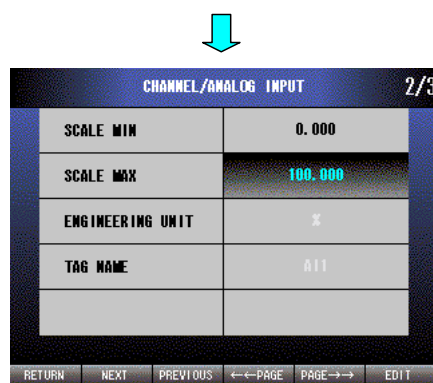
Press [DOWN] (F2) button to decrease the value of the selected digit, or reverse the sign for + or -.

Press [UP] (F3) button to increase the value of the selected digit, or reverse the sign for + or -.

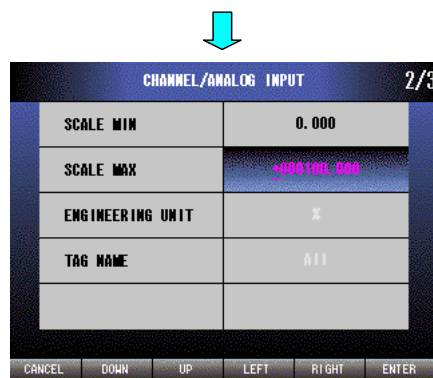
Press [CANCEL] (F1) button to disable editing without saving SCALE MIN.

Press [ENTER] (F6) button to disable editing with saving SCALE MIN.

- Setting range  
-999999.999 – +999999.999



Press [NEXT] (F2) button to select SCALE MAX. Press [EDIT] (F6) button to enable editing. The text color changes to magenta.



Press [LEFT] (F4) button to move the cursor to the left digit.

Press [RIGHT] (F5) button to move the cursor to the right digit.

Press [DOWN] (F2) button to decrease the value of the selected digit, or reverse the sign for + or -.

Press [UP] (F3) button to increase the value of the selected digit, or reverse the sign for + or -.

Press [CANCEL] (F1) button to disable editing without saving SCALE MAX.

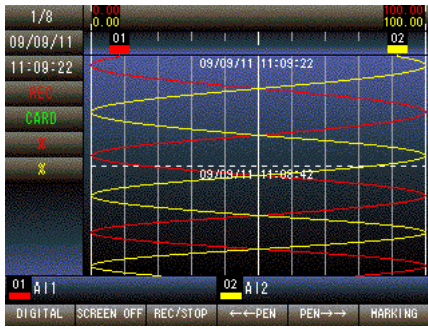
Press [ENTER] (F6) button to disable editing with saving SCALE MAX.

- Setting range  
-999999.999 – +999999.999

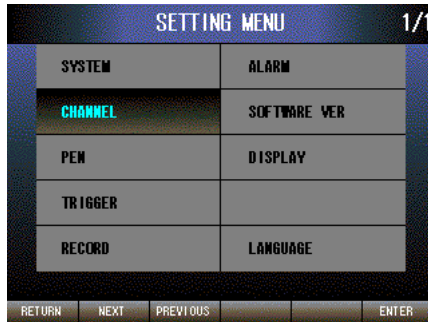
#### NOTE

These are screens of x001/x101.

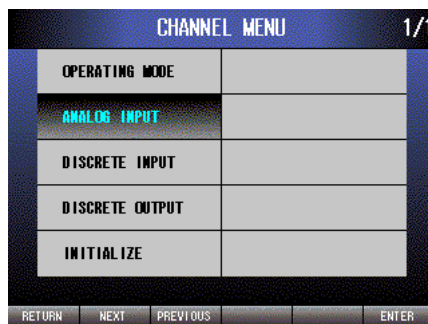
[Case of universal input terminal block (Ai3, Ai4 and Ai5), x501]



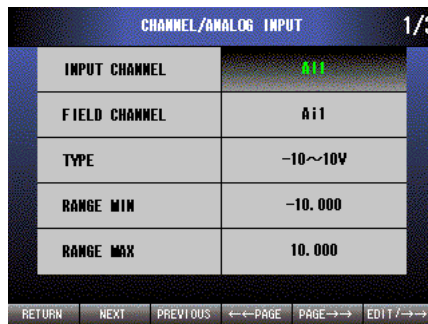
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display CHANNEL MENU.

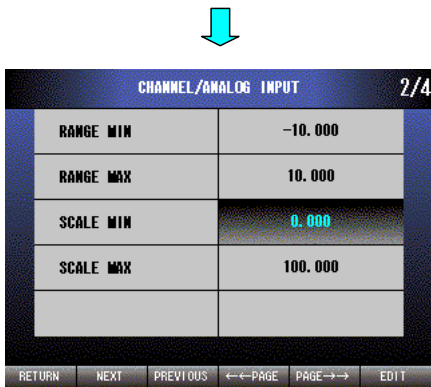


Press [NEXT] (F2) button to select ANALOG INPUT, press [ENTER] (F6) button to display CHANNEL/ANALOG INPUT menu.

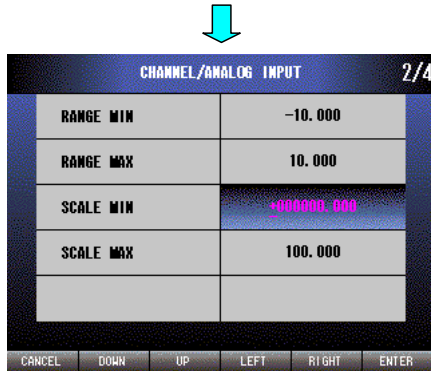


Press [EDIT/→→] (F6) button, choose an INPUT CHANNEL you want to set, press [PAGE→→] (F5) button.





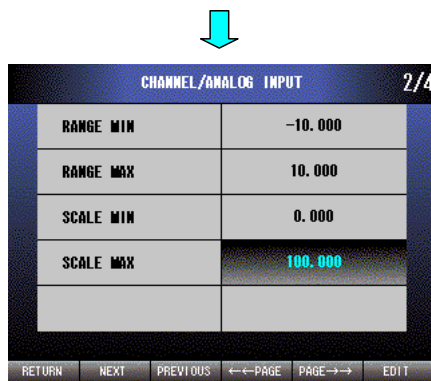
Press [NEXT] (F2) button to select SCALE MIN. Press [EDIT] (F6) button to enable editing. The text color changes to magenta.



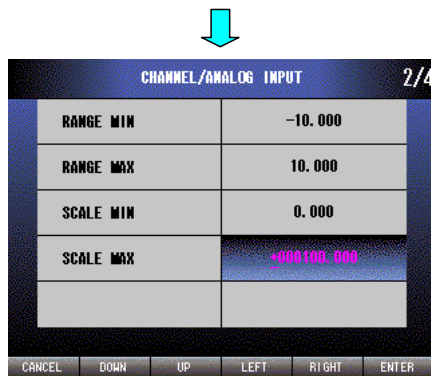
Press [LEFT] (F4) button to move the cursor to the left digit.  
 Press [RIGHT] (F5) button to move the cursor to the right digit.  
 Press [DOWN] (F2) button to decrease the value of the selected digit, or reverse the sign for + or –.  
 Press [UP] (F3) button to increase the value of the selected digit, or reverse the sign for + or –.  
 Press [CANCEL] (F1) button to disable editing without saving SCALE MIN.

Press [ENTER] (F6) button to disable editing with saving SCALE MIN.

- Setting range  
-999999.999 – +999999.999



Press [NEXT] (F2) button to select SCALE MAX. Press [EDIT] (F6) button to enable editing. The text color changes to magenta.



Press [LEFT] (F4) button to move the cursor to the left digit.  
 Press [RIGHT] (F5) button to move the cursor to the right digit.  
 Press [DOWN] (F2) button to decrease the value of the selected digit, or reverse the sign for + or –.  
 Press [UP] (F3) button to increase the value of the selected digit, or reverse the sign for + or –.  
 Press [CANCEL] (F1) button to disable editing without saving SCALE MAX.

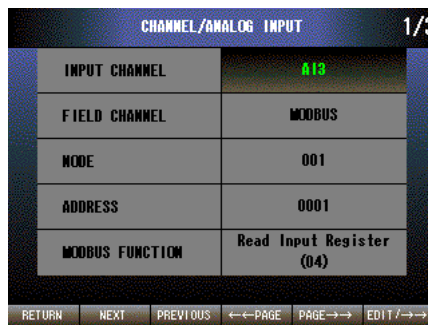
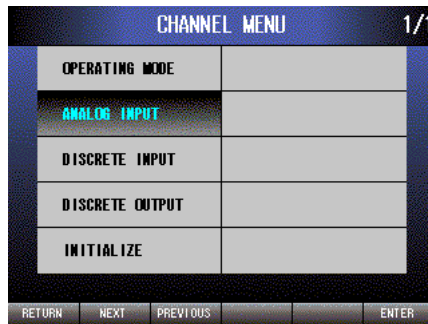
Press [ENTER] (F6) button to disable editing with saving SCALE MAX.

- Setting range  
-999999.999 – +999999.999

**NOTE**

When SENSOR TYPE is set to T/C or RTD, SCALE setting is not required.

[Case of MODBUS input]

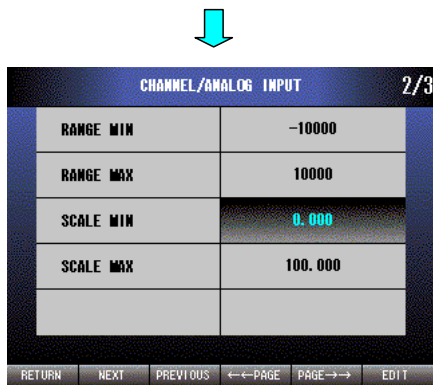


Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.

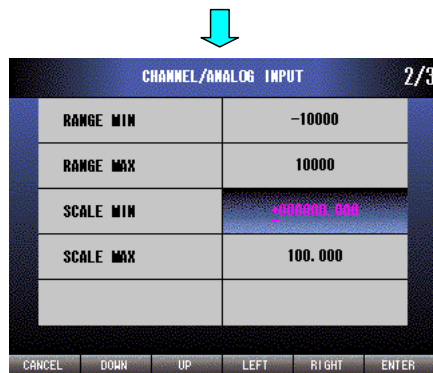
Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display CHANNEL MENU.

Press [NEXT] (F2) button to select ANALOG INPUT, press [ENTER] (F6) button to display CHANNEL/ANALOG INPUT menu.

Press [EDIT/→→] (F6) button, choose an INPUT CHANNEL you want to set, press [PAGE→→] (F5) button.

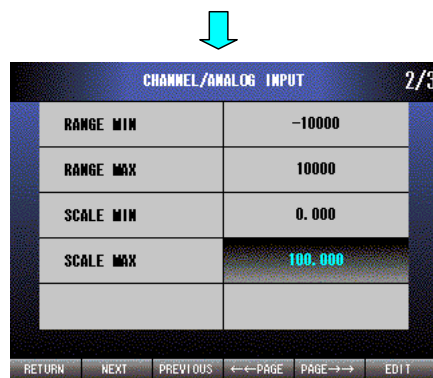


Press [NEXT] (F2) button to select SCALE MIN. Press [EDIT] (F6) button to enable editing. The text color changes to magenta.

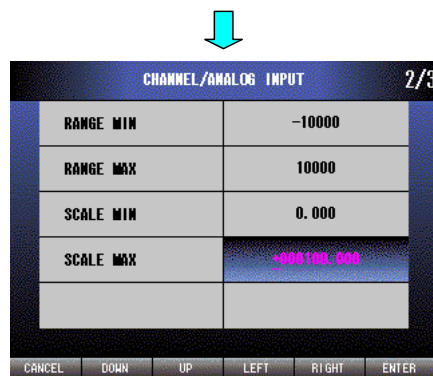


Press [LEFT] (F4) button to move the cursor to the left digit.  
 Press [RIGHT] (F5) button to move the cursor to the right digit.  
 Press [DOWN] (F2) button to decrease the value of the selected digit, or reverse the sign for + or -.  
 Press [UP] (F3) button to increase the value of the selected digit, or reverse the sign for + or -.  
 Press [CANCEL] (F1) button to disable editing without saving SCALE MIN.  
 Press [ENTER] (F6) button to disable editing with saving SCALE MIN.

- Setting range  
-999999.999 – +999999.999



Press [NEXT] (F2) button to select SCALE MAX. Press [EDIT] (F6) button to enable editing. The text color changes to magenta.



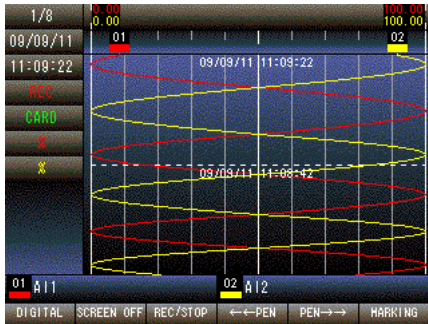
Press [LEFT] (F4) button to move the cursor to the left digit.  
 Press [RIGHT] (F5) button to move the cursor to the right digit.  
 Press [DOWN] (F2) button to decrease the value of the selected digit, or reverse the sign for + or -.  
 Press [UP] (F3) button to increase the value of the selected digit, or reverse the sign for + or -.  
 Press [CANCEL] (F1) button to disable editing without saving SCALE MAX.  
 Press [ENTER] (F6) button to disable editing with saving SCALE MAX.

- Setting range  
-999999.999 – +999999.999

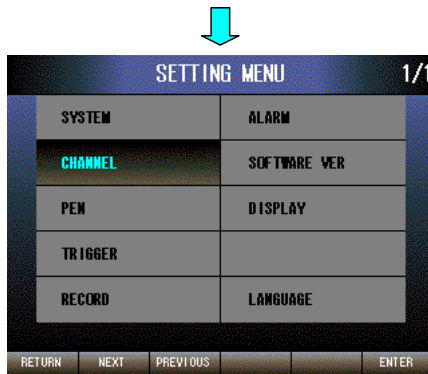
### 10.2.2.14 ENGINEERING UNIT

Set the ENGINEERING UNIT within 4 characters. It can be set by using the 71VRCFG, displayed on the 71VR1 by using the operation buttons. The editing is not available on the 71VR1.

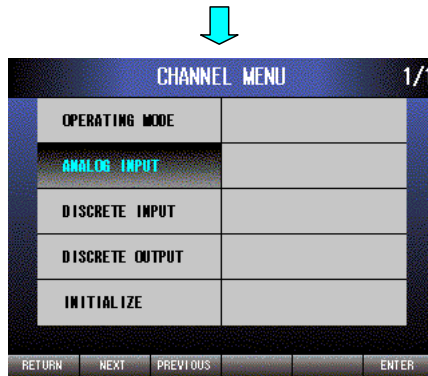
[Case of DC input terminal block (Ai1, Ai2)]



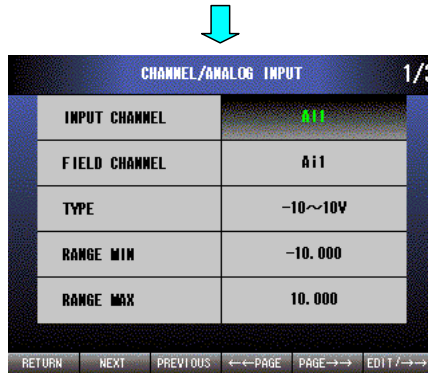
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display CHANNEL MENU.



Press [NEXT] (F2) button to select ANALOG INPUT, press [ENTER] (F6) button to display CHANNEL/ANALOG INPUT menu.



Press [EDIT/→→] (F6) button, choose an INPUT CHANNEL you want to set, press [PAGE→→] (F5) button to display page 2/3.

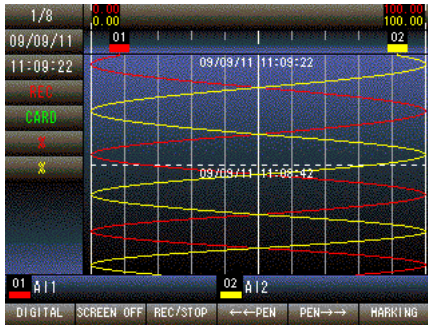


CHANNEL/ANALOG INPUT		2/3
SCALE MIN	0.000	
SCALE MAX	100.000	
ENGINEERING UNIT	%	
TAG NAME	ALL	
RETURN	NEXT	PREVIOUS ←←PAGE PAGE→→ EDIT

The ENGINEERING UNIT and the TAG NAME which were set via the 71VRCFG are displayed here.



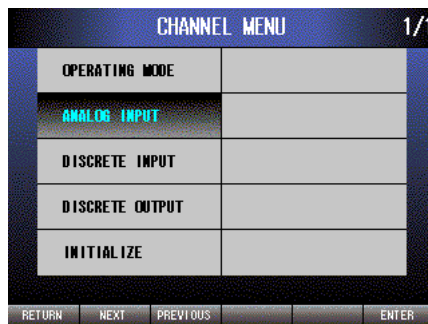
[x501]



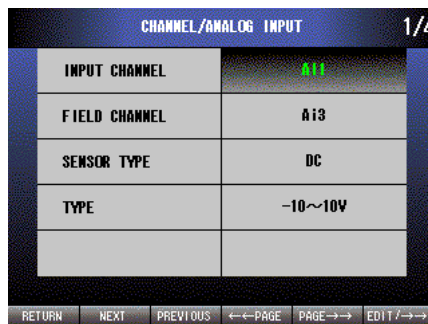
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



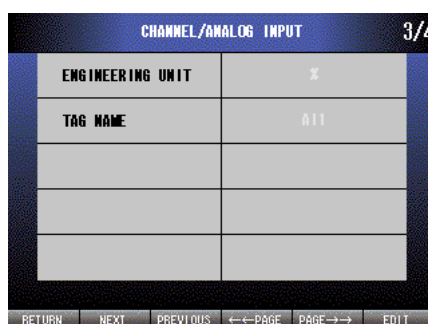
Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display CHANNEL MENU.



Press [NEXT] (F2) button to select ANALOG INPUT, press [ENTER] (F6) button to display CHANNEL/ANALOG INPUT menu.

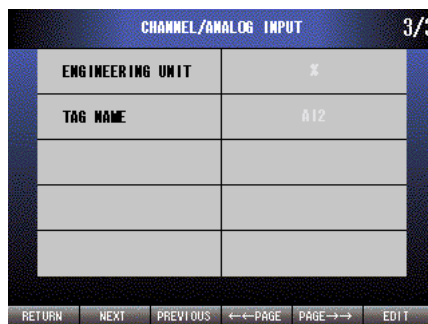
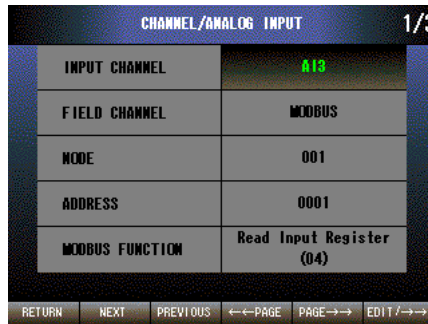
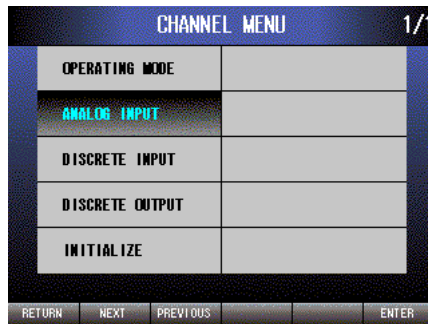


Press [EDIT/→] (F6) button, choose an INPUT CHANNEL you want to set, press [PAGE→] (F5) button to display page 3/4.



The ENGINEERING UNIT and the TAG NAME which were set via the 71VRCFG are displayed here.

[Case of MODBUS input]



Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.

Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display CHANNEL MENU.

Press [NEXT] (F2) button to select ANALOG INPUT, press [ENTER] (F6) button to display CHANNEL/ANALOG INPUT menu.

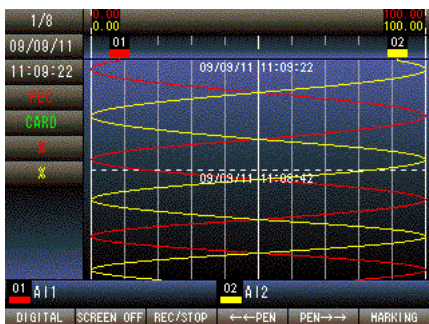
Press [EDIT/→→] (F6) button, choose an INPUT CHANNEL you want to set, press [PAGE→→] (F5) button to display page 3/3.

The ENGINEERING UNIT and the TAG NAME which were set via the 71VRCFG can be displayed but can not be edited here.

#### 10.2.2.15 TAG NAME

Set the TAG NAME within 8 characters by using the 71VRCFG. The 71VR1 can only display the TAG NAME you set. Refer to Section “10.2.2.13 SCALE” to learn how to display the TAG NAME on the 71VR1.

### 10.2.2.16 ZERO/SPAN ADJUSTMENT (DC input terminal block)



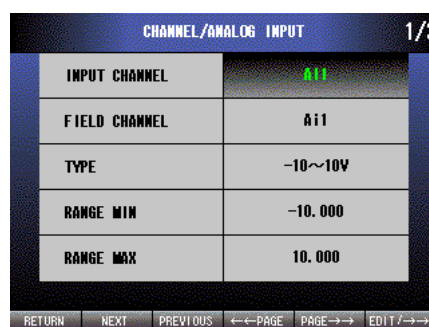
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display CHANNEL MENU.

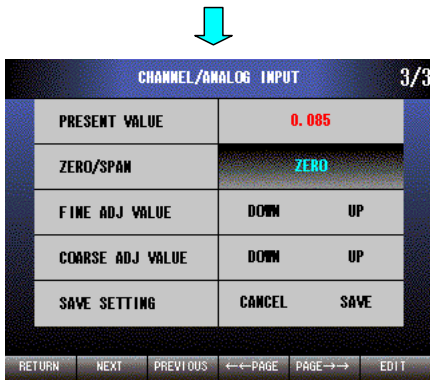


Press [NEXT] (F2) button to select ANALOG INPUT, press [ENTER] (F6) button to display CHANNEL/ANALOG INPUT menu.

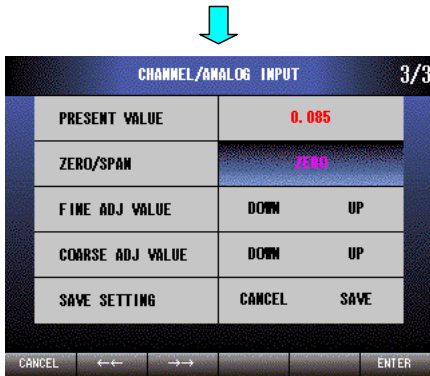


Press [EDIT/→→] (F6) button, choose an INPUT CHANNEL you want to set, press [PAGE→→] (F5) button to display page 3/3.





ZERO/SPAN is selected. Press [EDIT] (F6) button to enable editing. The text color changes to magenta.



Press [←←] (F2) button to set -SPAN → +SPAN → ZERO.

Press [→→] (F3) button to set ZERO → +SPAN → -SPAN.

Press [CANCEL] (F1) button to cancel editing without saving changes.

Press [ENTER] (F6) button to save changes and quit.

Use [NEXT] (F2) and [PREVIOUS] (F3) buttons to move the cursor among UP, DOWN, CANCEL and SAVE.

Use [EDIT] (F6) button to control UP, DOWN, CANCEL and SAVE values.

FINE ADJ VALUE is used to calibrate the input signal slightly.

COARSE ADJ VALUE is used to calibrate it significantly.

Adjusted value goes down by pressing [EDIT] (F6) button when the cursor is at DOWN position, while it goes up at UP position.

SAVE SETTING/CANCEL is used to invalidate the adjusted value.

SAVE SETTING/SAVE is used to save the adjusted value into the non-volatile memory.

#### NOTE

These are screens of x001/x101.

PRESENT VALUE shows the actual input value in red color, in Volts [V] for TYPE -1 – 1V, -5 – 5V, -10 – 10V or in Milliamps [mA] for TYPE -20 – 20mA. The table below shows setting examples. The upper rows in each column show the input signal at the terminals, and the lower rows show the target values.

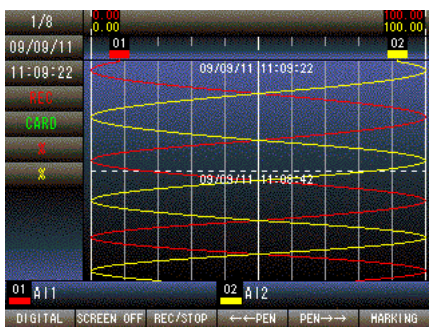
	ZERO	+SPAN	-SPAN
-1 – 1V	0V	1V	-1V
	0.000	1.000	-1.000
-5 – 5V	0V	5V	-5V
	0.000	5.000	-5.000
-10 – 10V	0V	10V	-10V
	0.000	10.000	-10.000
-20 – 20mA	0mA	20mA	-20mA
	0.000	20.000	-20.000

#### NOTE

SPAN is applied as gain adjustment. When -SPAN adjustment is applied, the greater the adjusted value is, the smaller the input value is adjusted to, and vice versa.

### 10.2.2.17 ZERO/SPAN ADJUSTMENT (Universal input terminal, x501)

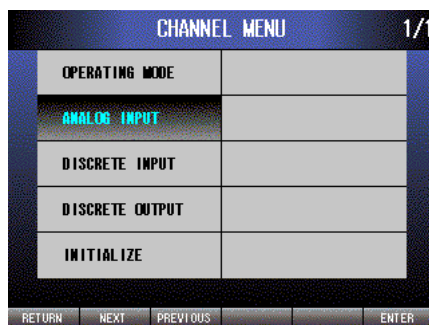
[SENSOR TYPE: DC]



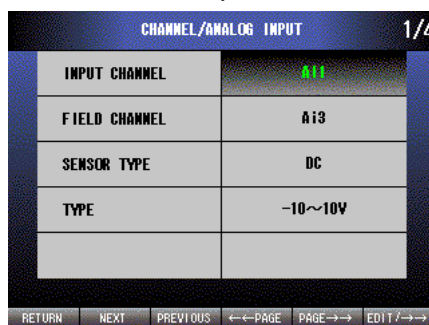
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display CHANNEL MENU.

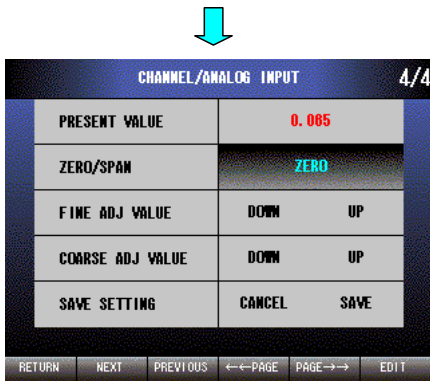


Press [NEXT] (F2) button to select ANALOG INPUT, press [ENTER] (F6) button to display CHANNEL/ANALOG INPUT menu.

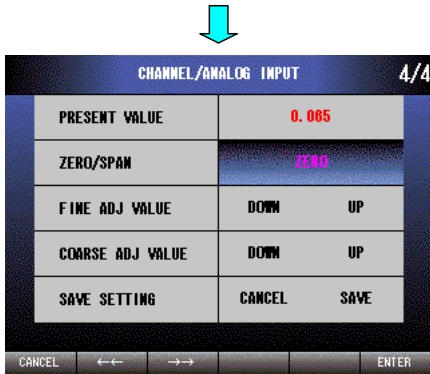


Press [EDIT/→] (F6) button, choose an INPUT CHANNEL you want to set, press [PAGE→] (F5) button to display page 4/4.





ZERO/SPAN is selected. Press [EDIT] (F6) button to enable editing. The text color changes to magenta.



Press [←←] (F2) button to set -SPAN → +SPAN → ZERO.

Press [→→] (F3) button to set ZERO → +SPAN → -SPAN.

Press [CANCEL] (F1) button to cancel editing without saving changes.

Press [ENTER] (F6) button to save changes and quit.

Use [NEXT] (F2) and [PREVIOUS] (F3) buttons to move the cursor among UP, DOWN, CANCEL and SAVE.

Use [EDIT] (F6) button to control UP, DOWN, CANCEL and SAVE values.

FINE ADJ VALUE is used to calibrate the input signal slightly.

COARSE ADJ VALUE is used to calibrate it significantly.

Adjusted value goes down by pressing [EDIT] (F6) button when the cursor is at DOWN position, while it goes up at UP position.

SAVE SETTING/CANCEL is used to invalidate the adjusted value.

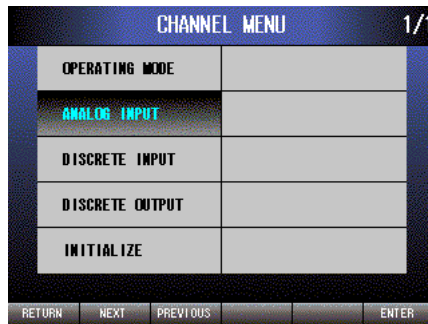
SAVE SETTING/SAVE is used to save the adjusted value into the non-volatile memory.

[SENSOR TYPE: T/C or RTD]

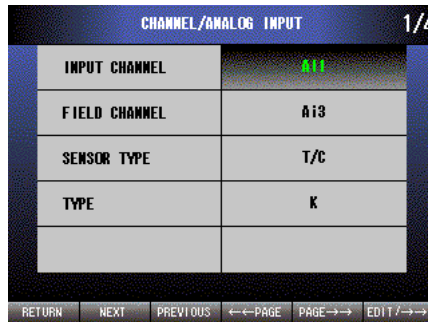


Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.

Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display CHANNEL MENU.



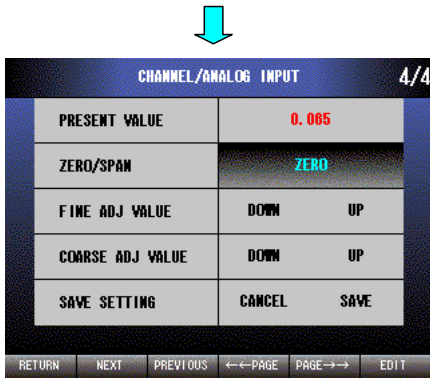
Press [NEXT] (F2) button to select ANALOG INPUT, press [ENTER] (F6) button to display CHANNEL/ANALOG INPUT menu.



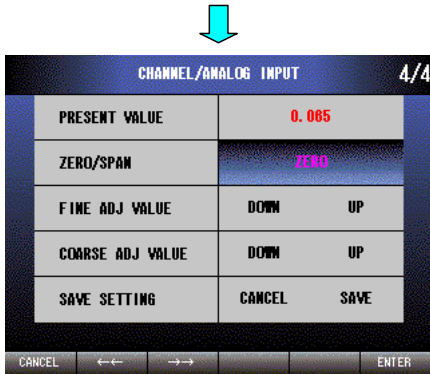
Press [EDIT/→→] (F6) button, choose an INPUT CHANNEL you want to set, press [PAGE→→] (F5) button to display page 4/4.







ZERO/SPAN is selected. Press [EDIT] (F6) button to enable editing. The text color changes to magenta.



Press [←←] (F2) button to set +SPAN → ZERO.

Press [→→] (F3) button to set ZERO → +SPAN.

Press [CANCEL] (F1) button to cancel editing without saving changes.

Press [ENTER] (F6) button to save changes and quit.

Use [NEXT] (F2) and [PREVIOUS] (F3) buttons to move the cursor among UP, DOWN, CANCEL and SAVE.

Use [EDIT] (F6) button to control UP, DOWN, CANCEL and SAVE values.

FINE ADJ VALUE is used to calibrate the input signal slightly.

COARSE ADJ VALUE is used to calibrate it significantly.

Adjusted value goes down by pressing [EDIT] (F6) button when the cursor is at DOWN position, while it goes up at UP position.

SAVE SETTING/CANCEL is used to invalidate the adjusted value.

SAVE SETTING/SAVE is used to save the adjusted value into the non-volatile memory.

PRESENT VALUE shows present input value by red color. The temperature unit is the one which was selected in TEMPERATURE UNIT.

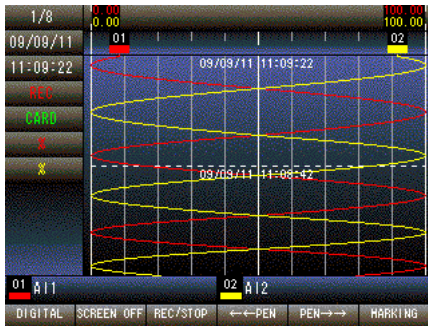
#### CAUTION !

Make sure that CJC setting is correct when making ZERO/SPAN adjustment.

## 10.2.3 DISCRETE INPUT (DI1 – DI8)

### 10.2.3.1 FIELD CHANNEL (Terminal block/MODBUS)

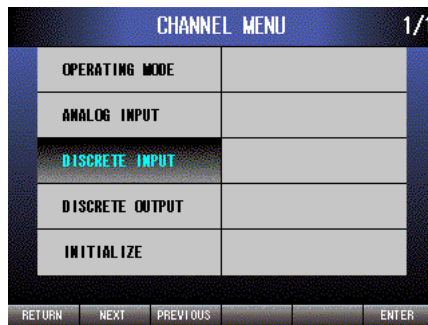
Set a form of FIELD CHANNEL (terminal block or MODBUS) which is assigned to DI1 – DI8.



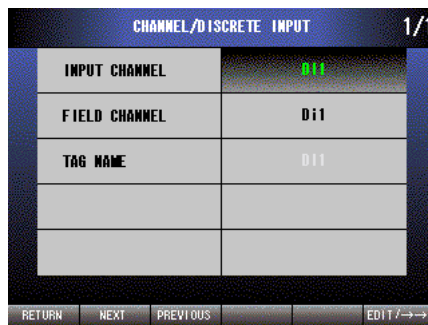
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display CHANNEL MENU.

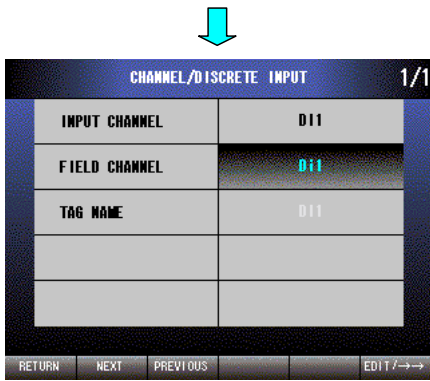


Press [NEXT] (F2) button to select DISCRETE INPUT, press [ENTER] (F6) button to display CHANNEL/DISCRETE INPUT menu.

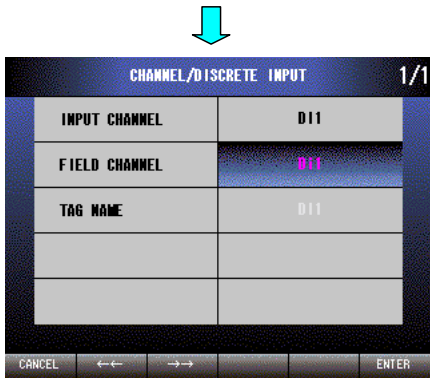


Press [EDIT/->>] (F6) button, choose an INPUT CHANNEL from DI1 till DI8.





Press [NEXT] (F2) button to select a FIELD CHANNEL. Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.



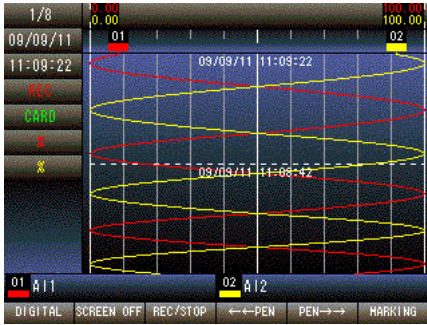
Press [←←] (F2) button to set NONE → MODBUS → Di2 → Di1.  
 Press [→→] (F3) button to set Di1 → Di2 → MODBUS → NONE.  
 Press [CANCEL] (F1) button to disable editing without saving FIELD CHANNEL.  
 Press [ENTER] (F6) button to disable editing with saving FIELD CHANNEL.

### 10.2.3.2 NODE (MODBUS: 1 – 247)

Set the remote I/O NODE number when you selected MODBUS as the FIELD CHANNEL. The available range is 1 – 247.

#### CAUTION !

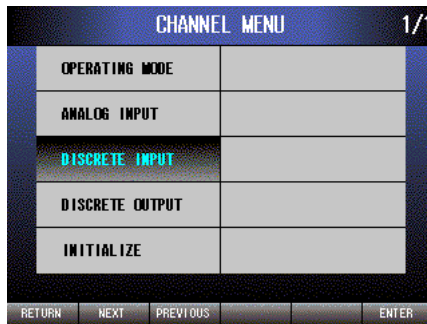
MODBUS Node number 247 of x501 is used for internal processing, therefore the setting is not available.



Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display CHANNEL MENU.

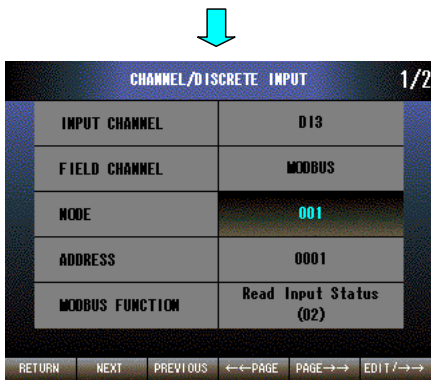


Press [NEXT] (F2) button to select DISCRETE INPUT, press [ENTER] (F6) button to display the CHANNEL/DISCRETE INPUT menu.

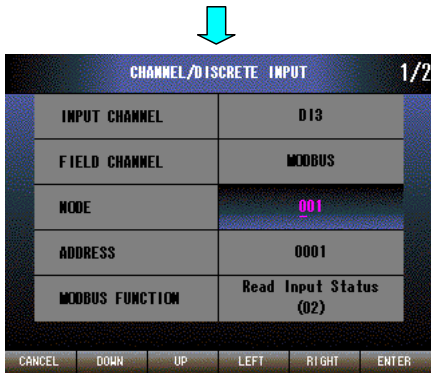


Press [EDIT/→→] (F6) button, choose an INPUT CHANNEL from D11 till D18.





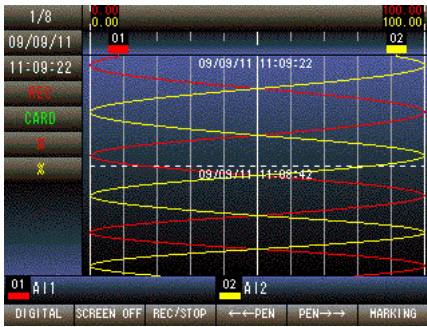
Press [NEXT] (F2) button twice to select NODE. Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.



Press [LEFT] (F4) button to move the cursor to the left digit.  
 Press [RIGHT] (F5) button to move the cursor to the right digit.  
 Press [DOWN] (F2) button to decrease the value of the selected digit.  
 Press [UP] (F3) button to increase the value of the selected digit.  
 Press [CANCEL] (F1) button to disable editing without saving NODE.  
 Press [ENTER] (F6) button to disable editing with saving NODE.

### 10.2.3.3 ADDRESS (MODBUS: 1 – 9999)

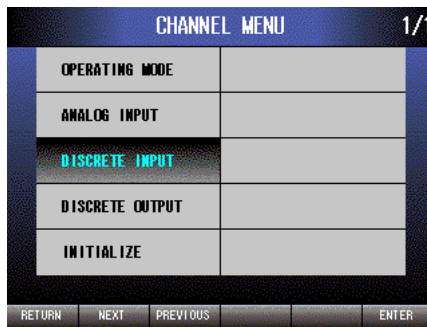
Set the assigned channel's remote I/O address when selecting MODBUS as the FIELD CHANNEL. The available setting range is 1 – 9999.



Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display the CHANNEL MENU.

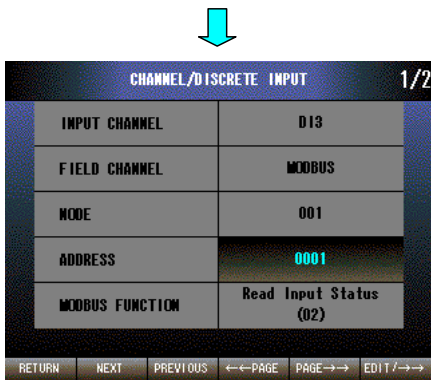


Press [NEXT] (F2) button to select DISCRETE INPUT, press [ENTER] (F6) button to display the CHANNEL/DISCRETE INPUT menu.

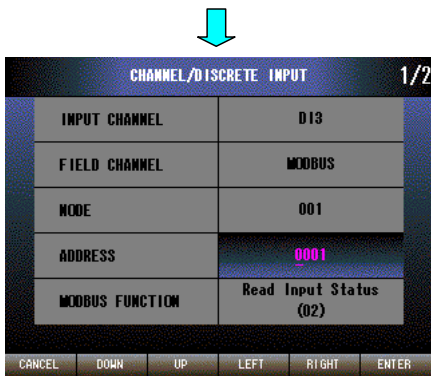


Press [EDIT/→→] (F6) button, choose an INPUT CHANNEL from D11 till D18.





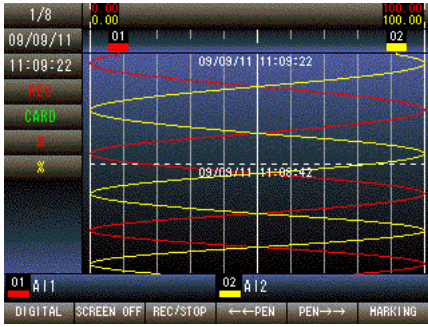
Press [NEXT] (F2) button 3 times to select ADDRESS. Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.



Press [LEFT] (F4) button to move the cursor to the left digit.  
 Press [RIGHT] (F5) button to move the cursor to the right digit.  
 Press [DOWN] (F2) button to decrease the value of the selected digit.  
 Press [UP] (F3) button to increase the value of the selected digit.  
 Press [CANCEL] (F1) button to disable editing without saving ADDRESS.  
 Press [ENTER] (F6) button to disable editing with saving ADDRESS.

### 10.2.3.4 MODBUS FUNCTION (For Modbus: Read Input Status (02) / Read Coil Status (01) 1.4

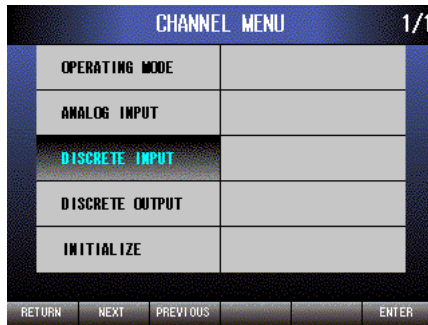
Set the assigned channel's MODBUS FUNCTION when selecting MODBUS as the FIELD CHANNEL.



Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display the CHANNEL MENU.



Press [NEXT] (F2) button to select DISCRETE INPUT, press [ENTER] (F6) button to display the CHANNEL/DISCRETE INPUT menu.



Press [EDIT/→] (F6) button, choose an INPUT CHANNEL from DI1 till DI8.







Press [NEXT] (F2) button to select MODBUS FUNCTION. Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.



Press [←←] (F2) button to set Read Coil Status (01) → Read Input Status (02).

Press [→→] (F3) button to set Read Input Status (02) → Read Coil Status (01).

Press [CANCEL] (F1) button to disable editing without saving MODBUS FUNCTION.

Press [ENTER] (F6) button to disable editing with saving MODBUS FUNCTION.

#### NOTE

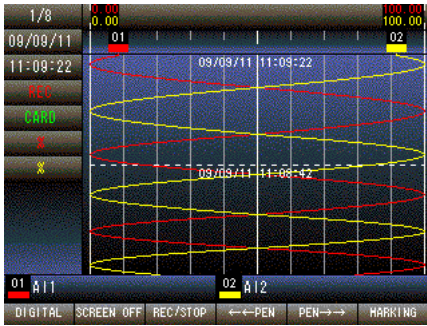
---

Set Read Coil Status (01), only when the 71VR1 communicates with SC200 or SC210.

---

### 10.2.3.5 TAG NAME

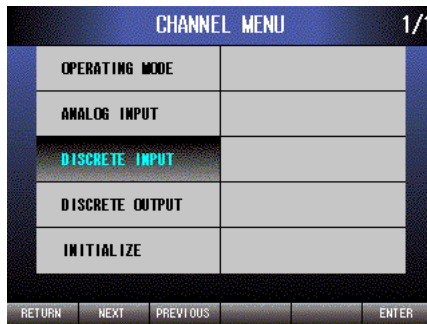
Set the TAG NAME within 8 characters by using the 71VRCFG. The 71VR1 can only display the TAG NAME you set.



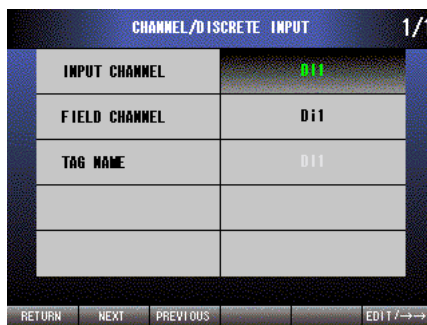
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display the CHANNEL MENU.



Press [NEXT] (F2) button to select DISCRETE INPUT, press [ENTER] (F6) button to display the CHANNEL/DISCRETE INPUT menu.



Press [EDIT/→→] (F6) button, choose an INPUT CHANNEL from DI1 till DI8. The selected channel's tag name is displayed.

## 10.2.4 DISCRETE OUTPUT (DO1 – DO8)

### 10.2.4.1 FIELD CHANNEL (Terminal block/MODBUS)

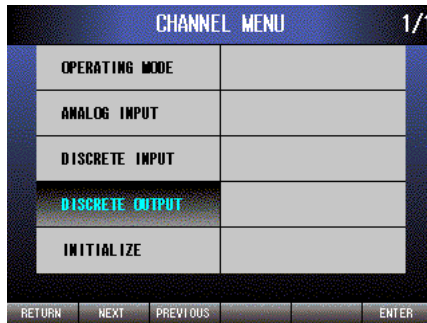
Set a form field channel (Terminal block or MODBUS) which is assigned to DO1 – DO8.



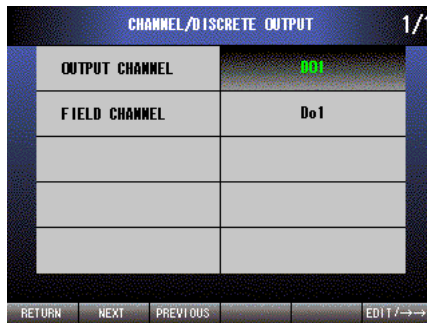
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display the CHANNEL MENU.

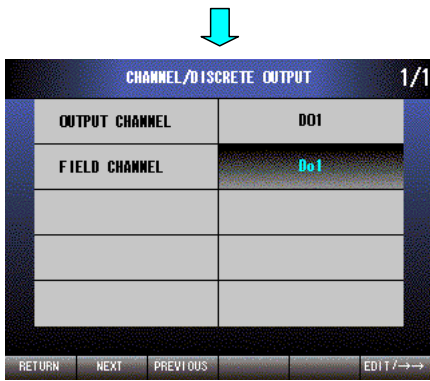


Select DISCRETE OUTPUT, press [ENTER] (F6) button to display CHANNEL/DISCRETE OUTPUT menu.

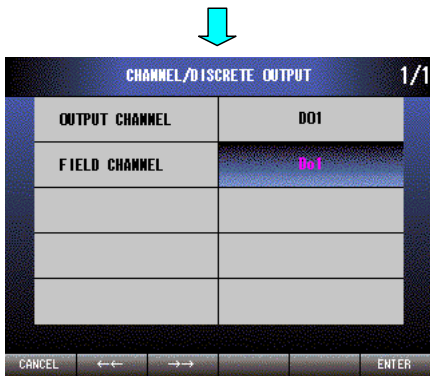


Press [EDIT/→→] (F6) button, choose an OUTPUT CHANNEL from DO1 till DO8.





Press [NEXT] (F2) button to select FIELD CHANNEL. Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.



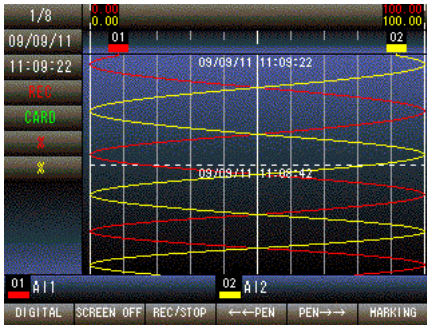
Press [←←] (F2) button to set NONE → MODBUS → Do2 → Do1.  
 Press [→→] (F3) button to set Do1 → Do2 → MODBUS → NONE.  
 Press [CANCEL] (F1) button to disable editing without saving FIELD CHANNEL.  
 Press [ENTER] (F6) button to disable editing with saving FIELD CHANNEL.

### 10.2.4.2 NODE (MODBUS: 1 – 247)

Set the remote I/O NODE number when you selected MODBUS as the FIELD CHANNEL. The available range is 1 – 247.

#### CAUTION !

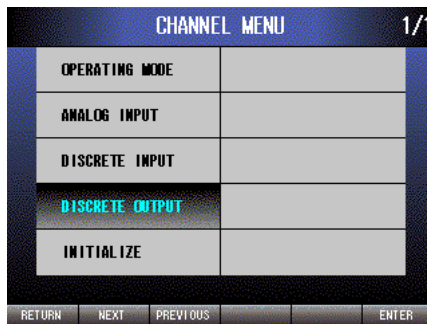
MODBUS Node number 247 of x501 is used for internal processing, therefore the setting is not available.



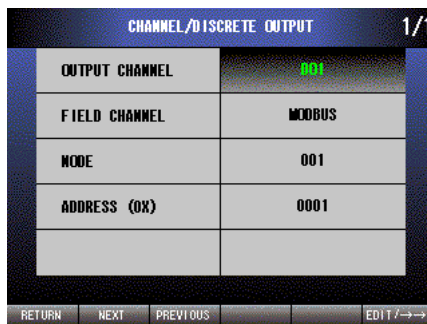
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display the CHANNEL MENU.

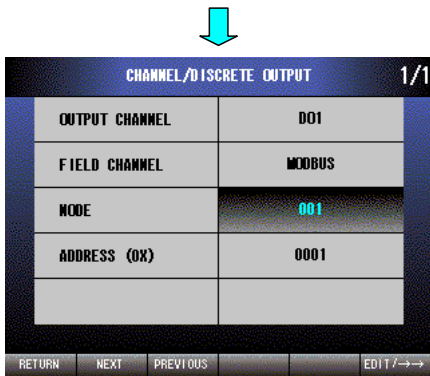


Press [NEXT] (F2) button, select DISCRETE OUTPUT, press [ENTER] (F6) button to display the CHANNEL/DISCRETE OUTPUT menu.

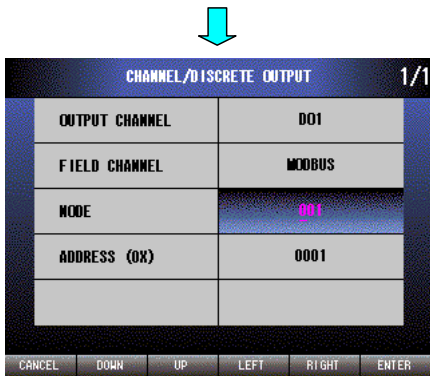


Press [EDIT/→→] (F6) button, choose an OUTPUT CHANNEL you want to set.





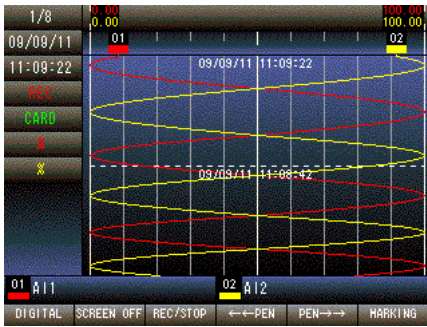
Press [NEXT] (F2) button to select NODE. Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.



Press [LEFT] (F4) button to move the cursor to the left digit.  
 Press [RIGHT] (F5) button to move the cursor to the right digit.  
 Press [DOWN] (F2) button to decrease the value of the selected digit.  
 Press [UP] (F3) button to increase the value of the selected digit.  
 Press [CANCEL] (F1) button to disable editing without saving NODE.  
 Press [ENTER] (F6) button to disable editing with saving NODE.

### 10.2.4.3 ADDRESS (MODBUS)

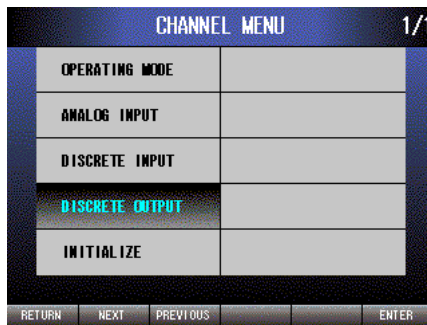
Set the remote I/O ADDRESS number when you selected MODBUS as the FIELD CHANNEL. The setting range is 1 – 9999.



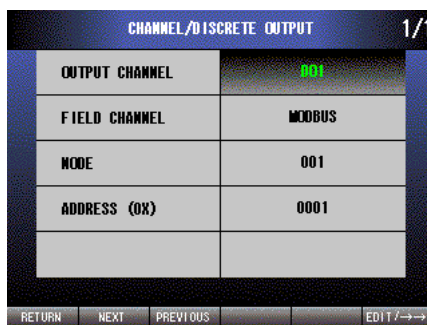
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display the CHANNEL MENU.

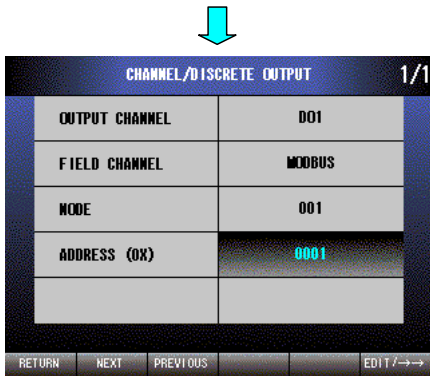


Press [NEXT] (F2) button to select DISCRETE OUTPUT, press [ENTER] (F6) button to display the CHANNEL/DISCRETE OUTPUT menu.

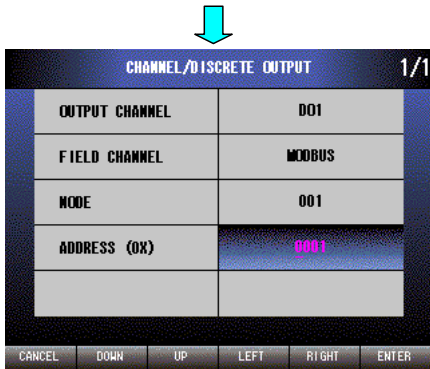


Press [EDIT/→→] (F6) button, choose an OUTPUT CHANNEL you want to set.





Press [NEXT] (F2) button to select ADDRESS. Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.

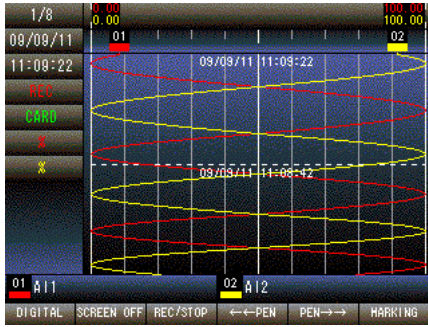


Press [LEFT] (F4) button to move the cursor to the left digit.  
 Press [RIGHT] (F5) button to move the cursor to the right digit.  
 Press [DOWN] (F2) button to decrease the value of the selected digit.  
 Press [UP] (F3) button to increase the value of the selected digit.  
 Press [CANCEL] (F1) button to disable editing without saving ADDRESS.  
 Press [ENTER] (F6) button to disable editing with saving ADDRESS.



### 10.2.5 INITIALIZE (Reset the adjustment value from Terminal Input to the factory setting)

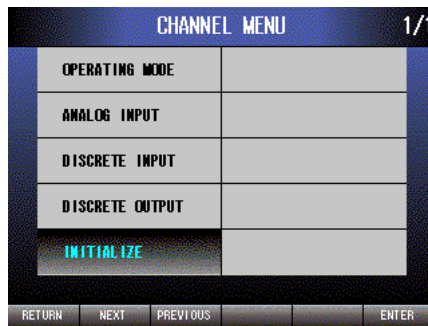
Set the ZERO/SPAN adjustment value back to the factory setting.



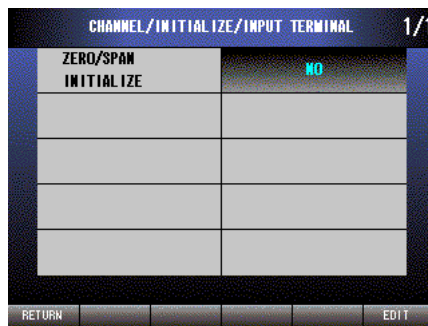
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



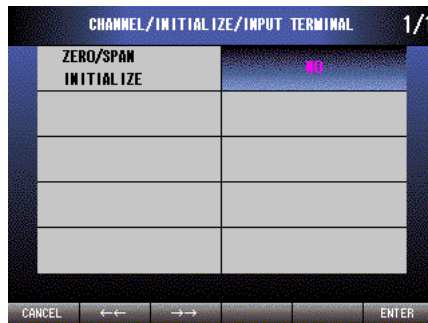
Press [NEXT] (F2) button to select CHANNEL, press [ENTER] (F6) button to display CHANNEL MENU.



Press [NEXT] (F2) button to select INITIALIZE, press [ENTER] (F6) button to display CHANNEL/INITIALIZE/INPUT TERMINAL menu. ZERO/SPAN INITIALIZE is selected.



Press [EDIT] (F6) button to enable editing. The text color changes to magenta.



Press [←←] (F2) button to set YES → NO.

Press [→→] (F3) button to set NO → YES.

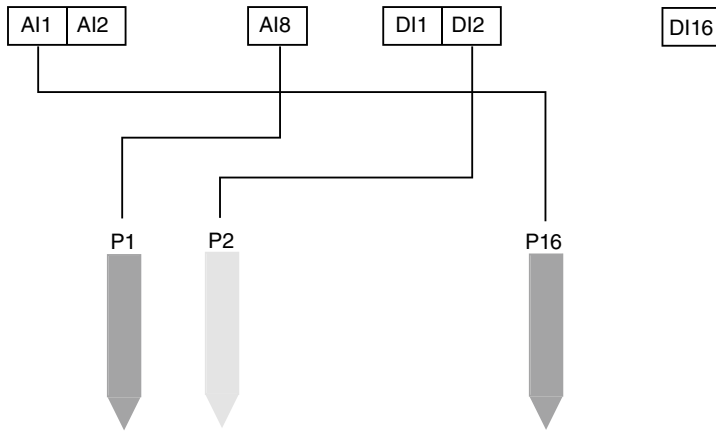
Press [CANCEL] (F1) button to disable editing without saving ZERO/SPAN INITIALIZE.

Press [ENTER] (F6) button to disable editing with saving ZERO/SPAN INITIALIZE.

# 11. PEN

## 11.1 DESCRIPTION

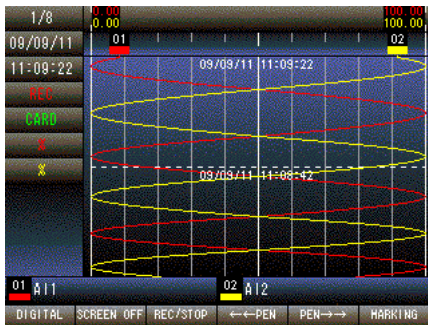
In order to record and display the data which was mapped to the logical channel (AI, DI) in the CHANNEL block, you also need to map it to the PEN.



## 11.2 SETTING

### 11.2.1 INPUT (Input channel selection: AI1 – AI8, DI1 – DI8)

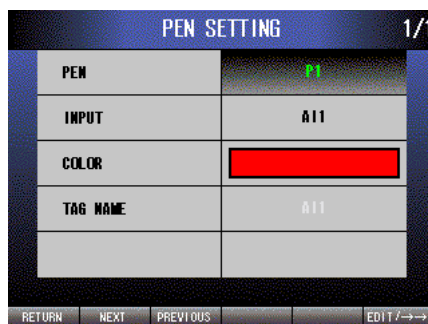
Select the INPUT CHANNEL mapping to the PEN from AI1 to AI8 or DI1 to DI8.



Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.

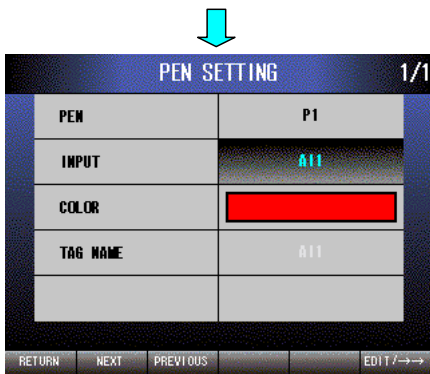


Press [NEXT] (F2) button to select PEN, press [ENTER] (F6) button to display PEN SETTING menu.

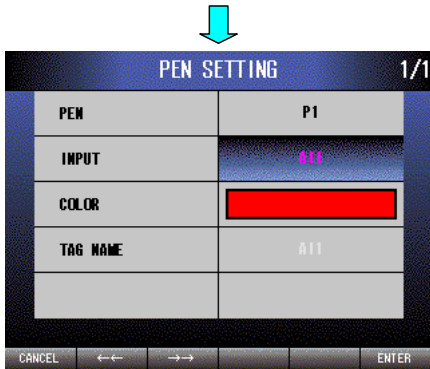


Press [EDIT/→→] (F6) button to select a PEN from P1 to P16.





Press [NEXT] (F2) button to select INPUT. Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.



Press [←←] (F2) button to set NONE → DI8 →... → DI1 → AI8 → ... → AI1.

Press [→→] (F3) button to set AI1 → ... → AI8 → DI1 → ... → DI8 → NONE.

Press [CANCEL] (F1) button to disable editing without saving INPUT.

Press [ENTER] (F6) button to disable editing with saving INPUT.

## 11.2.2 COLOR

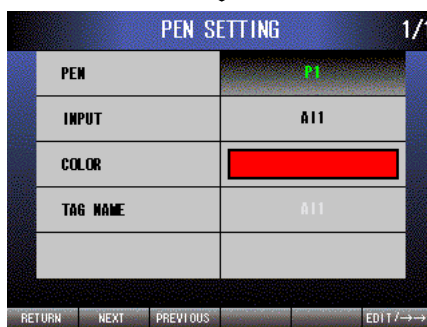
Set the COLOR of a PEN for Trend graph display.



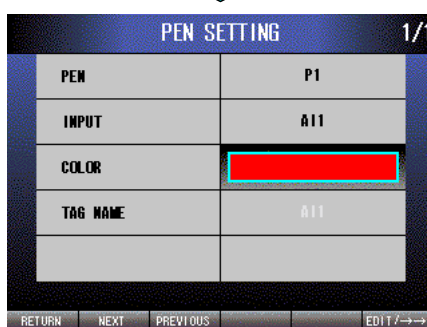
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



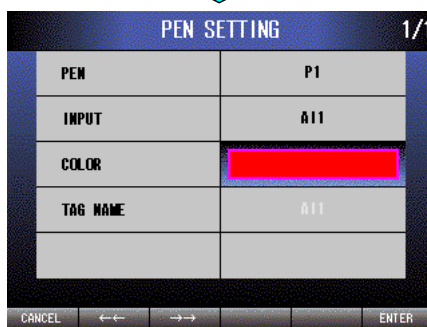
Press [NEXT] (F2) button to select PEN, press [ENTER] (F6) button to display PEN SETTING menu.



Press [EDIT/>] (F6) button to select a PEN from P1 to P16.



Press [NEXT] (F2) button twice to select COLOR. Press [EDIT/>] (F6) button to enable editing.



Press [<<] (F2) or [>>] (F3) button to select a color you like.  
 Press [CANCEL] (F1) button to disable editing without saving COLOR.  
 Press [ENTER] (F6) button to disable editing with saving COLOR.

### 11.2.3 TAG NAME

It is available to display the TAG NAME which was set to the channel (AI, DI) mapping to the PEN. Editing the TAG NAME is not available.

## 12. TRIGGER

### 12.1 DESCRIPTION

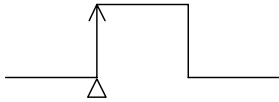
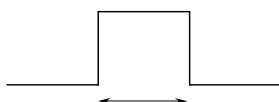
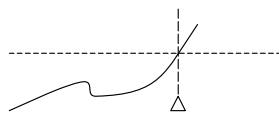
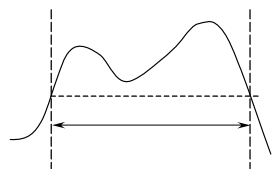
Trigger functions are useful for efficient use of memory area, by saving only necessary trend data. Three trigger conditions, T1 through T3, can be combined in logical AND or OR operations to activate recording. By combining these conditions, not only simple 'under-zone' or 'over-zone' triggers but also more complex 'inside-zone' and 'outside-zone' triggers can be programmed easily.

#### CAUTION !

The channels used for trigger conditions are Not pens, but logical channels defined in the CHANNEL block.

DETECT MODE	DESCRIPTION	
OR	Recording is triggered when one or more of T1, T2 and T3 trigger conditions are true.	
AND	Recording is triggered only when all of T1, T2 and T3 trigger conditions are true.	

TRIGGER TYPE	DESCRIPTION	IMAGE
Manual	Manually starting recording by pressing the button. A pre-defined number of samples (pretrigger and posttrigger) are recorded.	
DI Edge	When a change from ON to OFF or OFF to ON, pre-defined as trigger edge, is detected, a pre-defined number of samples (pretrigger and posttrigger) are recorded.	
DI Level	Recording is started when the trigger DI signal is at the pre-defined trigger level, ON or OFF. After the trigger condition is cancelled, recording continues until the posttrigger number of samples are stored.	
AI Edge	When the trigger AI signal goes over (OVER) or falls under (UNDER) the pre-defined level, a pre-defined number of samples (pretrigger and posttrigger) are recorded.	
AI Level	Recording is started when the trigger AI signal goes over (OVER) or falls under (UNDER) the pre-defined level. After the trigger condition is cancelled, recording continues until the posttrigger number of samples are stored.	

(Setting example 1) Recording is triggered when AI1 > 5 V or AI2 > 5 V.

DETECT MODE: OR

T1 settings: Trigger type: AI level, Mode: OVER, Channel: AI1, Level: 5.000

T2 settings: Trigger type: AI level, Mode: OVER, Channel: AI2, Level: 5.000

(Setting example 2) Recording is triggered when 2 V < AI1 < 5 V.

DETECT MODE: AND

T1 settings: Trigger type: AI level, Mode: OVER, Channel: AI1, Level: 2.000

T2 settings: Trigger type: AI level, Mode: UNDER, Channel: AI1, Level: 5.000

(Setting example 3) Detection of burnout (x501)

Temperature: °C

AI 1: T/C (K)

DETECT MODE: OR

T1 settings: Trigger type: AI level, Mode: OVER, Channel: AI1, Level: 1472.000

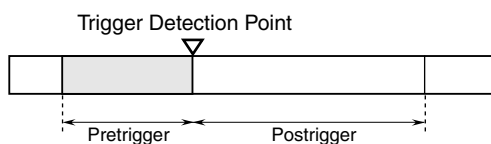
Set the level at the maximum value in the measurement range. The temperature unit is set in TEMPERATURE UNIT. (About the maximum value in the measurement range, see section “10.1.9.3 AVAILABLE RANGE”)

When START TRIGGER RECORDING is selected in CONTROL MENU, the recorder enters the trigger waiting state. REC indicator (red) in the trend screen blinks.

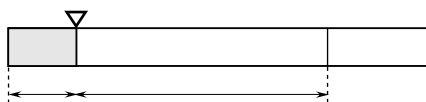
When it records data into a file, REC (red) stops blinking. It restarts blinking when the recorder goes back to the waiting state.

If the trigger conditions are judged true before the pretrigger number of samples are sampled after the trigger recording is initiated, only those already sampled are recorded.

If the trigger conditions are judged true before the posttrigger recording for the previous recording is complete, the posttrigger number of samples from that moment are recorded.



If the trigger conditions are judged true before the posttrigger recording for the previous recording is complete, the posttrigger number of samples from that moment are recorded.

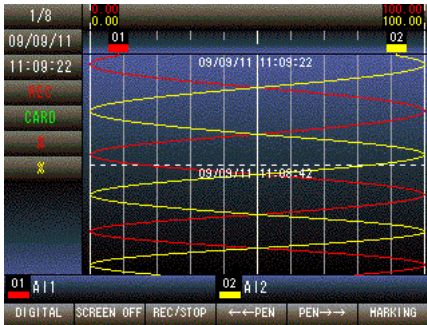


If the trigger conditions are judged true before the pretrigger number of samples are sampled after the trigger recording is initiated, only those already sampled are recorded.

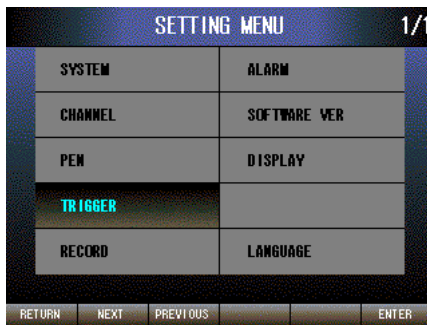
## 12.2 SETTING

### 12.2.1 TRIGGER COMMON SETTING

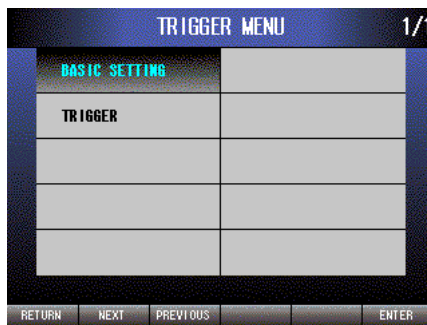
#### 12.2.1.1 DETECT MODE (OR/AND)



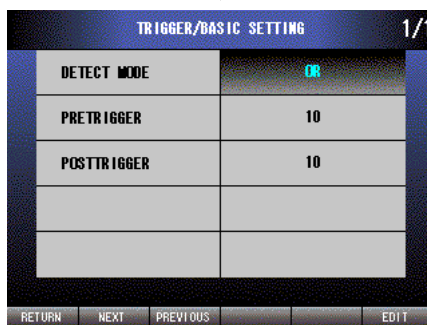
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select TRIGGER. Press [ENTER] (F6) button to display TRIGGER MENU.



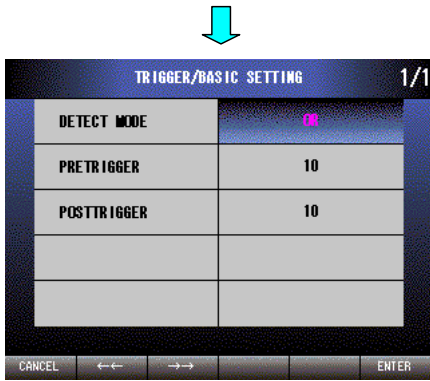
BASIC SETTING is selected. Press [ENTER] (F6) button.



DETECT MODE is selected. Press [EDIT] (F6) button to enable editing. The text color changes to magenta.







Press [←←] (F2) button to set AND → OR.

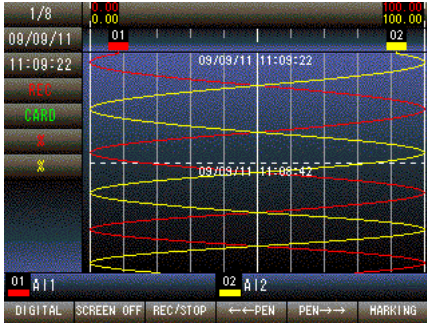
Press [→→] (F3) button to set OR → AND.

Press [CANCEL] (F1) button to disable editing without saving DETECT MODE.

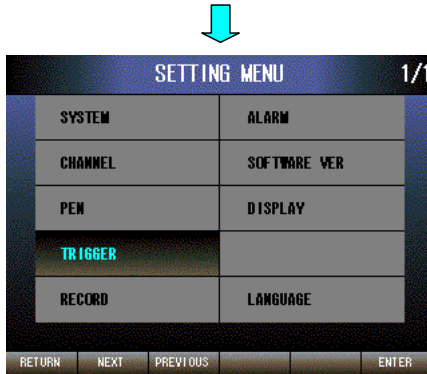
Press [ENTER] (F6) button to disable editing with saving DETECT MODE.

### 12.2.1.2 PRETRIGGER (0 – 99 samples)

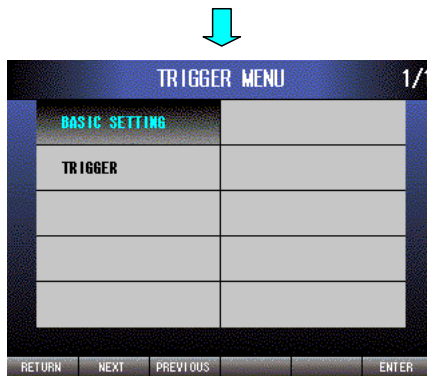
Set the recording sample number (pretrigger) before detecting trigger.



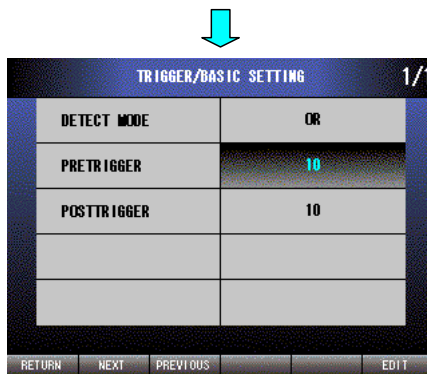
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



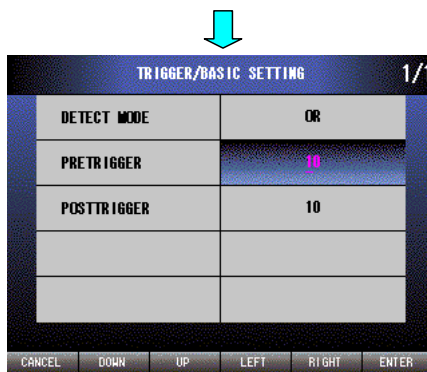
Press [NEXT] (F2) button to select TRIGGER. Press ENTER (F6) button to display TRIGGER MENU.



BASIC SETTING is selected. Press [ENTER] (F6) button.



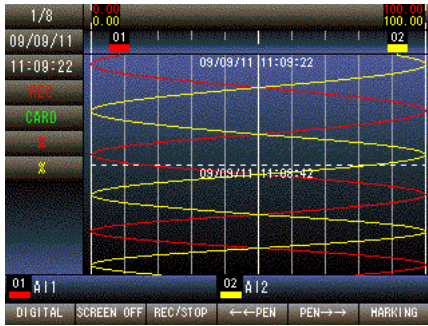
Press [NEXT] (F2) button to select PRETRIGGER. Press [EDIT] (F6) button to enable editing. The text color changes to magenta.



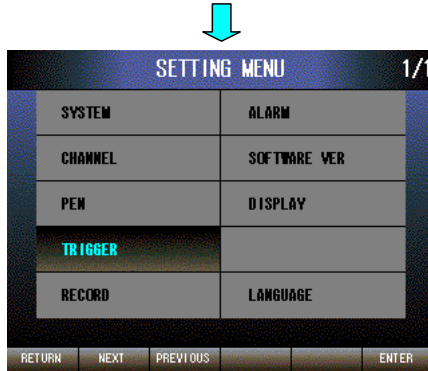
Press [LEFT] (F4) button to move the cursor to the left digit.  
 Press [RIGHT] (F5) button to move the cursor to the right digit.  
 Press [DOWN] (F2) button to decrease the value of the selected digit.  
 Press [UP] (F3) button to increase the value of the selected digit.  
 Press [CANCEL] (F1) button to disable editing without saving PRETRIGGER.  
 Press [ENTER] (F6) button to disable editing with saving PRETRIGGER.

### 12.2.1.3 POSTTRIGGER (0 – 99 samples)

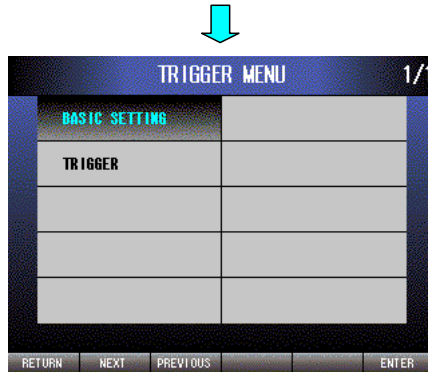
Set the recording sample number (posttrigger) after detecting trigger.



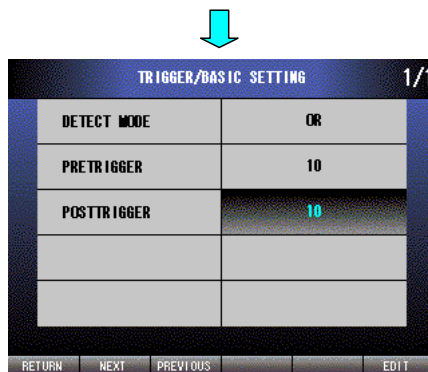
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



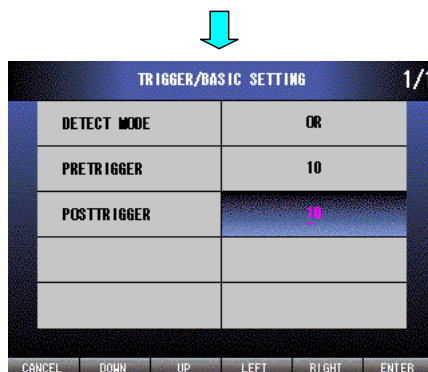
Press [NEXT] (F2) button to select TRIGGER. Press [ENTER] (F6) button to display TRIGGER MENU.



BASIC SETTING is selected. Press [ENTER] (F6) button.



Press [NEXT] (F2) button to select POSTTRIGGER. Press [EDIT] (F6) button to enable editing. The text color changes to magenta.

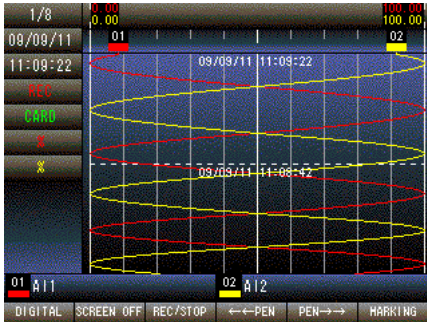


Press [LEFT] (F4) button to move the cursor to the left digit.  
 Press [RIGHT] (F5) button to move the cursor to the right digit.  
 Press [DOWN] (F2) button to decrease the value of the selected digit.  
 Press [UP] (F3) button to increase the value of the selected digit.  
 Press [CANCEL] (F1) button to disable editing without saving POSTTRIGGER.  
 Press [ENTER] (F6) button to disable editing with saving POSTTRIGGER.

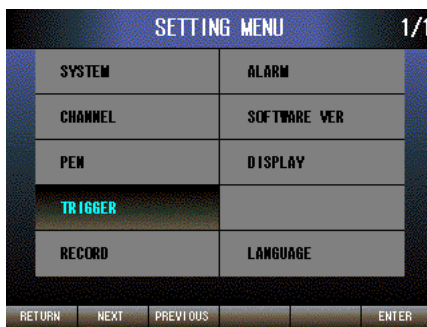
## 12.2.2 TRIGGER

### 12.2.2.1 TRIGGER CONDITION (DI edge / DI level / AI edge / AI level / None)

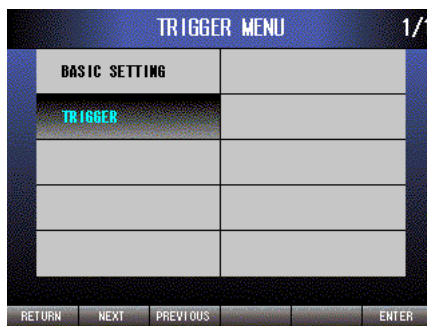
Set the trigger condition. Settings are done individually for T1 through T3. AI edge and AI level are analog trigger, DI edge and DI level are digital trigger.



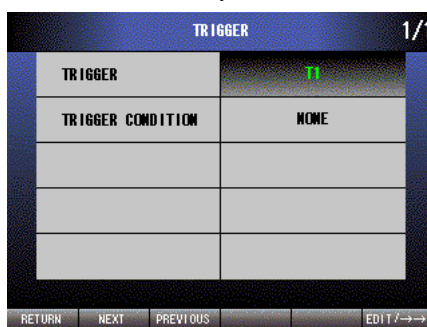
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select TRIGGER. Press [ENTER] (F6) button to display TRIGGER MENU.

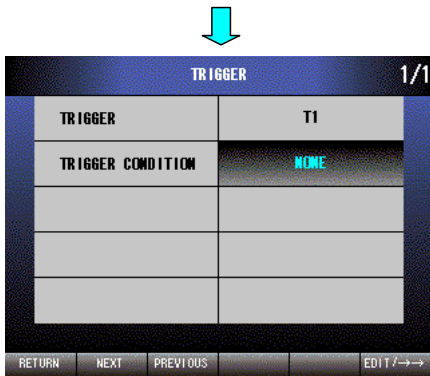


Press [NEXT] (F2) button to select TRIGGER and press [ENTER] (F6) button.

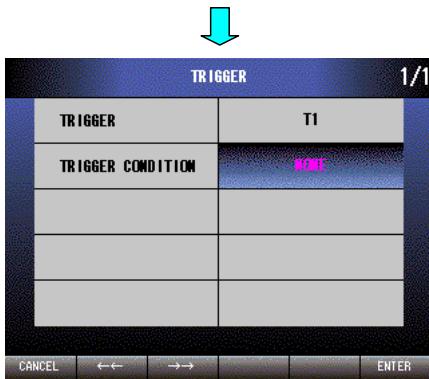


Select desired trigger T1 through T3 by pressing [EDIT/→→] (F6) button. Press [NEXT] (F2) button to select TRIGGER CONDITION.





Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.



Press [←←] (F2) button to set NONE → AI LEVEL → AI EDGE → DI LEVEL → DI EDGE.

Press [→→] (F3) button to set DI EDGE → DI LEVEL → AI EDGE → AI LEVEL → NONE.

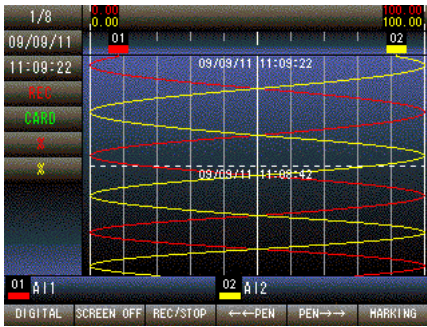
Press [CANCEL] (F1) button to disable editing without saving TRIGGER CONDITION.

Press [ENTER] (F6) button to disable editing with saving TRIGGER CONDITION.

### 12.2.2.2 MODE (UNDER/OVER, ON/OFF)

Set the trigger mode. Settings are done individually for T1 through T3.

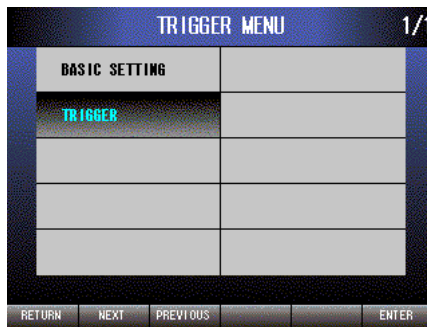
[Case of Analog trigger]



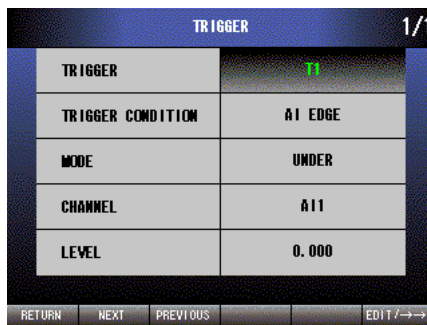
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select TRIGGER. Press [ENTER] (F6) button to display TRIGGER MENU.

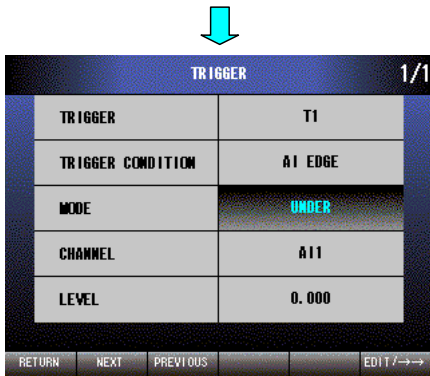


Press [NEXT] (F2) button to select TRIGGER and press [ENTER] (F6) button.

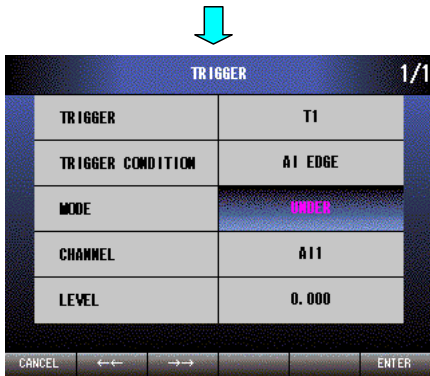


Select desired trigger T1 through T3 by pressing [EDIT/→→] (F6) button. When TRIGGER CONDITION is AI EDGE or AI LEVEL, left screen is shown.



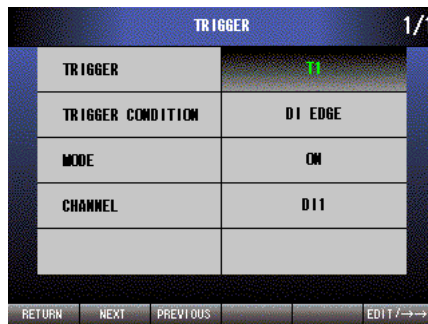
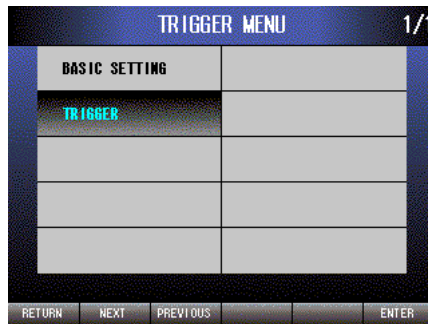


Press [NEXT] (F2) button twice to select MODE. Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.



Press [←←] (F2) button to set OVER → UNDER.  
 Press [→→] (F3) button to set UNDER → OVER.  
 Press [CANCEL] (F1) button to disable editing without saving MODE.  
 Press [ENTER] (F6) button to disable editing with saving MODE.

[Case of Digital trigger]



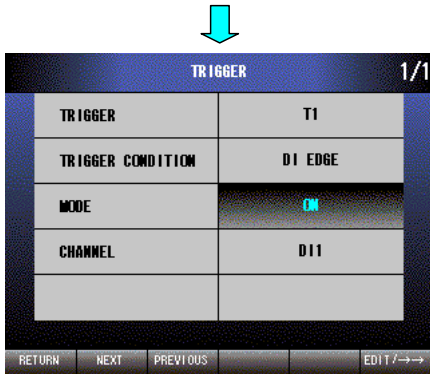
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.

Press [NEXT] (F2) button to select TRIGGER. Press [ENTER] (F6) button to display TRIGGER MENU.

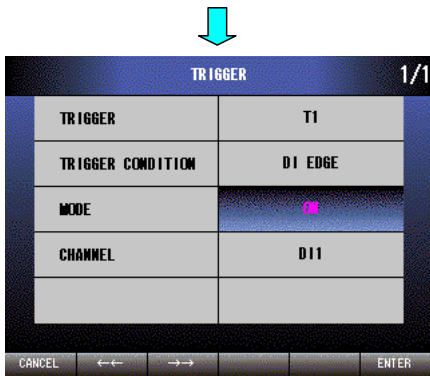
Press [NEXT] (F2) button to select TRIGGER and press [ENTER] (F6) button.

Select desired trigger T1 through T3 by pressing [EDIT/→→] (F6) button. When TRIGGER CONDITION is DI EDGE or DI LEVEL, left screen is shown.





Press [NEXT] (F2) button twice to select MODE. Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.

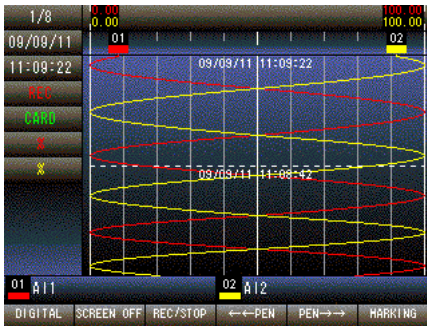


Press [←←] (F2) button to set OFF → ON.  
 Press [→→] (F3) button to set ON → OFF.  
 Press [CANCEL] (F1) button to disable editing without saving MODE.  
 Press [ENTER] (F6) button to disable editing with saving MODE.

### 12.2.2.3 CHANNEL (AI1 – AI8, DI1 – DI8)

Set the trigger channel. Settings are done individually for T1 through T3.

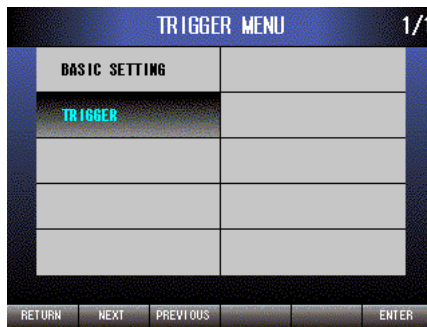
[Case of Analog trigger]



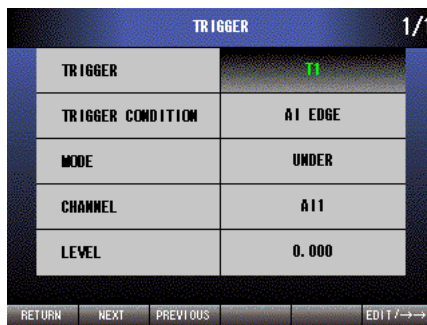
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select TRIGGER. Press [ENTER] (F6) button to display TRIGGER MENU.

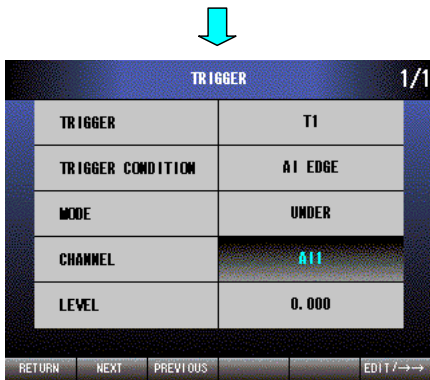


Press [NEXT] (F2) button to select TRIGGER and press [ENTER] (F6) button.

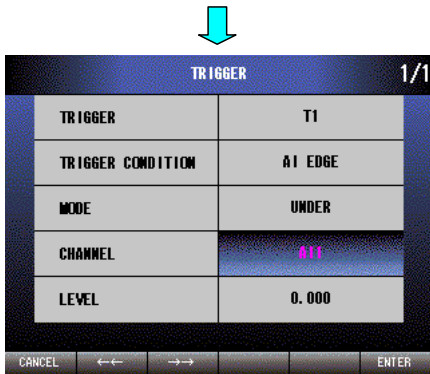


Select desired trigger T1 through T3 by pressing [EDIT/→→] (F6) button. When TRIGGER CONDITION is AI EDGE or AI LEVEL, left screen is shown.



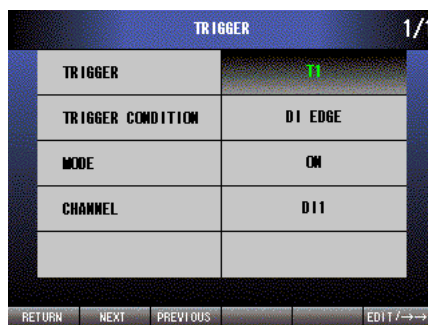
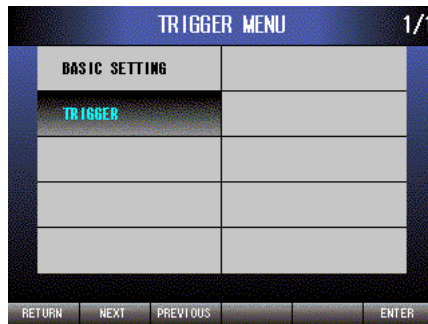


Press [NEXT] (F2) button three times to select CHANNEL. Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.



Press [←←] (F2) button to set AI8 → AI7 → ... → AI2 → AI1.  
 Press [→→] (F3) button to set AI1 → AI2 → ... → AI7 → AI8.  
 Press [CANCEL] (F1) button to disable editing without saving CHANNEL.  
 Press [ENTER] (F6) button to disable editing with saving CHANNEL.

[Case of Digital trigger]

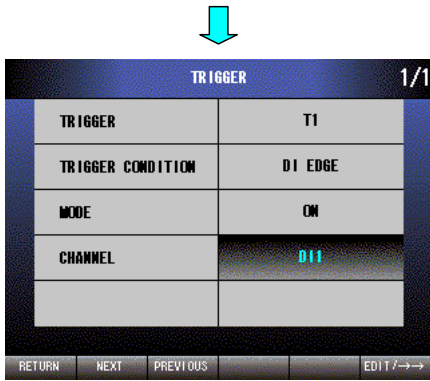


Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.

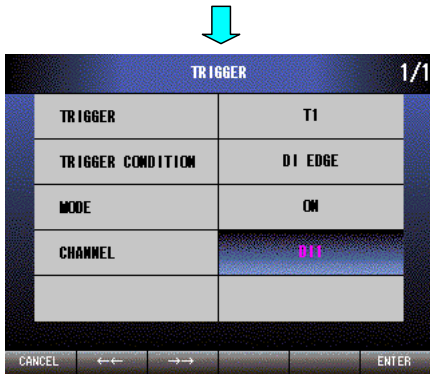
Press [NEXT] (F2) button to select TRIGGER. Press [ENTER] (F6) button to display TRIGGER MENU.

Press [NEXT] (F2) button to select TRIGGER and press [ENTER] (F6) button.

Select desired trigger T1 through T3 by pressing [EDIT/→→] (F6) button. When TRIGGER CONDITION is DI EDGE or DI LEVEL, left screen is shown.



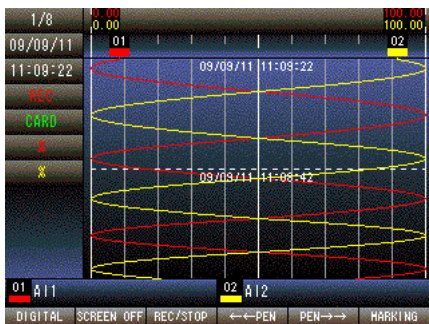
Press [NEXT] (F2) button three times to select CHANNEL. Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.



Press [←←] (F2) button to set DI8 → DI7 → ... → DI2 → DI1.  
 Press [→→] (F3) button to set DI1 → DI2 → ... → DI7 → DI8.  
 Press [CANCEL] (F1) button to disable editing without saving CHANNEL.  
 Press [ENTER] (F6) button to disable editing with saving CHANNEL.

### 12.2.2.4 LEVEL (For analog trigger)

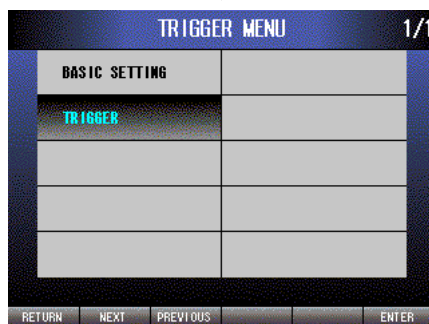
For analog trigger, trigger level is set as engineering unit. Settings are done individually for T1 through T3.



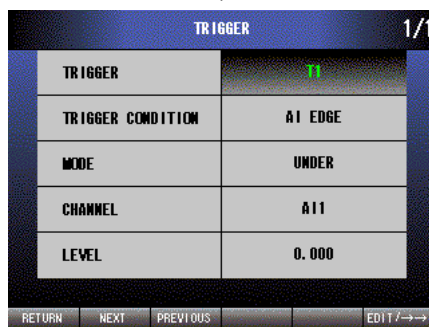
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select TRIGGER. Press [ENTER] (F6) button to display TRIGGER MENU.

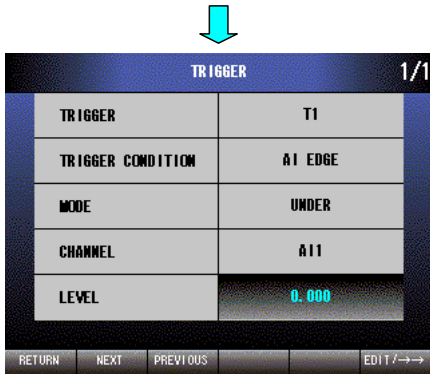


Press [NEXT] (F2) button to select TRIGGER and press [ENTER] (F6) button.

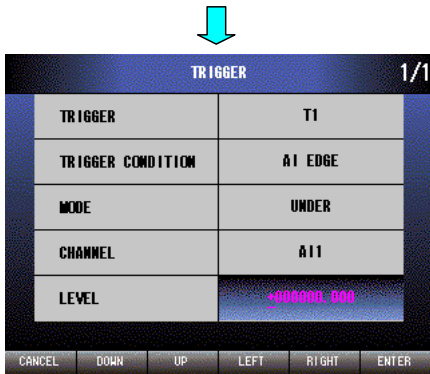


Select desired trigger T1 through T3 by pressing [EDIT/->>] (F6) button. When TRIGGER CONDITION is AI EDGE or AI LEVEL, left screen is shown.





Press [NEXT] (F2) button four times to select LEVEL. Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.



Press [LEFT] (F4) button to move the cursor to the left digit.  
 Press [RIGHT] (F5) button to move the cursor to the right digit.  
 Press [DOWN] (F2) button to decrease the value of the selected digit, or reverse the sign for + or -.  
 Press [UP] (F3) button to increase the value of the selected digit, or reverse the sign for + or -.  
 Press [CANCEL] (F1) button to disable editing without saving LEVEL.  
 Press [ENTER] (F6) button to disable editing with saving LEVEL.

# 13. RECORD

## 13.1 DESCRIPTION

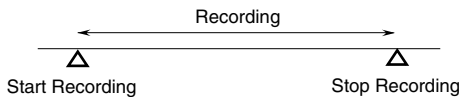
### 13.1.1 GENERAL DESCRIPTION

The 71VR1 can store the data (BIN data) of channels, which are registered in pen block, as a trend waveform data file into a memory card. A trend waveform data file can be converted to CSV format with the 71VRCFG (PC configurator software for Windows), and can be edited with Microsoft Excel.

### 13.1.2 RECORDING TYPE

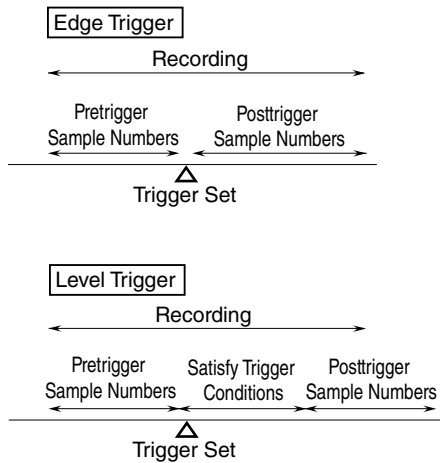
#### 13.1.2.1 CONTINUOUS RECORDING

General operating method. Pressing buttons enable start and stop recording.



#### 13.1.2.2 TRIGGER RECORDING

The 71VR1 becomes recording wait state until trigger condition settings are satisfied. When trigger conditions are satisfied, it starts recording.



### 13.1.3 START AUTOMATIC RECORDING AT THE STARTUP

The recording can be started automatically at the startup.

When START CONTINUOUS RECORDING or START TRIGGER RECORDING is set, the recording is started at the startup with each mode. If a memory card is not inserted, the recording is not started.

### 13.1.4 MARKING

Markings can be added to specific points of trend data while recording. Alphabet 'M' is added to the last column of marked samples when the file is converted into CSV.

Press MARKING button when you want to leave a marking. The data sample immediately after the moment of button operation is marked, with the picture shown below appearing at the center of the screen for approx. 1 second.





### 13.1.5 STORING TREND WAVEFORM DATA INTO A FILE

Trend waveform data are stored into the memory card in the order of pen numbers.

ITEM	DESCRIPTION
File Name	The time stamp of the head of sample is used for a file name. “D” “Year (2-digits)” “Month” “Day” “Time” “Minute” “Second” “Milli-second” *71VR Example: D090305_111048_600.71VR
Samples per File	Maximum number of samples per file. Setting range: 1000 – 60000
Max. Number of Files	Maximum 200 files. Older files are deleted when the number of files is over the limit. See “File management of trend waveform data.”

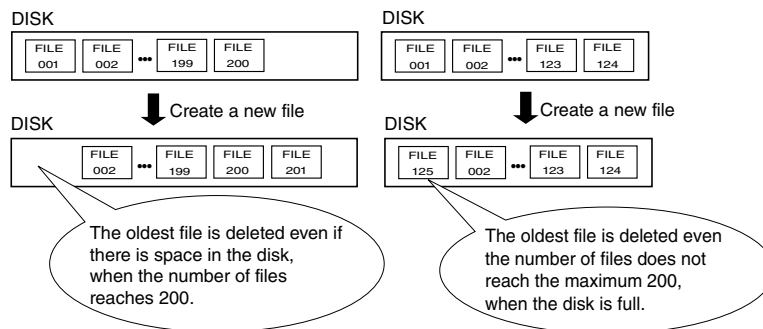
The data folder name differs by suffix code of the recorder.

SUFFIX CODE	FOLDER NAME
x001	\71VR\
x101	
x501	\71VRU\

### 13.1.6 FILE MANAGEMENT

The 71VR1 manages trend data files according to the rules shown below:

- A new file is created when a recording sequence is initiated. It is closed when it stops.
- When the number of recorded data samples reaches the maximum limit, a new file is created to save more data.
- At the maximum of 200 files are managed. When the number of files reaches the maximum limit, the oldest file is deleted to create a new one.
- The oldest file is deleted even while it is accessed in the past trend screen. In such a case, an error message appears when you try to switch to next page in the past trend data.
- Whenever a memory card is recognized, i.e. when the power supply is turned on and/or a card is inserted, file catalog information is created. Files are sorted in the order of time stamps to identify the oldest file. A file created after this moment is always treated as the newest file, so that the file order is not affected by eventual system clock adjustments.
- If more than 200 files exist in the memory card, the first 200 in the order of time stamps are managed.



### 13.1.7 STORING ALARM HISTORY INTO A FILE

ALARM HISTORY created in the alarm block is stored into a file in the memory card.

See the section ALARM.

### 13.1.8 MEMORY CARD

Recordable time of the data into the memory card is shown below. (Number of samples per file: 60000, number of files: 200)

SAMPLE RATE	RECORDING TIME
100 msec.	Approx. 333 hours (13 days)
200 msec.	Approx. 666 hours (27 days)
500 msec.	Approx. 1666 hours (69 days)
1 sec.	Approx. 3333 hours (138 days)
2 sec.	Approx. 6666 hours (277 days)
5 sec.	Approx. 16666 hours (694 days)
10 sec.	Approx. 33333 hours (1388 days)
20 sec. <b>1.4</b>	Approx. 66666 hours (2777 days)
30 sec. <b>1.4</b>	100000 hours (Approx. 4166 days)
1 min. <b>1.4</b>	200000 hours (Approx. 8333 days)
5 min. <b>1.4</b>	1000000 hours (Approx. 41666 days)
10 min. <b>1.4</b>	2000000 hours (Approx. 83333 days)
20 min. <b>1.4</b>	4000000 hours (Approx. 166666 days)
30 min. <b>1.4</b>	6000000 hours (Approx. 250000 days)
1 hour <b>1.4</b>	12000000 hours (Approx. 500000 days)

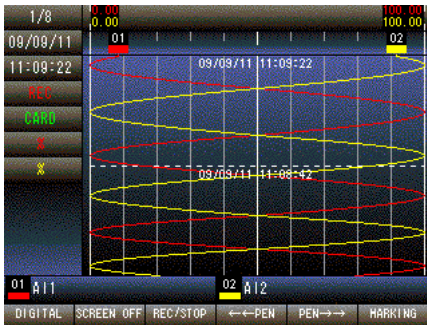
#### CAUTION !

- Use a memory card dedicated to the 71VR1.
- Make sure the lock switch is at the unlock position or the memory card is not recognized.
- It will take longer to recognize a memory card when a large number of files are stored.

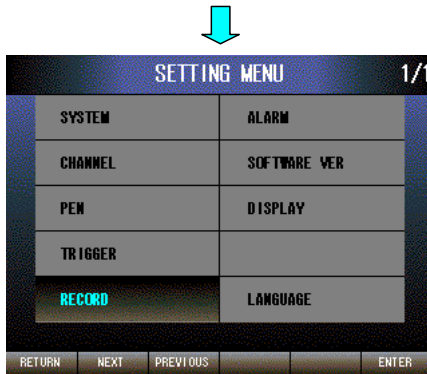
## 13.2 SETTING

### 13.2.1 SAMPLES PER FILE (maximum number of samples per file)

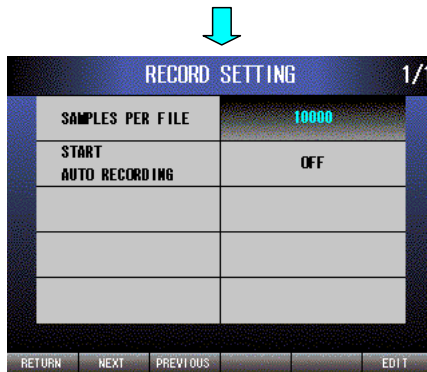
Set the maximum number of samples per file. (range: 1000 – 60000)



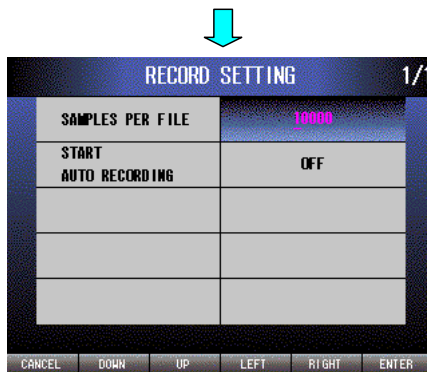
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button four times to select RECORD. Press [ENTER] (F6) button to display RECORD SETTING.

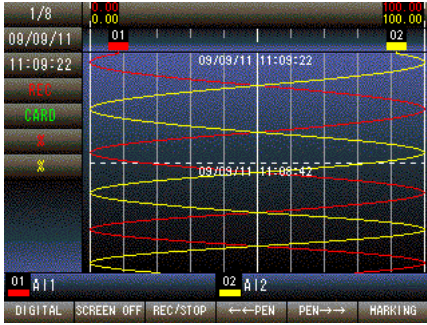


SAMPLES PER FILE is selected. Press [EDIT] (F6) button to enable editing. The text color changes to magenta.



Press [LEFT] (F4) button to move the cursor to the left digit.  
Press [RIGHT] (F5) button to move the cursor to the right digit.  
Press [DOWN] (F2) button to decrease the value of the selected digit.  
Press [UP] (F3) button to increase the value of the selected digit.  
Press [CANCEL] (F1) button to disable editing without saving SAMPLES PER FILE.  
Press [ENTER] (F6) button to disable editing with saving SAMPLES PER FILE.

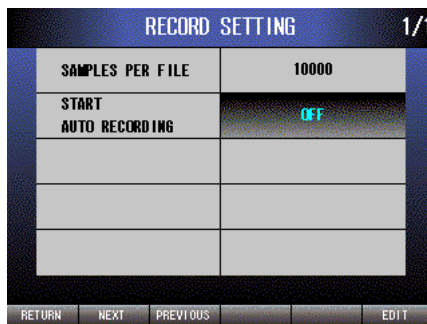
### 13.2.2 START AUTO RECORDING (OFF/START CONTINUOUS RECORDING/START TRIGGER RECORDING)



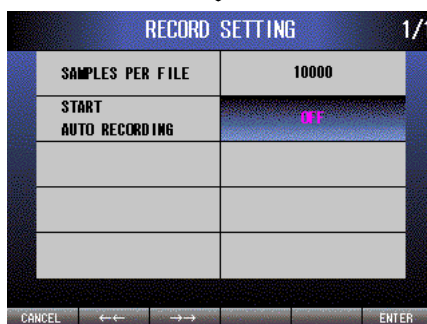
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button four times to select RECORD. Press [ENTER] (F6) button to display RECORD SETTING.



Press [NEXT] (F2) button to select START AUTO RECORDING. Press [EDIT] (F6) button to enable editing. The text color changes to magenta.



Press [←←] (F2) button to set OFF → START CONTINUOUS RECORDING → START TRIGGER RECORDING.

Press [→→] (F3) button to set START TRIGGER RECORDING → START CONTINUOUS RECORDING → OFF.

Press [CANCEL] (F1) button to disable editing without saving START AUTO RECORDING.

Press [ENTER] (F6) button to disable editing with saving START AUTO RECORDING.

# 14. ALARM

## 14.1 GENERAL DESCRIPTIONS

### 14.1.1 FEATURES

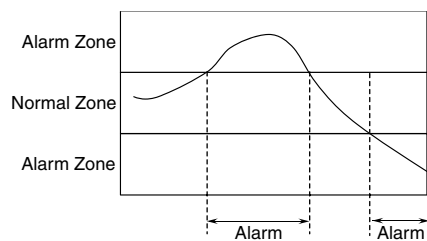
The alarm functions operate independently from the trend data recording. Alarms are triggered, provided to field contact outputs and recorded in the alarm history file even while no data recording is performed. It is important to be aware of this when you need to replace the memory card. Observe a correct procedure to prevent its destruction.

### 14.1.2 ANALOG ALARM

#### 14.1.2.1 DESCRIPTIONS

Alarm functions are independently selectable for each analog input channel (AI1 through AI8). Analog alarm for AI1 is called AA1, AI2 for AA2. Alarm for AI8 is set at AA8.

The full-scale range of an input signal is divided into at the maximum of five zones, with each zone defined as normal or alarm. When the input signal entered an 'alarm' zone, the alarm is triggered. It can be sent to a discrete output channel to alert externally.



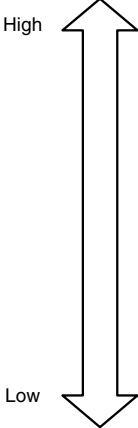
### 14.1.2.2 DETAILS

The number of dividable zones (PARTITIONS) is between 2 and 5. Zone numbers are assigned from the lowest range. For example, when you choose '2' as PARTITIONS, you have Zone 1 and Zone 2.

The boundary of each zone is defined by UPPER LIMIT, specified in an engineering unit value of the input channel. There is no need of specifying the upper limit to the highest range zone.

Specify (1) alarm ID, (2) mode (alarm or normal), (3) upper limit, (4) color for the digital display, and (5) DO channel number if you need to alert externally.

ZONE	SETTING ITEM
Zone 5	CONTACT OUTPUT NONE/DO1 – DO8, COLOR for digital display, NORMAL/ALARM, Alarm name
Zone 4	UPPER LIMIT value (PARTITIONS: 5) CONTACT OUTPUT NONE/DO1 – DO8, COLOR for digital display, NORMAL/ALARM/DEADBAND, Alarm name
Zone 3	UPPER LIMIT value (PARTITIONS: 4 – 5) CONTACT OUTPUT NONE/DO1 – DO8, COLOR for digital display, NORMAL/ALARM/DEADBAND, Alarm name
Zone 2	UPPER LIMIT value (PARTITIONS: 3 – 5) CONTACT OUTPUT NONE/DO1 – DO8, COLOR for digital display, NORMAL/ALARM/DEADBAND, Alarm name
Zone 1	UPPER LIMIT value CONTACT OUTPUT NONE/DO1 – DO8, COLOR for digital display, NORMAL/ALARM, Alarm name



#### NOTE

When an input value is same value as UPPER LIMIT value of each zone, the value is judged as in that zone.

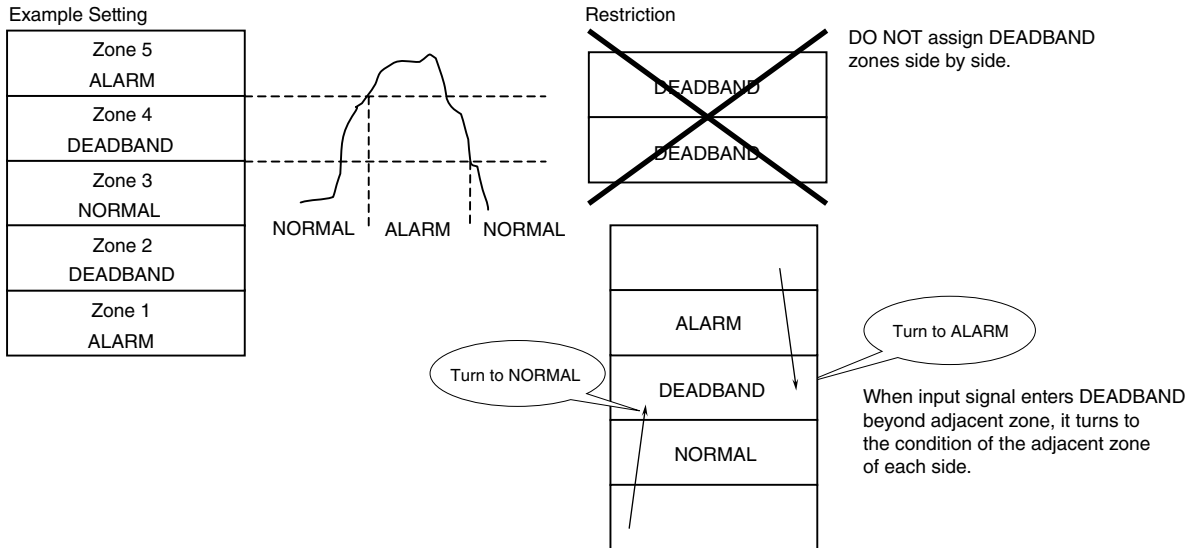
#### CAUTION !

The alarm zones for DC input signals are defined in BIN data, 0 through 10000, while the upper limits are defined by SCALE range. When the scale is very wide and a zone is very narrow, the upper limits defining two adjacent zones could be converted to the same BIN data, which results in a setting error. When this error is shown, review the range and limit values, e.g. narrow the scale range, or widen the zone by setting the upper limit values of the adjacent zones wide apart.

For temperature input signals, similar error could occur because of the rounding off to no or one decimal place. With Celsius and Kelvin unit, BIN data is valid to one decimal place of the input temperature. With Fahrenheit unit, only the integer part is valid. When the temperature values defined as the upper limits of two adjacent zones are rounded off, they could be converted to the same BIN value, which result in a setting error. When this error is shown, review the range and limit values, e.g. narrow the scale range, or widen the zone by setting the upper limit values of the adjacent zones wide apart.

### 14.1.2.3 DEADBAND

Beside NORMAL and ALARM, zones can be defined as DEADBAND. DEADBAND zone has flexible properties, NORMAL or ALARM, depending on those of its adjacent zone. When the input signals enter DEADBAND from ALARM zone, ALARM state is maintained, while it comes from NORMAL zone, NORMAL state is maintained. Naturally you have to have either ALARM or NORMAL zones on both sides of DEADBAND, and you cannot have two DEADBAND zones side by side.



### 14.1.2.4 BURNOUT (x501)

Wire breakdown of temperature sensors is alerted as BURNOUT by setting the alarm as explained below.

Set the maximum temperature value of the selected sensor as the upper limit of the second highest range zone, so that the burnout value (0x7FFF) is contained in the highest range zone, defined as ALARM zone.

(Setting example)

Temperature: °C  
 AI 1: T/C (K)  
 ENABLE/DISABLE: ENABLE  
 PARTITIONS: 3  
 ZONE 1: MODE: NORMAL, UPPER LIMIT: 80.000  
 ZONE 2: MODE: DEADBAND, UPPER LIMIT: 1472.000\*  
 ZONE 3: MODE: ALARM

\*Set UPPER LIMIT at the maximum value in the measurement range. The temperature unit is set in TEMPERATURE UNIT. (About the maximum value in the measurement range, see section "10.1.9.3 AVAILABLE RANGE")

### 14.1.2.5 ALARM OUTPUT

A discrete contact output can be provided for each alarm zone. Assign CONTACT OUTPUT, DO1 through DO8.

- When the input signal is in the ALARM zone, the assigned contact output turns on. When it is out of the zone, it turns off.
- You cannot assign CONTACT OUTPUT to NORMAL zone.
- The contact output functions by logical OR operation when multiple alarms are assigned to one output.

### 14.1.3 DISCRETE ALARM

#### 14.1.3.1 DESCRIPTIONS

Alarm functions are independently selectable for each analog input channel (DI1 through DI8). Discrete alarm for DI1 is called AD1, DI2 for AA2. Alarm for DI8 is set at AD8.

When the input signal turns to the predefined alarm state (TRIGGER MODE: ON or OFF) and remains the same state for the predefined DELAY time, the alarm is triggered. The delay time is applied also when the alarm is to be reset. When the input signal turns to the non-alarm state and remains so for the DELAY time period, the alarm is reset. It can be sent to a discrete output channel to alert externally.

ITEM	DETAILS
ENABLE/DISABLE	ENABLE/DISABLE
ALARM NAME	Enter strings of characters
TRIGGER MODE	ON/OFF
DELAY	Set number of samples (0 – 99)
CONTACT OUTPUT	DO1 – DO8/NONE

#### 14.1.3.2 ALARM OUTPUT

When the alarm is triggered, the assigned contact output turns on. When it is reset, it turns off. The contact output functions by logical OR operation when multiple alarms are assigned to one output.

### 14.1.4 ALARM HISTORY

At the maximum of 200 alarm events are stored in the alarm history file, \71VR\71VR\_Alarm.alm\* in the memory card.

\*\71VRU\71VR\_Alm.alm for the 71VR1-x501.

Alarm event is not stored while the memory card is removed from the card slot.

ITEM	DETAILS
FILE NAME	\71VR\71VR_Alarm.alm (x001/x101) \71VRU\71VR_Alarm.alm (x501)
TIME	Year/Month/Day Time : Minute : Second
TRIGGER CONDITION	SET or CLEAR
TAG NAME	Tag name for input channel
MESSAGE	SET: Alarm name for ALARM zone CLEAR: Alarm name for recovered NORMAL zone

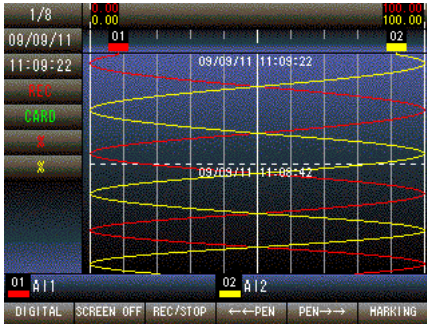


## 14.2 SETTING

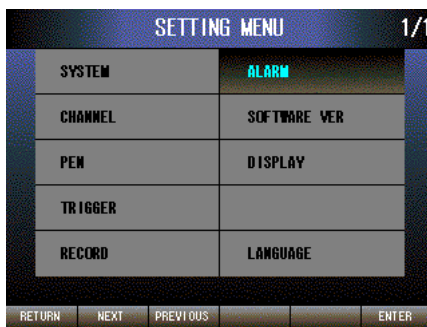
### 14.2.1 ANALOG ALARM

#### 14.2.1.1 ENABLE/DISABLE

Set ENABLE/DISABLE of analog alarm function. Setting is individually done for AA1 through AA8.



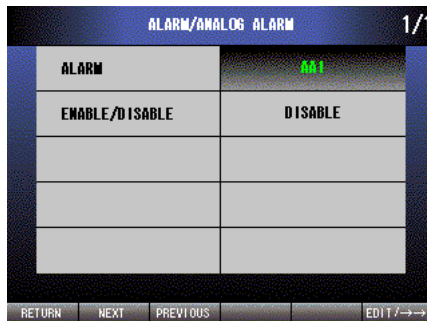
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button five times to select ALARM. Press [ENTER] (F6) button to display ALARM MENU.

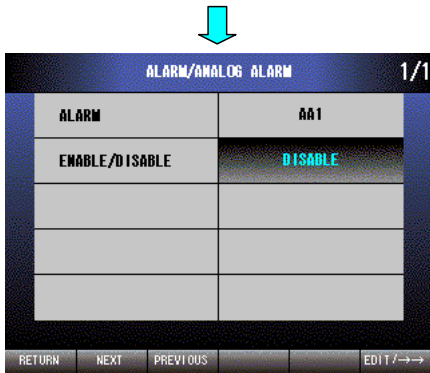


ANALOG ALARM is selected. Press [ENTER] (F6) button to display ALARM/ANALOG ALARM menu.

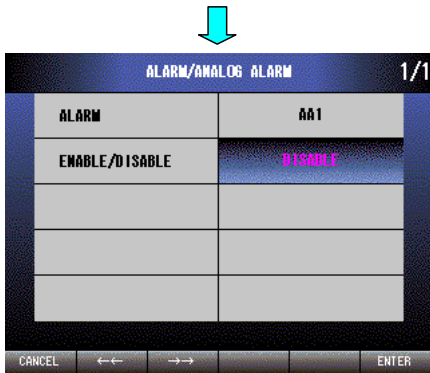


Select desired ALARM AA1 through AA8 by pressing [EDIT/→→] (F6) button.





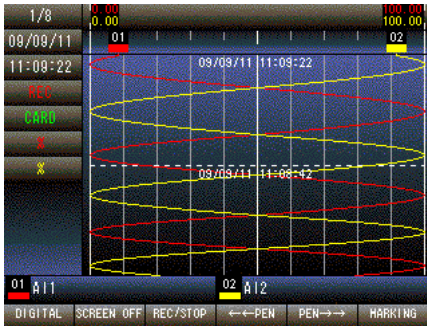
Press [NEXT] (F2) button to select ENABLE/DISABLE. Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.



Press [←←] (F2) button to set DISABLE → ENABLE.  
 Press [→→] (F3) button to set ENABLE → DISABLE.  
 Press [CANCEL] (F1) button to disable editing without saving ENABLE/DISABLE.  
 Press [ENTER] (F6) button to disable editing with saving ENABLE/DISABLE.

### 14.2.1.2 PARTITIONS (2 – 5)

Set PARTITIONS for analog alarm. Setting is individually done for AA1 through AA8.



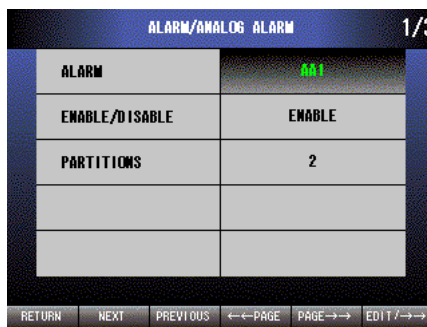
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button five times to select ALARM. Press [ENTER] (F6) button to display ALARM MENU.

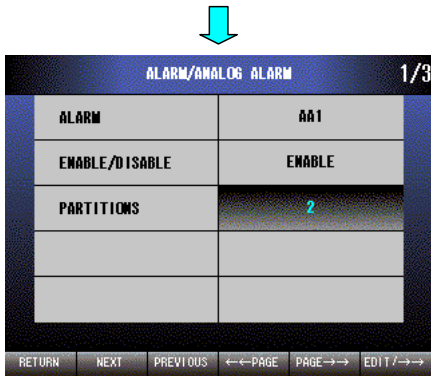


ANALOG ALARM is selected. Press [ENTER] (F6) button to display ALARM/ANALOG ALARM menu.

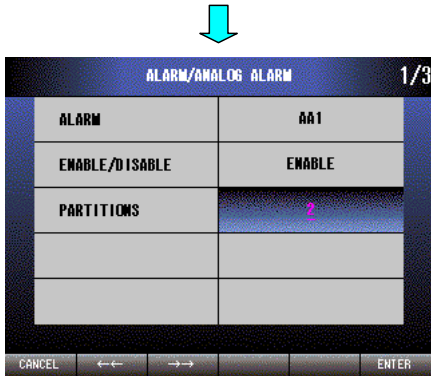


Select desired ALARM AA1 through AA8 by pressing [EDIT/→→] (F6) button.





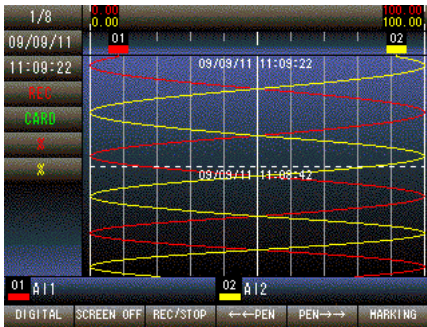
Press [NEXT] (F2) button twice to select PARTITIONS. Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.



Press [←←] (F2) button to set 5 → 4 → 3 → 2.  
 Press [→→] (F3) button to set 2 → 3 → 4 → 5.  
 Press [CANCEL] (F1) button to disable editing without saving PARTITIONS.  
 Press [ENTER] (F6) button to disable editing with saving PARTITIONS.

### 14.2.1.3 ALARM NAME (For alarm use)

Display the name for analog alarm zone. Setting is done with the 71VRCFG for each alarm and zone.



Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



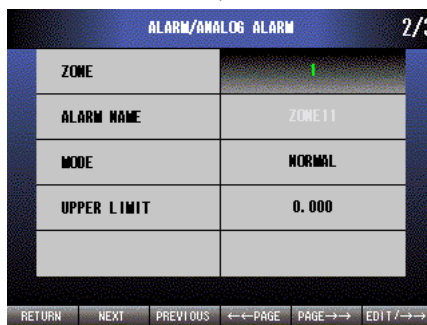
Press [NEXT] (F2) button five times to select ALARM. Press [ENTER] (F6) button to display ALARM MENU.



ANALOG ALARM is selected. Press [ENTER] (F6) button to display ALARM/ANALOG ALARM menu.



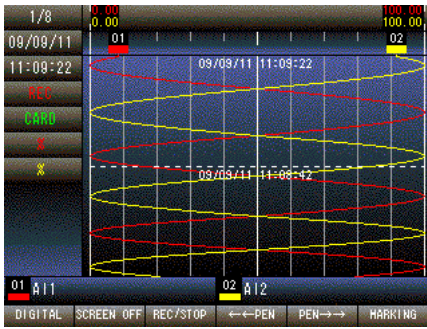
Select desired ALARM AA1 through AA8 by pressing [EDIT/→] (F6) button. Press [PAGE→] (F5) button.



Select desired ZONE according to the PARTITIONS setting, by pressing [EDIT/→] (F6) button, ALARM NAME is displayed accordingly.

#### 14.2.1.4 COLOR (For alarm use, setting alarm zone)

Set background color of digital display when an analog alarm occurs. Setting is done for each alarm and zone.



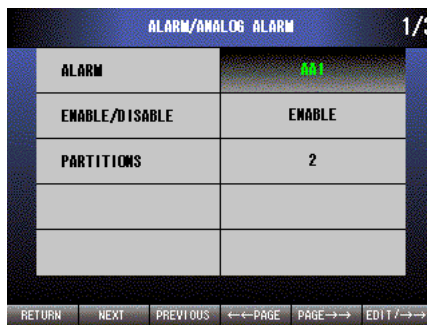
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button five times to select ALARM. Press [ENTER] (F6) button to display ALARM MENU.

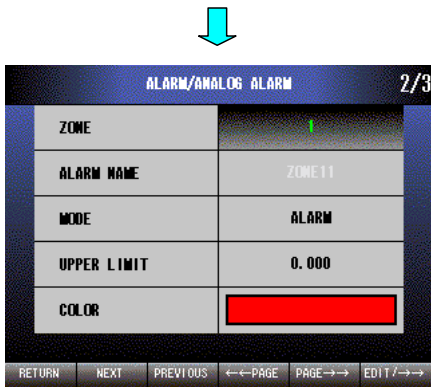


ANALOG ALARM is selected. Press [ENTER] (F6) button to display ALARM/ANALOG ALARM menu.

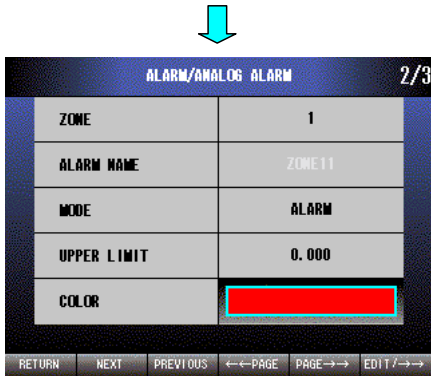


Select desired ALARM AA1 through AA8 by pressing [EDIT/→→] (F6) button. Press [PAGE→→] (F5) button.

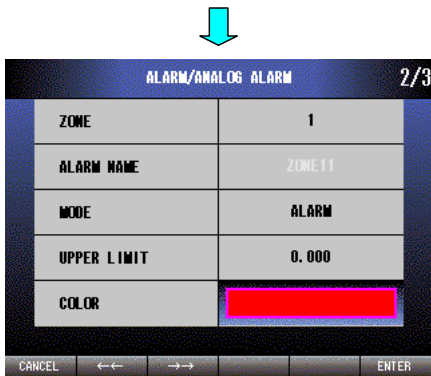




Select desired ZONE according to the PARTITIONS setting, by pressing [EDIT/→→] (F6) button.



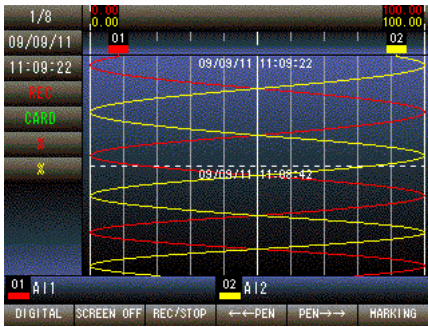
Press [NEXT] (F2) button to select COLOR. Press [EDIT/→→] (F6) button to enable edit color mode.



Press [←←] (F2) or [→→] (F3) button to select a color you like.  
 Press [CANCEL] (F1) button to disable editing without saving COLOR.  
 Press [ENTER] (F6) button to disable editing with saving COLOR.

### 14.2.1.5 MODE (For alarm use: NORMAL/ALARM/DEADBAND)

Set MODE for analog alarm zone. Setting is done for each alarm and zone.



Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button five times to select ALARM. Press [ENTER] (F6) button to display ALARM MENU.



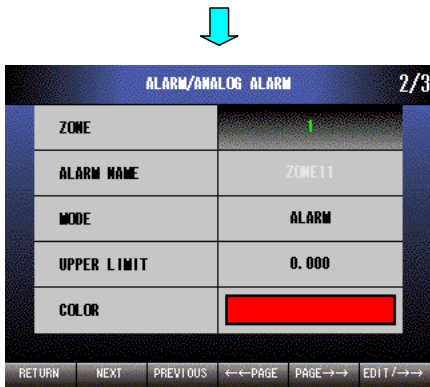
ANALOG ALARM is selected. Press [ENTER] (F6) button to display ALARM/ANALOG ALARM menu.



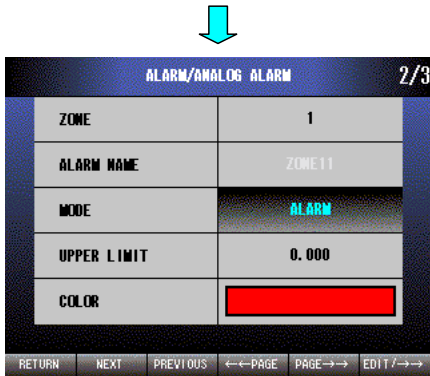
Select desired ALARM AA1 through AA8 by pressing [EDIT/→→] (F6) button. Press [PAGE→→] (F5) button.



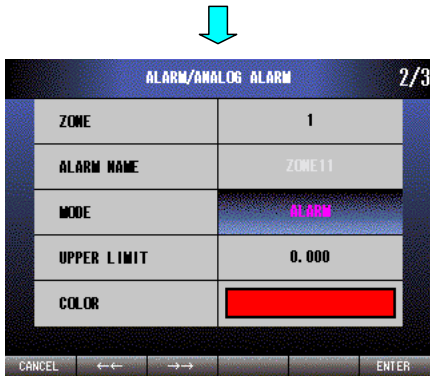




Select desired ZONE according to the PARTITIONS setting, by pressing [EDIT/→→] (F6) button.



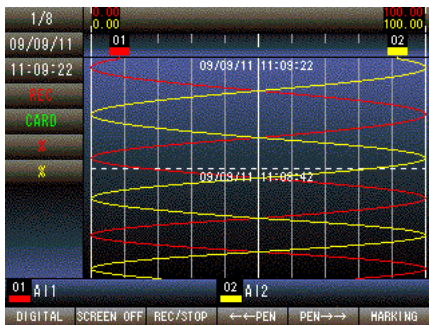
Press [NEXT] (F2) button to select MODE. Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.



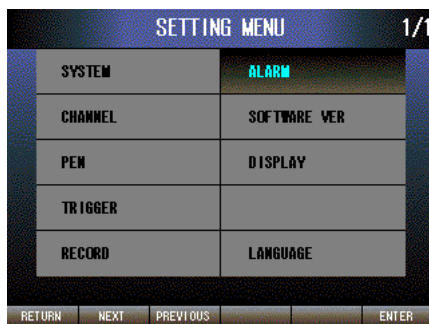
Press [←←] (F2) button to set DEADBAND → ALARM → NORMAL.  
 Press [→→] (F3) button to set NORMAL → ALARM → DEADBAND.  
 Press [CANCEL] (F1) button to disable editing without saving MODE.  
 Press [ENTER] (F6) button to disable editing with saving MODE.

### 14.2.1.6 UPPER LIMIT (For alarm use)

Set UPPER LIMIT for analog alarm zone. Setting is done for each alarm and zone.



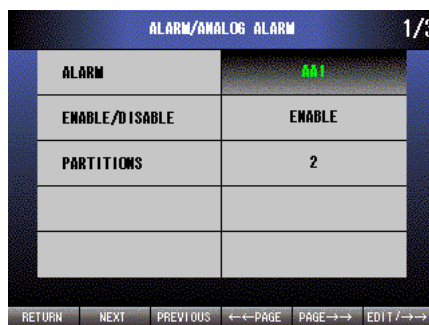
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button five times to select ALARM. Press [ENTER] (F6) button to display ALARM MENU.

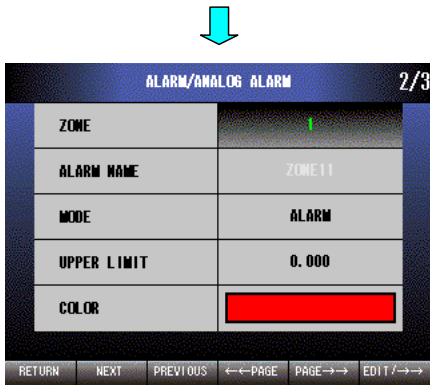


ANALOG ALARM is selected. Press [ENTER] (F6) button to display ALARM/ANALOG ALARM menu.

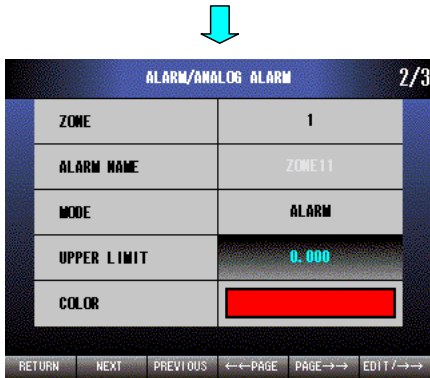


Select desired ALARM AA1 through AA8 by pressing [EDIT/→→] (F6) button. Press [PAGE→→] (F5) button.

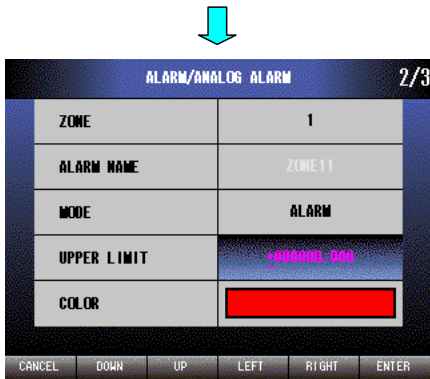




Select desired ZONE according to the PARTITIONS setting, by pressing [EDIT/→→] (F6) button.



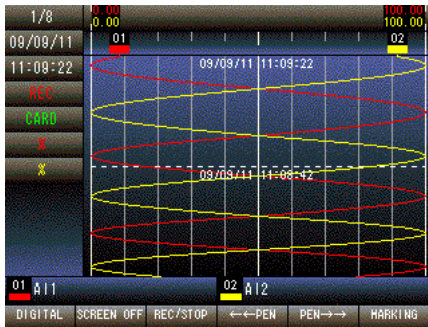
Press [NEXT] (F2) button to select UPPER LIMIT. Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.



Press [LEFT] (F4) button to move the cursor to the left digit.  
 Press [RIGHT] (F5) button to move the cursor to the right digit.  
 Press [DOWN] (F2) button to decrease the value of the selected digit, or reverse the sign for + or -.  
 Press [UP] (F3) button to increase the value of the selected digit, or reverse the sign for + or -.  
 Press [CANCEL] (F1) button to disable editing without saving UPPER LIMIT.  
 Press [ENTER] (F6) button to disable editing with saving UPPER LIMIT.

### 14.2.1.7 CONTACT OUTPUT (For alarm use)

Set CONTACT OUTPUT for analog alarm. Setting is done for each alarm and zone.



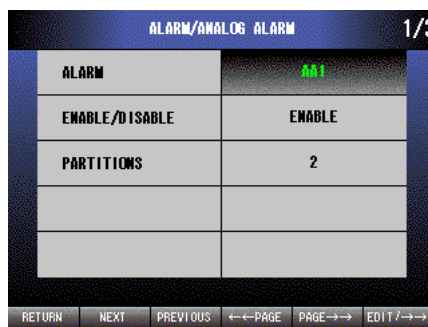
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button five times to select ALARM. Press [ENTER] (F6) button to display ALARM MENU.

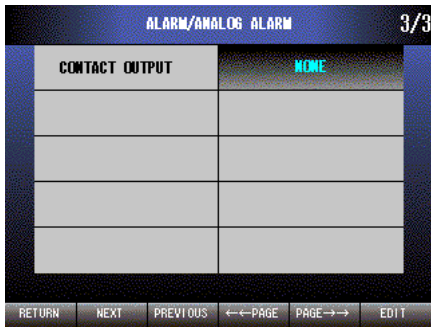


ANALOG ALARM is selected. Press [ENTER] (F6) button to display ALARM/ANALOG ALARM menu.



Select desired ALARM AA1 through AA8 by pressing [EDIT/→] (F6) button. Press [PAGE→] (F5) button twice.





CONTACT OUTPUT is selected. Press [EDIT] (F6) button to enable editing. The text color changes to magenta.



Press [←←] (F2) button to set NONE → DO8 → ... → DO2 → DO1.

Press [→→] (F3) button to set DO1 → DO2 → ... → DO8 → NONE.

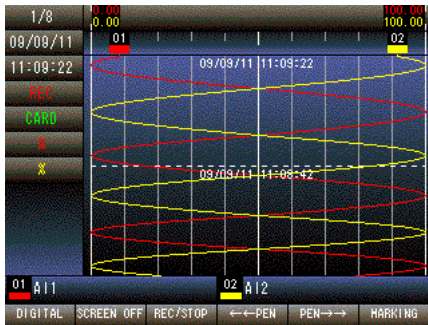
Press [CANCEL] (F1) button to disable editing without saving CONTACT OUTPUT.

Press [ENTER] (F6) button to disable editing with saving CONTACT OUTPUT.

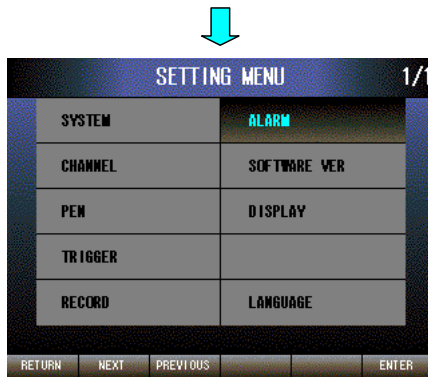
## 14.2.2 DISCRETE ALARM

### 14.2.2.1 ENABLE/DISABLE

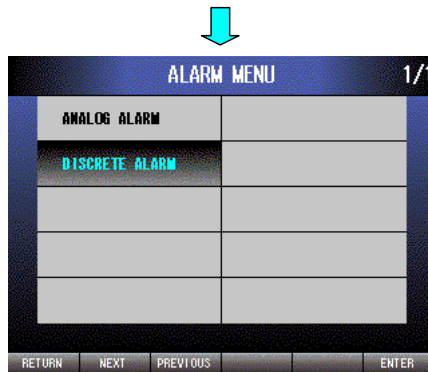
Set ENABLE/DISABLE of discrete alarm function. Setting is individually done for AD1 through AD8.



Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



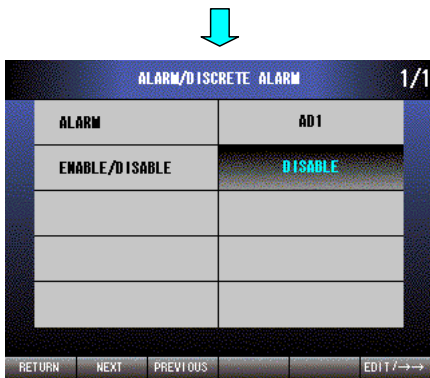
Press [NEXT] (F2) button five times to select ALARM. Press [ENTER] (F6) button to display ALARM MENU.



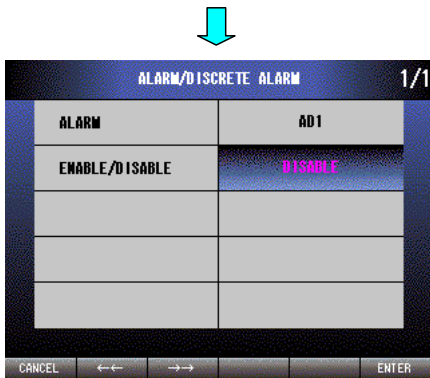
Press [NEXT] (F2) button to select DISCRETE ALARM and press [ENTER] (F6) button to display ALARM/DISCRETE ALARM menu.



Select desired ALARM AD1 through AD8 by pressing [EDIT/→→] (F6) button.



Press [NEXT] (F2) button to select ENABLE/DISABLE. Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.



Press [←←] (F2) button to set DISABLE → ENABLE.  
 Press [→→] (F3) button to set ENABLE → DISABLE.  
 Press [CANCEL] (F1) button to disable editing without saving ENABLE/DISABLE.  
 Press [ENTER] (F6) button to disable editing with saving ENABLE/DISABLE.

### 14.2.2.2 ALARM NAME (For alarm use)

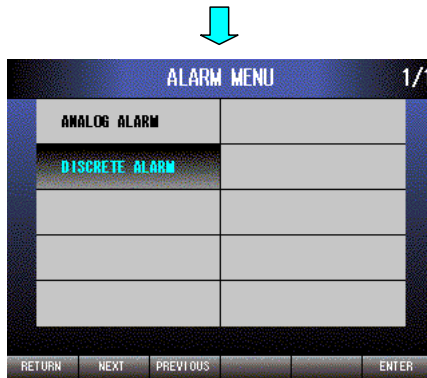
Display the name for discrete alarm. Setting is done by the 71VRCFG for each alarm.



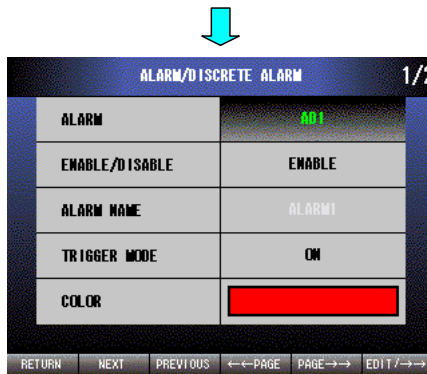
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button five times to select ALARM. Press [ENTER] (F6) button to display ALARM MENU.



Press [NEXT] (F2) button to select DISCRETE ALARM and press [ENTER] (F6) button to display ALARM/DISCRETE ALARM menu.

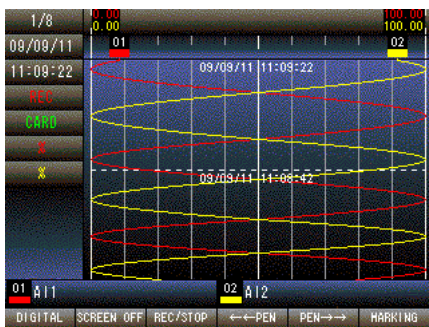


The entered alarm name is displayed at ALARM NAME, when ENABLE/DISABLE is set to ENABLE.



### 14.2.2.3 COLOR (For alarm use)

Set background color of DIGITAL display when a discrete alarm occurs. Setting is done for each alarm.



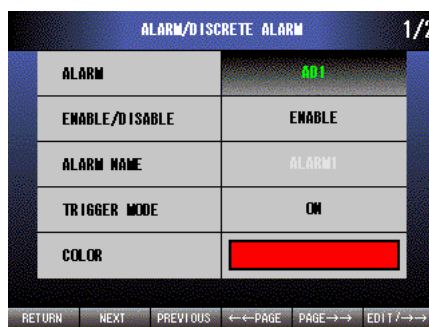
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button five times to select ALARM. Press [ENTER] (F6) button to display ALARM MENU.

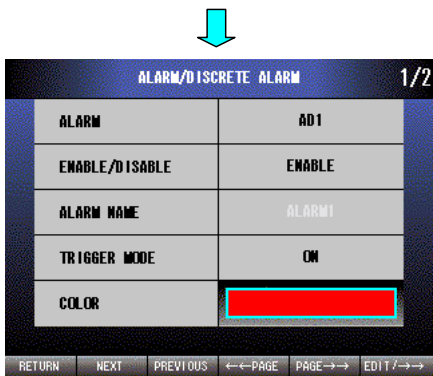


Press [NEXT] (F2) button to select DISCRETE ALARM and press [ENTER] (F6) button to display ALARM/DISCRETE ALARM menu.

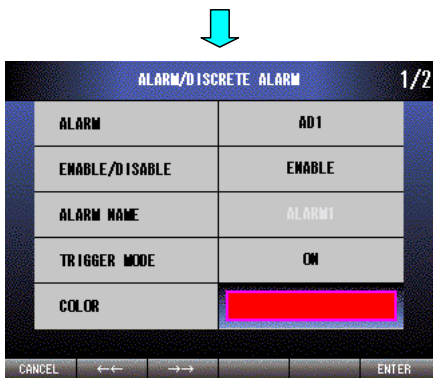


Select desired ALARM AD1 through AD8 by pressing [EDIT/→→] (F6) button.





Press [NEXT] (F2) button to select COLOR. Press [EDIT/→→] (F6) button to enable edit color mode.



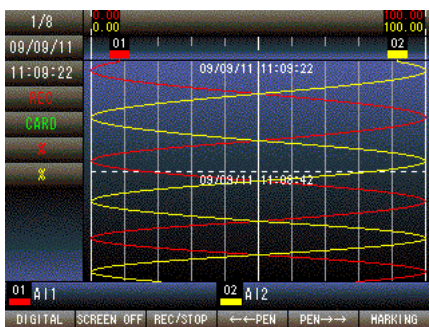
Press [←←] (F2) or [→→] (F3) button to select a color you like.

Press [CANCEL] (F1) button to disable editing without saving COLOR.

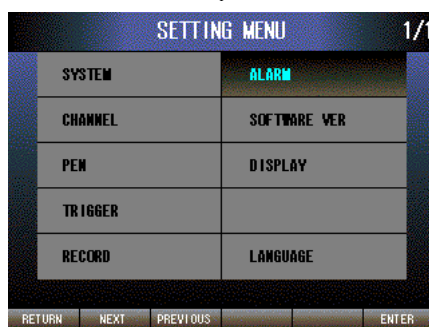
Press [ENTER] (F6) button to disable editing with saving COLOR.

#### 14.2.2.4 TRIGGER MODE (For alarm use: ON/OFF)

For discrete alarm, select ON/OFF of TRIGGER MODE for corresponding contact input.



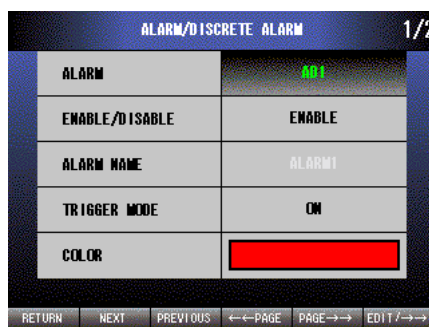
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button five times to select ALARM. Press [ENTER] (F6) button to display ALARM MENU.

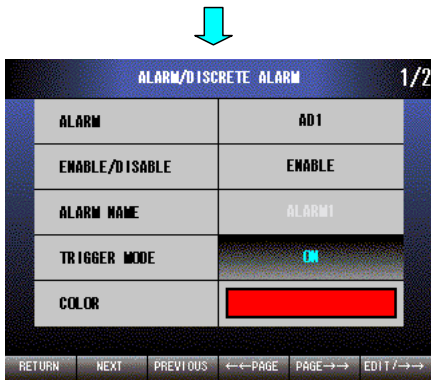


Press [NEXT] (F2) button to Select DISCRETE ALARM and press [ENTER] (F6) button to display ALARM/DISCRETE ALARM menu.

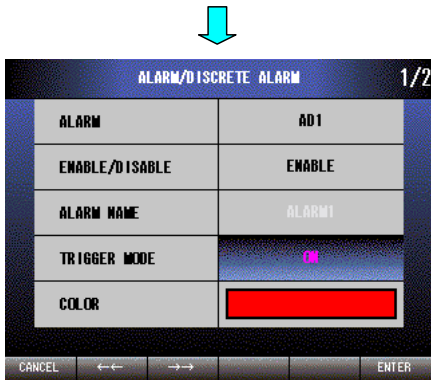


Select desired ALARM AD1 through AD8 by pressing [EDIT/→→] (F6) button.





Press [NEXT] (F2) button to select TRIGGER MODE. Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.



Press [←←] (F2) button to set OFF → ON.

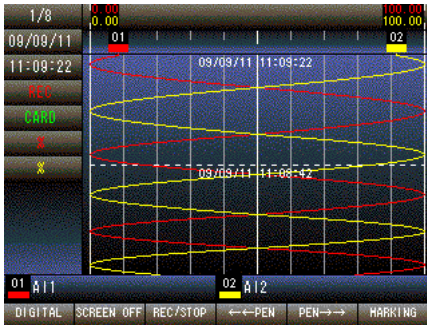
Press [→→] (F3) button to set ON → OFF.

Press [CANCEL] (F1) button to disable editing without saving TRIGGER MODE.

Press [ENTER] (F6) button to disable editing with saving TRIGGER MODE.

### 14.2.2.5 DELAY (For alarm use: 0 – 99 samples)

For discrete alarm, set the sample numbers to specify the DELAY time.



Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button five times to select ALARM. Press [ENTER] (F6) button to display ALARM MENU.

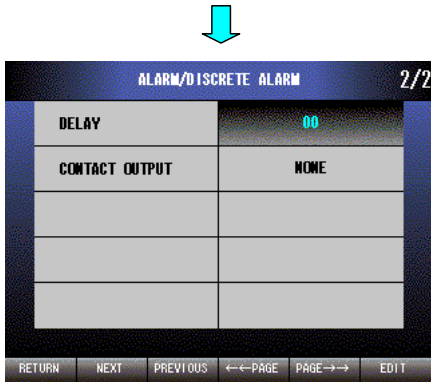


Press [NEXT] (F2) button to Select DISCRETE ALARM and press [ENTER] (F6) button to display ALARM/DISCRETE ALARM menu.

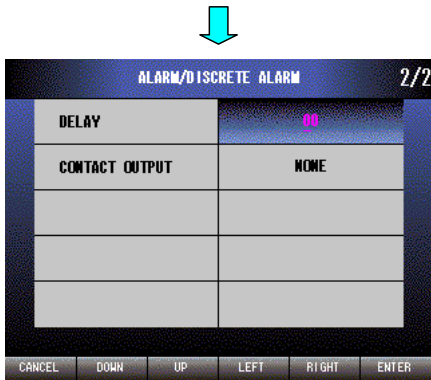


Select desired ALARM AD1 through AD8 by pressing [EDIT/→→] (F6) button. Press [PAGE→→] (F5) button.





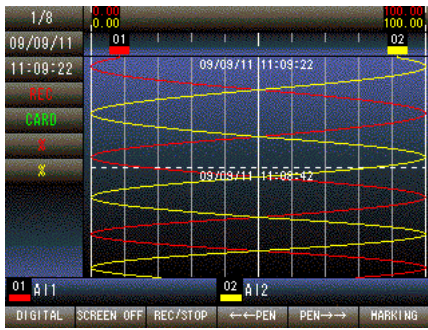
DELAY is selected. Press [EDIT] (F6) button to enable editing. The text color changes to magenta.



Press [LEFT] (F4) button to move the cursor to the left digit.  
 Press [RIGHT] (F5) button to move the cursor to the right digit.  
 Press [DOWN] (F2) button to decrease the value of the selected digit.  
 Press [UP] (F3) button to increase the value of the selected digit.  
 Press [CANCEL] (F1) button to disable editing without saving DELAY.  
 Press [ENTER] (F6) button to disable editing with saving DELAY.

### 14.2.2.6 CONTACT OUTPUT (For alarm use)

Set CONTACT OUTPUT for DISCRETE ALARM. Setting is done for each alarm.



Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



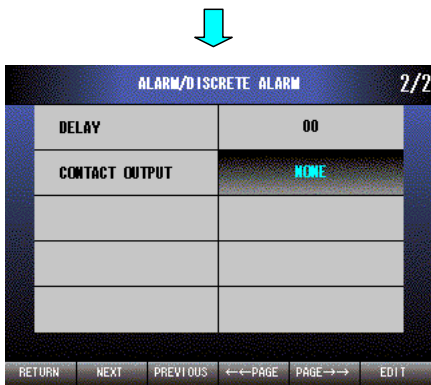
Press [NEXT] (F2) button five times to select ALARM. Press [ENTER] (F6) button to display ALARM MENU.



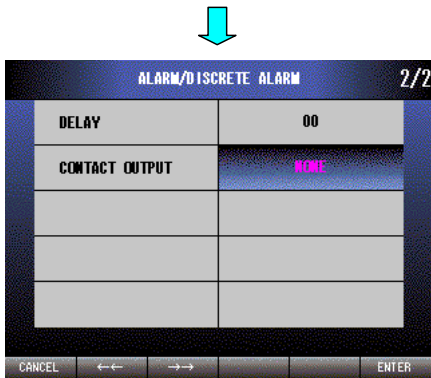
Press [NEXT] (F2) button to Select DISCRETE ALARM and press [ENTER] (F6) button to display ALARM/DISCRETE ALARM menu.



Select desired ALARM AD1 through AD8 by pressing [EDIT/→→] (F6) button. Press [PAGE→→] (F5) button.



Press [NEXT] (F2) button to select CONTACT OUTPUT. Press [EDIT] (F6) button to enable editing. The text color changes to magenta.

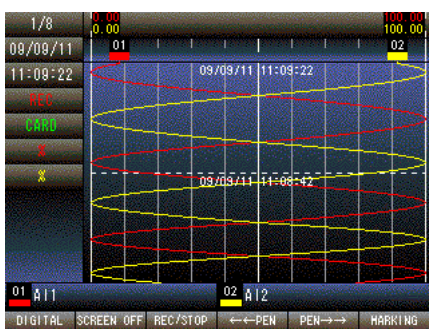


Press [←←] (F2) button to set NONE → DO8 → ... → DO2 → DO1.  
 Press [→→] (F3) button to set DO1 → DO2 → ... → DO8 → NONE.  
 Press [CANCEL] (F1) button to disable editing without saving CONTACT OUTPUT.  
 Press [ENTER] (F6) button to disable editing with saving CONTACT OUTPUT.



## 15. SOFTWARE VER

Display TYPE of the recorder and the firmware version.



Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button six times to select SOFTWARE VER. Press [ENTER] (F6) button to display SOFTWARE VER menu.



Press [RETURN] (F1) button to quit the SOFTWARE VER menu.

## 16. DISPLAY 1.4

### 16.1 DESCRIPTION

#### 16.1.1 GENERAL DESCRIPTION

Set the display functions.

#### 16.1.2 ZERO SUPPRESSION

In the DIGITAL display screen, set the ZERO SUPPRESSION DISABLE to display leading zeros and with fixed number of digits. Set the ZERO SUPPRESSION ENABLE to eliminate leading zeros and to display with non-fixed number of digits.



ZERO SUPPRESSION DISABLE

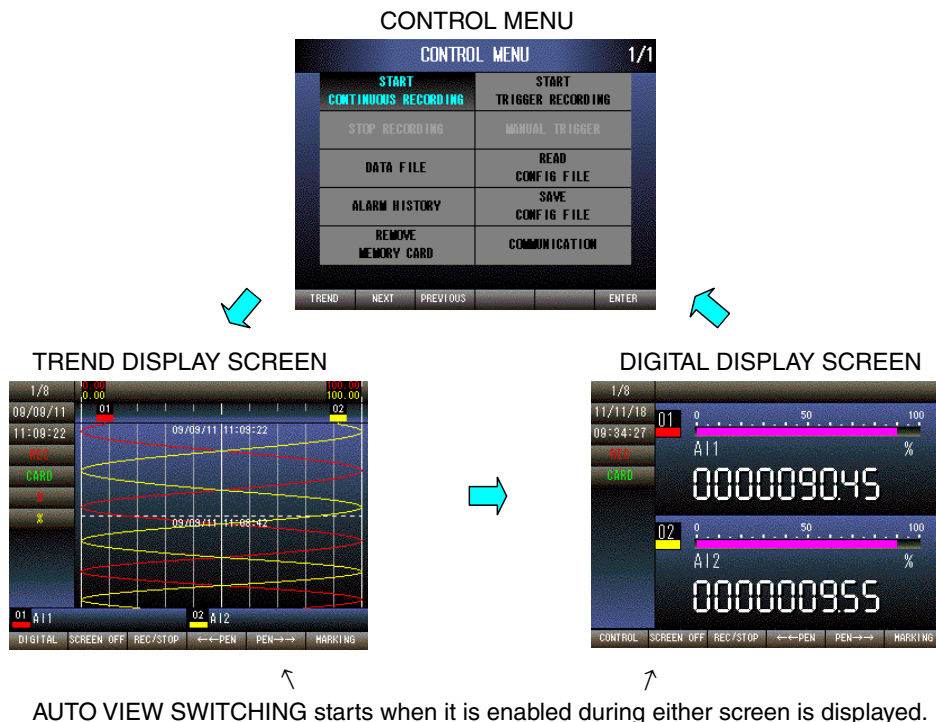


ZERO SUPPRESSION ENABLE

#### 16.1.3 AUTO VIEW SWITCHING

Set ENABLE / DISABLE of AUTO VIEW SWITCHING which automatically switches TREND DISPLAY SCREEN, DIGITAL DISPLAY SCREEN and their pages when no operation is performed for a certain period of time.

When no button is pressed for the time specified with WAITING TIME (s) during TREND DISPLAY SCREEN or DIGITAL DISPLAY SCREEN is displayed, the AUTO VIEW SWITCHING starts. The specified TREND DISPLAY SCREEN, DIGITAL DISPLAY SCREEN and their pages are switched and displayed automatically.



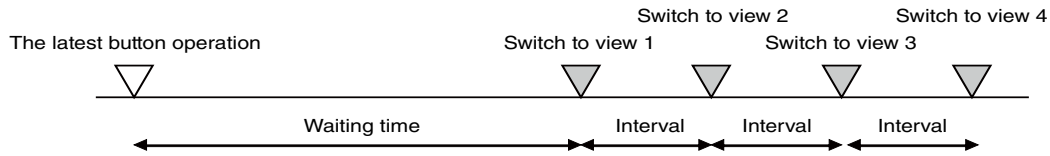
#### NOTE

AUTO VIEW SWITCHING is not available while the display is turning off.

IR COM is displayed instead of COMMUNICATION for version 2.0 or earlier.

**16.1.3.1 WAITING TIME (s)**

Specify the time to start AUTO VIEW SWITCHING between 10 to 180 sec. during TREND DISPLAY SCREEN or DIGITAL DISPLAY SCREEN is displayed.



**16.1.3.2 INTERVAL (s)**

Specify the time to switch to next view between 3 to 180 sec. during AUTO VIEW SWITCHING.

**16.1.3.3 VIEW ORDER**

VIEW ORDER is the number that shows the order of view displayed during AUTO VIEW SWITCHING. The VIEW ORDER number is 1 to 16. Configure the AUTO VIEW SWITCHING by selecting VIEW ORDER, VIEW TYPE and PAGE NUMBER.

Example)

When the PAGE NUMBERS of DIGITAL DISPLAY SCREEN are switched.

VIEW ORDER	VIEW TYPE	PAGE NUMBER
1	DIGITAL	1
2	DIGITAL	2
3	DIGITAL	3
4	DIGITAL	4
5 to 16	NONE	—

The 71VR1 repeats the display sequence from VIEW ORDER 1 to 4.

Example)

When the same PAGE NUMBERS of TREND DISPLAY SCREEN and DIGITAL DISPLAY SCREEN are switched.

VIEW ORDER	VIEW TYPE	PAGE NUMBER
1	TREND	1
2	DIGITAL	1
3 to 16	NONE	—

The 71VR1 repeats the display sequence from VIEW ORDER 1 to 2.

**NOTE**

When all VIEW TYPE columns are set to None, the AUTO VIEW SWITCHING does not start after the WAITING TIME is passed.

**16.1.3.4 VIEW TYPE**

Choose the screen that is displayed during the AUTO VIEW SWITCHING among the followings.

VIEW TYPE : NONE / TREND / DIGITAL

When NONE is chosen, the VIEW ORDER number is excluded from the AUTO VIEW SWITCHING.

**16.1.3.5 PAGE NUMBER**

Set the page number of the screen that is displayed during the AUTO VIEW SWITCHING. PAGE NUMBERS are the page numbers displayed in TREND DISPLAY SCREEN and DIGITAL DISPLAY SCREEN. Available range is 1 to 8.

“16.1.4 SCREEN SAVER 1.6”

When there is no operation for a definite period of time, screen and the back light of LCD turn off.

Defined time is selectable: “nothing / 1 minute/2 minutes/5 minutes/10 minutes.”

If the button of the main unit is operated during screen saver, screen will finish and screen will display again.

Screen server can start during “TREND DISPLAY SCREEN and DIGITAL DISPLAY SCREEN and an OPERATION MENU SCREEN.

It does not start, while displaying other screens.

Screen saver starts also during AUTO VIEW SWITCHING.

#### 16.1.4 SCREEN SAVER 1.6

The LCD display's backlight can be turned off when no operation for a specific time period. Choose among "NONE / 1 min / 2 min / 5 min / 10 min".

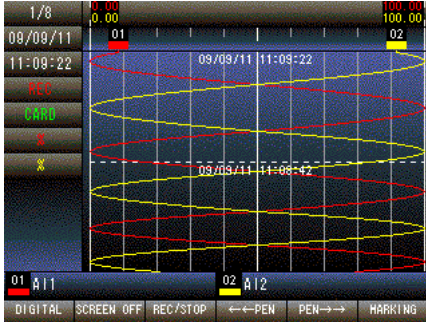
When the button of the unit is pressed during the screen saver is activated, the screen saver is cancelled and display the screen. The screen saver is activated while TREND DISPLAY SCREEN, DIGITAL DISPLAY SCREEN or CONTROL MENU is displayed. While other screen is displayed the screen saver is not activated. Also the screen saver is activated while AUTO VIEW SWITCHING is enabled.

## 16.2 SETTING

### 16.2.1 DIGITAL DISPLAY SCREEN

#### 16.2.1.1 ZERO SUPPRESSION (ENABLE / DISABLE)

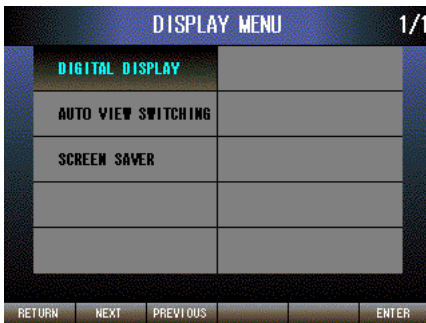
In the DIGITAL display screen, set ENABLE/ DISABLE for display of leading zeros in a numeral. ENABLE eliminates leading zeros, DISABLE display leading zeros.



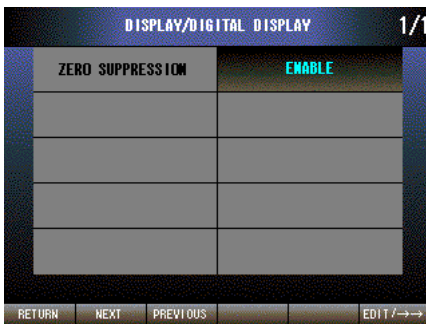
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select DISPLAY, press [ENTER] (F6) button to display DISPLAY MENU.



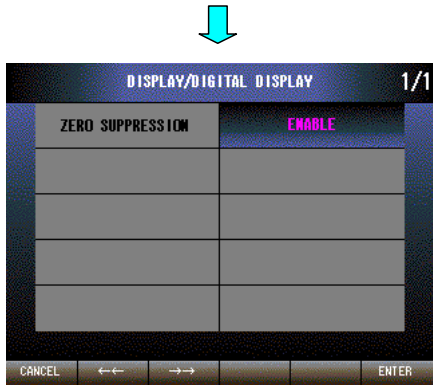
DIGITAL DISPLAY is selected. Press [ENTER] (F6) button to display DISPLAY/ DIGITAL DISPLAY menu.



ZERO SUPPRESSION is selected. Press [EDIT] (F6) button to enable editing.

The text color changes to magenta.





Press [←←] (F2) button to set ENABLE → DISABLE.

Press [→→] (F3) button to set DISABLE → ENABLE.

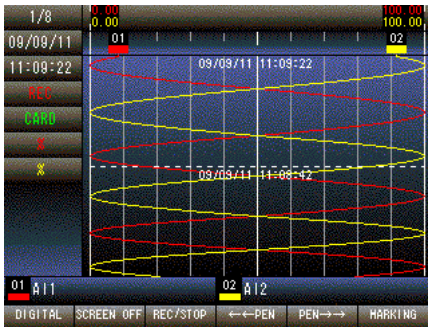
Press [CANCEL] (F1) button to disable editing without saving ENABLE / DISABLE.

Press [ENTER] (F6) button to disable editing with saving ENABLE / DISABLE.

## 16.2.2 AUTO VIEW SWITCHING

### 16.2.2.1 AUTO VIEW SWITCHING (ENABLE / DISABLE)

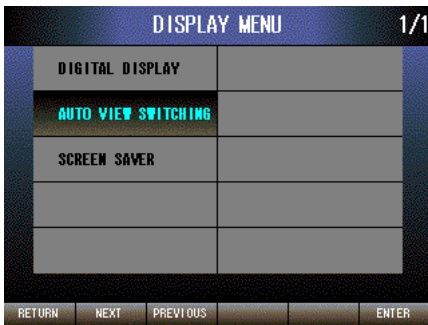
Set ENABLE/ DISABLE for AUTO VIEW SWITCHING.



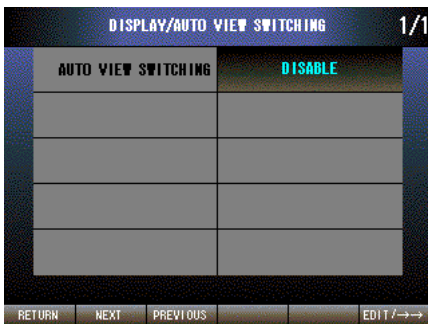
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select DISPLAY, press [ENTER] (F6) button to display DISPLAY MENU.

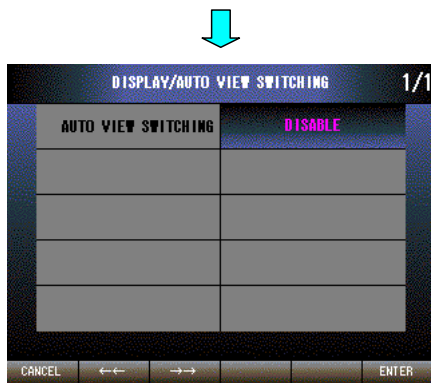


Press [NEXT] (F2) button to select AUTO VIEW SWITCHING, press [ENTER] (F6) button to display DISPLAY/AUTO VIEW SWITCHING menu.



AUTO VIEW SWITCHING is selected. Press [EDIT] (F6) button to enable editing. The text color changes to magenta.





Press [←←] (F2) button to set ENABLE → DISABLE.  
Press [→→] (F3) button to set DISABLE → ENABLE.  
Press [CANCEL] (F1) button to disable editing without saving ENABLE / DISABLE.  
Press [ENTER] (F6) button to disable editing with saving ENABLE / DISABLE.

#### NOTE

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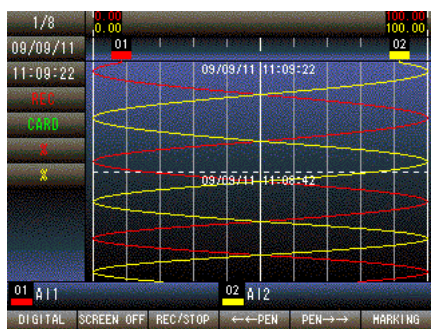
When AUTO VIEW SWITCHING is set to ENABLE, other items to select for AUTO VIEW SWITCHING are displayed.

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### 16.2.2.2 WAITING TIME (s) (3 to 180 sec.)

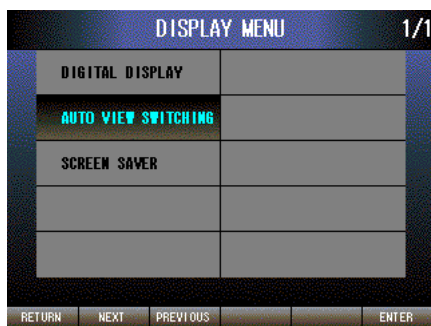
Set waiting time prior to the start of AUTO VIEW SWITCHING.



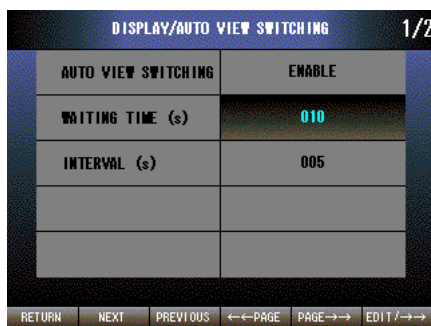
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select DISPLAY, press [ENTER] (F6) button to display DISPLAY MENU.

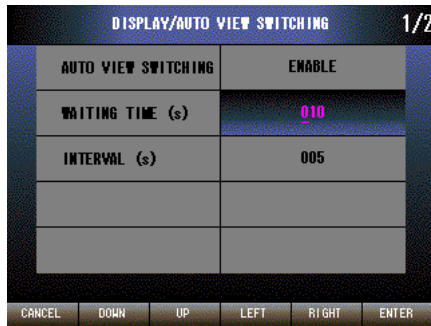


Press [NEXT] (F2) button to select AUTO VIEW SWITCHING, press [ENTER] (F6) button to display DISPLAY/AUTO VIEW SWITCHING menu.



Press [NEXT] (F2) button to select WAITING TIME (s). Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.





Press [LEFT] (F4) button to move the cursor to the left digit.

Press [RIGHT] (F5) button to move the cursor to the right digit.

Press [DOWN] (F2) button to decrease the value of the selected digit.

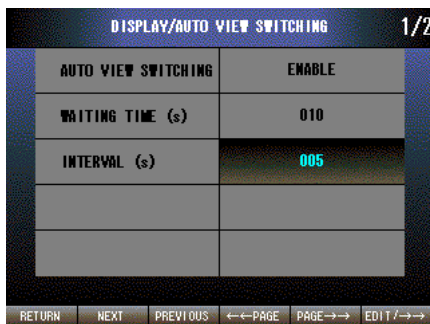
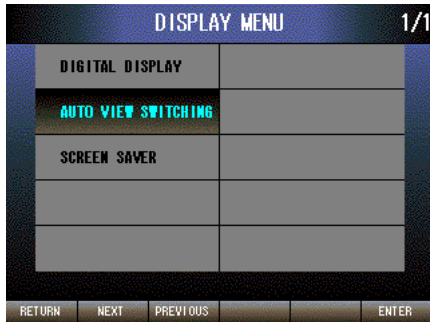
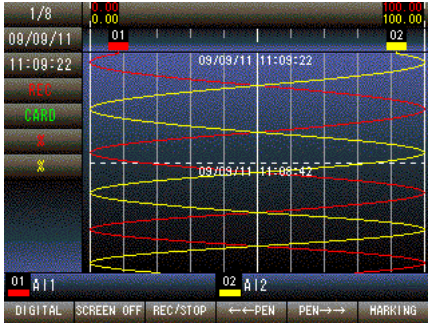
Press [UP] (F3) button to increase the value of the selected digit.

Press [CANCEL] (F1) button to disable editing without saving WAITING TIME (s).

Press [ENTER] (F6) button to disable editing with saving WAITING TIME (s).

### 16.2.2.3 INTERVAL (s) (3 to 180 sec.)

Set INTERVAL (s) during AUTO VIEW SWITCHING.

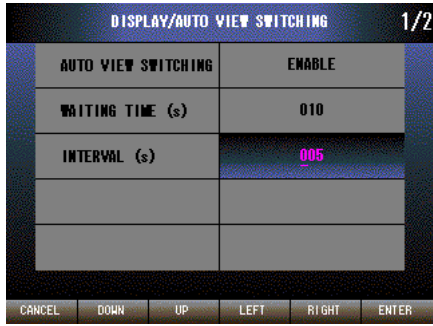


Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.

Press [NEXT] (F2) button to select DISPLAY, press [ENTER] (F6) button to display DISPLAY MENU.

Press [NEXT] (F2) button to select AUTO VIEW SWITCHING, press [ENTER] (F6) button to display DISPLAY/AUTO VIEW SWITCHING menu.

Press [NEXT] (F2) button to select WAITING TIME (s). Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.



Press [LEFT] (F4) button to move the cursor to the left digit.

Press [RIGHT] (F5) button to move the cursor to the right digit.

Press [DOWN] (F2) button to decrease the value of the selected digit.

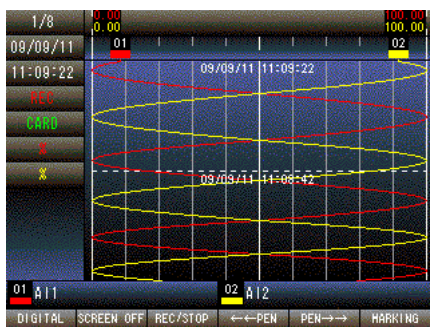
Press [UP] (F3) button to increase the value of the selected digit.

Press [CANCEL] (F1) button to disable editing without saving INTERVAL (s).

Press [ENTER] (F6) button to disable editing with saving INTERVAL (s).

### 16.2.2.4 VIEW TYPE (NONE / TREND / DIGITAL)

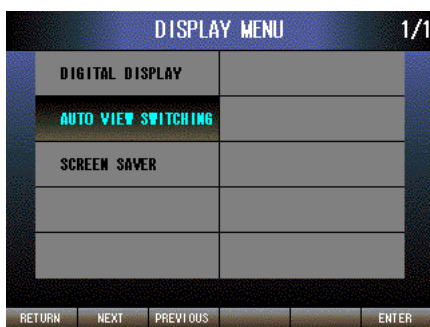
Set the screen that is displayed during the AUTO VIEW SWITCHING.



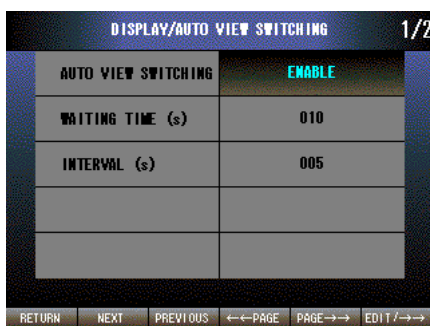
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select DISPLAY, press [ENTER] (F6) button to display DISPLAY MENU.

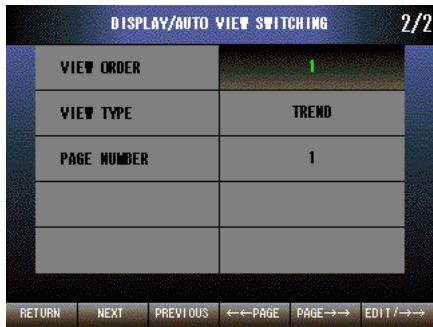


Press [NEXT] (F2) button to select AUTO VIEW SWITCHING, press [ENTER] (F6) button to display DISPLAY/AUTO VIEW SWITCHING menu.

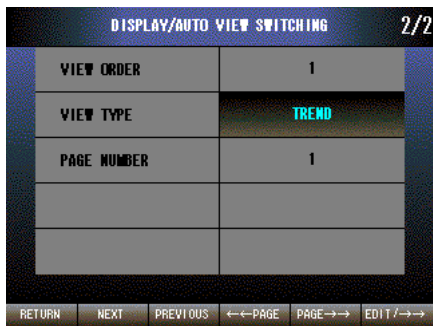


Press [PAGE→→] (F5) button.

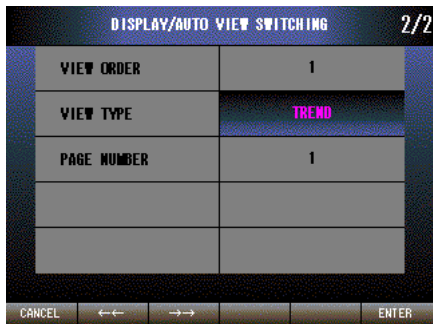




Press [EDIT/→→] (F6) button, choose VIEW ORDER from 1 to 16.



Press [NEXT] (F2) button to select VIEW TYPE. Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.



Press [←←] (F2) button to set DIGITAL → TREND → NONE.

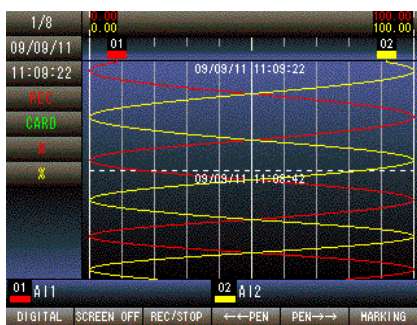
Press [→→] (F3) button to set NONE → TREND → DIGITAL.

Press [CANCEL] (F1) button to disable editing without saving VIEW TYPE.

Press [ENTER] (F6) button to disable editing with saving VIEW TYPE.

### 16.2.2.5 PAGE NUMBER (1 to 8)

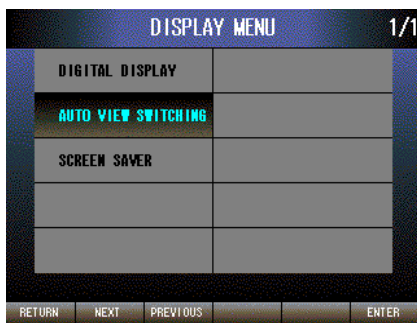
Set the PAGE NUMBER of the screen that is displayed during the AUTO VIEW SWITCHING.



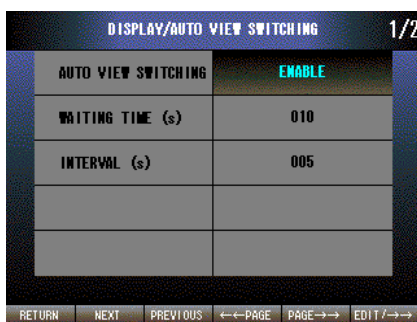
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select DISPLAY, press [ENTER] (F6) button to display DISPLAY MENU.

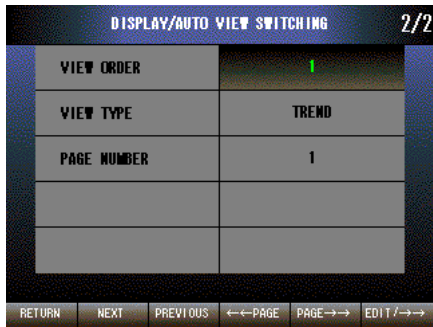


Press [NEXT] (F2) button to select AUTO VIEW SWITCHING, press [ENTER] (F6) button to display DISPLAY/AUTO VIEW SWITCHING menu.

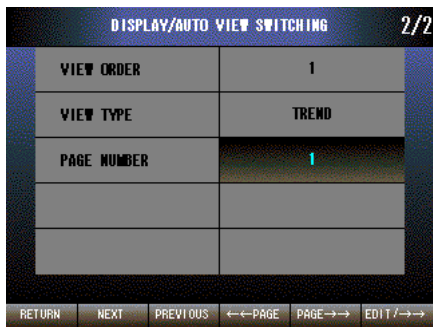


Press [PAGE->>] (F5) button.

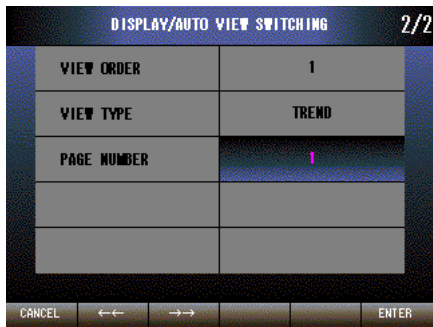




Press [EDIT/→→] (F6) button, choose VIEW ORDER from 1 to 16.



Press [NEXT] (F2) button to select VIEW TYPE. Press [EDIT/→→] (F6) button to enable editing. The text color changes to magenta.



Press [←←] (F2) button to set 8 → 7 → 6 → 5 → 4 → 3 → 2 → 1.

Press [→→] (F3) button to set 1 → 2 → 3 → 4 → 5 → 6 → 7 → 8.

Press [CANCEL] (F1) button to disable editing without saving PAGE NUMBER.

Press [ENTER] (F6) button to disable editing with saving PAGE NUMBER.

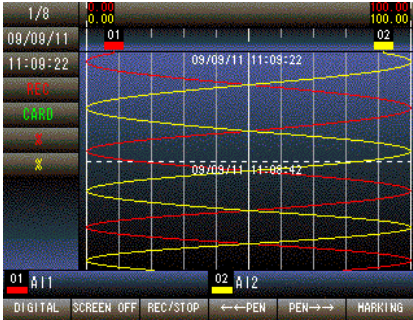


## 16.2.3 SCREEN SAVER 1.6

### 16.2.3.1 SCREEN SAVER (NONE / 1 min / 2 min / 5 min / 10 min)

Set a desired time to initiate the screen saver.

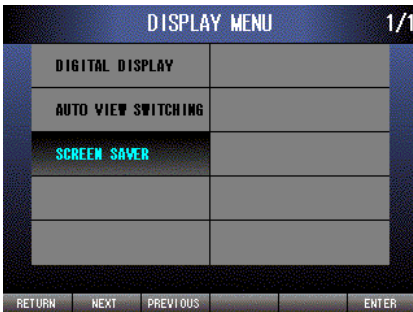
When "NONE" is selected the screen saver is not activated.



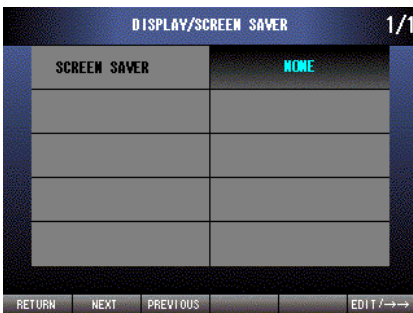
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button to select DISPLAY, press [ENTER] (F6) button to display DISPLAY MENU.

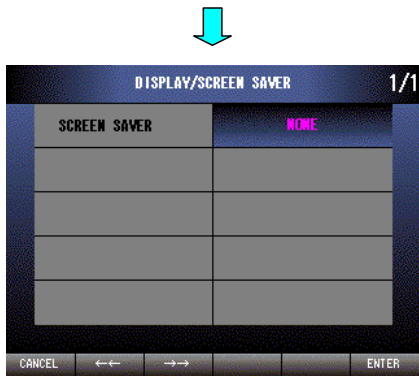


Press [NEXT] (F2) button to select SCREEN SAVER, press [ENTER] (F6) button to display DISPLAY/SCREEN SAVER menu.



SCREEN SAVER is selected. Press [EDIT] (F6) button to enable editing.



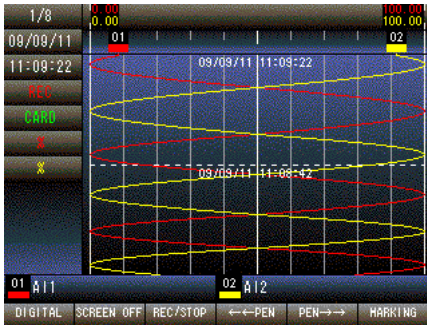


Press [←←] (F2) button to set NONE ← 1 min ← 2 min ← 5 min ← 10 min  
Press [→→] (F3) button to set NONE → 1 min → 2 min → 5 min → 10 min  
Press [CANCEL] (F1) button to disable editing without saving SCREEN SAVER.

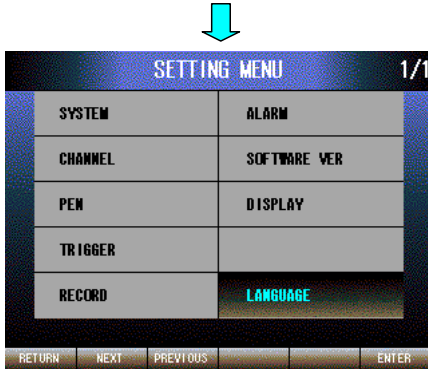
Press [ENTER] (F6) button to disable editing with saving SCREEN SAVER.

## 17. LANGUAGE

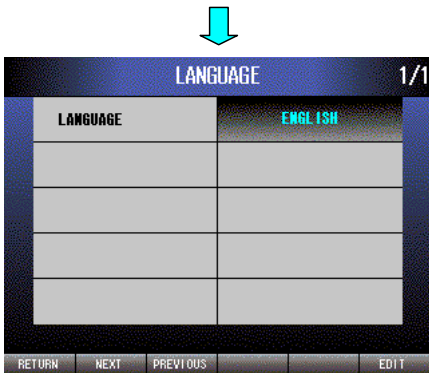
Select LANGUAGE to switch the display language. English and Japanese are available.



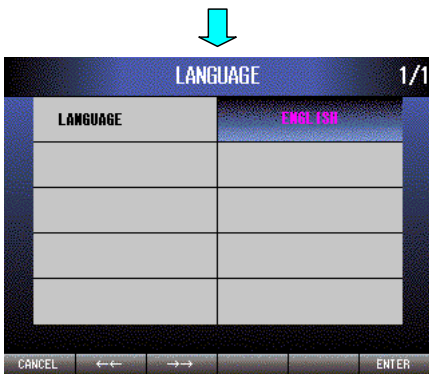
Press and hold F1 button to display SETTING MENU from TREND, DIGITAL or CONTROL MENU screen.



Press [NEXT] (F2) button seven times to select LANGUAGE. Press [ENTER] (F6) button to display LANGUAGE menu.



LANGUAGE is selected. Press [EDIT] (F6) button to enable editing. The text color changes to magenta.



Press [←←] (F2) button to set ENGLISH → JAPANESE.

Press [→→] (F3) button to set JAPANESE → ENGLISH.

Press [CANCEL] (F1) button to disable editing without saving LANGUAGE.

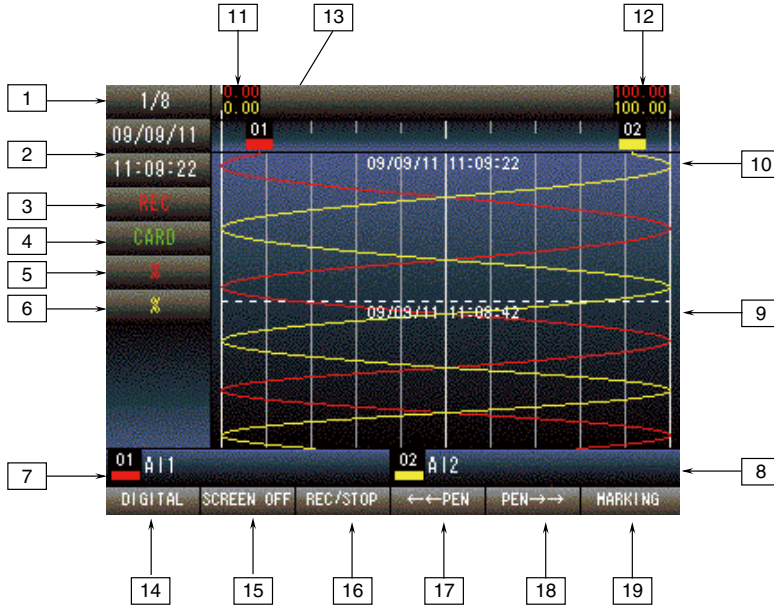
Press [ENTER] (F6) button to disable editing with saving LANGUAGE.

# 18. DISPLAY & OPERATION

## 18.1 TREND DISPLAY SCREEN

When DC type input is used, the recorder plots the data so that the left hand side of display shows 0 of BIN data, the right hand side of display shows 10000 of BIN data. About BIN data, see section 10.1.8.1.

When T/C or RTD type of x501 is used, the recorder plots the data so that the left hand side of display is Low of the range, the right hand side of display is High of the range. See section 10.1.9.1.



NUMBER	DESCRIPTION
1	The page number for current screen. Total 8 pages, because 2 pens are displayed in one page and the total 16 pens available (P1 through P16).
2	Current date and time
3	REC is displayed in colors shown below. Recording: Red, Recording stopped: Black, Waiting for triggers: Blinking in red
4	CARD is displayed in colors shown below. The memory card is recognized correctly: Yellow green, Recognition error: Yellow*, Not recognized: Black * Recognition error occurs when abnormal access to the memory card. Back up the data and format the memory card again.
5	Engineering unit for the pens currently displayed (The first pen)
6	Engineering unit for the pens currently displayed (The second pen)
7	Tag name for the pens currently displayed (The first pen). The background becomes alarm color when an alarm occurs.
8	Tag name for the pens currently displayed (The second pen). The background becomes alarm color when an alarm occurs.
9	The date and time at the center point in the trend data on the screen.
10	The date and time at the extreme end of the trend data on the screen.
11	The minimum value of engineering unit value range. The upper row shows the first pen, the lower shows the second pen, displayed in color set for each pen.
12	The maximum value of engineering unit value range. The upper row shows the first pen, the lower shows the second pen, displayed in color set for each pen.
13	Pen
14	Press F1 button to switch to DIGITAL display screen
15	Press F2 button to turn off the display. Press any key to turn on the display.
<b>1.4</b>	Pressing and holding F3 button enables following operations. While recording stopped: Continuous recording is started and the REC indicator is displayed in red. (Except when continuous recording cannot be started e.g. memory card is not inserted.) While continuous recording: Continuous recording is stopped and the REC indicator is displayed in black. While trigger recording: Trigger recording is stopped and the REC indicator is displayed in black.
16	
17	Display previous page and previous two pens.
18	Display next page and next two pens.
19	Press F6 button to leave a marking on trend waveform data. Available only during recording.

• **Trend screen chart speed**

The trend screen chart speed is modifiable with sample rate setting as indicated below.

SAMPLE RATE SETTING	TIME ELAPSED PER PAGE
100ms	16.5 sec./page
200ms	33 sec./page
500ms	82.5 sec./page
1s	165 sec./page
2s	330 sec./page
5s	825 sec./page
10s	1650 sec./page
20s to 1 hour*1 <b>1.4</b>	1650 sec./page

\*1. When sample rate is set longer than 10 seconds, the recording is performed at sample rate. However, detecting of alarm and updating of Trend Display Screen and Digital Display Screen are performed at 10 seconds interval.

**18.1.1 BURNOUT DISPLAY (x501)**



## 18.2 DIGITAL DISPLAY SCREEN



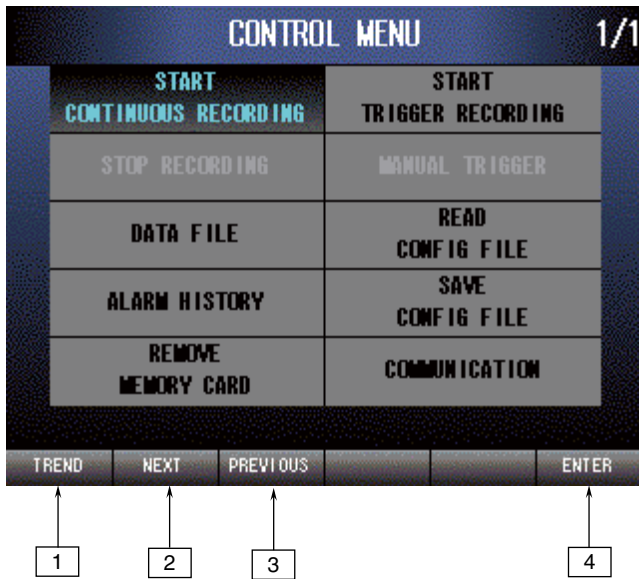
NUMBER	DESCRIPTION
1	The page number for current screen. Total 8 pages, because 2 pens are displayed in one page and the total 16 pens available (P1 through P16).
2	Current date and time
3	REC is displayed in colors shown below. Recording: Red, Recording stopped: Black, Waiting for triggers: Blinking in red
4	CARD is displayed in colors shown below. The memory card is recognized correctly: Yellow green, Recognition error: Yellow*, Not recognized: Black * Recognition error occurs when abnormal access to the memory card. Back up the data and format the memory card again.
5	Digital display of engineering unit value for the pens currently displayed (The first pen)
6	Digital display of engineering unit value for the pens currently displayed (The second pen)
7	Graph of BIN data. 0 corresponds 0 %, 10000 corresponds 100 %. (The first pen)
8	Graph of BIN data. 0 corresponds 0 %, 10000 corresponds 100 %. (The second pen)
9	Press F1 button to switch to CONTROL MENU.
10	Press F2 button to turn off the display. Press any key to turn on the display.
<b>1.4</b>	Pressing and holding F3 button enables following operations.
11	While recording stopped: Continuous recording is started and the REC indicator is displayed in red. (Except when continuous recording cannot be started e.g. memory card is not inserted.) While continuous recording: Continuous recording is stopped and the REC indicator is displayed in black. While trigger recording: Trigger recording is stopped and the REC indicator is displayed in black.
12	Display previous page and previous two pens.
13	Display next page and next two pens.
14	Press F6 button to leave a marking on trend waveform data. Available only during recording.

### 18.2.1 BURNOUT DISPLAY (x501)



The bargraph and the text "BURNOUT" blink.

## 18.3 CONTROL MENU



IR COM is displayed instead of COMMUNICATION for version 2.0 or earlier.

NUMBER	DESCRIPTION
1	Press F1 button to switch to TREND display screen.
2	Press F2 button to move the cursor to next item.
3	Press F3 button to move the cursor to previous item.
4	Press F6 button to execute the selected operation.

### 18.3.1 START CONTINUOUS RECORDING

Recording starts when START CONTINUOUS RECORDING is selected and continues until STOP RECORDING is selected.

### 18.3.2 START TRIGGER RECORDING

The recorder enters the trigger waiting state when START TRIGGER RECORDING is selected. When a trigger is detected, the recorder starts recording. When recording is complete, the recorder goes back to the trigger waiting state.

### 18.3.3 STOP RECORDING

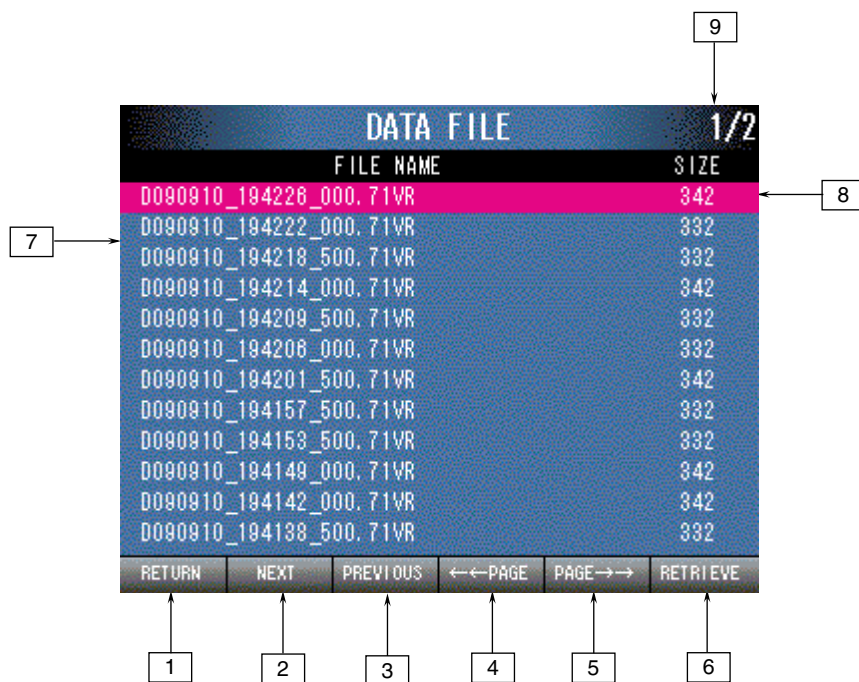
Recording stops and the recorder enters stand-by state when STOP RECORDING is selected while the recorder is recording or waiting for a trigger.

### 18.3.4 MANUAL TRIGGER

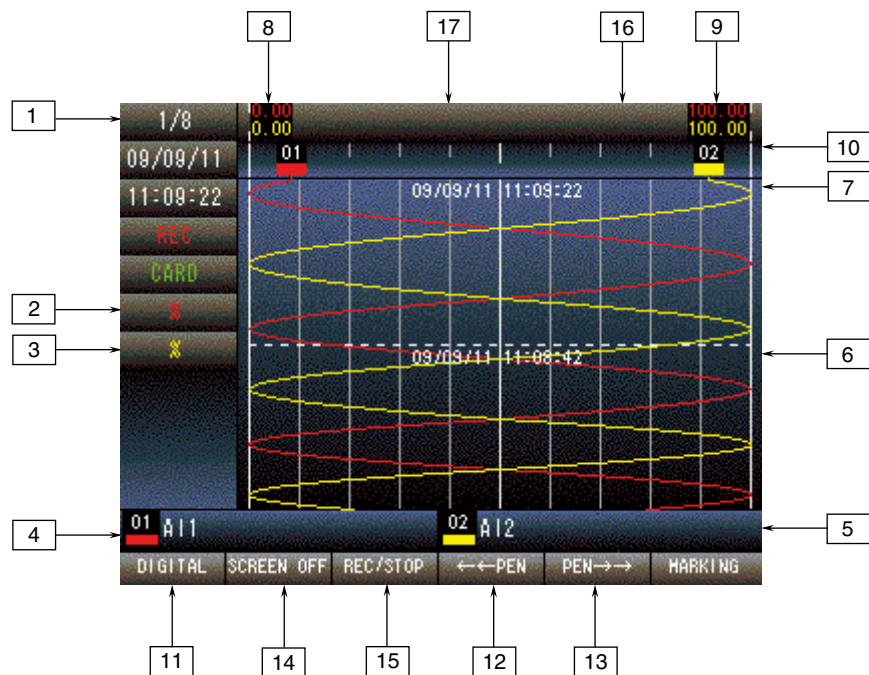
During waiting trigger state, a trigger can be set by this operation. The data corresponding to pretrigger and posttrigger from that time is recorded.



### 18.3.5 DATA FILE (→ PAST TREND)



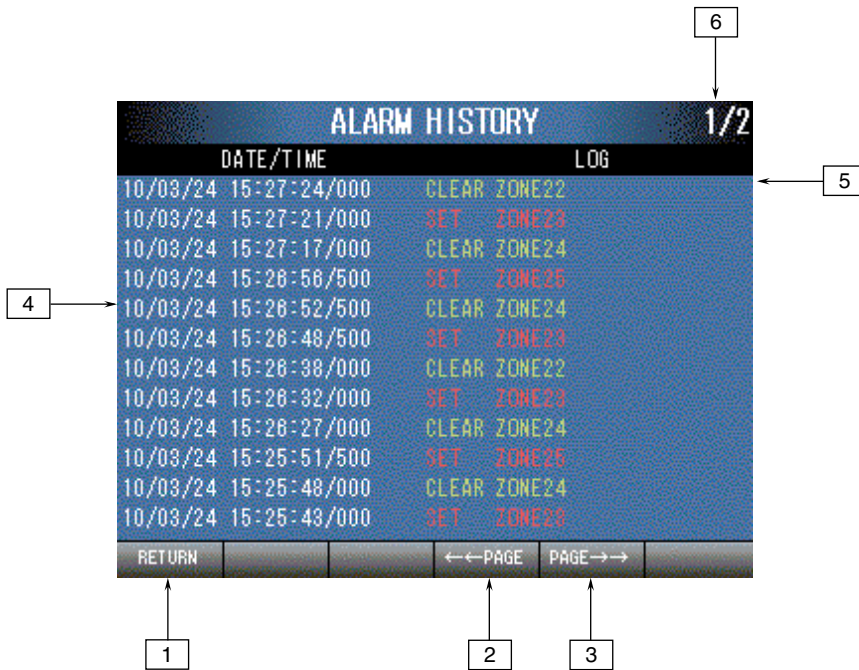
NUMBER	DESCRIPTION
1	Press F1 button to return to CONTROL MENU.
2	Press F2 button to move the cursor downward.
3	Press F3 button to move the cursor upward.
4	Press F4 to display previous 12 files.
5	Press F5 to display next 12 files.
6	Press F6 to display selected file.
7	Display the file names stored in the 71VR folder of the memory card.
8	Display the size of each file in bytes. For the file that is recording, REC is displayed.
9	The number of pages. Maximum 12 files are displayed in one page.



NUMBER	DESCRIPTION
1	The page number for the pens. Total 8 pages, because 2 pens are displayed in one page and the total 16 pens available (P1 through P16).
2	Engineering unit for the pens currently displayed (The first pen)
3	Engineering unit for the pens currently displayed (The second pen)
4	Tag name for the pens currently displayed (The first pen). The background becomes alarm color when an alarm occurs.
5	Tag name for the pens currently displayed (The second pen). The background becomes alarm color when an alarm occurs.
6	The date and time at the center point in the trend data on the screen.
7	The date and time at the extreme end of the trend data on the screen.
8	The minimum value of engineering unit value range. The upper row shows the first pen, the lower shows the second pen, displayed in color set for each pen.
9	The maximum value of engineering unit value range. The upper row shows the first pen, the lower shows the second pen, displayed in color set for each pen.
10	Pen
11	Press F1 button to switch to DATA FILE menu
12	Decrement the page of pens and display previous two pens.
13	Increment the page of pens and display next two pens.
14	Decrement the page of data samples, display previous page.
15	Increment the page of data samples, display next page.
16	Display the page number for data samples.
17	Display the file name without a file extension.

### 18.3.6 ALARM HISTORY

Maximum 200 events of alarm history can be stored in a memory card. This screen displays the list of alarm events. They are displayed in red for SET, in yellow green for CLEAR.



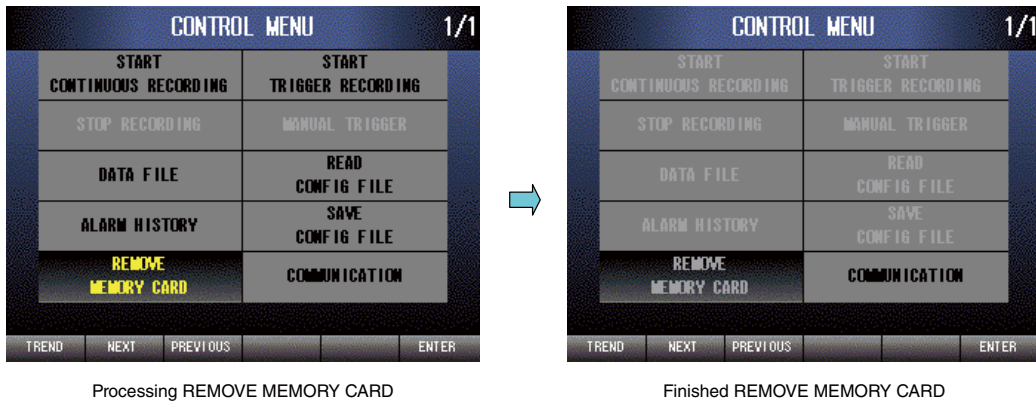
NUMBER	DESCRIPTION
1	Press F1 button to return to CONTROL MENU.
2	Decrement the page number and display previous 12 alarm events.
3	Increment the page number and display next 12 alarm events.
4	Date and time of the alarm occur
5	Display the alarm status (SET or CLEAR.)
6	Page number. 12 alarm events can be displayed in one page.

### 18.3.7 REMOVE MEMORY CARD

When REMOVE MEMORY CARD is executed, the text is displayed in yellow while processing, in gray when finished. After finished, a memory card can be removed safely.

#### CAUTION !

Be aware that alarm history is recording even during the recording is stopped, when the memory card is removed.



IRCOM is displayed instead of COMMUNICATION for version 2.0 or earlier.

### 18.3.8 READ CONFIG FILE

Read the configuration file named "71VR0000.cfg" in the "\71VR" folder\* of a memory card. After reading is finished, setting values are effective.

If the 71VR1 fails in READ CONFIG FILE, confirm the followings.

- The configuration file is not in the specified folder.

Confirm that the configuration file named "71VR0000.cfg" is in the "\71VR" folder of a memory card.

- Reading the configuration file for different options of 71VR1 such as E501, E101.

Read the setting values by using 71VRCFG and confirm that the options are same.

- Reading the configuration file that cannot be read.

Refer to the CAUTION shown below.

- Reading a file that is not a configuration file.

- The 71VR1 cannot read the configuration file due to some defect of the memory card.

Initialize the memory card. Save the setting values and read them.

#### CAUTION!

When setting values are stored with 71VR1 with firmware version 1.4.01 (MAJOR Ver: 1, MINOR Ver: 4.01) or later by using SAVE CONFIG FILE, it is not available to read the setting values with 71VR1 with firmware version earlier than 1.4.01. In this case, follow the steps shown below to perform READ CONFIG FILE.

1. Read the setting values from the file by using 71VRCFG with version 3.02 or later.
2. Store the setting values, which are read in the step 1, into a file after selecting firmware version of the 71VR1 to which the setting values are applied.
3. Store the setting values, which are stored in the step 2, into the file named "71VR0000.cfg" in the "\71VR" folder\* of a memory card and perform READ CONFIG FILE.

#### NOTE

Refer to the "PC Configurator Software Users Manual for 71VR1" for detailed operation.

\*\71VRU\71VR0000.cfg for the 71VR-x501.

### 18.3.9 SAVE CONFIG FILE

Store the setting values into the file named "71VR0000.cfg" in the "\71VR" folder\* of a memory card. The stored setting values can be read to other 71VR and the 71VRCFG.

\*\71VRU\71VR0000.cfg for the 71VR1-x501.

### 18.3.10 COMMUNICATION 2.1

Execute COMMUNICATION to enable communication.

After communication is finished, be sure to press DISCONNECT (F6) button to quit communication.



### 18.3.11 IR COM (Ver. 2.0 or earlier)

Execute IR COM to enable infrared communication. Execute IR COM for only one recorder to avoid interference from other recorders when more than two of the 71VR1 are mounted close to each other. After communication is finished, be sure to press DISCONNECT (F6) button to quit infrared communication.



## 18.4 OTHER OPERATIONS

### 18.4.1 SETTING MENU

Hold down F1 button in TREND display screen, DIGITAL display screen or CONTROL MENU until SETTING MENU is displayed.

### 18.4.2 TURNING THE SCREEN OFF

Press F2 button in TREND display screen or DIGITAL display screen to turn off the LCD backlight. Press any key to turn on the display.

## 19. LIGHTNING SURGE PROTECTION

We offer a series of lightning surge protector for protection against induced lightning surges. Please contact us to choose appropriate models.

## **20. FIRMWARE VERSION HISTORY**

### **20.1 VERSION 1.3 OF 71VR1-E001 AND 71VR1-E101, AND VERSION 1.1 OF 71VR1-E501**

The following inconveniences in the previous versions were corrected:

- 1) Temperature unit selection (only for 71VR1-E501): "TEMPERATURE SETTING" → "TEMPERATURE UNIT"
- 2) Record setting: "NUMBER OF SAMPLES" → "SAMPLES PER FILE"
- 3) START AUTO RECORDING: "NONE" → "OFF"
- 4) Analog alarm: "AREA" → "ZONE"
- 5) Alarm: "ON/OFF" → "ENABLE/DISABLE"

### **20.2 VERSION 1.4.01**

The following new features were incorporated:

- 1) "20s/30s/1min/5min/10min/20min/30min/1hour" are added as sample rate.
- 2) When sample rate is set longer than 10 seconds, the recording is performed at sample rate. Detecting of alarm and updating of Trend Display Screen and Digital Display Screen are performed at 10 seconds interval.
- 3) Auto View Switching was added.
- 4) When Modbus is chosen in ANALOG INPUT and DISCRETE INPUT, Modbus function can be set per each channel. (SC200 and SC210 are supported.)
- 5) DISABLE/ ENABLE of ZERO SUPPRESSION can be chosen in Digital display of Digital Display Screen.
- 6) The message is displayed, when reading the Configuration file is completed,
- 7) In Trend Display Screen and Digital Display Screen, pressing and holding F3 button enables start/stop control of Continuous recording or Trigger recording.

### **20.3 VERSION 1.5.01 OF 71VR1-E001 AND 71VR1-E101**

The following inconvenience in the previous versions was corrected.

The problem when READ CONFIG FILE is performed in the CONTROL MENU.

### **20.4 VERSION 1.6.01**

Screensaver function was added.

### **20.5 VERSION 2.1.01**

Wired communication (COP-US) for configurator communication is supported.