KRN1000 Series

Features

- 5.6-inch color TFT LCD (640×480) touchscreen display with excellent readability and intuitive control interface
- Supports 27 input types (thermocouple, RTD, analog voltage and current[shunt])
- 4 / 8 / 12 / 16 input channel models available
- Various communication methods (RS422/485, Ethernet, USB) standard
- 25 to 250 ms high-speed sampling, 1 to 3600 s recording cycle
- 200 MB internal memory and external memory support (SD/USB up to 32 GB)
- Store and backup internal data to external memory (SD/USB)
- 9 different graph types available
- Various option input/output available: digital input (contact/non-contact), alarm output, transmitter power output
- Compact, space-saving design (rear length: 69.2 mm)

⚠ **Please read "Safety Considerations" in operation manual before using this unit.**

Manual

- For more information and instructions, refer to the user manual and the user manual for communication.
  Visit our web site (www.autonics.com) to download the manuals.
- The user manual includes product specifications, functions, and operations.
- The user manual for communication includes information about Modbus RTU protocol, Modbus TCP protocol, and Modbus mapping table.

Comprehensive device management program [DAQMaster]

- DAQMaster is the comprehensive device management program for convenient management of parameters and multiple device data monitoring.
- Visit our website (www.autonics.com) to download user manual and comprehensive device management program.

< Computer specification for using software >

Item	Minimum requirements
System	IBM PC compatible computer with Intel Pentium III or above
Operating system	Microsoft Windows 98/NT/XP/Vista/7/8/10
Memory	256MB or more
Hard disk	More than 1GB of free hard disk space
VGA	1024 × 768 or higher resolution display
Others	RS-232 serial port (9-pin), USB port

< DAQMaster screen >
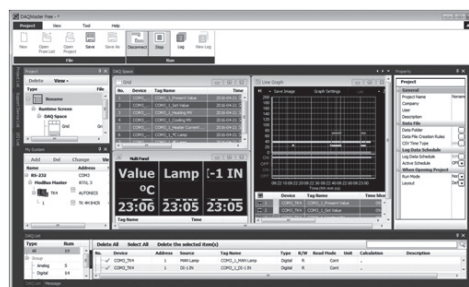
Ordering information

KRN1000	—	04	0	1	—	0	S

	Case	
S		Standard panel installation type
	Power supply	
0		100-240VAC 50/60Hz
	Communication output	
1		RS422/485+Ethernet+USB Device
	Option input/output	
0		None
1		Alarm relay output 8 channels
2		Alarm relay output 6 channels + Digital input 2 channels
3		Alarm relay output 6 channels + 24VDC power output for transmitter
4		Alarm relay output 4 channels + Digital input 2 channels + 24VDC power output for transmitter
	Input channels	
04		4 channels
08		8 channels
12		12 channels
16		16 channels
	Item	
KRN1000		Paperless recorder

Autonics

LCD Touchscreen Paperless Recorder

	A. Recorders
	B. Indicators
	C. Converters
	D. Controllers
	E. Thyristor power controllers
	F. Pressure transmitters
	G. Temperature transmitters
	H. Accessories

Connections

■ KRN1000 Rear part
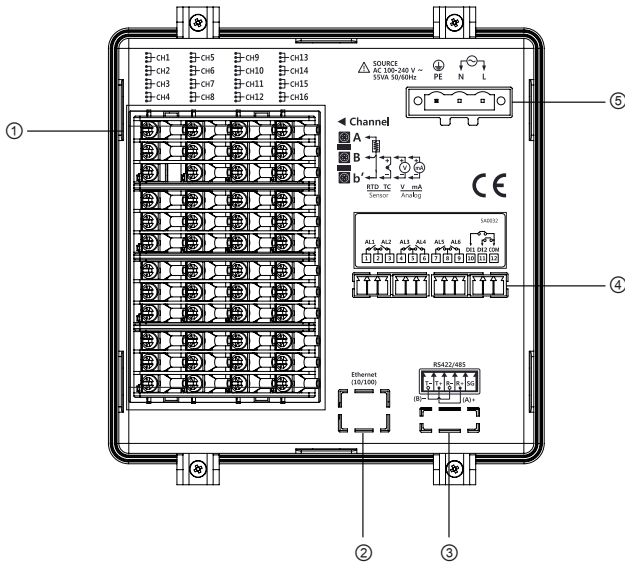
① Sensor input terminal: Connects universal input.
② Ethernet port: Connector for ethernet cable.
It communicates Modbus TCP.
③ RS422/485 port: Connects RS422/485 for Modbus
RTU communication.
④ Option input/output port: Connects for option input/output .
⑤ Power input: Power connection (100-240VAC 50/60Hz)

■ Input/Output Circuit

Universal input※	Communication output
Option input/output 1	**Option input/output 2**
 Alarm output 8 channels	 Alarm output 6 channels + Digital input 2 channels
Option input/output 3	**Option input/output 4**
 Alarm output 6 channels + Power for transmitter output	 Alarm output 4 channels + Digital input 2 channels + Power for transmitter output

※ In case of current input, connect 250Ω resistance at external part.

KRN1000
KRN100
KRN50

KRN1000 Series

Specifications

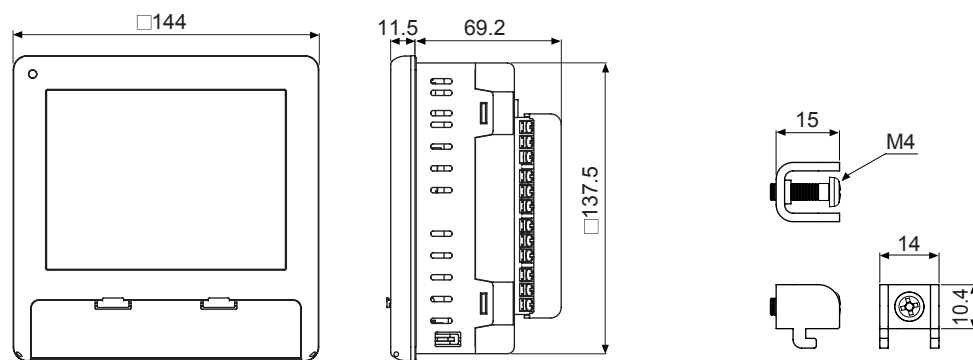| Series	KRN1000
Power supply	100-240VAC 50/60Hz
Allowable voltage range	85 to 110% of rated voltage
Power consumption	Max. 23VA
Screen — Display method	5.6 inch TFT Color LCD
Screen — Resolution	640×480 pixels
Screen — Adjusting brightness	3-level (Min/Standard/Max)
Screen — Input method	Touch screen (pressure sensitive type)
Number of input channels	4 / 8 / 12 / 16 channels
Universal input[1]	Temperature sensors (thermocouple, RTD), Analog (voltage, current (shunt))
Sampling period	1 to 4-CH: 25ms/125ms/250ms, 5 to 16-CH: 125ms/250ms (internal sampling period is average movement filter and alarm output operation unit time)
Recording period	1 to 3600 sec
Internal memory	Approx. 200MB
External memory	SD / USB memory max. 32GB
Dielectric strength	2300VAC 50/60Hz for 1 min (between power terminals and case) ※Except ethernet and USB device
Vibration — Mechanical	10 to 60Hz 4.9m/s^2 in each X, Y, Z direction for 1 hour
Vibration — Malfunction	10 to 60Hz 1m/s^2 in each X, Y, Z direction for 10 min
Insulation resistance	Over 20MΩ (at 500VDC megger)
Noise immunity	Square shaped noise by noise simulator (pulse width 1μs) ±2kV
Time accuracy	Within ±2 min/year (available up to 2099)
Protection structure	IP50 (front part)
Environment — Ambient temperature	0 to 50℃, storage: -20 to 60℃
Environment — Ambient humidity	35 to 85%RH, storage: 35 to 85%RH
Approval	C€
Weight[2]	Approx. 1290 to 1400g (approx. 590 to 700g)

※1. For more information of universal input, please refer to 「Input/Output」 of the A-5 page.
※2. The weight includes packaing. The weight in parenthesis is for unit only.
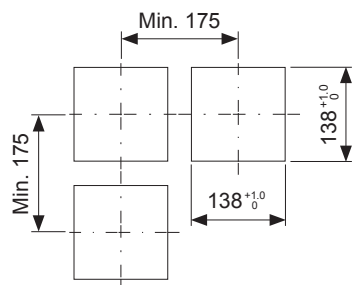※Environment resistance is rated at no freezing or condensation.

Dimensions

(unit: mm)

□144

11.5   69.2

□137.5

15

M4

14

10.4

● Panel cut-out

Min. 175

Min. 175

138 $^{+1.0}_{0}$

138 $^{+1.0}_{0}$

LCD Touchscreen Paperless Recorder

■ **Input/Output**

Type	Input/Output type		Description
Universal input	Input type	RTD	JPt100Ω, DPt100Ω, DPt50Ω, Cu100Ω, Cu50Ω (supplied current: approx. 190μA)
		Thermocouple	B, C (W5), E, G, J, K, L, L (Russia), N, P, R, S, T, U
		Analog	Voltage: ±60mV, ±200mV, ±2V, 1-5V, ±5V, -1V-10V Current: 0-20mA, 4-20mA (measureable when using 250Ω shunt resistance)[※1]
	Input impedance		Voltage (V): Approx. 205kΩ RTD, Thermocouple, Voltage (mV): Min. 200kΩ
	Display accuracy[※2]	RTD	Warm-up time: Max. 30 min At room temperature (25±5℃): ±0.1% F.S.±1-digit Out of room temperature: ±0.2% F.S.±1-digit
		Thermocouple	
		Analog	
	Resolution		16-bit
Option input/output[※3]	Digital input	No-contact input	ON: Residual voltage max. 1V, OFF: Leakage current max. 0.1mA
		Contact input	ON: Max. 1kΩ, OFF: Min. 100kΩ, Short-circuit: Approx. 4mA
	Alarm relay output	Capacity	250VAC 3A, 30VDC 3A, 1 Form A (resistive load)
		Life cycle	Mechanical: Min. 20,000,000 operations Electrical: 100,000 operations (3A 250V AC, 3A 30V DC)
	Power output for transmitter[※4]		24±2VDC, Max. 60mA ※Built-in over current protection circuit
Communication output[※5]	RS422/485		Modbus RTU ※It is recommended to use shielded cable over AWG 24.
	Ethernet		IEEE802.3 10 BASE-T / IEEE802.3U 100 BASE-TX (Modbus TCP)
	USB Device		USB V2.0 Full Speed (Modbus RTU)

※1. Current measurement and connection examples
Connect 250Ω shunt resistance and set analog input type 0-20mA (shunt) / 4-20mA (shunt).
It is available to measure 0-20mA / 4-20mA current.
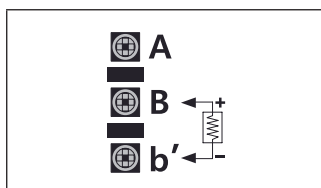
※2. ◎ At room temperature (23℃ ± 5℃)
· RTD Cu50Ω (-200≤T≤200): (±0.1% F.S. or ±1.5℃, select the higher one) ±1 digit
· RTD DPt50Ω (-200≤T≤500): (±0.1% F.S. or ±1.5℃, select the higher one) ±1 digit
· Thermocouple R, S, C, G type (0≤T≤100): (±0.1% F.S. or ±4.0℃, select the higher one) ±1 digit
· Thermocouple U, T type (-100≤T≤400): (±0.1% F.S. or ±2.0℃, select the higher one) ±1 digit
· Thermocouple B type, below 400℃: There is no accuracy standards.
· All thermocouples, below -100℃: (±0.3% F.S. or ±4.0℃, select the higher one) ±1 digit
◎ Out of room temperature range
· RTD Cu50Ω (-200≤T≤200): (±0.2% F.S. or ±3.0℃, select the higher one) ±1 digit
· RTD DPt50Ω (-200≤T≤500): (±0.2% F.S. or ±3.0℃, select the higher one) ±1 digit
※3. Input/Output is different by option. Please refer to 「Ordering information」 of the A-2 page.
※4. For supplying power for transmitter, it is recommened to use shield cable to reduce noise.
※5. RS422/485, ethernet, USB device communication outputs are not used at the same time.
※If sensor input line is longer, it is recommended to use shield cable to reduce noise.

Input type and range

| Input type		Display	Input range		
			℃	°F	K
Thermocouple	K(CA)	TC-K	-200.0 to 1350.0	-328.0 to 2462.0	73.2 to 1623.2
	J(IC)	TC-J	-200.0 to 800.0	-328.0 to 1472.0	73.2 to 1073.2
	E(CR)	TC-E	-200.0 to 800.0	-328.0 to 1472.0	73.2 to 1073.2
	T(CC)	TC-T	-200.0 to 400.0	-328.0 to 752.0	73.2 to 673.2
	B(PR)	TC-B	100.0 to 1800.0	212.0 to 3272.0	373.2 to 2073.2
	R(PR)	TC-R	0.0 to 1750.0	32.0 to 3182.0	273.2 to 2023.2
	S(PR)	TC-S	0.0 to 1750.0	32.0 to 3182.0	273.2 to 2023.2
	N(NN)	TC-N	-200.0 to 1300.0	-328.0 to 2372.0	73.2 to 2023.2
	C(TT)[1]	TC-C	0.0 to 2300.0	32.0 to 4172.0	273.2 to 2573.2
	G(TT)[2]	TC-G	0.0 to 2300.0	32.0 to 4172.0	273.2 to 2573.2
	L(IC)	TC-L	-200.0 to 900.0	-328.0 to 1652.0	73.2 to 1173.2
	L(Russian type)[3]	TC-L_R	0 to 600.0	32.0 to 1112.0	273.2 to 873.2
	U(CC)	TC-U	-200.0 to 400.0	-328.0 to 752.0	73.2 to 673.2
	Platinel II	TC-P	0.0 to 1350.0	32.0 to 2462.0	273.2 to 1623.2
RTD	Cu50Ω	CU50	-200.0 to 200.0	-328.0 to 392.0	73.2 to 473.2
	Cu100Ω	CU100	-200.0 to 200.0	-328.0 to 392.0	73.2 to 473.2
	JPt100Ω	JPT100	-200.0 to 600.0	-328.0 to 1112.0	73.2 to 873.2
	DPt50Ω	DPT50	-200.0 to 600.0	-328.0 to 1112.0	73.2 to 873.2
	DPt100Ω	DPT100	-200.0 to 850.0	-328.0 to 1562.0	73.2 to 1123.2
Analog	Voltage	-60.00 - 60.00mV	±60mV	Resolution : 10μV	-99999 to 99999 (display range depends on the decimal point position)
		-200.00 - 200.00mV	±200mV	Resolution : 10μV	
		-2.000 - 2.000V	±2V	Resolution : 1mV	
		1.000 - 5.000V	1-5V	Resolution : 1mV	
		-5.000 - 5.000V	±5V	Resolution : 1mV	
		-1.00 - 10.00V	-1V-10V	Resolution : 10mV	
	Current (shunt)	0 - 20mA	0-20mA (shunt)	—	
		4 - 20mA	4-20mA (shunt)	—	

※1. C (TT): Same as existing W5 (TT) type sensor
※2. G (TT): Same as existing W (TT) type sensor
※3. Russian type L type temperature sensor is divided from general purpose L type.

Part descriptions
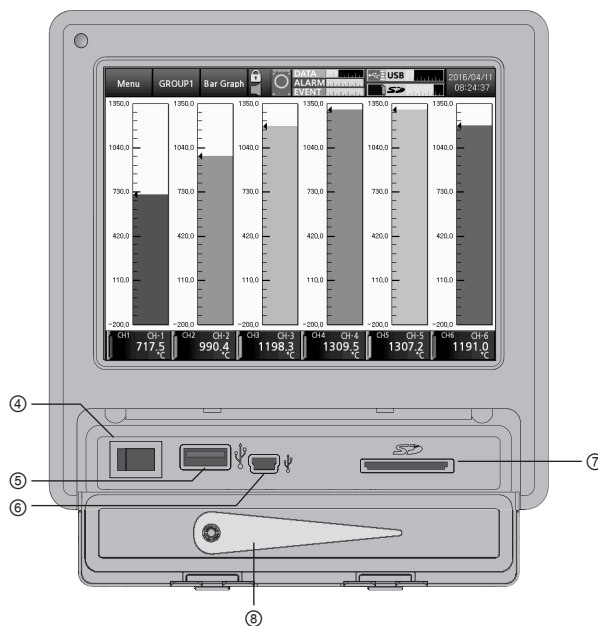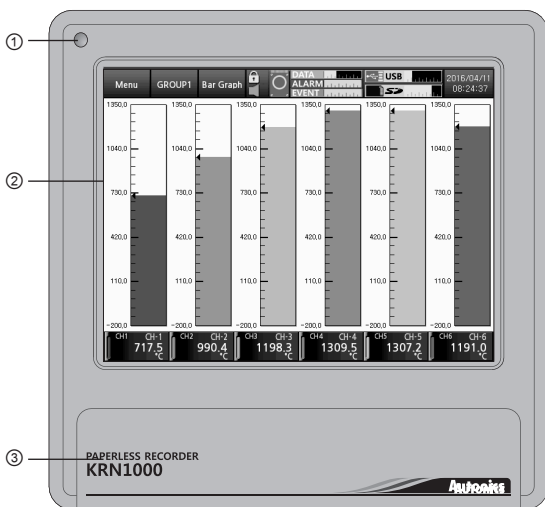
① Power indicator: Power turns ON and the red LED turns ON.
② Screen (touch panel): Measrued value is displayed as trand graph, bar bar graph, digital figures.
③ Front cover: Open the front cover. There are power switch and, USB Host/Device, SD card slot.
④ Power switch: Turn ON/OFF the power of KRN1000.
⑤ USB host port: Connect the USB memory.
　　　　　　　　 It recognizes up to 32GB. When using extension cable, cable length should be up to 1.5m.
　　　　　　　　 Connect only USB device.
⑥ USB device port: Used for connecting PC via Modbus RTU communication.
⑦ SD card slot: SD card memory slot. It supports up to 32GB.
⑧ Stylus pen: Used for touching screen.

KRN1000

KRN100

KRN50

KRN1000 Series

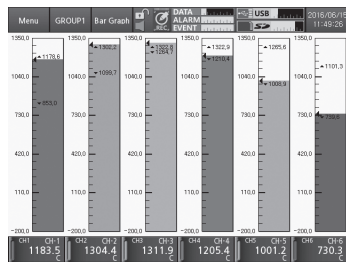## ■ Booting screen

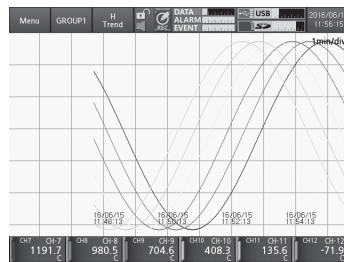PAPERLESS RECORDER KRN1000
V20160718
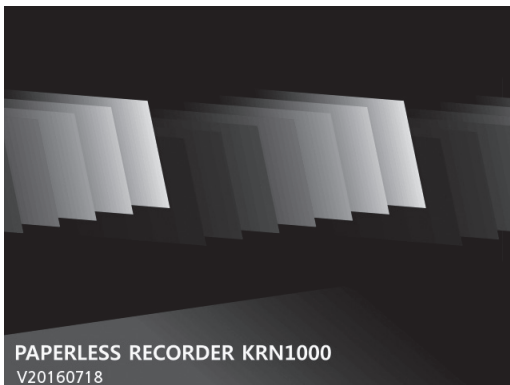
■ Run screen
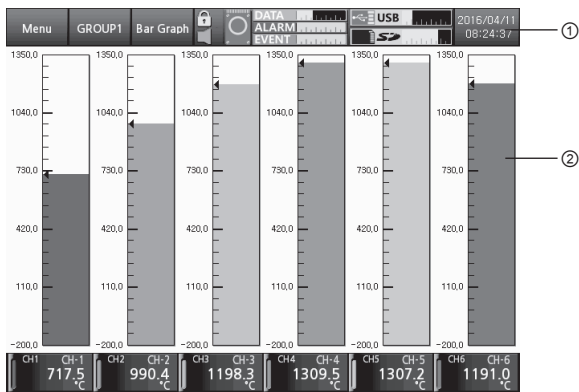
① Status display part
  : Status display part appears at top screen. Touch each icon and it enters the menu.

② Measurement value display part
  : Displays the measured value of each channel as graph. Set one graph among 9 graphs: bar graph, (Vertical/Horizontal) Trend graph, (Vertical/Horizontal) Mixed graph, Divided (Vertical/Horizontal) Trend Graph, (Group/All)Digital.
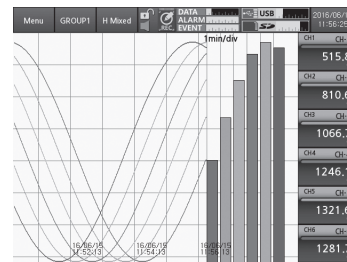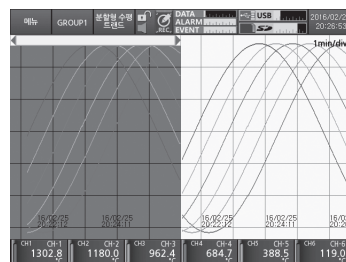
Bar graph

(Vertical/Horizontal) Trend graph

(Vertical/Horizontal) Mixed graph
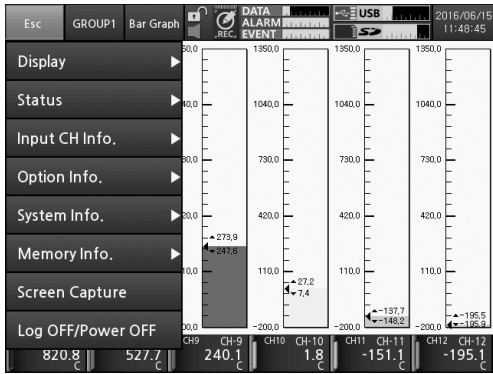

Divided (Vertical/Horizontal) Trend Graph

(Group/All) Digital

Autonics

LCD Touchscreen Paperless Recorder

Menu

Touch the status display part at the upper screen and menu appears as right screen.
Menu is as below.

Display	History
	File History
	Group Setting
	Touch Calibration
Status	Alarm List
	Event List
	AO/DI Status
Input CH Info.	Input/Display
	Input Option
	Alarm
	User Unit
Option Info.	Alarm Output
	Digital Input
	RS422/485
	Ethernet/USB

System Info.	Date/Time
	Reservation
	Device
	File
	Log In
	System Info.
Memory Info.	Memory Management
	Internal Memory
Screen Capture	
Log OFF/Power OFF	

Functions

■ History

It checks data history which is recording at [Menu]-[Display]-[History]. When recording is stop, it displays warning message.
- Checks data history by each group, channel.
- Data history displays as horizontal/vertical trend, divided horizontal/vertical trend.
- Saves the screen as *.bmp file.
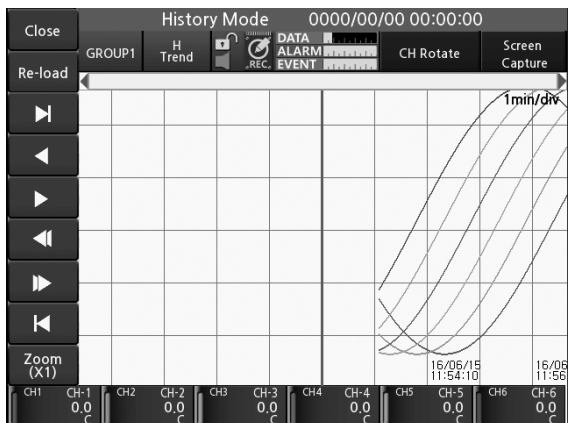
■ File History

It checks the saved data history at internal/external memory.
Touch [Menu]-[Display]-[File History].
- Set the information of display group or channel.
- Data history displays as horizontal/vertical trend, divided horizontal/vertical trend.

■ Special Function

It displays the applied measuring value of the set special function. Depending on Input type, applied special function is different.

- Setting range :
  - When input type is temperature sensor (thermocouple, RTD): None ↔ Difference
  - When input type is analog (voltage, current (shunt)): Linear ↔ Root ↔ Square ↔ Two Unit

    Two Unit is displayed when input type is set as 4-20mA (shunt).

◎ Difference (deviation)

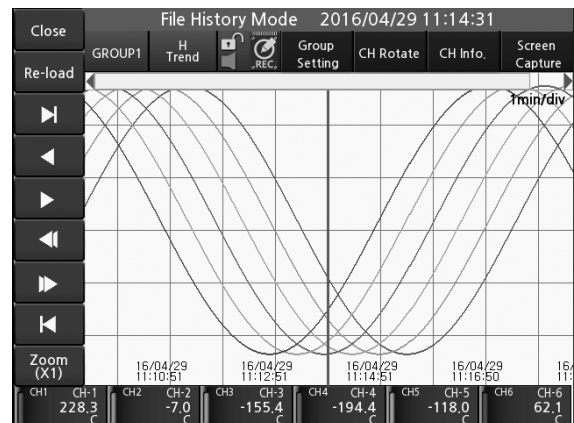It is available to set when input type is temperature sensor (thermocouple, RTD). It displays the deviation of reference channel measuring value.

(Display value = standard channel measuring value - reference channel measuring value)

- The set channel as analog (voltage, current (shunt)) of Input type is not able to set as reference channel.
- If there is no set reference channel, it displays standard channel measuring value.
- If any one of reference channel, or standard channel is break (BURN), high-limit value (HHHH), low-limit value (LLLL) status, it displays as correspond value. If you select the channel which is used Difference function as reference channel, it displays the value based on calculating actual measuring value, not display value of reference channel.

◎ Linear

It applies low-limit scale and high-limit scale to low-limit input value and high-limit input value and displays this values.

E.g.) In case low-limit input value: -5V, high-limit input value: +5V and in case low-limit scale: -1000, high-limit scale: 1000, if input value is 2V, display value is 400.

◎ Root

In case voltage, current (shunt) input type, this mode is used when input value is calculated by Root ($\sqrt{\ }$) for the desired display value. Differential pressure signal of differential pressure flow meter is calculated Root ($\sqrt{\ }$) for the to-be measured flux. This function is used to measure flux by input value.

E.g.) In case low-limit input value: -5V, high-limit input value: +5V and in case low-limit scale: -1000, high-limit scale: 1000, if input value is 2V, display value is approx. 673.32.

◎ Square

In case of voltage, current (shunt) input type, this mode is used when input value is calculated by square for the desired display value. Reverse of Root, flux signal is calculated by square for differential pressure signal.

E.g.) In case low-limit range: -5V, high-limit range: +5V and in case low-limit scale: -1000, high-limit scale: 1000, if input value is 2V, display value is -20.

◎ Two Unit

For compound pressure, if input pressure is lower than atmospheric pressure (0), it displays the degree of a vacuum with mmHg unit. If input pressure is higher than or same as atmospheric pressure (0), it displays positive pressure with kg/cm^2 unit.

When using Two Unit function, low-limit value is fixed as -760mmHg and kg/cm^2 value is able to set within Setting range 1 to 35.

Two Unit limits scale point as 0 ↔ 0.0 ↔ 0.00 . When using Two Unit, display unit is automatically changed as mmHg or kg/cm^2.

This function has two different unit values and it is impossible to calculate by recording method and digital filter and ignore it.

E.g.) If pressure range is -760mmHg to 3kg/cm^2, and pressure transmitter outputs 4-20mA, for 4mA input it displays -760mmHg, 8mA input is unit changing point. For 20mA input, it displays 3kg/cm^2.

■ Reservation

It sets reservation recording time to start and finish recording. Touch [Menu]-[System Info.]-[Reservation].

Set reservation recording type; repeat, single.

◎ Repeat

Records from the start time to end time at every day during start date to end date. If start time is later of end time, it records and saves until end of next day.

◎ Single

Records from the start date and time to end date and time.

■ Digital Input

It sets digital input operation mode and status to operate for DI-1/2 input.
Touch [Menu]-[Option Info.]-[Digital Input].
The operation mode and status are as below.

◎ DI-□ Type

Set the operation type for digital input.
(None, Rec/Stop, Alarm Reset, Alarm ON, Capture)

◎ DI-□ Status

Set digital input operation status.

(only when DI type is set as 'Record/Stop')

- Edge: When supplying digital input over 0.3 sec, the recording starts. When resupplying it, the recording stops.
- Level: When shorting digital input over 0.3 sec, the recording starts. When opening it, the recording stops.

◎ Alarm Reset/ON

- Alarm Reset

  When DI type is set as 'Alarm Reset', select the desired relay to reset the alarm.
- Alarm ON

  When DI type is set as 'Alarm ON', select the desired relay to turn ON the alarm.

■ Summer Time

Set the summer time duration.

Set enable to summer time and designate start date and end date of summer time at [Menu]-[System Info.]-[Date/Time].

■ Screen Capture

It saves current screen as *.bmp file. Set file storage location and file name.

Storage setting range: Internal, SD/USB memory

Internal memory saves the set number of screen captures at [Menu]-[Memory Info.]-[Internal Memory].

■ High/Low-Limit Graph Scale Value

In case of temperature sensor input (thermocouple, RTD), set the graph scale value to set the desired record range. Therefore, it helps to record as curve at the desired range.

■ Display Scale

For analog input, this function is to set (-9999.9 to 9999.9) for particular high/low-limit value in order to display high/low-limit value of measurement input. If measurement inputs are 'a' and 'b' and particular values are 'A' and 'B', it will display a=A, b=B as below graphs.
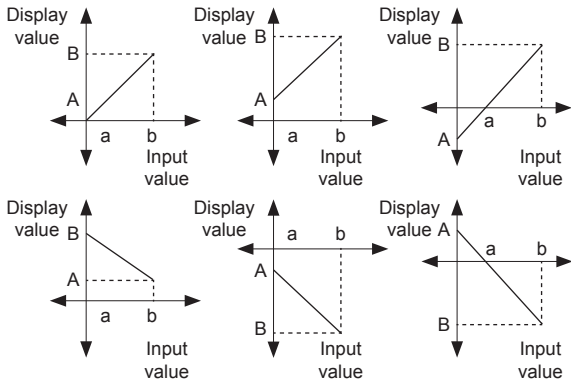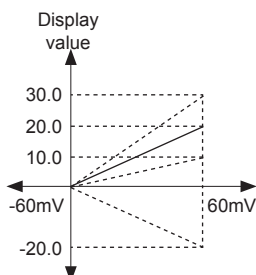
Display scale function is able to change display value for max./min. measured input by setting high-limit scale and low-limit scale.

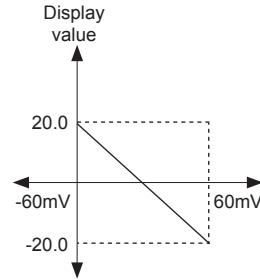Set high/low-limit scale at [Menu]-[Input CH Info.]-[Input/Display].

E.g.) Setting high/low-limit scale value

(In case of input type, -60 to +60mV)

- Low Scale (low-limit scale value) = 0.0
- Hi Scale (high-limit scale value) = 10.0, 20.0, 30.0, -20.0

- Low Scale (low-limit scale value) = 20.0
- Hi Scale (high-limit scale value) = -20.0

- Low Scale (low-limit scale value) = -20.0
- Hi Scale (high-limit scale value) = 20.0
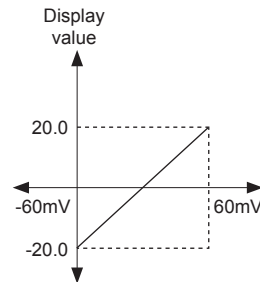
※When changing input type, high/low-limit scale is changed as factory default display range of the set input type.

■ Internal Memory Info.

It sets number of events, alarms, screen captures, and storage options at internal memory.

It sets also internal memory storage options. When internal memory uses all, it operates overwrite (deletes oldest data) or stop (stops saving).

■ Firmware update

Update firmware.

Download the firmware at our web site (www.autonics.com). Save the downloaded firmware at the top-level folder on USB/SD memory and touch [Menu]-[System Info.]-[System Info.].

When completes firmware update, re-boot the unit.

Do not turn OFF the power during firmware update.

■ Ethernet Communication setting

It sets about Ethernet communications.

Set IP address, subnet mask, default gateway, communication write, ethernet port, USB communication write, USB device usage.

KRN1000 Series

■ RS422/485 Communication setting

Setting items are only available to check by communication.

RS422/485 communication makes set or monitor parameters at external upper system (PC or graphic panel, etc.) and uses transfer data.

It is recommended to use our dedicated software program DAQMaster for monitoring.

If you want to develop monitoring program not using our DAQMaster program or to use the related Modbus program, please refer to user manual for communication.

Visit our homepage (www.autonics.com) to download DAQMaster program, and user manual for communication.

◎ Interface

Item	RS485	Ethernet	USB
Application standard	Compliance with EIA RS485	──	Compliance with USB V2.0
Max. connections	31 units (address: 1 to 127)	1 unit (number of occupations per a unit)	1 unit
Com. distance※1	Within max. 1km (below 9600bps)	Single cable within 100m (recommended over CAT5E)	Single cable within 1.5m
Com. method	Full duplex / Half duplex	Full duplex	──
Com. synchronization method	Asynchronous	Asynchronous	Asynchronous
Com. speed	2400/4800/9600/19200/38400bps	10/100Mbps	12Mbps (full Speed)
Com. response wait time	5 to 99ms	──	──
Start Bit	1-bit (fixed)	──	──
Data Bit	8-bit (fixed)	──	──
Parity Bit	None, Odd, Even	──	──
Stop Bit	1, 2-bit	──	──
Protocol	Modbus RTU	Modbus TCP	Modbus RTU

※1. In case of Ethernet connection, and connecting through the network such as network hub (HUB) and gateway, etc, there is no distance limit, but it is recommaned to use min. network. Please use communication cables which is satisfied the below conditions.

· RS422/485 communication: Shield Twist Pair over AWG24, characteristic impedance 100Ω,
capacity component 50 pF/m cable length max. 1km

· Ethernet communication: Over CAT5E, cable max. length: 100m

· USB communication: Single cable built-in ferrite core within 1.5m

※USB device is recognized as USB to Serial device and communication speed: 115200bps, start bit: 1-bit, data bit: 8-bit, parity bit: none, stop bit: 1-bit are fixed.

◎ Application of system organization
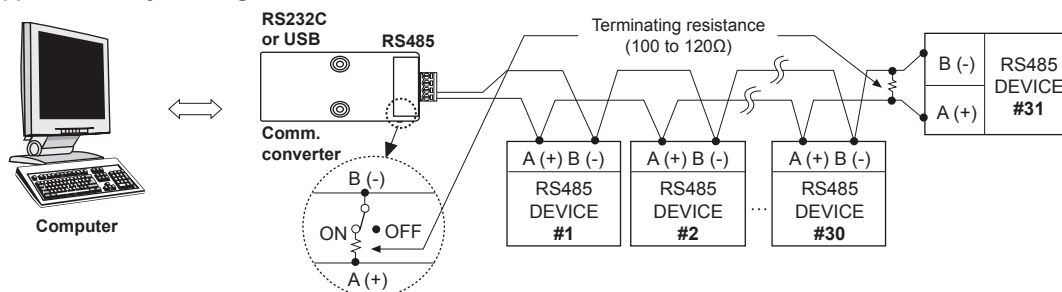
※It is recommended to use Autonics communication converter; SCM-US48I (USB to RS485 converter, sold separately), SCM-38I (RS232C to RS485 converter, sold separately). Please use twisted pair wire for RS485 communication.

■ Error

Displays error messages on screen and print data when error occurs.

Message	Description
HHHH	When input type is temperature sensor (Thermocouple, RTD) and the measurement value is higher than high-limit value of input range, it flashes HHHH. It is cleared when the measurement value is within the high-limit range. When input type is analog (voltage, current (shunt)) and the measurement value is over 10% of high-limit input range, it flashes HHHH. It is cleared when the measurement value is within 10% of high-limit input range.
LLLL	When input type is temperature sensor (Thermocouple, RTD) and the measurement value is lower than low-limit value of input range, it flashes LLLL. It is cleared when the measurement value is within the low-limit range. When input type is analog (voltage, current (shunt)) and the measurement value is over 10% of low-limit input range, it flashes LLLL. It is cleared when the measurement value is within 10% of low-limit input range.
BURN	When input type is temperature sensor (Thermocouple, RTD) and input is break, it flashes BURN. It is cleared when input is connected.
ASKey	When forgetting and entering unvaild password 3 times, "ASKey" appears with error message. Contact our service center with ASKey.

※**For more functions, refer to the user manual of KRN1000.**

Autonics

LCD Touchscreen Paperless Recorder

■ Display

◎ File History

Menu	Default
History Mode Graph	H Trend
Memory	Internal Memory
File Name	—

◎ Group Setting

Parameter	Default	Parameter	Default
CH Rotation Time	5s	Display CH Color	Auto set
Name	GROUP1	Line Thickness	2Pt
No. of CHs	Auto set	Min. Value	-200.0
Background	21 (White)	Max. Value	1350.0
Display CH	Auto set		

■ Input CH Info.

◎ Input/Display

Parameter	Default	Parameter	Default
Copy	None	High-Limit Input	Auto set
Tag Name	CH-1	Point	0.0
Input Type	TC-K	Low-Limit Scale	—
Low-Limit Graph Scale	-200.0	Low-Limit Scale	—
High-Limit Graph Scale	1350.0	Display Unit	℃
Low-Limit Input	Auto set		

◎ Input Option

Parameter	Default	Parameter	Default
Special Func.	None	Record Method	Instant
Ref. CH	—	Digital Filter	None
Two Unit	—	No. of Digital Filters	1
Input Bias	0.0	Burn-out Mark	None
Span	1.000		

◎ Alarm

Parameter	Default	Parameter	Default
Type	PV.Hi	ON Delay	0s
Ref. CH	—	OFF Delay	0s
Option	Normal	Alarm No.	None
Setting Value	1350.0	Save Event	ON
Hys	0.0		

■ Option Info.

◎ Alarm Output

Parameter	Default	Parameter	Default
Alarm Mark	ON	Alarm Color	(Alarm 1) Red (Alarm 2) Orange (Alarm 3) Light green (Alarm 4) Green
Alarm Mark Type	Flash	Relay output method	(Relay-1 to 6) N.O. (Relay-7 to 8) —

◎ Digital Input

Parameter	Default	Parameter	Default
DI-1 Type	None	DI-2 Status	—
DI-2 Type	None	Alarm Reset	(Relay-1 to 8) —
DI-1 Status	—	Alarm ON	(Relay-1 to 8) —

◎ RS422/485

Parameter	Default	Parameter	Default
Comm. Address	1	Response Wait Time	20ms
Buad Rate	9600	Protocol	RTU
Parity Bit	None	Comm. Write	Enable
Stop Bit	2 bit	RS422/485 Port	Disable

◎ Ethernet/USB

Parameter	Default	Parameter	Default
IP Address	10.0.2.15	Ethernet Port	Disable
Subnet Mask	255.255.255.0	USB Comm. Write	Enable
Default Gateway	10.0.2.2	USB Device	Enable
Comm. Write	Enable		

■ System Info.

◎ Date/Time

Parameter	Default	Parameter	Default
Date Setting	Auto set	Summer Time	Disable
Time Setting		Summer Time Duration	1month 1day to 1month 1day
Date Type	yyyy/mm/dd	Time	1 hour

◎ Reservation

Parameter	Default	Parameter	Default
Reservation Recording Date	―	Reservation Type	Disable
Reservation Recording Time			

◎ Device

Parameter	Default	Parameter	Default
Device Name	KRN1000 Recorder	Backlight	Standard
Language	English	Screen Save	Disable
PWR ON Record	Hold	Alarm Sound	OFF
Sampling	125ms	Touch Sound	Standard
Log Record Speed	1s		

◎ File

Parameter	Default	Parameter	Default
Parameter Setting File	None	Screen Simulation (Demo)	Start

◎ Log In

Parameter	Default	Parameter	Default
Log In Function	Disable	Input CH Info.	Unlocka
Activate Administer Mode	0000	Option Info.	Unlocka
Change Password	―	System Info.	Unlocka
Display	Unlocka	Memory Info.	Unlocka
Status	Unlocka		

■ Memory Info.

◎ Memory Management

Parameter	Default	Parameter	Default
Clear	―	Storage	Internal

◎ Internal Memory

Parameter	Default	Parameter	Default
No. of Events	100	No. of Screen Captures	10
No. of Alarms	100	Internal Memory Storage Options	Overwrite

※Shaded parameters are depending on other parameters' SV. Refer to the more information of the parameter.

Proper usage

- Do not use the unit outdoors. Failure to follow this instruction may result in electric shock or shortening the life cycle of the unit.
- When connecting the power input or measuring input, power cable should be over AWG20 (0.50mm^2).Make sure to tighten the terminal screw bolt above 0.74 N·m to 0.90 N·m.
- Use the unit within the rated specifications. Failure to follow this instruction may result in fire or shortening the life cycle of the unit.
- Do not use loads beyond the rated switching capacity of the relay contact. Failure to follow this instruction failure, contact melt, contact failure, relay broken, or fire, etc.
- When connecting magnet contact as load of relay contact output, connect surge absorber on coil part of contact. Failure to follow this instruction may result in malfunction.
- Do not use water or oil-based detergent when cleaning the unit. Use dry cloth to clean the unit. Failure to follow this instruction may result in electric shock or fire.
- Do not use the unit where flammable or explosive gas, humidity, direct sunlight, vibration, or impact may be present. Failure to follow this instruction may result in fire or explosion.
- Keep dust and wire residue from flowing into the unit. Failure to follow this instruction may result in fire or malfunction.
- Check the polarity of the power contact before wiring the unit. Failure to follow this instruction may result in fire or explosion.
- Check the polarity of the terminal when connecting a temperature sensor to the unit. Failure to follow this instruction may result in cause malfunction.
- Check the connection diagram of this manual before supplying power. Failure to follow this instruction may result in fire.
- Do not touch terminal during dielectric or insulation resistance test. Failure to follow this instruction may result in electric shock.
- Use insulation transformer and noise filter power for too much noise from the power. Attach noise filter on the grounded panel, etc. Use short cables for noise filter output part and power terminal of the unit. Failure to follow this instruction may result in product damage, malfunction by surge, etc.
- If power line and input signal line are close each other, install line filter for noise protection at power line and use shielded input signal line.
- Do not control the alarm output or measure the data during firmware upgrade. Failure to follow this instruction may result in malfunction. Alarm output, contact input, data measurement do not operate normally.
- After completing firmware upgrade, check the complete message and turn OFF to ON the power.
- All parameter set value is reset after firmware upgrade. It may not operate as same way with before upgrade operation.
- Use voltage output of transmitter power output card only for transmitter power. Failure to follow this instruction may result in output module damage.
- Do not press the touch screen by sharp or hard objects with excessive force.
- To prevent inductive noise, separate cables of the unit from high-voltage line, power line.
- Do not install inductive noise or power line closely. It may cause measurement error.
- Install the unit at well-ventilated place to prevent over-heat and give space over 30mm against wall.
- Install the unit vertically.

MEMO