ΗΙΟΚΙ

INSTRUCTION MANUAL

9636-01

RS-232C PACKAGE

HIOKI E.E. CORPORATION

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Introduction

Thank you for purchasing this HIOKI "9636-01 RS-232C PACKAGE." To get the maximum performance from the product, please read this manual first, and keep this at hand.

Request

We have tried to bring this manual as close to perfection as we could achieve. If perchance you find any unclear portions, mistakes, omissions, or the like, we would be most obliged if you could please notify us of them via any HIOKI agent, or directly.

Shipping Check

When the product is delivered, check and make sure that it has not been damaged in transit.

If the product is damaged, or fails to operate according to the specifications, contact your dealer or HIOKI representative.

i.

Safety

Incorrect measurement procedures could result in injury or death, as well as damage to the equipment. Please read this manual carefully and be sure that you understand its contents before using the equipment. The manufacturer disclaims all responsibility for any accident or injury except that resulting due to defect in its product.

> This Instruction Manual provides information and warnings essential for operating this product in a safe manner and for maintaining it in safe operating condition. Before using this product, be sure to carefully read the following safety notes.

The following symbols are used in this Instruction Manual to indicate the relative importance of cautions and warnings.

	Indicates that incorrect operation presents possibility of injury to the user or damage to the equipment.
NOTE	Denotes items of advice related to performance of the equipment or to its correct operation.

Safety Symbols

This symbols is affixed to locations on the
product where the operator should consult
corresponding topics in this manual (which
are also marked with the M symbol) before
using relevant functions of the product.
In the manual, this mark indicates
explanations which it is particularly
important that the user read before using
the product.

Precautions for Using the RS-232C PACKAGE

 This product is designed for indoor use, and operates reliably from 0° to 40°.

Please be aware of the following items before use:

- The "RS-232C PACKAGE" is copyrighted by HIOKI E.E. Corporation. Reproducing, copying or modifying the product in whole or in part, except for the specific purpose of processing data for the 3286 (-20), is prohibited by law.
- The "RS-232C PACKAGE" may be subject to revision or upgraded for purposes of technological improvement without notification.
- Republishing portions of the "RS-232C PACKAGE" requires the prior consent of our company. The HIOKI trademark may not be used.
- In no case shall we accept responsibility for consequential effects resulting from use of the "RS-232C PACKAGE".
- CD Handling Precautions
- Always hold the disc by the edges, so as not to makefingerprints on the disc or scratch the printing.
- Never touch the recorded side of the disc. Do not placethe disc directly on anything hard.
- Do not wet the disc with volatile alcohol or water,

Precautions for Using the RS-232C PACKAGE

asthere is a possibility of the label printing disappearing.

- To write on the disc label surface, use a spirit-based felt pen. Do not use a ball-point pen or hard-tipped pen, because there is a danger of scratching the surface and corrupting the data. Do not use adhesive labels.
- Do not expose the disc directly to the sun's rays, or keep it in conditions of high temperature or humidity, as there is a danger of warping, with consequent lossof data.
- To remove dirt, dust, or fingerprints from the disc, wipewith a dry cloth, or use a CD cleaner. Always wiperadially from the inside to the outside, and do no wipewith circular movements. Never use abrasives orsolvent cleaners.
- Hioki shall not be held liable for any problems with a computer system that arises from the use of this CD, or for any problem related to the purchase of a Hioki product.

Registered Trademarks

- Windows is a registered trademark of Microsoft Corporation (USA).
- Other product names are the trademarks or registered trademarks of their respective companies. Copyright© 1987-1995 Microsoft Corporation, All rights reserved
 Conversion 2001

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Chapter 1 RS-232C PACKAGE Overview

The "RS-232C PACKAGE" is a PC software program that processes data from the HIOKI Model 3286 (-20) CLAMP ON POWER HITESTER.

Chapter 2 Specifications

2.1 General Specifications

Media:

One CD (Exclusive PC application software) Compatible Measuring Instrument: HIOKI Model 3286 (-20) CLAMP ON POWER HITESTER

Operating Environment

OS	Microsoft Windows 95 ^(Note 1) /98 Microsoft Windows 2000 Microsoft Windows Me Microsoft Windows NT 4.0 Note 1: Microsoft Windows 95 must be OSR2 or later version.
PC	PC-AT compatible machine
Disp. Resolution	XGA (1024 x 768) or higher
Memory	32 MB or greater
Hard Disk	At least 20 MB free space

This software is not guaranteed to operate normally unless the operating environment is as specified. Even if the conditions are satisfied, this software may not operate normally or display data unless your hardware and software are configured appropriately.

2.2 RS-232C PACKAGE Function Specifications

Maximum readings accepted	32700
File operations	Open file and save file
Printing	Data printing
Recording	CSV format
Communications	Acquires data via RS-232C

2.3 Screen Example

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The screen of harmonics

1. Function Mode Indication

This area shows the measurement function and mode.

1P_P	1¢P Meter
1P_PF	1¢PF Meter
3P_PF	3¢PF Meter
HARM_I	Current harmonics
HARM U	Voltage harmonics

2. Range Indication

This area shows the current and voltage ranges. When auto-ranging is enabled, the auto-selected range is indicated within parenthesis, as in "AUTO (600V)"

3. Measured Value Display Each measurement value is shown.

- 4. Remaining Battery Indication The remaining battery charge in the 3286 (-20) is shown.
- 5. LEAD/LAG Indication Phase lead and lag of the current relative to voltage is shown.

6. RS-232C Indication Shows RS-232C communications.

- It is on during the communication.
 - It goes on and off while waiting for the communication.
 - It is off when there is no vacancy in the COM port.

Chapter 2 Specifications

NOTE

Chapter 3 Connection Procedure

Use the supplied cable to connect the 3286 (-20) to the PC.



PC Connection



• Be careful of the cable direction when connecting it to the 3286 (-20).

Chapter 4 Program Installation

- 1. Confirm that the operating environment satisfies the requirements in "Chapter 2. Specifications" above, and insert the RS-232C PACKAGE diskette into the CD-ROM drive.
- 2. Open My Computer, and select the CD-ROM drive with the RS-232C PACKAGE diskette.
- 3. Copy all of the files from the CD to a folder on the hard disk.
- 4. Execute the lm3286.exe file included in the copied files.
- 5. Refer to the help file if you need help with the operating procedures.

Chapter 5 3286 (-20) Settings

To use the RS-232C PACKAGE, make settings at DATA OUTPUT SETUP and at OPTION mode on the 3286 (-20).

NOTE

• If the RS-232C PACKAGE does not work after settings, initialize the setting (refer to "5.3 Default Settings") and retry the settings.

5.1 OPTION Mode

To use an option with the 3286 (-20), enable its OPTION mode.

1. OPTION Types

Model	Name	Input type	Function
9636-01	RS-232C PACKAGE	9636-01	PC Output

- 2. To activate the OPTION mode, hold the **U/▼** key while pressing **POWER** to turn the 3286 (-20) on.
- The digit selected for changing the OPTION mode blinks. Pressing the MODE key moves the blinking selection to the right, and pressing the MAX/MIN key moves it the left.
- 4. Set the numerical value to ∃ ∃ ∃ ∃ □ | by pressing the U/▼ or I/▲ keys to change the blinking digit.
- 5. After setting all digits appropriately, turn the power off: $\Box \square \square E$ (SAVE) is displayed as the settings are saved.
- 6. If you desire to revert the option to the default state, on the OPTION mode, press the **HOLD** key so that

9999 - 99 is displayed, then turn the power off. $\Box \ \Box \ \Box \ \Box$ is displayed, and the option setting reverts to its default.



The digits may not flash, depending on the version of software used for the 3286 (-20). When using a version of software for which the digits do not flash, use the U/▼ or I/▲ key to change the input type setting.

5.2 DATA OUTPUT SETUP Mode

The DATA OUTPUT function must be enabled in the DATA OUTPUT SETUP mode. The DATA OUTPUT SETUP mode also allows setting the output type, output items and communications parameters. The RS-232C communications speed (item 2-04), RS-232C data length (item 2-05), RS-232C stop bits (item 2-06) and RS-232C parity bit (item 2-07) must be set to be the same as the RS-232C

PACKAGE.

- To activate the DATA OUTPUT SETUP mode, hold the SET2 key while pressing the POWER key to turn the 3286 (-20) on.
- Select the appropriate settings. Use the MODE and MAX/MIN keys to increment and decrement the item number, respectively. The communications status display (item 2-03) is off by default. Items 2-04 to 2-07 are displayed by setting the communications status display to d 15 P.
- Change the settings as needed using the U/▼ or I/▲ keys.

- 4. If needed, the settings can be returned to their default values by pressing the **HOLD** key twice.
- When finished setting, turn the power off:
 S A ⊔ E E ⊓ d (SAVE END) is displayed as the settings are saved.

Display 1 Item No.	Display 2 Item Name	Display 3 Available Settings	Default Value
2-01	9 U U U U	⋴╒∊∕┍	۵FF
2-02	ForN	ALL/d .5P	ALL
2-03	гSıF	oFF/d iSP	۵FF
2-04	ЬАПЯ	2400/4800/9600	9600
2-05	LEn	86,2/96,2	86 i E
2-06	StoP	וף יד/קף יד	16 iE
2-07	РАги	non/EuEn/odd	поп



• Items 2-04 and later are not displayed unless item 2-03 (-5 + F) is set to -5 + 5 = 15.

6. Setting Details

(1)	DATA	OUTPUT Function: Item 2-01	9 U F U
	off	DATA OUTPUT Function disabled	οFF
	PC	Select the RS-232C PACKAGE for	output
			Pc
(2)	Output	Format: Item 2-02	(FORM)
	ALL	Select all items for output	ALL
	DISP	Select display items for output	d iSP
(3)	RS-232	C Communications Display: Item 2-	03
		r Sı F	(RS-IF)
	off	No display	σFF
	DISP	Display items 2-04 to 2-07	d iSP

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(4) RS-232C Communications Speed: Item 2-04 Select from 2400/4800 or 9600 bps ΙFп (5) RS-232C Data Length: Item 2-05 A h L8 bits Set data length to 8 bits $\Pi h \downarrow F$ 7 bits Set data length to 7 bits $S \vdash n \vdash P$ (6) RS-232C Stop Bits: Item 2-06 1 bit Select one stop bit $|h_{1}|$ 76,1 2 bits Select two stop bits PHr I (PARI) (7) RS-232C Parity Bit: Item 2-07 Select no parity bit none поп EuEn EVEN Select even parity bit Select odd parity bit пЧЧ ODD

5.3 Default Settings

This procedure returns the RS-232C settings to their factory defaults.

- 1. Hold the **SET2** key while turning the power on.
- 2. Press the **HOLD** key until $\Box \Box \Box$ is displayed.
- 3. Press the **HOLD** key again to initialize the settings to their default values.

Default Values	
DATA OUTPUT Function	n OFF
Output Format	ALL (All items for
	output)
Communication Speed	9600 bps
Data Length	8 bits
Stop Bits	1 bit
Parity	none

• Holding down the **RANGE** key, as turning power on, will display "HLL cLr" and initialize all the saved settings (RS-232C settings, SETUP function and measurement status saving function).

5.4 Data Format

The 3286 (-20) outputs measurement data at each interval of about six seconds. The end of each measurement data has by a CR + LF. Details of the output data and examples are shown below. When creating receiving software, make sure the receiving software must recognize the first data. The data after an interval become the first data.



- For measurements of the $1\phi P$ meter, SIN ϕ and ϕ are used only as reference data.
- For measurements of the $1\phi PF$ meter, P, S, and Q are used only as reference data.
- For phase detection data, reverse phase may be indicated with a minus sign (-).

Output contents

Data	Power	Harmonic measurement
number	measurement	
0	Line	Line
1	Display data	Display data
2	Voltage range	Range
3	Current range	THD-R
4	U	THD-F
5	Upeak	I_1 or U_1
6	UHz	$I_2 \text{ or } U_2$
7	Ι	I_3 or U_3

Data	Power	Harmonic measurement
number	measurement	
8	Ipeak	I_4 or U_4
9	IHz	$I_5 \text{ or } U_5$
10	Р	I_6 or U_6
11	S	I ₇ or U ₇
12	Q	I ₈ or U ₈
13	COS¢	I ₉ or U ₉
14	SIN¢	I_{10} or U_{10}
15	φ	I_{11} or U_{11}
16	LEAD/LAG	I_{12} or U_{12}
17	Phase detection	I_{13} or U_{13}
18	Battery capacity	I_{14} or U_{14}
19		I_{15} or U_{15}
20		I_{16} or U_{16}
21		I_{17} or U_{17}
22		I_{18} or U_{18}
23		I_{19} or U_{19}
24		I_{20} or U_{20}
25		I_1 or U_1 harmonic percentage
26		I_2 or U_2 harmonic percentage
27		I_3 or U_3 harmonic percentage
28		I_4 or U_4 harmonic percentage
29		I_5 or U_5 harmonic percentage
30		I_6 or U_6 harmonic percentage
31		I_7 or U_7 harmonic percentage
32		I_8 or U_8 harmonic percentage
33		I ₉ or U ₉ harmonic percentage
34		I ₁₀ or U ₁₀ harmonic percentage
35		I_{11} or U_{11} harmonic percentage
36		I_{12} or U_{12} harmonic percentage
37		I_{13} or U_{13} harmonic percentage
38		I ₁₄ or U ₁₄ harmonic percentage
39		I ₁₅ or U ₁₅ harmonic percentage
40		I ₁₆ or U ₁₆ harmonic percentage

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Data	Power	Harmonic measurement
number	measurement	
41		I ₁₇ or U ₁₇ harmonic percentage
42		I_{18} or U_{18} harmonic percentage
43		I_{19} or U_{19} harmonic percentage
44		I_{20} or U_{20} harmonic percentage
45		Display order
46		Battery capacity

Line

Line	Number
1¢P Meter	0
1	1
3¢PF Meter	2
Current hermonics	3
Voltage hermonics	4

Display data

LCD display (DSIP1,DISP2,DISP3)	Number
P,U,I	0
S,U,I	1
I,Ipeak,IHz	2
U,Upeak,UHz	3
P,-,Q	4
S,-,Q	5
COSø,U,I	6
φ,U,I	7
SIN¢,U,I	8
P instantaneous value, P maximum value, P	9*
minimum value	
S instantaneous value, S maximum value, S	10*
minimum value	
I instantaneous value,I maximum value,I	11*
minimum value	
Ipeak instantaneous value, Ipeak maximum	12*
value,Ipeak minimum value	
U instantaneous value,U maximum value,U	13*
minimum value	
Upeak instantaneous value,Upeak maximum	14*
value,Upeak minimum value	
I _k ,k,THD-R	15
I _k ,k,THD-F	16
I _k ,k,harmonic percentage	17
	18
U _k ,k,THD-R	19
U _k ,k,THD-F	20
U _k ,k,harmonic percentage	21
	22

(* is with the recording function activated.)

Range

	0	1	2	+10
Current range	200A	1000A	20A	AUTO
Voltage range	150V	300V	600V	AUTO

Phase Detection

Phase detection	Number
Missing phase	0
Normal phase	1
Reverse phase	-1
None	9

LEAD/LAG

LEAD/LAG	Number
LEAD	0
LAG	1
None	9

Format of easurement values

	Format of easurement values
Normal	• • • • • E •
	Mantissa: Max 4-digit numerial
	value + decimal point
	Exponent: 1-digit numerial value
Range over	99999+9
Frequency less than 30 Hz	
When there is not data	

Output example [1op Meter] ←Line 0 0 ←Display data 10 ←Voltage range 10 ←Current range +106.4E+0 ←U +151.8E+0 ←Upeak +055.0E+0 ←UHz +098.8E+0 ←I +145.6E+0 ←Ipeak ←IHz +055.0E+0 +03.55E+3 ←P +10.51E+3 ←S +09.90E+3 ←Q +0.338E+0 ←COS∳ ←SINø +0.941E+0 +070.3E+0 ←¢ 0 ←LEAD/LAG 9 ←Phase detection 100 ←Battery capacity

[Harmonic measurement] 3 ←Line 15 ←Display data 10 ←Range

10	←Range
+002.6E+0	←THD-R
+002.6E+0	←THD - F
+102.4E+0	$\leftarrow I_1$
+002.5E+0	$\leftarrow I_2$
+001.0E+0	←I ₃
+000.1E+0	$\leftarrow I_4$
+000.0E+0	←I ₅
+000.1E+0	$\leftarrow I_6$
+000.1E+0	←I ₇

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+000.0E+0	$\leftarrow I_8$
+000.0E+0	$\leftarrow I_9$
+000.0E+0	$\leftarrow I_{10}$
+000.0E+0	$\leftarrow I_{11}$
+000.0E+0	$\leftarrow I_{12}$
+000.1E+0	$\leftarrow I_{13}$
+000.0E+0	$\leftarrow I_{14}$
+000.0E+0	$\leftarrow I_{15}$
+000.0E+0	$\leftarrow I_{16}$
+000.0E+0	$\leftarrow I_{17}$
+000.0E+0	$\leftarrow I_{18}$
+000.0E+0	$\leftarrow I_{19}$
+000.0E+0	$\leftarrow I_{20}$
+100.0E+0	$\leftarrow I_1$ harmonic percentage
+002.4E+0	$\leftarrow I_2$ harmonic percentage
+000.9E+0	$\leftarrow I_3$ harmonic percentage
+000.1E+0	$\leftarrow I_4$ harmonic percentage
+000.0E+0	$\leftarrow I_5$ harmonic percentage
+000.1E+0	$\leftarrow I_6$ harmonic percentage
+000.1E+0	$\leftarrow I_7$ harmonic percentage
+000.0E+0	$\leftarrow I_8$ harmonic percentage
+000.0E+0	$\leftarrow I_9$ harmonic percentage
+000.0E+0	$\leftarrow I_{10}$ harmonic percentage
+000.0E+0	$\leftarrow I_{11}$ harmonic percentage
+000.0E+0	$\leftarrow I_{12}$ harmonic percentage
+000.1E+0	$\leftarrow I_{13}$ harmonic percentage
+000.0E+0	$\leftarrow I_{14}$ harmonic percentage
+000.0E+0	$\leftarrow I_{15}$ harmonic percentage
+000.0E+0	$\leftarrow I_{16}$ harmonic percentage
+000.0E+0	$\leftarrow I_{17}$ harmonic percentage
+000.0E+0	$\leftarrow I_{18}$ harmonic percentage
+000.0E+0	$\leftarrow I_{19}$ harmonic percentage
+000.0E+0	$\leftarrow I_{20}$ harmonic percentage
1	←Display order
100	←Battery capacity

Chapter 6 Troubleshooting

Although the following problems might seem to be program malfunctions, they can result from other causes. So before seeking repair service, please confirm the indicated items.

Symptom	Confirmation item
Not able to display it	 Confirm that the RS-232C cable is properly connected to the 3286 (-20). Confirm that the RS-232C cable is properly connected to the PC. Confirm that the communication settings of the 3286 (-20) and the PC software program match each other.
If the problem is not so To initialize, hold dow LCD will go on, and " contents to their initial	blved after the troubleshooting, initialize the settings. In the RANGE key as powering on. The entire $L \ L \ L \ L'$ will appear. This will reset all the saved values.

Check the following setup when the connection is not established.

Setup example

	Port	Baud Rate	Data Length	Stop Bit	Parity
3286 (-20) Settings		9800	8bit	1bit	None
lm3286.exe Set up Com Port	COM1	9800	8bit	1bit	None

Lower both Band Rates when RS-232C indication goes on and off.

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