

HIOKI

INTELLIGENT RECORDER INR-9000 Series

JULIUS



**“INFOMEDIA” – New concept
Fusion of data logging system and
multi-recording / indicating / reproducing media
Max.12 pen recording & 24ch. data logging**



ISO 9001
JMI-0216



ISO14001
JQA-E-90091



www.hioki.com

HIOKI company overview, new products, environmental considerations and other information are available on our website.

MO disk & driver



Record and store whichever data you need by whichever media you select

Max.12 pen recording, 24ch. data-logging



FD & driver

FEATURES

Abundant INFORMEDIA: Chart paper, Large LCD, big capacity memory devices

● **250mm chart paper**

high resolution, clear colored recordings, digital & printing recordings, reproducing of stored waveform

● **Large LCD**

Display of measured waveform, digital data, reproducing stored data

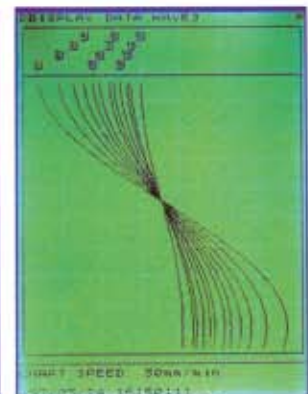
The "JULIUS" having:

- 1) max.12 pen recording & 24ch. data logging system and
- 2) multi - recording / indicating / reproducing functions such as
 - (1) real-time recording on large-sized chart-paper,
 - (2) digital data - or waveform - indication on large LCD
 - (3) a wide option of media among floppy disc(FD) and MO disc(MO)

leads to extensive selections among recording, monitoring, storing and processing of the data, which may respond to the diverse and highly required technical needs for application of various R & D, testing and quality control.



24ch digital data display



12ch waveform display

● **Memory devices (FD, MO) option**

Selected from easy-to-use simple FD or large capacity of MO suitable for long term and/or large volume of data storage (No combination of each device is allowed.)

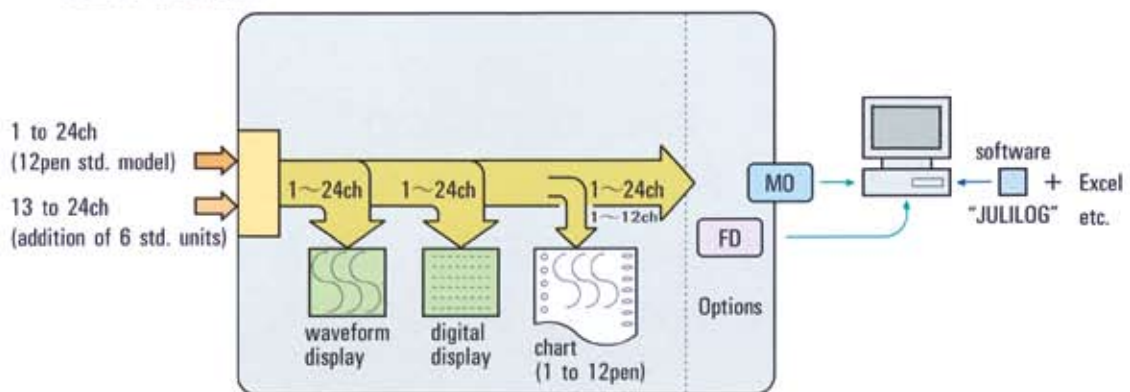
● **Data processing**

An exclusive waveform storage software "JULILOG" is prepared and the software such as Excel is also used together.

Kind of memory (data storage)

Media	Max. sampling speed
FD floppy disk (PC98/IBM)	10ms (12ch or less)
MO (3.5" 230Mbyte)	20ms (13ch or more)

JULIUS Infomedia



JULIUS

INTELLIGENT RECORDER INR-9000 Series JULIUS



Free selection of max. 12pen recording/ 24ch data logging*1

With 6 pcs. of standard input unit*2 installed into 12 pen standard model recorder, max. 12-pen recording and 24ch data logging are available.

In pen recording or data logging, necessary channels can be selected from 1 to 24ch.

Pen recording is recommended for real-time data recording and data verification, while data logging is for data storing and processing, however, in case neither is required, data can be displayed on LCD.

Relation of pen numbers and max. data acquisition ch number*3

Pen number	1	2	3	4	6	8	10	12
Max. data acquisition ch. number	2	4	6				24	
max. fitting standard unit number	1	2	3				12	

*1 Optional FD, etc required. *2 Standard unit consists of 2ch/unit. *3 The unit other than standard one consists of 1 ch/unit. Max. data storage number becomes half.

Selecting the recording channel(s) from multi-channels

Free selection & combination are available between pen recording channels and measuring input one. If the channel number increases in addition to measuring input units after purchasing the recorder, recording is possible at the selected channels. For example, 4ch can be freely selected from max. 24ch and recorded even in 4ch recorder.

Superior operability

● large LCD, dialog type operation

The combination of individual keys such as "channel", "range", "span", etc. and touchkeys on LCD and the "dialog" type touch-key help easy settings.

● small size and light weight

Weight of 12pen recorder is down to approx. 60% and volume to 70%, comparing to our conventional model.

High speed phenomena with colored lines recording

With use of optional transient unit, 12ch of high speed phenomena can be recorded. OR trigger by trigger condition setting every channel is provided, thus enabling easy comparative examination of data between channels, together with colored lines recording.

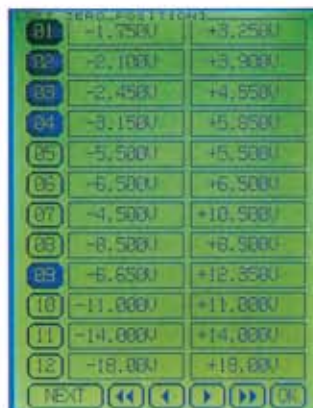
Sampling cycle	100 μ s to 1s
Memory capacity	16k data/ch

Versatile recording objects

Beside standard unit (± 5 mV to 100VDC & thermocouple), RTD, AC voltage, AC log voltage, transient, DC voltage (± 0.5 mV to 250V) are prepared as input units. and also resistor units are prepared for DC current measurement. With replacement or combination of these units, this recorder can respond to the needs in vast fields such as electrical machinery (electricity, electronics, machine, automobile), temperature, high speed phenomena, & electro-chemistry.



Individual key & LCD



Touchscreen at ZERO point setting

INR-9000 series

Versatile analog and digital recording Easy data acquisition and processing

Standard recording functions

■ DC voltage ($\pm 5\text{mV}$ to 100V) & Thermocouple (JIS 7 kinds) recording

■ Either time offset recording or positionless recording between printer and pen position

Available in timeless recording between printing position and each pen as well as among pens

■ Calculation (sum, subtraction, product, quotient) recording

Calculated result of appointed 2ch can be recorded at other channel. Only calculated result can be recorded.

■ Auto-shift recording

At DC voltage and thermocouple recording, the pen is automatically shifted by ± 1 span when it off-scaled.

■ Zone recording

To prevent overlapped recording, recording with of each ch. can be specified (ex. 20 to 60%) without changing the span. Auto separate recording according to numbers of pen is possible.

■ Logging recording

Max. 24 ch. of digital values are printed every preset interval time.

■ Alarm recording

Channel No., time & level are printed when pen comes into alarm area.

■ Auto range down recording

When excessive input signal is applied, sensitivity is automatically decreased and the optimum range is selected.

Convenient functions

■ Free span setting

Left and right end values can be freely set.

■ Simultaneous pen storing

All pens can be stored into pen rest position or recalled. Convenient pins for pen cap are provided at front left side.

■ Physical unit setting

Small or large alphabetical characters are used, besides $^{\circ}\text{C}$, μ .

■ Alarm contact output, chart end output (option)

Contact output is obtained at alarm occurrence. TTL level is changed from High to Low.

■ 12VDC (all pens), 24VDC operation (1 to 4 pens) (option)

Data processing

■ 24ch waveform storage/conversion to text data by exclusive software and data analysis by software on the market.

● Waveform storage software "JULILOG"

① Input data for 1 to 24ch. are acquired into FD or MO, while displaying them on the Window in real time via GP-IB or RS-232C.

② Data file acquired by Julius into FD or MO are converted into text file.

● Software on the market * 6

Free processing is available with Excel etc

* Excel is the trademarks of Microsoft, Inc. respectively.



MO disk driver

Specifications of INR-9000

Main body

- Operating method Automatic self-balancing (digital servo type)
- Input Plug-in unit method
- Recording method Disposable felt-tip pen
- Effective recording width 250mm
- Recording accuracy measuring accuracy $\pm 0.2\%$ of recording width (including linearity, dead band) Except expansion & contraction of paper
- Accuracy of chart speed $\pm (0.1\% \pm 0.5\text{mm})$
- Pen interval $3.2\text{mm} \pm 0.5\text{mm}$
- Measuring cycle $5\text{ms} \pm 1\%$
10ms at 13ch or more and memory func.
- Pen gap compensation. Standard equipped (print, pen position reference) (pen offset compens.) with ON/OFF switch
- Max. Pen Speed 1,600mm/s $\pm 10\%$ (at AC operation)
- Chart speed range 10, 20, 30, 60, 120, 180, 300, 600, 1,200mm/h&min.
(Settable in 1mm step within above ranges)
- Chart feed approx. 300mm/min. slow-up method
- Chart paper Z fold type SF-10CXZ-35 35m long (DIN)
Roll type SF-10CX 20m long (DIN)
- Chart end detection Pen lifts up and chart stops.
- Zero position Freely settable
- Off-scale protection Electronic limiter
- Clock Accuracy: less than ± 30 s/month (at 25°C)
- Display LCD (320 × 240 dots) with back light & auto off function
- Channel expansion Recording pen can be freely linked with any unit insertion channel.
1pen (max. 2ch), 2pen (max. 4ch)
3pen (max. 6ch), 4pen or more (max. 24ch)
- Span Freely settable
- Auto-ranging down Range sensitivity is automatically shifted down at DC voltage
- Auto shift ± 1 span shift (DC voltage, temp.)
- Zone recording MANUAL/AUTO (separate)
- Logging recording Time: 1 to 59min. 1 to 24h (max. 24ch)
- Alarm function Start/stop level setting (upper limit, lower limit, upper/lower limit, medium level)
Chart speed 1 is set to chart speed 2 when alarm condition is established.
- Chart speed change Physical volume unit & scale input at DC voltage measurement
- Physical volume
- Print Printing method wire dot method
- Printing speed approx. 90cps
- Interval print LINE, EACH
Setting cycle (1 to 59min., 1 to 24h) At date alternation: Month & day are printed
At chart stop time: Year, month, day printed
Alarm time, ch. No., Alarm level printed
COMMENT(1) Prints with COMMENT PRINT key pressed.
COMMENT(1) to (5) Prints via GP-IB, RS-232C
Time, ch No., measured value printed
Max. 6 characters settable
Time & PGC ON/OFF printed at PGC ON/OFF
- Manual print Prints when changing the range
- TAG. NO. Print Prints when changing the chart speed
- PGC print Prints setting condition
- Range print Records addition, subtraction, multiplication, and division of specified channels
- Chart speed print Main body: 0 to 40°C, 40 to 80%RH
FDD: 10 to 40°C, 40 to 80%RH
- List print Printing head: 5 to 40°C, 40 to 80%RH
more than 100MΩ at 500VDC between Case and power source or input terminal
- Calculation recording 85 to 132VAC or 170 to 250VAC (Please specify when ordering.)
- Ambient condition 12VDC (11 to 15VDC)
- Insulation resistance 24VDC (applicable to 1 to 4 pen)
- Power source
- DC power source(op.)
- DC power source(op.)
- Power Consumption (approx.) *

No. of Pen	1	2	3	4	6	8	10	12	
MAX.	AC(VA)	90	105	120	140	180	200	220	240
	DC(W)	50	60	70	80	90	110	125	135
Bal.	AC(VA)	45	48	51	54	60	70	80	90
	DC(W)	25	27	29	31	35	40	45	50

*By standard specifications (without options)

- External dimensions approx. 438(w) × 230(h) × 334(d)mm
- Weight *

No. of pen	1	2	3	4	6	8	10	12
Kgs.	10.2	10.5	11.0	11.4	12.2	13.0	13.7	14.5

*By standard specifications (without options)

Standard Accessories

- Chart paper (SF-10CXZ-35) 35m long Z-fold 1 pc.
- Disposable felt-tip pen 1 pc./pen
- Ribbon cassette P-1101 1 pc.
- Power cord 1 pc.
- Instruction manual 1 copy

Model No. & Pen number

Model	No. of Pen	Number of standard unit
INR-9011	1	1
INR-9021	2	1
INR-9031	3	2
INR-9041	4	2
INR-9061	6	3
INR-9081	8	4
INR-9101	10	5
INR-9121	12	6

Consumables

(1) Chart paper

	Type	Remark
Chart (Z-fold)	SF-10CXZ-35	35m long, DIN size
Chart (roll) 10 rolls	SF-10CX	20m long, DIN size

(2) Disposable felt-tip pen (All are of same shape.)

No. of Pen	Type	Color
1	P-1201□	Red
2	P-1202□	Green
3	P-1203□	Blue
4	P-1204□	Brown
5	P-1205□	Black
6	P-1206□	Purple
7	P-1207□	Orange
8	P-1208□	Pink
9	P-1209□	Blue purple
10	P-1210□	Light blue
11	P-1211□	Yellowish-green
12	P-1212□	Yellow

- : A: standard, B: high speed, C: low speed
- For standard: general recording with less than 700mm/s of pen speed
- For high speed: high speed phenomena with more than 700mm/s of pen speed
- For low speed: at less than 120mm/h of Chart speed

(3) ribbon cassette P-1101

OPTIONS

Measuring plug-in units

Standard unit (FU-911A) (having two inputs)

- Measuring range
 - DC voltage $\pm 5, 10, 25, 50, 100, 250\text{mV}$
 $\pm 0.5, 1, 2.5, 5, 10, 25, 50, 100\text{V}$
 - Thermocouple
 - K (-200 to 1300°C)
 - T (-200 to 400°C)
 - R (0 to 1,700°C)
 - E (-200 to 1,000°C)
 - J (-200 to 1,700°C)
 - S (0 to 1,700°C)
 - B (0 to 1,800°C) guaranteed range: 400 to 1,800°C
- Measuring Accuracy
 - Voltage $\pm (0.05\% \text{ of rdg} + 0.1\% \text{ of range})$
 - Thermocouple (K,E,J,T) $\pm (0.1\% \text{ of rdg.} + 0.5^\circ\text{C})$
 - (R,S,B) $\pm (0.1\% \text{ of rdg.} + 1.0^\circ\text{C})$
- Ref. Temp. compens accuracy
 - $\pm 1.0^\circ\text{C}$ K,E,J,T
 - $\pm 0.5^\circ\text{C}^*$ K,E,J,T
 - $\pm 1.5^\circ\text{C}$ R,S,B
 - with temp. comp. ON/OFF SW.
 - * Available by input unit FU-911B
 - After delivery, this unit is not allowed to move and additional input unit(s) not mounted later.
- Temp. coefficient voltage
 - Zero: $0.6\mu\text{V}/^\circ\text{C} + 0.01\% \text{ of range}/^\circ\text{C}$
 - FS: $0.01\% \text{ of range}/^\circ\text{C}$
- Max. input voltage 200VDC
- Input resistance $1\text{M}\Omega \pm 1\%$
- Permissible signal source Less than 1k Ω

FU-913A 0.5mVDC thermocouple unit

Voltage $\pm 0.5\text{mV}$ to 250VDC, 18 range
Thermocouple JIS 7 kinds, Wre. KpvsAu7Fe

FU-961A Transient unit

Measuring range $\pm 5\text{mV}$ to 100VDC, 14 range

FU-917A RTD temp. unit

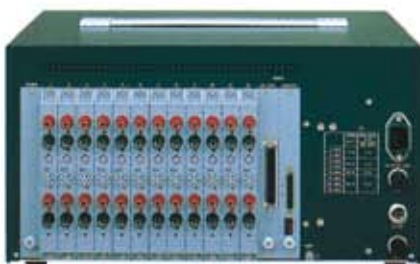
Measuring range Pt100 (-200 to 850°C)
JPt100 (-200 to 649°C)

FU-941A AC voltage unit

Range 10mV to 50Vrms, 12 ranges
Freq. Characteristics 10Hz to 100kHz ($\pm 1\text{dB}$ at 1kHz ref.)

FU-972A AC voltage log unit

Freq. Characteristics 20Hz to 20kHz ($\pm 0.5\text{dB}$ at 1kHz ref.)
Range 0 to -60dBm



DATA STORAGE MEDIA

FD-9000 FDD (floppy driver) *

Format MS-DOS (PC98/IBM)
File number Setting condition information file: 10
Setting condition & data Information file: 100

MO-9000 Interface for External MO *

MO driver MO driver with SCSI-2 interface option (Melco .. recommended manufacturer)
MO 230 Mbyte
File number Setting condition information: 20
Setting condition & data information file: 100

Interface

IF-9000 RS-232

STANDARD EIA RS-232C CONFORMED

GP-9000 GP-IB

STANDARD IEEE 488-1978

DC POWER SOURCE INPUT, ETC.

RA-9001 1k Ω RESISTOR ADAPTER

MAX. INPUT CURRENT : $\pm 250\mu\text{A}$

RA-9002 1 Ω RESISTOR ADAPTER

MAX. INPUT CURRENT : $\pm 250\text{mA}$

DC-9001 12VDC POWER SOURCE *

Can be connected to all channel recorders

DC-9002 24VDC POWER SOURCE *

Can be connected to 1 to 4ch recorders

CT-9000 EXTERNAL CONTROL/ALARM OUTPUT CONTROL

MM-9000 RACK MOUNT

* The options with mark * will be mounted in our factory before shipping. When ordering the recorder, please specify the necessary one(s).

HIOKI

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