User's Manual FD5000 Series Communication Functions

UU-33564a

8/8

S P | I N | 2 | . 0 | (Response with a span input value.) S | P | A | N | | 9 | 0 | 0 | CR LF (Calibration with actual load 5 | 0 | 0 | 0 | CR LF | N CR LF Calibration data setting (Equivalent calibration) Sets the zero input value N | CR | LF | | | 15 15 1 5 0 2 CR LF 10 N CRLF | | ote: The main unit returns to span input value setting. lote: Under normal conditions, this response is made only once lote: ERROR B to ERROR F are available as the response com Note: If a response to the ERROR X command is received, execute the same D | A | T | A | | L | O | S | T | | C | O | N | D | CR|LF| esponse in case of data failure in the 13 Note: Set the comparator data again. D | A | T | A | | L | O | S | T | | M | E



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FD5000 Series Communication Functions User's Manual

Overview

This manual explains the specifications of the communication functions provided by the FD5000 series of digital panelmeters. It also explains how to handle the FD5000 series

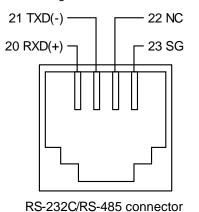
2. Specifications

	RS-232C	RS-485						
	(Compatible with EIA RS-232C)	(Compatible with EIA RS-485)						
Synchronization	Start-stop							
Communication method	Full-duplex	Two-wire half-duplex (polling/selecting)						
Transmission rate	2400, 4800, 960	00, 19200, 38400 bps						
Number of start bits		1bit						
Data length	7 bi	its / 8 bits						
Error detection	Even parity, odd parity, or no parity							
	Block check character (BCC) checksum							
Number of stop bits	1 bits / 2 bits							
Character code		ASCII						
Transmission control procedure	Non-	procedural						
Signal name used	TXD, RXD, SG	Non-inverting (+), inverting (-)						
Number of units that can be connected	1	31 for meters						
Transmission line length	15 m 500 m max. (overall len							
Delimiter	CR+LF/CR							

3. Terminal Assignments and Connection Method

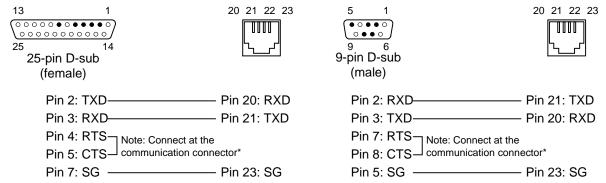
The communication connector of the FD5000 series is a modular jack connector compatible with the FCC68 standard. Use a modular plug connector also compatible with the FCC68 standard when connecting the panelmeter.

3.1. Terminal Assignments



Terminal No.	Name	Description
20	RXD(+)	RS-232C: Receive Data terminal; RS-485: Non-inverting output
21		RS-232C: Transmit Data terminal; RS-485: Inverting output
22	NC	Do not connect.
23	SG	Common terminal for the communication functions

3.2. Example of RS-232C Connection



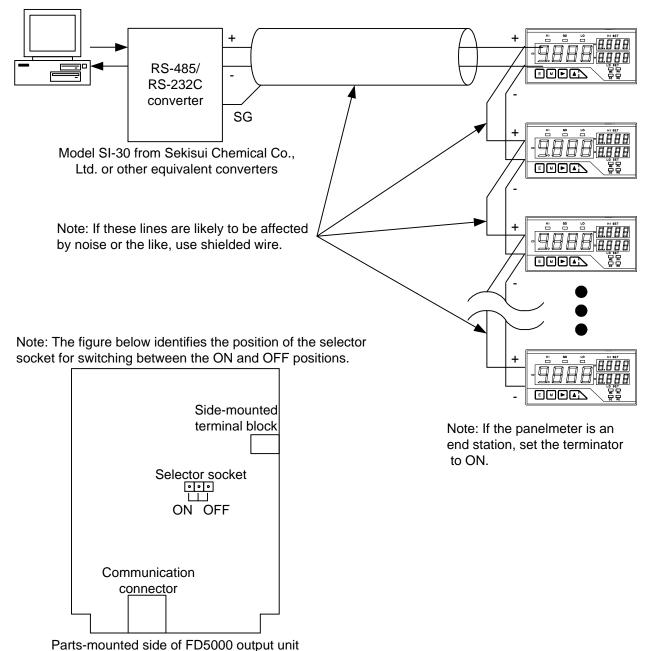
Note: The above-illustrated connection of the CTS and RTS terminals on the host side is only a typical example for hardware control. Consult your system designer for further details on how to cope with the terminals.

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User's Manual FD5000 Series Communication Functions

3.3. Example of RS-485 Connection

If the panelmeter is positioned to be an end station as the result of an RS-485 connection, set the terminator to ON by using the selector socket in the FD5000 output unit.



rans-mounted side of 1 D3000 output unit

The baud rate, data length, parity bit, stop bit, delimiter, and device ID (RS-485 only) are the user-selectable parameters of the communication functions provided by the FD5000 panelmeter. For details on how to set the parameters, see the user's manual of the FD5000 main unit.

5. RS-485 Transmission/Reception Formats

4. Communication Function Parameters

5.1. Establishing and Releasing the Communication Link

Function	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 Char. Length 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 Char. Length 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 Char. Length 2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 Char. Length 2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 Char. Length 2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 Char. Length 2 1 2 3 4 5 6 7 8 8 9 10 11 12 13 14 15 16 17 18 19 20 Char. Length 2 1 2 3 4 5 6 7 8 8 9 10 11 12 13 14 15 16 17 18 19 20 Char. Length 2 1 2 3 4 5 6 7 8 8 9 10 11 12 13 14 15 16 17 18 19 20 Char. Length 2 1 2 3 4 5 6 7 8 8 9 10 11 12 13 14 15 16 17 18 19 20 Char. Length 2 1 2 3 4 5 6 7 8 8 9 10 11 12 13 14 15 16 17 18 19 20 Char. Length 2 1 2 3 4 5 6 7 8 8 9 10 11 12 13 14 15 16 17 18 19 20 Char. Length 2 1 2 3 4 5 6 7 8 8 9 10 11 12 13 14 15 16 17 18 19 20 Char. Length 2 1 2 3 4 5 6 7 8 8 9 10 11 12 13 14 15 16 17 18 19 20 Char. Length 2 1 2 3 4 5 6 7 8 8 9 10 11 12 13 14 15 16 17 18 19 20 Char. Length 2 1 2 3 4 5 6 7 8 8 9 10 11 12 13 14 15 16 17 18 19 20 Char. Length 2 1 2 3 4 5 6 7 8 8 9 10 11 11 12 13 14 15 16 17 18 19 20 Char. Length 2 1 2 3 4 5 6 7 8 8 9 10 11 11 12 13 14 15 16 17 18 19 20 Char. Length 2 1 2 3 4 5 6 7 8 8 9 10 11 11 12 13 14 15 16 17 18 19 20 Char. Length 2 1 2 3 4 5 6 7 8 8 9 10 11 11 12 13 14 15 16 17 18 19 20 Char. Length 2 1 2 3 4 5 6 7 8 8 9 10 11 11 12 13 14 15 16 17 18 19 20 Char. Length 2 1 2 3 4 5 6 7 8 8 9 10 11 11 12 13 14 15 16 17 18 19 20 Char. Length 2 1 2 3 4 5 6 7 8 8 9 10 11 11 12 13 14 15 16 17 18 19 20 Char. Length 2 1 2 3 4 5 6 7 8 8 9 10 11 11 12 13 14 15 16 17 18 19 20 Char. Length 2 1 2 3 4 5 6 7 8 8 9 10 11 11 12 13 14 15 16 17 18 19 20 Char. Length 2 1 2 3 4 5 6 7 8 8 9 10 11 11 12 13 14 15 16 17 18 19 20 Char. Length 2 1 2 3 4 5 6 7 8 8 9 10 11 11 12 13 14 15 16 17 18 19 20 Char. Length 2 1 2 3 4 5 6 7 8 8 9 10 11 11 12 13 14 15 16 17 18 19 20 Char. Length 2 1 2 3 4 5 6 7 8 8 9 10 11 11 12 13 14 15 16 17 18 19 10 10 10 10 10 10 10 10 10 10 10 10 10
Establishment of communication link	
	Note: Set a two-digit number as the device ID (00 is void).
	Note: The response time is 40 ms maximum.
Release of communication link	
	Note: Communication is still possible when another device ID is specified without releasing (No response is made for release.)
	the communication link.

5.2. Available Control Codes

Control Code	Hexadecimal	Name	Description
STX	02H	Start of Text	Marks the starting point of text.
ETX	03H	End of Text	Marks the ending point of text.
EOT	04H	End of Transmission	Marks the end of transmission.
ENQ	05H	Enquiry	Denotes an enquiry.
ACK	06H	Acknowledge	Denotes an affirmative reply.

User's Manual FD5000 Series Communication Functions

2/8

Function Scaling data response	M E T CR LF	Char. Length 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 Char. Length 3 F S C 9 9 9 9 9 CR LF 10 10 10 10
	Note: The reading of the main unit changes to MET the moment it receives an MET command. N CR LF	(Response with a full-scale reading.) 1 F I N 9 9 9 CR LF 10
	N CR LF	(Response with a full-scale input value.) 1
		(Response with an offset reading.)
	N CR LF	1 O I N 0 CR LF 10 (Response with an offset input value.)
	N CR LF	1 D L H I 9 9 9 9 9 CR LF 10 (Response with the HI value of the digital limiter.)
	N CR LF	1 DLLLO - 99999CRLF 10
	N CR LF	(Response with the LO value of the digital limiter.) 1
	N CR LF	(Response with the HI reading of the analog output.) 1
	N CR LE	(Response with the LO reading of the analog output.) 1 D E P 4 CR LF 6
		(Response with the position of the decimal point.)
	R CR LF	1 Y E S
	the response with the full-scale reading if an N command is sent.)	
Scaling data setting Note: This example shows a case	M E T CR LF	3 F S C 9 9 9 CR LF 10
where FSC is set to 8000 and OFS to 20.	8 0 0 0 CR LF	4 F S C 8 0 0 0 CR LF 10
	N CR LF	1 F I N 9 9 9 CR LF 10
	N CR LF	1 OFS 0 CR LF 10
	2 0 CR LF	2 O F S 2 0 CR LF 10
	(Sets the offset reading to 20.) R CR LF	1 Y E S CR LF 5
	Note: If an R command is sent after setting required data, the main unit saves data provided up to that moment and then returns to measurement operation.	
	up to that moment and then returns to measurement operation.	E r r o r CR LF 6 (Response when a value outside the setpoint range is input.)
Linearization function status response	L I N CR LF	3 L I N O F F CR LF 7 (Response with the status of the linearization function being set to OFF.)
тоаронас		
		(Response with the status of the linearization function being set to ON.) L I N C L R CR LF 7
		(Response with the status of the linearization function being cleared.)
Linearization function status setting	L I N O F F CR LF (Sets the linearization function to an OFF status.)	7 Y E S
	L I N O N CR LF (Sets the linearization function to an ON status.)	6 Y E S CR LF 5
	L I N C L R CR LF	7 Y E S
	(Sets the linearization function to a cleared status.)	N O ? CR LF 5
		(Response with the status of the linearization function being cleared.) Note: Since the linearization data are all cleared when the linearization function
		is cleared, the main unit does not accept either a LIN ON or LIN OFF command. (Set the linearization function status after setting the linearization data again.)
Response for number of linearization	L N O CR LF	3 L N O 0 0 CR LF 6
correction data items		(Response with the status of the linearization function being cleared.) L N O 0 2 CR LF 6
		(Response with the status of the number of linearization correction data items being 02.)
		L N O 1 6 CR LF 6
		(Response with the status of the number of linearization correction data items being 16.)
Setting for number of linearization	L N O 0 2 CR LF	6 Y E S CR LF 5
correction data items	(Sets the number of linearization correction data items to 02.) L N O 1 6 CR LF	6 Y E S CR LF 5
	(Sets the number of linearization correction data items to 16.)	E r r o r CRLF 6
		(Response when linearization data is not correctly set.)
		Note: Set the number of linearization correction data items after setting linearization data.)
Linearization data response	L N D 0 1 CR LF Note: A reading can be made from any of the data items 01 to 16.	6 L N D 0 1 I = 0 0 CR LF 14
	Note: The reading of the main unit changes to LINE the moment it receives an LND XX	(Response with the input value of linearization data N-01.)
	command.	1 L N D 0 1 O = 0 CR LF 14
	N CR LF	(Response with the output value of linearization data N-01.) 1
		(Response with the input value of linearization data N-02.)
	N CR LF	1
	N CR LF	1
	1:	
	N CR LF	1
	N CR LF	1
	R CR LF Note: The main unit returns to measurement operation upon an R command (or returns to	1 Y E S CR LF
	the response with the input value of linearization data N-01 if an N command is sent.)	
Linearization data setting	L N D 0 1 CR LF	6 L N D 0 1 I = 0 CR LF 14
	Note: Setting can be made from any of the data items 01 to 16. Note: The reading of the main unit changes to LINE the moment it receives an LND XX	
	command.	4 L N D 0 1 I = - 1 0 0 0 CR LF 14
	Sets the input value of linearization data N-01 to -1000.) N CR LF	1 L N D 0 1 O = 0 CR LF 14
I		
	- 9 0 0 CR LF	1 L N D 0 1 O = - 9 0 0 CR LF 14
		1 L N D 0 2 I = 0 CR LF 14
	N CR LF	
	N CR LF	1 L N D 0 2 I = - 5 0 0 CR LF 14
	N CR LF	1 L N D 0 2 I = -5 0 0 CR LF 14 1 L N D 0 2 O = 0 CR LF 14
	N CR LF	
	N CR LF	1 L N D 0 2 O = 0 CR LF 14
	N CR LF	1 L N D 0 2 O = 0 CR LF 14
	N CR LF	1 L N D 0 2 O = 0 CR LF 14
	N CR LF - 5 0 0 CR LF (Sets the input value of linearization data N-02 to -500.) N CR LF - 6 0 0 CR LF (Sets the output value of linearization data N-01 to -600.) .	1 L N D 0 2 O = 0 CR LF 14 1 L N D 0 2 O = -6 0 0 CR LF 14

7/8

Hser's Manual	FD5000 Series	Communication	Functions
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Function	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23	Char Length	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 Char. Length
Tracking zero response	T R K CR LF	3	O N T = 1 W = 1 CR LF 10
			(Response with the status of the tracking zero time being 1 and tracking zero width being 1.)
			Width Deling 1.7
			(Response with the status of the tracking zero time being 99 and tracking zero width being 99.)
			T R K O F F CR LF
			(Response with the status of the tracking zero function being set to OFF.)
Tracking zero setting	T R K T = 1 CR LF	7	Y E S CR LF 5
	(Sets the tracking zero time to 1.) T R K T = 9 9 CR LF	8	Y E S CRLF 5
	(Sets the tracking zero time to 99.)	o	
	T R K W = 1 CR LF	7	Y E S CR LF 5
	T R K W = 9 9 CR LF	8	Y E S CR LF 5
	(Sets the tracking zero width to 99 digits.) T R K T = 0 CR LF	-	
	(Sets the tracking zero function to OFF.)	7	Y E S
Sensor power supply response	S N S R CR LF	4	S N S R 1 0 CR LF 7
			(Response with the status of sensor power supply being set to 10 V.) S N S R 5 CR LF 6
			(Response with the status of sensor power supply being set to 5 V.)
Sensor power supply setting	S N S R 1 0 CR LF	7	Y E S
cannot parter sapply assuming	(Sets the sensor power supply to 10 V.)		
	S N S R 5 CR LF	6	Y E S CR LF 5
Power-on delay time response	P O N CR LF	3	PONOFFCRLF 7
			(Response with the status of the power-on delay function being set to OFF.)
			P O N 1 CR LF 5 (Response with the status of the power-on delay function being set to 1 sec.)
			P O N 3 0 CR LF 6
			(Response with the status of the power-on delay function being set to 30 sec.)
Power-on delay time setting	P O N 1 CR LF	5	Y E S CR LF 5
	(Sets the power-on delay function to 1 sec.) P O N 3 0 CR LF	6	Y E S CR LF 5
	(Sets the power-on delay function to 30 sec.)	_	
	P O N 0 CR LF	5	Y E S
Protection response	P R O CR LF	3	PROOFFCRLF 7
			(Response with the status of the protection function being set to OFF.)
			P R O O O N CR LF O O O N CR LF O O O O O O O O O O O O O O O O O O
Protection setting	PROOFFCRLF	7	Y E S CRLF
Trocodor setting	(Sets the protection function to OFF.)		
	P R O O N CR LF	6	Y E S CR LF
Unit number response	U N O CR LF	3	
·			(Response with the status of the input unit being strain gauge measurement
			and the output unit being a combination of comparison output, analog output and RS-232C.)
			- 0 1 , O - 3 CR LF
			(Response with the status of the input unit being DC voltage measurement (11 ranges) and the output unit being RS-232C.)
Key operation prohibition response	K E Y CR LF	3	K E Y O F F CR LF 7
			(Response with the status of the key operation prohibition function being set to
			OFF.)
			(Response with the status of the key operation prohibition function being set to
			ON.)
Key operation prohibition setting	K E Y O F F CR LF	7	Y E S CR LF 5
	K E Y O N CR LF	6	Y E S CR LF 5
	(Sets the key operation prohibition function to ON.)		
Comparator data response	C O M CR LF	3	S - H I 1 0 0 CR LF 10 (Response with the HI-side judgment value.)
	N CR LF	1	S - L O 5 0 0 CR LF 10
	N CR LF	1	(Response with the LO-side judgment value.) H - H I 0 CR LF 10
		'	(Response with the HI-side hysteresis.)
	N CR LF	1	H - L O 0 CR LF 10
	R CR LF	1	(Response with the LO-side hysteresis.) Y E S
	Note: The main unit returns to measurement operation upon an R command		
	(or returns to the HI-side judgment value if an N command is sent.)		
Comparator data setting Note: This example shows a case	C O M CR LF	3	S - H I 1 0 0 CR LF 10
where S-HI is set to 8000 and S-LO	8 0 0 0 CR LF	4	S - H I 8 0 0 0 CR LF 10
to 4000.	(Sets the HI-side judgment value to 8000.) N CR LF	1	S - L O 5 0 0 CR LF 10
		'	
	4 0 0 0 CR LF	4	S - L O 4 0 0 0 CR LF 10
	(Sets the LO-side judgment value to 4000.) R CR LF	1	Y E S CR LF 5
	Note: If an R command is sent after setting required data, the main unit saves data provided		
	up to that moment and then returns to measurement operation.		E r r o r CR LF 6 (Response when a value that does not meet the setting conditions is input.)
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User's Manual FD5000 Series Communication Functions

5.3. BCC Checksum

6/8

As a means of error detection, a block check character (BCC) checksum is added to the RS-485 communication function of the FD5000 panelmeter. See the following illustrations for details on the transmission and reception formats (which are as illustrated in the table of communication commands in Section 6 for the RS-232C communication function).

3/8

Example of B	CC Checksum	າ for Transmis	ssion	
Character	STX D	S	ETX A E	CR LF
Hexadecimal	02H 44H	53H 50H	1 03H 1 41H 45H	ODH OAH
	[1]	[2] [3]	¦ [4]	
				BCC H = Higher-order 4 bits among the lower-order 8 bits of
				the sum of the hexadecimal values numbered from [1] to [4]
				44H+53H+50H+03H=EAH
				— BCC L = Lower-order 4 bits among the lower-order 8 bits of
				the sum of the hexadecimal values numbered from [1] to [4]
Example of B	CC Checksum	n for Reception	on	44H+53H+50H+03H=EAH
Character	STX	1 1	5 0 0	1 0
	02H 20H	20H 20H	35H 30H 30H	30H 20H 48H 49H 03H 39H 44H 0DH 0AH
	[1]	1 [2] 1 [3]	[4] [5] [6]	
		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		ong the lower-order 8 bits of the
				values numbered from [1] to [11]
	201			0H+20H+48H+49H+03H=1D9H
	20.	= • = •		nong the lower-order 8 bits of the
		_	•	values numbered from [1] to [11]
	21			30H+20H+48H+49H+03H=1D9H
		311120111201		0011120111 10111 10111 10111 10111

6. Communication Commands

	Function	1	1 2) :	3	4	5	6 7	8	9	10 1	1 12	13	14 1	5 16	3 17	18	19	20 3	21 22	23	Char. Le	enath	1	2 3	4	5	6 7	7 8	9	10 11	1 12	2 13	14 15	5 16	17 1	8 19	20	Char. Length
	Measured value and comparison					RI		' '	Ť	١	10 1	112	10	''	J 10	7 17	10	13	20 2	1 22	20	3	angui.		- 1 5		0)		I CF			14 10	10		0 13	20	10
	results response																						((+ rea	ading,	w/o	decim	nal po	int)										
																							١.	,			0			н	I CF	R LF	F						10
																							((- rea	iding,	W/O C	iecim n	ai po ດ l	nt)		нΙ	CF	RIF						11
																							((+ rea	ading,	w/d	ecima	ıl poir	nt)			.	1-1						
																								<	=	9	8	0 0)		I CF	R LF	=						10
																									errang														
																							,	< : /- ov/	= -	9	8	0 . w/d	0	 Looin	" H	CF	입내						11
																							(P 1	errang H	5	0	0 0)	H	'i CF	R LF	=						10
																									k hold														
	Hold remote control response	S	1	Г	1 0	R	LF															3			ТА				R LF						\Box				6
																							((Res	ponse	with	the s	tatus	of the	hold	functi	ion b	eing s	set to (OFF b	y rem	ote		
																								contr	01) O L	n	,	CR L	_										5
																														hold	functi	์ ion b	oeing s	set to (ON by	remo	te con	rol)	3
	Hold terminal response	E	١,	, ,	، ا	R																3			ТА				R LF						1 1			1	6
	noid terminar response	15	"	' '	` `	'ا'^	니															3			ponse						hold 1	l funct	tion)						b
																								H (0 L	D		CR L	F										5
																							((Res	ponse	with	the C	N sta	atus o	f the I	hold fu	uncti	ion)						
	Hold remote control	s	1	г	4		sc	R LI	-													5		Y	E S			CRL	F										5
		(S	ets	the	holo	d für	nctio	n to C	ĖF.)																														
								R LI														5		Y	E S			CRL	F										5
				- 1	- 1	ıuı 	ictioi	n to () (.VIC																														
	Trigger input	Т	C	R L	F																	1		,	J		0		0		н г	CF	R LF						11
																									ading, The r						at of "	 "DSE] D"						
																																	Ϊl						
	Hold remote control cancellation	_				R		_			_	_	_	_		_			_			3		_	E S			CR L	_	-			+	_	+	_	\perp	_	5
	Peak hold remote control response	Р	\	/ '	4 0	R	LF															3			V H						F CF		f ction b	oina s	 ot to ()EE P	.,		10
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	Peak hold terminal response	L		٠,	4 C	R	LE															3		Р .	vН		0	F F	CR	LE									7
		1-	'	'			_															-	((Res	ponse	with	the C)FF s	tatus i	of the	peak	holo	d funct	tion)					
																																							6
																								- 1	- 1				- 1	f the p	oeak h	nold i	function	on)					
	Peak hold type setting							н С	R LF													6		Y	E S			CRL	F										5
							holo	I.) H C														6		Υ	E S		,	CR L	_										_
		(S	ets '	to th	il ne v	alle	y hol	d.)	` ''													U		١.	- "				'										3
1		Р	\	/ H	4		P '	v C														6		Υ	E S			CRL	F										5
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	Peak hold remote control	Р		/ H				и С														6		Υ	E S			CRL	F										5
		(S	ets	the	pea	k ho	old fu	nctic	n to	ON.)												_			_ _			.	_										_
								F F		(LF OFF.)												7		Y	E S			CRL	-										5
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1		1															1						I.	P '	v	11	L L	6 0	0 0		0 CF	R LF	=						12
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	Peak hold value clear		c					н сі														6		Υ	E S			CRL	F										5
1		(C	ear	s th	e p	eak 	nold	valu H C	e.)													6		Υ	E S		,	CR L	-										5
1		(C	lear	s th	e va	alley	/ hold	d valu	e.)													U		. [٠١3			~ -	1										J
		Р	0		L	ľ	P '	v c	R LF													6		Υ	E S			CRL	F										5
1		(C	lear I	s th	e p	eak/	valle	y hol	d val	ues.)																													
1	Peak hold remote control cancellation	E	Ė	, ו	и ˈc	R,I	LF.	1			- 1											3		Υ .	e¦s			CR L	F.		- 1	1	1 1						5
	-	•	_		_											_	_		_															_		_			

Function	1 2 3 4 5	6 7 8 9 10 11 12 13 14 15 16 17	7 18 19 20 21 22 23 Char. Length	th
Digital zero remote control respon			3	D Z R O F F CR LF 7 (Response with the status of the digital zero function being set to OFF by
				remote control)
				(Response with the status of the digital zero function being set to ON by remote control)
				Note: The main unit responds with the reading when the digital zero function is set to ON,
Digital zero terminal response	E Z A CR LF		3	D Z R O F F CR LF 7
				(Response with the OFF status of the digital zero function) D Z R O N CR LF 6
Di italiana da				(Response with the ON status of the digital zero function) Y E S CR LF 5
Digital zero remote control	(Sets the digital zer		6	
	D Z R O	o function to OFF.)	7	Y E S CR LF 5
		0 0 0 CR LF o function to ON at 1000.)	8	Y E S CR LF 5
Digital zero remote control cancel			3	Y E S CR LF 5
Comparison output remote contro response	R L Y CR LF		3	R L Y O F F CR LF 7 (Response with the status of the comparison output being set to OFF by
				remote control)
				(Response with the status of the comparison output being set to ON for HI by remote control)
				R L Y G O CR LF 6 (Response with the status of the comparison output being set to ON for GO by
				remote control) R L Y L O CR LF 6
				(Response with the status of the comparison output being set to ON for LO by remote control)
Comparison output remote contro		I CR LF	6	Y E S CR LF 5
	(Sets to ON for HI.) R L Y G	O CR LF	6	Y E S CR LF 5
	(Sets to ON for GO	O CR LF	6	Y E S CR LF 5
	(Sets to ON for LO. R L Y O	F F CR LF	7	Y E S CR LF 5
0	(Sets all compariso			Y E S CR LF 5
Comparison output remote contro cancellation			3	
Remote control response	R E A CR LF		3	N O ?
				S T H CR LF 3 (Response with the status of the hold function being remote-controlled)
				P V H CR LF 3 (Response with the status of the peak hold function being remote-controlled)
				D Z R CR LF 3 (Response with the status of the digital zero function being remote-controlled)
				R L Y CR LF 3 (Response with the status of the comparison output function being
				remote-controlled)
MAX/MIN/(MAX-MIN) value respo	se M A X CR LF		3	them with delimiters if multiple functions are being remote-controlled. M A X 5 0 0 . 0 CR LF 9
, , , , , , , , , , , , , , , , , , , ,				(Response with a MAX value)
				(Response with a (MAX-MIN) value)
				with delimiters.
MAX/MIN/(MAX-MIN) value clear	M C L M (Clears the MAX va	A CR LF lue.)	6	Y E S CR LF 5
	M C L M (Clears the MIN val		6	Y E S CR LF 5
	M C L M (Clears the (MAX-N	M CR LF	6	Y E S CR LF 5
Range response (except for thermometers)	R N G CR LF		3	R A N G E 1 2 CR LF 8 (Response with the status of range 12 being selected)
thermometers)				R A N G E 2 4 CR LF 8
				(Response with the status of range 24 being selected) R A N G E 2 A CR LF
				(Response with the status of range 2A being selected)
				(Response with the status of no range being selected)
Range response (thermometers)	R N G CR LF			selection (8 characters max.). K A CR LF 2
g- :porioo (monnotels)				
				CR CR CR CR CR CR CR CR
				(Response with the status of range J being selected) T CR LF 1
				(Response with the status of range T being selected)
				R CR LF 1 (Response with the status of range R being selected)
				S CR LF 1 (Response with the status of range S being selected)
				B CR LF 1 (Response with the status of range B being selected)
				P A CR LF
				P b CR LF 2 (Response with the status of range Pb being selected)
				J P A CR LF
				J P b CR LF
Range setting		2 CR LF	6	Y E S
	(Sets to range 12.) R N G 2	4 CR LF	6	Note: The main unit switches to the range immediately after the setting. Y E S
	(Sets to range 24.) R N G 2	A CR LF	6	Note: The main unit switches to the range immediately after the setting. 5 Y E S
	(Sets to range 2A.) R N G K		6	Note: The main unit switches to the range immediately after the setting. Y E S
	(Sets to range KA.)		5	Note: The main unit switches to the range immediately after the setting. Y E S CR LF
	(Sets to range T.)			Note: The main unit switches to the range immediately after the setting. Y E S
	(Sets to range JPb.			Note: The main unit switches to the range immediately after the setting. N O ? CR LF
				(Response when a nonexistent range is set.)

Function Averaging frequency respo	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 nse A V G CR LF		1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 Char. Length A V G
Avoidging noquoney reope		((Response with the status of the averaging frequency being once.)
			A V G 8 0 CR LF 6 (Response with the status of the averaging frequency being 80 times.)
Averaging frequency settin	g		Y E S
	(Sets the averaging frequency to once.) A V G 8 0 CR LF	6	Y E S CRLF 5
	(Sets the averaging frequency to 80 times.)	1	Note: The main unit switches to the frequency immediately after the setting.
Moving average calculation frequency response	M A V CR LF		M A V O F F CR LF
.,,,			M A V O N = 4 CR LF
		l b	(Response with the status of the moving average calculation frequency being 4 times.)
			M A V O N = 1 6 CR LF
		t	being 16 times.)
Moving average calculation frequency setting	M A V 4 CR LF	5	Y E S CR LF 3
inequency doming	M A V 1 6 CR LF	6	Y E S CR LF 3
	(Sets the moving average calculation frequency to 16 times.) M A V 0 CR LF		Y E S
Step width response	(Cancels moving average calculation (OFF).) S W D CR LF		Note: The main unit switches to the OFF status immediately after the setting. S . W D 1 CR LF 6
Otep widen response		((Response with the status of the step width being 1.)
			S . W D 1 0 CR LF 7 (Response with the status of the step width being 10.)
Step width setting	S W D 1 CR LF	5	Y E S CR LF 5
	(Sets the step width to 1.) S W D 1 0 CR LF	6	Y E S CR LF 5
	(Sets step width to 10.)		Note: The main unit switches to the setpoint immediately after the setting.
Communication function pa response	rrameter R S - CR LF	(1 9 2 0 0 - 7 - E - 2 - C R / L F CR LF 17 (Response with the status of the baud rate being 19200 bps, data length being 7
			bits, parity being even, number of stop bits being 2, and delimiter being CR+LF.) 9 6 0 0 - 8 - N - 1 - C R CR LF 13
		((Response with the status of the baud rate being 9600 bps, data length being 8 bits, parity being none, number of stop bits being 1, and delimiter being CR.)
Communication function pa	rrameter R S - 1 9 2 0 0 - 7 - E - 2 - C R / L F CR LF		oits, parity being none, number of stop bits being 1, and delimiter being CR.) Y E S CR LF
setting	(Sets the baud rate to 19200 bps, data length to 7 bits, parity to even, number of stop bits to		
	2, and delimiter to CR+LF.) R S - 9 6 0 0 - 7 - E - 1 - C R CR LF		Y E S
	(Sets the baud rate to 9600 bps, data length to 8 bits, parity to none, number of stop bits to 1, and delimiter to CR.)	1	Note: The main unit switches to the setpoints immediately after the setting.
Device ID response	A D R CRLF		0 1 CR LF 2
			(Response with the status of the device ID being 01)
		1 1	(Response with the status of the device ID being 99)
Device ID setting	A D R 0 1 CR LF	6	Y E S CR LF 5
	A D R 9 9 CR LF (Sets the device ID to 99.)	6	Y E S CR LF 5
Analog output type respons			A . O U T O F F CR LF 9
		((Response with the status of the analog output type being OFF.)
		((Response with the status of the analog output type being 0-1 V.) 0 - 1 0 CR LF 4
		((Response with the status of the analog output type being 0-10 V.)
			1 - 5 CR LF 3 (Response with the status of the analog output type being 1-5 V.)
			0 - 2 0 CR LF
			4 - 2 0 CR LF 4
		1	(Response with the status of the analog output type being 4-20 mA.)
			(Response with the status of the analog output unit being not installed.) Y E S CR LF 5 5
Analog output type setting	A O P O F F CR LF	7	Y E S
	A O P 0 - 1 1 CR LF (Sets the analog output type to 0-1 V.)	7	Y E S CR LF 5
	A O P 0 - 1 0 CR LF	8	Y E S CR LF 5
	(Sets the analog output type to 0-10 V.) A O P	7	Y E S CR LF 5
	(Sets the analog output type to 1-5 V.) A O P 0 - 2 0 CR LF	8	Y E S CR LF 5
	(Sets the analog output type to 0-20 mA.) A O P 4 - 2 0 CR LF		Y E S CR LF 5
	(Sets the analog output type to 4-20 mA.)		
		((Response with the status of the analog output unit being not installed.)
Digital zero backup status	response B D Z CR LF		B D Z ON CRLF 6 (Response with the status of digital zero backup being ON.)
		[B D Z O F F CR LF 7
Digital zero backup control	B D Z O N CR LF	1	(Response with the status of digital zero backup being OFF.) Y E S CR LF 5
Digital Zelo backup control	(Sets digital zero backup to ON.)		
	B D Z O F F CR LF (Sets digital zero backup to OFF.)	7	Y E S CR LF 5
Digital zero data save com	mand S A V CR LF	3	Y E S CR LF 5
			N O ? CR LF 5
lonut c=!==ti==		((Response with the status of digital zero backup being OFF.)
Input selection response			O . C CR LF 3 (Response with the status of the input selection option being "open collector.")
		(L O G CR LF 3 (Response with the status of the input selection option being "logic.")
			M A G CR LF 3 (Response with the status of the input selection option being "magnet.")
			N O ? 5
			(Response with the status of the frequency measurement unit not being installed.)
Input selection setting	I S E L O . C CR LF		Y E S CR LF 5
	(Sets the input selection option to "open collector.") I S E L L O G CR LF	8	Y E S CR LF 5
	(Sets the input selection option to "logic.")		
	I S E L M A G CR LF (Sets the input selection option to "magnet.")		Y E S CR LF 5
			N O ? CRLF 5 (Response with the status of the frequency measurement unit not being
			installed.)