

PAPERLESS RECORDER (model: 73VR3100)

REMOTE MODE

Reference Manual

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INTRODUCTION

Thank you for choosing M-System's Paperless Recorder Model: 73VR3100 ('73VR' or 'the device' in this manual).

The 73VR3100 Remote Mode, in combination with the R3 Series Network "Gateway" Interface Modules, enables a PLC to control the recorder operation and to send data for local display and recording.

This manual will explain the device setting and PLC commands specific to Remote Mode. Please read this manual carefully to ensure the safe use before getting started.

The descriptions in this manual are applied to the 73VR3100 Version 6 or later.

TERMINOLOGY

- Input channel:** I/O module channel defined by slot assignment and data allocation DIP switch setting.
Refer to "4.5. Pen setting" and "4.6. Pens assigned to functions" in the 73VR3100 Users Manual (EM-7397-B) for detailed information.
- Output channel:** I/O module channel defined by slot assignment and data allocation DIP switch setting, used for alarm output.
Refer to "4.5. Pen setting" and "4.6. Pens assigned to functions" in the 73VR3100 Users Manual (EM-7397-B) for detailed information.
- Input pen:** Pen number defined in "PEN SETTING (COMMON)" and "PEN SETTING (INPUT)."
Refer to "4.5. Pen setting" and "4.6. Pens assigned to functions" in the 73VR3100 Users Manual (EM-7397-B) for detailed information.
- Function pen:** Pen number defined in "PEN SETTING (COMMON)" and "PEN SETTING (FUNCTION)."
Refer to "4.5. Pen setting" and "4.6. Pens assigned to functions" in the 73VR3100 Users Manual (EM-7397-B) for detailed information.
- Display pen:** Pen displayed in Trend, Bargraph and Retrieve views. Set for each view (Group 1 to 4).
Refer to the sections 7.1.5, 7.3.4 and 7.4.2 in the 73VR3100 Users Manual (EM-7397-B) for menu control key functions of each view.
- Started:** The state where the 'Start' button located on the 73VR3100 screen is touched on. With 'normal' storing setting, recording is in progress. With other conditional storing settings, recording may not be in progress.
- Stopped:** The state where the 'Stop' button located on the 73VR3100 screen is touched on. Recording is stopped.

1. GENERAL DESCRIPTIONS

1.1 FUNCTIONS & FEATURES

The 73VR3100 Remote Mode enables the following functions by utilizing virtual slot No. 5 through 7 (input channel 65 through 112) created by the R3 Series Network “Gateway” Interface Modules and by exchanging commands/responses through an open network:

- Host PLC can send a command via open field network and control the 73VR3100 operation to start/stop recording and to change recording conditions.
- Data sent from the host PLC can be displayed and recorded.
- The R3 Series I/O modules can be added to display and record field data.
- Discrete output modules can be added for local alarm outputs.

■ OPERATION COMMANDS

CATEGORY	COMMAND	COMMAND No.
Record	Start / Stop	1
	Switch Record views	2
	Switch group	3
	Switch scale bar	4
	Show large digital display	5
	Switch to Record (data display) view	6
	Switch to Retrieve (past data) view	
	Switch to Alarm History	
	Switch to Comment History	
	Set comment	7
	Select pens	8
	Enable / Disable remote mode	9
	Show digital display	N/A
	Insert/Remove CF Card	N/A
	Write comment directly	N/A
Cancel screen saver	N/A	
Retrieval	Switch group	21
	Select pens	22
	Switch scale bar	23
	Page Up	24
	Page Down	
	1/4 Up	
	1/4 Down	
	Search data	25
Back to Record view	6	
Alarm History Comment History	Oldest	41
	Newest	
	Page Up	
	Page Down	
	1/4 Up	
	1/4 Down	
	Search data	42
	Acknowledge all	43
	Auto update	44
	Back to Record view	6
Jump	N/A	
Read Status *1	Read status	90
	Read registers	91
	Read engineering unit values	92

*1. Read Status commands are available only for Remote Mode, thus cannot be used on the 73VR3100 device.

■ SETTING COMMANDS

CATEGORY	COMMAND	NO.	MDFY
Setting mode	Enable / Disable	101	Y
System	Operating mode	102	N
	Temperature unit		N
	Start mode		N
	Data storing form		N
	Data overwrite	103	N
	Screen saver		Y
	Touch panel beep	104	Y
	Date and time		N
	Password	N/A	N
	IP address	105	N
	Subnet mask		N
	Default gateway		N
	Linger time		N
	Data storing method	Storing interval	121
Storing setting		N	
Trigger signal, Discrete / Analog		N	
Threshold		N	
Condition		N	
Pen number		N	
One time only / Every day		N	
Date-time		N	
Time duration	N		
Display	Chart speed	141	N
	Chart direction	142	Y
	Digital display type		Y
	Digital display		Y
	Data file used volume		Y
	Display pen number		Y
	Display pen number (OV)		Y
	Auto pen switching		Y
Chart color	Y		
Error output	Enable / Disable	151	N
Pen (common)	Enable / Disable	181	N
	Analog / Discrete		N
	Channel No.		N
	Tag name		N
	Unit	N	
	Color	Y	
	Line thickness	182	Y
Decimal place	Y		
Pen (input)	Analog type	201	N
	Input range		N
	Eng. range		N
	Plot position	202	Y
	Scale shift		Y
	Normal / Log	201	N
	Logarithmic exponential scale		N
	Plot position exponent	202	Y
	Square root	201	N
	Overview color	202	Y

CATEGORY	COMMAND	NO.	MDFY	
Pen (function)	Function	221	N	
	Input (X1, X2)		N	
	Input (X3)		N	
	Coefficient (K1, K2)		N	
	Constant (A1, A2)		N	
	Constant (A3)		N	
	Initial value		N	
	Plot position		202	Y
	Scale shift			Y
	Normal / Log		221	N
	Logarithmic exponential scale			N
	Plot position exponent		202	Y
	Overview color			Y
	OFF description		221	N
ON description	N			
Analog alarm	Limit / deadband 1	241	Y	
	Limit / deadband 2		Y	
	Limit / deadband 3		Y	
	Limit / deadband 4		Y	
	Normal zone		Y	
	Zone color 0 to 4		Y	
	Relay 1 to 4, Enable / Disable		Y	
	Relay 1 to 4 output		Y	
	Up message (0-1), Enable / Disable		242	Y
	Up message (1-2), Enable / Disable			Y
	Up message (2-3), Enable / Disable			Y
	Up message (3-4), Enable / Disable			Y
	Up message (0-1)			Y
	Up message (1-2)			Y
Up message (2-3)	Y			
Up message (3-4)	Y			
Down message (1-0), Enable / Disable	Y			
Down message (2-1), Enable / Disable	Y			
Down message (3-2), Enable / Disable	Y			
Down message (4-3), Enable / Disable	Y			
Down message (1-0)	Y			
Down message (2-1)	Y			
Down message (3-2)	Y			
Down message (4-3)	Y			
Discrete alarm	OFF output, Enable / Disable	243	Y	
	ON output, Enable / Disable		Y	
	OFF output delay		Y	
	ON output delay		Y	
	Normal state		Y	
	OFF color		Y	
	ON color		Y	
	OFF output channel		Y	
	ON output channel		Y	
	OFF message, Enable / Disable		Y	
	ON message, Enable / Disable		Y	
	OFF message		Y	
	ON message		Y	
	Comment		Comment direct input	261
Group name		Y		
Group color		Y		
Comment		262	Y	
Auto write in			Y	
Trigger signal, Discrete / Analog			Y	
Threshold			Y	
Condition			Y	
Pen number	Y			

■ LIMITATION OF REMOTE MODE

- Remote Mode is not applicable for Storing Interval of 20 msec. and 100 msec.
- Remote Mode is not usable in DEMO mode which does not use network communication.

1.2 DEVICE SETTING

■ GATEWAY MODULES

MODEL	NETWORK	SLOT LOCATION*1	REMARKS
R3-GE1	Modbus/TCP	1 to 4	Data allocation mode must be set so that all slots following the module location are valid up to Slot 7.
R3-GM1	Modbus RS-485	1 to 4	
R3-GFL1	FL-net	1 to 4	Set the data allocation mode to 7 when the module is mounted at Slot 1. Set the mode to 4 when it is mounted at Slot 4.
R3-GC1	CC-Link (Ver 2.00)	1 to 4	Set the cyclic expansion to 8 when the module is mounted at Slot 1 thr. 3. Set the cyclic expansion to 4 when it is mounted at Slot 4. (Function not available with Ver 1.10.)
R3-GD1	DeviceNet	4	Only Slot 4 is usable. Set data allocation mode to 4.

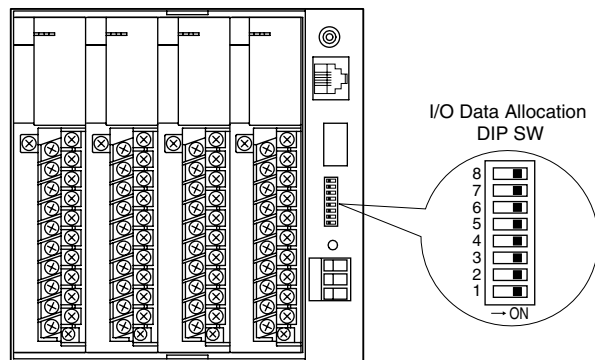
*1. Vacant slots of the numbers smaller than the one mounted with the gateway module are available for I/O modules.

■ 73VR3100 DIP SWITCH SETTING

Turn on all switches of I/O data allocation DIP SW at the rear side of the 73VR3100. Slot 5 through 7 are automatically set to 16 channels. Analog channels are assigned to each slot as below:

- Slot 1 : Channel 1 to 16
- Slot 2 : Channel 17 to 32
- Slot 3 : Channel 33 to 48
- Slot 4 : Channel 49 to 64
- Slot 5 : Channel 65 to 80
- Slot 6 : Channel 81 to 96
- Slot 7 : Channel 97 to 112

• 73VR3100 Rear View



■ I/O MODULES

Vacant slots are available for the R3 Series I/O modules for field input data recording and alarm outputs. Slot numbers smaller than the one mounted with the gateway module are usable.

[Channel Assignment Example]

- Slot 1 : R3-SV4 (4-point DC voltage input module) → Input channel 1 to 4 (5 to 16 invalid)
- Slot 2 : R3-DA16 (16-point discrete input module) → Input channel 65 to 80 (81 to 128 invalid)
- Slot 3 : R3-DC16 (16-point discrete output module) → Output channel 129 to 144 (145 to 192 invalid)
- Slot 4 : R3-GM1 (Modbus gateway module) → Input channel 49 to 64

Assign field I/O data to the above channels of the 73VR pens.

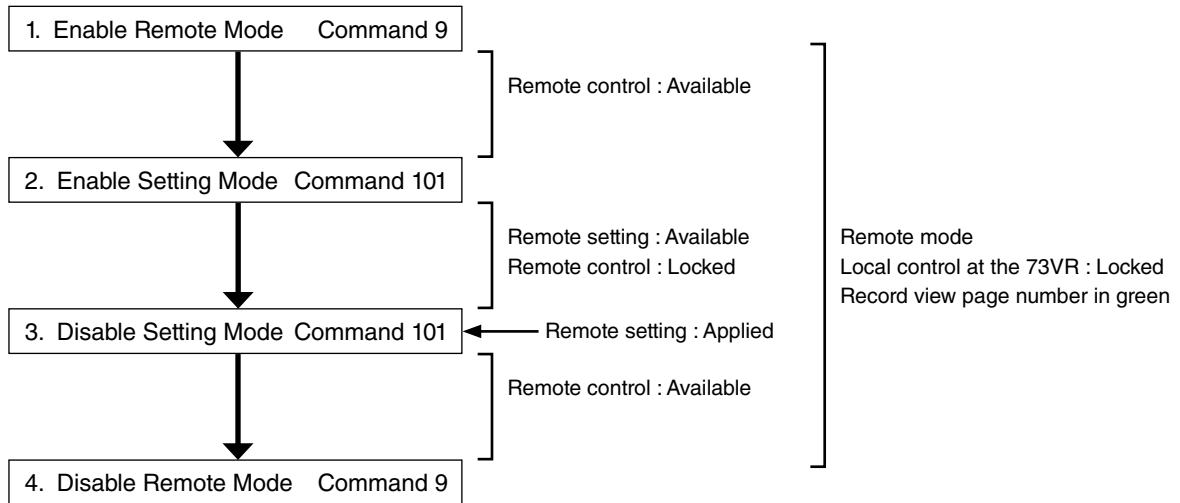
Data transmitted from the host device (PLC) is provided to Slot 4. Assign the above channels for Slot 4 to plot and record these signals.

CAUTION !

Channels 65 through 112 are used for transmitting/receiving control and setting data via network, however, addresses (registers) allotted for use by the host depend upon the slot position of the gateway module. User must have good understanding of the relations between the physical module position and register assignment in order to be able to write and read data remotely.

1.3 OPERATION / SETTING FLOW VIA NETWORK

■ OPERATION / SETTING FLOW



1. Enable Remote Mode

- Enable Remote Mode command is usable only when the 73VR shows Record view.
- Once the 73VR has received the command successfully, local operation is locked except for CF card's hot swapping.
- The 73VR Record view page number character is turned green after the command has been received.

2. Enable Setting Mode

- Enable Setting Mode command is usable only when Remote Mode is on.
- Certain parameters are not modifiable during recording. Refer to 1.1. Functions and features > Table: Setting commands.

3. Disable Setting Mode

- The 73VR applies newly modified setting when Disable Setting Mode command is received. Only date and time setting is updated when the specific command is received.

4. Disable Remote Mode

- If the 73VR receives Disable Remote Mode command before Disable Setting Mode, it quits the mode without applying any modified setting.
- The 73VR Record view page number is back to white color after the command has been received.

CAUTION !

Remote set parameters are stored temporarily in the 73VR and not applied until the setting mode is disabled. Read Status command during the setting mode can obtain only those already applied to the 73VR. If you want to confirm new setting during a series of setting process, quit the setting mode at each setting step.

■ COMMAND / RESPONSE FORMAT

Command (PLC to 73VR)

CH	CONTENTS
65	Sequence No.
66	Command No.
67 : 111	Operation / Setting data of the specified command number
112	Sequence No.

Response (73VR to PLC)

CH	CONTENTS
65	Sequence No.
66	Command No.
67 : 111	Operation / Setting response for the specified command number
112	Sequence No.

- Ch. 65 : Sequence No. Indicates that a new command is written. (0 to 10000)
Returns to 0 when overflow.
The PLC sets a value by 1 increment every time a command is sent.
The 73VR does not start processing at the startup if the value equals 0.
- Ch. 66 : Command No. Indicates the type of operation or setting.
The 73VR returns the same command No. in its response in normal conditions, sets +0x8000 in an abnormality.
- Ch. 67 to 111 : Data Data for operation or setting
- Ch. 112 : Sequence No. The PLC sets the same number as in Ch. 65, preventing parting of the data.
The 73VR does not start processing the command if Ch. 65 and Ch. 112 values do not match. Be sure to set Ch. 112 after all data for Ch. 67 through 111 are set.

■ CHARACTER CODE

Use ASCII code when setting pens' tag names, alarm messages, comments, etc.

■ ENGINEERING UNIT DATA MANAGEMENT

The gateway module handles 16-bit integer data. To handle engineering unit data (including a decimal point), the following method is used:

- 1) An engineering unit value is described with two parts: the mantissa (signed 16-bit data, -32768 to 32767) and the exponent (signed 16-bit data, -9 to 9).
- 2) The 73VR obtains the original engineering unit value using the following equation:

$$\text{Engineering unit value} = (\text{Mantissa} / 10000) \times 10^{\text{Exponent}}$$

[Example] -123.4 : Mantissa = -12340 and Exponent = 2

- 3) The 73VR stores the engineering unit data in 6-digit characters. A value exceeding 6 characters is rounded down.

[Example] -123.45 : Mantissa = -12345 and Exponent = 2

'-123.45' has 7 characters and is rounded down to the exponential expression '-1e+2.'

In order to maintain the maximum of significant figures, the same value should be described as '-123.4' (Mantissa = -12340 and Exponent = 2).

■ COLOR CODE

Use color codes assigned to each of available 48 colors when setting colors for pens, alarm zones and comments. User's own color chart cannot be used.

The color codes corresponding to the color chart are as shown below.

Code	Color Chart							
1 ... 8								
9 ... 16								
17 ... 24								
25 ... 32								
33 ... 40								
41 ... 48								

2. OPERATION COMMANDS

2.1 START / STOP

Command No. 1 (Remote Mode)

Used to start / stop recording of the 73VR.

- Host → 73VR

Data 1 : -1: Status confirmation, 1: Stop, 2: Start

- 73VR → Host

Normal | Data 1 : 1: Stop, 2: Started

Error | Data 1 : 1: Stop, 2: Started (Status of 73VR in error)

- Example: Start

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	123
66	Command No.	1
67	Data 1	2
112	Sequence No.	123

- Error

- The 73VR sends back command No. 0x8001 when the operation is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is in Remote Setting mode or when it is not in Record view.
- Sending Start command when the 73VR has been already started or sending Stop command when it has been stopped is not an error.

2.2 SWITCH RECORD VIEWS

Command No. 2 (Remote Mode)

Used to switch among Record display views (Trend, Overview, Bargraph).

- Host → 73VR

Data 1 : -1: Status confirmation, 1: Trend, 2: Overview, 3: Bargraph

- 73VR → Host

Normal | Data 1 : 1: Trend, 2: Overview, 3: Bargraph

Error | Data 1 : -1: Operation unavailable, 1 to 3: Parameter error (View No.)

- Example: Switch to Trend View

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	124
66	Command No.	2
67	Data 1	1
112	Sequence No.	124

- Error

- The 73VR sends back command No. 0x8002 when the operation is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is in Remote Setting mode or when it is not in Record view. (Error with views other than Trend, Overview or Bargraph (e.g. Retrieve, Alarm History or Comment History))

2.3 SWITCH GROUP

Command No. 3 (Remote Mode)

Used to switch the display groups in Trend, Overview, Bargraph views. (See Command 21 for Retrieve views.)

- Host → 73VR

Data 1 : -1: Status confirmation
1 to 4 (max.): Group No. for Trend, Bargraph
1 to 64 (max.): Group No. for Overview
(Selectable Group No. range depends upon setting.)

- 73VR → Host

Normal | Data 1 : Present or selected Group No.
Error | Data 1 : -1: Operation unavailable, Group No.: Parameter error

- Example: Switch to Group 1

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	125
66	Command No.	3
67	Data 1	1
112	Sequence No.	125

- Error

- The 73VR sends back command No. 0x8003 when the operation is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is in Remote Setting mode or when it is not in Record view. (Error with views other than Trend, Overview or Bargraph (e.g. Trend Retrieval, Alarm History or Comment History))
- Parameter error when a Group No. exceeding the maximum possible number is specified.

2.4 SWITCH SCALE BAR

Command No. 4 (Remote Mode)

Used to switch the scale bar type in Trend or Bargraph view.

- Host → 73VR

Data 1 : -1: Status confirmation
0: Standard scale
1 to 8 (max.): Pen No. for the scale

- 73VR → Host

Normal | Data 1 : 0: Standard scale or specified Pen No.
Error | Data 1 : -1: Operation unavailable, Pen No.: Parameter error (0 with standard scale)

- Example: Switch to the scale for Pen 1

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	126
66	Command No.	4
67	Data 1	1
112	Sequence No.	126

- Error

- The 73VR sends back command No. 0x8004 when the operation is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is in Remote Setting mode or when it is not in Record view. (Error with views other than Trend, Overview or Bargraph (e.g. Retrieve, Alarm History or Comment History))
- Selectable Pen No. range depends upon setting. Error is sent when the specified Pen No. is greater than the maximum possible value, or invalid one.

- Note

- Refer also to 2.12. Switch scale bar (retrieval).

2.5 SHOW LARGE DIGITAL DISPLAY

Command No. 5 (Remote Mode)

Used to show the large digital display in Trend, Overview, Bargraph views.

- Host → 73VR

Data 1 : -1: Status confirmation
0: Back to normal view
1 to 8 (max.): Pen No. for Trend, Bargraph
1 to 16 (max.): Pen No. for Overview
(Selectable Pen No. range depends upon setting.)

- 73VR → Host

Normal | Data 1 : Specified Pen No. (0 when the normal view is returned.)
Error | Data 1 : -1: Operation unavailable, Pen No.: Parameter error

- Example: Switch to Pen No. 1 large digital display

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	127
66	Command No.	5
67	Data 1	1
112	Sequence No.	127

- Error

- The 73VR sends back command No. 0x8005 when the operation is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is in Remote Setting mode or when it is not in Record view. (Error with views other than Trend, Overview or Bargraph (e.g. Trend Retrieval, Alarm History or Comment History))
- Error is sent when an out-of-range or invalid value is set at Data 1 (e.g. Effective pen number = 1, Overview display pen = 2, Pen No. 2 : Error)

- Caution

- Setting an out-of-range value as pen number in Overview is not handled as error but the pen shown in the large digital display in this case may not be as expected. (e.g. Effective pen number = 16, Overview display group = 2, Pen No. 17 : Group 3 top pen is shown.)

2.6 SWITCH VIEW – Record, Retrieve, Alarm History and Comment History

Command No. 6 (Remote Mode)

Used to switch among Record, Retrieval, Alarm History and Comment History views.

- Host → 73VR

Data 1 : -1: Status confirmation
0: Record, 1: Retrieve, 2: Alarm History, 3: Comment History

- 73VR → Host

Normal | Data 1 : 0 to 3: Specified view type
Error | Data 1 : -1: Operation unavailable, View type No.: Parameter error

- Example: Switch to Retrieve view

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	128
66	Command No.	6
67	Data 1	1
112	Sequence No.	128

- Error

- The 73VR sends back command No. 0x8006 when the operation is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is in Remote Setting mode.
- Specifying a view type No. which the 73VR is presently showing is not an error.

2.7 SET COMMENT

Command No. 7 (Remote Mode)

Used to enter a present comment. (Only Group 7 is available with free comment entry. Max. 30 characters)

• Host → 73VR

Data 1 : Comment group (1 to 7)
 Data 2 : Comment number (1 to 8)
 Data 3 : Comment, 1st character (valid with Group 7)
 : :
 Data 32 : Comment, 30th character (valid with Group 7)

- Preset comments can be confirmed and changed with Remote Setting mode.
- With Group 7 (free entry), a preset comment is used when Data 3 is set with 0 (Null).
- With Group 7, a new comment is set when Data 3 is set with a value other than 0 (Null).
- With Group 7, if one of data 4 or following data is set with 0 (Null), all data following the one is ignored.
- Use ASCII code characters for comments.

• 73VR → Host

Normal | Data 1 : Comment group (1 to 7)
 Data 2 : Comment number (1 to 8)
 Data 3 : Comment, 1st character (valid with Group 7) ... ASCII code or 0: No setting (Null)
 : :
 Data 32 : Comment, 30th character (valid with Group 7) ... ASCII code or 0: No setting (Null)

Error | Data 1 : Comment group
 Data 2 : Comment number
 Data 3 : -1: Operation unavailable
 -2: Parameter error (including when an undefined comment is specified)

• Example: Set "STOP" at Comment Group 7, Comment number 1.

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	129
66	Command No.	7
67	Data 1	7
68	Data 2	1
69	Data 3	0x0053 (S)
70	Data 4	0x0054 (T)
71	Data 5	0x004F (O)
72	Data 6	0x0050 (P)
73	Data 7	0x0
112	Sequence No.	129

• Error

- The 73VR sends back command No. 0x8007 when the operation is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is in Remote Setting mode, or when it is NOT in recording.
- Error when an undefined comment is specified.

• Note

- Comments can be set only while the 73VR is recording. Comment entry is unavailable when the 73VR is in standby status for Remote Trigger, Event Trigger or Time Specified recording setting.

2.8 SELECT PENS

Command No. 8 (Remote Mode)

Used to specify pen assignment for Trend and Bargraph views.

- Host → 73VR

Data 1 : Pen group (1 to 4, 101 to 104) (101 to 104 for status confirmation)
 Data 2 : Input No. for Pen 1
 (-1: Disable, 1 to 128: Input No., 65 to 128 assigned for Function Pen 1 to 64)
 Data 3 : Input No. for Pen 2 (-1, 1 to 128)
 : :
 Data 9 : Input No. for Pen 8 (-1, 1 to 128)

- 73VR → Host

Normal | Data 1 : Pen group (1 to 4, 101 to 104)
 Data 2 : Input No. for Pen 1 (-1, 1 to 128)
 Data 3 : Input No. for Pen 2 (-1, 1 to 128)
 : :
 Data 9 : Input No. for Pen 8 (-1, 1 to 128)

Error | Data 1 : Pen group No. (1 to 4, 101 to 104)
 Data 2 : Input No. for Pen 1 (-1, 1 to 128)
 Data 3 : Input No. for Pen 2 (-1, 1 to 128)
 : :
 Data 9 : Input No. for Pen 8 (-1, 1 to 128)

- Normal parameters are valid even if invalid data is contained in other parameters.

- Example: Set Group 2, Pen 1 to Input 1, Pen 2 to Input 2, Pen 3 to Function 1, Pen 4 to Function 2 (display pen number set to 4)

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	130
66	Command No.	8
67	Data 1	2
68	Data 2	1
69	Data 3	2
70	Data 4	65
71	Data 5	66
112	Sequence No.	130

- Error

- The 73VR sends back command No. 0x8008 when the operation is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is in Remote Setting mode, or when it is NOT in Trend or Bargraph view.
- The 73VR ignores abnormal parameters (invalid Pen No.).

- Note

- Data sets exceeding the possible number of display pens are ignored. (The 73VR sends back '-1' if status confirmation is requested.)

2.9 ENABLE / DISABLE REMOTE MODE

Command No. 9

Used by the host device to turn on and off the remote mode.

- Host → 73VR

Data 1 : -1: Status confirmation, 1: Disable, 2: Enable

- 73VR → Host

Normal | Data 1 : 1: Disable, 2: Enable

Error | Data 1 : -1: Operation unavailable or parameter error

- Example: Disable the remote mode.

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	131
66	Command No.	9
67	Data 1	1
112	Sequence No.	131

- Error

- The 73VR sends back command No. 0x8009 when the operation is unavailable or when the parameter is in error.
- 'Enable' operation is unavailable when the 73VR is NOT in Record view. 'Disable' operation is always available.

- Caution

- If Remote Mode is disabled while the 73VR is in Remote Setting mode, it quits the setting mode without applying new settings.

- Note

- When Remote Mode is activated, local operation of the 73VR are limited to:

- 1) Cancel screen saver mode by touching over the screen
- 2) Call digital value indicator by touching over the screen
- 3) Hot swapping CF card

2.10 SWITCH GROUP (RETRIEVE)

Command No. 21 (Remote Mode)

Used to switch the display groups in Retrieve views. (See Command No. 3 for Record views.)

- Host → 73VR

Data 1 : -1: Status confirmation
1 to 4: Group number

- 73VR → Host

Normal | Data 1 : Present or selected Group number
Error | Data 1 : -1: Operation unavailable, Group number: Parameter error

- Example: Switch to Group 1

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	132
66	Command No.	21
67	Data 1	1
112	Sequence No.	132

- Error

- The 73VR sends back command No. 0x8015 when the operation is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is in Remote Setting mode, or when it is NOT in Retrieve view.

- Note

- Group of which no display pen is assigned can be specified.

2.11 SELECT PENS (RETRIEVE)

Command No. 22 (Remote Mode)

Used to specify pen assignment for Retrieve views.

Input/function pen numbers must be renumbered to the smallest. (See Note)

Setting exceeding available display points is invalid.

• Host → 73VR

Data 1 : Group number (1 to 4, 101 to 104) (101 to 104 for status confirmation)
 Data 2 : Renumbered input/function No. for Pen 1
 (-1: No setting, 1 to 128: Input No., 65 to 128 assigned for Function Pen 1 to 64)
 Data 3 : Renumbered input/function No. for Pen 2 (-1, 1 to 128)
 : :
 Data 9 : Renumbered input/function No. for Pen 8 (-1, 1 to 128)

• 73VR → Host

Normal | Data 1 : Group number (1 to 4, 101 to 104)
 Data 2 : Renumbered input/function No. for Pen 1 (-1, 1 to 128)
 Data 3 : Renumbered input/function No. for Pen 2 (-1, 1 to 128)
 : :
 Data 9 : Renumbered input/function No. for Pen 8 (-1, 1 to 128)

Error | Data 1 : Pen group No. (1 to 4, 101 to 104)
 Data 2 : Renumbered input/function No. for Pen 1 (-1, 1 to 128)
 Data 3 : Renumbered input/function No. for Pen 2 (-1, 1 to 128)
 : :
 Data 9 : Renumbered input/function No. for Pen 8 (-1, 1 to 128)

• Example: Set Group 2, Pen 1 to Input 1, Pen 2 to Input 2, Pen 3 to Function 1, Pen 4 to Function 2

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	133
66	Command No.	22
67	Data 1	2
68	Data 2	1
69	Data 3	2
70	Data 4	65
71	Data 5	66
112	Sequence No.	133

• Error

- The 73VR sends back command No. 0x8016 when the operation is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is in Remote Setting mode, or when it is NOT in Retrieve view.
- The 73VR ignores abnormal parameters (invalid Pen No.).

• Note

- Pen numbers must be renumbered to the smallest. For example, when the input pen No. 1, 2, 4 are valid (3 is invalid), specify Input No. 3 instead of 4.
- Data sets exceeding the possible number of display pens are ignored. (The 73VR does not send back an error code.)

• Caution

- Pen assignment of Trend view and Retrieve view may not match. Be sure to confirm the present pen assignment before changing setting.

2.12 SWITCH SCALE BAR (RETRIEVE)

Command No. 23 (Remote Mode)

Used to switch the scale bar type in Retrieve view.

- Host → 73VR

Data 1 : -1: Status confirmation
0: Standard scale
1 to 8 (max.): Pen No. of the scale

- 73VR → Host

Normal | Data 1 : 0: Standard scale or specified Pen No.
Error | Data 1 : -1: Operation unavailable, Pen No.: Parameter error

- Example: Switch to the scale for Pen 1

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	134
66	Command No.	23
67	Data 1	1
112	Sequence No.	134

- Error

- The 73VR sends back command No. 0x8017 when the operation is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is in Remote Setting mode, or when it is NOT in Retrieve view.
- Selectable Pen No. range depends upon setting. Error is sent when the specified Pen No. is greater than the maximum possible value, or invalid one.

- Caution

- Pen assignment of Trend view and Retrieve view may not match. Be sure to confirm the present pen assignment before changing setting.

2.13 PAGE UP / PAGE DOWN (RETRIEVE)

Command No. 24 (Remote Mode)

Used to move the trend chart forward or back by page or by 1/4 page.

- Host → 73VR

Data 1 : 1: 1 page Up
 2: 1 page Down
 3: 1/4 page Up
 4: 1/4 page Down

- 73VR → Host

Normal | Data 1 : 1 to 4 as specified in the command
Error | Data 1 : -1: No more page to scroll, -2: Operation unavailable, 1 to 4: Page error

- Example: 1/4 page Down

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	135
66	Command No.	24
67	Data 1	4
112	Sequence No.	135

- Error

- The 73VR sends back command No. 0x8018 when the operation is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is in Remote Setting mode, or when it is NOT in Retrieve view.
- Data 1 other than 1, 2, 3, 4

2.14 SEARCH DATA (RETRIEVE)

Command No. 25 (Remote Mode)

Used to search data in Retrieve view.

Input/function pen numbers must be renumbered to the smallest. (See Note)

- Host → 73VR

Data 1	:	1: Specific date/time, 2: Maximum value, 3: Minimum value	
Data 2	:	Specific date/time: Year (YY)	Maximum/Minimum value: Start Year (YY)
Data 3	:	Specific date/time: Month	Maximum/Minimum value: Start Month
Data 4	:	Specific date/time: Day	Maximum/Minimum value: Start Day
Data 5	:	Specific date/time: Hour	Maximum/Minimum value: End Year (YY)
Data 6	:	Specific date/time: Minute	Maximum/Minimum value: End Month
Data 7	:	Specific date/time: Second	Maximum/Minimum value: End Day
Data 8	:	Not used	Maximum/Minimum value: Pen No. 1 to 128 (max.)

- 73VR → Host

Normal		Specific date/time	Data 1...7	: Identical to the command
		Maximum/Minimum value	Data 1...8	: Identical to the command

Error		Parameter error	Data 1	: -1, Identical to the command for Data 2 to 7 (or 8)
		Operation unavailable	Data 1	: -2, Identical to the command for Data 2 to 7 (or 8)

- Example: Search data of July 14, 2010, at 17:15:35

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	136
66	Command No.	25
67	Data 1	1
68	Data 2	10
69	Data 3	7
70	Data 4	14
71	Data 5	17
72	Data 6	15
73	Data 7	35
112	Sequence No.	136

- Error

- The 73VR sends back command No. 0x8019 when the operation is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is in Remote Setting mode, or when it is NOT in Retrieve view.

- Note

- 'Search Next' function for Max/Min value is unavailable in Remote mode.
- Pen numbers must be renumbered to the smallest. For example, when the input pen No. 1, 2, 4 are valid (3 is invalid), specify Input No. 3 instead of 4.
- If no data exists at the specified date/time, the 73VR searches for the nearest available data without alerting an error.

2.15 OLDEST, NEWEST, PAGE UP/DOWN, 1/4 UP/DOWN (ALARM HISTORY / COMMENT HISTORY)

Command No. 41 (Remote Mode)

Used to search data and control pages in Alarm History and Comment History views.

- Host → 73VR

Data 1 : 1: Oldest
 2: Newest
 3: 1 page Up
 4: 1 page Down
 5: 1/4 page Up
 6: 1/4 page Down

- 73VR → Host

Normal | Data 1 : 1 to 6 as specified in the command
 Error | Data 1 : -1: Parameter error, -2: Operation unavailable

- Example: Search the newest data

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	137
66	Command No.	41
67	Data 1	2
112	Sequence No.	137

- Error

- The 73VR sends back command No. 0x8029 when the operation is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is in Remote Setting mode, or when it is NOT in Alarm History or Comment History view.
- Parameter error when Auto Update is enabled in Alarm History or Comment History view.
- Data 1 other than 1...6

- Caution

- The 73VR sends normal response even when there is no more pages to go forward/back.

2.16 SEARCH DATA (ALARM HISTORY / COMMENT HISTORY)

Command No. 42 (Remote Mode)

Used to search data of a specific date/time in Alarm History or Comment History view.

- Host → 73VR

Data 1 : 00 to 99: Year (YY)
Data 2 : 1 to 12: Month
Data 3 : 1 to 31: Date

- 73VR → Host

Normal | Data 1...3 : Identical to the command

Error | Data 1 : -1: Parameter error, -2: Operation unavailable
Data 2...3 : Identical to the command

- Example: Search data of July 14, 2010

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	138
66	Command No.	42
67	Data 1	10
68	Data 2	7
69	Data 3	14
112	Sequence No.	138

- Error

- The 73VR sends back command No. 0x802A when the operation is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is in Remote Setting mode, or when it is NOT in Alarm History or Comment History view.
- Parameter error when Auto Update is enabled in Alarm History or Comment History view, when out-of-range value is sent in Data 1...3.

- Note

- If the specified date/time is older than the oldest stored data, the 73VR shows the oldest available data.
- If the specified date/time is newer than the newest stored data, the screen does not change. The 73VR sends a normal response.

2.17 ACKNOWLEDGE ALL (ALARM HISTORY)

Command No. 43 (Remote Mode)

Used to acknowledge all alarm events in Alarm History view.

- Host → 73VR

Data 1 : 1: Acknowledge all

- 73VR → Host

Normal | Data 1 : Identical to the command

Error | Data 1 : -1: Parameter error, -2: Operation unavailable

- Example: Acknowledge all alarm events

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	139
66	Command No.	43
67	Data 1	1
112	Sequence No.	139

- Error

- The 73VR sends back command No. 0x802B when the operation is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is in Remote Setting mode, or when it is NOT in Alarm History view.

2.18 AUTO UPDATE (ALARM HISTORY / COMMENT HISTORY)

Command No. 44 (Remote Mode)

Used to enable/disable automatic update of Alarm History and Comment History.

- Host → 73VR

Data 1 : -1: Status confirmation, 1: Disable auto update, 2: Enable auto update

- 73VR → Host

Normal | Data 1 : 1: Disable auto update, 2: Enable auto update

Error | Data 1 : -1: Parameter error, -2: Operation unavailable

- Example: Enable auto update

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	140
66	Command No.	44
67	Data 1	2
112	Sequence No.	140

- Error

- The 73VR sends back command No. 0x802C when the operation is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is in Remote Setting mode, or when it is NOT in Alarm History or Comment History view.

- Note

- There is no visible change on the screen of the 73VR at the moment of this command. New record is automatically added on the screen when such (alarm/comment) events occur.
- Scroll (Command 41) or Search (Command 42) is not available while the auto update function is enabled.

2.19 READ STATUS

Command No. 90

Used to read status of the 73VR.

- Host → 73VR

Command No.

- 73VR → Host

Normal | Data 1 : 1: Remote mode disabled, 2: Remote mode enabled

Data 2 : 1: Remote Setting mode disabled, 2: Remote Setting mode enabled

- Example: Read status (Remote mode enabled, Remote Setting mode disabled)

Host → 73VR (command)

CH	CONTENTS	EXAMPLE
65	Sequence No.	141
66	Command No.	90
112	Sequence No.	141

73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	141
66	Command No.	90
67	Data 1	2
68	Data 2	1
112	Sequence No.	141

- Note

· The command is available as far as the device is connected correctly.

2.20 READ REGISTERS

Command No. 91

Used to read raw input data (before scaling) regardless of the input pen assignments.

- Host → 73VR

Data 1 : 1: Input channels (analog) 1...32
 2: Input channels (analog) 33...64
 3: Input channels (discrete) 1...192

- 73VR → Host

Normal | Data 1 : 1: Input channels (analog) 1...32
 2: Input channels (analog) 33...64
 3: Input channels (discrete) 1...192
 Data 2 : Raw data for input channel (analog) 1 or 33 or input channel (discrete) 1...16
 Data 3 : Raw data for input channel (analog) 2 or 34 or input channel (discrete) 17...32
 : : :
 Data 13 : Raw data for input channel (analog) 12 or 44 or input channel (discrete) 177...192
 : : :
 Data 33 : Raw data for input channel (analog) 32 or 64

Error | Data 1 : Identical to the received data
 Data 2 : 0
 : :
 Data 33 : 0

- Example: Read raw data for input channel (analog) 33...64

Host → 73VR (command)

CH	CONTENTS	EXAMPLE
65	Sequence No.	142
66	Command No.	91
67	Data 1	2
68	Data 2	---
69	Data 3	---
:	:	:
99	Data 33	---
112	Sequence No.	142

73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	142
66	Command No.	91
67	Data 1	2
68	Data 2	Raw data, input channel 33
69	Data 3	Raw data, input channel 34
:	:	:
99	Data 33	Raw data, input channel 64
112	Sequence No.	142

- Error

· The 73VR sends back command No. 0x805B when the parameter is in error (Data 1 parameter other than 1, 2, 3).

- Caution

· No data update available while the 73VR is stopped. Data 0 is given if the command is received immediately after the 73VR has been started.

- Note

- Analog data format: 16-bit integer. Sign may be added depending upon the input module specifications.
- Discrete data format: 16 bits. LSB assigned to the smallest channel number. (e.g. Input channel 1...15 at OFF, channel 16 at ON → Data 2 value equals 0x8000.
- The command is available as far as the device is connected correctly.

2.21 READ ENGINEERING UNIT VALUES

Command No. 92

Used to read input pen/function data (after scaling).

- Host → 73VR

Data 1 : 1: Input pen 1...16 2: Input pen 17...32
 3: Input pen 33...48 4: Input pen 49...64
 5: Function pen 1...16 6: Function pen 17...32
 7: Function pen 33...48 8: Function pen 49...64

- 73VR → Host

Normal | Data 1 : 1: Input pen 1...16 2: Input pen 17...32
 3: Input pen 33...48 4: Input pen 49...64
 5: Function pen 1...16 6: Function pen 17...32
 7: Function pen 33...48 8: Function pen 49...64
 Data 2 : Mantissa of engineering unit data for input pen 1, 17, 33, 49 or function pen 1, 17, 33 or 49
 Data 3 : Exponent of engineering unit data for input pen 1, 17, 33, 49 or function pen 1, 17, 33 or 49
 Data 4 : Mantissa of engineering unit data for input pen 2, 18, 34, 50 or function pen 2, 18, 34 or 50
 Data 5 : Exponent of engineering unit data for input pen 2, 18, 34, 50 or function pen 2, 18, 34 or 50
 :
 Data 32 : Mantissa of engineering unit data for input pen 16, 32, 48, 64 or function pen 16, 32, 48 or 64
 Data 33 : Exponent of engineering unit data for input pen 16, 32, 48, 64 or function pen 16, 32, 48 or 64

Error | Data 1 : Parameter in error

- Example: Read data for function pen 1...16

Host → 73VR (command)

CH	CONTENTS	EXAMPLE
65	Sequence No.	143
66	Command No.	92
67	Data 1	5
68	Data 2	---
69	Data 3	---
:	:	:
98	Data 32	---
99	Data 33	---
112	Sequence No.	143

73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	143
66	Command No.	92
67	Data 1	5
68	Data 2	Mantissa, function pen 1
69	Data 3	Exponent, function pen 1
:	:	:
98	Data 32	Mantissa, function pen 16
99	Data 33	Exponent, function pen 16
112	Sequence No.	143

- Error

· The 73VR sends back command No. 0x805C when the parameter is in error (Data 1 parameter other than 1...8).

- Caution

· No data update available while the 73VR is stopped. Data 0 is given if the command is received immediately after the 73VR has been started.

· When a requested data is in error (e.g. function operation error), the mantissa 0 and the exponent 9 are sent.

· When a specified pen is invalid, both mantissa and exponent are given as 0.

- Note

· Effective number of digit: 4 or 5. To obtain effective digits for 32-bit data, use Read Register (Command 91) to get two sets of 16-bit data and reconstruct them into 32-bit data.

· The command is available as far as the device is connected correctly.

3. SETTING COMMANDS

3.1 ENABLE / DISABLE / CANCEL SETTING MODE

Command No. 101

Used to start or stop the 73VR setting. Once the 73VR is in Remote Setting mode, all setting changes sent from the host are temporarily stored and applied when the mode is disabled.

When Cancel command is sent, the mode is disabled without applying the changes.

If Enable command is sent when the 73VR is already in Remote Setting mode, or if Disable/Cancel command is sent when it has already exited the mode, the 73VR sends back an error.

- Host → 73VR

Data 1 : -1: Status confirmation
 1: Disable setting mode, 2: Enable setting mode, 3: Cancel setting mode

- 73VR → Host

Normal | Data 1 : 1: Setting mode disabled, 2: Setting mode enabled, 3: Setting cancelled

Error | Data 1 : -1: Parameter error
 -2: Setting mode enabled in the setting mode, or disabled or cancelled while the 73VR is not in the setting mode.
 -3: Setting unavailable

- Example: Enable setting mode

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	234
66	Command No.	101
67	Data 1	2
112	Sequence No.	234

- Error

- The 73VR sends back command No. 0x8065 when the setting is unavailable or when the parameter is in error.
- The setting is unavailable when the 73VR is NOT in Remote mode.
- Parameter error: Data 1 parameter other than 1, 2, 3

- Caution

- Stored data is reset when one or more of the following setting parameters are changed. Save backup data in advance to prevent loss of any necessary data.

System > Data storing form
 Data storing method > Storing interval
 Pen (input/function) > Enable / Disable

- Date/time setting is immediately applied while all other parameters are applied only when the setting mode is disabled.
- Enable setting mode command is valid while the 73VR is recording, however, certain parameters are locked.

3.2 SYSTEM

Command No. 102 (Remote Mode, Remote Setting Mode, Stopped)

- Host → 73VR

Data 1	: Confirmation or setting	...	-1: Status confirmation, 1: Setting
Data 2	: Operating mode	...	0: No change, 1: Normal
Data 3	: Temperature unit	...	0: No change, 1: Centigrade, 2: Fahrenheit
Data 4	: Start mode	...	0: No change, 1: Cold start, 2: Hot start
Data 5	: Data storing form	...	0: No change, 1: 4-byte floating point, 2: 2-byte short integer
Data 6	: Data overwrite	...	0: No change, 1: OFF, 2: ON

- When data 1 equals -1 (status confirmation), data 2..6 are not required.
- 'DEMO' mode is not selectable in operating mode setting.

- 73VR → Host

Normal		Data 1	: Confirmation or setting	...	0: Status confirmation, 1: Setting
		Data 2	: Operating mode	...	1: Normal
		Data 3	: Temperature unit	...	1: Centigrade, 2: Fahrenheit
		Data 4	: Start mode	...	1: Cold start, 2: Hot start
		Data 5	: Data storing form	...	1: 4-byte floating point, 2: 2-byte short integer
		Data 6	: Data overwrite	...	1: OFF, 2: ON

- For status confirmation or no-change command, the 73VR sends back present setting.

Error		Data 1	: -1: Parameter error, -2: Setting unavailable
		Data 2..6	: Current setting values

- When one or more of data 2..6 parameters are in error, the 73VR sends back normal present setting while error settings are ignored. (Normal data is valid.)

- Example 1:

Normal operating mode, centigrade unit, hot start, no change in data storing form and data format ON

Host → 73VR (command)

CH	CONTENTS	EXAMPLE
65	Sequence No.	235
66	Command No.	102
67	Data 1	1
68	Data 2	1
69	Data 3	1
70	Data 4	2
71	Data 5	0
72	Data 6	2
112	Sequence No.	235

73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	235
66	Command No.	102
67	Data 1	1
68	Data 2	1
69	Data 3	1
70	Data 4	2
71	Data 5	2
72	Data 6	2
112	Sequence No.	235

- Example 2: Confirm status

Host → 73VR (command)

CH	CONTENTS	EXAMPLE
65	Sequence No.	236
66	Command No.	102
67	Data 1	-1
68	Data 2	---
69	Data 3	---
70	Data 4	---
71	Data 5	---
72	Data 6	---
112	Sequence No.	236

73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	236
66	Command No.	102
67	Data 1	0
68	Data 2	1
69	Data 3	1
70	Data 4	1
71	Data 5	2
72	Data 6	1
112	Sequence No.	236

- Error

- The 73VR sends back command No. 0x8066 when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is in NOT Remote Setting mode, or when it is started. Status confirmation is always available.

- Caution

- Data 2...6 in the command is ignored at the 73VR.
- Normal parameters are valid even if invalid data is contained in other parameters.

3.3 SYSTEM – Screen saver, touch panel beep

Command No. 103 (Remote Mode, Remote Setting Mode)

- Host → 73VR

Data 1 : Confirmation or setting ... -1: Status confirmation, 1: Setting
 Data 2 : Screen saver ... 0...99 minutes
 Data 3 : Touch panel beep ... 0: No change, 1: OFF, 2: ON

- 73VR → Host

Normal | Data 1 : Confirmation or setting ... 0: Status confirmation, 1: Setting
 Data 2 : Screen saver ... 0...99 minutes
 Data 3 : Touch panel beep ... 1: OFF, 2: ON

Error | Data 1 : -1: Parameter error, -2: Setting unavailable
 Data 2, 3 : Current setting values

- Example: 5 minutes to activate screen saver, touch panel beep ON

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	237
66	Command No.	103
67	Data 1	1
68	Data 2	5
69	Data 3	2
112	Sequence No.	237

- Error

- The 73VR sends back command No. 0x8067 when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode or when it is NOT in Remote Setting mode. Status confirmation is always available.

- Note

- Setting touch panel beep ON or OFF while the 73VR is already in the same setting is not handled as an error.
- Normal parameters are valid even if invalid data is contained in other parameters.

3.4 SYSTEM – Date and time

Command No. 104 (Remote Mode, Remote Setting Mode, Stopped)

- Host → 73VR

Data 1 : -1: Status confirmation, 1: Date/time setting
 Data 2 : 00 to 99: Year (YY)
 Data 3 : 1 to 12: Month
 Data 4 : 1 to 31: Date
 Data 5 : 0 to 23: Hour
 Data 6 : 0 to 59: Minute
 Data 7 : 0 to 59: Second

- 73VR → Host

Normal | Data 1 : 0: Status confirmation response, 1: Setting complete
 Data 2 : 00 to 99: Year (YY)
 Data 3 : 1 to 12: Month
 Data 4 : 1 to 31: Date
 Data 5 : 0 to 23: Hour
 Data 6 : 0 to 59: Minute
 Data 7 : 0 to 59: Second

Error | Data 1 : -1: Parameter error
 -2: Specified date/time is older than the latest stored data
 -3: Setting unavailable

- Example: July 20, 2010, 15:23:35

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	238
66	Command No.	104
67	Data 1	1
68	Data 2	10
69	Data 3	7
70	Data 4	20
71	Data 5	15
72	Data 6	23
73	Data 7	35
112	Sequence No.	238

- Error

- The 73VR sends back command No. 0x8068 when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is NOT in Remote Setting mode or when it is started. Status confirmation is always available.
- Parameter error: Date/time data older than the latest stored data.

- Note

- **Date/time data older than the latest stored data is invalid.**
- ‘Time specified’ storing is not initiated if new date/time setting fulfilling the condition is given while the 73VR is in ‘time specified’ storing setting.

3.5 SYSTEM – IP address, subnet mask, default gateway, linger time

Command No. 105 (Remote Mode, Remote Setting Mode, Stopped)

• Host → 73VR

Data 1	:	-1: Status confirmation, 1: Setting
Data 2	:	The 1st byte of IP address (0 to 255)
Data 3	:	The 2nd byte of IP address (0 to 255)
Data 4	:	The 3rd byte of IP address (0 to 255)
Data 5	:	The 4th byte of IP address (0 to 255)
Data 6	:	The 1st byte of subnet mask (0 to 255)
Data 7	:	The 2nd byte of subnet mask (0 to 255)
Data 8	:	The 3rd byte of subnet mask (0 to 255)
Data 9	:	The 4th byte of subnet mask (0 to 255)
Data 10	:	The 1st byte of default gateway (-1 to 255), -1: Null
Data 11	:	The 2nd byte of default gateway (-1 to 255), -1: Null
Data 12	:	The 3rd byte of default gateway (-1 to 255), -1: Null
Data 13	:	The 4th byte of default gateway (-1 to 255), -1: Null
Data 14	:	Linger time (0 to 30000), unit: 100 msec.

· When data 10 is specified to Null (-1), data 12 and 13 must be Null.

• 73VR → Host

Normal		Data 1	:	0: Status confirmation response, 1: Setting complete
		Data 2	:	The 1st byte of IP address (0 to 255)
		Data 3	:	The 2nd byte of IP address (0 to 255)
		Data 4	:	The 3rd byte of IP address (0 to 255)
		Data 5	:	The 4th byte of IP address (0 to 255)
		Data 6	:	The 1st byte of subnet mask (0 to 255)
		Data 7	:	The 2nd byte of subnet mask (0 to 255)
		Data 8	:	The 3rd byte of subnet mask (0 to 255)
		Data 9	:	The 4th byte of subnet mask (0 to 255)
		Data 10	:	The 1st byte of default gateway (-1 to 255), -1: Null
		Data 11	:	The 2nd byte of default gateway (-1 to 255), -1: Null
		Data 12	:	The 3rd byte of default gateway (-1 to 255), -1: Null
		Data 13	:	The 4th byte of default gateway (-1 to 255), -1: Null
		Data 14	:	Linger time (0 to 30000), unit: 100 msec.

Error		Data 1	:	-1: Parameter error, -2: Setting unavailable
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· All parameters turn to invalid when there is any parameter error.

- Example:

IP address = 150.10.1.10, Subnet mask = 255.255.255.0, Default gateway = 150.10.1.1, Linger time = 5 seconds (50)

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	239
66	Command No.	105
67	Data 1	1
68	Data 2	150
69	Data 3	10
70	Data 4	1
71	Data 5	10
72	Data 6	255
73	Data 7	255
74	Data 8	255
75	Data 9	0
76	Data 10	150
77	Data 11	10
78	Data 12	1
79	Data 13	1
80	Data 14	50
112	Sequence No.	239

- Error

- The 73VR sends back command No. 0x8069 when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is NOT in Remote Setting mode or when it is started. Status confirmation is always available.
- Parameter error: All parameters turn to invalid when there is any parameter error.

- Note

- In order to enable the network parameters, be sure to restart the 73VR.

3.6 DATA STORING METHOD

Command No. 121 (Remote Mode, Remote Setting Mode, Stopped)

3.6.1 NO STORING, NORMAL

- Host → 73VR

- Data 1 : -1: Status confirmation, 1: Setting
(Data 2 or later is not required for status confirmation.)
- Data 2 : Storing interval ... 0: No change, 3: 500 msec., 4: 1 sec., 5: 2 sec. 6: 5 sec.
7: 10 sec., 8: 1 min., 9: 10 min.
- Data 3 : Storing setting ... **1: No storing, 2: Normal**, 3: Remote trigger
4: Event recording, 5: Time specified

· With 'no storing' or 'normal' storing mode, data 4 or later is not required.

- 73VR → Host

- Normal | Data 1 : 0: Status confirmation response, 1: Setting complete
- Data 2 : Storing interval ... 3: 500 msec., 4: 1 sec., 5: 2 sec. 6: 5 sec.
7: 10 sec., 8: 1 min., 9: 10 min.
- Data 3 : Storing setting ... 1: No storing, 2: Normal

- Error | Data 1 : -1: Parameter error, -2: Setting unavailable

- Example: Normal storing mode, storing interval 1 second

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	240
66	Command No.	121
67	Data 1	1
68	Data 2	4
69	Data 3	2
112	Sequence No.	240

- Error

- The 73VR sends back command No. 0x8079 when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is NOT in Remote Setting mode or when it is started. Status confirmation is always available.
- Parameter error: All parameters turn to invalid when there is any parameter error.

- Note

- Storing interval 20 msec., or 100 msec. is unavailable in Remote mode.
- **When the storing interval setting is changed, previously stored data are reset and overwritten with new data.**

3.6.2 REMOTE TRIGGER

- Host → 73VR

Data 1 : -1: Status confirmation, 1: Setting
 Data 2 : Storing interval ... 0: No change, 3: 500 msec., 4: 1 sec., 5: 2 sec. 6: 5 sec.
 7: 10 sec., 8: 1 min., 9: 10 min.
 Data 3 : Storing setting ... 1: No storing, 2: Normal, **3: Remote trigger**
 4: Event recording, 5: Time specified
 Data 4 : Trigger signal ... 1: Analog, 2: Discrete
 Data 5 : Threshold ... 16-bit signed integer (valid with analog trigger signal only)
 Data 6 : Condition (analog) ... 0: No change
 1: Value > Threshold, 2: Value < Threshold
 3: Value ≥ Threshold, 4: Value ≤ Threshold
 Condition (discrete) ... 0: No change, 1: ON, 2: OFF
 Data 7 : Pen No. (input or function) ... 0: No change

· The 73VR manages the threshold in floating point data. However for a simple management on the PLC, 16-bit integer is used in Remote mode. Use input (function) pens which are able to treat the threshold by the integer type data.

- 73VR → Host

Normal | Data 1 : 0: Status confirmation response, 1: Setting complete
 Data 2 : Storing interval ... 3: 500 msec., 4: 1 sec., 5: 2 sec. 6: 5 sec.
 7: 10 sec., 8: 1 min., 9: 10 min.
 Data 3 : Storing setting ... 3: Remote trigger
 Data 4 : Trigger signal ... 1: Analog, 2: Discrete
 Data 5 : Threshold ... 16-bit signed integer (valid with analog trigger signal only,
 0 with discrete trigger signal)
 Data 6 : Condition (analog) ... 1: Value > Threshold, 2: Value < Threshold
 3: Value ≥ Threshold, 4: Value ≤ Threshold
 Condition (discrete) ... 1: ON, 2: OFF
 Data 7 : Pen No. (input or function)

Error | Data 1 : -1: Parameter error, -2: Setting unavailable

- Example: Remote trigger storing mode, digital trigger signal, ON condition, input pen 12, storing interval 1 second

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	241
66	Command No.	121
67	Data 1	1
68	Data 2	4
69	Data 3	3
70	Data 4	2
71	Data 5	0
72	Data 6	1
73	Data 7	12
112	Sequence No.	241

- Error

- The 73VR sends back command No. 0x8079 when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is NOT in Remote Setting mode or when it is started. Status confirmation is always available.
- Parameter error: All parameters turn to invalid when there is any parameter error.

- Note

- Storing interval 20 msec., or 100 msec. is unavailable in Remote mode.
- When the storing interval setting is changed, previously stored data are reset and overwritten with new data.

3.6.3 EVENT RECORDING

- Host → 73VR

Data 1 : -1: Status confirmation, 1: Setting
 Data 2 : Storing interval ... 0: No change, 3: 500 msec., 4: 1 sec., 5: 2 sec. 6: 5 sec.
 7: 10 sec., 8: 1 min., 9: 10 min.
 Data 3 : Storing setting ... 1: No storing, 2: Normal, 3: Remote trigger
4: Event recording, 5: Time specified
 Data 4 : Trigger signal ... 1: Analog, 2: Discrete
 Data 5 : Threshold ... 16-bit signed integer (valid with analog trigger signal only)
 Data 6 : Condition (analog) ... 0: No change
 1: Value > Threshold, 2: Value < Threshold
 3: Value ≥ Threshold, 4: Value ≤ Threshold
 Condition (discrete) ... 0: No change, 1: Up, 2: Down
 Data 7 : Pen No. (input or function) ... 0: No change
 Data 8 : Pretrigger ... 0 to 1200
 Data 9 : Posttrigger ... 0 to 1200

· The 73VR manages the threshold in floating point data. However for a simple management on the PLC, 16-bit integer is used in Remote mode. Use input (function) pens which are able to treat the threshold by the integer type data.

- 73VR → Host

Normal | Data 1 : 0: Status confirmation response, 1: Setting complete
 Data 2 : Storing interval ... 3: 500 msec., 4: 1 sec., 5: 2 sec. 6: 5 sec.
 7: 10 sec., 8: 1 min., 9: 10 min.
 Data 3 : Storing setting ... 4: Event recording
 Data 4 : Trigger signal ... 1: Analog, 2: Discrete
 Data 5 : Threshold ... 16-bit signed integer (0 for discrete trigger signal)
 Data 6 : Condition (analog) ... 1: Value > Threshold, 2: Value < Threshold
 3: Value ≥ Threshold, 4: Value ≤ Threshold
 Condition (discrete) ... 1: Up, 2: Down
 Data 7 : Pen No. (input or function)
 Data 8 : Pretrigger ... 0 to 1200
 Data 9 : Posttrigger ... 0 to 1200

Error | Data 1 : -1: Parameter error, -2: Setting unavailable

- Example: Event recording mode, analog trigger signal, condition 9999, Measured value>Threshold, input pen 13, pretrigger 300, posttrigger 60, storing interval 1 second

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	242
66	Command No.	121
67	Data 1	1
68	Data 2	4
69	Data 3	4
70	Data 4	1
71	Data 5	9999
72	Data 6	1
73	Data 7	13
74	Data 8	300
75	Data 9	60
112	Sequence No.	242

- Error

- The 73VR sends back command No. 0x8079 when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is NOT in Remote Setting mode or when it is started. Status confirmation is always available.
- Parameter error: All parameters turn to invalid when there is any parameter error.

- Note

- Storing interval 20 msec., or 100 msec. is unavailable in Remote mode.
- **When the storing interval setting is changed, previously stored data are reset and overwritten with new data.**

3.6.4 TIME SPECIFIED

• Host → 73VR

Data 1	:	-1: Status confirmation, 1: Setting	
Data 2	:	Storing interval	... 0: No change, 3: 500 msec., 4: 1 sec., 5: 2 sec. 6: 5 sec. 7: 10 sec., 8: 1 min., 9: 10 min.
Data 3	:	Storing setting	... 1: No storing, 2: Normal, 3: Remote trigger 4: Event recording, 5: Time specified
Data 4	:	Condition (number of times)	... 1: One time only, 2: Every day
Data 5	:	Date (Year)	... 0 to 99 (YY), invalid with 'every day' condition setting
Data 6	:	Date (Month)	... 1 to 12, invalid with 'every day' condition setting
Data 7	:	Date (Day)	... 1 to 31, invalid with 'every day' condition setting
Data 8	:	Time (Hour)	... 0 to 23
Data 9	:	Time (Min.)	... 0 to 59
Data 10	:	Time (Sec.)	... 0 to 59
Data 11	:	Duration (Hour)	... 0 to 23
Data 12	:	Duration (Min.)	... 0 to 59

• 73VR → Host

Normal		Data 1	:	0: Status confirmation response, 1: Setting complete
		Data 2	:	Storing interval ... 3: 500 msec., 4: 1 sec., 5: 2 sec. 6: 5 sec. 7: 10 sec., 8: 1 min., 9: 10 min.
		Data 3	:	Storing setting ... 5: Time specified
		Data 4	:	Condition (number of times) ... 1: One time only, 2: Every day
		Data 5	:	Date (Year) ... 0 to 99 (YY), 0 with 'every day' condition setting
		Data 6	:	Date (Month) ... 1 to 12, 0 with 'every day' condition setting
		Data 7	:	Date (Day) ... 1 to 31, 0 with 'every day' condition setting
		Data 8	:	Time (Hour) ... 0 to 23
		Data 9	:	Time (Min.) ... 0 to 59
		Data 10	:	Time (Sec.) ... 0 to 59
		Data 11	:	Duration (Hour) ... 0 to 23
		Data 12	:	Duration (Min.) ... 0 to 59

Error | Data 1 : -1: Parameter error, -2: Setting unavailable

• Example:

Time specified recording mode, Every day at 8:45:00 for 9 hours 30 minutes, input pen 12, storing interval 1 second

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	243
66	Command No.	121
67	Data 1	1
68	Data 2	4
69	Data 3	5
70	Data 4	2
71	Data 5	---
72	Data 6	---
73	Data 7	---
74	Data 8	8
75	Data 9	45
76	Data 10	0
77	Data 11	9
78	Data 12	30
112	Sequence No.	243

- Error

- The 73VR sends back command No. 0x8079 when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is NOT in Remote Setting mode or when it is started. Status confirmation is always available.
- Parameter error: All parameters turn to invalid when there is any parameter error.

- Note

- Storing interval 20 msec., or 100 msec. is unavailable in Remote mode.
- **When the storing interval setting is changed, previously stored data are reset and overwritten with new data.**

3.7 DISPLAY – Chart speed

Command No. 141 (Remote Mode, Remote Setting Mode, Stopped)

- Host → 73VR

Data 1 : -1: Status confirmation, 1: Setting
 Data 2 : 0: No change, 1: 4, 2: 1, 3: 1/5, 4: 1/32, 5: 1/160, 6: 1/480, 7: 1/960

- 73VR → Host

Normal | Data 1 : 0: Status confirmation response, 1: Setting complete
 Data 2 : 1: 4, 2: 1, 3: 1/5, 4: 1/32, 5: 1/160, 6: 1/480, 7: 1/960

Error | Data 1 : -1: Parameter error, -2: Setting unavailable

- Example: 1/5

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	244
66	Command No.	141
67	Data 1	1
68	Data 2	3
112	Sequence No.	244

- Error

- The 73VR sends back command No. 0x808D when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is NOT in Remote Setting mode or when it is started. Status confirmation is always available.

3.8 DISPLAY – Except chart speed

Command No. 142 (Remote Mode, Remote Setting Mode)

• Host → 73VR

- Data 1 : -1: Status confirmation, 1: Setting
- Data 2 : Chart direction ... 0: No change, 1: Perpendicular, 2: Horizontal
- Data 3 : Digital display type ... 0: No change, 1: Tag name + value, 2: Tag name, 3: Value
- Data 4 : Digital display ... 0: No change, 1: Auto-hide, 2: Continuous
(invalid with horizontal chart setting)
- Data 5 : Data file used volume setting ... 0: No change, 1: Not shown, 2: Show
- Data 6 : Display pen number ... 0: No change, 1: 2 pens, 2: 4 pens, 3: 6 pens, 4: 8 pens
- Data 7 : Display pen number (OV) ... 0: No change, 1: 2 pens, 2: 4 pens, 3: 6 pens
4: 8 pens, 5: 16 pens
- Data 8 : Auto pen switching ... 0: No change, 1: Disabled, 2: Enabled
- Data 9 : Chart color ... 0: No change, 1: Gradation 1, 2: Gradation 2
3: Plain (Light), 4: Plain (Dark), 5: Plain (White)

• 73VR → Host

- Normal |
- Data 1 : 0: Status confirmation response, 1: Setting complete
 - Data 2 : Chart direction ... 1: Perpendicular, 2: Horizontal
 - Data 3 : Digital display type ... 1: Tag name + value, 2: Tag name, 3: Value
 - Data 4 : Digital display ... 1: Auto-hide, 2: Continuous
(invalid with horizontal chart setting)
 - Data 5 : Data file used volume setting ... 1: Not shown, 2: Show
 - Data 6 : Display pen number ... 1: 2 pens, 2: 4 pens, 3: 6 pens, 4: 8 pens
 - Data 7 : Display pen number (OV) ... 1: 2 pens, 2: 4 pens, 3: 6 pens, 4: 8 pens, 5: 16 pens
 - Data 8 : Auto pen switching ... 1: Disabled, 2: Enabled
 - Data 9 : Chart color ... 1: Gradation 1, 2: Gradation 2
3: Plain (Light), 4: Plain (Dark), 5: Plain (White)

- Error | Data 1 : -1: Parameter error, -2: Setting unavailable

• Example: Perpendicular chart, 'tag name + value' digital display, continuous digital display indication, data file used volume setting indication, displaying 8 pens and 16 pens (OV), auto pen switching enabled, no change in chart color

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	245
66	Command No.	142
67	Data 1	1
68	Data 2	1
69	Data 3	1
70	Data 4	2
71	Data 5	2
72	Data 6	4
73	Data 7	5
74	Data 8	2
75	Data 9	0
112	Sequence No.	245

• Error

- The 73VR sends back command No. 0x808E when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode or when it is NOT in Remote Setting mode. Status confirmation is always available.

• Caution

- When data 2 (chart direction) is set to 'horizontal,' data 4 (digital display) is always set to 'continuous.'
(Data 4 is changed to 'continuous' together with all other parameters when the remote setting mode is disabled.)

3.9 ERROR OUTPUT

Command No. 161 (Remote Mode, Remote Setting Mode, Stopped)

- Host → 73VR

Data 1 : -1: Status confirmation, 1: Setting
 Data 2 : Error output ... 0: No change, 1: Disable, 2: Enable
 Data 3 : Output channel ... Channel No., 0: No change (invalid with error output disabled)
 Data 4 : Contact logic ... 0: No change, 1: OFF, 2: ON (invalid with error output disabled)

- 73VR → Host

Normal | Data 1 : 0: Status confirmation response, 1: Setting complete
 Data 2 : Error output ... 1: Disable, 2: Enable
 Data 3 : Output channel ... Channel No. or 0 with error output disabled
 Data 4 : Contact logic ... 1: OFF, 2: ON, or 0 with error output disabled

Error | Data 1 : -1: Parameter error, -2: Setting unavailable

- Example: Error output enabled, output channel 14, contact logic ON

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	246
66	Command No.	161
67	Data 1	1
68	Data 2	2
69	Data 3	14
70	Data 4	2
112	Sequence No.	246

- Error

- The 73VR sends back command No. 0x80A1 when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is NOT in Remote Setting mode or when it is started. Status confirmation is always available.

3.10 PEN (COMMON)

Command No. 181 (Remote Mode, Remote Setting Mode, Stopped)

• Host → 73VR

Data 1	:	-1: Status confirmation, 1: Setting	
Data 2	:	Input (function) pen number 1 to 128 (65 to 128 for function pens 1 to 64)	
Data 3	:	Enable or disable pen	... 0: No change, 1: Disable, 2: Enable
Data 4	:	Signal type	... 0: No change, 1: Analog, 2: Discrete
Data 5	:	Channel No.	... Input channel No. or 0: No change (invalid for function pen)
Data 6	:	Tag name, 1st character	... ASCII code or 0: No setting (Null)
Data 7	:	Tag name, 2nd character	... ASCII code or 0: No setting (Null)
Data 8	:	Tag name, 3rd character	... ASCII code or 0: No setting (Null)
Data 9	:	Tag name, 4th character	... ASCII code or 0: No setting (Null)
Data 10	:	Tag name, 5th character	... ASCII code or 0: No setting (Null)
Data 11	:	Tag name, 6th character	... ASCII code or 0: No setting (Null)
Data 12	:	Tag name, 7th character	... ASCII code or 0: No setting (Null)
Data 13	:	Tag name, 8th character	... ASCII code or 0: No setting (Null)
Data 14	:	Engineering unit, 1st character	... ASCII code or 0: No setting (Null)
Data 15	:	Engineering unit, 2nd character	... ASCII code or 0: No setting (Null)
Data 16	:	Engineering unit, 3rd character	... ASCII code or 0: No setting (Null)
Data 17	:	Engineering unit, 4th character	... ASCII code or 0: No setting (Null)

- Data 4 and later data settings are ignored if data 3 is set to 'disable.'
- Data 14 to 17 are invalid for discrete signal.
- All tag name data is handled as Null if data 6 (tag name's 1st character) is set to Null.
- All engineering unit data is handled as Null if data 14 (engineering unit's 1st character) is set to Null.

• 73VR → Host

Normal		Data 1	:	0: Status confirmation response, 1: Setting complete	
		Data 2	:	Input (function) pen number 1 to 128 (65 to 128 for function pens 1 to 64)	
		Data 3	:	1: Disable, 2: Enable	
		Data 4	:	1: Analog, 2: Discrete	
		Data 5	:	Channel No.	... Input channel No. or 0: No change (invalid for function pen)
		Data 6	:	Tag name, 1st character	... ASCII code or 0: No setting
		Data 7	:	Tag name, 2nd character	... ASCII code or 0: No setting
		Data 8	:	Tag name, 3rd character	... ASCII code or 0: No setting
		Data 9	:	Tag name, 4th character	... ASCII code or 0: No setting
		Data 10	:	Tag name, 5th character	... ASCII code or 0: No setting
		Data 11	:	Tag name, 6th character	... ASCII code or 0: No setting
		Data 12	:	Tag name, 7th character	... ASCII code or 0: No setting
		Data 13	:	Tag name, 8th character	... ASCII code or 0: No setting
		Data 14	:	Engineering unit, 1st character	... ASCII code or 0: No setting
		Data 15	:	Engineering unit, 2nd character	... ASCII code or 0: No setting
		Data 16	:	Engineering unit, 3rd character	... ASCII code or 0: No setting
		Data 17	:	Engineering unit, 4th character	... ASCII code or 0: No setting
Error		Data 1	:	-1: Parameter error, -2: Setting unavailable	

- Example: Input pen 10 enabled, analog signal, channel 17, tag name "INPUT01," engineering unit "%"

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	247
66	Command No.	181
67	Data 1	1
68	Data 2	10
69	Data 3	2
70	Data 4	1
71	Data 5	17
72	Data 6	0x0049 (I)
73	Data 7	0x004E (N)
74	Data 8	0x0050 (P)
75	Data 9	0x0055 (U)
76	Data 10	0x0054 (T)
77	Data 11	0x0030 (0)
78	Data 12	0x0031 (1)
79	Data 13	0x0
80	Data 14	0x0025 (%)
81	Data 15	0x0
82	Data 16	0x0
83	Data 17	0x0
112	Sequence No.	247

- Error

- The 73VR sends back command No. 0x80B5 when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is NOT in Remote Setting mode or when it is started. Status confirmation is always available.
- Parameter error: All parameters turn to invalid when there is any parameter error.

- Note

- Specify data 2 (pen number) for status confirmation.

3.11 PEN (COMMON) – Color, line thickness, decimal place

Command No. 182 (Remote Mode, Remote Setting Mode)

- Host → 73VR

- Data 1 : -1: Status confirmation, 1: Setting
- Data 2 : Input (function) pen number 1 to 128 (65 to 128 for function pens 1 to 64)
- Data 3 : Color ... 0: No change, Color code 1 to 48
- Data 4 : Line thickness ... 0: No change, 1: Normal, 2: Thick
- Data 5 : Decimal place ... 0: No change, 1: 0, 2: 1, 3: 2, 4: 3 (invalid for discrete signal)

- Refer to 1.3 Operation / setting flow via network for color code.
- 2 or 3 decimal places are not selectable for temperature input.

- 73VR → Host

- Normal | Data 1 : 0: Status confirmation response, 1: Setting complete
- Data 2 : Input (function) pen number 1 to 128 (65 to 128 for function pens 1 to 64)
- Data 3 : Color ... Color code 1 to 48
- Data 4 : Line thickness ... 1: Normal, 2: Thick
- Data 5 : Decimal place ... 1: 0, 2: 1, 3: 2, 4: 3 (0 for discrete signal)

- Error | Data 1 : -1: Parameter error, -2: Setting unavailable

- Example: Input pen 3, red color (color code 9), normal line thickness, 2 decimal places

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	248
66	Command No.	182
67	Data 1	1
68	Data 2	3
69	Data 3	9
70	Data 4	1
71	Data 5	3
112	Sequence No.	248

- Error

- The 73VR sends back command No. 0x80B6 when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode or when it is NOT in Remote Setting mode. Status confirmation is always available.
- Parameter error: All parameters turn to invalid when there is any parameter error.

- Note

- If a user specific color is used (not in the color code), the 73VR returns '0' for status confirmation.

3.12 PEN (INPUT) – Analog type, input range, eng. range, log, square root

Command No. 201 (Remote Mode, Remote Setting Mode, Stopped)

- Common setting
- Analog type
 - 0: No change 1: 0 to 100 percent
 - 2: PR 3: K (CA), 4: E (CRC), 5: J (IC), 6: T (CC), 7: B (RH), 8: R, 9: S, 10: C (WRe 5-26), 11: N, 12: U, 13: L, 14: P (Platinel II), 15: Cu 10, 16: Cu 50, 17: JPt 100 (JIS '89), 18: Pt 100 (JIS '89), 19: Pt 100 (JIS '97 or IEC), 20: Pt 1000, 21: Pt 50 (JIS '81), 22: Ni 100, 23: Ni 508.4, 24: Ni 1000, 25: COUNT 16, 26: COUNT 32, 27: US4 (Temp.)
- An engineering unit value is represented with 'mantissa' and 'exponent.' For more information, refer to 1.3 Operation / setting flow via network.
- Caution
 - Pen (common) (Command 181) must be set in advance when changing between analog and discrete signals. Be aware that setting is not applied until Remote Setting mode is exited. In order to confirm a new setting, exit Remote Setting mode, enter to the mode again, and then send status confirmation command.
 - When an invalid parameter is set in a command, it response contains the invalid one. Confirm correct setting by status confirmation after having exited Remote Setting mode.

3.12.1 PEN (INPUT) – Analog type: 0 to 100 percent, COUNT 16, COUNT 32

- Host → 73VR

Data 1	:	-1: Status confirmation, 1: Setting	
Data 2	:	Input pen number 1 to 64	
Data 3	:	Analog type 1, 25 or 26	
Data 4	:	Input range, lower, mantissa	... -32768 to 32767
Data 5	:	Input range, lower, exponent	... -9 to 9
Data 6	:	Input range, upper, mantissa	... -32768 to 32767
Data 7	:	Input range, upper, exponent	... -9 to 9
Data 8	:	Eng. range, lower, mantissa	... -32768 to 32767
Data 9	:	Eng. range, lower, exponent	... -9 to 9
Data 10	:	Eng. range, upper, mantissa	... -32768 to 32767
Data 11	:	Eng. range, upper, exponent	... -9 to 9
Data 12	:	Logarithmic function	... 0: No change, 1: Normal, 2: Log 1, 3: Log 2
Data 13	:	Exponential scale	... 0: No change, 1: 10, 2: 5, 3: 4, 4: 2, 5: 1
Data 14	:	Square root	... 0: No change, 1: Normal, 2: Square root

· Data 13 is invalid without logarithmic function specified in Data 12.

- 73VR → Host

Normal		Data 1	:	0: Status confirmation response, 1: Setting complete	
		Data 2	:	Input pen number 1 to 64	
		Data 3	:	Analog type 1, 25 or 26	
		Data 4	:	Input range, lower, mantissa	... -32768 to 32767
		Data 5	:	Input range, lower, exponent	... -9 to 9
		Data 6	:	Input range, upper, mantissa	... -32768 to 32767
		Data 7	:	Input range, upper, exponent	... -9 to 9
		Data 8	:	Eng. range, lower, mantissa	... -32768 to 32767
		Data 9	:	Eng. range, lower, exponent	... -9 to 9
		Data 10	:	Eng. range, upper, mantissa	... -32768 to 32767
		Data 11	:	Eng. range, upper, exponent	... -9 to 9
		Data 12	:	Logarithmic function	... 1: Normal, 2: Log 1, 3: Log 2
		Data 13	:	Exponential scale	... 1: 10, 2: 5, 3: 4, 4: 2, 5: 1
		Data 14	:	Square root	... 1: Normal, 2: Square root

Error		Data 1	:	-1: Parameter error, -2: Setting unavailable
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- Example: Input pen 10, analog type 0 to 100 percent, input range 0-100.0, eng. range 0-100.0, no logarithmic function or no square root

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	249
66	Command No.	201
67	Data 1	1
68	Data 2	10
69	Data 3	1
70	Data 4	0
71	Data 5	0
72	Data 6	10000
73	Data 7	2
74	Data 8	0
75	Data 9	0
76	Data 10	10000
77	Data 11	2
78	Data 12	1
79	Data 13	0
80	Data 14	1
112	Sequence No.	249

- Error

- The 73VR sends back command No. 0x80C9 when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is NOT in Remote Setting mode or when it is started. Status confirmation is always available.
- Parameter error: All parameters turn to invalid when there is any parameter error.

3.12.2 PEN (INPUT) – Analog type: Temperature

- Host → 73VR

Data 1	:	-1: Status confirmation, 1: Setting
Data 2	:	Input pen number 1 to 64
Data 3	:	Analog type 2 to 24 (thermocouple or RTD)
Data 4	:	Invalid
Data 5	:	Invalid
Data 6	:	Invalid
Data 7	:	Invalid
Data 8	:	Invalid
Data 9	:	Invalid
Data 10	:	Invalid
Data 11	:	Invalid
Data 12	:	Logarithmic function ... 0: No change, 1: Normal, 2: Log 1, 3: Log 2
Data 13	:	Exponential scale ... 0: No change, 1: 10, 2: 5, 3: 4, 4: 2, 5: 1
Data 14	:	Square root ... 0: No change, 1: Normal, 2: Square root

· Data 13 is invalid without logarithmic function specified in Data 12.

- 73VR → Host (Status confirmation)

Normal		Data 1	:	0: Status confirmation response, (1: Setting complete)
		Data 2	:	Input pen number 1 to 64
		Data 3	:	Analog type 2 to 24 (thermocouple or RTD)
		Data 4	:	Measuring range, lower (Sensor specific value) (mantissa) ... -32768 to 32767
		Data 5	:	Measuring range, lower (Sensor specific value) (exponent) ... -9 to 9
		Data 6	:	Measuring range, upper (Sensor specific value) (mantissa) ... -32768 to 32767
		Data 7	:	Measuring range, upper (Sensor specific value) (exponent) ... -9 to 9
		Data 8	:	0
		Data 9	:	0
		Data 10	:	0
		Data 11	:	0
		Data 12	:	Logarithmic function ... 1: Normal, 2: Log 1, 3: Log 2
		Data 13	:	Exponential scale ... 1: 10, 2: 5, 3: 4, 4: 2, 5: 1
		Data 14	:	Square root ... 1: Normal, 2: Square root

Error		Data 1	:	-1: Parameter error, -2: Setting unavailable
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- 73VR → Host (Setting)

Normal		Data 1	:	(0: Status confirmation response), 1: Setting complete
		Data 2	:	Input pen number 1 to 64
		Data 3	:	Analog type 2 to 24 (thermocouple or RTD)
		Data 4	:	0
		:	:	
		Data 11	:	0
		Data 12	:	Logarithmic function ... 1: Normal, 2: Log 1, 3: Log 2
		Data 13	:	Exponential scale ... 1: 10, 2: 5, 3: 4, 4: 2, 5: 1
		Data 14	:	Square root ... 1: Normal, 2: Square root

Error		Data 1	:	-1: Parameter error, -2: Setting unavailable
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- Example: Input pen 11, analog type K, no logarithmic function or no square root

Host → 73VR (command)

CH	CONTENTS	EXAMPLE
65	Sequence No.	250
66	Command No.	201
67	Data 1	1
68	Data 2	11
69	Data 3	3
70	Data 4	0
71	Data 5	0
72	Data 6	0
73	Data 7	0
74	Data 8	0
75	Data 9	0
76	Data 10	0
77	Data 11	0
78	Data 12	1
79	Data 13	0
80	Data 14	1
112	Sequence No.	250

73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	250
66	Command No.	201
67	Data 1	1
68	Data 2	11
69	Data 3	3
70	Data 4	0
71	Data 5	0
72	Data 6	0
73	Data 7	0
74	Data 8	0
75	Data 9	0
76	Data 10	0
77	Data 11	0
78	Data 12	1
79	Data 13	0
80	Data 14	1
112	Sequence No.	250

- Error

- The 73VR sends back command No. 0x80C9 when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is NOT in Remote Setting mode or when it is started. Status confirmation is always available.
- Parameter error: All parameters turn to invalid when there is any parameter error.

- Caution

- When “US4(Temp.)” is set to Analog type, the 73VR returns measuring range for status confirmation as follows. lower: 0, upper: 1000, fixed value.
- In practice, the temperature of measuring range for temperature sensor type can be measured. For detailed measuring range, refer to the specification sheet of R3-US4. Use R3CON configurator software to set analog type for R3-US4.

3.12.3 PEN (INPUT) – Discrete

- Host → 73VR

- Data 1 : -1: Status confirmation, 1: Setting
- Data 2 : Input pen number 1 to 64
- Data 3 : OFF description, 1st character ... ASCII code or 0: No setting (Null)
- Data 4 : OFF description, 2nd character ... ASCII code or 0: No setting (Null)
- Data 5 : OFF description, 3rd character ... ASCII code or 0: No setting (Null)
- Data 6 : OFF description, 4th character ... ASCII code or 0: No setting (Null)
- Data 7 : OFF description, 5th character ... ASCII code or 0: No setting (Null)
- Data 8 : ON description, 1st character ... ASCII code or 0: No setting (Null)
- Data 9 : ON description, 2nd character ... ASCII code or 0: No setting (Null)
- Data 10 : ON description, 3rd character ... ASCII code or 0: No setting (Null)
- Data 11 : ON description, 4th character ... ASCII code or 0: No setting (Null)
- Data 12 : ON description, 5th character ... ASCII code or 0: No setting (Null)

- All OFF description data is handled as Null if data 3 (OFF's 1st character) is set to Null.
- All ON description data is handled as Null if data 8 (ON's 1st character) is set to Null.

- 73VR → Host

- | | | |
|--------|--|---|
| Normal | | Data 1 : 0: Status confirmation response, 1: Setting complete |
| | | Data 2 : Input pen number 1 to 64 |
| | | Data 3 : OFF description, 1st character ... ASCII code or 0: No setting |
| | | Data 4 : OFF description, 2nd character ... ASCII code or 0: No setting |
| | | Data 5 : OFF description, 3rd character ... ASCII code or 0: No setting |
| | | Data 6 : OFF description, 4th character ... ASCII code or 0: No setting |
| | | Data 7 : OFF description, 5th character ... ASCII code or 0: No setting |
| | | Data 8 : ON description, 1st character ... ASCII code or 0: No setting |
| | | Data 9 : ON description, 2nd character ... ASCII code or 0: No setting |
| | | Data 10 : ON description, 3rd character ... ASCII code or 0: No setting |
| | | Data 11 : ON description, 4th character ... ASCII code or 0: No setting |
| | | Data 12 : ON description, 5th character ... ASCII code or 0: No setting |
| Error | | Data 1 : -1: Parameter error, -2: Setting unavailable |

- Example: Input pen 12, OFF description 'OFF,' ON description 'ON'

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	251
66	Command No.	201
67	Data 1	1
68	Data 2	12
69	Data 3	0x004F (O)
70	Data 4	0x0046 (F)
71	Data 5	0x0046 (F)
72	Data 6	0x0
73	Data 7	0x0
74	Data 8	0x004F (O)
75	Data 9	0x004E (N)
76	Data 10	0x0
77	Data 11	0x0
78	Data 12	0x0
112	Sequence No.	251

- Error

- The 73VR sends back command No. 0x80C9 when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is NOT in Remote Setting mode or when it is started. Status confirmation is always available.
- Parameter error: All parameters turn to invalid when there is any parameter error.

3.13 PEN (INPUT/FUNCTION) – Plot position, scale shift, plot position exponent, overview color

Command No. 202 (Remote Mode, Remote Setting Mode)

- Host → 73VR

Data 1	:	-1: Status confirmation, 1: Setting
Data 2	:	Input (function) pen number 1 to 128 (65 to 128 for function pens 1 to 64)
Data 3	:	Plot position, lower, mantissa ... -32768 to 32767
Data 4	:	Plot position, lower, exponent ... -9 to 9
Data 5	:	Plot position, upper, mantissa ... -32768 to 32767
Data 6	:	Plot position, upper, exponent ... -9 to 9
Data 7	:	Scale shift ... -100 to 100
Data 8	:	Plot position exponent ... -9 to 8
Data 9	:	Overview color ... 0: No change, Color code 1 to 48

- Data 3 to 9 are invalid when the input pen is set to a discrete type.
- Data 8 is invalid when the logarithmic function is set to 'normal.'
- Data 3 to 6 are invalid when the logarithmic function is set to 'logarithmic.'
- Refer to 1.3 Operation / setting flow via network for color code.

- 73VR → Host

Normal		Data 1	:	0: Status confirmation response, 1: Setting complete
		Data 2	:	Input (function) pen number 1 to 128 (65 to 128 for function pens 1 to 64)
		Data 3	:	Plot position, lower, mantissa ... -32768 to 32767
		Data 4	:	Plot position, lower, exponent ... -9 to 9
		Data 5	:	Plot position, upper, mantissa ... -32768 to 32767
		Data 6	:	Plot position, upper, exponent ... -9 to 9
		Data 7	:	Scale shift ... -100 to 100
		Data 8	:	Plot position exponent ... -9 to 8
		Data 9	:	Overview color ... Color code 1 to 48

Error		Data 1	:	-1: Parameter error, -2: Setting unavailable
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- Example: Input pen 15, plot position -100 to 200, scale shift +10%, green overview color (code 26)

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	252
66	Command No.	202
67	Data 1	1
68	Data 2	15
69	Data 3	-10000
70	Data 4	2
71	Data 5	20000
72	Data 6	2
73	Data 7	10
74	Data 8	0
75	Data 9	26
112	Sequence No.	252

- Error

- The 73VR sends back command No. 0x80CA when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode or when it is NOT in Remote Setting mode. Status confirmation is always available.
- Parameters are set only to an analog channel pen. The command is ignored if sent to a discrete channel pen and not handled as error.

- **Caution**

- Pen (input) (Command 201) must be set in advance when changing between normal and logarithmic functions. Be aware that setting is not applied until Remote Setting mode is exited. In order to confirm a new setting, exit Remote Setting mode, enter to the mode again, and then send status confirmation command.

3.14 PEN (FUNCTION)

Command No. 221 (Remote Mode, Remote Setting Mode, Stopped)

- Common setting
- Function type
 - 1: Addition/Subtraction, 2: Multiplication, 3: Division, 4: Moving average, 5: First order lag
 - 6: Square root extraction, 7: Peak (maximum value) hold, 8: Valley (minimum value) hold
 - 9: Power, 10: Analog accumulation, 11: Pulse accumulation, 12: F value calculation
 - 13: AND, 14: OR, 15: NOT, 16: XOR, 17: Anemoscope
- Caution
- Command data format depends upon the function type. Refer to the following subsections.
- Effective digits for coefficients and constants are by two decimal places. Setting three or more decimal places is not effective.
- Pen (common) (Command 181) must be set in advance to choose function pens. Be careful to choose appropriate parameters in order to avoid any inconsistency.
- When an invalid parameter is set in a command, its response contains the invalid one. Confirm correct setting by status confirmation after having exited Remote Setting mode.

3.14.1 PEN (FUNCTION) – Addition/Subtraction

- Host → 73VR

Data 1	:	-1: Status confirmation, 1: Setting
Data 2	:	Function pen number 1 to 64
Data 3	:	Function type ... 1: Addition/Subtraction
Data 4	:	Input X1 ... 0: No change, 1 to 128 (65 to 128 for function pens 1 to 64)
Data 5	:	Input X1 flag ... 0: No change, 1: Normal data, 2: Last (previous) data
Data 6	:	Input X2 ... 0: No change, 1 to 128 (65 to 128 for function pens 1 to 64)
Data 7	:	Input X2 flag ... 0: No change, 1: Normal data, 2: Last (previous) data
Data 8	:	Coefficient K1, mantissa ... -32768 to 32767
Data 9	:	Coefficient K1, exponent ... -9 to 9
Data 10	:	Coefficient K2, mantissa ... -32768 to 32767
Data 11	:	Coefficient K2, exponent ... -9 to 9
Data 12	:	Constant A1, mantissa ... -32768 to 32767
Data 13	:	Constant A1, exponent ... -9 to 9
Data 14	:	Initial value flag ... 0: No change, 1: Disable, 2: Enable
Data 15	:	Initial value, mantissa ... -32768 to 32767
Data 16	:	Initial value, exponent ... -9 to 9
Data 17	:	Logarithmic function ... 0: No change, 1: Normal, 2: Log
Data 18	:	Exponential scale ... 0: No change, 1: 10, 2: 5, 3: 4, 4: 2, 5: 1

- Data 15, 16 are invalid when the initial value flag (data 14) is disabled.
- Data 18 is invalid when the logarithmic function (data 17) is set to 'normal.'

- 73VR → Host

Normal		Data 1	:	0: Status confirmation response, 1: Setting complete
		Data 2	:	Function pen number 1 to 64
		Data 3	:	Function type ... 1: Addition/Subtraction
		Data 4	:	Input X1 ... 1 to 128 (65 to 128 for function pens 1 to 64)
		Data 5	:	Input X1 flag ... 1: Normal data, 2: Last (previous) data
		Data 6	:	Input X2 ... 1 to 128 (65 to 128 for function pens 1 to 64)
		Data 7	:	Input X2 flag ... 1: Normal data, 2: Last (previous) data
		Data 8	:	Coefficient K1, mantissa ... -32768 to 32767
		Data 9	:	Coefficient K1, exponent ... -9 to 9
		Data 10	:	Coefficient K2, mantissa ... -32768 to 32767
		Data 11	:	Coefficient K2, exponent ... -9 to 9
		Data 12	:	Constant A1, mantissa ... -32768 to 32767
		Data 13	:	Constant A1, exponent ... -9 to 9
		Data 14	:	Initial value flag ... 1: Disable, 2: Enable
		Data 15	:	Initial value, mantissa ... -32768 to 32767
		Data 16	:	Initial value, exponent ... -9 to 9
		Data 17	:	Logarithmic function ... 1: Normal, 2: Log
		Data 18	:	Exponential scale ... 1: 10, 2: 5, 3: 4, 4: 2, 5: 1

Error		Data 1	:	-1: Parameter error, -2: Setting unavailable
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- Example: Function pen 16, addition/subtraction (1), X1 = input pen 8 (normal data), X2 = function pen 5 (normal data), K1 = 1.98, K2 = 14.14, A1 = 1.73, initial value disabled, logarithmic function disabled

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	253
66	Command No.	221
67	Data 1	1
68	Data 2	16
69	Data 3	1
70	Data 4	8
71	Data 5	1
72	Data 6	69
73	Data 7	1
74	Data 8	19800
75	Data 9	0
76	Data 10	14140
77	Data 11	1
78	Data 12	17300
79	Data 13	0
80	Data 14	1
81	Data 15	---
82	Data 16	---
83	Data 17	1
84	Data 18	---
112	Sequence No.	253

- Error

- The 73VR sends back command No. 0x80DD when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is NOT in Remote Setting mode or when it is started. Status confirmation is always available.
- Parameter error: Normal parameters are valid even if invalid data is contained in other parameters.

- Note

- The 73VR sends back certain values for those indicated with '---,' however these parameters are ignored.

3.14.2 PEN (FUNCTION) – Multiplication / Division

• Host → 73VR

Data 1	:	-1: Status confirmation, 1: Setting
Data 2	:	Function pen number 1 to 64
Data 3	:	Function type ... 2: Multiplication, 3: Division
Data 4	:	Input X1 ... 0: No change, 1 to 128 (65 to 128 for function pens 1 to 64)
Data 5	:	Input X1 flag ... 0: No change, 1: Normal data, 2: Last (previous) data
Data 6	:	Input X2 ... 0: No change, 1 to 128 (65 to 128 for function pens 1 to 64)
Data 7	:	Input X2 flag ... 0: No change, 1: Normal data, 2: Last (previous) data
Data 8	:	Coefficient K1, mantissa ... -32768 to 32767
Data 9	:	Coefficient K1, exponent ... -9 to 9
Data 10	:	Coefficient K2, mantissa ... -32768 to 32767
Data 11	:	Coefficient K2, exponent ... -9 to 9
Data 12	:	Constant A1, mantissa ... -32768 to 32767
Data 13	:	Constant A1, exponent ... -9 to 9
Data 14	:	Constant A2, mantissa ... -32768 to 32767
Data 15	:	Constant A2, exponent ... -9 to 9
Data 16	:	Constant A3, mantissa ... -32768 to 32767
Data 17	:	Constant A3, exponent ... -9 to 9
Data 18	:	Initial value flag ... 0: No change, 1: Disable, 2: Enable
Data 19	:	Initial value, mantissa ... -32768 to 32767
Data 20	:	Initial value, exponent ... -9 to 9
Data 21	:	Logarithmic function ... 0: No change, 1: Normal, 2: Log
Data 22	:	Exponential scale ... 0: No change, 1: 10, 2: 5, 3: 4, 4: 2, 5: 1

- Data 19, 20 are invalid when the initial value flag (data 18) is disabled.
- Data 22 is invalid when the logarithmic function (data 21) is set to 'normal.'

• 73VR → Host

Normal		Data 1	:	0: Status confirmation response, 1: Setting complete
		Data 2	:	Function pen number 1 to 64
		Data 3	:	Function type ... 2: Multiplication, 3: Division
		Data 4	:	Input X1 ... 1 to 128 (65 to 128 for function pens 1 to 64)
		Data 5	:	Input X1 flag ... 1: Normal data, 2: Last (previous) data
		Data 6	:	Input X2 ... 1 to 128 (65 to 128 for function pens 1 to 64)
		Data 7	:	Input X2 flag ... 1: Normal data, 2: Last (previous) data
		Data 8	:	Coefficient K1, mantissa ... -32768 to 32767
		Data 9	:	Coefficient K1, exponent ... -9 to 9
		Data 10	:	Coefficient K2, mantissa ... -32768 to 32767
		Data 11	:	Coefficient K2, exponent ... -9 to 9
		Data 12	:	Constant A1, mantissa ... -32768 to 32767
		Data 13	:	Constant A1, exponent ... -9 to 9
		Data 14	:	Constant A2, mantissa ... -32768 to 32767
		Data 15	:	Constant A2, exponent ... -9 to 9
		Data 16	:	Constant A3, mantissa ... -32768 to 32767
		Data 17	:	Constant A3, exponent ... -9 to 9
		Data 18	:	Initial value flag ... 1: Disable, 2: Enable
		Data 19	:	Initial value, mantissa ... -32768 to 32767
		Data 20	:	Initial value, exponent ... -9 to 9
		Data 21	:	Logarithmic function ... 1: Normal, 2: Log
		Data 22	:	Exponential scale ... 1: 10, 2: 5, 3: 4, 4: 2, 5: 1

Error		Data 1	:	-1: Parameter error, -2: Setting unavailable
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- Example: Function pen 17, multiplication (2), X1 = input pen 3 (normal data), X2 = input pen 5 (normal data), K1 = 1.98, K2 = 14.14, A1 = 1.73, A2 = 12.33, A3 = 128.5, initial value disabled, logarithmic function disabled

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	254
66	Command No.	221
67	Data 1	1
68	Data 2	17
69	Data 3	2
70	Data 4	3
71	Data 5	1
72	Data 6	5
73	Data 7	1
74	Data 8	19800
75	Data 9	0
76	Data 10	14140
77	Data 11	1
78	Data 12	17300
79	Data 13	0
80	Data 14	12330
81	Data 15	1
82	Data 16	12850
83	Data 17	2
84	Data 18	1
85	Data 19	---
86	Data 20	---
87	Data 21	1
88	Data 22	---
112	Sequence No.	254

- Error

- The 73VR sends back command No. 0x80DD when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is NOT in Remote Setting mode or when it is started. Status confirmation is always available.
- Parameter error: Normal parameters are valid even if invalid data is contained in other parameters.

- Note

- The 73VR sends back certain values for those indicated with '---,' however these parameters are ignored.

3.14.3 PEN (FUNCTION) – Moving average

- Host → 73VR

Data 1 : -1: Status confirmation, 1: Setting
 Data 2 : Function pen number 1 to 64
 Data 3 : Function type ... 4: Moving average
 Data 4 : Samples ... 0: No change, 2 to 16
 Data 5 : Input X1 ... 0: No change, 1 to 128 (65 to 128 for function pens 1 to 64)
 Data 6 : Logarithmic function ... 0: No change, 1: Normal, 2: Log
 Data 7 : Exponential scale ... 0: No change, 1: 10, 2: 5, 3: 4, 4: 2, 5: 1

· Data 7 is invalid when the logarithmic function (data 6) is set to 'normal.'

- 73VR → Host

Normal | Data 1 : 0: Status confirmation response, 1: Setting complete
 Data 2 : Function pen number 1 to 64
 Data 3 : Function type ... 4: Moving average
 Data 4 : Samples ... 2 to 16
 Data 5 : Input X1 ... 1 to 128 (65 to 128 for function pens 1 to 64)
 Data 6 : Logarithmic function ... 1: Normal, 2: Log
 Data 7 : Exponential scale ... 1: 10, 2: 5, 3: 4, 4: 2, 5: 1

Error | Data 1 : -1: Parameter error, -2: Setting unavailable

- Example: Function pen 17, moving average (4), 5 samples X1 = input pen 11, logarithmic function disabled

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	255
66	Command No.	221
67	Data 1	1
68	Data 2	17
69	Data 3	4
70	Data 4	5
71	Data 5	11
72	Data 6	1
73	Data 7	---
112	Sequence No.	255

- Error

- The 73VR sends back command No. 0x80DD when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is NOT in Remote Setting mode or when it is started. Status confirmation is always available.
- Parameter error: Normal parameters are valid even if invalid data is contained in other parameters.

- Note

- The 73VR sends back certain values for those indicated with '---,' however these parameters are ignored.

3.14.4 PEN (FUNCTION) – First order lag

- Host → 73VR

Data 1 : -1: Status confirmation, 1: Setting
 Data 2 : Function pen number 1 to 64
 Data 3 : Function type ... 5: First order lag
 Data 4 : Time constant, mantissa ... 0 to 32767
 Data 5 : Time constant, exponent ... -9 to 9
 Data 6 : Input X1 ... 0: No change
 1 to 128 (65 to 128 for function pens 1 to 64)
 Data 7 : Logarithmic function ... 0: No change, 1: Normal, 2: Log
 Data 8 : Exponential scale ... 0: No change, 1: 10, 2: 5, 3: 4, 4: 2, 5: 1

· Data 4/5 setting range: 0 to +100.00

- 73VR → Host

Normal | Data 1 : 0: Status confirmation response, 1: Setting complete
 Data 2 : Function pen number 1 to 64
 Data 3 : Function type ... 5: First order lag
 Data 4 : Time constant, mantissa ... 0 to 32767
 Data 5 : Time constant, exponent ... -9 to 9
 Data 6 : Input X1 ... 1 to 128 (65 to 128 for function pens 1 to 64)
 Data 7 : Logarithmic function ... 1: Normal, 2: Log
 Data 8 : Exponential scale ... 1: 10, 2: 5, 3: 4, 4: 2, 5: 1

Error | Data 1 : -1: Parameter error, -2: Setting unavailable

- Example: Function pen 18, first order lag (5), time constant 1.0 second, X1 = input pen 12, logarithmic function disabled

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	256
66	Command No.	221
67	Data 1	1
68	Data 2	18
69	Data 3	5
70	Data 4	10000
71	Data 5	0
72	Data 6	12
73	Data 7	1
74	Data 8	---
112	Sequence No.	256

- Error

- The 73VR sends back command No. 0x80DD when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is NOT in Remote Setting mode or when it is started. Status confirmation is always available.
- Parameter error: Normal parameters are valid even if invalid data is contained in other parameters.

- Note

- The 73VR sends back certain values for those indicated with '---,' however these parameters are ignored.

3.14.5 PEN (FUNCTION) – Square root extraction

- Host → 73VR

Data 1 : -1: Status confirmation, 1: Setting
 Data 2 : Function pen number 1 to 64
 Data 3 : Function type ... 6: Square root extraction
 Data 4 : Input X1 ... 0: No change, 1 to 128 (65 to 128 for function pens 1 to 64)
 Data 5 : Input X1 flag ... 0: No change, 1: Normal data, 2: Last (previous) data
 Data 6 : Coefficient K1, mantissa ... -32768 to 32767
 Data 7 : Coefficient K1, exponent ... -9 to 9
 Data 8 : Initial value flag ... 0: No change, 1: Disable, 2: Enable
 Data 9 : Initial value, mantissa ... -32768 to 32767
 Data 10 : Initial value, exponent ... -9 to 9
 Data 11 : Logarithmic function ... 0: No change, 1: Normal, 2: Log
 Data 12 : Exponential scale ... 0: No change, 1: 10, 2: 5, 3: 4, 4: 2, 5: 1

- 73VR → Host

Normal | Data 1 : 0: Status confirmation response, 1: Setting complete
 Data 2 : Function pen number 1 to 64
 Data 3 : Function type ... 6: Square root extraction
 Data 4 : Input X1 ... 1 to 128 (65 to 128 for function pens 1 to 64)
 Data 5 : Input X1 flag ... 1: Normal data, 2: Last (previous) data
 Data 6 : Coefficient K1, mantissa ... -32768 to 32767
 Data 7 : Coefficient K1, exponent ... -9 to 9
 Data 8 : Initial value flag ... 1: Disable, 2: Enable
 Data 9 : Initial value, mantissa ... -32768 to 32767
 Data 10 : Initial value, exponent ... -9 to 9
 Data 11 : Logarithmic function ... 1: Normal, 2: Log
 Data 12 : Exponential scale ... 1: 10, 2: 5, 3: 4, 4: 2, 5: 1

Error | Data 1 : -1: Parameter error, -2: Setting unavailable

- Example: Function pen 19, square root extraction (6), X1 = input pen 13 (normal data), K1 = 2.34, initial value disabled, logarithmic function disabled

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	257
66	Command No.	221
67	Data 1	1
68	Data 2	19
69	Data 3	6
70	Data 4	13
71	Data 5	1
72	Data 6	23400
73	Data 7	0
74	Data 8	1
75	Data 9	---
76	Data 10	---
77	Data 11	1
78	Data 12	---
112	Sequence No.	257

- Error

- The 73VR sends back command No. 0x80DD when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is NOT in Remote Setting mode or when it is started. Status confirmation is always available.
- Parameter error: Normal parameters are valid even if invalid data is contained in other parameters.

- Note

- The 73VR sends back certain values for those indicated with '---,' however these parameters are ignored.

3.14.6 PEN (FUNCTION) – Peak hold / Valley hold

• Host → 73VR

Data 1	:	-1: Status confirmation, 1: Setting
Data 2	:	Function pen number 1 to 64
Data 3	:	Function type ... 7: Peak hold (max.), 8: Valley hold (min.)
Data 4	:	Reset condition (duration)... 0: No change, 1: No condition, 2: 30 minutes 3: 1 hour, 4: 2 hours, 5: 3 hours, 6: 4 hours, 7: 6 hours 8: 12 hours, 9: 24 hours
Data 5	:	Reset condition (trigger input) ... 0: No change, 1: No condition 2: Up, 3: Down, 4: ON, 5: OFF
Data 6	:	Reset time ... 0 to 23
Data 7	:	Input X1 ... 0: No change, 1 to 128 (65 to 128 for function pens 1 to 64)
Data 8	:	Input X1 flag ... 0: No change, 1: Normal data, 2: Last (previous) data
Data 9	:	Input X2 ... 0: No change, 1 to 128 (65 to 128 for function pens 1 to 64)
Data 10	:	Initial value flag ... 0: No change, 1: Disable, 2: Enable
Data 11	:	Initial value, mantissa ... -32768 to 32767
Data 12	:	Initial value, exponent ... -9 to 9
Data 13	:	Logarithmic function ... 0: No change, 1: Normal, 2: Log
Data 14	:	Exponential scale ... 0: No change, 1: 10, 2: 5, 3: 4, 4: 2, 5: 1

- Reset time (data 6) is valid when the reset condition (data 4) is set to 9: 24 hours.
- Input X2 (data 9) is valid when the trigger input reset condition (data 5) is set to other than 1: No condition.

• 73VR → Host

Normal		Data 1	:	0: Status confirmation response, 1: Setting complete
		Data 2	:	Function pen number 1 to 64
		Data 3	:	Function type ... 7: Peak hold (max.), 8: Valley hold (min.)
		Data 4	:	Reset condition (duration)... 1: No condition, 2: 30 minutes 3: 1 hour, 4: 2 hours, 5: 3 hours, 6: 4 hours, 7: 6 hours 8: 12 hours, 9: 24 hours
		Data 5	:	Reset condition (trigger input) ... 1: No condition, 2: Up, 3: Down, 4: ON, 5: OFF
		Data 6	:	Reset time ... 0 to 23
		Data 7	:	Input X1 ... 1 to 128 (65 to 128 for function pens 1 to 64)
		Data 8	:	Input X1 flag ... 1: Normal data, 2: Last (previous) data
		Data 9	:	Input X2 ... 1 to 128 (65 to 128 for function pens 1 to 64)
		Data 10	:	Initial value flag ... 1: Disable, 2: Enable
		Data 11	:	Initial value, mantissa ... -32768 to 32767
		Data 12	:	Initial value, exponent ... -9 to 9
		Data 13	:	Logarithmic function ... 1: Normal, 2: Log
		Data 14	:	Exponential scale ... 1: 10, 2: 5, 3: 4, 4: 2, 5: 1
Error		Data 1	:	-1: Parameter error, -2: Setting unavailable

- Example: Function pen 19, peak hold (7), reset condition = 24 hours, trigger input, Up, reset time = 8 o'clock, X1 = input pen 17 (normal data), X2 = input pen 1, initial value disabled, logarithmic function disabled

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	258
66	Command No.	221
67	Data 1	1
68	Data 2	19
69	Data 3	7
70	Data 4	9
71	Data 5	2
72	Data 6	8
73	Data 7	17
74	Data 8	1
75	Data 9	1
76	Data 10	1
77	Data 11	---
78	Data 12	---
79	Data 13	1
80	Data 14	---
112	Sequence No.	258

- Error

- The 73VR sends back command No. 0x80DD when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is NOT in Remote Setting mode or when it is started. Status confirmation is always available.
- Parameter error: Normal parameters are valid even if invalid data is contained in other parameters.

- Note

- The 73VR sends back certain values for those indicated with '---,' however these parameters are ignored.

3.14.7 PEN (FUNCTION) – Power

• Host → 73VR

- Data 1 : -1: Status confirmation, 1: Setting
- Data 2 : Function pen number 1 to 64
- Data 3 : Function type ... 9: Power
- Data 4 : Input X1 ... 0: No change, 1 to 128 (65 to 128 for function pens 1 to 64)
- Data 5 : Input X1 flag ... 0: No change, 1: Normal data, 2: Last (previous) data
- Data 6 : Constant A1, mantissa ... -32768 to 32767
- Data 7 : Constant A1, exponent ... -9 to 9
- Data 8 : Initial value flag ... 0: No change, 1: Disable, 2: Enable
- Data 9 : Initial value, mantissa ... -32768 to 32767
- Data 10 : Initial value, exponent ... -9 to 9
- Data 11 : Logarithmic function ... 0: No change, 1: Normal, 2: Log
- Data 12 : Exponential scale ... 0: No change, 1: 10, 2: 5, 3: 4, 4: 2, 5: 1

- Data 9/10 setting range: -99.99 to +99.99

• 73VR → Host

- Normal |
- Data 1 : 0: Status confirmation response, 1: Setting complete
 - Data 2 : Function pen number 1 to 64
 - Data 3 : Function type ... 9: Power
 - Data 4 : Input X1 ... 1 to 128 (65 to 128 for function pens 1 to 64)
 - Data 5 : Input X1 flag ... 1: Normal data, 2: Last (previous) data
 - Data 6 : Constant A1, mantissa ... -32768 to 32767
 - Data 7 : Constant A1, exponent ... -9 to 9
 - Data 8 : Initial value flag ... 1: Disable, 2: Enable
 - Data 9 : Initial value, mantissa ... -32768 to 32767
 - Data 10 : Initial value, exponent ... -9 to 9
 - Data 11 : Logarithmic function ... 1: Normal, 2: Log
 - Data 12 : Exponential scale ... 1: 10, 2: 5, 3: 4, 4: 2, 5: 1

Error | Data 1 : -1: Parameter error, -2: Setting unavailable

• Example: Function pen 20, power (9), X1 = input pen 18 (normal data), A1 = 1.5, initial value disabled, logarithmic function disabled

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	259
66	Command No.	221
67	Data 1	1
68	Data 2	20
69	Data 3	9
70	Data 4	18
71	Data 5	1
72	Data 6	15000
73	Data 7	0
74	Data 8	1
75	Data 9	---
76	Data 10	---
77	Data 11	1
78	Data 12	---
112	Sequence No.	259

- Error

- The 73VR sends back command No. 0x80DD when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is NOT in Remote Setting mode or when it is started. Status confirmation is always available.
- Parameter error: Normal parameters are valid even if invalid data is contained in other parameters.

- Note

- The 73VR sends back certain values for those indicated with '---,' however these parameters are ignored.

3.14.8 PEN (FUNCTION) – Analog accumulation

• Host → 73VR

Data 1	:	-1: Status confirmation, 1: Setting
Data 2	:	Function pen number 1 to 64
Data 3	:	Function type ... 10: Analog accumulation
Data 4	:	Reset condition (duration)... 0: No change, 1: No condition, 2: 30 minutes 3: 1 hour, 4: 2 hours, 5: 3 hours, 6: 4 hours, 7: 6 hours 8: 12 hours, 9: 24 hours
Data 5	:	Reset condition (trigger input) ... 0: No change, 1: No condition 2: Up, 3: Down, 4: ON, 5: OFF
Data 6	:	Reset time ... 0 to 23
Data 7	:	Input X1 ... 0: No change, 1 to 128 (65 to 128 for function pens 1 to 64)
Data 8	:	Input X1 flag ... 0: No change, 1: Normal data, 2: Last (previous) data
Data 9	:	Input X2 ... 0: No change, 1 to 128 (65 to 128 for function pens 1 to 64)
Data 10	:	Sum scale ... 0: No change, 1: No scale, 2: Sec., 3: Min., 4: Hour, 5: Day
Data 11	:	Drop out (A3), mantissa ... -32768 to 32767
Data 12	:	Drop out (A3), exponent ... -9 to 9
Data 13	:	Initial value flag ... 0: No change, 1: Disable, 2: Enable
Data 14	:	Initial value, mantissa ... -32768 to 32767
Data 15	:	Initial value, exponent ... -9 to 9
Data 16	:	Logarithmic function ... 0: No change, 1: Normal, 2: Log
Data 17	:	Exponential scale ... 0: No change, 1: 10, 2: 5, 3: 4, 4: 2, 5: 1

- Reset time (data 6) is valid when the reset condition (data 4) is set to 9: 24 hours.
- Input X2 (data 9) is valid when the trigger input reset condition (data 5) is set to other than 1: No condition.
- Constant A3 (data 11/12) is used as drop out value; must be of 0 or greater value.

• 73VR → Host

Normal		Data 1	:	0: Status confirmation response, 1: Setting complete
		Data 2	:	Function pen number 1 to 64
		Data 3	:	Function type ... 10: Analog accumulation
		Data 4	:	Reset condition (duration)... 1: No condition, 2: 30 minutes, 3: 1 hour, 4: 2 hours, 5: 3 hours, 6: 4 hours, 7: 6 hours 8: 12 hours, 9: 24 hours
		Data 5	:	Reset condition (trigger input) ... 1: No condition, 2: Up, 3: Down, 4: ON, 5: OFF
		Data 6	:	Reset time ... 0 to 23
		Data 7	:	Input X1 ... 1 to 128 (65 to 128 for function pens 1 to 64)
		Data 8	:	Input X1 flag ... 1: Normal data, 2: Last (previous) data
		Data 9	:	Input X2 ... 1 to 128 (65 to 128 for function pens 1 to 64)
		Data 10	:	Sum scale ... 1: No scale, 2: Sec., 3: Min., 4: Hour, 5: Day
		Data 11	:	Drop out (A3), mantissa ... -32768 to 32767
		Data 12	:	Drop out (A3), exponent ... -9 to 9
		Data 13	:	Initial value flag ... 1: Disable, 2: Enable
		Data 14	:	Initial value, mantissa ... -32768 to 32767
		Data 15	:	Initial value, exponent ... -9 to 9
		Data 16	:	Logarithmic function ... 1: Normal, 2: Log
		Data 17	:	Exponential scale ... 1: 10, 2: 5, 3: 4, 4: 2, 5: 1
Error		Data 1	:	-1: Parameter error, -2: Setting unavailable

- Example: Function pen 20, analog accumulation (10), reset condition = 1 hour, trigger input, Up, X1 = input pen 18 (normal data), X2 = input pen 1, scale sum = hour, drop out = 0.5, initial value disabled, logarithmic function disabled

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	260
66	Command No.	221
67	Data 1	1
68	Data 2	20
69	Data 3	10
70	Data 4	3
71	Data 5	2
72	Data 6	---
73	Data 7	18
74	Data 8	1
75	Data 9	1
76	Data 10	4
77	Data 11	5000
78	Data 12	0
79	Data 13	1
80	Data 14	---
81	Data 15	---
82	Data 16	1
83	Data 17	---
112	Sequence No.	260

- Error

- The 73VR sends back command No. 0x80DD when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is NOT in Remote Setting mode or when it is started. Status confirmation is always available.
- Parameter error: Normal parameters are valid even if invalid data is contained in other parameters.

- Note

- The 73VR sends back certain values for those indicated with '---,' however these parameters are ignored.

3.14.9 PEN (FUNCTION) – Pulse accumulation

• Host → 73VR

Data 1	:	-1: Status confirmation, 1: Setting
Data 2	:	Function pen number 1 to 64
Data 3	:	Function type ... 11: Pulse accumulation
Data 4	:	Reset condition (duration)... 0: No change, 1: No condition, 2: 30 minutes 3: 1 hour, 4: 2 hours, 5: 3 hours, 6: 4 hours, 7: 6 hours 8: 12 hours, 9: 24 hours
Data 5	:	Reset condition (trigger input) ... 0: No change, 1: No condition 2: Up, 3: Down, 4: ON, 5: OFF
Data 6	:	Reset time ... 0 to 23
Data 7	:	Input X1 ... 0: No change, 1 to 128 (65 to 128 for function pens 1 to 64)
Data 8	:	Input X1 flag ... 0: No change, 1: Normal data, 2: Last (previous) data
Data 9	:	Input X2 ... 0: No change, 1 to 128 (65 to 128 for function pens 1 to 64)
Data 10	:	Constant A1, mantissa ... -32768 to 32767
Data 11	:	Constant A1, exponent ... -9 to 9
Data 12	:	Initial value flag ... 0: No change, 1: Disable, 2: Enable
Data 13	:	Initial value, mantissa ... -32768 to 32767
Data 14	:	Initial value, exponent ... -9 to 9
Data 15	:	Logarithmic function ... 0: No change, 1: Normal, 2: Log
Data 16	:	Exponential scale ... 0: No change, 1: 10, 2: 5, 3: 4, 4: 2, 5: 1

- Reset time (data 6) is valid when the reset condition (data 4) is set to 9: 24 hours.
- Input X2 (data 9) is valid when the trigger input reset condition (data 5) is set to other than 1: No condition.
- Constant A1 (data 10/11) is used as added pulse value for adjustment; must be of 0 or greater value.

• 73VR → Host

Normal		Data 1	:	0: Status confirmation response, 1: Setting complete
		Data 2	:	Function pen number 1 to 64
		Data 3	:	Function type ... 11: Pulse accumulation
		Data 4	:	Reset condition (duration)... 1: No condition, 2: 30 minutes 3: 1 hour, 4: 2 hours, 5: 3 hours, 6: 4 hours, 7: 6 hours 8: 12 hours, 9: 24 hours
		Data 5	:	Reset condition (trigger input) ... 1: No condition, 2: Up, 3: Down, 4: ON, 5: OFF
		Data 6	:	Reset time ... 0 to 23
		Data 7	:	Input X1 ... 1 to 128 (65 to 128 for function pens 1 to 64)
		Data 8	:	Input X1 flag ... 1: Normal data, 2: Last (previous) data
		Data 9	:	Input X2 ... 1 to 128 (65 to 128 for function pens 1 to 64)
		Data 10	:	Constant A1, mantissa ... -32768 to 32767
		Data 11	:	Constant A1, exponent ... -9 to 9
		Data 12	:	Initial value flag ... 1: Disable, 2: Enable
		Data 13	:	Initial value, mantissa ... -32768 to 32767
		Data 14	:	Initial value, exponent ... -9 to 9
		Data 15	:	Logarithmic function ... 1: Normal, 2: Log
		Data 16	:	Exponential scale ... 1: 10, 2: 5, 3: 4, 4: 2, 5: 1

Error		Data 1	:	-1: Parameter error, -2: Setting unavailable
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- Example: Function pen 21, pulse accumulation (11), reset condition = 12 hours, trigger input, Down, X1 = input pen 19 (normal data), X2 = input pen 1, A1 = 10000, initial value disabled, logarithmic function disabled

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	260
66	Command No.	221
67	Data 1	1
68	Data 2	21
69	Data 3	11
70	Data 4	8
71	Data 5	3
72	Data 6	---
73	Data 7	19
74	Data 8	1
75	Data 9	1
76	Data 10	10000
77	Data 11	4
78	Data 12	1
79	Data 13	---
80	Data 14	---
81	Data 15	1
82	Data 16	---
112	Sequence No.	260

- Error

- The 73VR sends back command No. 0x80DD when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is NOT in Remote Setting mode or when it is started. Status confirmation is always available.
- Parameter error: Normal parameters are valid even if invalid data is contained in other parameters.

- Note

- The 73VR sends back certain values for those indicated with '---,' however these parameters are ignored.

3.14.10 PEN (FUNCTION) – F value calculation

• Host → 73VR

Data 1	:	-1: Status confirmation, 1: Setting
Data 2	:	Function pen number 1 to 64
Data 3	:	Function type ... 12: F value calculation
Data 4	:	Reset condition (discrete)... 0: No change, 1: No condition 2: Up, 3: Down, 4: ON, 5: OFF
Data 5	:	Reset condition (analog) ... 0: No change, 1: No condition 2: Value < Threshold, 3: Value ≤ Threshold
Data 6	:	Threshold, mantissa ... -32768 to 32767
Data 7	:	Threshold, exponent ... -9 to 9
Data 8	:	Deadband flag ... 0: No change, 1: Disable, 2: Enable
Data 9	:	Deadband, mantissa ... -32768 to 32767
Data 10	:	Deadband, exponent ... -9 to 9
Data 11	:	Input X1 ... 0: No change, 1 to 128 (65 to 128 for function pens 1 to 64)
Data 12	:	Input X2 (analog trigger) ... 0: No change, 1 to 128 (65 to 128 for function pens 1 to 64)
Data 13	:	Input X3 (discrete trigger)... 0: No change, 1 to 128 (65 to 128 for function pens 1 to 64)
Data 14	:	Reference temperature T0, mantissa ... -32768 to 32767
Data 15	:	Reference temperature T0, exponent ... -9 to 9
Data 16	:	Z value, mantissa ... -32768 to 32767
Data 17	:	Z value, exponent ... -9 to 9
Data 18	:	Logarithmic function ... 0: No change, 1: Normal, 2: Log
Data 19	:	Exponential scale ... 0: No change, 1: 10, 2: 5, 3: 4, 4: 2, 5: 1

- Threshold (data 6/7) is valid when the analog reset condition (data 5) is set.
- Deadband (data 8/9/10) is valid when the analog reset condition (data 5) is set. Range: 0 or greater value.
- Input X2 (data 12) is valid when the analog reset condition is set.
- Input X3 (data 13) is valid when the discrete reset condition is set.

• 73VR → Host

Normal		Data 1	:	0: Status confirmation response, 1: Setting complete
		Data 2	:	Function pen number 1 to 64
		Data 3	:	Function type ... 12: F value calculation
		Data 4	:	Reset condition (discrete)... 1: No condition, 2: Up, 3: Down, 4: ON, 5: OFF
		Data 5	:	Reset condition (analog) ... 1: No condition, 2: Value < Threshold, 3: Value ≤ Threshold
		Data 6	:	Threshold, mantissa ... -32768 to 32767
		Data 7	:	Threshold, exponent ... -9 to 9
		Data 8	:	Deadband flag ... 1: Disable, 2: Enable
		Data 9	:	Deadband, mantissa ... -32768 to 32767
		Data 10	:	Deadband, exponent ... -9 to 9
		Data 11	:	Input X1 ... 1 to 128 (65 to 128 for function pens 1 to 64)
		Data 12	:	Input X2 (analog trigger) ... 1 to 128 (65 to 128 for function pens 1 to 64)
		Data 13	:	Input X3 (discrete trigger)... 1 to 128 (65 to 128 for function pens 1 to 64)
		Data 14	:	Reference temperature T0, mantissa ... -32768 to 32767
		Data 15	:	Reference temperature T0, exponent ... -9 to 9
		Data 16	:	Z value, mantissa ... -32768 to 32767
		Data 17	:	Z value, exponent ... -9 to 9
		Data 18	:	Logarithmic function ... 1: Normal, 2: Log
		Data 19	:	Exponential scale ... 1: 10, 2: 5, 3: 4, 4: 2, 5: 1
Error		Data 1	:	-1: Parameter error, -2: Setting unavailable

- Example: Function pen 22, F value calculation (12), discrete reset condition = Up, analog reset condition = value < threshold, threshold = 125.0, deadband = 2.0, X1 = input pen 20 (normal data), X2 = input pen 2, X3 = input pen 17, T0 = 121.1°C, Z value 10.0, logarithmic function disabled

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	261
66	Command No.	221
67	Data 1	1
68	Data 2	22
69	Data 3	12
70	Data 4	2
71	Data 5	2
72	Data 6	12500
73	Data 7	2
74	Data 8	2
75	Data 9	20000
76	Data 10	0
77	Data 11	20
78	Data 12	2
79	Data 13	17
80	Data 14	12110
81	Data 15	2
82	Data 16	10000
83	Data 17	1
84	Data 18	1
85	Data 19	---
112	Sequence No.	261

- Error

- The 73VR sends back command No. 0x80DD when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is NOT in Remote Setting mode or when it is started. Status confirmation is always available.
- Parameter error: Normal parameters are valid even if invalid data is contained in other parameters.

- Note

- The 73VR sends back certain values for those indicated with '---,' however these parameters are ignored.

3.14.11 PEN (FUNCTION) – AND, OR, XOR

• Host → 73VR

Data 1	:	-1: Status confirmation, 1: Setting
Data 2	:	Function pen number 1 to 64
Data 3	:	Function type ... 13: AND, 14: OR, 16: XOR
Data 4	:	Input X1 ... 0: No change, 1 to 128 (65 to 128 for function pens 1 to 64)
Data 5	:	Input X1 flag ... 0: No change, 1: Normal data, 2: Last (previous) data
Data 6	:	Input X2 ... 0: No change, 1 to 128 (65 to 128 for function pens 1 to 64)
Data 7	:	Input X2 flag ... 0: No change, 1: Normal data, 2: Last (previous) data
Data 8	:	Initial value flag ... 0: No change, 1: Disable, 2: Enable
Data 9	:	Initial value ... 0, 1 (valid with data 8 enabled)
Data 10	:	OFF description, 1st character ... ASCII code or 0: No setting (Null), -1: No change
Data 11	:	OFF description, 2nd character ... ASCII code or 0: No setting (Null)
Data 12	:	OFF description, 3rd character ... ASCII code or 0: No setting (Null)
Data 13	:	OFF description, 4th character ... ASCII code or 0: No setting (Null)
Data 14	:	OFF description, 5th character ... ASCII code or 0: No setting (Null)
Data 15	:	ON description, 1st character ... ASCII code or 0: No setting (Null), -1: No change
Data 16	:	ON description, 2nd character ... ASCII code or 0: No setting (Null)
Data 17	:	ON description, 3rd character ... ASCII code or 0: No setting (Null)
Data 18	:	ON description, 4th character ... ASCII code or 0: No setting (Null)
Data 19	:	ON description, 5th character ... ASCII code or 0: No setting (Null)

· All OFF description data is invalid if data 10 (OFF's 1st character) is set to 0 (Null). No change is applied if set to -1 (No change).

· All ON description data is invalid if data 15 (ON's 1st character) is set to 0 (Null). No change is applied if set to -1 (No change).

• 73VR → Host

Normal		Data 1	:	0: Status confirmation response, 1: Setting complete
		Data 2	:	Function pen number 1 to 64
		Data 3	:	Function type ... 13: AND, 14: OR, 16: XOR
		Data 4	:	Input X1 ... 1 to 128 (65 to 128 for function pens 1 to 64)
		Data 5	:	Input X1 flag ... 1: Normal data, 2: Last (previous) data
		Data 6	:	Input X2 ... 1 to 128 (65 to 128 for function pens 1 to 64)
		Data 7	:	Input X2 flag ... 1: Normal data, 2: Last (previous) data
		Data 8	:	Initial value flag ... 1: Disable, 2: Enable
		Data 9	:	Initial value ... 0, 1 (valid with data 8 enabled)
		Data 10	:	OFF description, 1st character ... ASCII code or 0: No setting (Null)
		Data 11	:	OFF description, 2nd character ... ASCII code or 0: No setting (Null)
		Data 12	:	OFF description, 3rd character ... ASCII code or 0: No setting (Null)
		Data 13	:	OFF description, 4th character ... ASCII code or 0: No setting (Null)
		Data 14	:	OFF description, 5th character ... ASCII code or 0: No setting (Null)
		Data 15	:	ON description, 1st character ... ASCII code or 0: No setting (Null)
		Data 16	:	ON description, 2nd character ... ASCII code or 0: No setting (Null)
		Data 17	:	ON description, 3rd character ... ASCII code or 0: No setting (Null)
		Data 18	:	ON description, 4th character ... ASCII code or 0: No setting (Null)
		Data 19	:	ON description, 5th character ... ASCII code or 0: No setting (Null)

Error | Data 1 : -1: Parameter error, -2: Setting unavailable

- Example: Input pen 21, XOR (16), X1 = input pen 1 (normal data), X2 = input pen 1 (last data), OFF description 'OFF,' ON description 'ON,' initial value disabled

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	262
66	Command No.	221
67	Data 1	1
68	Data 2	21
69	Data 3	16
70	Data 4	1
71	Data 5	1
72	Data 6	1
73	Data 7	2
74	Data 8	1
75	Data 9	---
76	Data 10	0x004F (O)
77	Data 11	0x0046 (F)
78	Data 12	0x0046 (F)
79	Data 13	0x0
80	Data 14	0x0
81	Data 15	0x004F (O)
82	Data 16	0x004E (N)
83	Data 17	0x0
84	Data 18	0x0
85	Data 19	0x0
112	Sequence No.	262

- Error

- The 73VR sends back command No. 0x80DD when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is NOT in Remote Setting mode or when it is started. Status confirmation is always available.
- Parameter error: Normal parameters are valid even if invalid data is contained in other parameters.

- Note

- The 73VR sends back certain values for those indicated with '---,' however these parameters are ignored.

3.14.12 PEN (FUNCTION) – NOT

- Host → 73VR

Data 1	:	-1: Status confirmation, 1: Setting
Data 2	:	Function pen number 1 to 64
Data 3	:	Function type ... 15: NOT
Data 4	:	Input X1 ... 0: No change, 1 to 128 (65 to 128 for function pens 1 to 64)
Data 5	:	Input X1 flag ... 0: No change, 1: Normal data, 2: Last (previous) data
Data 6	:	Initial value flag ... 0: No change, 1: Disable, 2: Enable
Data 7	:	Initial value ... 0, 1 (valid with Data 6 enabled)
Data 8	:	OFF description, 1st character ... ASCII code or 0: No setting (Null), -1: No change
Data 9	:	OFF description, 2nd character ... ASCII code or 0: No setting (Null)
Data 10	:	OFF description, 3rd character ... ASCII code or 0: No setting (Null)
Data 11	:	OFF description, 4th character ... ASCII code or 0: No setting (Null)
Data 12	:	OFF description, 5th character ... ASCII code or 0: No setting (Null)
Data 13	:	ON description, 1st character ... ASCII code or 0: No setting (Null), -1: No change
Data 14	:	ON description, 2nd character ... ASCII code or 0: No setting (Null)
Data 15	:	ON description, 3rd character ... ASCII code or 0: No setting (Null)
Data 16	:	ON description, 4th character ... ASCII code or 0: No setting (Null)
Data 17	:	ON description, 5th character ... ASCII code or 0: No setting (Null)

- All OFF description data is invalid if data 8 (OFF's 1st character) is set to 0 (Null). No change is applied if set to -1 (No change).
- All ON description data is invalid if data 13 (ON's 1st character) is set to 0 (Null). No change is applied if set to -1 (No change).

- 73VR → Host

Normal		Data 1	:	0: Status confirmation response, 1: Setting complete
		Data 2	:	Function pen number 1 to 64
		Data 3	:	Function type ... 15: NOT
		Data 4	:	Input X1 ... 1 to 128 (65 to 128 for function pens 1 to 64)
		Data 5	:	Input X1 flag ... 1: Normal data, 2: Last (previous) data
		Data 6	:	Initial value flag ... 1: Disable, 2: Enable
		Data 7	:	Initial value ... 0, 1 (valid with data 8 enabled)
		Data 8	:	OFF description, 1st character ... ASCII code or 0: No setting (Null)
		Data 9	:	OFF description, 2nd character ... ASCII code or 0: No setting (Null)
		Data 10	:	OFF description, 3rd character ... ASCII code or 0: No setting (Null)
		Data 11	:	OFF description, 4th character ... ASCII code or 0: No setting (Null)
		Data 12	:	OFF description, 5th character ... ASCII code or 0: No setting (Null)
		Data 13	:	ON description, 1st character ... ASCII code or 0: No setting (Null)
		Data 14	:	ON description, 2nd character ... ASCII code or 0: No setting (Null)
		Data 15	:	ON description, 3rd character ... ASCII code or 0: No setting (Null)
		Data 16	:	ON description, 4th character ... ASCII code or 0: No setting (Null)
		Data 17	:	ON description, 5th character ... ASCII code or 0: No setting (Null)

Error		Data 1	:	-1: Parameter error, -2: Setting unavailable
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- Example: Input pen 22, NOT (15), X1 = input pen 1 (normal data), OFF description 'OFF,' ON description 'ON,' initial value disabled

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	263
66	Command No.	221
67	Data 1	1
68	Data 2	22
69	Data 3	15
70	Data 4	1
71	Data 5	1
72	Data 6	1
73	Data 7	---
74	Data 8	0x004F (O)
75	Data 9	0x0046 (F)
76	Data 10	0x0046 (F)
77	Data 11	0x0
78	Data 12	0x0
79	Data 13	0x004F (O)
80	Data 14	0x004E (N)
81	Data 15	0x0
82	Data 16	0x0
83	Data 17	0x0
112	Sequence No.	263

- Error

- The 73VR sends back command No. 0x80DD when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is NOT in Remote Setting mode or when it is started. Status confirmation is always available.
- Parameter error: Normal parameters are valid even if invalid data is contained in other parameters.

- Note

- The 73VR sends back certain values for those indicated with '---,' however these parameters are ignored.

3.14.13 PEN (FUNCTION) – Anemoscope

- Host → 73VR

Data 1	:	-1: Status confirmation, 1: Setting
Data 2	:	Function pen number 1 to 64
Data 3	:	Function type ... 17: Anemoscope
Data 4	:	Input X1 ... 0: No change, 1 to 128 (65 to 128 for function pens 1 to 64)
Data 5	:	Input X1 flag ... 0: No change, 1: Normal data, 2: Last (previous) data
Data 6	:	Constant A3, mantissa ... 0
Data 7	:	Constant A3, exponent ... 0
Data 8	:	Initial value flag ... 0: No change, 1: Disable, 2: Enable
Data 9	:	Initial value, mantissa ... -32768 to 32767
Data 10	:	Initial value, exponent ... -9 to 9
Data 11	:	Logarithmic function ... 0: No change, 1: Normal, 2: Log
Data 12	:	Exponential scale ... 0: No change, 1: 10, 2: 5, 3: 4, 4: 2, 5: 1

- 73VR → Host

Normal I	Data 1	:	0: Status confirmation response, 1: Setting complete
	Data 2	:	Function pen number 1 to 64
	Data 3	:	Function type ... 17: Anemoscope
	Data 4	:	Input X1 ... 1 to 128 (65 to 128 for function pens 1 to 64)
	Data 5	:	Input X1 flag ... 1: Normal data, 2: Last (previous) data
	Data 6	:	Constant A3, mantissa ... 0
	Data 7	:	Constant A3, exponent ... 0
	Data 8	:	Initial value flag ... 1: Disable, 2: Enable
	Data 9	:	Initial value, mantissa ... -32768 to 32767
	Data 10	:	Initial value, exponent ... -9 to 9
	Data 11	:	Logarithmic function ... 1: Normal, 2: Log
	Data 12	:	Exponential scale ... 1: 10, 2: 5, 3: 4, 4: 2, 5: 1

Error I	Data 1	:	-1: Parameter error, -2: Setting unavailable
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- Note

Set constant A3 to 0.

- Example: Function pen 23, Anemoscope (17), X1 = input pen 3 (normal data), initial value disabled, logarithmic function disabled

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	264
66	Command No.	221
67	Data 1	1
68	Data 2	23
69	Data 3	17
70	Data 4	3
71	Data 5	1
72	Data 6	0
73	Data 7	0
74	Data 8	1
75	Data 9	0
76	Data 10	0
77	Data 11	1
78	Data 12	0
112	Sequence No.	264

· Error

- The 73VR sends back command No. 0x80DD when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode, when it is NOT in Remote Setting mode or when it is started. Status confirmation is always available.
- Parameter error: Normal parameters are valid even if invalid data is contained in other parameters.

3.15 ANALOG ALARM – Limit, deadband, normal zone, zone color, relay

Command No. 241 (Remote Mode, Remote Setting Mode)

• Host → 73VR

Data 1	:	-1: Status confirmation, 1: Setting	
Data 2	:	Input (function) pen number 1 to 128 (65 to 128 for function pens 1 to 64)	
Data 3	:	Limit 1 flag	... 0: No change, 1: Disable, 2: Enable
Data 4	:	Limit 1, mantissa	... -32768 to 32767
Data 5	:	Limit 1, exponent	... -9 to 9
Data 6	:	Limit 2 flag	... 0: No change, 1: Disable, 2: Enable
Data 7	:	Limit 2, mantissa	... -32768 to 32767
Data 8	:	Limit 2, exponent	... -9 to 9
Data 9	:	Limit 3 flag	... 0: No change, 1: Disable, 2: Enable
Data 10	:	Limit 3, mantissa	... -32768 to 32767
Data 11	:	Limit 3, exponent	... -9 to 9
Data 12	:	Limit 4 flag	... 0: No change, 1: Disable, 2: Enable
Data 13	:	Limit 4, mantissa	... -32768 to 32767
Data 14	:	Limit 4, exponent	... -9 to 9
Data 15	:	Deadband 1 flag	... 0: No change, 1: Disable, 2: Enable
Data 16	:	Deadband 1, mantissa	... -32768 to 32767
Data 17	:	Deadband 1, exponent	... -9 to 9
Data 18	:	Deadband 2 flag	... 0: No change, 1: Disable, 2: Enable
Data 19	:	Deadband 2, mantissa	... -32768 to 32767
Data 20	:	Deadband 2, exponent	... -9 to 9
Data 21	:	Deadband 3 flag	... 0: No change, 1: Disable, 2: Enable
Data 22	:	Deadband 3, mantissa	... -32768 to 32767
Data 23	:	Deadband 3, exponent	... -9 to 9
Data 24	:	Deadband 4 flag	... 0: No change, 1: Disable, 2: Enable
Data 25	:	Deadband 4, mantissa	... -32768 to 32767
Data 26	:	Deadband 4, exponent	... -9 to 9
Data 27	:	Normal zone	... 0: No change 1: Zone 0, 2: Zone 1, 3: Zone 2, 4: Zone 3, 5: Zone 4
Data 28	:	Zone color 0	... 0: No change, Color code 1 to 48
Data 29	:	Zone color 1	... 0: No change, Color code 1 to 48
Data 30	:	Zone color 2	... 0: No change, Color code 1 to 48
Data 31	:	Zone color 3	... 0: No change, Color code 1 to 48
Data 32	:	Zone color 4	... 0: No change, Color code 1 to 48
Data 33	:	Relay 1 flag	... 0: No change, 1: Disable, 2: Enable
Data 34	:	Relay 2 flag	... 0: No change, 1: Disable, 2: Enable
Data 35	:	Relay 3 flag	... 0: No change, 1: Disable, 2: Enable
Data 36	:	Relay 4 flag	... 0: No change, 1: Disable, 2: Enable
Data 37	:	Relay 1 output channel	... 0: No change, Output channel 1 to 256
Data 38	:	Relay 2 output channel	... 0: No change, Output channel 1 to 256
Data 39	:	Relay 3 output channel	... 0: No change, Output channel 1 to 256
Data 40	:	Relay 4 output channel	... 0: No change, Output channel 1 to 256
Data 41	:	Relay 1 output flag	... 0 to 31
Data 42	:	Relay 2 output flag	... 0 to 31
Data 43	:	Relay 3 output flag	... 0 to 31
Data 44	:	Relay 4 output flag	... 0 to 31

· Refer to 1.3 Operation / setting flow via network for color code.

· Relay output flag: Set the addition result of the values assigned to zones with ON output as below:

Zone 0 ON : 1

Zone 1 ON : 2

Zone 2 ON : 4

Zone 3 ON : 8

Zone 4 ON : 16

For example, set 17 (= 1 + 16) to set ON for Zones 0 and 4.

· Deadband range: 0 or greater

• 73VR → Host

Normal		Data 1	:	0: Status confirmation response, 1: Setting complete
		Data 2	:	Input (function) pen number 1 to 128 (65 to 128 for function pens 1 to 64)
		Data 3	:	Limit 1 flag ... 1: Disable, 2: Enable
		Data 4	:	Limit 1, mantissa ... -32768 to 32767
		Data 5	:	Limit 1, exponent ... -9 to 9
		Data 6	:	Limit 2 flag ... 1: Disable, 2: Enable
		Data 7	:	Limit 2, mantissa ... -32768 to 32767
		Data 8	:	Limit 2, exponent ... -9 to 9
		Data 9	:	Limit 3 flag ... 1: Disable, 2: Enable
		Data 10	:	Limit 3, mantissa ... -32768 to 32767
		Data 11	:	Limit 3, exponent ... -9 to 9
		Data 12	:	Limit 4 flag ... 1: Disable, 2: Enable
		Data 13	:	Limit 4, mantissa ... -32768 to 32767
		Data 14	:	Limit 4, exponent ... -9 to 9
		Data 15	:	Deadband 1 flag ... 1: Disable, 2: Enable
		Data 16	:	Deadband 1, mantissa ... -32768 to 32767
		Data 17	:	Deadband 1, exponent ... -9 to 9
		Data 18	:	Deadband 2 flag ... 1: Disable, 2: Enable
		Data 19	:	Deadband 2, mantissa ... -32768 to 32767
		Data 20	:	Deadband 2, exponent ... -9 to 9
		Data 21	:	Deadband 3 flag ... 1: Disable, 2: Enable
		Data 22	:	Deadband 3, mantissa ... -32768 to 32767
		Data 23	:	Deadband 3, exponent ... -9 to 9
		Data 24	:	Deadband 4 flag ... 1: Disable, 2: Enable
		Data 25	:	Deadband 4, mantissa ... -32768 to 32767
		Data 26	:	Deadband 4, exponent ... -9 to 9
		Data 27	:	Normal zone ... 1: Zone 0, 2: Zone 1, 3: Zone 2, 4: Zone 3, 5: Zone 4
		Data 28	:	Zone color 0 ... Color code 1 to 48
		Data 29	:	Zone color 1 ... Color code 1 to 48
		Data 30	:	Zone color 2 ... Color code 1 to 48
		Data 31	:	Zone color 3 ... Color code 1 to 48
		Data 32	:	Zone color 4 ... Color code 1 to 48
		Data 33	:	Relay 1 flag ... 1: Disable, 2: Enable
		Data 34	:	Relay 2 flag ... 1: Disable, 2: Enable
		Data 35	:	Relay 3 flag ... 1: Disable, 2: Enable
		Data 36	:	Relay 4 flag ... 1: Disable, 2: Enable
		Data 37	:	Relay 1 output channel ... Output channel 1 to 256
		Data 38	:	Relay 2 output channel ... Output channel 1 to 256
		Data 39	:	Relay 3 output channel ... Output channel 1 to 256
		Data 40	:	Relay 4 output channel ... Output channel 1 to 256
		Data 41	:	Relay 1 output flag ... 0 to 31
		Data 42	:	Relay 2 output flag ... 0 to 31
		Data 43	:	Relay 3 output flag ... 0 to 31
		Data 44	:	Relay 4 output flag ... 0 to 31
Error		Data 1	:	-1: Parameter error, -2: Setting unavailable

- Example: Input pen 19, Zone 2 as normal,
Zone colors: 0 = Blue (29), 1 = Light blue (13), 2 = White (48), 3 = Orange (26), 4 = Red (9)
Limit 1 = -200, Deadband 1 = 10, Relay 1 output channel = 129, Relay 1 output = Zone 0
Limit 2 = -100, Deadband 2 = 5, Relay 2 output channel = 130, Relay 2 output = Zone 1
Limit 3 = 100, Deadband 3 = 5, Relay 3 output channel = 131, Relay 3 output = Zone 3
Limit 4 = 200, Deadband 4 = 10, Relay 4 output channel = 132, Relay 4 output = Zone 4

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	264
66	Command No.	241
67	Data 1	1
68	Data 2	19
69	Data 3	2
70	Data 4	-20000
71	Data 5	2
72	Data 6	2
73	Data 7	-10000
74	Data 8	2
75	Data 9	2
76	Data 10	10000
77	Data 11	2
78	Data 12	2
79	Data 13	20000
80	Data 14	2
81	Data 15	2
82	Data 16	10000
83	Data 17	1
84	Data 18	2
85	Data 19	5000
86	Data 20	1
87	Data 21	2
88	Data 22	5000

CH	CONTENTS	EXAMPLE
89	Data 23	1
90	Data 24	2
91	Data 25	10000
92	Data 26	2
93	Data 27	3
94	Data 28	29
95	Data 29	13
96	Data 30	48
97	Data 31	26
98	Data 32	9
99	Data 33	2
100	Data 34	2
101	Data 35	2
102	Data 36	2
103	Data 37	129
104	Data 38	130
105	Data 39	131
106	Data 40	132
107	Data 41	1
108	Data 42	2
109	Data 43	8
110	Data 44	16
112	Sequence No.	264

• Error

- The 73VR sends back command No. 0x80F1 when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode or when it is NOT in Remote Setting mode. Status confirmation is always available.
- Parameter error: Normal parameters are valid even if invalid data is contained in other parameters.

3.16 ANALOG ALARM – Message

Command No. 242 (Remote Mode, Remote Setting Mode)

• Host → 73VR

Data 1	:	-1: Status confirmation, 1: Setting	
Data 2	:	Input (function) pen number 1 to 128 (65 to 128 for function pens 1 to 64)	
Data 3	:	Message number	... 1: Up (0-1), Down (1-0) 2: Up (1-2), Down (2-1) 3: Up (2-3), Down (3-2) 4: Up (3-4), Down (4-3)
Data 4	:	Up message Enable/Disable	... 0: No change, 1: Disable, 2: Enable
Data 5	:	Down message Enable/Disable	... 0: No change, 1: Disable, 2: Enable
Data 6	:	Up message, 1st character	... ASCII code or 0: No setting (Null)
Data 7	:	Up message, 2nd character	... ASCII code or 0: No setting (Null)
Data 8	:	Up message, 3rd character	... ASCII code or 0: No setting (Null)
Data 9	:	Up message, 4th character	... ASCII code or 0: No setting (Null)
Data 10	:	Up message, 5th character	... ASCII code or 0: No setting (Null)
Data 11	:	Up message, 6th character	... ASCII code or 0: No setting (Null)
Data 12	:	Up message, 7th character	... ASCII code or 0: No setting (Null)
Data 13	:	Up message, 8th character	... ASCII code or 0: No setting (Null)
Data 14	:	Up message, 9th character	... ASCII code or 0: No setting (Null)
Data 15	:	Up message, 10th character	... ASCII code or 0: No setting (Null)
Data 16	:	Down message, 1st character	... ASCII code or 0: No setting (Null)
Data 17	:	Down message, 2nd character	... ASCII code or 0: No setting (Null)
Data 18	:	Down message, 3rd character	... ASCII code or 0: No setting (Null)
Data 19	:	Down message, 4th character	... ASCII code or 0: No setting (Null)
Data 20	:	Down message, 5th character	... ASCII code or 0: No setting (Null)
Data 21	:	Down message, 6th character	... ASCII code or 0: No setting (Null)
Data 22	:	Down message, 7th character	... ASCII code or 0: No setting (Null)
Data 23	:	Down message, 8th character	... ASCII code or 0: No setting (Null)
Data 24	:	Down message, 9th character	... ASCII code or 0: No setting (Null)
Data 25	:	Down message, 10th character	... ASCII code or 0: No setting (Null)

- All Up data is invalid if data 6 (message's 1st character) is set to 0 (Null).
- All Down data is invalid if data 16 (message's 1st character) is set to 0 (Null).

3.17 DISCRETE ALARM

Command No. 243 (Remote Mode, Remote Setting Mode)

• Host → 73VR

Data 1	:	-1: Status confirmation, 1: Setting	
Data 2	:	Input (function) pen number 1 to 128 (65 to 128 for function pens 1 to 64)	
Data 3	:	OFF output Enable/Disable	... 0: No change, 1: Disable, 2: Enable
Data 4	:	ON output Enable/Disable	... 0: No change, 1: Disable, 2: Enable
Data 5	:	OFF output delay time	... 0 to 99
Data 6	:	ON output delay time	... 0 to 99
Data 7	:	Normal status	... 0: No change, 1: ON/OFF, 2: ON, 3: OFF
Data 8	:	OFF color	... 0: No change, Color code 1 to 48
Data 9	:	ON color	... 0: No change, Color code 1 to 48
Data 10	:	OFF output channel	... 0: No change, 1 to 256
Data 11	:	ON output channel	... 0: No change, 1 to 256
Data 12	:	OFF message Enable/Disable	... 0: No change, 1: Disable, 2: Enable
Data 13	:	ON message Enable/Disable	... 0: No change, 1: Disable, 2: Enable
Data 14	:	OFF message, 1st character	... ASCII code, -1: No change or 0: No setting (Null)
Data 15	:	OFF message, 2nd character	... ASCII code, -1: No change or 0: No setting (Null)
Data 16	:	OFF message, 3rd character	... ASCII code, -1: No change or 0: No setting (Null)
Data 17	:	OFF message, 4th character	... ASCII code, -1: No change or 0: No setting (Null)
Data 18	:	OFF message, 5th character	... ASCII code, -1: No change or 0: No setting (Null)
Data 19	:	OFF message, 6th character	... ASCII code, -1: No change or 0: No setting (Null)
Data 20	:	OFF message, 7th character	... ASCII code, -1: No change or 0: No setting (Null)
Data 21	:	OFF message, 8th character	... ASCII code, -1: No change or 0: No setting (Null)
Data 22	:	OFF message, 9th character	... ASCII code, -1: No change or 0: No setting (Null)
Data 23	:	OFF message, 10th character	... ASCII code, -1: No change or 0: No setting (Null)
Data 24	:	ON message, 1st character	... ASCII code, -1: No change or 0: No setting (Null)
Data 25	:	ON message, 2nd character	... ASCII code, -1: No change or 0: No setting (Null)
Data 26	:	ON message, 3rd character	... ASCII code, -1: No change or 0: No setting (Null)
Data 27	:	ON message, 4th character	... ASCII code, -1: No change or 0: No setting (Null)
Data 28	:	ON message, 5th character	... ASCII code, -1: No change or 0: No setting (Null)
Data 29	:	ON message, 6th character	... ASCII code, -1: No change or 0: No setting (Null)
Data 30	:	ON message, 7th character	... ASCII code, -1: No change or 0: No setting (Null)
Data 31	:	ON message, 8th character	... ASCII code, -1: No change or 0: No setting (Null)
Data 32	:	ON message, 9th character	... ASCII code, -1: No change or 0: No setting (Null)
Data 33	:	ON message, 10th character	... ASCII code, -1: No change or 0: No setting (Null)

- Refer to 1.3 Operation / setting flow via network for color code.
- All OFF message data is invalid if data 14 (message's 1st character) is set to 0 (Null). No change is applied if set to -1 (No change).
- All ON message data is invalid if data 24 (message's 1st character) is set to 0 (Null). No change is applied if set to -1 (No change).

• 73VR → Host

Normal		Data 1	:	0: Status confirmation response, 1: Setting complete
		Data 3	:	OFF output Enable/Disable ... 1: Disable, 2: Enable
		Data 4	:	ON output Enable/Disable ... 1: Disable, 2: Enable
		Data 5	:	OFF output delay time ... 0 to 99
		Data 6	:	ON output delay time ... 0 to 99
		Data 7	:	Normal status ... 1: ON/OFF, 2: ON, 3: OFF
		Data 8	:	OFF color ... Color code 1 to 48
		Data 9	:	ON color ... Color code 1 to 48
		Data 10	:	OFF output channel ... 1 to 256
		Data 11	:	ON output channel ... 1 to 256
		Data 12	:	OFF message Enable/Disable ... 1: Disable, 2: Enable
		Data 13	:	ON message Enable/Disable ... 1: Disable, 2: Enable
		Data 14	:	OFF message, 1st character ... ASCII code or 0: No setting (Null)
		Data 15	:	OFF message, 2nd character ... ASCII code or 0: No setting (Null)
		Data 16	:	OFF message, 3rd character ... ASCII code or 0: No setting (Null)
		Data 17	:	OFF message, 4th character ... ASCII code or 0: No setting (Null)
		Data 18	:	OFF message, 5th character ... ASCII code or 0: No setting (Null)
		Data 19	:	OFF message, 6th character ... ASCII code or 0: No setting (Null)
		Data 20	:	OFF message, 7th character ... ASCII code or 0: No setting (Null)
		Data 21	:	OFF message, 8th character ... ASCII code or 0: No setting (Null)
		Data 22	:	OFF message, 9th character ... ASCII code or 0: No setting (Null)
		Data 23	:	OFF message, 10th character ... ASCII code or 0: No setting (Null)
		Data 24	:	ON message, 1st character ... ASCII code or 0: No setting (Null)
		Data 25	:	ON message, 2nd character ... ASCII code or 0: No setting (Null)
		Data 26	:	ON message, 3rd character ... ASCII code or 0: No setting (Null)
		Data 27	:	ON message, 4th character ... ASCII code or 0: No setting (Null)
		Data 28	:	ON message, 5th character ... ASCII code or 0: No setting (Null)
		Data 29	:	ON message, 6th character ... ASCII code or 0: No setting (Null)
		Data 30	:	ON message, 7th character ... ASCII code or 0: No setting (Null)
		Data 31	:	ON message, 8th character ... ASCII code or 0: No setting (Null)
		Data 32	:	ON message, 9th character ... ASCII code or 0: No setting (Null)
		Data 33	:	ON message, 10th character ... ASCII code or 0: No setting (Null)
Error		Data 1	:	-1: Parameter error, -2: Setting unavailable

- Example: Input pen 20, OFF output disabled, ON output enabled, OFF delay time = 0, ON delay time = 5 sec., Normal status = OFF, OFF color = White (48), ON color = Red (9), ON output channel = 1, OFF message enabled, ON message enabled, OFF message "NORMAL," ON message "WARNING"

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	266
66	Command No.	243
67	Data 1	1
68	Data 2	20
69	Data 3	1
70	Data 4	2
71	Data 5	0
72	Data 6	5
73	Data 7	3
74	Data 8	48
75	Data 9	9
76	Data 10	0
77	Data 11	1
78	Data 12	2
79	Data 13	2
80	Data 14	0x004E (N)
81	Data 15	0x004F (O)
82	Data 16	0x0052 (R)
83	Data 17	0x004D (M)

CH	CONTENTS	EXAMPLE
84	Data 18	0x0041 (A)
85	Data 19	0x004C (L)
86	Data 20	0x0
87	Data 21	0x0
88	Data 22	0x0
89	Data 23	0x0
90	Data 24	0x0057 (W)
91	Data 25	0x0041 (A)
92	Data 26	0x0052 (R)
93	Data 27	0x004E (N)
94	Data 28	0x0049 (I)
95	Data 29	0x004E (N)
96	Data 30	0x0047 (G)
97	Data 31	0x0
98	Data 32	0x0
99	Data 33	0x0
112	Sequence No.	266

- Error

- The 73VR sends back command No. 0x80F3 when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode or when it is NOT in Remote Setting mode. Status confirmation is always available.
- Parameter error: Normal parameters are valid even if invalid data is contained in other parameters.

3.18 COMMENT – Direct input, group name and color

Command No. 261 (Remote Mode, Remote Setting Mode)

• Host → 73VR

Data 1	:	-1: Status confirmation response, 1: Setting
Data 2	:	Direct comment input ... 0: No change, 1: Disable, 2: Enable
Data 3	:	Group number ... 1 to 7
Data 4	:	Group name, 1st character ... ASCII code, -1: No change or 0: No setting (Null)
Data 5	:	Group name, 2nd character ... ASCII code, -1: No change or 0: No setting (Null)
Data 6	:	Group name, 3rd character ... ASCII code, -1: No change or 0: No setting (Null)
Data 7	:	Group name, 4th character ... ASCII code, -1: No change or 0: No setting (Null)
Data 8	:	Group name, 5th character ... ASCII code, -1: No change or 0: No setting (Null)
Data 9	:	Group name, 6th character ... ASCII code, -1: No change or 0: No setting (Null)
Data 10	:	Group name, 7th character ... ASCII code, -1: No change or 0: No setting (Null)
Data 11	:	Group name, 8th character ... ASCII code, -1: No change or 0: No setting (Null)
Data 12	:	Group name, 9th character ... ASCII code, -1: No change or 0: No setting (Null)
Data 13	:	Group name, 10th character ... ASCII code, -1: No change or 0: No setting (Null)
Data 14	:	Group color ... 0: No change, Color code 1 to 48

· Refer to 1.3 Operation / setting flow via network for color code.

· All group name data is invalid if data 4 (name's 1st character) is set to 0 (Null). No change is applied if set to -1 (No change).

• 73VR → Host

Normal		Data 1	:	0: Status confirmation response, 1: Setting complete
		Data 2	:	Direct comment input ... 1: Disable, 2: Enable
		Data 3	:	Group number ... 1 to 7
		Data 4	:	Group name, 1st character ... ASCII code or 0: No setting (Null)
		Data 5	:	Group name, 2nd character ... ASCII code or 0: No setting (Null)
		Data 6	:	Group name, 3rd character ... ASCII code or 0: No setting (Null)
		Data 7	:	Group name, 4th character ... ASCII code or 0: No setting (Null)
		Data 8	:	Group name, 5th character ... ASCII code or 0: No setting (Null)
		Data 9	:	Group name, 6th character ... ASCII code or 0: No setting (Null)
		Data 10	:	Group name, 7th character ... ASCII code or 0: No setting (Null)
		Data 11	:	Group name, 8th character ... ASCII code or 0: No setting (Null)
		Data 12	:	Group name, 9th character ... ASCII code or 0: No setting (Null)
		Data 13	:	Group name, 10th character ... ASCII code or 0: No setting (Null)
		Data 14	:	Group color ... Color code 1 to 48

Error		Data 1	:	-1: Parameter error, -2: Setting unavailable
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- Example: Direct input enabled, Group No. = 2, Group name "Notes," Group color = Yellow (10)

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	267
66	Command No.	261
67	Data 1	1
68	Data 2	2
69	Data 3	2
70	Data 4	0x004E (N)
71	Data 5	0x006F (o)
72	Data 6	0x0074 (t)
73	Data 7	0x0065 (e)
74	Data 8	0x0073 (s)
75	Data 9	0x0
76	Data 10	0x0
77	Data 11	0x0
78	Data 12	0x0
79	Data 13	0x0
80	Data 14	10
112	Sequence No.	267

- Error

- The 73VR sends back command No. 0x8105 when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode or when it is NOT in Remote Setting mode. Status confirmation is always available.
- Parameter error: Normal parameters are valid even if invalid data is contained in other parameters.

3.19 COMMENT – Comment, auto write in, threshold, condition, pen number

Command No. 262 (Remote Mode, Remote Setting Mode)

• Host → 73VR

Data 1	:	-1: Status confirmation, 1: Setting
Data 2	:	Group number ... 1 to 7
Data 3	:	Comment number ... 1 to 8
Data 4	:	Comment, 1st character ... ASCII code, -1: No change or 0: No setting (Null)
Data 5	:	Comment, 2nd character... ASCII code, -1: No change or 0: No setting (Null)
:	:	:
Data 33	:	Comment, 30th character... ASCII code, -1: No change or 0: No setting (Null)
Data 34	:	Auto write in ... 0: No change, 1: Disable, 2: Enable
Data 35	:	Trigger signal type ... 0: No change, 1: Analog, 2: Discrete
Data 36	:	Threshold, mantissa ... -32768 to 72767
Data 37	:	Threshold, exponent ... -9 to 9
Data 38	:	Condition (analog) ... 0: No change, 1: Value > Threshold, 2: Value < Threshold 3: Value ≥ Threshold, 4: Value ≤ Threshold
		Condition (discrete) ... 0: No change, 1: Up, 2: Down
Data 39	:	Input (function) pen number 1 to 128 (65 to 128 for function pens 1 to 64)

- All comment data is invalid if data 4 (comment's 1st character) is set to 0 (Null). No change is applied if set to -1 (No change).
- Data 35, 38 and 39 are valid when the auto write in function is enabled (data 34 = 2).
- Data 36 and 37 are valid when the auto write in function is enabled (data 34 = 2) and the trigger signal type is set to Analog (data 35 = 1).

• 73VR → Host

Normal		Data 1	:	0: Status confirmation response, 1: Setting complete
		Data 2	:	Group number ... 1 to 7
		Data 3	:	Comment number ... 1 to 8
		Data 4	:	Comment, 1st character ... ASCII code or 0: No setting (Null)
		Data 5	:	Comment, 2nd character... ASCII code or 0: No setting (Null)
		:	:	:
		Data 33	:	Comment, 30th character... ASCII code or 0: No setting (Null)
		Data 34	:	Auto write in ... 1: Disable, 2: Enable
		Data 35	:	Trigger signal type ... 1: Analog, 2: Discrete
		Data 36	:	Threshold, mantissa ... -32768 to 72767
		Data 37	:	Threshold, exponent ... -9 to 9
		Data 38	:	Condition (analog) ... 1: Value > Threshold, 2: Value < Threshold 3: Value ≥ Threshold, 4: Value ≤ Threshold
				Condition (discrete) ... 1: Up, 2: Down
		Data 39	:	Input (function) pen number 1 to 128 (65 to 128 for function pens 1 to 64)
Error		Data 1	:	-1: Parameter error, -2: Setting unavailable

- Example: Group 3, Comment number 1, Comment “STOP” auto-write in enabled, analog trigger signal, threshold = 25.0, condition = value < threshold, input pen 20

Host → 73VR (command) / 73VR → Host (response)

CH	CONTENTS	EXAMPLE
65	Sequence No.	268
66	Command No.	262
67	Data 1	1
68	Data 2	3
69	Data 3	1
70	Data 4	0x0053 (S)
71	Data 5	0x0054 (T)
72	Data 6	0x004F (O)
73	Data 7	0x0050 (P)
74	Data 8	0x0
:	:	:
99	Data 33	0x0
100	Data 34	2
101	Data 35	1
102	Data 36	25000
103	Data 37	1
104	Data 38	2
105	Data 39	20
112	Sequence No.	268

- Error

- The 73VR sends back command No. 0x8106 when the setting is unavailable or when the parameter is in error.
- The operation is unavailable when the 73VR is NOT in Remote mode or when it is NOT in Remote Setting mode. Status confirmation is always available.
- Parameter error: Normal parameters are valid even if invalid data is contained in other parameters.

- Caution

- When a comment setting is cleared (invalid), the auto write in function is disabled.