PAPERLESS RECORDER
Model: 73VR1100
– Software Operation –

Users Manual

INTRODUCTIONS

Thank you for choosing our Paperless Recorder.

The Users Manual for model 73VR1100 describes its software functions and how to operate the 73VR1100. Please read this manual carefully to ensure the safe use before getting started.

A series of documents is provided for this product as listed below, each providing helpful instructions and suggestions for maximum use of the 73VR1100. They are available in the CD package, 73VRPAC2, that came with your product.

Title	Document No.	Details
73VR1100 Users Manual – Hardware & I/O, connection & setup	EM-7399-B	Basic users manual explaining the hardware aspects of the product, including installation, connection and setting.
73VR1100 Users Manual – Software functions and operations of the 73VR1100	EM-7399-C	Basic users manual explaining the software aspects of the product, including various software capabilities and operations of the 73VR1100.
73VR11BLD Users Manual	EM-7399-D	Focuses on the features and operation of the PC configuration program, model 73VR11BLD.
73VRWV Users Manual	EM-7394-D	Focuses on the features and operation of the 73VR Data Viewer program, model 73VRWV.
73VR1100 / 73VR21x Modbus/TCP Reference Guide	EM-7395-D	Focuses on the Modbus/TCP specifications and functions supported by the 73VR1100.

This users manual corresponds to version 6 or later.

NOTE

Configuration files created with 73VR1100 ver. 5 or earlier cannot be read out with ver. 6. In such a case, convert them with the builder software (73VR11BLD) before use.

CAUTION !

If you intend to use the 73VR1100 in the following environments or conditions, redundant and/or failsafe system designs should be used to ensure the proper degree of reliability and safety.

- Environments or conditions which are not defined in this manual
- Nuclear power control devices, railway control devices, aircraft control devices, transportation vehicles, fuel control equipment, medical equipment, recreational equipment, safety equipment, and other critical equipment for which safety must be secured according to relevant laws.
- Those devices which inherently require extremely high level of safety and reliability.

PACKAGE INCLUDES...

REF	ITEM	QUANTITY
1.	Paperless Recorder	(1)
2.	Mounting bracket	(2)
3.	73VRPAC2 CD-ROM	(1)
4.	73VR1100 Startup Guide	(1)

Contents

1. GENERAL DESCRIPTIONS

■ DATA RECORDING FUNCTIONS

Number of input channels:	High speed mode: Max. 64 points Normal mode: Max. 128 points Includes the function pen points.
Storing rate:	High speed mode: 100 msec. Normal mode: 500 msec., 1 sec., 2 sec., 5 sec., 10 sec., 1 minute, 10 minutes
Data storing method:	Normal, Auto, Event recording or Remote trigger
Data form:	Binary, floating or short integer
Data storage:	Compact Flash (CF) Card

■ DATA DISPLAY FUNCTIONS

• Trend View — Shows data stored in real time on the trend graphs.

Display channels:	2, 4, 6, 8 points per view selectable
Number of display views:	4 views
Display rate:	1, 2, 5 sec. selectable
Chart direction:	Perpendicular or Horizontal
Chart speed:	4, 1, 1/5, 1/32, 1/160, 1/480, 1/960
Graph line thickness:	Normal or Thick
Digital display:	Shows momentary values on the digital indicators
Alarm display:	Shows alarm status for all displayed pens
Scale:	Linear or Square root; Scales in an engineering unit is selectable.
Comment:	Shows comments inserted on the trend graph.

• Overview — Shows real-time data for all channels.

Display channels:	2, 4, 6, 8, 16 points per view selectable
Display rate:	1, 2, 5 sec. selectable
Data display items:	Analog: Tag name, alarm status, momentary value (bargraph) Discrete: Tag name, alarm status, momentary value
Detailed data display:	Analog: Tag name, momentary value (bargraph + digital indicator), alarm event date/time (trigger & reset) Discrete: Tag name, momentary value, alarm event date/time

• Bargraph View — Shows data stored in real time on the bargraphs.

Display channels:	2, 4, 6, 8 points per view selectable
Number of display views:	4 views
Display rate:	1, 2, 5 sec. selectable
Bar direction:	Perpendicular or Horizontal
Digital display:	Shows momentary values on the digital indicators
Alarm display:	Shows alarm status for all displayed pens
Scale:	Linear or Square root; Scales in an engineering unit is selectable.

• Graphic View — Shows data stored in real time on an imported background image.

Number of display views:	2 views
Display rate:	1, 2, 5 sec. selectable
Background image format:	*.bmp
Background image size:	320 x 240 pixels
Background image color:	256 colors
Components placed on the image: Max. 64	

• Retrieve View — Shows data stored in the CF Card.

Display channels:	2, 4, 6, 8 points per view selectable
Number of display views:	4 views
Retrievable data:	Those stored in the CF Card
Long span view:	Thins data out to show data for a longer time span on the chart
Data search:	By scrolling the window; by specifying the time index; or by specify a search parameter (Maximum or Minimum)
Data read out:	When a part of the screen for a specific time index is touched, digital indicators appear on the screen indicating the data at the specified time.

• Alarm History — Shows alarm event information.

Number of display views:	1 view
Displayed events:	16 events
Data display items:	Alarm event date/time (trigger & reset), tag name, pen No., alarm message
Search:	By scrolling the window or by specifying the time index
Acknowledge:	Individual or all events
Update:	Automatic
Jump:	Data at the time of an alarm event can be called up by specifying the event on the screen.

• Comment History

Number of display views:	1 view
Displayed comments:	16 comments
Data display items:	Comment and date/time
Search:	By scrolling the window or by specifying the time index
Jump:	Data at the time of the comment can be called up by specifying the comment on the screen.

■ OPERATION FUNCTIONS

Number of channels:	High speed mode: 32 points Normal mode: 32 or 64 points selectable
Operations:	Arithmetic: Addition/subtraction, Multiplication, Division Logical: AND, OR, NOT, XOR Mathematical: Square root, Power Accumulation: Analog accumulation, pulse accumulation (difference) Filter: Moving average, First order lag Peak hold: Peak (maximum value) hold, Peak (minimum value) hold F value calculation: F value calculation Others: Anemoscope (16 directions)
Alarm:	Alarm trip can be programmed for calculated results.

■ ALARM

Alarm setting:	Analog: 4 Upper (high) and Lower (low) alarm setpoints are selectable for each channel. Discrete: ON or OFF bit status alarm for each channel.
Deadband:	Analog: Deadband (hysteresis) is selectable in engineering unit value. Discrete: Delay time can be specified.
Output:	To remote output modules
Alarm history record:	Stored in the CF Card: Date/time of alarm events (trigger & reset), tag name and pen No., alarm message. Number of stored alarm events depends upon the CF Card capacity.: 250 events with 128 MB, 500 events with 256 MB, 1000 events with 512 MB or 1 GB

■ ETHERNET CONNECTIVITY

Real time communication:	Transmits specific data to a host PC installed with the PC Recorder Software (model: MSR128).
FTP communication:	Transmits data stored in the CF Card using the FTP protocol to a host PC by the 73VR Data Viewer (model: 73VRWV) installed in it. Data can be transmitted even during recording.
Download, Upload:	A software configuration created on the 73VR1100 Configuration Builder (model: 73VR-11BLD) can be downloaded to the 73VR1100. The configuration set up on the 73VR1100 can be uploaded and displayed on the 73VR11BLD.
Modbus:	Communicates with the host PC using Modbus/TCP protocol. Detailed information is provided in 73VR1100 Modbus/TCP Reference Guide.

■ OTHER FEATURES

Operation Lockout:	With a password setting, unauthorized operations on the Trend View, Bargraph View and Overview can be locked out.
Data File Used Volume Information:	A bargraph with % indication is provided on the screen to show how much percent of the data file memory has been used up. 0 – 49% used: Green bargraph 50 – 79% used: Amber bargraph 80 – 100% used: Red bargraph
Hot Swapping of the CF Card:	The CF Card is hot swappable: removable during data recording. However, there may be a slight disturbance in storing rate when the card is inserted.
Screen Saver:	The backlight is automatically turned off if the screen is untouched for a certain time period.
Writing/Reading Setting:	The 73VR1100's present setting can be stored in a USB flash-memory. Setting stored in the memory can be read in to the 73VR1100.

NOTE

Please refer to the MSR128, 73VR11BLD and the 73VRWV Users Manuals for more information about respective software features.

2. BEFORE GETTING STARTED

2.1 POINTS OF CAUTION

■ CONFORMITY WITH EU DIRECTIVES

- This equipment is suitable for Pollution Degree 2 and Installation Category II (transient voltage 2500V). Reinforced insulation (alarm output to RUN contact output to power input to FG/Ethernet/RS-485: 300V) is maintained.*1 Prior to installation, check that the insulation class of this unit satisfies the system requirements.
- The equipment must be mounted on a panel surface. Once mounted on a panel, take appropriate precautions to prevent operators to be exposed to the terminal block. *1

  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. *1
- Altitude up to 2000 meters. *1
- Insert a noise filter for the power source and RS-485 line connected to the unit. NEC Tokin Noise Filter Model ESD-SR-250 or equivalent is recommended.
- 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.

*1. Except desktop type

■ SAFETY PRECAUTION

- This equipment 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 equipment must be conducted by qualified personnel.
- Before you remove the unit, turn off the power supply and input signal for safety.
- Do not use the 73VR1100 in an environment where flammable gases are present. This may result in an explosion.
- Do not disassemble or modify the 73VR1100 in any way. Doing so may result in a fire or an electrical shock.
- Do not strike the panel of the 73VR1100 with a hard, heavy or pointed object, or press the panel with excessive force. Doing so may result in panel damage or injury.
- Do not block the 73VR1100's ventilation openings or use it in areas where heat accumulates. Additionally, do not store or use it under high-temperature conditions.
- Do not store or use the 73VR1100 in locations subject to direct sunlight, or where excessive dust or dirt is present.
- The 73VR1100 is a precision instrument. Do not store or use it where large shocks or excessive vibration can occur.
- Do not store or use the 73VR1100 in environments subject to chemical evaporation (such as that of organic solvents), or where there are chemicals and/or acids present in the air.
- Do not use paint thinner or organic solvents to clean the 73VR1100.
- Observe the environmental conditions when using the 73VR1100.
- Wait at least for 5 seconds before turning on the power supply after it has been turned off. The 73VR1100 may not start up if the time interval is less than 5 seconds.

■ ENVIRONMENT

- Indoor use.
- The 73VR1100 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 0 to 50°C (32 to 122°F) with relative humidity within 30 to 85% RH in order to ensure adequate life span and operation.
- Desktop type cannot be mounted on a panel surface.
- The handle and rubber feet cannot be detached from desktop type unit.

■ GROUNDING

- Be sure to determine in advance the most stable grounding point in the environment and earth the 73VR1100's FG terminal and that of connected devices (PC) to it in order to protect the devices from dielectric breakdown.
- Grounding is also effective to eliminate noise that could cause errors in the 73VR1100's operation.

■ 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 blank-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 73VR1100 and wait 10 seconds 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.

■ INTERNAL CLOCK

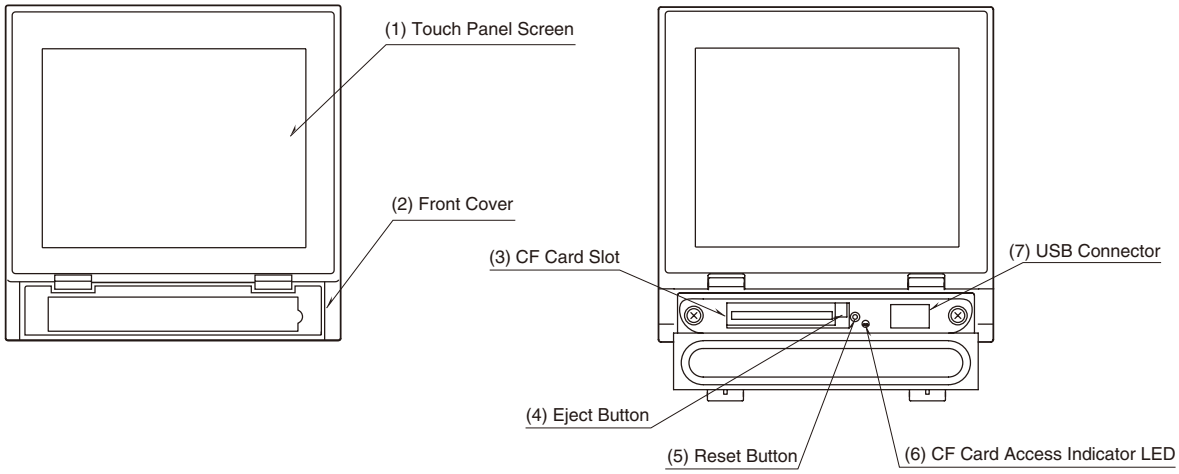
- The internal clock data is stored in memory powered by a backup battery while the 73VR1100 is without external power supply.
- The data will be reset to its default status when the battery is used up while the 73VR1100 is left without power supply for a long time period. The clock adjustment will be necessary once the power is restored. Please refer to Section 5.1.11 for the procedure.
- Once the power is restored, the 73VR1100 starts recharging the battery. It will be full in approximately in 36 to 48 hours.

■ AND....

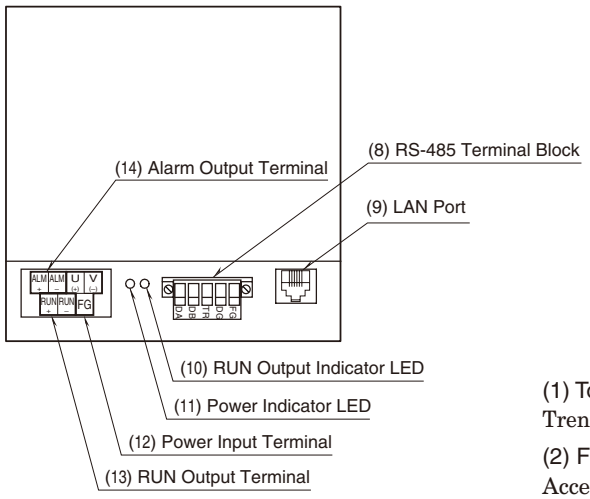
- We recommend use of an UPS to supply power backups.
- The module is designed to function as soon as power is supplied, however, a warm up for 10 minutes is required for satisfying complete performance described in the data sheet.

2.2 73VR1100 COMPONENT IDENTIFICATIONS

■ **FRONT VIEW**



■ **REAR VIEW**



(1) Touch Panel Screen
Trend chart and other data views and setup views are displayed.

(2) Front Cover
Access to the CF Card Slot.

(3) CF Card Slot
Insert a CF Card.

(4) Eject Button
Used to retrieve the CF Card.

(5) Reset Button
Used to restart the 73VR1100.

(6) CF Card Access Indicator LED
Red light turns on during the CF Card is accessed.

(7) USB Connector
Connect an USB flash-memory.

(8) RS-485 Terminal Block
Used to connect the 73VR1100 to its I/O devices via RS-485.

(9) LAN Port
Connects the LAN cable (10BASE-T or 100BASE-TX)

(10) RUN Output Indicator LED
Green light turns on in normal conditions; off when the RUN output contact is tripped in an abnormality of the unit.

(11) Power Indicator LED
Light turns on while the power is supplied.

(12) Power Input Terminal

(13) RUN Output Terminal

(14) Alarm Output Terminal

2.3 INSTALLING THE 73VR1100

The 73VR1100 is suitable to be mounted on a panel surface. Please refer to 73VR1100 Users Manual (hardware & I/O, connection & setup – EM-7399-B) for details.

2.4 TERMINAL WIRING

Please refer to 73VR1100 Users Manual (hardware & I/O, connection & setup – EM-7399-B) for details.

2.5 CF CARD

We will not guarantee the product's described performance if a CF Card other than purchased from us, or specified below, is used.

1. Manufacturer: Hagiwara Solutions
   Model No.: MCF10P-xxxxS
   Capacity: 128 MB through 1 GB
   (CFI-xxxxDG ... discontinued)
2. Manufacturer: Apacer Technology
   Model name: CFC III
   Model No.: AP-CFxxxxRBNS-ETNDNRG Parts No.: 256 MB ... 81.28L10.UC08B
   512 MB ... 81.29L10.UC08B
   1 GB ... 81.2AL10.UC08B
   Capacity: 256 MB through 1 GB
   (AP-CFxxxxE3ER-ETNDNR, AP-CFxxxxE3ER-ETNDNRK,
   AP-CFxxxxE3NR-ETNDNRQ ... discontinued)

The 73VR1100 reads the setting file (e.g. storing condition, pen setting) in the CF Card during its startup. If you have started the 73VR1100 without the CF Card inserted in the unit, it reads settings stored in the unit.

The setting in the card is not read in if you inserted it after the unit has been started.

Be sure to have the CF Card inserted before the power supply is turned on.

CAUTION !

- DO NOT turn off the power supply to the 73VR1100 or reset it during data recording. The CF Card can be removed during recording, but observe a specifically described procedure in this manual.
- Confirm the sides of the CF Card and the connector position.

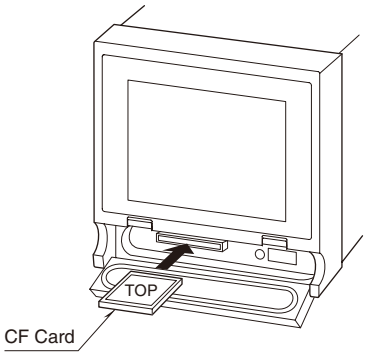
WARNING ! – Data in the CF Card May be Lost

Data file in the CF Card is reset by the following actions. Data in the file is deleted and overwritten when the card is reset. We recommend you to keep data backup files in an external device.

- Changing data format in System Configuration
- Changing storing interval in Store Setting
- Enabling/Disabling pens (including Function pens)
- Hot swapping the CF Card

INSERTING THE CF CARD

1. Open the front cover.
2. Insert the CF Card maintaining its top side visible from above.
3. Push it in until EJECT button is popped up.
4. Close the front cover.



REMOVING THE CF CARD (DURING RECORDING)

1. According to “9.4 HOT SWAPPING THE CF CARD”, perform the hot swapping.
2. Push EJECT button to extract the CF Card.

REMOVING THE CF CARD (CF CARD IS SWAPPED DURING STOPPING)

1. When the CF card, which differs from the one inserted into 73VR1100, is going to inserted, follow the instruction below.
2. If the power is supplied to the 73VR1100, confirm with the LED behind the cover that the CF Card is not accessed.
3. According to “9.4 HOT SWAPPING THE CF CARD”, perform the hot swapping the CF card to remove the CF card.
4. Push EJECT button to extract the CF Card.
5. When inserting the CF card, According to “9.4 HOT SWAPPING THE CF CARD”, perform the hot swapping the CF card to insert the CF card. In this case, the data in the inserted CF card is deleted.

REMOVING THE CF CARD (STOPPING, WHEN SAME CF CARD IS SWAPPED)

1. When the CF card, which was inserted into 73VR1100, is going to inserted, follow the instruction below.
2. If the power is supplied to the 73VR1100, confirm with the LED behind the cover that the CF Card is not accessed.
3. Push EJECT button to extract the CF Card
4. Special operation is not required when CF card is inserted. In this case, the data in the inserted CF card is not deleted. (The inserted CF card must not be deleted or edited the file in the card with PC etc.)

2.6 SD CARD

The operation confirmed SD/CF conversion adapter and SD card described below are available for storing on SD card. The SD/CF conversion adapter, which has SD card incorporated, can be handled as CF card.

SD/CF conversion adapter: DeLOCK adaptor CF II to SDHC,SDXC,
61796 (operation has been confirmed with the adaptor purchased in the year of 2016.)
62637 (operation has been confirmed with the adaptor purchased in the year of 2018.)

SD card: Hagiwara Solutions NSDA-004GT (discontinued), NSDA-004GL (discontinued),
NSD6-004GH (B21SEI

Note: The use of recommended device prevents loose of data, however correct operating it is not always guaranteed.

WARNING ! – SD card limitations

- SD card memory is 4 GB, however, only 1 GB will be used.
- Storing interval 100 msec. setting is not available. Use the SD card in a storing interval slower than 0.5 sec.
- Do NOT hot swap the CF card every minute on the minute (at 00 second). The data of one cycle may be lost.
- FTP data transfer setting is not available. If FTP data transfer operation starts during storing data on SD card, data on SD card may be lost.

3. CONNECTING TO I/O DEVICES

3.1 I/O DEVICE SELECTIONS

• PC Recorder (R1, R2, RZ) Series

SIGNAL TYPE	MODELS
DC voltage input	R1M-GH2, R1MS-GH3, R2M-2G3, RZMS-U9
Thermocouple input	R1M-GH2, R1MS-GH3, R2M-2H3, RZMS-U9
RTD input	R1M-J3, RZMS-U9
Potentiometer input	R1M-J3, RZMS-U9
Contact input	R1M-A1
Contact output	R1M-D1
Totalized pulse input	R1M-P4, R1M-A1
Pulse input	R1M-P4

• R3 Series Remote I/O

SIGNAL TYPE	MODELS
DC voltage input	R3-SV4, R3-SV4A, R3-SV4B, R3-SV4C, R3(Y)-SV8, R3-SV8A, R3-SV8B, R3-SV8C, R3(S/Y)-SV8N, R3(Y)-SV16N
DC current input	R3-SS4, R3(Y)-SS8, R3(S/Y)-SS8N, R3(Y)-SS16N
Thermocouple input	R3-TS4, R3-TS8
RTD input	R3-RS4, R3(S)-RS4A, R3(Y)-RS8, R3-RS8A, R3-RS8B
Universal input	R3-US4
Discrete input	R3(S/Y)-DA16, R3(Y)-DA16A, R3-DA16B, R3-DA32A, R3-DA64A
Discrete output	R3(Y)-DC16, R3-DC16A, R3-DC16B, R3-DC16C, R3-DC32A, R3-DC32C, R3-DC64A, R3-DC64C
Discrete I/O	R3(S)-DAC16*, R3(S)-DAC16A*
4 – 20mA input with excitation supply	R3(Y)-DS4, R3-DS8N
Potentiometer input	R3-MS4, R3(Y)-MS8
CT input	R3-CT4
AC current input with clamp-on current sensor	R3-CT4A**, R3-CT4B**, R3-CT4C, R3-CT8A**, R3-CT8B**, R3-CT8C
PT input	R3-PT4
Zero-phase current input	R3-CZ4
AC power input	R3-WT4, R3-WT4A, R3-WT4B, R3-WTU
High speed pulse input	R3-PA4
Speed/position input	R3-PA2
Totalized pulse input	R3-PA4A, R3-PA4B, R3(Y)-PA16, R3(S)-PA8
Strain gauge input	R3-LC2
Alarm	R3-AD4, R3-AR4, R3-AS4, R3-AS8, R3-AT4, R3-AV4, R3-AV8
Gateway	R3-GC1, R3-GD1, R3-GE1, R3-GFL1, R3-GM1

* Only continuous output mode is available.

** Data range must be setup with the PC Configurator Software R3CON and the dedicated cable.

• R5 Series Remote I/O

SIGNAL TYPE	MODELS
DC voltage input	R5-SV, R5T-SV
DC current input	R5-SS, R5T-SS
Thermocouple input	R5-TS, R5T-TS
RTD input	R5-RS, R5T-RS
Discrete input	R5-DA4, R5T-DA4, R5-DA16
Discrete output	R5-DC4, R5T-DC4, R5-DC16
4 – 20mA input with excitation supply	R5-DS, R5T-DS
Potentiometer input	R5-MS
CT input	R5T-CT
AC current input with clamp-on current sensor*	R5T-CTA, R5T-CTB
PT input	R5T-PT

* Data range must be setup with the PC Configurator Software R5CON and the dedicated cable.

• R7M Series Remote I/O*

SIGNAL TYPE	MODELS
DC voltage/current input	R7M-SV4
Thermocouple input	R7M-TS4
RTD input	R7M-RS4
Potentiometer input	R7M-MS4
CT input	R7M-CT4E
Discrete input	R7M-DA16
Discrete output	R7M-DC16A, R7M-DC16B, R7M-DC8C
Discrete input (Extension)	R7M-EA8, R7M-EA16
Discrete output (Extension)	R7M-EC8A, R7M-EC16A, R7M-EC8B, R7M-EC16B

* Must be setup with R7X Configurator Software and the dedicated cable.

• R7E Series Remote I/O

SIGNAL TYPE	MODELS
DC voltage/current input	R7E-SV4
Thermocouple input	R7E-TS4
RTD input	R7E-RS4
Potentiometer input	R7E-MS4
CT input	R7E-CT4E*
Discrete input	R7E-DA16
Discrete output	R7E-DC16A, R7E-DC16B
Discrete input (Extension)	R7E-EA8, R7E-EA16
Discrete output (Extension)	R7E-EC8A, R7E-EC16A, R7E-EC8B, R7E-EC16B

* Must be setup with R7X Configurator Software and the dedicated cable.

• Multi Power Monitor

SIGNAL TYPE	MODELS
AC power/energy	53U*

* Choose Code 1 for External Interface (53U-1xx1-AD4).

• IT60 Tower Light

SIGNAL TYPE	MODELS
Discrete output	IT60RE, IT40SRE, IT50SRE, IT60SRE

NOTES

- Use the resistor module (model: REM3-250) to accept DC current inputs for the R1M-GH2, R1MS-GH3 and RZMS-U9.
- The R1M-GH2 and the R1M-J3 are equipped with a trigger contact input (1 ch) which can be used for the 73VR1100.
- The R1MS-GH3, RZMS-U9, R2M-2G3 and R2M-2H3 are equipped with a trigger input (1 ch) and alarm output (1 ch) which can be used with the 73VR1100.
- The R7X configurator software (model: R7CON) is required in order to set mode and parity of the R7M, and the temperature unit of R7M-TS4/R7E-TS4 and R7M-RS4/ R7E-RS4, and the scaling of R7M-CT4E/R7E-CT4E.

3.2 CONNECTING TO THE I/O DEVICES

Please refer to 73VR1100 Users Manual (hardware & I/O, connection & setup – EM-7399-B) for details.

4. GETTING STARTED

4.1 STARTING UP THE 73VR1100

(1) Insert the CF Card to save data.

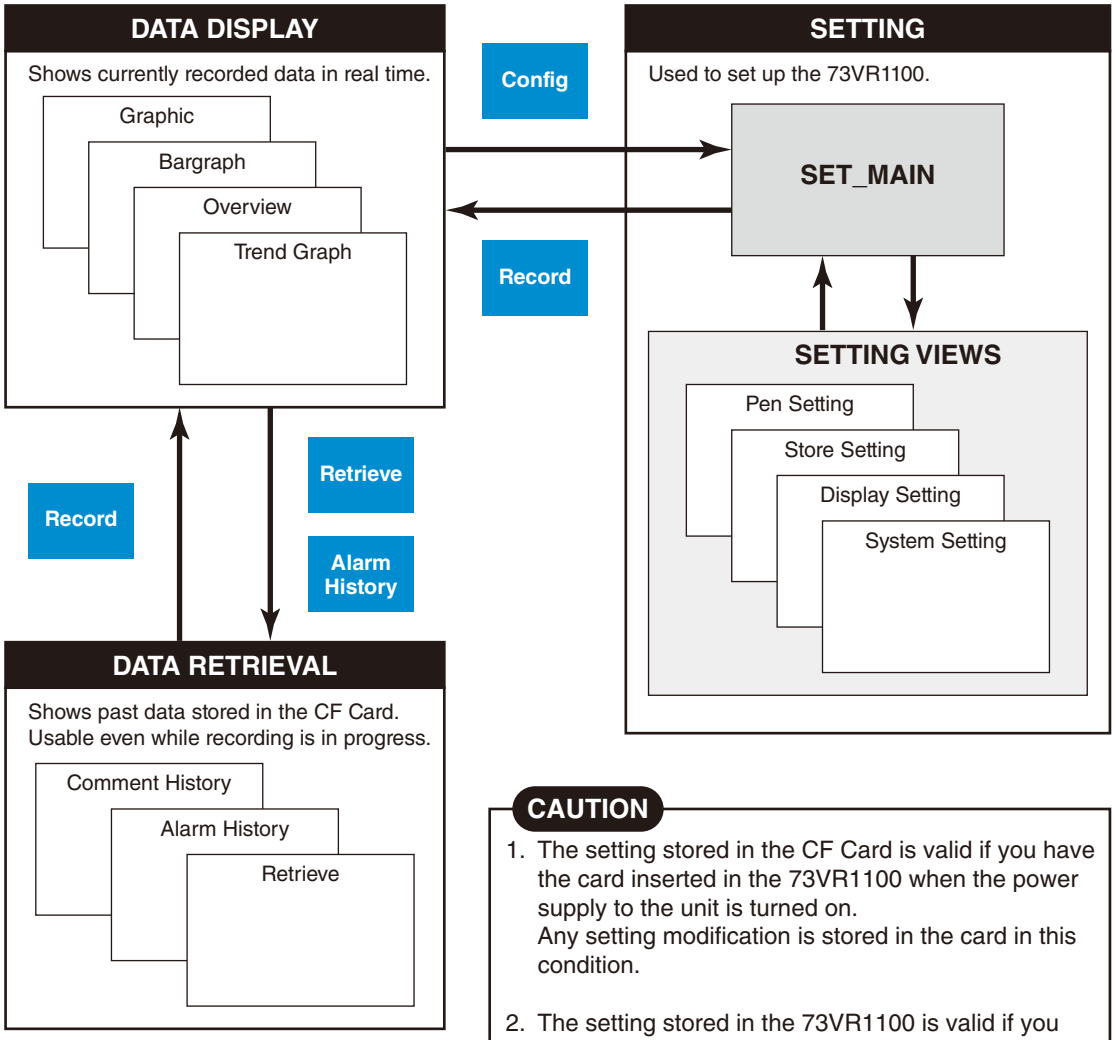
(2) Confirm that the power input terminals are correctly connected and turn on the power supply.

(3) Wait until a message indicating the initialization is in process. The 73VR1100 is now creating files necessary to store data in the CF Card. This may take a certain time.

(4) Once all files are ready, the initial view of the 73VR1100 appears on the screen.

4.2 73VR1100 VIEWS & BASIC OPERATIONS

Views used in the 73VR1100 are grouped in three functions: Data display, Setting and Data retrieval. Groups and views are related to each other as shown in the figure below.



CAUTION

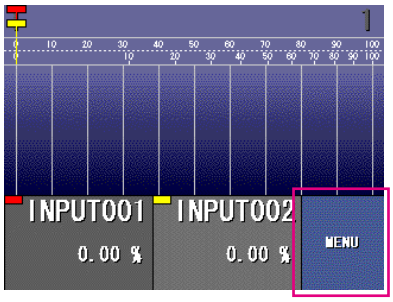
1. The setting stored in the CF Card is valid if you have the card inserted in the 73VR1100 when the power supply to the unit is turned on.
   Any setting modification is stored in the card in this condition.

2. The setting stored in the 73VR1100 is valid if you have no card in the 73VR1100 when the power supply is turned on.
   Any setting modification is stored in the unit in this condition.

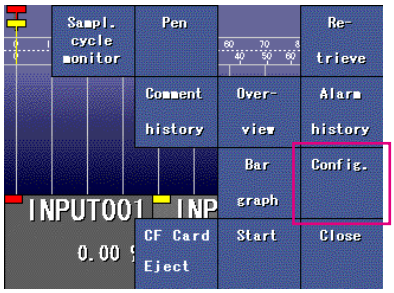
You can copy the setting stored in the unit to a card using the Builder Software or the reading/writing operation of the unit via USB Flash Memory.

5. SETTING UP THE 73VR1100

Touching Menu key on one of the display views (Trend, Overview and Bargraph) opens selectable menu items on the right half of the screen. Touch Config key to open Main view listing the name of detailed setting windows.

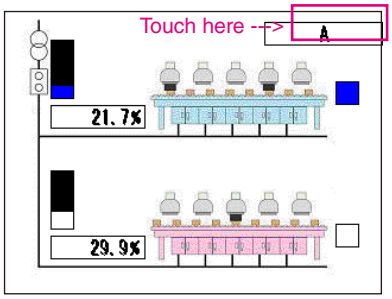


Menu key.

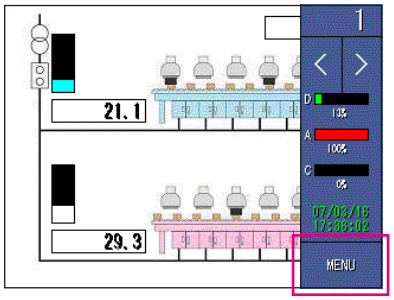


Config key.

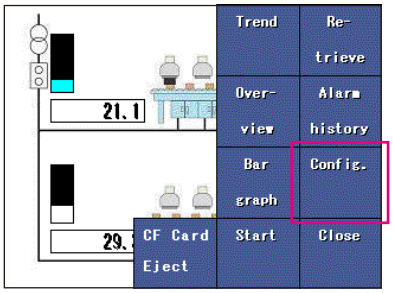
In Graphic view, touch the top right corner of the screen to show Menu key. Touch Menu key to open selectable menu items in the same manner.



Graphic view.

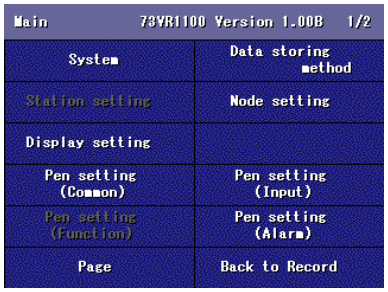


Menu key.

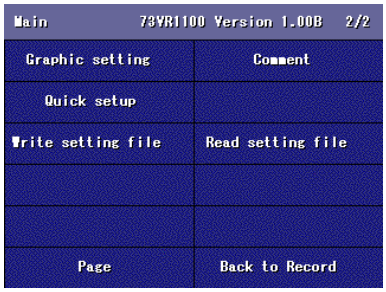


Config key.

Figures below show Main menu views.



Main view 1.



Main view 2.

In order to enable new setting, touch Back to Record key and go back to the previously displayed recording view (Trend, Overview, Bargraph or Graphic).

■ MAIN MENU & SUB MENU LIST

MODIFY : Y = Can be modified during recording, N = Not)

MAIN MENU	SUB MENU		MODIFY
System	Operating mode		N
	Storing mode		N
	Type downloads		N
	Alarm output cycle		N
	Temperature unit		N
	Start mode		N
	Data storing form		N
	Data overwrite		N
	Screen saver		Y
	Touch panel beep		Y
	Date and time		N
	Password		N
	Function channel		N
	IP address		N
	Subnet mask		N
	Default gateway		N
	Linger time		N
Data storing method	Storing interval		N
	Storing setting		N
Station setting	Station 1, 2		N
	IP address 1, 2		N
Node setting	Node 1...F		N
Display setting	Chart speed		N
	Display rate		N
	Graph direction		Y
	Digital display type		Y
	Digital display		Y
	Data file used volume		Y
	Display pen number		Y
	Display pen number (Overview)		Y
	Auto pen switching		Y
	Chart color		Y
Pen setting (Common)	Enable / Disable		N
	Analog / Discrete		N
	Tag		N
	Unit		N
	Station		N
	Node		N
	Channel		N
	Color		Y
	Line thickness		Y
	Decimal place		Y
Pen setting (Input)	Analog	Analog type	N
		Input range	N
		Engineering range	N
		Plot position	Y
		Scale shift	Y
		Normal / Log (Exp. scale, Log. plot position)	N
		Square root	N
		Overview color	Y
	Discrete	OFF description	N
		ON description	N

MAIN MENU	SUB MENU		MODIFY
Pen setting (Function)	Function		N
	Parameters		N
	Analog	Overview color	Y
		Plot position	Y
		Scale shift	Y
		Normal / Log (Exp. scale, Log. plot position)	N
	Discrete	OFF description	N
		ON description	N
Pen setting (Alarm)	Analog	Limit 1...4	Y
		Deadband 1...4	Y
		Normal zone	Y
		Zone color 0...4	Y
		Relay 1...4	Y
		Relay output 1...4	Y
		Up message	Y
		Down message	Y
	Discrete	OFF output / delay	Y
		ON output / delay	Y
		Normal state	Y
		OFF color	Y
		ON color	Y
		OFF station, node, channel	Y
		ON station, node, channel	Y
		OFF message output	Y
		ON message output	Y
		OFF message	Y
		ON message	Y
Graphic setting	Page	Page number	N
		Import image	N
		Background color	N
	Parts	Parts type	N
		Position	N
		Width, Height	N
		Input (Pen)	N
		Link view	N
		Link number	N
		Title	N
		Graph direction	N
		Transparent	N
		Outline color	N
		Background color	N
		Text color	N
Quick setup			N
Comment	Group name		Y
	Group color		Y
	Comment (Group 7 comment can be modified during recording)		Y
Write setting file			Y
Read setting file			N

■ TIPS FOR KEY OPERATIONS

Alphanumeric Keypad

When you need to enter alphabets and numbers during a setting process, the alphanumeric keypad consisting three pages are used: Small letters, Capital letters and Numbers as shown below.

Figure: Small letters.

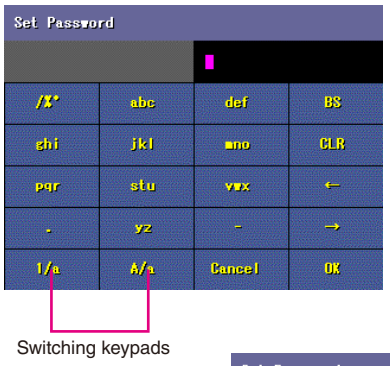
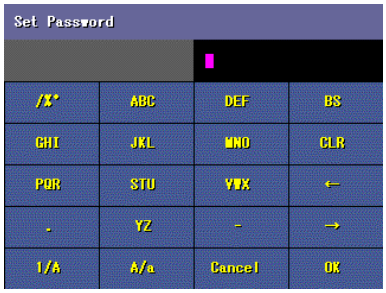


Figure: Capital letters.



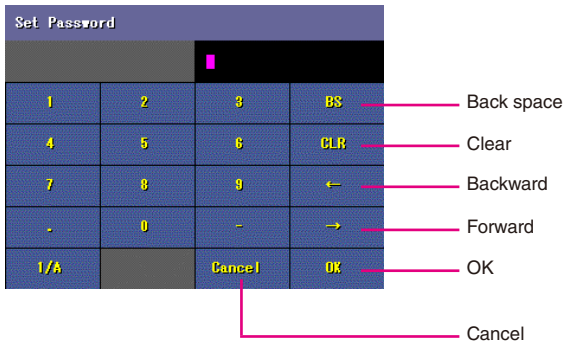


Figure: Numbers.

For example, the key showing 'abc' is used to enter characters 'a,' 'b,' or 'c.' 'a' is entered by touching the key once, 'b' for twice, and 'c' for three times. Other letters can be selected in the same manner. When you need to enter the same character or another character on the same key in series, move the cursor before choosing the second character.

OK and Cancel Keys

When you are satisfied with changes you applied, touch OK to confirm the setting and move to the next window. If you do not want to apply the changes, touch Cancel key.

Page, Next and Previous Keys

When more than one page exist for one menu item, use Page key to switch from one page to another.

Next and Previous keys are used to move between different channels for the same setting item.

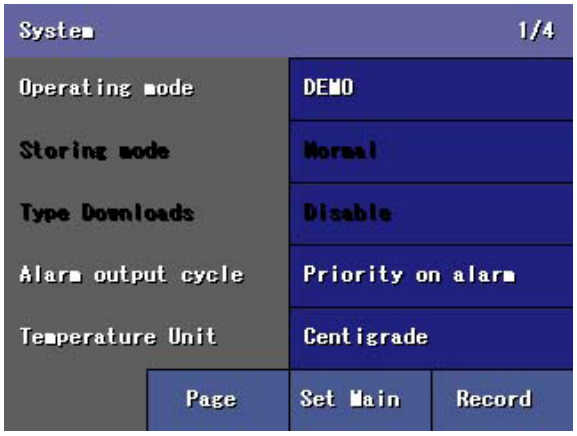
Record Key

Important !

In order to apply new setting, touch Record key to save and return to one of the Display views (Trend, Overview or Bargraph).

5.1 SYSTEM SETTING

The System setting menu consists of four (4) views as shown below.



Touch Page key to switch between pages.

5.1.1 OPERATING MODE

Touching the current selection of the Operating mode shows selectable options at the bottom of the screen. Choose among the following options.

DEMO	Demonstration mode	You can run the 73VR1100 program without actual signal input for learning, evaluation and demonstration when you choose DEMO.
Modbus RTU	RS-485 connection	Choose this option when you connect actual input signals to the 73VR1100 via RS-485.
Modbus/TCP	Ethernet connection	Choose this option when you connect actual input signals to the 73VR1100 via Ethernet.

5.1.2 STORING MODE

In Modbus/TCP operating mode, you have an option of High Speed storing mode. In the high speed mode, only one station of the R3-NE1 is used. Max. pen numbers are also limited to 64 channels (must be located at Slot 1, Channel 1 thr. 64). When Function pens are to be mixed, max. pen numbers are limited to 32 input channels (must be located at Slot 1, Channel 1 thr. 32) + 32 function channels.

Touching the current selection of the Storing mode shows selectable options at the bottom of the screen. Choose among the following options.

Normal	500 msec. storing rate
High speed	100 msec. storing rate

5.1.3 TYPE DOWNLOADS

Choose Yes when you need to automatically configure ranges from the 73VR1100 for the field I/O modules (e.g. R1M-GH2) connected via a communication adaptor (e.g. 72EM2-M4).

When you have the following I/O modules, no downloading is available from the 73VR1100. Choose No for: R3, R5, R7M and 53U.

For the R3, R5 and R7M, DIP switches equipped on the modules are used to set, while there is no type setting for the 53U.

Yes	Type downloading
No	No type downloading

NOTE

When 73VR1100 is connected to R1M Series via RS-485, 73VR1100 runs Type downloading to R1M Series. Settings are not available in the case.

5.1.4 DATA CYCLE

When the 73VR1100 communicates with contact output modules for alarm output, it usually monitors alarm output status once after monitoring input signals of every node in order to respond quickly to any (alarm) status change.

The Data Cycle specifies the timing of alarm monitoring.

Touching the current selection of the Data Cycle shows selectable options at the bottom of the screen. Choose among the following options.

Priority on alarm	Default (normal) setting. Priority is set to alarm monitoring. The 73VR1100 monitors alarm output status once after monitoring every node.
Priority on sampling time	The 73VR1100 monitors alarm output status once after monitoring all nodes.
No alarm	No discrete output regardless of alarm setting. Priority is set to input signal monitoring.

When you do not need any alarm output, you may want to choose 'Priority on sampling time' or 'Non alarm' in order to get faster sampling rate. It may be effective also when there are a great number of input modules connected, though it depends upon their types and numbers and also the PC's performance. Please refer to [Example] below for more detailed explanations.

Usually the setting 'Priority on alarm' is recommended for optimal performance.

[Example]

Data monitoring cycle for three (3) input modules with alarm contact output.

'Priority on alarm' option
(default or normal setting)

Sending/receiving Node 1 analog data
Monitoring Node 1 alarm output
Monitoring Node 2 alarm output
Monitoring Node 3 alarm output

Sending/receiving Node 2 analog data
Monitoring Node 1 alarm output
Monitoring Node 2 alarm output
Monitoring Node 3 alarm output

Sending/receiving Node 3 analog data
Monitoring Node 1 alarm output
Monitoring Node 2 alarm output
Monitoring Node 3 alarm output

'Priority on sampling time' option

Sending/receiving Node 1 analog data
Sending/receiving Node 2 analog data
Sending/receiving Node 3 analog data

Monitoring Node 1 alarm output
Monitoring Node 2 alarm output
Monitoring Node 3 alarm output

'Non alarm' option (fastest sampling)

Sending/receiving Node 1 analog data
Sending/receiving Node 2 analog data
Sending/receiving Node 3 analog data

5.1.5 TEMPERATURE UNIT

Touching the current selection of the Temperature Unit shows selectable options at the bottom of the screen. Choose among the following options.

When the temperature unit for the R3, R5 and/or R7 modules is set to K (absolute temperature) by the PC Configurator Software, choose Centigrade on the 73VR1100.

Centigrade	Centigrade (Celsius)
Fahrenheit	Fahrenheit

5.1.6 START MODE

Touching the current selection of the Start Mode shows selectable options at the bottom of the screen. Choose among the following options.

Cold Start	At a restart, the 73VR1100 stands by showing the initial view.
Hot Start	At a restart, the 73VR1100 automatically starts recording.

5.1.7 DATA STORING FORM

Touching the current selection of the Data Storing Form shows selectable options at the bottom of the screen. Choose among the following options.

Float	Floating point	1 data size: 4 bytes Decimal fraction: max. 4 decimal places (effective number of digits: 6 or 7) Float is to be selected when you need to store data including decimal fractions. The 4-byte-long data is better in data precision but the total storable time in the CF Card becomes shorter compared from Short Int.
Short int	Short integer	Integer data multiplied by 10. The 2-byte-long data is not as precise (one decimal place) as Float type is, but the total storable time in the CF Card is longer.

WHICH FORM TO CHOOSE? -- EXAMPLE

If you have selected Short integer, and when an input range 1 – 5V is converted in an engineering unit range of 0 – 10, the actual converted values are: 0 at 1V input, 0.25 at 1.1V. In this case, the 73VR1100 can store only one decimal place, and '0.25' is saved only as '0.2.' Likewise, the input 1.15V is converted into 0.275 in the engineering unit range, but is saved also as '0.2.' 1.1V and 1.15V inputs make no difference in the short integer form.

Choose Float if you want to make difference between 1.1V and 1.15V.

CAUTION

Choose Float to store the following data types:

R1M-A1 (totalized pulse count)

R1M-P4 (totalized pulse count)

R3-PA4A, R3-PA4B, R3(S)-PA8

R3-PA2 (position data)

R3-WTU, R3-WT4, R3-WT4A, R3-WT4B (depending on setting and measurement items)

53U

WARNING !

When the data storing form setting is changed, new data stored in the same data file overwrite previously stored data.

5.1.8 DATA OVERWRITE

You can specify if you want to stop recording or continue recording by overwriting the oldest data when the CF card capacity is full. Detailed explanations on the data file is given in Section 9.1.

OFF	Recording is stopped.
ON	Recording continues by overwriting the oldest data.

5.1.9 SCREEN SAVER

The LCD display's backlight can be turned off when the screen is untouched for a specific time period.

Touching the current selection of the Screen saver replaces the screen with a numeric keypad. The setting can be modified even while recording is in progress.

Enter a desired time in minutes to initiate the screen saver.

Screen saver time setting	Selectable range: 0 to 99 (minutes) The screensaver function is deactivated with the time set to zero (0).

Touching the screen cancels the screen saver mode. The screen saver is automatically cancelled when an alarm is output.

5.1.10 TOUCH PANEL BEEP

You can specify if you want a beep sound or not whenever you touch the screen.

Touching the current selection of the Touch panel beep shows selectable options at the bottom of the screen. The setting can be modified even while recording is in progress.

OFF	Beep sound is off.
ON	Beep sound is on.

5.1.11 DATE AND TIME

Date / time is indicated in the format: YY / MM / DD HH : MM : SS.

Touching the current time index replaces the screen with a numeric keypad. Enter a correct time and touch OK.

CAUTION !

If incorrect date is entered, OK button turns grey and becomes disabled.

CAUTION !

After the clock has been rewound (e.g. from 10:02:34 to 10:00:00), a part of the data in Data file, Comment history file and Alarm history file will be deleted in certain conditions as explained in the following. They are not deleted when the clock has been forwarded.

1. When you touch Start button, a warning dialog box will appear if the clock shows the time earlier than the last data's time index in the data files. When you touch OK, the data will be deleted. If you touch Cancel, no data will be deleted but recording is stopped.

   With the remote trigger, event recording or time specified storing mode, data will be deleted not at the moment of Start, but at the moment of the trigger (or the specified time).
2. With Hot Start setting, data will be deleted without warning if the clock shows the time earlier than the last data's time index in the data files when the data recording has been started automatically.
3. When the recorder is started remotely by the 73VR11BLD or MSR128, data will be deleted without warning if the clock shows the time earlier than the last data's time index in the data files.

5.1.12 PASSWORD

Password setting prevents unauthorized access to data displays and changes in the setting. When you have set a password and returns to one of the Display views, the password will be requested every time you touch a control key on the screen.

Once the password lock is released, you can access control keys and move to other views including Config.

Password	Max. 6 alphanumeric characters

CAUTION !

The password lock function is valid only on the Display view (Trend, Overview or Bargraph). If another view is left open in unlocked state, anyone can change its setting.

If you forgot your password, please contact us.

The following functions are available without needing a password:

- Switching Pages within the same function view.
- Updating digital displays
- Zooming in a digital display

5.1.13 FUNCTION CHANNEL

Specify how many channels among the total channels (64 in High Speed mode, 128 in Normal mode) you want to use for Function pens.

Disable	Function channels are not used.
32	32 channels are for Function.
64	64 channels are for Function. (Not selectable in High Speed mode)

5.1.14 IP ADDRESS

In order to connect the 73VR1100 to a PC via Ethernet when using the 73VR11BLD (Builder) or the 73VRWV (Data Viewer), set an appropriate IP address.

Touching the current selection of the IP address replaces the screen with a numeric keypad. Enter a desired IP address on the keypad and touch OK.

IP address	Factory default setting: 192.168.0.1

CAUTION !

In order to apply new IP address setting, the 73VR1100 must be restarted. Be sure to return to one of the Display views to save the new setting. All new setting will be lost otherwise.

Consult your network administrator for IP address.

5.1.15 SUBNET MASK

Touching the current selection of the subnet mask replaces the screen with a numeric keypad. Enter a desired value on the keypad and touch OK.

Subnet mask	Factory default setting: 255.255.255.0

CAUTION !

In order to apply new subnet mask setting, the 73VR1100 must be restarted. Be sure to return to one of the Display views to save the new setting. All new setting will be lost otherwise.

Consult your network administrator for subnet mask.

5.1.16 DEFAULT GATEWAY

Touching the current selection of the default gateway replaces the screen with a numeric keypad. Enter a desired value on the keypad and touch OK.

Default gateway	Factory default setting: None

CAUTION !

In order to apply new default gateway setting, the 73VR1100 must be restarted. Be sure to return to one of the Display views to save the new setting. All new setting will be lost otherwise.

Consult your network administrator for default gateway.

5.1.17 LINGER TIME

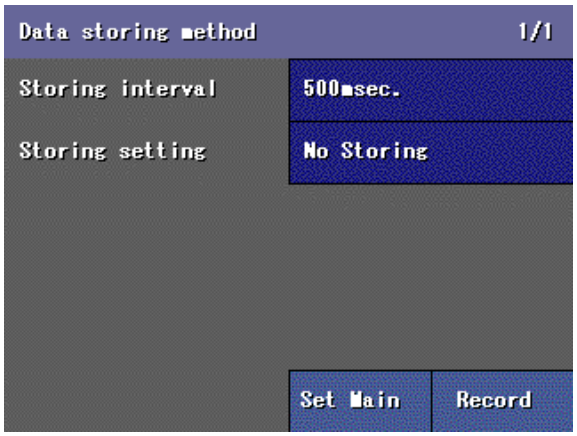
TCP Socket is closed after no communication is detected for a preset Linger Time. This setting is used when connecting to a host PC via Modbus/TCP.

Touching the current selection of the linger time replaces the screen with a numeric keypad. Enter a desired value on the keypad and touch OK.

Linger time	0.0 to 3000.0 seconds (100 msec. increments)

5.2 DATA STORING METHOD

The initial view for the Data storing method setting is as shown below.



5.2.1 STORING INTERVAL

The data is stored in time intervals preset as the Storing interval.

Touching the current selection of the Storing interval shows selectable options at the bottom of the screen. Choose among the following options. For the F value calculation, choose 500 milliseconds.

The storing intervals is fixed at 100 msec. for High Speed mode.

500msec.	500 milliseconds
1sec.	1 second
2sec.	2 seconds
5sec.	5 seconds
10sec.	10 seconds
1min.	1 minute
10min.	10 minutes

Total recording time in a CF Card depends upon the storing interval selection. Selecting greater storing interval allows longer recording time, though the data are more thinned, which may jeopardize the data accuracy.

CAUTION !

When the storing interval setting is changed, previously stored data are overwritten with new data.

Consider analog inputs' update cycle when determining the storing interval.

5.2.2 STORING SETTING

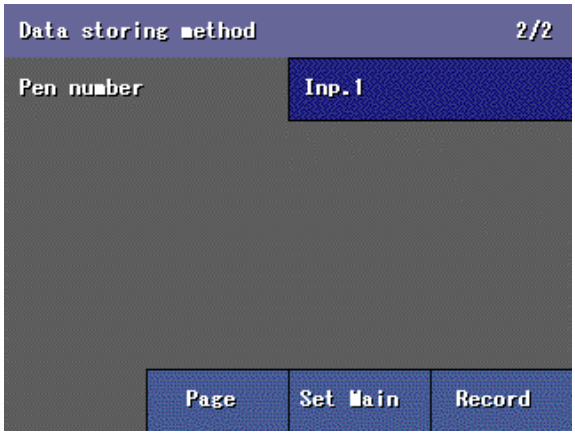
Five storing methods are selectable.

Touching the current selection of the Storing interval shows selectable options at the bottom of the screen. Choose among the following options:

No storing	No recording	Data is plotted on the chart or displayed on the digital meter or bargraph, but no data is stored in the CF Card.
Normal	Normal storing mode	Recording is manually initiated and stopped. Data is continuously stored while the recording is on.
Remote trigger	Remote trigger recording mode	Data is automatically recorded while the external trigger condition (analog or discrete input) is true. (See 5.2.3)
Event recording	Event recording mode	The 73VR1100 detects an external event by trigger signal, and stores preset number of samples (max. 1200 respectively) before and after the moment of event. (See 5.2.4)
Time specified	Store at defined time mode	Recording is automatically initiated and stopped at predefined time. (See 5.2.5)

5.2.3 REMOTE TRIGGER RECORDING

In the remote trigger recording mode, data is automatically stored while the external trigger condition (analog or discrete input) is true.



With an analog trigger, the signal are continuously compared with a preset threshold, and the 73VR1100 starts and stops recording when it is in a pre-determined condition (higher or lower than the threshold).

With a discrete trigger, the signal logic state is continuously monitored, and the 73VR1100 starts and stops recording when it is turned to a pre-determined state (ON or OFF).

■ Trigger Conditions for Analog

Value > Threshold	Data is stored while the trigger input signal value is higher than the threshold setpoint.
Value < Threshold	Data is stored while the trigger input signal value is lower than the threshold setpoint.
Value ≥ Threshold	Data is stored while the trigger input signal value is equal to or higher than the threshold setpoint.
Value ≤ Threshold	Data is stored while the trigger input signal value is equal to or lower than the threshold setpoint.

■ Trigger Conditions for Discrete

ON	Data is stored while the trigger input signal logic is ON.
OFF	Data is stored while the trigger input signal logic is OFF.

CAUTION !

If you touch Record button while the trigger condition is true, no recording starts until it turns true for a next time.

HOW TO SET THE REMOTE TRIGGER RECORDING

1. Storing setting: Select Remote trigger as explained in 5.2.2. Choosing the Remote trigger on the Data storing method view changes the subsequent menu items to those suitable for the remote trigger recording mode.
2. Discrete / Analog: Choose a type of trigger signal.

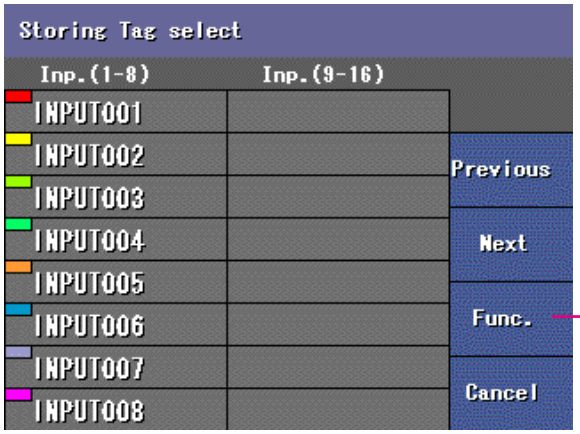
Discrete	Contact signal trigger	A discrete signal triggers recording.
Analog	Analog signal trigger	An analog signal triggers recording.

3. Threshold: For analog signals, set a threshold in an engineering unit value.

Threshold	Engineering unit value. Max. 6 digits including decimal point and minus (–) sign. 'e' is used to set an exponential value.

'e' can be used to input an exponential value such as '1e9.' Entering 'e' in any other way (e.g. '1ee') will not be recognized as a numeral.

4. Condition: Choose among the abovementioned options.
5. Pen number: Choose a pen to be designated as trigger. Touching the current selection of Pen number opens the Storing pen select view which listing all available (meaning the enabled pens) tag names.



Function key
Switches the window to pens assigned to the operation functions.
This key is replaced with Input key while the window shows Function tag selections.

5.2.4 EVENT RECORDING

In the event recording mode, the 73VR1100 detects an external event by trigger signal, and stores preset number of samples (max. 1200 respectively) before and after the moment of event.

With an analog trigger, the trigger signal is continuously compared with a preset threshold, and the 73VR1100 initiates recording when it is in a pre-determined condition (higher or lower than the threshold).

With a discrete trigger, the signal logic state is continuously monitored, and the 73VR1100 initiates recording when it is turned to a pre-determined state (ON or OFF).

■ Trigger Conditions for Analog

Value > Threshold	Data recording is initiated when the trigger input signal value goes above the threshold setpoint.
Value < Threshold	Data recording is initiated when the trigger input signal value goes below the threshold setpoint.
Value ≥ Threshold	Data recording is initiated when the trigger input signal values is equal to or goes above the threshold setpoint.
Value ≤ Threshold	Data recording is initiated when the trigger input signal values is equal to or goes below the threshold setpoint.

■ Trigger Conditions for Discrete

Up	Rising pulse edge	Data recording is initiated at a rising edge of the trigger input pulse.
Down	Sinking pulse edge	Data recording is initiated at a sinking edge of the trigger input pulse.

CAUTION !

If you touch Record button while the trigger condition is true, no recording starts until it turns true for a next time.

HOW TO SET THE EVENT RECORDING

1. Storing setting: Select Event recording as explained in 5.2.2. Choosing the Event recording on the Data storing method view changes the subsequent menu items to those suitable for the event recording mode.
2. Discrete / Analog: Choose a type of trigger signal.

Discrete	Contact signal trigger	A discrete signal triggers recording.
Analog	Analog signal trigger	An analog signal triggers recording.

3. Threshold: For analog signals, set a threshold in an engineering unit value.

Threshold	Engineering unit value. Max. 6 digits including decimal point and minus (–) sign. 'e' is used to set an exponential value.

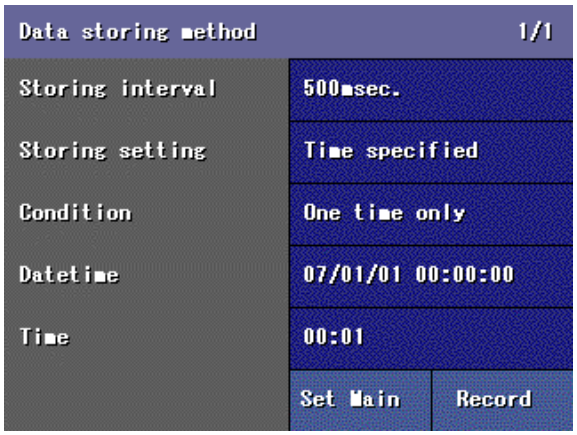
'e' can be used to input an exponential value such as '1e9.' Entering 'e' in any other way (e.g. '1ee') will not be recognized as a numeral.

4. Condition: Choose among the aforementioned options.
5. Pen number: Choose a pen to be designated as trigger. Touching the current selection of Pen number opens the Storing tag select view (See 5.2.3) which listing all available (meaning the enabled pens) tag names.
6. Pretrigger / Posttrigger: Specify numbers of samples to be stored before (Pretrigger) and after (Posttrigger) the event respectively.

Pretrigger	Number of pretrigger samples	Max. 1200 samples. Pretrigger recording is NOT applicable with the storing intervals set to 2 seconds or longer.
Posttrigger	Number of posttrigger samples	Max. 1200 samples.

5.2.5 STORE AT A DEFINED TIME MODE

In the Store-at-a-Defined Time mode, recording is automatically initiated and stopped at a predefined time.



Choose either 'One Time Only' or 'Every Day' under Condition option.

One Time Only	Data is stored once at a predefined time. Specify Year-Month-Day and Hour-Min-Sec. to start the recording and the time duration.
Every Day	The 73VR1100 runs recording once per day at a predefined time. Specify Hour-Min-Sec. to start the recording and the time duration.

CAUTION !

If you touch Record button while in the specified time, no recording starts until a next specified time.

HOW TO SET THE STORE-AT-A-DEFINED-TIME MODE

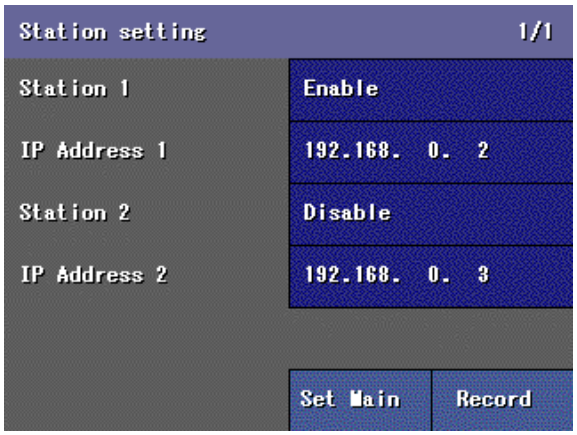
1. Storing setting: Select Time Specified as explained in 5.2.2. Choosing the Time Specified recording on the Data storing method view changes the subsequent menu items to those suitable for the storing mode.
2. Touching the current selection opens a numeric keypad to enter a new setting. Specify when you want to start recording (Datetime) and the time duration (Time). With Every day setting, 'Date' is not indicated.

Datetime or time	Recording started at	Specify YY/MM/DD HH:MM:SS.
Time	For	Specify HH:MM between 00:00 and 23:59.

5.3 STATION SETTING

Station setting is required when you have chosen Modbus/TCP for the operating mode. One (1) station is selectable for High Speed mode, two (2) is for Normal mode.

Set 'Enable' to relevant stations and specify IP addresses.

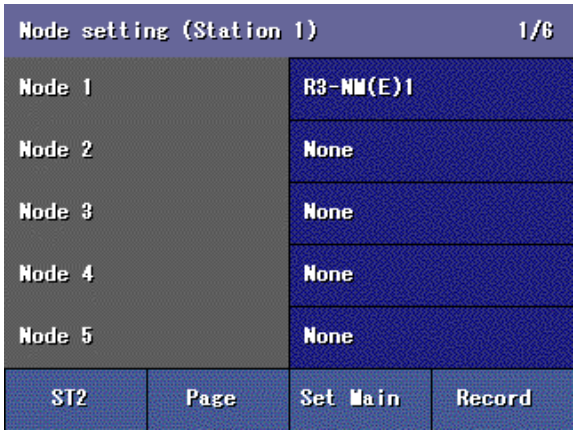


CAUTION

The R3CON program is used to set the IP address for the R3-NE1.
The R5CON program is used to set the IP address for the R5-NE1.
The R7CON program is used to set the IP address for the R7E.
The ITCFG program is used to set the IP address for the IT60RE/ITx0SRE.
Up to two (2) 73VR1100 units can be connected at once to one R3-NE1/R5-NE1/R7E.

5.4 NODE SETTING

Specify which node numbers are occupied by I/O modules, and which type of I/O modules are connected.



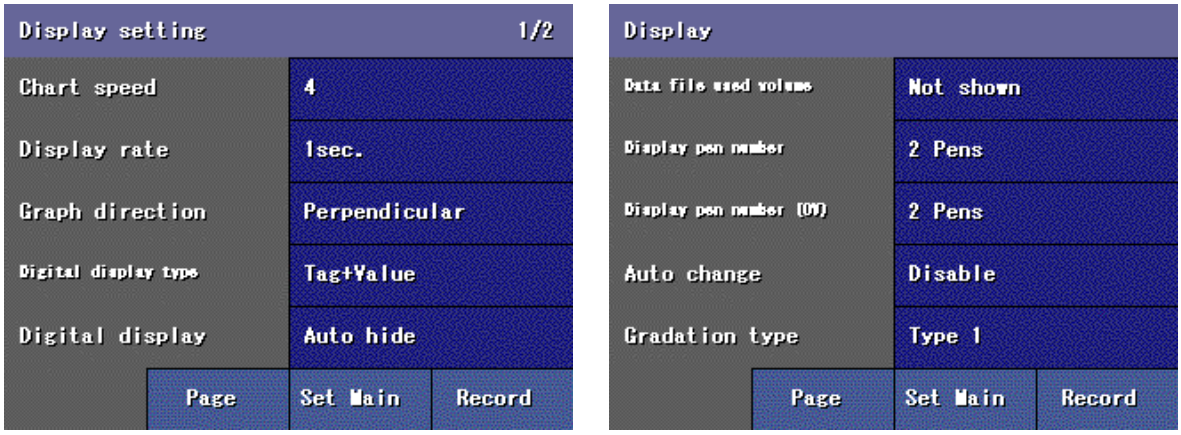
Touch the field to the right of a node number to show the list of selectable I/O types, and choose one.

R1M-GH2:	DC or thermocouple input, 16 points
R1M-J3:	RTD or potentiometer input, 8 points
R1M-A1:	Contact input, 32 points
R1M-A1C1:	Contact input, 32 points; with the FCN type connector
R1M-D1:	Open collector output, 32 points
R1M-D1C1:	Open collector output, 32 points; with the FCN type connector
R1M-P4(–):	Pulse totalizing counter inputs; detecting pulse edges to rise
R1M-P4(+):	Pulse totalizing counter inputs; detecting pulse edges to sink
R1MS-GH3:	Isolated DC or thermocouple input, 8 points
R2M-2H3:	Thermocouple input, 8 points
R2M-2G3:	DC input, 8 points
R3-(NM/NE)1:	Combination of R3 series I/O modules
R5-(NM/NE)11:	Combination of R5 series I/O modules, Data Allocation Mode 1
R5-(NM/NE)12:	Combination of R5 series I/O modules, Data Allocation Mode 2
R7(M/E)/IT60RE:	Analog input, discrete I/O and mixed analog input / discrete I/O, Tower Light
RZMS-U9:	Isolated universal (DC / T/C / RTD / potentiometer) input, 12 points
53U:	Multi Power Monitor

Go through the same procedure for all used nodes. Set 'None' to unused nodes.

5.5 DISPLAY SETTING

The Display setting view is available with the following menu items:



5.5.1 CHART SPEED

Touching the current selection of the Chart speed shows selectable options at the bottom of the screen.

Choose among the options in the table below. The numbers show how many pixels are used for one sample data. For example, if you choose '4,' one sample is plotted 4 pixels further than the previous one, and two sample points are connected to create a trend graph.

Plotting already on the screen disappears when the chart speed is changed, except when the new setting is 1 or 4.

The chart speed options may be limited when certain storing intervals are selected. Refer to the table below.

STORING INTERVAL / CHART SPEED	4	1	1/5	1/32	1/160	1/480	1/960
100 msec.	Yes	Yes	Yes	Yes	No	No	No
≥ 500 msec.	Yes	Yes	Yes	Yes	Yes	Yes	Yes

The following tables indicates actual time spans expressed on the chart depending upon different storing intervals.

■ Storing Interval 100 msec.

CHART TYPE / CHART SPEED	Perpendicular with digital display	Perpendicular without digital display	Horizontal
4	2.7 seconds	4.7 seconds	6.7 seconds
1	11 seconds	19 seconds	27 seconds
1/5	55 seconds	1 min., 35 sec.	2 min., 15 sec.
1/32	5 min., 52 sec.	10 min., 8 sec.	14 min., 24 sec.

■ Storing Interval 500 msec. or longer

CHART TYPE / CHART SPEED	Perpendicular with digital display	Perpendicular without digital display	Horizontal
4	13.5 seconds	23.5 seconds	33.5 seconds
1	55 seconds	1 min., 35 sec.	2 min., 15 sec.
1/5	4 min., 35 sec.	7 min. 52 sec.	11 min., 15 sec.
1/32	29 min., 20 sec.	50 min., 40 sec.	1 hour, 12 min.
1/160	2 hours, 26 min., 40 sec.	4 hours, 13 min., 20 sec.	6 hours
1/480	7 hours, 20 min.	12 hours, 40 min.	18 hours
1/960	14 hours, 40 min.	1 day, 1 hour, 20 min.	1 day, 12 hours

5.5.2 DISPLAY RATE

The display rate is applied to Trend, Bargraph, Overview and Graphic views.

When there are more numbers of I/O modules, longer time is needed to go through one data sampling cycle. It there are too many, the display values may not be updated in time for the preset display rate.

Confirm the actual sampling rate before selecting the display rate. Refer to Section 8.1.5 for how to check the sampling rate.

Touching the current selection of the Graph direction shows selectable options at the bottom of the screen. The setting can be modified even while recording is in progress. Choose among the following options:

1 sec.	Display values updated by every 1 second
2 sec.	Display values updated by every 2 seconds
5 sec.	Display values updated by every 5 seconds

5.5.3 GRAPH DIRECTION

You can specify if you want to show the chart in the perpendicular direction or the horizontal direction.

Touching the current selection of the Graph direction shows selectable options at the bottom of the screen. The setting can be modified even while recording is in progress. Choose among the following options:

Perpendicular	Perpendicular direction
Horizontal	Horizontal direction

5.5.4 DIGITAL DISPLAY TYPE

Touching the current selection of the Digital display type shows selectable options at the bottom of the screen to specify either to show only the tag name or the value, or both. Choose among the following options:

Tag + Value		The momentary value and the tag name of the data displayed on the screen.
Tag		The tag name of the data displayed on the screen.
Value		The momentary value of the data displayed on the screen.

5.5.5 DIGITAL DISPLAY

Touching the current selection of the Digital Display shows selectable options at the bottom of the screen to show or hide the digital display on the data display view. This option can be changed while recording.

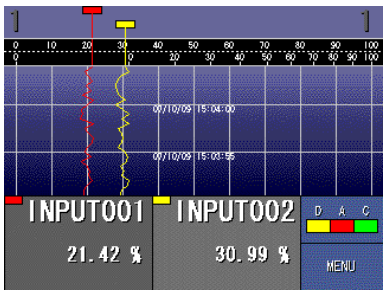
Auto hide	Digital display is automatically hidden in 30 seconds after it appears on the screen. Touch the area of the display to call it up.
Continuous	Digital display remains on the screen.

5.5.6 DATA FILE USED VOLUME SETTING

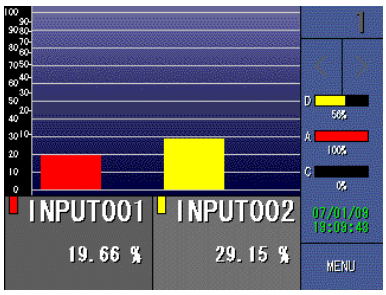
Trend view, Overview, Bargraph view and Graphic view can show a bargraph how much volume of the data file has been used.

The data file is automatically created when the 73VR1100 has started up. 0% is shown when there is no data in the file. Used-up rate is shown in the percentage of the total volume. This option can be changed while recording. For detailed information refer to Section 9.

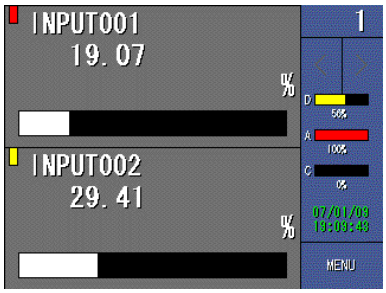
Not shown	Data file used volume bargraph is not shown.
Show	Data file used volume bargraph is shown.



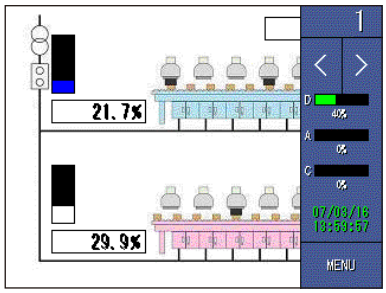
Trend view.



Bagraph view



Overview.

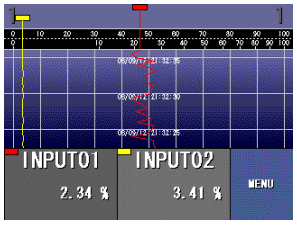


Graphic view.

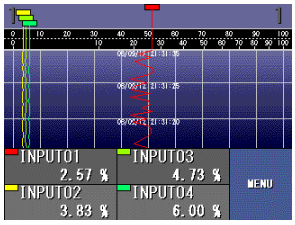
5.5.7 DISPLAY PEN NUMBER

You can specify the number of pens to show on the screen in Trend View and Bargraph View.

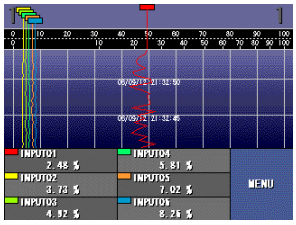
Touching the current selection of the Display Pen Number shows selectable options at the bottom of the screen. The setting can be modified even while recording is in progress. Choose among the following options:



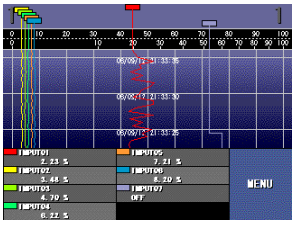
2 pens



4 pens



6 pens

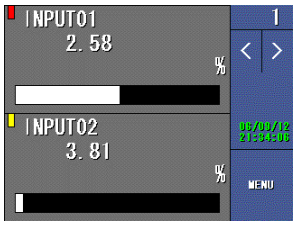


8 pens

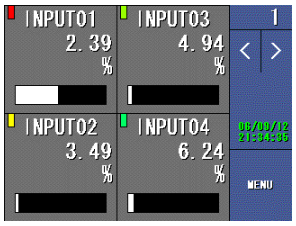
5.5.8 DISPLAY PEN NUMBER (OV)

You can specify the number of pens to show on the screen in Overview.

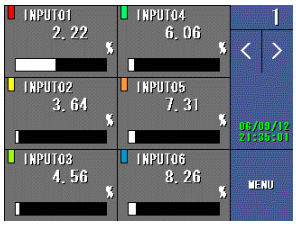
Touching the current selection of the Display Pen Number shows selectable options at the bottom of the screen. The setting can be modified even while recording is in progress. Choose among the following options:



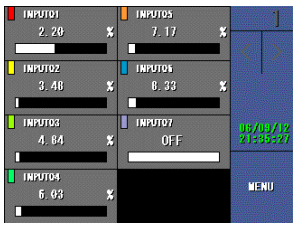
2 pens



4 pens



6 pens



8 pens

16 pens

5.5.9 AUTO PEN SWITCHING

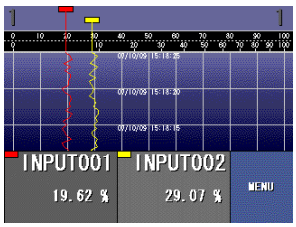
You can automatically switch the pens on the enlarged digital display on the screen.

Enable	Once the enlarged digital display is activated on the screen, pens are automatically switched from one to another.
Disable	Digital display remains on the same pen when the enlarged digital display is activated.

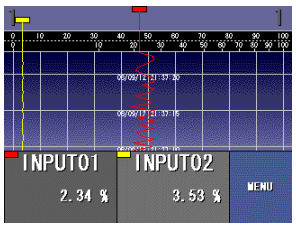
5.5.10 CHART COLOR

You can specify different types of chart colors.

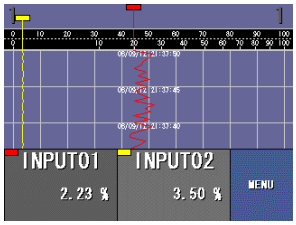
Touching the current selection of the Chart Color shows selectable options at the bottom of the screen. The setting can be modified even while recording is in progress. Choose among the following options:



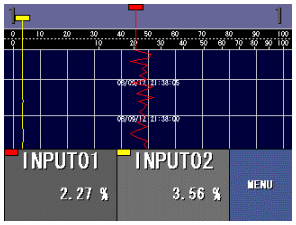
Gradation 1



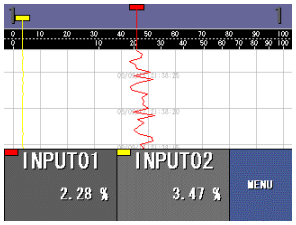
Gradation 2



Plain (Light)



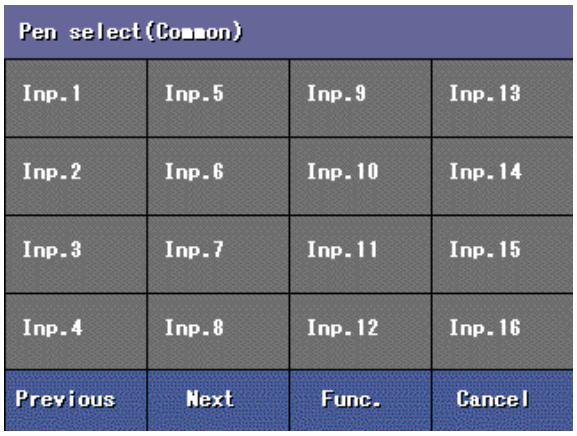
Plain (Dark)



Plain (White)

5.6 PEN SETTING (COMMON)

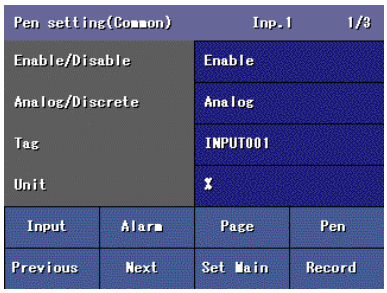
Four (4) pen setting keys are on the main menu: Pen setting (Common), Pen setting (Input), Pen setting (Function) and Pen setting (Alarm). Touching one of these three keys opens up Pen selector as shown below:



Example of pen setting, Pen select (common).

Touching Pen setting (Common) and choosing one of the pens opens the Pen setting (Common) view for the selected.

Pen setting (Common) views have three (3) pages as shown below:



Enable / Disable

Enable / Disable the recording. The pen's input data is stored when this selection is set to Enable.

Analog / Discrete

Choose Analog or Discrete signal for the pen so that the rest of the setting will be appropriately arranged.

Tag name

Touching the current selection of the Tag name opens an alphanumeric keypad.

DO NOT use symbols such as comma, period, space or tab, which can be used to separate data fields in a CSV file.

Be aware also that data cells including symbols such as plus (+) and minus (–) will be handled as an equation in an Excel file.

Tag	Max. 8 characters

Unit

Touching the current selection of the Unit opens an alphanumeric keypad.

DO NOT use symbols such as comma, period, space or tab, which can be used to separate data fields in a CSV file.

Be aware also that data cells including symbols such as plus (+) and minus (–) will be handled as an equation in an Excel file.

Unit	Max. 4 characters

Station No., Node No., Channel No.

Touching the current selection of each item opens an alphanumeric keypad. Identify the input signal for the pen.

When Modbus RTU is selected for connection, Station No. setting is not necessary.

The R1M-P4, R3, R5 and R7 series, 53U and the IT60RE, ITx0SRE series use different channel numbering systems. Refer to Appendix 1 for detailed information.

Color

Touching the current selection of the Color opens a color palette. Choose a desired color from the palette.

Line thickness

This setting is selectable even during recording.

Normal	Normal line
Thick	Thick line

Decimal place

Decimal places for the digital indicator can be specified. This setting is selectable even during recording.

3	3 decimal places
2	2 decimal places
1	1 decimal place
0	No decimal point

Plot range with decimal place on the scale

Plot range in an engineering unit can be indicated on the scale in Trend and Bargraph views. For example, when the lower range is set to 0, and the upper range is set to 1000, the scale shows 10 divisions (0, 100, 200, ... 900, 1000). How many decimal places are to be shown depends upon the 'Decimal place' setting. For example, when '2' decimals are selected, the scale shows two decimal places.

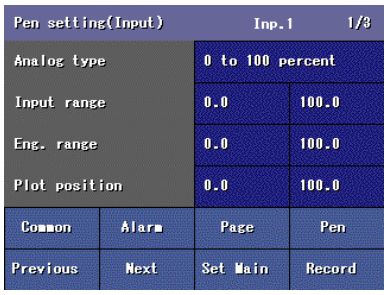
For thermocouple and RTD input with the R3 and R5 series, only '0' or '1' is selectable.

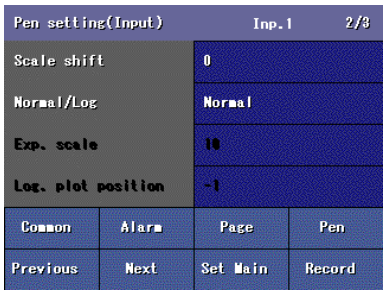
5.7 PEN SETTING (INPUT)

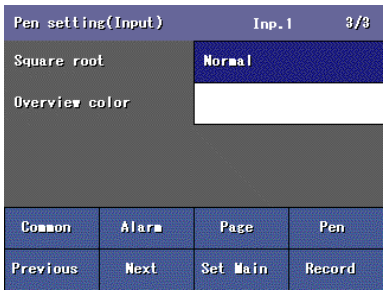
Touching Pen setting (Input) and choosing one of the pens opens the Pen setting (Input) view for the selected.

■ ANALOG SETTING

Pen setting (Input) views for analog signals have three (3) pages as shown below:







Analog type and Input range

With 100 msec. storing intervals, only voltage input ranges are selectable.

Selectable signal types and input ranges are as shown in the table in the next page. For DC input, choose the upper and lower range values (0% and 100%) within the measurable range. For temperature input, the input range is equal to the measurable range, thus fixed.

Input range	Max. 6 digits including a decimal point and minus sign

Eng. Range

Set up physical representation of the upper and lower input range values. This setting determines the momentary value unit displayed on the digital displays while recording. For a temperature input and a power factor input for the 53U, this setting is greyed out.

Eng. range	Max. 6 digits including a decimal point and minus sign

Caution !

The maximum data range handled by the 73VR1100 is from -1 x 10^{10} to 1 x 10^{10}. Engineering range must be within these limits. Any input out of this range is handled as errors.

Note

The engineering range setting for the R1M-P4 is used to reset the count by preset counts. The lower range value is used as reset value, the upper range value is used as the maximum limit. When the count reaches the upper range value, it is reset and restart at the lower range value.

■ MULTI POWER MONITOR 53U INPUT TYPES

DEVICE TYPE	PARAMETER	ANALOG TYPE ID	RANGE (UNIT)
53U	Current	I	0 to 2e9 (mA)
	Voltage	U	0.00 to 2.00e7 (V)
	Active power	P	-2e9 to 2e9 (W)
	Reactive power	Q	-2e9 to 2e9 (var)
	Apparent power	S	0 to 2e9 (VA)
	Power factor	PF	-1.00 to 1.00
	Frequency	F	0 or 40.00 to 70.00 (Hz)
	Phase direction	DIR	0 or 1
	Active energy	EP	0 to 1.0e8 (kWh)
	Reactive energy	EQ	0 to 1.0e8 (kvarh)
	Apparent energy	ES	0 to 1.0e8 (kVAh)
	Energy count time	TIMER	0 to 1.0e8 (hours)
	Harmonic distortion	THD	0 to 999.9 (%)
		HD	0 to 999.9 (%)

■ PC RECORDER R1M, R1MS AND INPUT TYPES

MODEL	I/O TYPE	SELECTIONS	DEFAULT	USABLE RANGE		NOTE
R1M-GH2	DC input	-20 – 20 V	0 – 20 V	-22.7 – 22.7 V		ATT SW ON
		-5 – 5 V	1 – 5 V	-5.6 – 5.6 V		ATT SW ON
		-1 – 1 V	0 – 1 V	-1.4 – 1.4 V		ATT SW ON
		-800 – 800 mV	0 – 800 mV	-860 – 860 mV		
		-200 – 200 mV	0 – 200 mV	-215 – 215 mV		
		-50 – 50 mV	0 – 50 mV	-53 – 53 mV		
		-10 – 10 mV	0 – 10 mV	-13.4 – 13.4 mV		
R2M-2G3	DC input	-10 – 10 V	0 – 10 V	-10 – 10 V		
R1MS-GH3	DC input	-10 – 10 V	0 – 10 V	-10 – 10 V		
				°C	°F	
R1M-GH2	T/C input	(PR)		0 – 1770	32 – 3218	
R2M-2H3		K (CA)		-270 – 1370	-454 – 2498	
R1MS-GH3		E (CRC)		-270 – 1000	-454 – 1832	
		J (IC)		-210 – 1200	-346 – 2192	
		T (CC)		-270 – 400	-454 – 752	
		B (RH)		100 – 1820	212 – 3308	
		R		-50 – 1760	-58 – 3200	
		S		-50 – 1760	-58 – 3200	
		C (WRe 5-26)		0 – 2320	32 – 4208	
		N		-270 – 1300	-454 – 2372	
		U		-200 – 600	-328 – 1112	
		L		-200 – 900	-328 – 1652	
		P (Platinel II)		0 – 1395	32 – 2543	
R1M-J3	RTD input	JPt 100 (JIS '89)		-200 – 500	-328 – 932	
		Pt 100 (JIS '89)		-200 – 660	-328 – 1220	
		Pt 100 (JIS '97, IEC)		-200 – 850	-328 – 1562	
		Pt 50 Ω (JIS '81)		-200 – 649	-328 – 1200	
		Ni 508.4 Ω		-50 – 280	-58 – 536	
		Pt 1000		-200 – 850	-328 – 1562	
	POT input	0 – 100Ω	0 – 100 %	0 – 100 %		
		0 – 500Ω	0 – 100 %	0 – 100 %		
		0 – 1kΩ	0 – 100 %	0 – 100 %		
		0 – 10kΩ	0 – 100 %	0 – 100 %		
R1M-D1	DO					
R1M-P4	DO					
R1M-A1	DI					
R1M-P4	DI					
R1M-P4	Counter	COUNT	0 – 1e9	0 – 1e9		
		PULSE	0 – 10000	0 – 10000		
R1M-A1C1	Counter	COUNT	0 – 1e9	0 – 1e9		

■ **PC RECORDER RZMS-U9**

MODEL	I/O TYPE	SELECTIONS	DEFAULT	USABLE RANGE		NOTE
RZMS-U9	DC input	-60 – 60 mV	0 – 60 mV	-60 – 60 mV		
		-125 – 125 mV	0 – 125 mV	-125 – 125mV		
		-250 – 250 mV	0 – 250 mV	250 – 250 mV		
		-500 – 500 mV	0 – 500 mV	-500 – 500 mV		
		-1000 – 1000 mV	0 – 1000 mV	-1000 – 1000 mV		
		-3 – 3 V	0 – 3 V	-3 – 3 V		
		-6 – 6 V	0 – 6 V	-6 – 6 V		
		-12 – 12 V	0 – 12 V	-12 – 12 V		
	T/C input			°C	°F	
		(PR)		0 – 1770	32 – 3218	
		K (CA)		-270 – 1370	-454 – 2498	
		E (CRC)		-270 – 1000	-454 – 1832	
		J (IC)		-210 – 1200	-346 – 2192	
		T (CC)		-270 – 400	-454 – 752	
		B (RH)		100 – 1820	212 – 3308	
		R		-50 – 1760	-58 – 3200	
		S		-50 – 1760	-58 – 3200	
		C (WRe 5-26)		0 – 2320	32 – 4208	
		N		-270 – 1300	-454 – 2372	
		U		-200 – 600	-328 – 1112	
		L		-200 – 900	-328 – 1652	
		P (Platinel II)		0 – 1395	32 – 2543	
	RTD input	JPt 100 (JIS '89)		-200 – 510	-328 – 950	
		Pt 100 (JIS '89)		-200 – 660	-328 – 1220	
		Pt 100 (JIS '97, IEC)		-200 – 850	-328 – 1562	
		Pt 50 Ω (JIS '81)		-200 – 649	-328 – 1200	
		Ni 508.4 Ω		-50 – 280	-58 – 536	
		Ni 100		-80 – 260	-112 – 500	
		Ni 120		-80 – 260	-112 – 500	
		Ni-Fe 604		-200 – 200	-328 – 392	
		Pt 200		-200 – 850	-328 – 1562	
		Pt 300		-200 – 850	-328 – 1562	
		Pt 400		-200 – 850	-328 – 1562	
		Pt 500		-200 – 850	-328 – 1562	
		Pt 1000		-200 – 850	-328 – 1562	
		Cu 10 @ 25°C		-50 – 250	-58 – 482	
	POT input	POT200	0 – 100 %	0 – 100 %		
		POT500	0 – 100 %	0 – 100 %		
		POT5k	0 – 100 %	0 – 100 %		

■ REMOTE I/O R3 SERIES INPUT TYPES

MODEL	I/O TYPE	SELECTIONS	INPUT RANGE	
			°C	°F
R3-TSx	Thermocouple input	(PR)	0 – 1760	-62 – 3200
		K (CA)	-270 – 1370	-454 – 2498
		E (CRC)	-270 – 1000	-454 – 1832
		J (IC)	-210 – 1200	-346 – 2192
		T (CC)	-270 – 400	-454 – 752
		B (RH)	100 – 1820	212 – 3308
		R	-50 – 1768	-58 – 3214
		S	-50 – 1768	-58 – 3214
		C (WRe 5-26)	0 – 2315	32 – 4199
		N	-270 – 1300	-454 – 2372
		U	-200 – 600	-328 – 1112
		L	-200 – 900	-328 – 1652
		P (Platinel II)	0 – 1395	32 – 2543
R3-RS4, R3(Y)-RS8	RTD input	Pt 100 (JIS'97, IEC)	-200 – 850	-328 – 1562
		Pt 100 (JIS'89)	-200 – 660	-328 – 1220
		JPt 100 (JIS'89)	200 – 510	-328 – 950
		Pt 50 Ω (JIS'81)	-200 – 649	-328 – 1200
		Ni 100	-80 – 250	-112 – 482
		Cu 10 @ 25°C	50 – 250	-58 – 482
		Pt 1000 *1	-200 – 850	-328 – 1562
		Ni 508.4 Ω *1	-50 – 200	-58 – 392
		Cu50	-50 – 150	-58 – 302
		Ni 1000 *1	-56 – 152	-68 – 305
R3(S)-RS4A, R3-RS8x		0 to 100 percent *2	0 to 100 percent	
R3-SV4, R3(Y)-SV8, R3(S/Y)-SV8N, R3(Y)-SV16N	DC voltage input	0 to 100 percent	0 to 100 percent	
R3-SV4B, R3-SV8B	DC voltage input	0 to 100 percent	0 to 100 percent	
R3-SV4C, R3-SV8C	DC voltage input	0 to 100 percent	0 to 100 percent	
R3(Y)-DSx	4 – 20mA input with excitation	0 to 100 percent	0 to 100 percent	
R3-SS4, R3(Y/S)-SS8(N), R3(Y)-SS16N	DC current input	0 to 100 percent	0 to 100 percent	
R3-US4	DC voltage, potentiometer input	0 to 100 percent	0 to 100 percent	
	Thermocouple, RTD	US4 (Temp.) *3	Refer to the specifications	
R3(Y)-MSx	Potentiometer input	0 to 100 percent	0 to 100 percent	
R3-CT4	CT input	0 to 100 percent	0 to 100 percent	
R3-CTxA	AC current input with clamp-on current sensor	0 to 100 percent *4	0 to 100 percent	
R3-CTxB	AC current input with clamp-on current sensor	0 to 100 percent *4	0 to 100 percent	
R3-CTxC	AC current input with clamp-on current sensor	0 to 100 percent	0 to 100 percent	
R3-PT4	AC voltage input	0 to 100 percent	0 to 100 percent	
R3-CZ4	Zero-phase current input	0 to 100 percent	0 to 100 percent	
R3-WTU	Multi power input	0 to 100 percent *5	0 to 100 percent	
		COUNT32 *6	0 – 1e8	
R3-WT4, R3-WT4A R3-WT4B	AC power input	COUNT16	0 – 10000	
		COUNT32 *6	0 – 1e8	

R3-PA2	Speed data	COUNT16	0 – 10000
	Position data	COUNT32 *6	0 – 1e8
R3-PA4	High speed pulse input	COUNT16	0 – 10000
R3(Y)-PA16	Totalized pulse input	COUNT16 *7	0 – 10000
R3-PA4A, R3-PA4B, R3(S)-PA8		COUNT32 *6	0 – 1e8
R3-LC2	Strain gauge input	0 to 100 percent	0 to 100 percent
R3-GC1, R3-GM1, R3-GE1, R3-GD1, R3-GFL1	Gateway	0 to 100 percent	0 to 100 percent
		COUNT16	0 – 10000
		COUNT32 *8	0 – 1e8
R3-Ax4/8	Alarm	COUNT16 *9	-32768 – 32767

*1. Not selectable with the R3(Y)-RS8

*2. When the unit is Fahrenheit, set scaling to 10 times the value of data.

*3. When measuring temperature with R3-US4, set the input type to “US4 (Temp)” regardless the sensor type (T/C or RTD). In that case, the 73VR1100 does not show the temperature range on the screen. Refer to the R3-US4 instruction manual for the temperature range.

*4. When input range is greater than 100A, set the scaling 0 – 10000 with R3CON PC configurator software. For the detail, refer to its manual.

*5. 16-bit data must be set between -32768 and 32767 with the R3CON. Since 16-bit energy data cannot be reset to 0 when it over flows, totalized pulse functions cannot be applicable.

*6. 32-bit data must be set 1e8 with the R3CON. For I/O modules with other length-data, refer to the instruction manuals.

*7. The maximum totalized pulse of the R3(Y)-PA16 can be set up to 32767 with the R3CON PC configurator software. If the 73VR1100 receives a value greater than 32767, it makes an error.

*8. COUNT32 data consists of 2 channel data. Set the module to send the lower significant data first, and higher significant data second.

*9. Recodes each alarm as 16-bit two’s complement integer.

■ REMOTE I/O R5 SERIES INPUT TYPES

MODEL	I/O TYPE	SELECTIONS	USABLE RANGE	
			°C	°F
R5-TS R5T-TS	Thermocouple input	(PR)	0 – 1760	-62 – 3200
		K (CA)	-270 – 1370	-454 – 2498
		E (CRC)	-270 – 1000	-454 – 1832
		J (IC)	-210 – 1200	-346 – 2192
		T (CC)	-270 – 400	-454 – 752
		B (RH)	100 – 1820	212 – 3308
		R	-50 – 1768	-58 – 3214
		S	-50 – 1768	-58 – 3214
		C (WRe 5-26)	0 – 2315	32 – 4199
		N	-270 – 1300	-454 – 2372
		U	-200 – 600	-328 – 1112
		L	-200 – 900	-328 – 1652
		P (Platinel II)	0 – 1395	32 – 2543
R5-RS R5T-RS	RTD input	Cu 10 @25°C	-50 – 250	-58 – 482
		Cu 50	-50 – 150	-38 – 302
		JPt 100 (JIS '89)	-200 – 510	-328 – 950
		Pt 100 (JIS '89)	-200 – 660	-328 – 1220
		Pt 100 (JIS '97, IEC)	-200 – 850	-328 – 1562
		Pt 1000	-200 – 850	-328 – 1562
		Pt 50 Ω (JIS '81)	-200 – 649	-328 – 1200
		Ni 100	-80 – 250	-112 – 482
		Ni 508.4 Ω	-50 – 200	-58 – 392

MODEL	I/O TYPE	SELECTIONS	INPUT RANGE
R5-SV R5T-SV	DC voltage input	0 to 100 percent	0 – 100%
R5-DS R5T-DS	4 – 20mA DC input (100 Ω)		
R5-MS	Potentiometer input	0 to 100 percent	0 – 100%
R5T-PT	AC voltage input		
R5T-CTx	CT and AC current input*		

* For the models R5T-CTA or R5T-CTB, see the scaling 0 to 10000 with the PC Configurator software (model: R5CON).

■ REMOTE I/O R7M/R7E INPUT TYPES

MODEL	I/O TYPE	ANALOG TYPE	SELECTIONS	USABLE RANGE
R7M-SV4 R7E-SV4	DC current/voltage input	0 to 100 percent	0 to 100 percent	-10 – +10V DC
				-5 – +5V DC
				-1 – +1V DC
				0 – 10V DC
				0 – 5V DC
				1 – 5V DC
				0 – 1V DC
				-0.5 – +0.5V DC
				-20 – +20mA DC
				4 – 20mA DC
				0 – 20mA DC
R7M-TS4 R7E-TS4	Thermocouple input	K (CA)	Same as the usable range	-272 – +1472 °C
		E (CRC)		-272 – +1020 °C
		J (IC)		-260 – +1300 °C
		T (CC)		-270 – +500 °C
		B (RH)		24 – 1920 °C
		R		-100 – +1860 °C
		S		-100 – +1860 °C
		C (WRe 5-26)		-52 – +2416 °C
		N		-272 – +1400 °C
		U		-252 – +600 °C
		L		-252 – +1000 °C
		P (Platinel II)		-52 – +1496 °C
		(PR)		-52 – +1860 °C
R7M-RS4 R7E-RS4	RTD	Pt 100 (JIS '97, IEC)		-240 – +900 °C
		Pt 100 (JIS '89)		-240 – +900 °C
		JPt 100 (JIS '89)		-236 – +560 °C
		Pt 50 Ω (JIS '81)		-236 – +700 °C
		Ni 100		-100 – +252 °C
		Cu 10 @ 25°C		-212 – +312 °C
		Cu 50		-100 – +200 °C
R7M-CT4E R7E-CT4E	AC current input with clamp-on current sensor	0 to 100 percent	0 to 100 percent	CLSE-60 (0 – 600A)*
				CLSE-40 (0 – 400A)*
				CLSE-20 (0 – 200A)*
				CLSE-10 (0 – 100A)
				CLSE-05 (0 – 50A)
				CLSE-R5 (0 – 5A)
R7M-MS4 R7E-MS4	Potentiometer input	0 to 100 percent	0 to 100 percent	100 Ω – 20 kΩ (total resistance)

* Set the scaling 0 – 10000 with R7CON PC configurator software.

Plot position

Determines the display range on the chart when 'Normal' is selected at 'Normal / Log.' Log's detailed setting including the display range is conducted in the Exp. scale. The plot position setting is effective on the Trend view, the Bargraph view, bargraphs on the Overview and on the Graphic view.

Set up the upper and lower display range values using the keypad. It is usually the same as the engineering unit range, but is set to a different range when you want to enlarge a part of the range to view details.

'e' can be used to input an exponential value such as '1e9.' Entering 'e' in any other way (e.g. '1ee') will not be recognized as a numeral.

Plot position	Max. 6 digits including a decimal and minus sign

For example, if you have a temperature input:

	UNIT	LOWER LIMIT	UPPER LIMIT
Scaled Range	°C	-270	1370
Plotted Range	°C	-270	1370

This is the most common setting. Eng. Range and Plot Position values are the same. Scales are -270°C at the left edge, 1370°C at the right edge of the chart.

	UNIT	LOWER LIMIT	UPPER LIMIT
Scaled Range	°C	-270	1370
Plotted Range	°C	0	1000

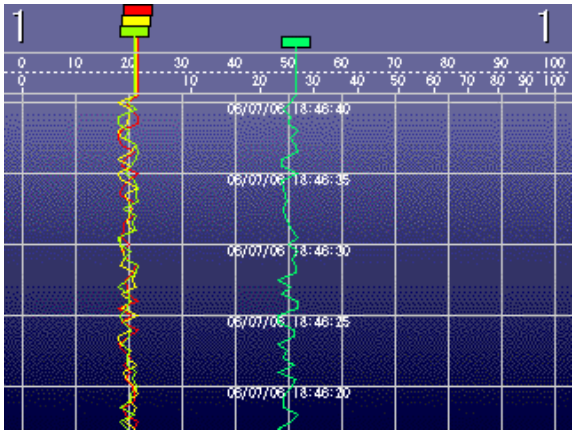
This is used when you want to enlarge a particular section of the Eng. Range. The chart is used only for a narrower range of 1000°C, between 0°C at the left edge and 1000°C at the right edge, against the 1640°C full-scale.

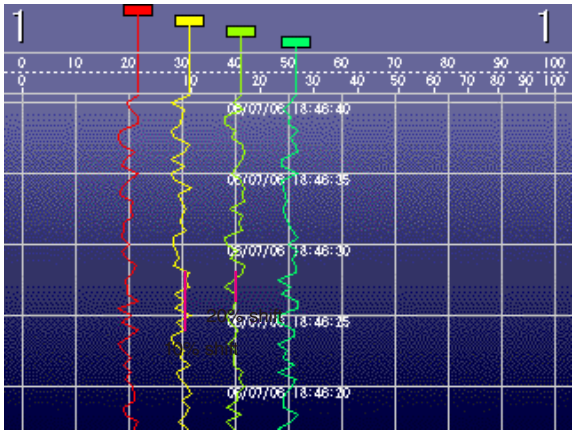
The plot range of a particular channel can be reflected on the scale bar (engineering unit scale). For example, if you have a plot range of 0 (lower limit) to 1000 (upper limit), the scale bar shows 0, 100, 200 .... 900, 1000, the full-scale range (0 to 1000) divided by ten.

Scale shift

Plot positions can be shifted in parallel on the trend chart. This function is useful when multiple graphs are overlapping. You can separate the plot positions while no other data is changed. Scale shift setting is greyed out for the power factor input (53U).

Scale shift	Selectable within -100 to 100%





Normal / Log

When Normal plotting is selected, the plot area is divided equally. Only Normal setting is selectable for the 53U.

For Logarithmic plotting, specify Logarithmic Exponential Scale and Plot Position Exponent.

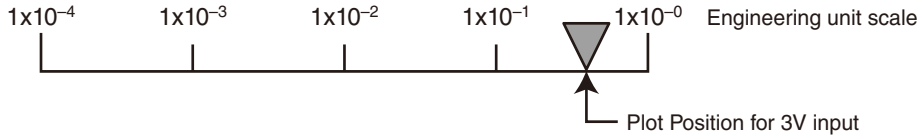
Logarithmic 1

Input signal is converted and plotted in direct logarithmic representation. Specify the lower limit of exponent in 'Logarithmic Plot Position Exponent' field within -9 to 8, and how many divisions you wish to have in 'Exponential Scale' among 10, 5, 4, 2, and 1.

[Example]
Input range: 1 to 5V
Scale: $1x10^{-4}$ to $1x10^{-0}$ (0.0001 to 1)
Exponential scale: 4
Logarithmic plot position exponent: -4

With 3V input, the engineering unit value equals to $5.0x10^{-1}$ (0.49995).

The lower plot range value equals to $1x10^{-4}$, the upper value equals to $1x10^{0}$. 3V input, 0.5 in the engineering range equals to $5.0x10^{-1}$, which is plotted as shown above.



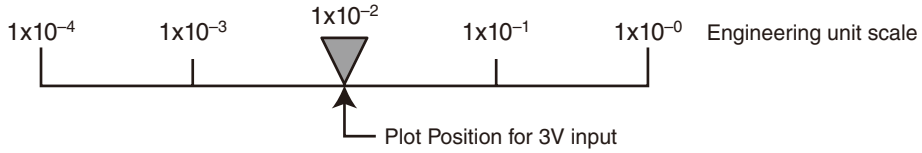
Logarithmic 2

Input signal is converted and only the exponential scale is plotted. Specify the lower limit of exponent in 'Logarithmic Plot Position Exponent' field within -9 to 8, and how many divisions you wish to have in 'Exponential Scale' among 10, 5, 4, 2, and 1.

[Example]
Input range: 1 to 5V
Scale: $1x10^{-4}$ to $1x10^{-0}$ (0.0001 to 1)
Exponential scale: 4
Logarithmic plot position exponent: -4

With 3V input, the engineering unit value equals to $1x10^{-2}$.

The lower plot range value, the same as in the case of Logarithmic 1, equals to $1x10^{-4}$, the upper value equals to $1x10^{0}$. Only the part of exponential scale (-2) of 3V input, $1x10^{-1}$, is plotted as shown above.



Square Root

Input data is square-root-extracted when this setting is enabled. Square root setting is greyed out for the 53U.

Overview Color

This option can be changed while recording.

Specify the bargraph color for the pen in the Overview. Use the color palette.

If you have specified alarm-specific colors in Pen (Alarm) Setting, these colors are applied instead of Overview Color.

■ DISCRETE SETTING

When Discrete is selected for Analog / Discrete setting, ON and OFF descriptions are specifiable for the pen.

DO NOT use symbols such as comma, period, space or tab, which can be used to separate data fields in a CSV file.

Be aware also that data cells including symbols such as plus (+) and minus (–) will be handled as an equation in an Excel file.

OFF Description, ON Description

Short description for ON (1) and OFF (0) status can be specified.

OFF description	Max. 5 characters
ON description	Max. 5 characters

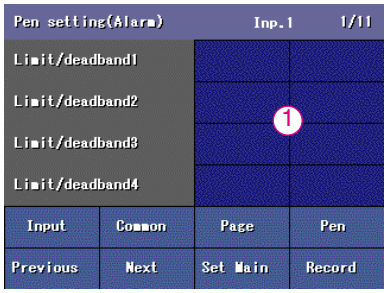
5.8 PEN SETTING (ALARM)

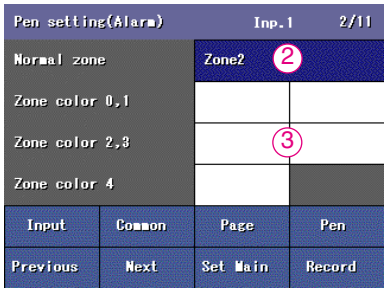
■ ANALOG ALARM

Limit alarms can be indicated on the screen. Alerting a remote device is also possible via the alarm output terminals. The alarm history is also stored as a file. Alarm functions regardless of the storing method.

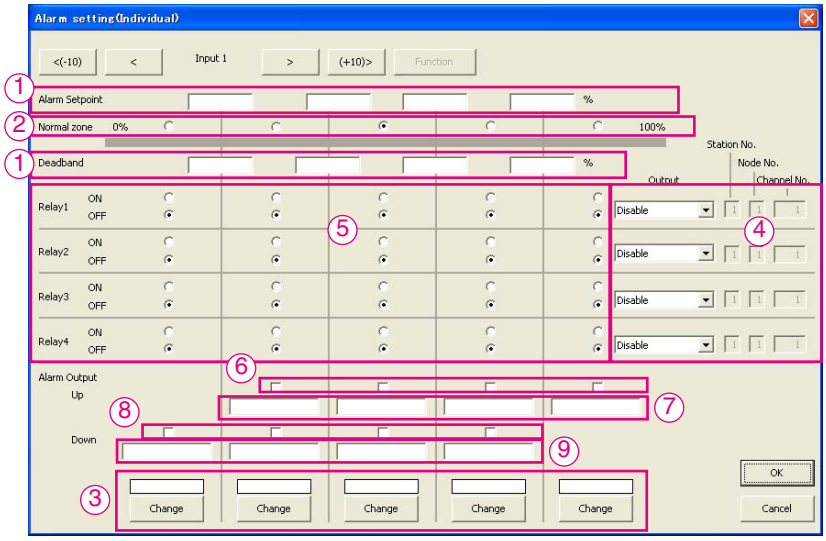
Touching Pen setting (Alarm) and choosing one of the pens specified as analog channel opens the Pen setting (Input) view for the selected. It consists of seven pages as shown below. The 73VR11BLD Alarm Setting Dialog Box is also shown in order to help you understand each parameter's functions. Corresponding parameters are marked with the same numbers.

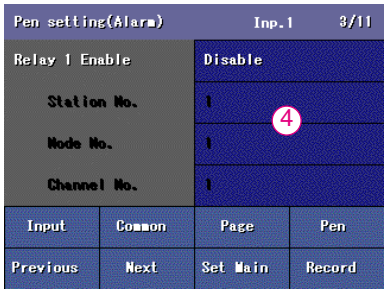
These options can be changed while recording.

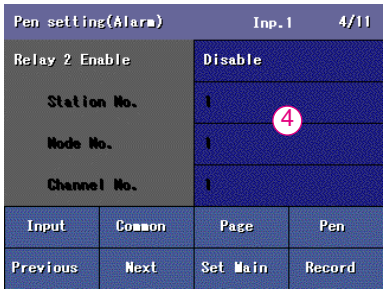


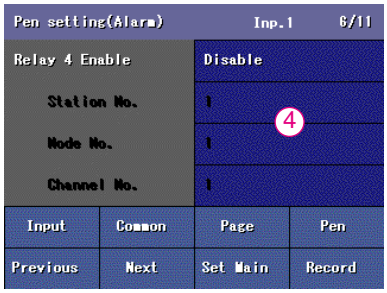


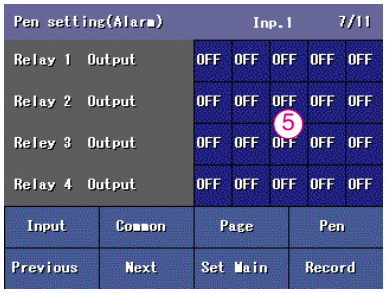
73VR11BLD Alarm Setting Dialog Box

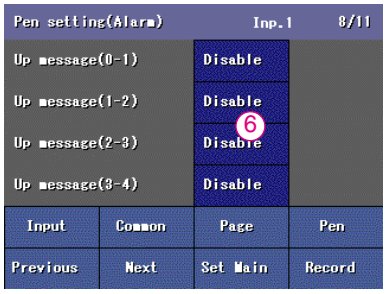


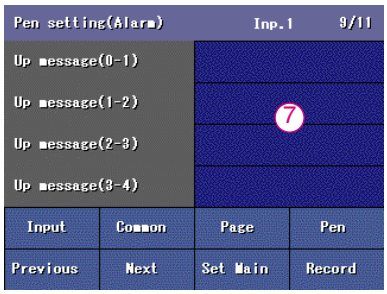


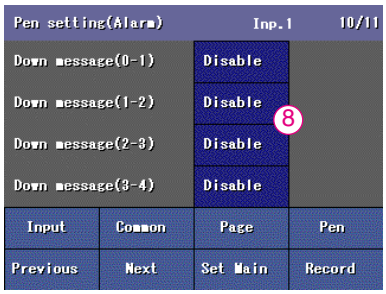


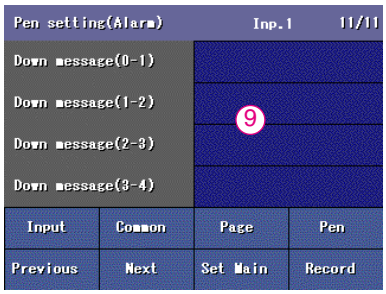












CAUTION FOR MODEL 53U

Disable all alarm settings applied at the 53U side when you want to use limit alarm functions on the 73VR1100. The setting on the 53U overrides that on the 73VR1100.

Limit (Alarm Setpoint), Deadband (1)

Specify up to 4 setpoints in engineering unit within the Input Range. Alarms are reset when the signal goes out of the alarm zone by the preset deadband values.

If you do not set all 4 setpoints, the limit setpoints must be next to each other, and 'Normal' zone must be set within or immediately next to the extreme limit.

Deadband is used to avoid the alarm ON and OFF quickly and repeatedly around the setpoint when the input signal changes that way. The alarm, once triggered, does not reset until the signal passes the point by the preset deadband.

'e' can be used to input an exponential value such as '1e9.' Entering 'e' in any other way (e.g. '1ee') will not be recognized as a numeral.

Limit / Deadband	Max. 6 digits including a decimal point and minus sign

Normal Zone (2)

Specify the zone of normal status. When the input signal is out of this zone, the alarm indicator of the pen flashes. Choose among Zone 0, 1, 2, 3 and 4.

Zone Color (3)

You can apply specific colors to represent each zone divided by the limits for use in the Display views. Touch the current selection and use the color palette.

Relay Enable 1...4 (4)

Set Enable to provide an external contact output, and specify its location (Station No. for Modbus/TCP only, Node No. and Channel No.).

In order to output at the alarm output terminals of the 73VR1100, choose 'Output terminal.' With this setting, location setting fields are greyed out.

In order to output at the alarm output terminals of the R1MS-GH3, R2M-2H3, R2M-2G3 and RZMS-U9, 53U, specify Channel 1.

The R3-DC , R3-DAC and R5(T)-DC Channel number systems are similar to those for the R3-DA and R5(T)-DA. Refer to Appendix-1.

When multiple alarm outputs are set for the same location, the contact turns ON/OFF by OR logic.

Relay Output 1...4 (5)

Specify the zone(s) in which you wish the contact to be turned on or off.

The keys are arranged from the left to right in the order of Zone numbers (Zone 0 for the leftmost key, Zone 4 for the rightmost key).

For the 53U, contact logic depends upon the output mode setting at the side of the 53U.

Alarm Message (6)...(9)

Set Enable to the thresholds where Messages are to be displayed on the Alarm History.

Up messages appear when the signal goes across an alarm setpoint upward. For example, Up message (0-1) is sent when the signal goes over the Limit 1. Down messages appear when the signal goes across an alarm setpoint downward. For example, Down message (0-1) is sent when the signal goes below the Limit 1. Message contents up to 10 characters respectively for Up and Down.

DO NOT use symbols such as comma, period, space or tab, which can be used to separate data fields in a CSV file.

Be aware also that data cells including symbols such as plus (+) and minus (–) will be handled as an equation in an Excel file.

Caution !

Number of alarm event per 1 sampling

- When alarm event occurs per every sampling, be sure to set not more than 8 points for the number of alarm event per 1 sampling.

■ DISCRETE ALARM

Alarm status can be indicated on the screen. Alerting a remote device is also possible via the unit's alarm output terminals and via remote contact output modules. The alarm history is also stored as a file. Alarm functions regardless of the storing method.

OFF / ON Output Enable, Delay

Alarm contact outputs can be provided at the alarm terminal.

Choose Enable to activate an relay output for respective signal status (input ON and OFF).

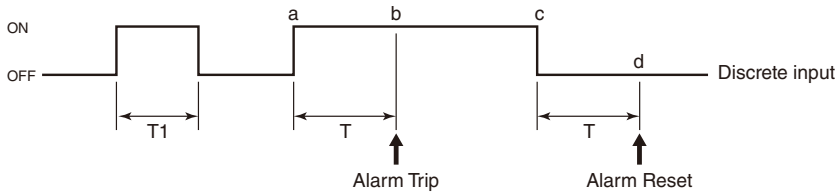
In order to output at the alarm output terminals of the 73VR1100, choose 'Output terminal.' With this setting, location setting fields are greyed out.

In order to eliminate noise interference, you can specify the time (seconds) to wait to apply change in signal status.

Delay	Selectable from 1 to 99 seconds

Caution !

Alarm is Not triggered if 'true' contact status lasts shorter than the delay time.



[Example] ON Alarm

- ON status for T1 time duration does not trigger alarm because the duration is shorter than the delay time.
- 'True' contact status starts at (a) point but an alarm is triggered only at (b) point, after the delay time T has been elapsed.
- 'False' contact status starts at (c) point but the alarm is reset only at (c) point, after the delay time T has been elapsed.

Normal State

You can specify which contact status from the trigger input terminal should be considered 'Normal.' For example, if you set 'OFF' to be normal, ON contact status triggers alarm, and it is indicated on the recorder view.

ON/OFF	Both ON and OFF are normal.
ON	ON is normal.
OFF	OFF is normal.

OFF Color, ON Color

You can apply specific colors to represent each ON and OFF status for use in the Display views. Touch the current selection and use the color palette.

OFF / ON Station, Node, Channel

Specify the location (Station No. for Modbus/TCP only, Node No. and Channel No.) of an external contact output for ON and OFF state respectively.

In order to output at the alarm output terminals of the R1MS-GH3, R2M-2H3, R2M-2G3 and RZMS-U9, 53U, specify Channel 1.

The R3-DC and R5(T)-DC Channel number systems are similar to those for the R3-DA and R5(T)-DA. Refer to Appendix-1.

When multiple alarm outputs are set for the same location, the contact turns ON/OFF by OR logic.

OFF / ON Message Output

Set Enable to the status for which Messages are to be displayed on the Overview and Alarm History.

OFF Message, ON Message

These messages is used for Overview and Alarm History. Message contents up to 10 characters respectively for Up and Down.

DO NOT use symbols such as comma, period, space or tab, which can be used to separate data fields in a CSV file.

Be aware also that data cells including symbols such as plus (+) and minus (–) will be handled as an equation in an Excel file.

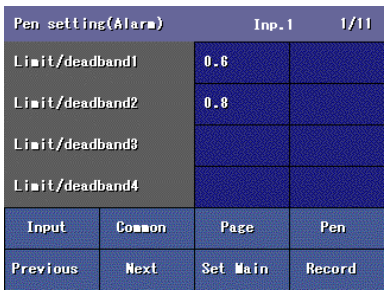
■ ALARM SETTING FOR POWER FACTOR

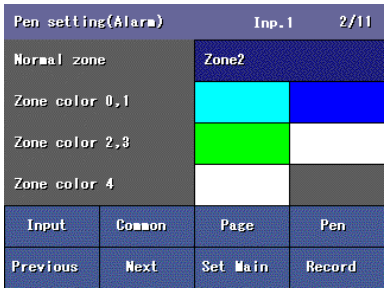
When a limit value is set for the power factor signal, it is automatically mirrored for both LEAD and LAG spheres. In the example below, with the normal zone specified to Zone 2, the limit 0.6 is set as LL setpoint, and the 0.8 as L setpoint.

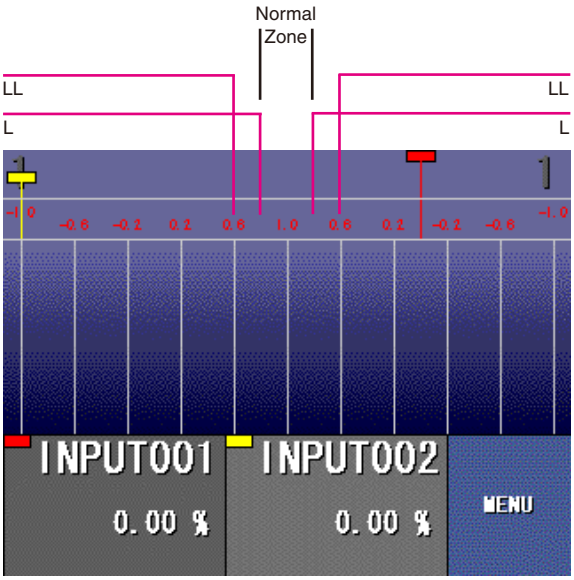
You cannot set different limit values for LEAD and LAG spheres. Choose between -1.0 and 1.0.

Caution !

Number of alarm event per 1 sampling
- When alarm event occurs per every sampling, be sure to set not more than 8 points for the number of alarm event per 1 sampling.

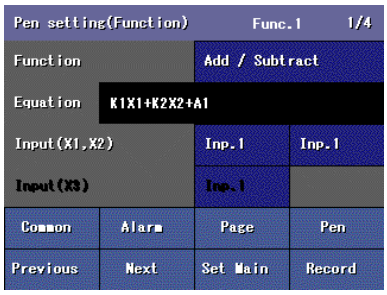


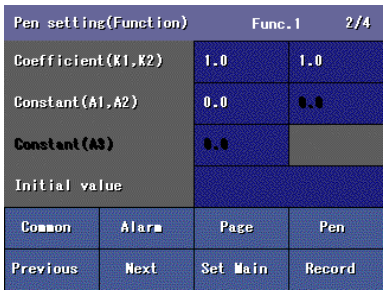


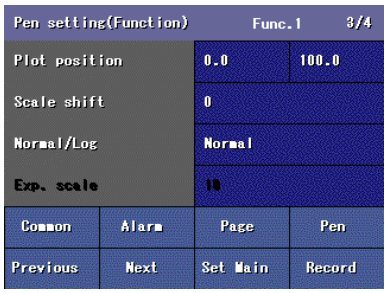


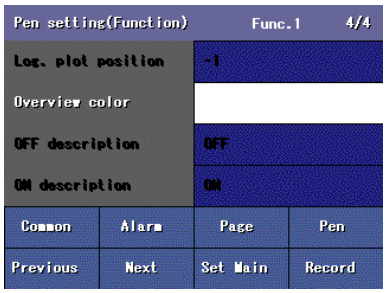
5.9 PEN SETTING (FUNCTION)

Touching Pen setting (Function) and choosing one of the Function pens opens the Pen setting (Function) view for the selected. It consists of multiple pages as shown below.









Function

Choosing one of the available functions will change the rest of the parameter list to match the selected function.

Add / Subtract	Addition / Subtraction
Multiplication	Multiplication
Division	Division
Moving average	Moving average filter
First order lag	First order lag filter
Square root	Square root extraction
Peak hold (max)	Maximum value hold
Valley hold (min)	Minimum value hold
Power	Power
Analog accumulation	Analog signal accumulation
Pulse accumulation	Pulse count (difference) accumulation
F value calculation	F value calculation
AND	Logical multiplication
OR	Logical addition (sum)
NOT	Logical negation
XOR	Exclusive disjunction
Anemoscope	Wind direction

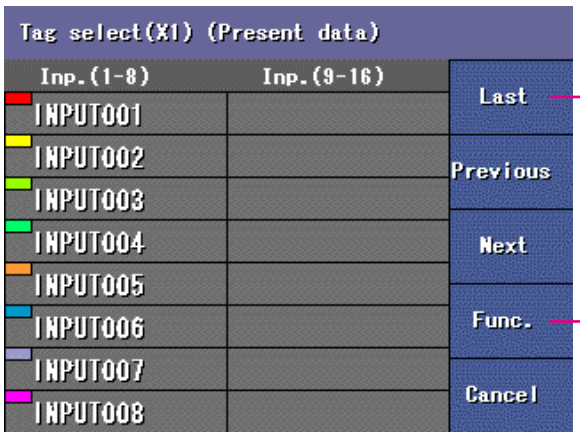
■ ARITHMETIC FUNCTIONS

Input (X)

Touching Inp. field opens the Tag name selector view. Select input signals used for the operating function.

If you want to use the previous data sample (last one) or one of the function pens, switch to the respective views and choose. Tag names for previous data samples are indicated with * (asterisk).

If you want to use the previous function pen data sample (last one), first switch to the Tag select (Function) view and then touch Last key.



Caution !

Be careful to choose a pen of Not Itself. For example, you cannot choose Function Pen 1 or the last data of Function Pen 1 to be used as X1, X2 or X3 in an equation for Function Pen 1.
When assigning 'last' data sample to X1, X2 or X3, specify also the initial value. Otherwise no data is recorded for the first operating cycle.

Coefficient (K), Constant (A)

Touching the current selection of these parameters opens a numeric keypad. Enter appropriate values.

Coefficient, Constant	Max. 6 digits including a decimal point and minus sign

Initial value

Initial value is used in the function operation cycle as default data sample when 'last' data is specified in an equation. If you do not need, leave the field blank.

Initial value	Max. 6 digits including a decimal point and minus sign

Note

'e' can be used to input an exponential value such as '1e9.' Entering 'e' in any other way (e.g. '1ee') will not be recognized as a numeral.

Scale shift

Plot positions can be shifted in parallel on the trend chart. This function is useful when multiple graphs are overlapping. You can separate the plot positions while no other data is changed. Refer to Section 5.5.1.

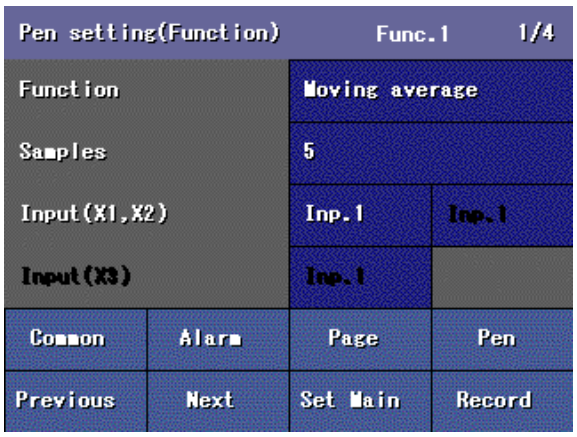
Normal / Log

When Normal plotting is selected, the plot area is divided equally. When Logarithmic 1 is selected, the plot area is divided in specified scale of exponents of 10.

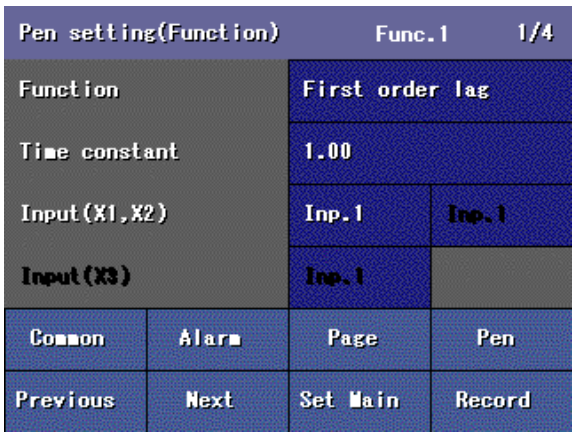
For Logarithmic plotting, specify the lower limit of exponent in 'Logarithmic Plot Position Exponent' field within -9 to 8, and how many divisions you wish to have in 'Exponential Scale' among 10, 5, 4, 2, and 1. Refer to Section 5.5.1.

■ FILTER FUNCTIONS

Touching Pen setting (Func) and choosing one of the pens specified as analog channel opens the Pen setting (Func) view for the selected. Filter function views are as follows:



Moving average.



First order lag filter.

Moving Average

Specify number of samples used for the moving average operation and an input channel. Touching Inp.1 opens the Tag name selector view. Select an input signal used for the operating function.

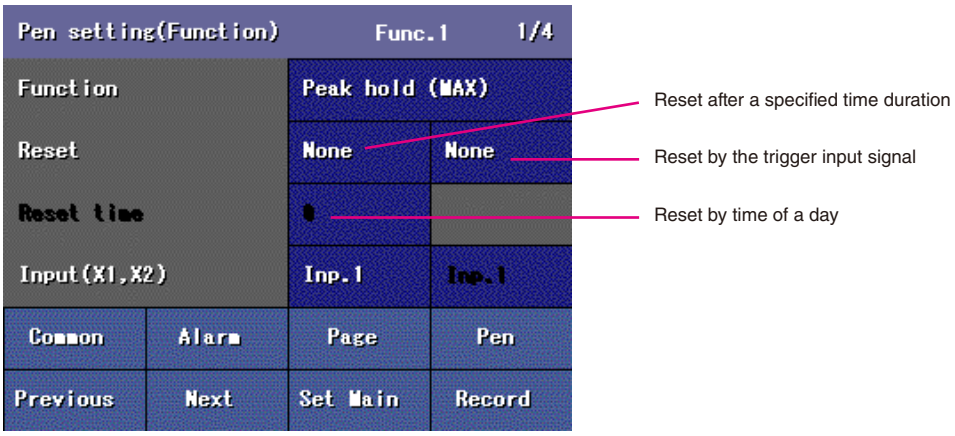
Samples	Specify between 2 and 16

First Order Lag Filter

Specify a time constant and an input channel. Touching Inp.1 opens the Tag name selector view. Select an input signal used for the operating function.

Time constant	Specify between 0.00 and 100.00 seconds. Max. 2 decimal places.

■ **PEAK HOLD (MAX) / PEAK HOLD (MIN)**



Input (X1)

Touching Inp.1 opens the Tag name selector view. Select an input signal used for the operating function.

Caution !

Be careful to choose a pen of Not Itself. For example, you cannot choose Function Pen 1 or the last data of Function Pen 1 to be used as X1 in an equation for Function Pen 1. When assigning 'last' data sample to X1, specify also the initial value. Otherwise no data is recorded for the first operating cycle.

Initial value

Initial value is used in the function operation cycle as default data sample when 'last' data is specified in an equation. If you do not need, leave the field blank.

Initial value	Max. 6 digits including a decimal point and minus sign

Reset / Reset time

In order to reset the hold function, 'Time' or 'Trigger input' can be specified. Touch the left 'None' key for 'Time,' the right key for 'Trigger input' conditions. If you leave the setting to 'None,' the data is reset only when 'Start' key is touched.

When '24 hours' is specified, the reset time must be specified. Touch the current time specification and a numeric keypad appears on the screen.

• 'Reset by time' selections

None	No resetting by time. Reset only when 'Start' key is touched.
30 min.	Reset at 0 minute and 30 minutes every hour
1 hour	Reset at 0 minute every hour
2 hours	Reset at 0 minute every even hours (0, 2, 4,...)
3 hours	Reset at 0 minute every three hours (0, 3, 6,...)
4 hours	Reset at 0 minute every four hours (0, 4, 8,...)
6 hours	Reset at 0 minute every six hours (0, 6, 12, 18)
12 hours	Reset at 0 minute every twelve hours (0, 12)
24 hours	Reset at a specified time of a day

• 'Reset by trigger input' selections

None	No resetting by trigger input. Reset only when 'Start' key is touched.
Up	Reset when the trigger input turns from OFF to ON.
Down	Reset when the trigger input turns from ON to OFF.
ON	Reset while the trigger input is ON.
OFF	Reset while the trigger input if OFF.

■ POWER FUNCTIONS

Input (X1)

Touching Inp.1 opens the Tag name selector view. Select input signal used for the operating function.

Caution !
Be careful to choose a pen of Not Itself. For example, you cannot choose Function Pen 1 or the last data of Function Pen 1 to be used as X1 in an equation for Function Pen 1. When assigning 'last' data sample to X1, specify also the initial value. Otherwise no data is recorded for the first operating cycle.
The following combinations of X1 and A1 will result in an error and the screen will show ERR: X1 = 0 and A1<0, or X1 is negative and A1 is not integer.
When an calculation result is overrange (equal to '-1 x 10^{10}' or lower, and '1 x 10^{10}' or higher), the screen will be blank. Such data cells are blank when converted into CSV.

Constant (A1)

Specify the exponent.

Constant	Exponent ±99.99

Initial value

Initial value is used in the function operation cycle as default data sample when 'last' data is specified in an equation. If you do not need, leave the field blank.

Initial value	Max. 6 digits including a decimal point and minus sign

Caution !

(1) The power function results in error when:

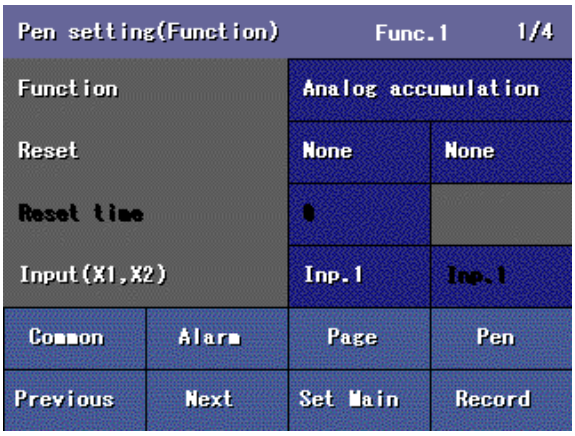
X1 = 0, A1 < 0 or
X1 < 0, A1 ≠ integer

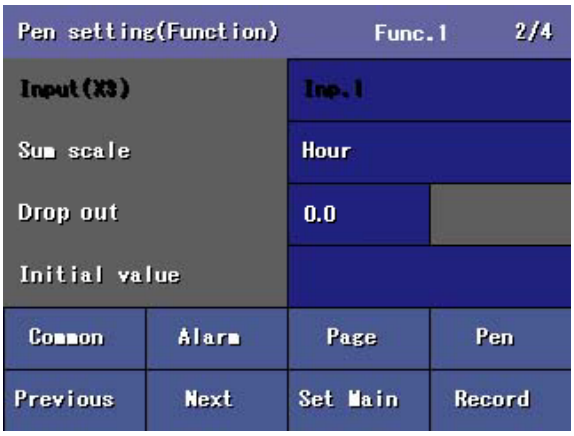
'ERR' is indicated on the screen.

(2) The power function results in overrange when the results exceeds the range from '-1x10^{10}' to '1x10^{10}.'

No data is displayed on the screen, and CSV data cells are blank.

■ ANALOG ACCUMULATION





Input (X1)

Touching Inp.1 opens the Tag name selector view. Select an input signal used for the operating function.

Caution !

Be careful to choose a pen of Not Itself. For example, you cannot choose Function Pen 1 or the last data of Function Pen 1 to be used as X1 in an equation for Function Pen 1.
When assigning 'last' data sample to X1, specify also the initial value. Otherwise no data is recorded for the first operating cycle.

Initial value

Initial value is used in the function operation cycle as default data sample when 'last' data is specified in an equation. If you do not need, leave the field blank.

Initial value	Max. 6 digits including a decimal point and minus sign

Reset / Reset time

In order to reset the totalized value, 'Time' or 'Trigger input' can be specified. Touch the left 'None' key for 'Time,' the right key for 'Trigger input' conditions. If you leave the setting to 'None,' the data is reset only when 'Start' key is touched.

When '24 hours' is specified, the reset time must be specified. Touch the current time specification and a numeric keypad appears on the screen.

For details of the selections, please refer to 'Peak Hold' function.

Sum scale

Input X1, such as flow signals, could be values per time unit (/day, /hour, /min, /sec). In order to accurately totalize this type of signals, specify the time unit.

None	Simple accumulation of the input data
Sec	Per second
Min	Per minute
Hour	Per hour
Day	Per day

Drop out

Touching the number next to Drop out opens a numeric keypad. Enter appropriate values.

Drop out	Max. 6 digits positive number including a decimal point.

■ PULSE ACCUMULATION (DIFFERENCE)

Specify measured data or function data (X1), with Reset condition.

The measured (function) data is accumulated until it is reset when the reset condition is true or when Start key is touched. In order to reset the hold function, 'Time' or 'Trigger input' can be specified.

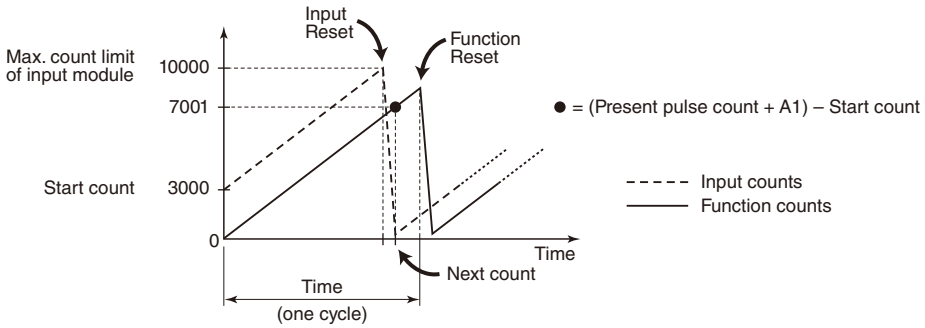
Reset	Time	30 min., 1 hour, 2 hours, 3 hours, 4 hours, 6 hours, 12 hours, 24 hours (selectable time of a day)
	Trigger input	Up, Down, ON, OFF.

With the totalized pulse input modules (e.g. models R3-PA16, R3-PA4A), the pulse count is automatically reset and starts with '1' again when it reaches the preset maximum limit.

Between the moment when the 73VR starts counting and reset, it is possible that certain counts are reset and ignored if the resetting occurs at the input module, according to the formula:

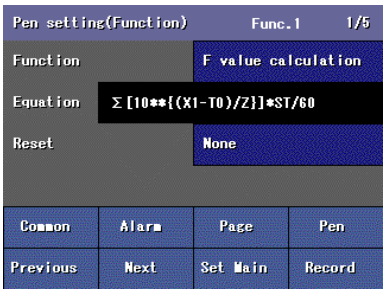
Pulse count difference = Present pulse count – Start count

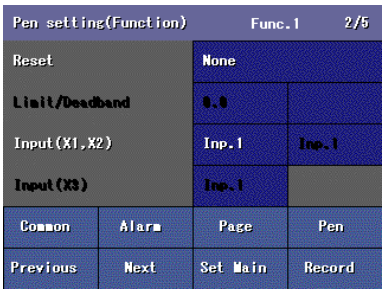
In order to add these ignored counts, set the value to A1. When the pulse counts are scaled, set the scaled value.

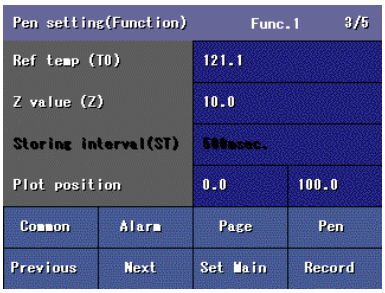


Caution – Max. count limit of the input module
Choose carefully the maximum count limit of the input module so that the count does not reach its limit twice during one cycle time ('Time' in the above figure).

■ F VALUE CALCULATION







Reset

In order to reset the totalized value, 'Trigger input' and/or 'Analog input' can be specified. Touch the 'None' key in Page 1/5 for 'Trigger,' the one in Page 2/5 for 'Analog input' conditions. If you leave the setting to 'None,' the data is reset only when 'Start' key is touched.

For details of the trigger input selections, please refer to 'Peak Hold' function.

For the analog input resetting, choose one of the following conditions:

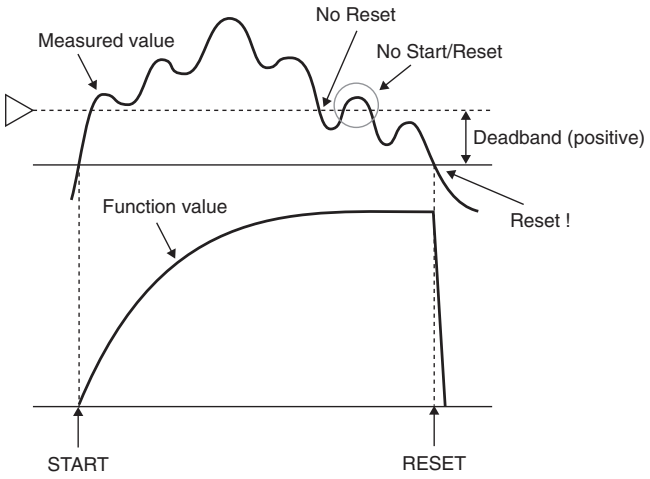
None	No resetting by analog input. Reset only when 'Start' key is touched.
Value < Limit	Reset when the measured value is lower than the limit value.
Value ≤ Limit	Reset when the measured value is equal to or lower than the limit value.

Limit / Deadband

Specify Limit value used to reset the function result. Deadband is used to prevent repeating of F value calculation execution and resetting when the measured value stays unstable close to the limit value.

A positive deadband is used to reset at 'Limit – Deadband,' while a negative deadband is used to reset at 'Limit + Deadband.'

By choosing an wide deadband, you can set different values for set and reset conditions.



Input (X1)

Touching Inp.1 opens the Tag name selector view. Select an input signal used for the operating function.

Input (X3)

Touching Inp.1 opens the Tag name selector view. Select an input signal used as resetting limit.

Ref. Temp (T0), Z value (Z)

Ref. Temp, Z value	Max. 6 digits including a decimal point and minus sign

Caution !
100 msec. storing interval is not usable with F value calculation.
Be careful to choose a pen of Not Itself. For example, you cannot choose Function Pen 1 or the X2 in an equation for Function Pen 1.
'e' can be used to input an exponential value such as '1e9.' Entering 'e' in any other way (e.g. '1ee') will not be recognized as a numeral.

■ LOGIC FUNCTIONS

Function

Choosing one of the available functions will change the rest of the parameter list to match the selected function.

Input (X1, X2)

Touching Inp.1 or Inp.2 opens the Tag name selector view. Select input signals used for the operating function.

Caution !

Be careful to choose a pen of Not Itself. For example, you cannot choose Function Pen 1 or the last data of Function Pen 1 to be used in an equation for Function Pen 1.

Initial value

Initial value is used in the function operation cycle as default data sample when 'last' data is specified in an equation. If you do not need, leave the field blank.

Initial value	1 for ON, 0 for OFF

Caution !

Any setting other than 0 and 1 will be handled as 0 as initial value.
For the XOR function, setting other than 0 and 1 to X1 or X2 will result in '0.'

OFF Description, ON Description

Short description for ON (1) and OFF (0) status for the operation result can be specified.

DO NOT use symbols such as comma, period, space or tab, which can be used to separate data fields in a CSV file.

Be aware also that data cells including symbols such as plus (+) and minus (–) will be handled as an equation in an Excel file.

OFF description	Max. 5 characters
ON description	Max. 5 characters

■ ANEMOSCOPE

Input (X1)

Touching Inp.1 opens the Tag name selector view. Select input signals used for the operating function.

Caution !

Be careful to choose a pen of Not Itself. For example, you cannot choose Function Pen 1 or the last data of Function Pen 1 to be used in an equation for Function Pen 1.

5.10 GRAPHIC VIEW SETTING

5.10.1 PAGE SETTING

■ PREPARING BACKGROUND IMAGES

Get ready image files of the following specifications in order to use it in Graphic View.

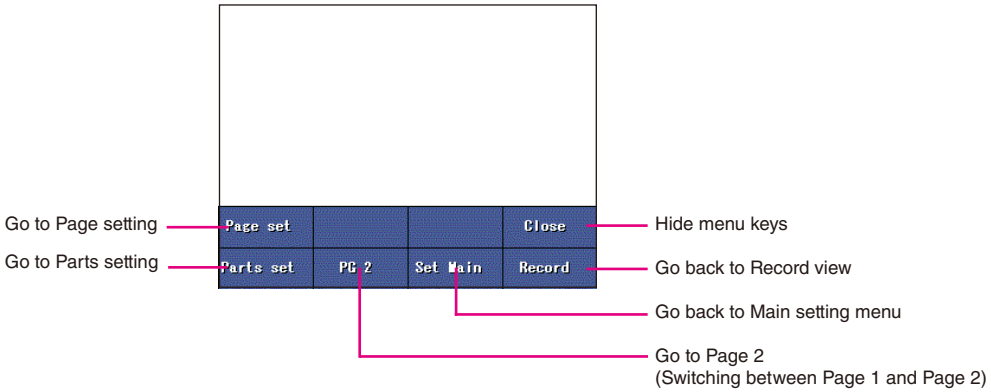
Format: .bmp
File size: 320 x 240 pixels (Trim and resize to this exact size if necessary.)
Color: 256 colors (The 73VR1100 automatically decreases color variation if higher colors are used.
File name: 73VRIMAGE1, 73VRIMAGE2

■ COPYING IMAGES TO THE CF CARD

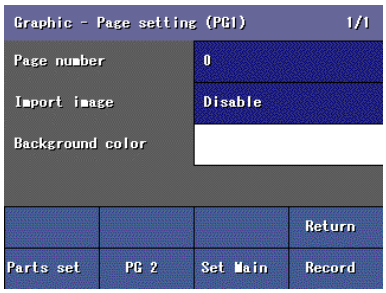
1. Stop the recording and turn off the power supply to the 73VR1100. If you are in the process of setting up the 73VR1100, be sure to touch Record key to save the setting before turning the power supply off.
2. Remove the CF Card from the 73VR1100 and copy the image files to the card.
3. Insert the CF Card to the 73VR1100 and turn on the power supply.

■ CREATING GRAPHIC PAGE & IMPORTING IMAGE

Touching Graphic setting on Main view opens up the graphic setting view as shown below:



1. Touch Page setting key to open Page setting.

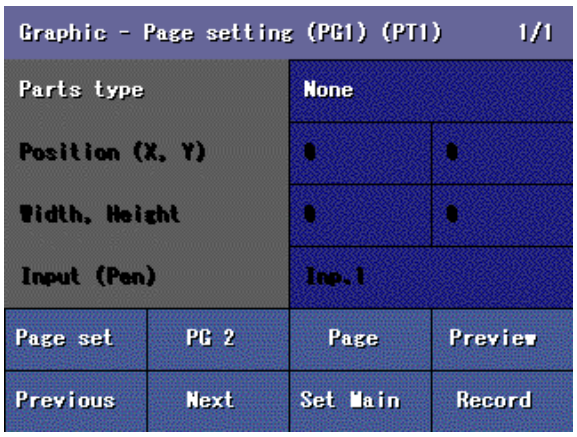


2. Page number: Specify how many graphic views you want to use. 0 (No graphic view), 1 or 2 views.
3. Import image: If you want to use the image file saved in the CF Card, choose Enable. The file named 73VRIMAGE1 is used for Page 1, and 73VRIMAGE2 for Page 2.
4. Background color: If you do not use a background image file, you can specify a plain color for the background. Touching the currently selected color field opens a color palette.

5.10.2 PARTS SETTING

Touching Part set key on Graphic – Page setting opens Parts setting view as shown below.

Max. 64 component parts per page such as Title, LED, Digital indicator and Bargraph, can be placed.



Position Coordinates and Size Unit

Parts position is specified by relative distance in pixels from the reference point, top-left corner of the screen.

X = Horizontal axis, 0 to 319 pixels
Y = Vertical axis, 0 to 239 pixels

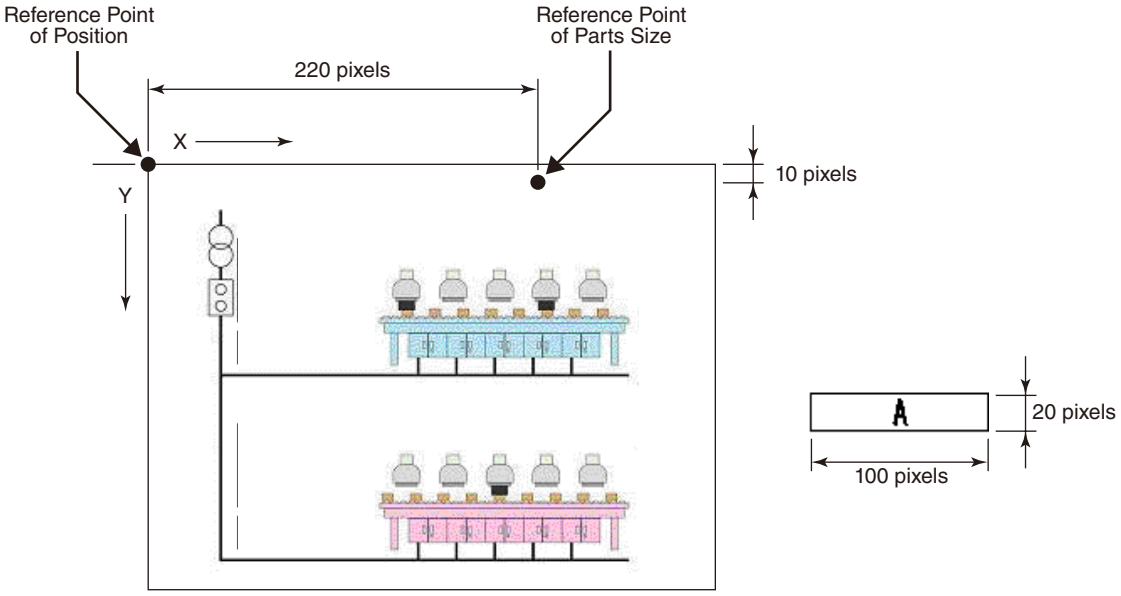
Specify the coordinates of the top-left corner of the parts.

Parts size is specified by width and height in pixels.

Width = 1 to 319 pixels
Height = 1 to 239 pixels

Refer to the example below.

Example: X = 220, Y = 10, Width = 100, Height = 20



CAUTION

Be sure that no one component is on another. Linked view may not be switched if multiple components are placed on the same spot.

Link view, Link number

You can choose a specific view to switch from the graphic when you touch a specific component parts on the screen.

Selectable views are: Trend, Overview, Bargraph and Graphic. If you do not want any switching views, specify 'Disable.'

Specify also the view number (Link number).

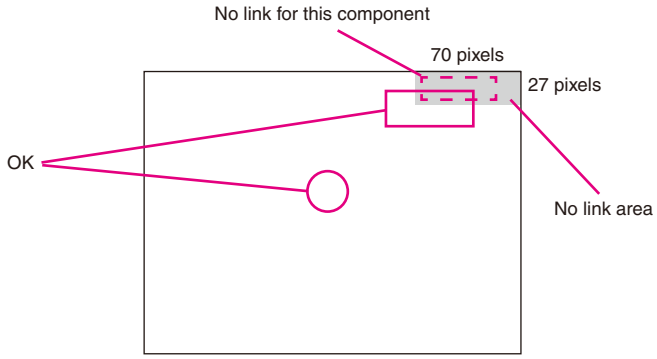
If a Trend or Bargraph view without any pens is specified to be linked, the 73VR1100 automatically switches to the one of next number with pens. Choose a view with pens.

Overview number depends upon how may pens (channels) are assigned per view. You may have to be careful when you change number of channels displayed per view after you have set link options from the graphic view.

CAUTION

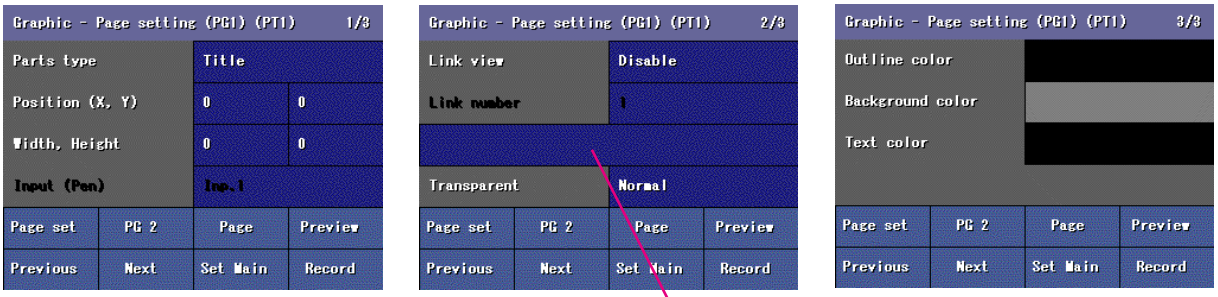
Be sure that no one component is on another. Linked view may not be switched if multiple components are placed on the same spot.

Link setting is invalid at the top-right corner of the screen (see below). If you place a component parts completely inside this area, Link is not valid. IF a part of the component is out of this area, touching the part running off the edges will switch the view.



■ PLACING COMPONENT PARTS

Title



1. Parts type: Touch the field to the right of Part type and choose Title.
2. Position, Width, Height: Specify the position and the size of the title field.
3. Link view, Link number: Choose a view if any.
4. The field below Link number is for entering texts for the title. Touch the field to open a keypad and compose a text.

   DO NOT use symbols such as comma, period, space or tab, which can be used to separate data fields in a CSV file.

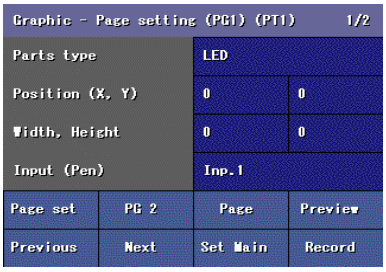
   Be aware also that data cells including symbols such as plus (+) and minus (–) will be handled as an equation in an Excel file.

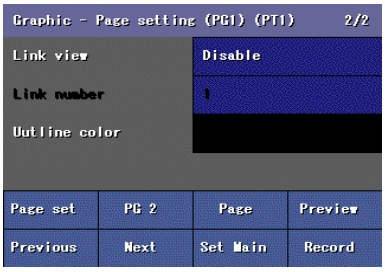
Title text	30 characters max.

5. Transparent, Outline color, Background color: Specify if you want the title text on an opaque background (Normal) or on a transparent background (Transparent).

   For an opaque background, specify the field outline and background colors.
6. Text color: Choose a color for the title text.

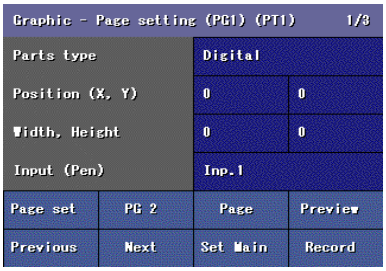
LED

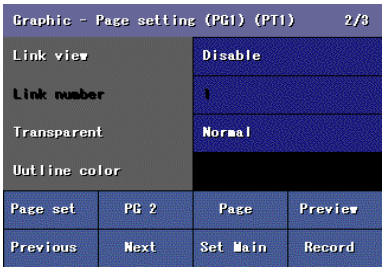


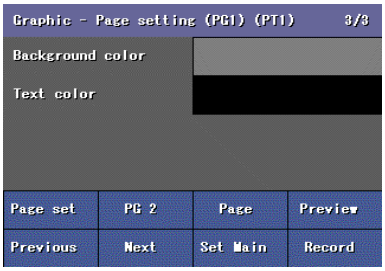


1. Parts type: Touch the field to the right of Part type and choose LED.
2. Position, Width, Height: Specify the position and the size of the LED.
3. Input (Pen): Specify a pen to be assigned to the LED.
4. Link view, Link number: Choose a view if any.
5. Outline color: Specify an outline color for the LED.

Digital Indicator



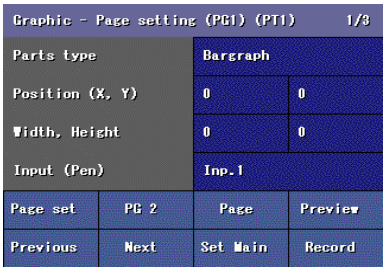


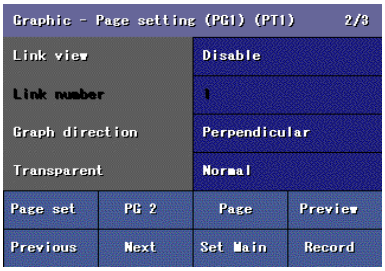


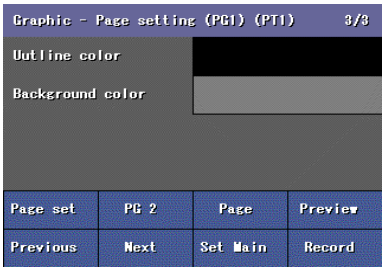
1. Parts type: Touch the field to the right of Part type and choose Digital.
2. Position, Width, Height: Specify the position and the size of the indicator.
3. Input (Pen): Specify a pen to be assigned to the indicator.
4. Link view, Link number: Choose a view if any.
5. Transparent, Outline color, Background color: Specify if you want the digital indicator on an opaque background (Normal) or on a transparent background (Transparent).

   For an opaque background, specify the field outline and background colors.
6. Text color: Choose a color for the value text.

Bargraph



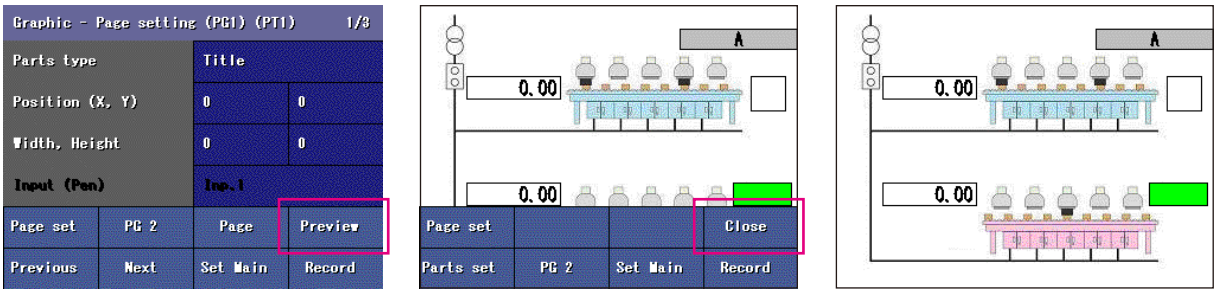




1. Parts type: Touch the field to the right of Part type and choose Bargraph.
2. Position, Width, Height: Specify the position and the size of the bargraph.
3. Input (Pen): Specify a pen to be assigned to the bargraph.
4. Link view, Link number: Choose a view if any.
5. Graph direction: Choose Perpendicular or Horizontal bar.
6. Transparent, Outline color, Background color: Specify if you want the bargraph on an opaque background (Normal) or on a transparent background (Transparent).

   For an opaque background, specify the field outline and background colors.

■ **CONFIRMING PREVIEW IMAGE**



In order to visually check the Graphic view setting, touch Preview key.

In the preview, touch Close key to hide the menu keys and to show the full screen.

On the full screen, touching a component parts switches the view to the setting views for the component.

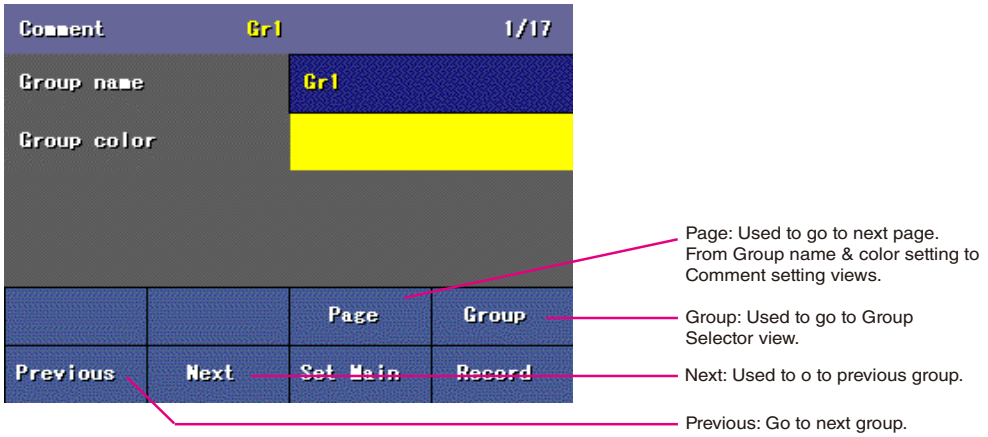
5.11 ENTERING COMMENTS

You can either preset a library of comments to be indicated on the Trend view.

The maximum of 56 comments categorized in 7 groups (8 comments per group) can be preset. The seventh group is used also for free comment entry during recording. The comments in this group can be modified while recording.

5.11.1 SETTING COMMENT GROUPS

You can assign a specific color to each comment group which can be identified with a specific name. Comments are indicated on the Trend view in this color.



1. Touch Comment Setting on the Main view.
2. Touch Group key.
3. Choose a group.
4. Enter the group name and choose a color.

   DO NOT use symbols such as comma, period, space or tab, which can be used to separate data fields in a CSV file.

   Be aware also that data cells including symbols such as plus (+) and minus (–) will be handled as an equation in an Excel file.

Group	Max. 10 characters

5.11.2 SETTING COMMENTS

1. Touch Page button at the bottom of the Group setting view. Turn pages until the screen shows the comment entry view you want to set up.
2. Touch the comment field and enter a comment. Character size is automatically adjusted according to the number of characters and character width (e.g. smaller size when 'w' or 'm' are used than when ' t ' or ' i ' are.)

   DO NOT use symbols such as comma, period, space or tab, which can be used to separate data fields in a CSV file.

   Be aware also that data cells including symbols such as plus (+) and minus (–) will be handled as an equation in an Excel file.

   On the 73VRWV Data Viewer software, these comments are used as file names when a file is to be divided using them as keyword. DO NOT use symbols which are not allowed in a file name such as / : * ? " < > | ~ \ .
3. Enable 'Auto Write In' if needed. More explanations are give in the following.
4. Touch Page button to go to another comment entry.

Auto write in

Comments can be automatically written on the chart according to preset conditions. Choose Enable to use this function.

Discrete/Analog

Specify the signal type (analog or discrete) that you want to use to trigger the automatic comment entry.

Threshold

Specify the threshold value for analog trigger signal.

Threshold	Max. 6 digits including a decimal point and minus sign

Condition

For analog trigger signal, the following conditions can be used to trigger the comment entry.

Value > Threshold	The comment is written in when the subject pen signal goes above the analog trigger signal value.
Value < Threshold	The comment is written in when the subject pen signal goes below the analog trigger signal value.
Value ≥ Threshold	The comment is written in when the subject pen signal is equal to or goes above the analog trigger signal value.
Value ≤ Threshold	The comment is written in when the subject pen signal is equal to or goes below the analog trigger signal value.

For discrete trigger signal, the following conditions can be used to trigger the comment entry.

Up	The comment is written in when the subject pen signal turns from OFF to ON.
Down	The comment is written in when the subject pen signal turns from ON to OFF.

Pen number

Choose the pen number for the trigger signal.

Caution !

Number of comment written per 1 sampling
- When writing comment occurs per every sampling, be sure to set not more than 5 points for writing comment per 1 sampling.

5.12 CONFIRMING CHANGES

New setting becomes valid when the display has gone back to one of the Display views by touching Record key If there was any change in the storing rate, the data storing form, and/or the number of enabled pens, the message as shown below appear on the screen.

Touching OK overwrites the previous data file, and touching Cancel return the screen to Display view.

5.13 SETTING UP WITH THE 73VR11BLD

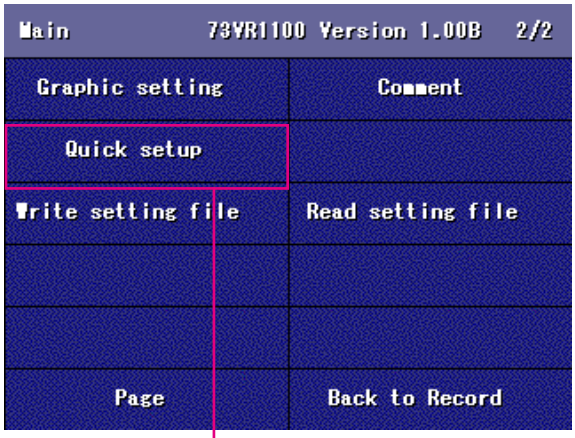
A software configuration created on the 73VR1100 Configuration Builder (model: 73VR11BLD) can be downloaded to the 73VR1100. The configuration set up on the 73VR1100 can be uploaded and displayed on the 73VR11BLD.

In order to apply a new setting stored in the CF Card using the 73VR11BLD, restart the 73VR1100. For detailed information about the 73VR11BLD, please refer to the users manual for the model.

6. QUICK STARTUP

The minimum setup required to start recording and showing on the screen is explained in this section, using Quick Setup.

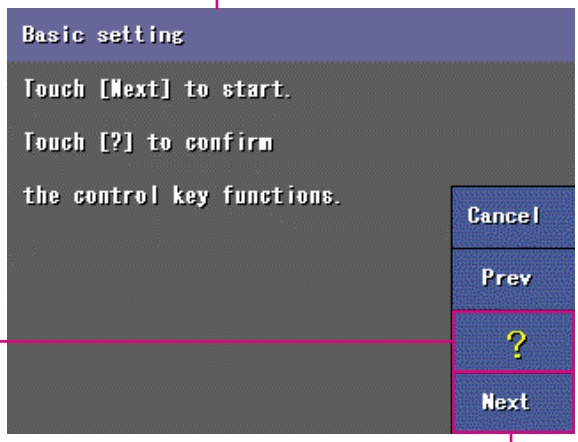
Touch [Quick setup] to open the Basic setting view.



BASIC SETTING

Control keys

[Cancel]	: Exits Quick Setup to go back to Main View without saving a new configuration setting.
[Previous]	: Goes to previous view.
[?]	: Shows Help view (below)
[Next]	: Goes to next view

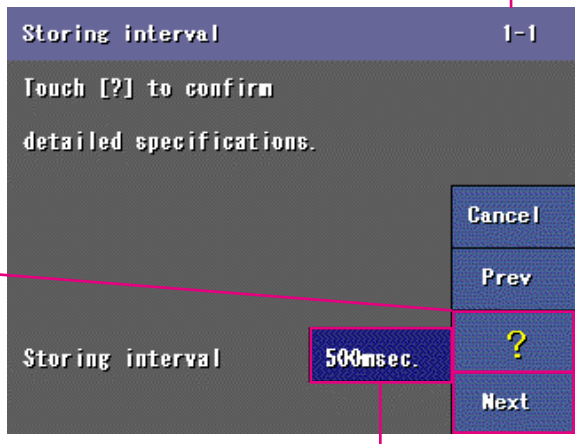


Help view (Basic setting)

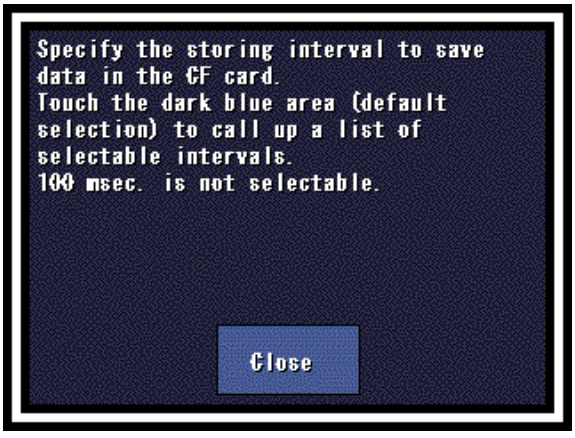
Touch [Next] to show Storing interval view.

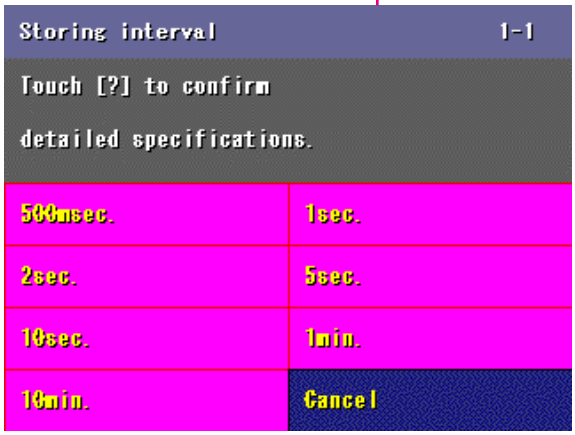
STORING INTERVAL

Touch the dark blue area (default selection) to call up a list of selectable intervals, choose one and touch [Next].



Help view (Storing interval)



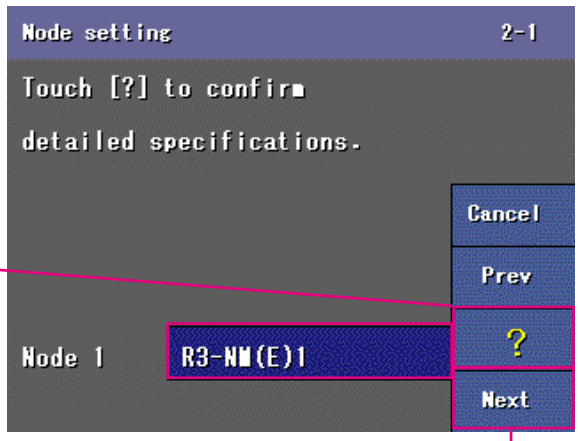


NODE SET

Setting the device type for Node 1.

Touch the dark blue area (default selection) to call up a list of selectable devices, choose one and touch [Next].

Help view (Node set)

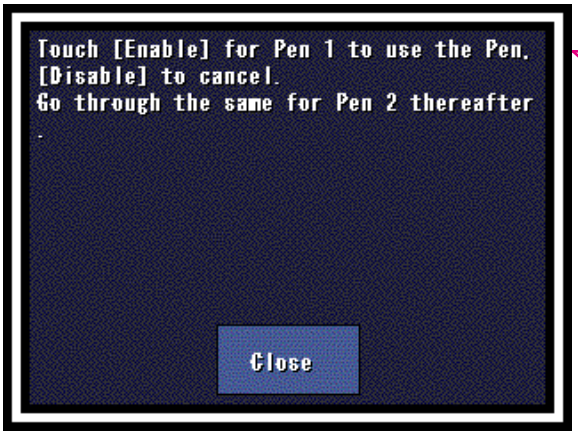


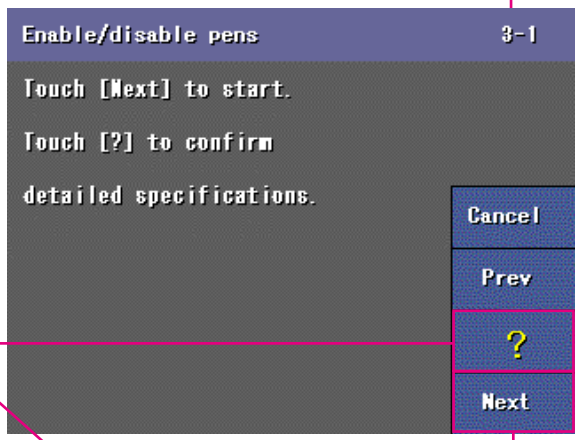
ENABLE / DISABLE PENS

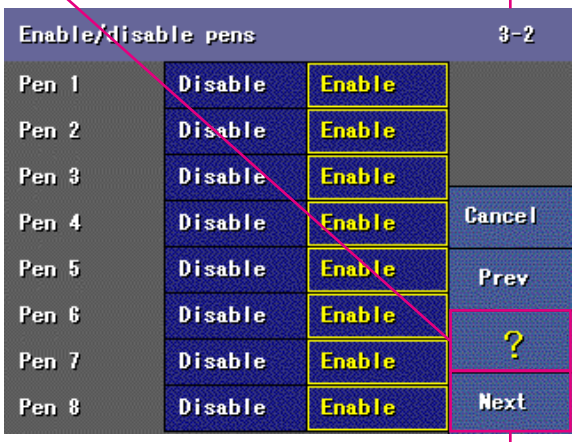
Touch [Next] to call up a list of pens (3-2).

Touch [Enable] to activate pens.

Help view (Enable/disable pens)





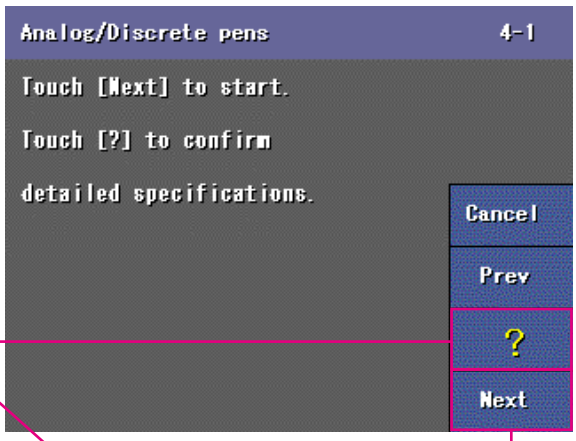


Touch [Next].

ANALOG / DISCRETE

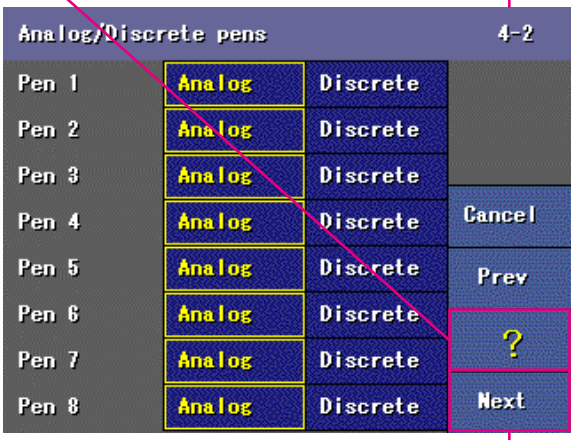
Touch [Next] to call up a list of pens (4-2).

Touch [Analog] or [Discrete] signals.



Help view (Analog/discrete)

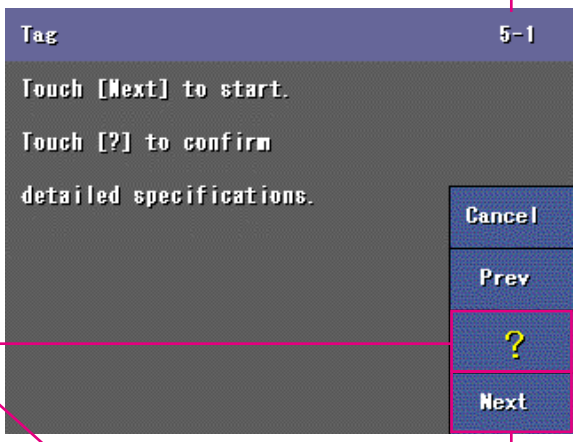
Touch [Next].



TAG

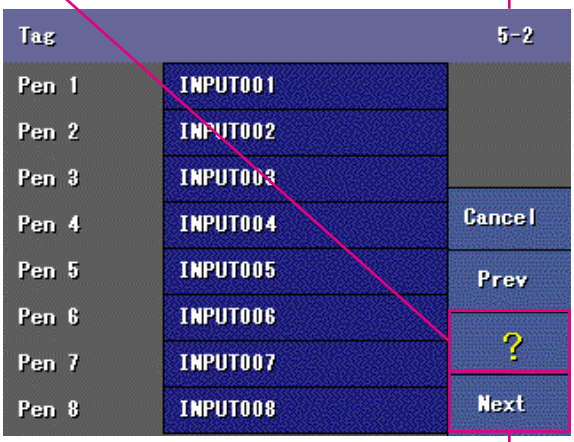
Touch [Next] to call up a list of pens (5-2).

Touch the dark blue area (default name) to call up a keypad and enter a tag name. Max. 8 alphanumeric characters.



Help view (Tag)

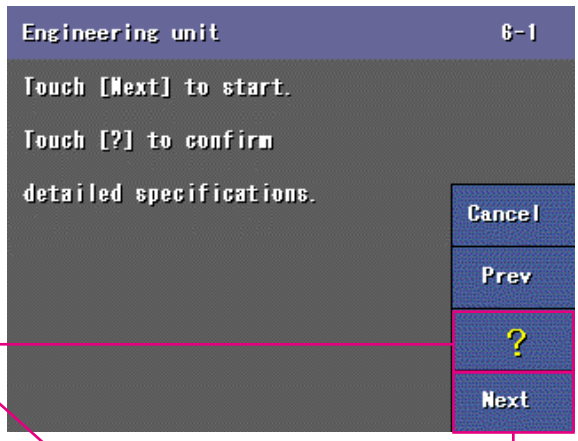
Touch [Next].



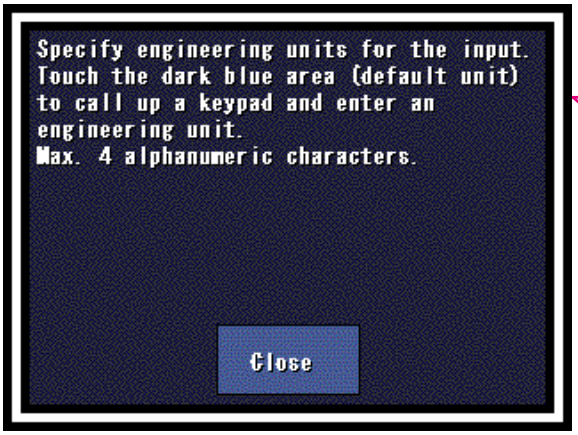
ENGINEERING UNIT

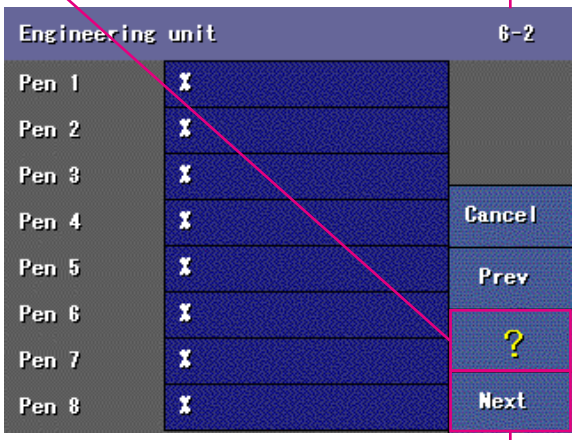
Touch [Next] to call up a list of pens (6-2).

Touch the dark blue area (default unit) to call up a key-pad and enter an engineering unit. Max. 4 alphanumeric characters.



Help view (Engineering unit)



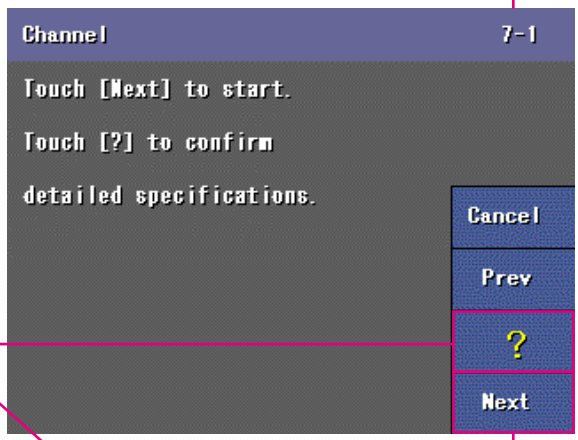


Touch [Next].

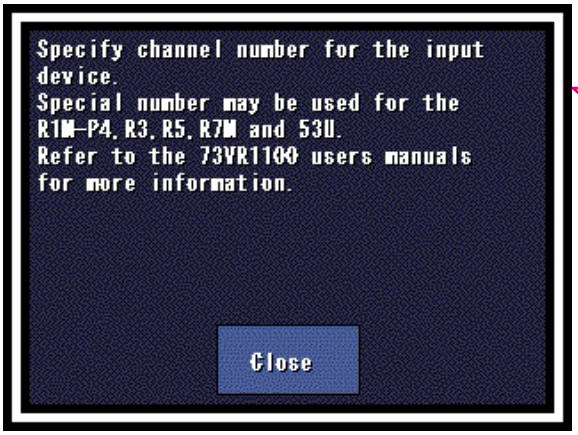
CHANNEL

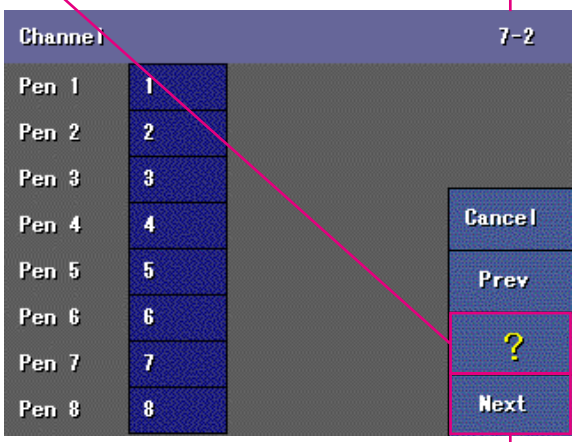
Touch [Next] to call up a list of pens (7-2).

Touch the dark blue area (default channel) to call up a keypad and enter a number. Touch [Next].



Help view (Channel)





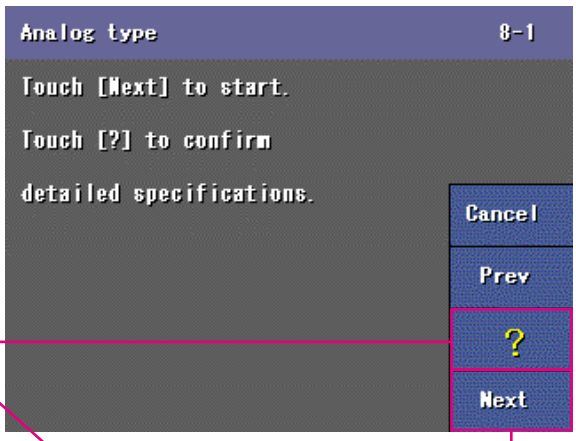
Touch [Next].

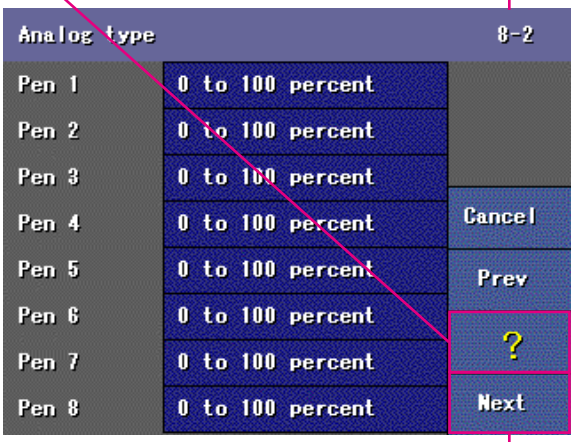
ANALOG TYPE

Touch [Next] to call up a list of pens (8-2).

Touch the dark blue area (default unit) to call up a list of selectable types, choose one and touch [Next].

Help view (Analog type)





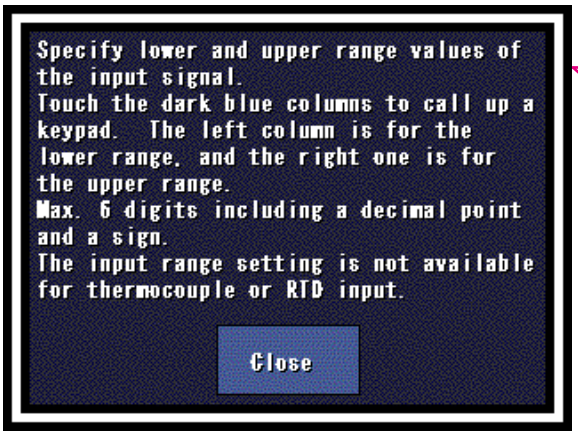
Touch [Next].

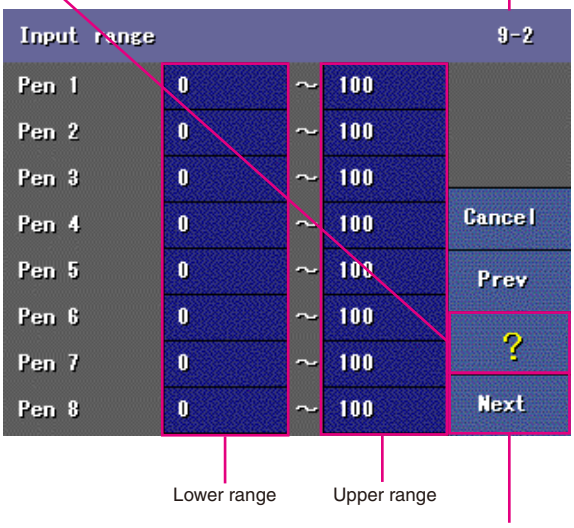
INPUT RANGE (DC input only)

Touch [Next] to call up a list of pens (9-2).

Touch the dark blue area (default unit) to call up a keypad. Max. 6 digits including a decimal point and a sign.

Help view (Input range)





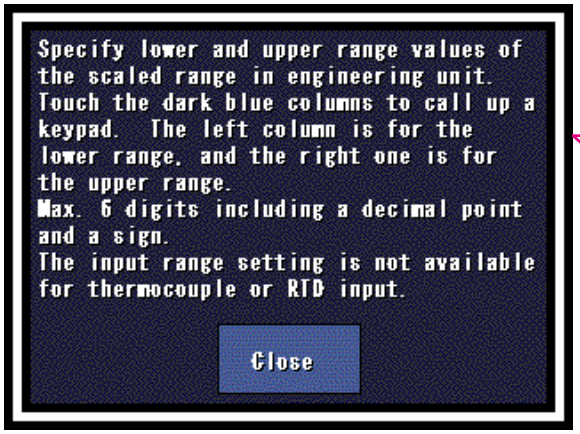
Touch [Next].

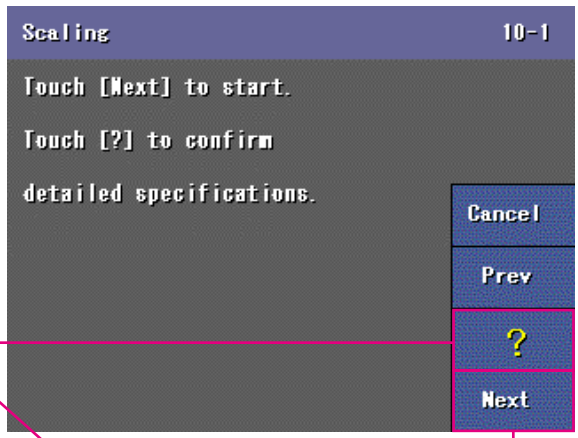
SCALING (DC input only)

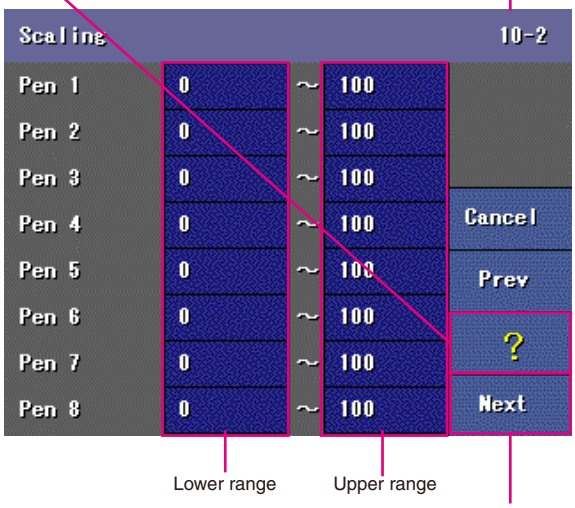
Touch [Next] to call up a list of pens (10-2).

Touch the dark blue area (default unit) to call up a keypad. Max. 6 digits including a decimal point and a sign.

Help view (Scaling)







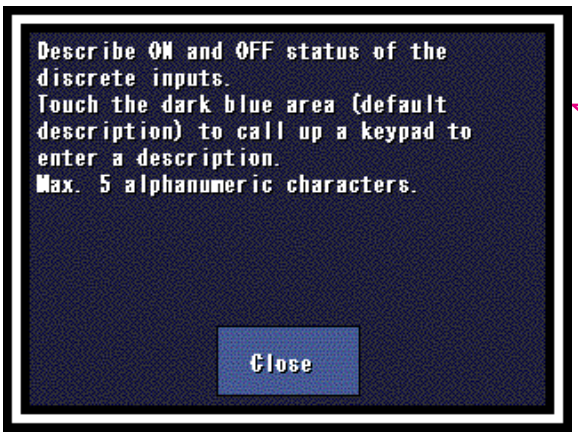
Touch [Next].

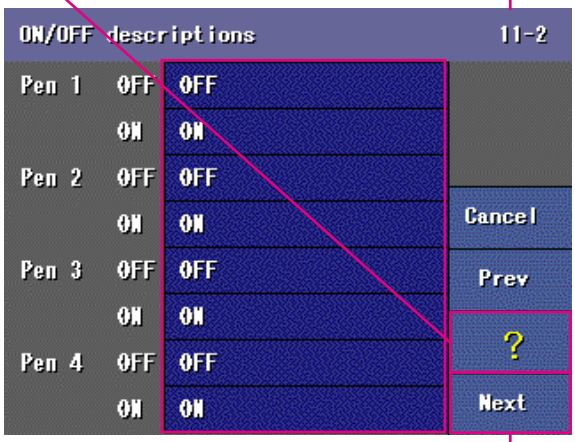
ON/OFF DESCRIPTIONS

This view appears only when you have specified discrete channels.

Touch the dark blue area (default description) to call up a keypad and enter a description. Max. 5 alphanumeric characters.

Help view (ON/OFF descriptions)





Touch [Next].

SETUP COMPLETE

Now the most basic settings are complete. Touch [Record] to go to Record view.

NOTES

The following parameters are automatically set in Quick Setup.

Operating mode:	Modbus RTU
Data cycle:	Priority on alarm
Data file used volume:	ON
Display pen number (OV):	8 pens
Data storing method:	Normal
Plot range:	Same as Scaling setting (Max. input range for temperature)

7. OPERATING FUNCTIONS

7.1 GENERAL DESCRIPTIONS

Arithmetic and logic functions are performed and stored at the Function pens. Either 32 or 64 pens can be assigned for the operating functions.

For setting up Function pens, please refer to Section 5.9.

■ OPERATING FUNCTIONS

CATEGORY	FUNCTIONS
Arithmetic functions	Addition/Subtraction, Multiplication, Division
Logic functions	AND, OR, XOR, NOT
Math functions	Square root extraction, Power
Accumulation	Analog/pulse accumulation (until reset)
Filter	Moving average, First order lag
Peak hold	Peak (maximum value) hold, Peak (minimum value) hold
F value calculation	Typically used to calculate the sterilization or disinfection time in predefined conditions
Others	Anemoscope (16 directions)

■ PARAMETERS

- Measuring data: Specify input pens. With analog data, engineering unit data is used for computations. Data sampled in the last cycle can be also used.
- Function data: Specify pen numbers used to store operation function results.
- Coefficients (K1, K2)
- Constants (A1, A2, A3)
- Other parameters: Number of data sampled to be used for the moving average function, Time constant for the first order lag operation, Reference temperature and Z value for F value calculation.

Caution 1

If 'Last' data is assigned to X1 and X2, the first function data will be missed.

Measuring data and function data are used as numbers without an engineering unit. No adjustment between different scales or engineering units are performed automatically.

The function operations are consecutively performed from the smallest Function Pen No. When you take one or more function data as parameters for another function, be sure of the orders of functions.

Data range handled by these functions are from -1×10^{10} to 1×10^{10}. Function result values out of this range will be handled as errors. For F value calculation, the range is from 0 to 1×10^{10}.

The effective number of digits for the calculation result is 6 digits. Function result values exceeding the effective number of digits may have intolerable deviations.

7.2 DETAILED PARAMETER SETTING

7.2.1 ARITHMETIC FUNCTIONS

Addition / Subtractions

K1X1 + K2X2 + A

Specify measured data or function data for X1 and X2 (analog signal only), gains (K1 and K2) and bias (A1).

Multiplication

(K1X1+A1) (K2X2+A2) + A3

Specify measured data or function data for X1 and X2 (analog signal only), gains (K1 and K2) and biases (A1, A2 and A3).

Division

(K1X1+A1) / (K2X2+A2) + A3

Specify measured data or function data for X1 and X2 (analog signal only), gains (K1 and K2) and biases (A1, A2 and A3).

7.2.2 LOGIC FUNCTIONS

AND

X1 ∧ X2

Specify two measured or function data (X1, X2: only discrete signals). When both samples equal '1,' '1' is output. '0' is output for all other combinations.

OR

X1 ∨ X2

Specify two measured or function data (X1, X2: only discrete signals). When both samples equal '0,' '0' is output. '1' is output for all other combinations.

NOT

¬ X1

Specify one measured or function data (X1, only discrete signal). An output of opposite logic to an input is provided.

XOR

X1 ^ X2

Specify two measured or function data (X1, X2: only discrete signals). When one sample's logic matches the other, '0' is output. When it does not, '1' is output.

7.2.3 MATH FUNCTIONS

Square root

K1√X1

Specify measured data or function data (X1), with a coefficient (gain K1).

Power

$X1^{A1}$

Specify measured data or function data (X1), with a constant (exponent A1).

7.2.4 ACCUMULATION

Analog accumulation

Specify measured data or function data (X1), with Reset condition.

The measured (function) data is accumulated until it is reset when the reset condition is true or when Start key is touched. In order to reset the hold function, 'Time' or 'Trigger input' can be specified.

Reset	Time	30 min., 1 hour, 2 hours, 3 hours, 4 hours, 6 hours, 12 hours, 24 hours (selectable time of a day)
	Trigger input	Up, Down, ON, OFF.

Input X1, such as flow signals, could be values per time unit (/day, /hour, /min, /sec). In order to accurately totalize this type of signals, specify the time unit. For example, without the time unit setting, with 1-minute storing interval, 500 m^3/h data input, 500 is added every 1 minute, up to 30000 m^3/h. With the time unit setting, only one-sixtyth (1/60) of the input data is counted by every storing interval.

Sum scale	None	∑ (input or function data)
	Sec	∑ (input or function data) x (3600/GAIN)
	Min	∑ (input or function data) x (60/GAIN)
	Hour	∑ (input or function data) x (1/GAIN)
	Day	∑ (input or function data) x (0.04166/GAIN)

Values assigned to GAIN depend upon the storing interval.

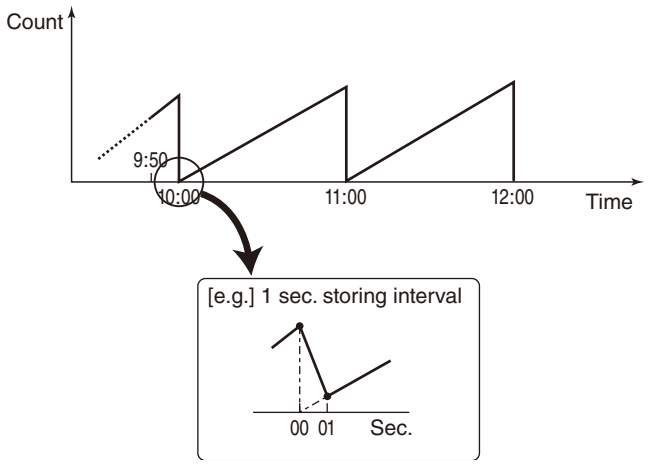
Storing interval	GAIN
0.1 seconds	36000
0.5 seconds	7200
1 second	3600
2 seconds	1800
5 seconds	720
10 seconds	360
1 minute	60
10 minutes	6

Drop out

Specify maximum 6 digits positive number including a decimal point.

The measured data or the function data is accumulated with every storing interval by drop out condition.

Drop out	Analog accumulation condition
0 or not specified	Accumulates regardless of the measured (or function) data.
More than 0	Accumulates when the measured (or function) data exceeds the drop out value.



At the timing of resetting, both the totalized count up to 00 second and '0' could exist at once. The 73VR1100 stores the totalized count at 00 second and a new count at 01 second after the resetting at 00 second.

Pulse accumulation

Specify measured data or function data (X1), with Reset condition.

The measured (function) data is accumulated until it is reset when the reset condition is true or when Start key is touched. In order to reset the hold function, 'Time' or 'Trigger input' can be specified.

Reset	Time	30 min., 1 hour, 2 hours, 3 hours, 4 hours, 6 hours, 12 hours, 24 hours (selectable time of a day)
	Trigger input	Up, Down, ON, OFF.

Plotting on the screen is performed in the same way as for the analog accumulation.

7.2.5 FILTER

First order lag

Time constant is a response time for a step input (0 to 100%) to reach 63%. By setting the first order lag filter, noises and spikes contained in the input signal could be attenuated in the output signal. Specify measured data or function data, with a time constant.

With 1 sec. or longer storing rate, function results displayed on the screen maintain the last value periodically, because the function is executed the sampling rate and displayed on the screen.

Moving average

Multiple samples of input data are averaged. When the next sample is added, the oldest sample is discarded and the new set of samples are averaged. By setting the moving average filter, noises and spikes contained in the input signal could be attenuated in the output signal.

With 1 sec. or longer storing rate, function results displayed on the screen maintain the last value periodically, because the function is executed the sampling rate and displayed on the screen.

7.2.6 PEAK HOLD

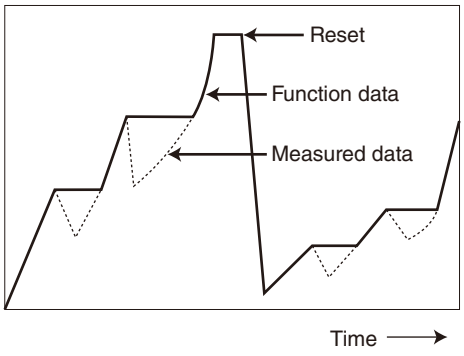
Peak hold (max)

Specify measured data or function data (X1), with Reset condition.

Maximum value hold function is operated by sampling interval (100 msec. with 100 msec. storing interval, 500 msec. with 500 msec. or longer intervals). The measured (function) data is compared with the current hold value and the former is taken when it is greater than the latter, while the latter is taken when it is smaller than the latter.

The measured data is reset when the reset condition is true or when Start key is touched. In order to reset the hold function, 'Time' or 'Trigger input' can be specified.

Reset	Time	30 min., 1 hour, 2 hours, 3 hours, 4 hours, 6 hours, 12 hours, 24 hours (selectable time of a day)
	Trigger input	Up, Down, ON, OFF.



Equation

When $X1_{MAX} < X1$
$Y = X1$
$X1_{MAX} = X1$

When $X1_{MAX} \geq X1$
$Y = X1_{MAX}$

When Reset condition is true: $Y = X1$
Y : Function data
X1 : Measured input data
$X1_{MAX}$: Hold value

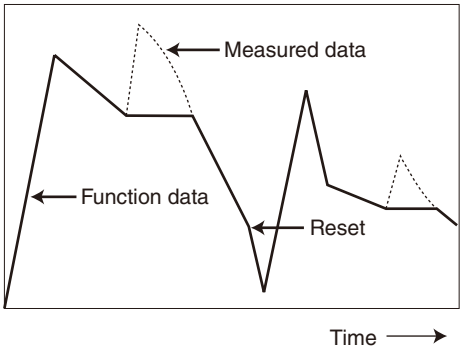
Peak hold (min)

Specify measured data or function data (X1), with Reset condition.

Minimum value hold function is operated by sampling interval (100 msec. with 100 msec. storing interval, 500 msec. with 500 msec. or longer intervals). The measured (function) data is compared with the current hold value and the former is taken when it is smaller than the latter, while the latter is taken when it is greater than the latter.

The measured data is reset when the reset condition is true or when Start key is touched. In order to reset the hold function, 'Time' or 'Trigger input' can be specified.

Reset	Time	30 min., 1 hour, 2 hours, 3 hours, 4 hours, 6 hours, 12 hours, 24 hours (selectable time of a day)
	Trigger input	Up, Down, ON, OFF.



Equation

When $X1_{MIN} > X1$
$Y = X1$
$X1_{MIN} = X1$

When $X1_{MIN} \leq X1$
$Y = X1_{MIN}$

When Reset condition is true: $Y = X1$

Y : Function data
X1 : Measured input data
$X1_{MIN}$: Hold value

7.2.7 F VALUE CALCULATION

F value calculation

Specify measured data or function data (X1), with Reset condition.

The measured (function) data is accumulated until it is reset when the reset condition is true or when Start key is touched. In order to reset the hold function, 'Time' or 'Trigger input' can be specified.

Reset	Trigger input	Up, Down, ON, OFF.
	Analog input	Value < Threshold, Value ≤ Threshold

At the timing of resetting, both the totalized count up to 00 second and '0' could exist at once. The 73VR1100 stores the totalized count at 00 second and a new count at 01 second after the resetting at 00 second.

If the reset condition remains true for more than a moment, the function data remains 0.

Equation: $\sum 10^{(X1 - T0) / Z} ST/60$

where X1: Measured temperature (°C)

T0: Reference temperature (°C)

Z: Z value

ST: Storing interval (seconds)

If the result of the equation is out of the range: 0 to 1.0×10^{10}, it is given as an error.

7.2.8 ANEMOSCOPE

Specify measured data or function data (X1).

Direction corresponding to measured data is displayed in the display view shown below.

1. Digital display of Trend view
2. Overview

Relation between input and direction

Input	Display
---	---
-3	WNW
-2	NW
-1	NNW
0	N
1	NNE
2	NE
3	ENE
4	E
5	ESE
6	SE
7	SSE
8	S
9	SSW
10	SW
11	WSW
12	W
13	WNW
14	NW
15	NNW
16	N
17	NNE
18	NE
---	---

When input is fractional value, closest direction is displayed.

Example: 1.5 ≤ X1 < 2.5 → NE

In the Retrieve view, input value is displayed, not direction.

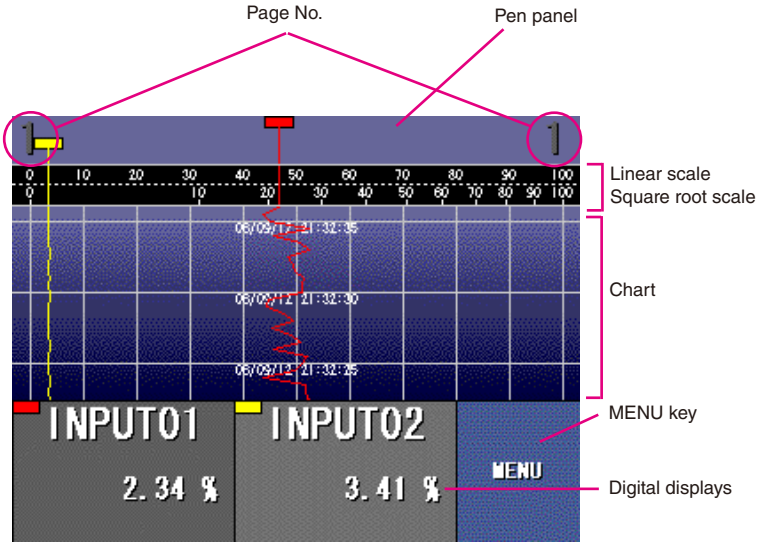
Recorded data is input value, not direction. Display in the 73VR Data Viewer (73VRWV) and converted CSV data is not direction.

8. DISPLAY VIEWS

Six (6) data display views are available for the 73VR1100: Data display (record) views (Trend, Overview, Bargraph and Graphic), Retrieve view and Alarm History. You can switch between these five views at any time.

8.1 TREND VIEW

The Trend view shows currently recorded data on a trending chart. Four pages are available, and each page consists of Pen Panel, Chart, Digital Displays and Menu key.



Trend view.

8.1.1 PEN PANEL

Pen Pointers

Pens on the chart are specified by Pen Select control. Each view can show 8 pens at the maximum. Display rate is selectable among 1 second, 2 seconds and 5 seconds.

Pen pointers are vertically offset to each other so that each pointer can be recognized even when multiple pointers are positioned at the same input value.

The number 1, 2, 3 and 4 indicated at the left and right ends indicates the current page. Touching the number switches the pages in turn. Ones not assigned with pens are skipped.

Scale Bar

Two scales, linear and square root from 0 to 100%, are indicated on the scale bar. The scales apply to the plot range specified in Pen Setting.

Engineering scale for a specific pen can replace the standard scale by touching the tag name for the pen. In order to return the scale to 0 to 100%, touch the scale.

The engineering unit scale is indicated to three decimal places (one decimal place with horizontal chart).

While recording, the scale bar is turned to black color.

Caution !

When more than 5 characters (including sign and decimal point) are to be shown on the scale, only those at 0%, 50% and 100% are indicated.

8.1.2 CHART

Perpendicular and horizontal charts are selectable. On the perpendicular chart, data stream from top to bottom. On the horizontal chart, data stream from left to right. In order to switch the direction, select Display setting – Graph direction (Section 5.5.3).

Perpendicular rules are lined by 10% of the linear scale.

Horizontal rules are lined by time. One (1) division time depends upon the chart speed setting and the storing interval as shown in the table below. For the entire chart time spans, refer to Section 5.5.1.

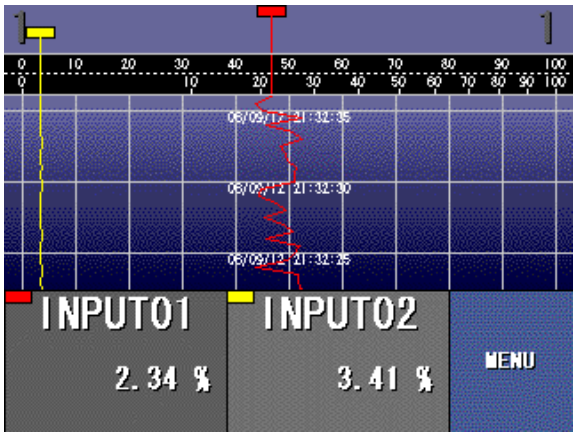
■ PERPENDICULAR CHART

Chart Speed	One Division Time	
	100 msec. storing interval	500 msec. storing interval
4	1 second	5 seconds
1	5 seconds	20 seconds
1/5	1 minute	1 minute
1/32	5 minutes	5 minutes
1/160	----	30 minutes
1/480	----	2 hours
1/960	----	4 hours

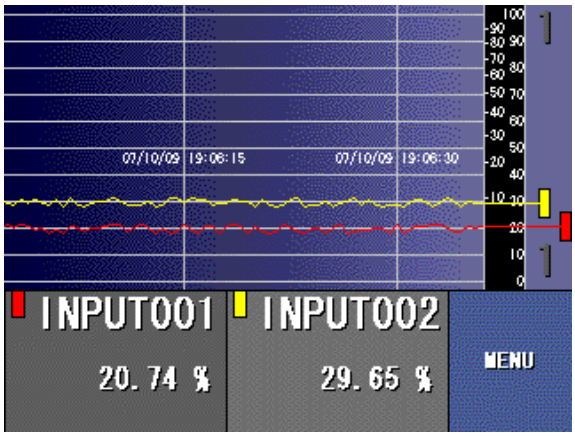
■ HORIZONTAL CHART

Chart Speed	One Division Time	
	100 msec. storing interval	500 msec. storing interval
4	2 seconds	15 seconds
1	10 seconds	1 minute
1/5	5 minutes	5 minutes
1/32	30 minutes	30 minutes
1/160	----	3 hours
1/480	----	6 hours
1/960	----	12 hours

Time index is shown at the center of the chart, in 'YY/MM/DD HH:MM:SS' format.



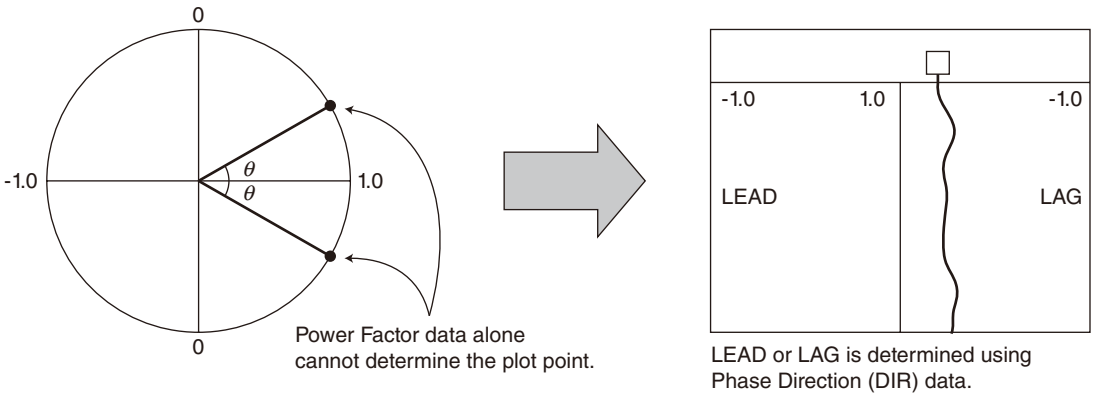
Perpendicular chart.



Horizontal chart.

How to Plot Power Factor Data

Power Factor (PF) is represented on the screen based on the power factor data and the Phase Direction (DIR) data (0 = LAG, 1 = LEAD). It ranges from -1.0 (LEAD) at the left end of the chart, to 1.0 in the middle, to -1.0 (LAG) at the right end of the chart.



NOTES
1. Input range, Engineering range and Plot position are NOT available for change.
2. DIR data is irrelevant for the maximum and minimum power factor values. Therefore no reference to DIR data is used to plot these values on the screen.
3. DIR data cannot be included in retrieved data. Power Factor data is directly read in and plotted on the screen.

Error indication

When an input (or function result) is lower than the data range limit -1 x 10^{10}, its pen pointer remains at the extreme left of the chart. When it is higher than the data range limit 1 x 10^{10}, the pen pointer remains at the extreme right of the chart.

8.1.3 DIGITAL DISPLAY

Digital displays include the tag name and/or instantaneous value or status as specified (Tag + Value, Tag, or Value) in Digital Display Type (See Section 5.5.3).

Engineering Unit Value or Discrete Status

Analog instantaneous values indicated in engineering unit are renewed by the specified display rate (1, 2, 5 sec.). Measured data is shown for the temperature. Decimal places are specified in Pen setting (Common).

Discrete status is indicated with the display description specified in the Pen setting, and renewed by the specified display rate (1, 2, 5 sec.).

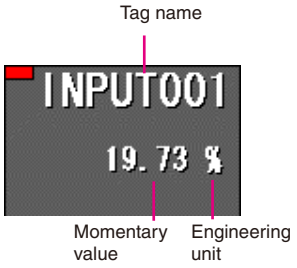
The alarm status is also indicated.

If Auto Hide function is enabled (See 5.5.4), the digital display is automatically hidden when the screen is untouched for 30 seconds. The chart time span is longer without the digital display. In order to show the digital display, touch the bottom half area of the screen.

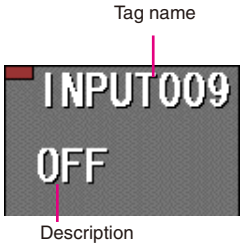
Alarm Status

Zone colors specified in Pen setting (alarm) (Section 5.8) are applied to the tag name and momentary value to indicate it is within respective zones. Indicator's background color turns to black color when the pen is in alarm status. Normal color is grey.

For discrete signals, ON and OFF status colors are applied to the tag name and description for respective states. Indicator's background color turns to black color in alarm, to grey in normal state.



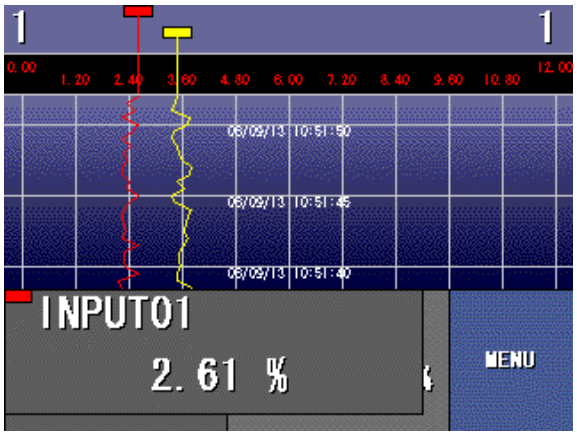
Digital display, analog signal.



Digital display, discrete signal.

Large digital display

Only one (1) digital display can be specified to appear in large size.



Large digital display.

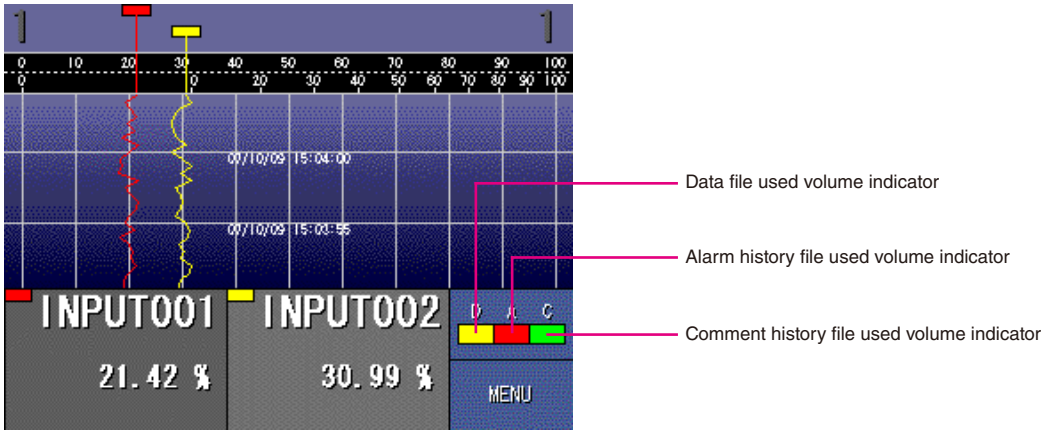
Touch twice the digital display of the pen you want to enlarge. The scale changes to the engineering unit of the pen at the first touch, and then the large display appears at the second touch. In order to reduce the display size to the original state, touch the large display once again.

Data File Used Volume

Data File Used Volume indicators are displayed above the MENU key when Data File Used Volume is set to 'Show' in the basic setting.

The 73VR1100 creates a data file at the startup using all unused space and shows while recording how much space has been used in percentage (1 percent increments) about Data (D), Alarm History (A) and C (Comment History). The indicator colors change according to the used volume: green below 50%, yellow up to 79% and red over 80%. Once the used space reaches 100%, the 73VR1100 overwrites the oldest data with a new one. There will be no update on this indicator after 100%.

While the CF card is hot-swapped or during the FTP while in recording, the indicators show the used volume of the backup file in the internal memory. Percentage indication turns to green color.



Data file used volume indicators

8.1.4 WRITING COMMENTS

Comments can be indicated on the screen in the Trend view. These comments are also saved in Comment History file to view on the Comment History view.

In order to write comments, two (2) methods are available:

1. Selecting from a preset list of comments
2. Writing a selected comment automatically by preset conditions

The maximum of 56 comments categorized in 7 groups (8 comments per group) can be preset. The seventh group is used also for free comment entry during recording. The comments in this group can be modified while recording.

NOTE

Comment function can be used only (1) when the trend graph is showing a perpendicular chart, and (2) when the 73VR1100 is recording in the CF Card. No comment can be written in while you are hot-swapping the CF Card.

While the automatic comment entry is on, DO NOT execute a FTP data transfer.

How to write in a comment:

1. Touch MENU button on the Trend view and then choose Comment write in.
2. In order to choose a comment from the list, choose a group and then a comment from the list, and touch OK. The comment is written in the chart at the time index indicated on the list (the moment when the Comment write in key is touched).

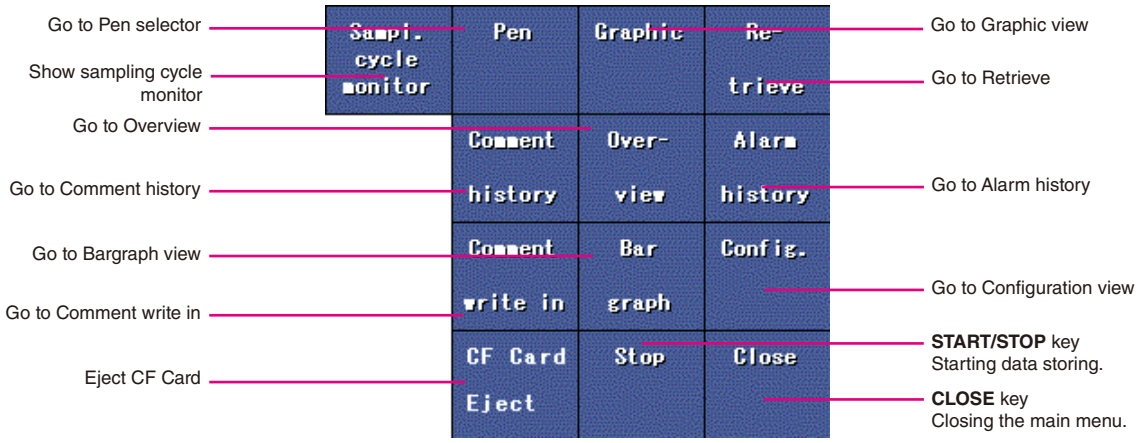
   In order to enter a free comment, choose Gr7 (Group 7). Choose one of the comment fields and enter a new comment, and touch OK. You can also choose an existing comment, touch Change key and modify it to use.
3. The comment appears in the center of the chart, at 50% position.

NOTE

1. A comment is written in according to the storing interval. For example, with 10-minute interval, even when you touch the Comment write in key at 20:27:00, the comment is written in only at 20:30:00.
2. If multiple comments are specified during the same storing interval, only the last comment is valid.
3. If the data recording is cancelled or terminated while you are operating to write in a comment, the comment is invalid.
4. Only 'Hour:Minute:Second' is valid in comment writing even when 100-msec. or 500-msec. storing interval is specified.
5. Up to 20 comments can be added on the screen. After the 21st comment, the oldest comment will be automatically deleted while it will be stored in the comment history data.
6. Automatic comment writing is also executed according to the storing intervals. The trigger condition must be true at the moment of data storing. If the condition comes to be true and then untrue between data storing cycles, no comment writing is executed.

8.1.5 MENU CONTROL KEYS

Touching Menu key opens selectable menu items on the right half of the screen as shown below.



Sampling Cycle Monitor

The 73VR1100 sends queries to the I/O devices. They in return sends responses. These message exchanges are repeated station by station, node by node. Multiple queries may be sent to I/O devices, and all responses must be returned from the I/O devices.

Overall time required to go through all message exchanges takes longer when more devices are connected. Sometimes it may take longer than the preset data storing interval or display rate.

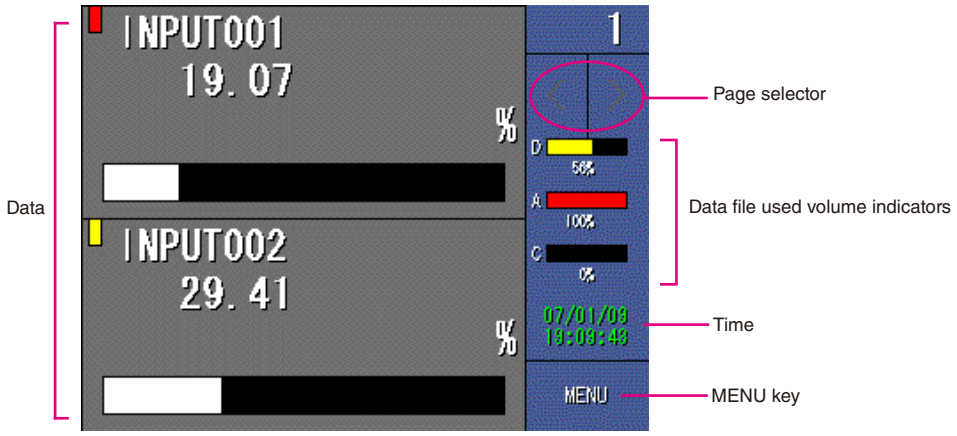
Using the sampling cycle monitor, confirm the most updated sampling cycle and set appropriate storing interval and the display rate.

The sampling cycle monitor shows the maximum, the minimum an the average time the 73VR1100 needed.

In order to have accurate cycle time, set all parameters before running the test.

8.2 OVERVIEW

The Overview is used to monitor up to 16 channels at once. Four groups (pages) are available, and each page consists of Page & Time Indicator, Data Indicators and Menu key.



Overview.

8.2.1 PAGE & TIME INDICATOR

Page Number

The number 1, 2, 3 or 4 indicated at the left and end indicates the current group (page). The number 1, 2, 3 and 4 indicated at the right top indicates the current page.

Page Selector

[<] and [>] buttons are used to switch between pages for the different groups. Touch [>] to go to the next page and [<] to the previous page.

Pages not assigned with pens are skipped.

Data File Used Volume

Data File Used Volume indicators are displayed above the MENU key when Data File Used Volume is set to 'Show' in the basic setting.

The 73VR1100 creates a data file at the startup using all unused space and shows while recording how much space has been used in percentage (1 percent increments) about Data (D), Alarm History (A) and C (Comment History). The indicator colors change according to the used volume: green below 50%, yellow up to 79% and red over 80%. Once the used space reaches 100%, the 73VR1100 overwrites the oldest data with a new one. There will be no update on this indicator after 100%.

While the CF card is hot-swapped or during the FTP while in recording, the indicators show the used volume of the backup file in the internal memory. Percentage indication turns to green color.

Date / Time

Date and time is shown in black characters when the recorder is stopped, in green while recording.

8.2.2 DATA INDICATORS

Pen Assignment

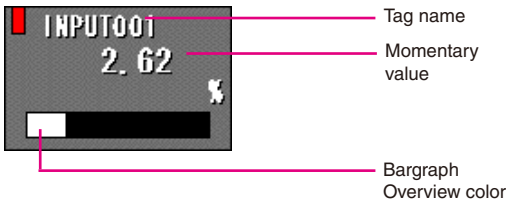
Up to 16 pens are indicated in the Overview. Numbers of pens as specified in Display pen number (Section 5.3.6).

Analog Data

Analog data is indicated in bargraph with its tag name (no bargraph with 16-pen view). The bargraph color is set in Analog Pen Setting (Overview color). When the signal is in alarm status, the tag name, momentary value and bargraph color changes to the one specified in Analog Alarm Setting (Alarm color).

Discrete Data

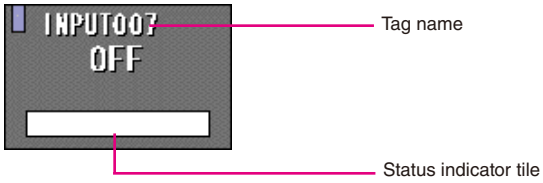
Tag name and discrete data status is indicated. The status indicator tile at the bottom turns to the designated colors according to each status. When the signal is in alarm status, the background turns to black color.



Analog data.

Analog data in alarm.

Analog data (16-pen view).

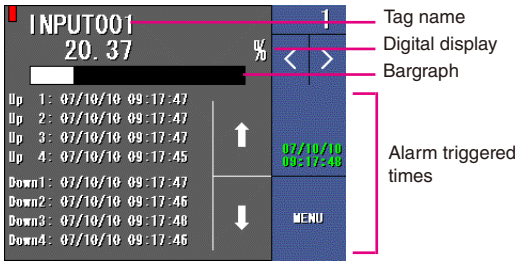


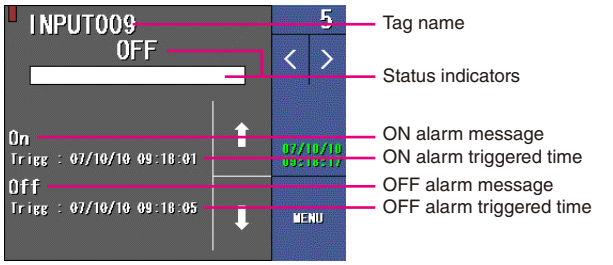
Discrete data.

Detail Monitor

More information can be displayed for a specific pen. Touch the data indicator you want to enlarge. Touch arrow keys to show other pens.

Touching the enlarged area closes the detailed information.





Detail monitor (analog and discrete).

Analog data is added with a momentary value in engineering unit. Alarm history is also indicated if the alarm setting has been enabled. When the alarm is disabled, time index shows --/--/-- --:--:--.

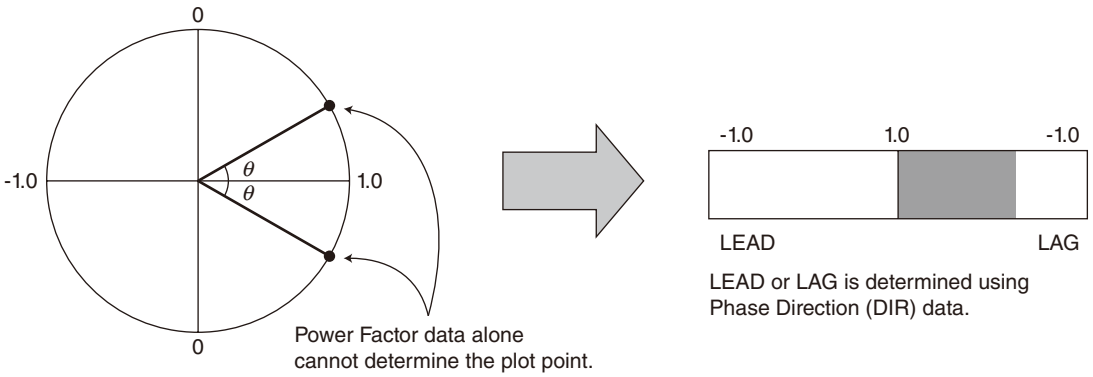
Discrete data is also added with ON/OFF history data.

Analog alarm history

Up 1	Time when the measured value goes up from Zone 0 to Zone 1.
Up 2	Time when the measured value goes up from Zone 1 to Zone 2.
Up 3	Time when the measured value goes up from Zone 2 to Zone 3.
Up 4	Time when the measured value goes up from Zone 3 to Zone 4.
Down 1	Time when the measured value goes down from Zone 1 to Zone 0.
Down 2	Time when the measured value goes down from Zone 2 to Zone 1.
Down 3	Time when the measured value goes down from Zone 3 to Zone 2.
Down 4	Time when the measured value goes down from Zone 4 to Zone 3.

How to Show Power Factor Data

Power Factor (PF) is represented on the screen based on the power factor data and the Phase Direction (DIR) data (0 = LAG, 1 = LEAD). It ranges from -1.0 (LEAD) at the left end of the graph, to 1.0 in the middle, to -1.0 (LAG) at the right end of the graph.



NOTES
1. Input range, Engineering range and Plot position are NOT available for change.
2. DIR data is irrelevant for the maximum and minimum power factor values. Therefore no reference to DIR data is used to plot these values on the screen.
3. DIR data cannot be included in retrieved data. Power Factor data is directly read in and plotted on the screen.

Error Data Indication

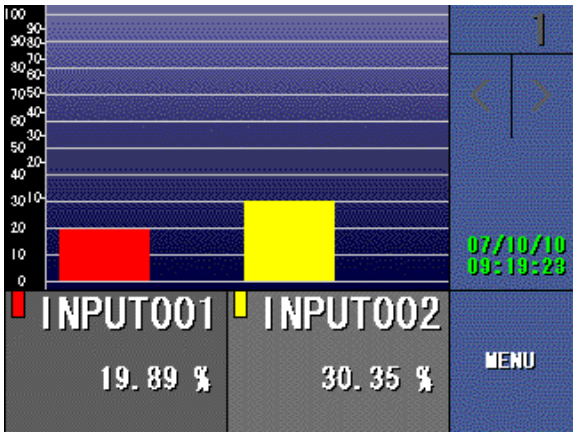
Bargraphs are blank when the input or function data is in error. For a discrete value, 'ERR' is indicated.

8.2.3 MENU CONTROL KEYS

Touching Menu key opens selectable menu items on the right half of the screen. Refer to Section 8.1.5.

8.3 BARGRAPH

The Bargraph view shows bargraphs with digital displays showing momentary values.



Bargraph view.

8.3.1 PAGE & TIME INDICATOR

Page Number

The number 1, 2, 3 and 4 indicated at the left and right ends indicates the current page. Touching the number switches the pages in turn. Ones not assigned with pens are skipped.

Data File Used Volume

A bargraph is indicated when Data File Used Volume is set to 'Show' in the basic setting.

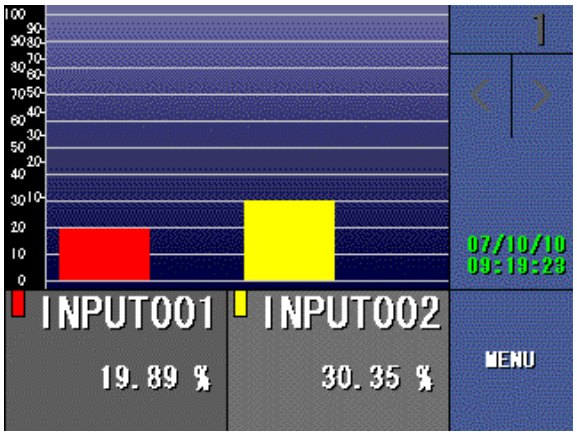
Refer to Section 8.1.3 for detailed explanations.

Date / Time

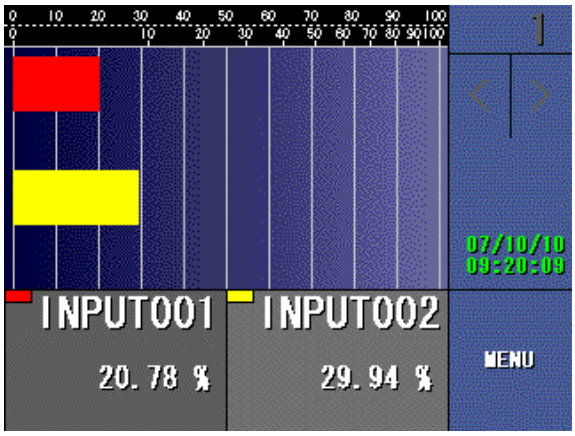
Date and time is shown in black characters when the recorder is stopped, in green while recording.

8.3.2 BARGRAPH

Perpendicular and horizontal bars are selectable.



Perpendicular bargraph.



Horizontal bargraph.

Analog Data

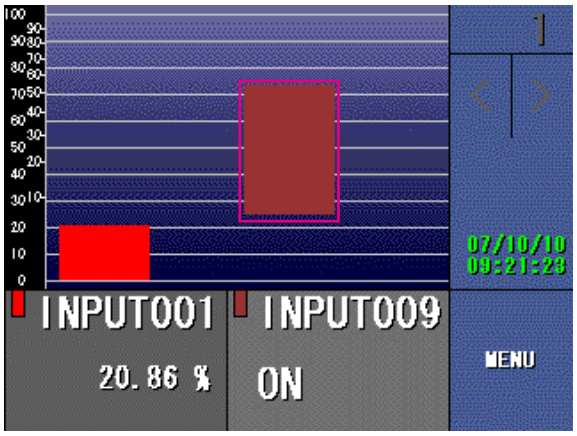
Analog data is indicated in bargraph within the range of 0 to 100%. 0% at the bottom (perpendicular bar) or at the left end (horizontal). The bargraph color is set in Pen Setting (input).

Bargraphs are blank when the input or function data is in error.

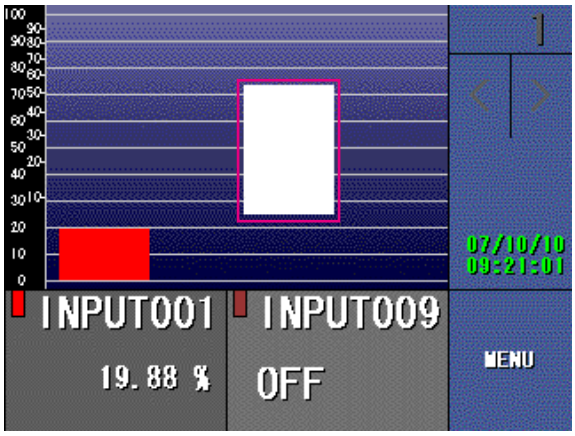
Discrete Data

Discrete data is indicated in boxes located between 25% and 75%. The box is filled in with the color specified in Common Pen Setting in ON (Logic 1) status. It is blank in OFF (Logic 0) status.

'ERR' is indicated on the digital indicator when the input or function data is in error.



Discrete data in bargraph, ON.



Discrete data in bargraph, OFF.

Scale Bar

Two scales, linear and square root from 0 to 100%, are indicated on the scale bar. The scales apply to the plot range specified in Pen Setting.

Engineering scale for a specific pen can replace the standard scale by touching the tag name for the pen. In order to return the scale to 0 to 100%, touch the scale.

The engineering unit scale is indicated to three decimal places (one decimal place with horizontal chart).

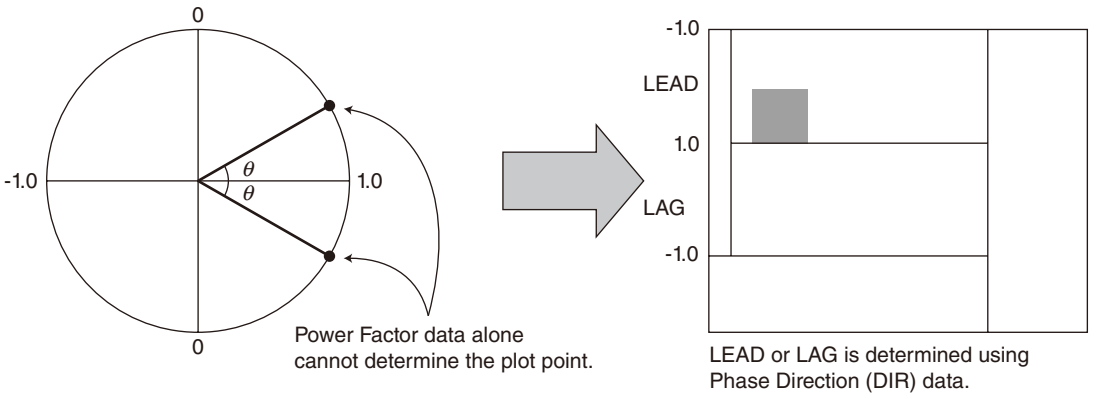
While recording, the scale bar is turned to black color.

Caution !

When more than 5 characters (including sign and decimal point) are to be shown on the scale, only those at 0%, 50% and 100% are indicated.

How to Show Power Factor Data

Power Factor (PF) is represented on the screen based on the power factor data and the Phase Direction (DIR) data (0 = LAG, 1 = LEAD). It ranges from -1.0 (LEAD) at the top of the graph, to 1.0 in the middle, to -1.0 (LAG) at the bottom of the graph.



NOTES
1. Input range, Engineering range and Plot position are NOT available for change.
2. DIR data is irrelevant for the maximum and minimum power factor values. Therefore no reference to DIR data is used to plot these values on the screen.
3. DIR data cannot be included in retrieved data. Power Factor data is directly read in and plotted on the screen.

8.3.3 DIGITAL DISPLAY

Digital displays include the tag name and/or instantaneous value or status as specified (Tag + Value, Tag, or Value) in Digital Display Type (See Section 5.5.3).

Engineering Unit Value or Discrete Status

Analog instantaneous values indicated in engineering unit are renewed by the specified display rate (1, 2, 5 sec.). Measured data is shown for the temperature. Decimal places are specified in Pen setting (Common).

Discrete status is indicated with the display description specified in the Pen setting, and renewed by the specified display rate (1, 2, 5 sec.).

The alarm status is also indicated.

Alarm Status

Zone colors specified in Pen setting (alarm) (Section 5.8) are applied to the tag name and momentary value to indicate it is within respective zones. Indicator's background color turns to black color when the pen is in alarm status. Normal color is grey.

For discrete signals, ON and OFF status colors are applied to the tag name and description for respective states. Indicator's background color turns to black color in alarm, to grey in normal state.

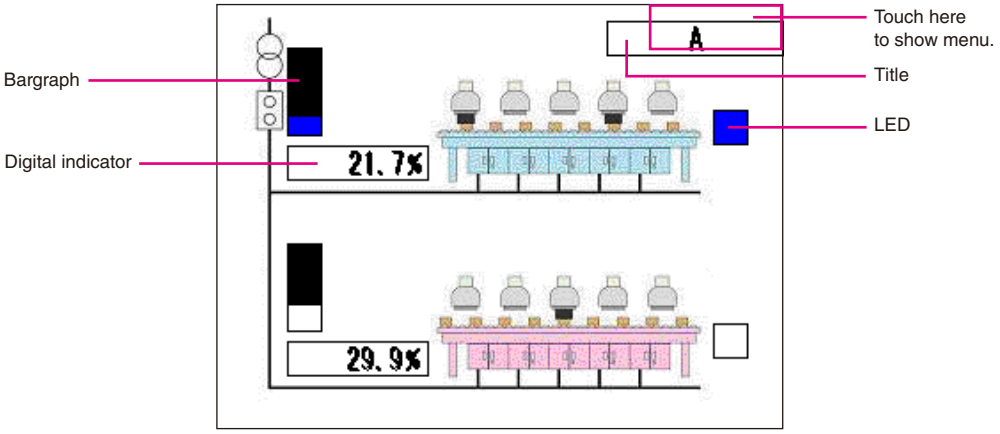
8.3.4 MENU CONTROL KEYS

Touching Menu key opens selectable menu items on the right half of the screen. Refer to Section 8.1.5.

8.4 GRAPHIC

The Graphic view shows components parts such as digital indicators, LED and bargraphs on a background image file.

Two sheets (pages) are available. Each can contain max. 64 component parts.



Graphic view example.

8.4.1 COMPONENT PARTS

Title

The title can be specified in Graphic setting.

LED

LEDs for analog signals are indicated in the color acording to the alarm zone color setting in Pen setting (Alarm). LEDs for discrete signals are indicated in the colors specified as ON and OFF colors in Pen setting (Alarm).

Bargraph

Bargraphs are assigned to the pens specified in Graphic setting.

Bargrarphs for analog signals are indicated in the color specified as OV (overview) color in Pen setting (Input). With alarm setting, the color changes according to the alarm zone color setting. The entire bars for discrete signals are indicated in the colors specified as ON and OFF colors in Pen setting (Alarm).

If an input data or a function data is in error, the graph does not show a bar.

Digital Indicator

Digital indicators are assigned to the pens specified in Graphic setting. If an input data or a function data is in error, the indicator shows 'ERR.'

8.4.2 SWITCHING TO LINKED VIEWS

Touching a component parts on the screen switches it to the one linked to it. Link information is set in Graphic setting.

8.4.3 PAGE & TIME INDICATOR

Touch the top-right corner of the screen to show the page & time indicator.

Page Number

The number 1 and 2 indicated at the top indicates the current page. Touch the arrow keys to switch between pages.

Data File Used Volume

A bargraph is indicated when Data File Used Volume is set to 'Show' in the basic setting.

Refer to Section 8.1.3 for detailed explanations.

Date / Time

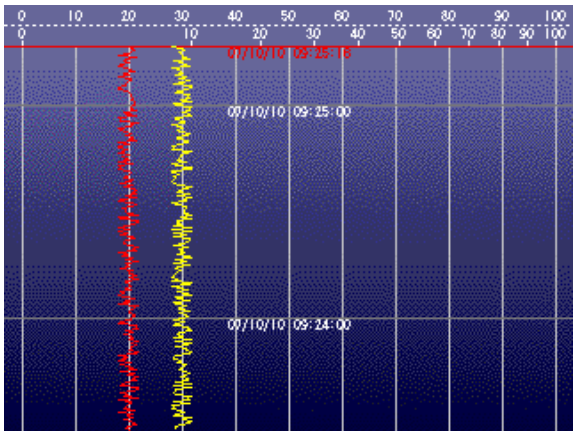
Date and time is shown in black characters when the recorder is stopped, in green while recording.

8.4.4 MENU CONTROL KEYS

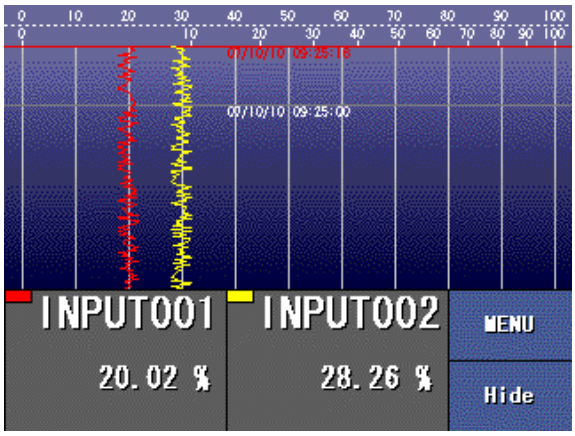
Touching Menu key opens selectable menu items on the right half of the screen. Refer to Section 8.1.5.

8.5 RETRIEVE

Data stored in the CF Card are searched and displayed on the Retrieve view. Retrieval is available even while recording. In order to show Menu key in the Retrieve view, touch on the screen. The digital display with Menu and Hide keys appear on the lower part of the screen.



Basic Retrieve view.



Retrieve view with digital display (Menu and Hide keys).

8.5.1 DATA DISPLAY

The Retrieve view can show 8 pens at the maximum. Four (4) pages (display groups) are available.

Last part of the stored data is indicated first. If you are using the 73VR1100 only for plotting on the screen without recording, naturally no retrieval is available.

The screen time frame in the Retrieve chart depends upon the storing rate. Table below shows the screen time frame by display types at various storing rate settings.

CHART TYPE STORING INTERVAL	Perpendicular with digital display	Perpendicular without digital display	Horizontal
100 msec.	13.7 seconds	21.7 seconds	29.7 seconds
500 msec.	1 min., 8.5 seconds	1 min., 48.5 seconds	2 min., 28.5 seconds
1 second	2 min., 17 seconds	3 min., 37 seconds	4 min., 57 seconds
2 seconds	4 min., 34 seconds	7 min., 14 seconds	9 min., 54 seconds
5 seconds	11 min., 25 seconds	18 min., 5 seconds	24 min., 45 seconds
10 seconds	22 min., 50 seconds	36 min., 10 seconds	49 min., 30 seconds
1 minute	2 hours, 17 min.	3 hours, 37 min.	4 hours, 57 min.
10 minutes	22 hours, 50 min.	1 day, 12 hours, 10 min.	2 days, 1 hour, 30 min.

The chart can be scrolled using your finger. Touch the screen with your finger and move up and down. The chart area shifts accordingly.

The digital meters shows values at the time point indicated with the red line on the screen. The red line moves to where your finger touches. Touch Hide button to remove the digital display

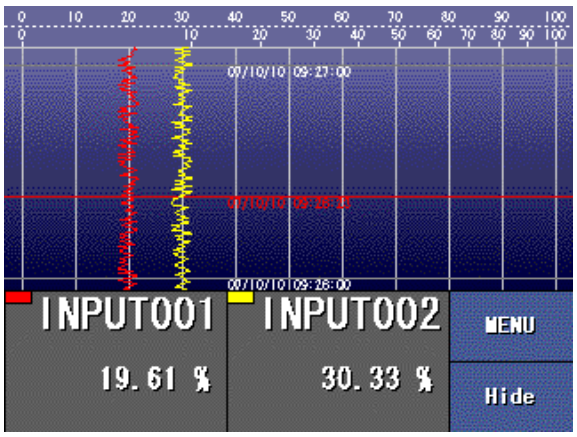


Figure: Data read-out.

Comments written in during recording is also indicated on the screen.

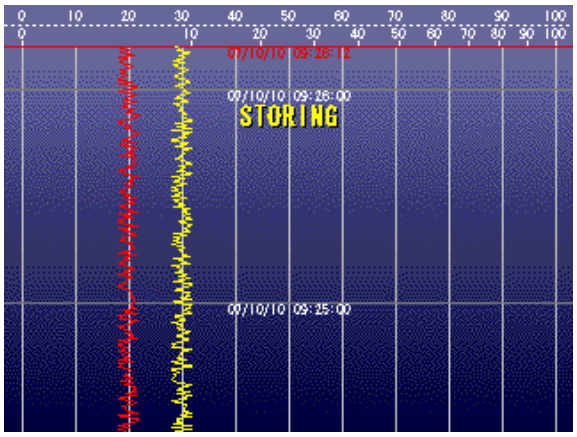
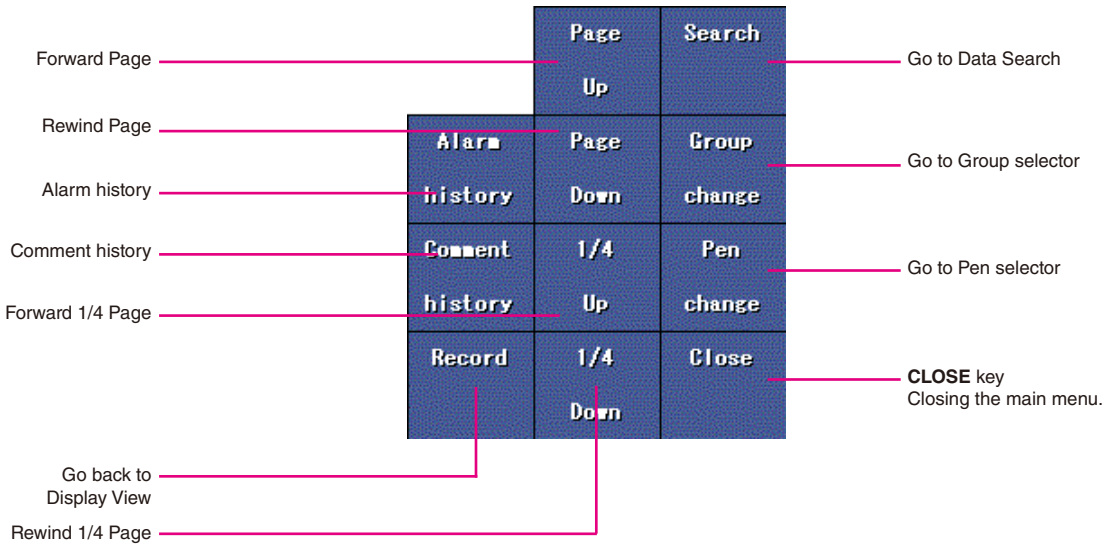


Figure: Comment written in the record.

Error Data Indication

When an input (or function data) is in error, it waveform is no plotted on the screen. 'ERR' is indicated on the digital display.

8.5.2 MENU CONTROL KEYS



Page Up / Page Down

These keys are used to scroll the chart in forward (Up) and reverse (Down) time directions.

1/4 Up / 1/4 Down

These keys are used to scroll the chart by quarter page in forward (Up) and reverse (Down) time directions.

Group Change

Group change key is used to move between the four display groups. Groups are switched every time the key is pressed.

Pen Change

Pen Change is used to assign signal channels to be displayed on the screen.

Alarm history

Touching Alarm history key switches the screen to the Alarm history view.

Comment history

Touching Comment history key switches the screen to the Comment history view.

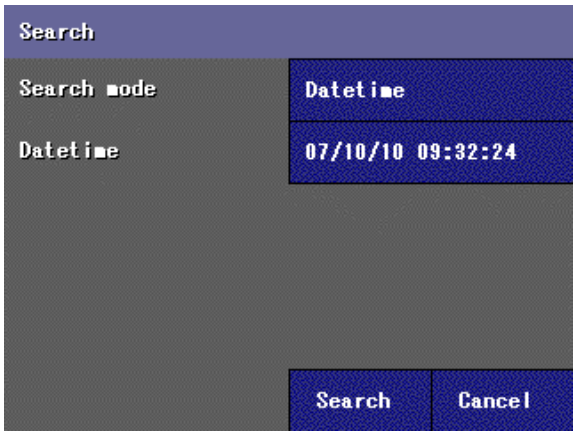
Record

Touching Record key switches the screen back to the Display view.

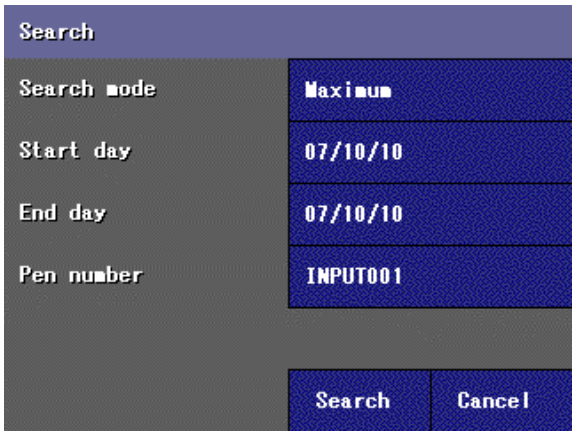
8.5.3 DATA SEARCH

Data search is available using three parameters: Date & time, Maximum value, and Minimum value.

Touching Search key in the main menu opens Search view as shown below.



Search view, Date & Time search mode.



Search view, Max. or Min. value search mode.

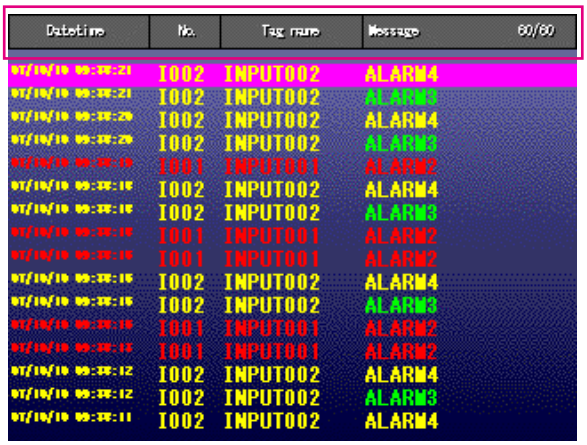
Datetime	Date & time search	Data at a specific time index. is searched. Specify a date and time using the numeric input keypad. The searched data at the specified time is located at the top of the chart, and the previous data is shown below that.
Maximum	Maximum value search	Maximum data within a specified time span is searched. The searched data at the specified time is located at the top of the chart, and the previous data is shown below that. When you press Menu key at this moment, Next key is added to the menu, so that you can continue searching the second greatest value.
Minimum	Minimum value search	Minimum data within a specified time span is searched. The searched data at the specified time is located at the top of the chart, and the previous data is shown below that. When you press Menu key at this moment, Next key is added to the menu, so that you can continue searching the second smallest value.

NOTE

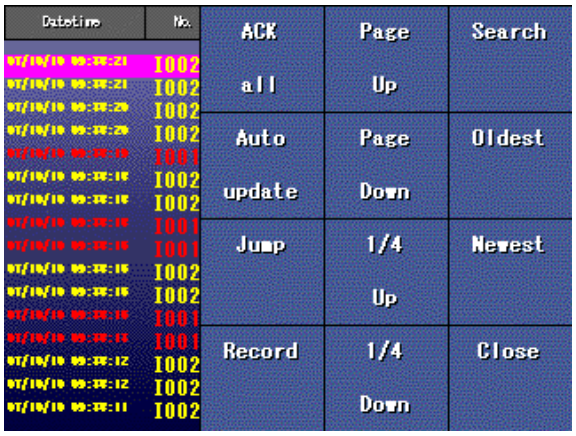
Data search may take time depending upon the data volume.

8.6 ALARM HISTORY

Analog alarm events and discrete signal status changes are stored in the CF Card. This data can be searched and displayed on the Alarm History view. When you touch the top part of the screen (enclosed in the frame), control keys appears.



Alarm history.



Alarm history control keys.

8.6.1 DATA DISPLAY

The Alarm History view shows the date and time of the events, pen No. and its tag name, and the alarm message (comment) pre-described for the particular status.

Sixteen (16) events are listed on the view, and the maximum of 1000 events can be searched and displayed with the 512 MB and 1GB CF card. The capacity depends upon the CF card capacity (See Section 9).

To the right top of the screen, the position of the presently selected alarm event among the total number of events is indicated.

Blinking message line means that the event is not acknowledged yet. Touch it twice to acknowledge (once to move the cursor to the line, twice to acknowledge), and it stops blinking. In order to acknowledge all events on the screen, use ACK All button.

While Auto Update is enabled, other control buttons are unavailable.

Input pens are identified as Ixx (xx = pen number), and Function pens are identified as Fxx (xx = function pen number).

8.6.2 DATA SEARCH BY ALARM EVENT

Touching Jump key when a specific alarm event is selected switches the screen to the Retrieve view where the data at the moment of alarm event is indicated.

Alarm events are stored according to the sampling rate (100 msec. or 500 msec.), while pen data are recorded according to the storing rate. When the storing rate is 1 second or longer, the time index of an alarm event does not match the storing rate. However, the 73VR1100 searches data at the time index by the storing rate. For example, with 1-minute storing rate, searching the event at 16:03:40 means searching data at 16:04:00.

8.6.3 MENU CONTROL KEYS

Touching the top part of the screen on the Alarm History shows Menu on the right part.

Page Up / Page Down

These keys are used to scroll the list in forward (Up) and reverse (Down) time directions.

1/4 Up / 1/4 Down

These keys are used to scroll the list by quarter page in forward (Up) and reverse (Down) time directions.

Search

Data at a specific time index can be called up. Touching the Search button shows a numeric keypad. Specify a date and time.

ACK (acknowledge) All

Touch ACK All key when you want to acknowledge all events of the alarm history. Unacknowledged events' message lines blink. Once acknowledged, they stop blinking.

Auto Update

Touch Auto Update key to enable automatic update of the alarm history. While it is enabled, other control buttons are unavailable. Touch the key again to disable to use other controls.

Jump

Touching Jump key when a specific alarm event is selected switches the screen to the Retrieve view where the data at the moment of alarm event is indicated.

Oldest

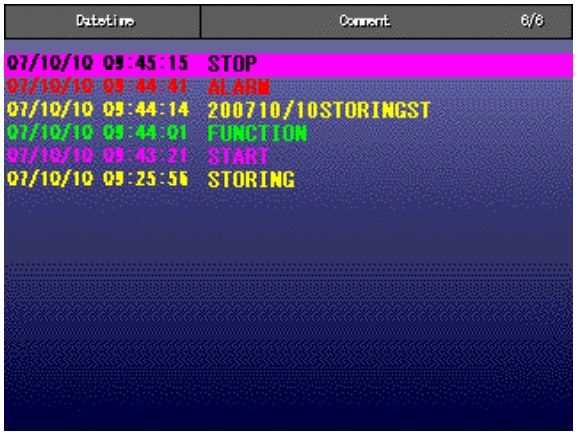
Touching Oldest key moves the screen to the oldest alarm event.

Newest

Touching Newest key moves the screen to the newest alarm event.

8.7 COMMENT HISTORY

Comments entered on the Record view are stored in the CF Card. This data can be searched and displayed on the Comment History view. When you touch the top part of the screen (enclosed in the frame), control keys appears.



Comment history.

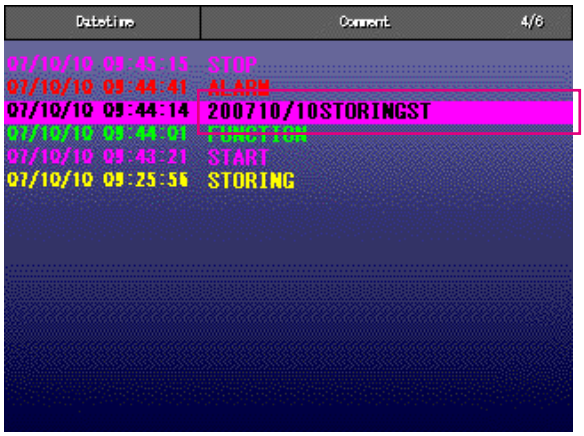
8.7.1 DATA DISPLAY

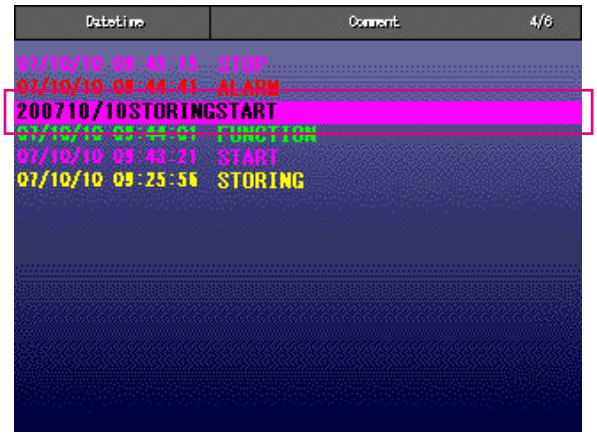
The Comment History view shows the date/time and the comments in the group specific color.

Sixteen (16) events are listed on the view, and the maximum of 1000 events can be searched and displayed.

To the right top of the screen, the position of the presently selected comment among the total number of comments is indicated.

Max. 18 characters are displayed on the list. When you want to read all characters of a comment longer than that, move the cursor to the comment row and touch the comment part.





8.7.2 DATA SEARCH BY COMMENT

Touching Jump key when a specific comment is selected switches the screen to the Retrieve view where the data at the moment of comment entry is indicated.

8.7.3 MENU CONTROL KEYS

Touching the top part of the screen on the Comment History shows Menu on the right part.

Page Up / Page Down

These keys are used to scroll the list in forward (Up) and reverse (Down) time directions.

1/4 Up / 1/4 Down

These keys are used to scroll the list by quarter page in forward (Up) and reverse (Down) time directions.

Search

Data at a specific time index can be called up. Touching the Search button shows a numeric keypad. Specify a date and time.

Auto Update

Touch Auto Update key to enable automatic update of the comment history. While it is enabled, other control buttons are unavailable. Touch the key again to disable to use other controls.

Jump

Touching Jump key when a specific comment row is selected switches the screen to the Retrieve view where the data at the moment of comment entry is indicated.

Oldest

Touching Oldest key moves the screen to the oldest comment row.

Newest

Touching Newest key moves the screen to the newest comment row.

9. DATA & FILES

9.1 73VR1100 FILES

Files required to store the 73VR1100 data are created automatically when the 73VR1100 gets started. Table below shows the types of files.

Type	Description	File Name	Extension
73VR1100 Data File	Data sampled by the 73VR1100	Fixed (73VR)	VRD11
73VR1100 Alarm History File	Alarm history data	Fixed (73VR)	VRA11
73VR1100 Comment History File	Comment history data	Fixed (73VR)	VRM11
73VR1100 Control File	Record pointer for 73VR.VRD11	Fixed (73VR)	VRC11
73VR1100 Parameter File	Parameter settings such operation mode, pen setting	Fixed (73VR)	VRP11

CAUTION !

When you delete the data file in a CF Card, delete also the control file. In any event do not modify the control file. A modified control file may destroy the data file.

WARNING !

Be sure to restart the 73VR1100 before using a data file created by the 73VR11BLD configurator software. If not, the data file will be destroyed.

DATA FILE

All 73VR1100 data are stored in binary in single data file named '73VR.VRD11.'

An empty data file is already created at the startup of the 73VR1100 using all available space. Once data recording starts, sampled data are stored in this file. It means that the data file size is fixed regardless of the data volume in it. In order to confirm data recording, open the file in Retrieve view.

All data are stored in a single file even if multiple sets of data are recorded within a day, or if single or multiple data are recorded over multiple days. Trigger data are stored also in the same principle. Therefore the user must be aware that some data may be overwritten by another of different configuration settings if you keep recording after setting new configuration.

ALARM HISTORY FILE

Alarm history is stored in binary in single data file named '73VR.VRA11.' Analog alarm events and discrete signal status changes (regardless of alarm setting) are recorded in this file. Alarm events are recorded regardless of the storing method.

Like the data file, an empty alarm history file is already created at the startup of the 73VR1100. The file size is fixed regardless of the data volume in it.

Number of events stored in this file depends upon the CF card capacity. Refer to Table below.

CF CARD CAPACITY	ALARM EVENT NUMBERS
128 MB	250
256 MB	500
512 MB, 1 GB	1000

The alarm history file is cyclic: data in the CF Card will be overwritten when the file is full.

COMMENT HISTORY FILE

Comment history is stored in binary in single data file named '73VR.VRM11.'

Like the data file, an empty comment history file is already created at the startup of the 73VR1100. The file size is fixed regardless of the data volume in it.

The comment history file is cyclic: data in the CF Card will be overwritten when the file is full.

CONTROL FILE

The control file contains the information to manage the data file. It is used to convert the file into compatible format for use on the 73VR Data Viewer program or into .CSV format.

If this file is deleted, the data file is initialized. When storing the data file in the PC's hard disk, store also the control file.

PARAMETER FILE

The parameter file contains information about the 73VR1100's system and pen configurations. The 73VR1100 reads this file at the startup to apply the parameters.

9.2 DATA STORAGE TIME

Data storage time for one CF Card depends upon the following:

1. Storing rate
2. Data storing form
3. Number of channels

There are also CF Cards of different capacities.

Data storage time of a CF Card is calculated as follows:

Record Size

[Date Information] (bytes) + [One Sample Data] (bytes) x [No. of Channels] (points) = [Record Size] (bytes)

Number of Records

[CF Card Memory Size]* (bytes) / [Record Size] (bytes) = [Number of Records]

Data Storable Time

[Number of Records] x [Storing Rate] (seconds) = [Data Storage Time] (seconds)

Date information takes 8 bytes and one bit of sampled data takes 4 bytes with the floating point form, 2 bytes with short integer form. No. of channels must include all channels set to 'Enable.'

*[CF Card Memory Size] means the volume of data file (73VR.VRD11) created in the CF Card.

[Example]

Storing rate: 5 sec.

Data storing form: Short integer

Number of channels: 6

CF Card memory size: 118 MB (for 128 MB CF Card)

A record size is calculated as:

8 (bytes) + 2 (bytes) x 6 (points) = 20 (bytes)

The number of records which can be stored in this CF card is calculated as:

(118 x 1024 x 1024**) (bytes) / 20 (bytes) = approx. 6186598 (records)

Time duration usable for the number of records is:

6186598 x 5 (sec.) = 30932990 (sec.) = approx. 8592 hours. = approx. 358 days

**1KB-CF card's memory size is calculated as 1024 bytes.

This calculated result is only for approximate estimation since the data file must be smaller than the full capacity of a CF Card.

9.3 WRITING/READING SETTING FILE IN AN USB FLASH-MEMORY

The 73VR1100's setting file can be read from or written in an USB flash-memory.

Connect the USB flash-memory at the USB connector at the front behind the front cover or at the rear side. See Section 2.2 for these connectors' locations.

The USB flash-memories listed below have been tested and confirmed adequate operations with the 73VR1100. Other memory sticks are not guaranteed.

Manufacturer:	Buffalo Technology
Models:	RUF2-S Series (256 MB through 1 GB) RUF-CL/U2 Series (256 MB)
Manufacturer:	I-O Data Devices, Inc.
Models:	TB-M2 Series (256 MB), TB-B Series (256 MB), EasyDisk Platinum2 (256 MB)

CAUTION !

USB memory sticks may need certain time before it is detected by the PC. DO NO try to read or write setting files until it is detected and confirmed.

Buffalo RUF-CL/U2, 64 MB, is Not compatible with the 73VR1100.

9.3.1 HOW TO WRITE A CONFIGURATION FILE IN

(1) Call up the Main Menu and touch Write Setting File key.

(2) Enter a file name you desire on the alphanumeric keypad (max. 8 characters).

(3) Touch OK. If you do not want to save a file, touch Cancel.

CAUTION !

A file extension is automatically added when the file is stored.

9.3.2 HOW TO READ A CONFIGURATION FILE OUT

(1) Call up the Main Menu and touch Read Setting File key.

(2) Touch the green panel to the right of File Name to show a list of setting files in the USB flash-memory. The list consists of two (2) pages, ten (10) files in each page.

(3) Choose a file and touch OK. If you do not want to save a file, touch Cancel.

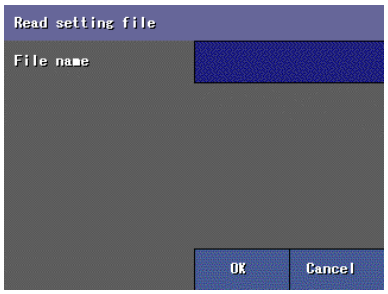


Figure: File read view.

Figure: File list.

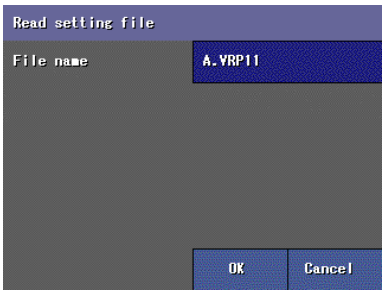


Figure: File selected.

CAUTION !

Touch Back to Record key to apply the new setting.

9.4 HOT SWAPPING THE CF CARD

The CF Card can be replaced while the 73VR1100 is running.

The data sampled while the card is not placed is stored in the 73VR1100's internal memory. Its capacity is enough approximately for 5 minutes without a card. Be sure to get ready with a CF Card for replacement. If the CF Card does not contain the files 73VR.VRD11, 73VR.VRP11, 73VR.VRC11, 73VR.VRM11 and 73VR.VRA11, they must be created beforehand using the 73VR11BLD Configurator software. If the CF Card already has these files with stored data, they will be overwritten.

Be sure to observe the following procedure. If not, CF Card and its data may be damaged or lost.

HOW TO REPLACE THE CF CARD

(1) Call up the Menu on the Display view and touch CF Card Eject key.

(2) Confirm that you want to remove the CF Card. If not touch Cancel.

(3) Confirm that the Menu now shows CF Card Insert key, and extract the card.

NOTE

No data retrieval or alarm history display is available while the card is removed.

(4) Insert a new CF Card, and touch CF Card Insert key.

(5) The 73VR1100 will ask you if you want to reset the data file if one exist. Confirm that and touch OK.

CAUTION !

The CF Card cannot be removed while data in the internal memory is transferred to the card, during the card replacement or after the recording is complete. It may take certain time.

CAUTION !

The 73VRWV can perform FTP transfer while the 73VR1100 is recording. The 73VR1100 stores data in its internal memory while the FTP is in progress. When the internal memory is full, the file transfer is stopped, and the 73VR1100 starts transferring data from the memory to the CF Card. Then with the transfer to the CF Card completed, the file transfer to the 73VRWV is resumed. Due to this operating procedure, it usually takes longer time in a file transfer when the 73VR1100 is recording.

NOTE

Time elapsed (used file volume) since a card is removed can be confirmed on the Bargraph or the Overview. The Data File Used Volume bargraph will indicated 100% after 5 minutes has been passed. To use this function, choose Enable in the Display Setting.

NOTE

While the automatic comment entry is on, DO NOT execute a FTP data transfer.

10. OTHER FUNCTIONS

10.1 RUN OUTPUT

The 73VR1100 is equipped with the RUN contact output terminals which trips in case of CPU errors and application errors.

The terminals are closed (ON) and the green light of the error indicator LED is on while the 73VR1100 is operating normally. After an error has been detected, the terminals open (OFF) in approx. 5 seconds and the LED turns off.

Note that the RUN output turns off while the 73VR1100 starts up.

APPENDIX – 1. CHANNEL NO. SYSTEMS FOR R1M-P4, R3/R5/R7 SERIES, 53U & IT60RE, ITx0SRE

■ R1M-P4

For the R1M-P4 channel numbers correspond to the 73VR1100 channels as in the table to the right.

73VR1100	R1M-P4
1 through 8	1 through 8
9	A
10	B
11	C
12	D

■ R3 SERIES

The R3 series modules' channel numbers depend upon the module types and their data allocation.

For analog modules, the data allocation mode assigned to each module, is then assigned to consecutive channel No. from Slot 1. For example, when 4 data areas (allocated units) are assigned to Slot No. 1 through 3, 1 data area is assigned to Slot No. 4, the module No. 1 takes Channels from 1 to 4, No. 2 from 5 to 8, No. 3 from 9 to 12, and No. 4 takes 13.

Slot No.	Data Allocation Mode	Channel No.
1	4	1 through 4
2	4	5 through 8
3	4	9 through 12
4	1	13

CAUTION FOR ASSIGNING CHANNEL NUMBERS FOR THE R3-PA4A R3-PA4B, R3(S)-PA8 & R3-WT4B

The R3-PA4A and R3-PA4B take 8 data areas for 4 input points. Set 'Previous Channel + 2' for the second and the following points.

The R3(S)-PA8 takes 16 data areas for 8 input points. Set 'Previous Channel + 2' for the second and the following points.

For example, if the R3-PA4A is located at Slot 1 position, set Channel 1 to the first point, Channel 2 for the second.

The R3-PA2 takes 8 data areas for 2 input points. Each point contains 2 sets of data, the speed and position conversion data, on which channel numbers assignment depends.

Refer to the figure to the right.

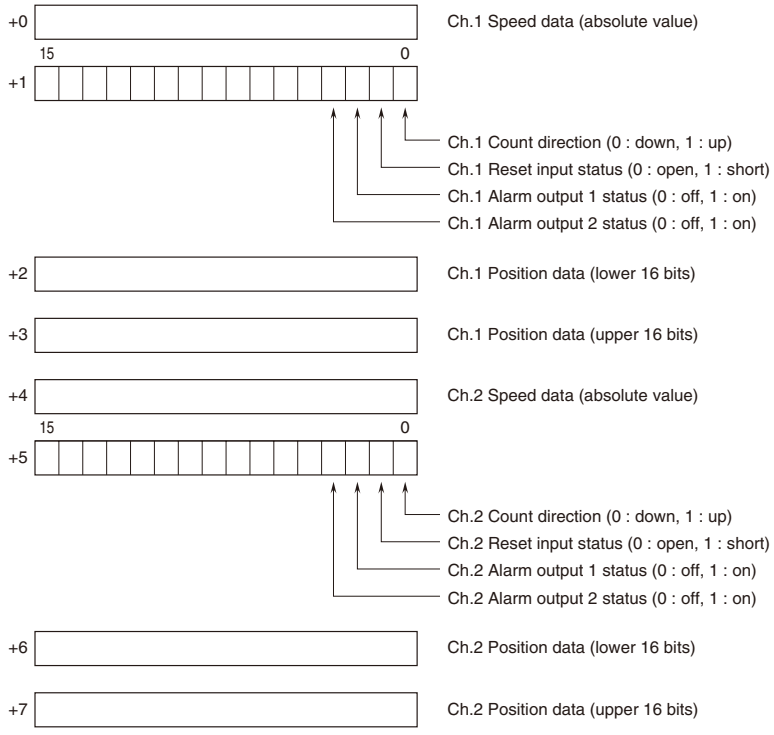


Figure: R3-PA2 data description.

For example, if the R3-PA2 is located at Slot 1 position, channel assignment on the 73VR1100 is as shown below:

R3-PA2 Ch.	Data Type	73VR1100 Channel No.
1	Speed	1
	Position	3
2	Speed	5
	Position	7

For discrete modules, the data allocation mode 1 takes 16 channels (1 x 16), and the mode 4 takes 64 (4 x 16), and the mode 8 and 16 takes automatically 64 data areas. For example, when 4 data areas are assigned to Slot No. 1, and 1 data area to Slot No. 2 through 4, the module No. 1 takes Channels from 1 through 64, No. 2 from 65 to 80, No. 3 from 81 to 96, and No. 4 from 97 to 112.

Slot No.	Data Allocation Mode	Channel No.
1	4	1 through 64
2	1	65 through 80
3	1	81 through 96
4	1	97 through 112

CAUTION FOR ASSIGNING CHANNEL NUMBERS FOR THE R3-WTU

R3-WTU takes 16 data areas (with option code "/D", virtual module's data area is also 16.)

Measurands and assigned word numbers are specified using the R3CON PC Configurator.

Data length (1 or 2-word) can be set up for every channel with the Configurator software R3CON.

The analog type of the channel set as 2-word length is set as "COUNT32."

Set 'Previous Channel + 2' for the second and the following points.

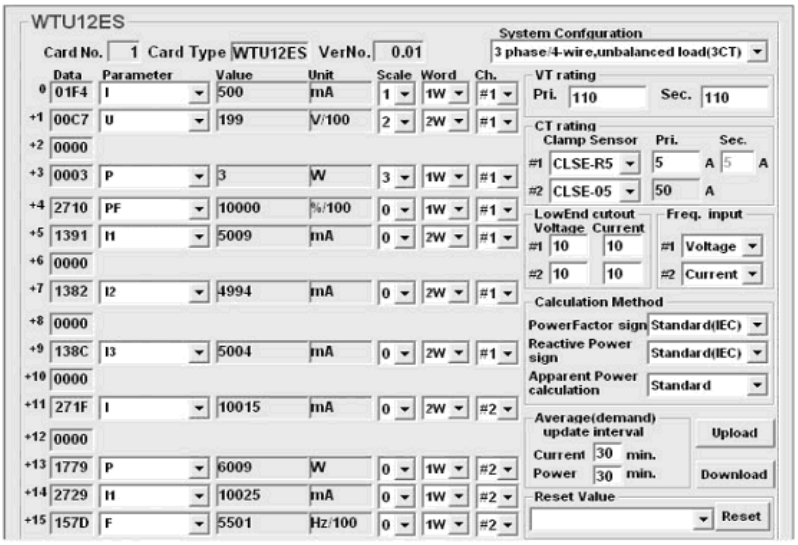


Figure: R3CON setting with R3-WTU (without option code) mounted on the module slot.

The channels indicated with the numbers +1, +5, +7, +9, and +11 on the left of the figure are set with 2-word length.

I.D.	Parameter	Data length	Channel No. set on the 73VR1100
0	I	1	1
+1	U	2	2
+3	P	1	4
+4	PF	1	5
+5	I1	2	6
+7	I2	2	8
+9	I3	2	10
+11	I	2	12
+13	P	1	14
+14	M	1	15
+15	F	1	16

CAUTION FOR ASSIGNING CHANNEL NUMBERS FOR THE R3-WT4, R3-WT4A & R3-WT4B

R3-WT4x data length can be set with the DIP switch.

1-word and 2-word length data mixed setting is also available. (Refer to each specifications and instruction manual for details)

Set 'Previous Channel + 2' for the second and the following points.

■ R5 SERIES

Since the R5 I/O modules can mix input types and numbers, Channel Number does not mean the module's physical position (slot number) on the base. Refer to the table below.

	R5 SLOT NUMBER															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Analog Module, Data Allocation Mode 1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Analog Signal, Data Allocation Mode 2	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	17-18	19-20	21-22	23-24	25-26	27-28	29-30	31-32
Discrete Signal	1 -16	17 -32	33 -48	49 -64	65 -80	81 -96	97 -112	113 -128	129 -144	145 -160	161 -176	177 -192	193 -208	209 -224	225 -240	241 -256
	73VR1100 CHANNEL NO.															

■ R7 SERIES

In the case of analog input and discrete-input/output units, the input 0 of R7 is corresponding to the channel 1 of the 73VR1100, and the input "n" of R7 is corresponding to the setting channel "n+1" of the 73VR1100.

The channel for digital I/O of extension unit is set on channel 17 of the 73VR1100.

■ 53U

Channel number for analog signal means the parameter's Modbus address. Please refer to the operating manual of the 53U (EM-6485-B), under 'MEASURED VARIABLES.' For example, to assign the momentary active power (P), specify the channel number to '5.'

For discrete signal, specify channel '1.'

■ IT60RE, ITx0SRE

There is no need of pen settings for the IT60RE, ITx0SRE since it is contact output for alarm output.

It is configurable with submenu of Relay 1 to 4 of Pen setting (alarm) menu. For analog alarm it is configurable with (3/11) – (6/11) of pen setting (alarm) screen and for digital alarm is configurable with (3/5) through (4/5).
Refer to the table below for the relation between channel setting number and the output number of IT60RE, ITx0SRE.

Ch. No.	IT60RE, ITx0SRE Output		Ch. No.	IT60RE, ITx0SRE Output	
1	Output 0	Indicator 1 ON	9	Output 8	Indicator 1 Blinking
2	Output 1	Indicator 2 ON	10	Output 9	Indicator 2 Blinking
3	Output 2	Indicator 3 ON	11	Output 10	Indicator 3 Blinking
4	Output 3	Indicator 4 ON	12	Output 11	Indicator 4 Blinking
5	Output 4	Indicator 5 ON	13	Output 12	Indicator 5 Blinking
6	Output 5	Buzzer (continuance)	14	Output 13	Buzzer (intermittent)
7	Output 6	---	15	Output 14	---
8	Output 7	---	16	Output 15	---

APPENDIX – 2. BACKLIGHT FAILURE

If the backlight is failed, the screen becomes dark in the following circumstances:

- The screen becomes dark even when no screen saver is activated.
- The screen becomes dark after the screen saver is activated, and then it does not recover even when the screen is touched.

The backlight can be replaced at our factory. Stop recording, turn off the power supply and consult us.

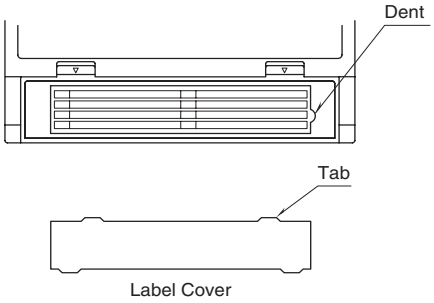
The 73VR1100 operation can be remotely stopped using the 73VR11BLD software. Refer to the 73VR11BLD users manual for detail.

APPENDIX – 3. REPLACING TAG LABEL

(1) Insert a small screwdriver or a similar device under the label cover from the dent on the right side of the label, and pull up until the right tabs on the label cover is lifted out of the slots.

(2) Lift also the left tabs.

(3) Replace the label on the front and put the label cover back.

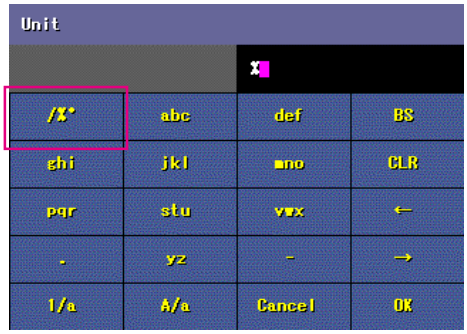


APPENDIX – 4. HOW TO SHOW TEMPERATURE UNIT ON THE 73VR1100 SCREEN

In order to enter '°C' or '°F' on the 73VR1100, please use the keypad as follows:

(1) Touch the current selection of Unit under Pen Setting (Common) to open the alphanumeric keypad.

(2) Touch three times [/%°] key to enter [°].



(3) Touch [A/a] key to switch to the capital letters mode.

(4) Touch [→] key to move to [ABC] key, and enter [C] by touching the key three times. To enter [F], move to [DEF] key.

(5) Touch OK.

NOTE

Max. 4 characters can be used for an engineering unit. '°C' or '°F' takes two characters.

APPENDIX – 5. UPDATE HISTORY

History major update of the firmware Ver. 5 or later.

Ver. 5.00I	Add low-end cutout function to totalized input.
Ver. 5.02.xx	Add anemoscope function.
	Add R7E series, IT60RE and I/O module models of R3 series.
Ver. 5.03.xx	Add SD card availability
Ver. 6.00.xx	Add ITx0SRE