TRM-10C
HYBRID RECORDER
COMMUNICATION COMMAND
INSTRUCTION MANUAL

TOHO ELECTRONICS INC.

For safety using

Thank you for purchasing our TRM-10C Hybrid Recorder.

In order to this instrument to exhibit all of its functions effectively and correctly, read and understand this instruction manual thoroughly before using the instrument.

The symbols below are used on this instrument for the cautioning information.

Symbols used on the instrument	
⚠	This shows "Caution for handling". This symbol is used on the parts need to reference the instruction manual for saving human body and the instrument.
⏚	This shows "Protective grounding". Be sure to provide protective grounding prior to operate this instrument.
⚡	This shows "Risk of electric shock". This symbol is used on the parts, which has a risk of electric shock.

Be sure to observe the following warnings/cautions and those provided in the text in order to secure safety in handling the instrument.	
⚠ **WARNING**	
General	In order to prevent electric shock; be sure to disconnect this instrument from the main power source when wiring it.
Protective Grounding	(1) In order to prevent an electric shock; be sure to provide protective grounding prior to turning on this instrument.
	(2) Do not cut a protective grounding conductor or disconnect protective grounding.
Power Source	(1) Make sure that the supply voltage for this instrument conforms to the voltage of the supply source.
	(2) Attach a protective cover prior to turning on this instrument.
Working Environment	Do not operate this instrument in the environment where it is exposed to a combustible/explosive/corrosive gas or water/steam.
Input and Output Wiring	Provide input and output wiring after turning off the power.

⚠ CAUTION

Input and Output Wiring	Do not use empty terminals for other purposes such as relaying, etc.
Transportation	When transporting this instrument or the equipment with this instrument incorporated in it, take measures to prevent opening the door and falling out the inner module.
Inside of Instrument	Do not touch the switches, etc. inside this instrument. Also, do not replace the main unit or PRINTed circuit boards. When this is neglected, we cannot guarantee functioning of the instrument. Contact our dealer where you purchased the instrument, or our sales representative.

[Note]

Instruction Manual	(1) Deliver this instruction manual to an end user.
	(2) Prior to handling this instrument, be sure to read this manual.
	(3) If you have any questions on this manual or find any errors or omissions in this manual, contact our sales representative.
	(4) After reading this manual, keep it carefully by the instrument.
	(5) When the manual is lost or stained, contact our sales representative.
	(6) It is prohibited to copy or reproduce this manual without our permission.
Installation	(1) When installing this instrument, put on a protective gear such as safety shoes, helmet, etc. for your safety.
	(2) Do not put your foot on the installed instrument or get on it, because it is dangerous.
Maintenance	Only our serviceman or persons authorized by our company are allowed to remove and take the inner module, the main unit and PRINTed circuit boards apart.
Disposal	(1) Dispose the replaced batteries in a correct way.
	(2) Do not incinerate plastics of maintenance parts and replacement parts. A harmful gas may be produced.
Cleaning	(1) Use dry cloth to clean the surface of this instrument.
	(2) Do not use any organic solvent.
	(3) Cleaning the instrument after turning off the power.
Revisions	This instruction manual is subject to change without prior notice.

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Using procedure for this manual

1.Using procedure

This instruction manual consists of "For safety using", "Contents" and "Chapter 1 to Chapter 4" as bellow.

Read the applying sections for your purpose to use this instrument.

Chapter and TITLE	For purchase and install	For initial setting and change setting	For daily operation	For using communication	For maintenance and trouble-shooting
For safety using (page 1)	◎	◎	◎	◎	◎
1. INTRODUCTION	◎			◎	
2. THE RECEPTION OF DATA		○		◎	○
3. DATA TRANSMISSION		○		◎	○
4. NOTE OF DATA COMMUNICATION		○		◎	○

◎ : Be absolutely certain to read this.

○ : Be certain to read this if you need.

The symbols below are used on the warning and cautioning information in this manual.

Symbols used on this manual	
⚠ **WARNING**	Failure to observe this information could result in death or injury. Be absolutely certain to read this.
⚠ CAUTION	Failure to observe this information could damage the instrument. Be certain to read it.
[Note]	This is cautionary information for correct use of the instrument. Be certain to read it.
[Reference]	This is information to help you use the functions of this instrument more effectively.

2.Guide of Instruction manual

The instruction manuals of this instrument are as the table below.

	Name	Part No.	Outline
1	TRM-10C Hybrid Recorder instruction manual	HXPRM10mnCT001E HXPRM10mnCT002E	Explanation for installing, wiring, standard operation. And setting or operation for using this instrument.
2	TRM-10C Hybrid Recorder Communication Command instruction manual	HXPRM10mnCT005E	Explanation for reading and writing data of the recorder by communication function.

This manual ⇨ 2

CONTENTS

1 INTRODUCTION

1. 1 General Description

This instruction manual describes the communication command of the TRM-10C Recorder. Please refer to the instruction manual (HXPRM10mnCT001E, HXPRM10mnCT002E) for the transmission of the measurement data, a setup of communication and wiring.

contents	Wiring and communication procedure	Request measurement value	Setting of the recorder	Control of the recorder
TRM-10C Hybrid Recorder instruction manual (HXPRM10mnCT001E, HXPRM10mnCT002E)	○	○		
TRM-10C Hybrid Recorder Communication Command instruction manual (HXPRM10mnCT005E)			○	○

1. 2 Difference in RS-485, RS-232C

There is no difference between RS-232C and RS-485 about the communication command in this Recorder. But, wiring and signal level are different.

1. 3 Basic item about the command

The communication command consists of a command distinction code, a parameter, delimiter(comma), and terminator. The format of the command is as follows.

（Example）SR02 VOLT,200mV,0, 20000（terminator）

Command distinction code:

This code is defined by two characters the capital letter.(Exp. SR)

If the command needs a channel number, a channel number is described behind the distinction code.

Parameter:

Each parameter is divided with comma.

All the setting value is shown with the integer. (The plus sign can be omitted.)

The space character in the input parameter is ignored. The other side, the space character in the unit code, the comment printout code and the tag printout code isn't ignored. The parameter can be omitted unless the parameter is varied. But, a comma(,) can't be omitted. Comma which is in front of the terminator can be omitted.

（Example）SR02, VOLT, , , (CR)(LF)

↖――――――――――― Omission is possible

The date parameter, the time parameter and the channel number parameter have fixed length. When that parameter length is different, these data induce errors.

（1）Date YY／MM／DD （8 characters）

（2）Time HH:MM:SS （8 characters）

（3）Channel Number: $_{CH}XX$ （2characters）

2. 1 Setup command

2. 1. 1 Setup command list

Table 2.1 Setup command list

Command	Setting item	The number of the parameters	Contents of a parameter
SR	Setting the range	MAX 7	Channel,Mode,Range(Reference Channel) Span lower limit value. Span higher limit value. Scaling lower limit value. Scaling higher limit value
SA	Setting the Alarm	7	Channel, Alarm level Alarm on/off Alarm type,Alarm set point Relay on/off､Relay No.
SN	Setting the Unit	2	Channel, Unit
SC	Setting the Chart Speed	1	1st Chart speed
SD	Setting the Date/Time	2	Date, time
SF	Setting the Digital Print	2	Channel Digital print on/off
ST	Setting the Tag	2	Channel, Tag characters
SG	Setting the Comment	2	Comment number, Comment characters
SZ	Setting the Zone recording	3	Channel, Left position, Right position
SP	Setting the Partial Compression/Expansion recording	4	Channel, Partial on/off Compression Expansion
SE	Setting the Chart Speed	1	2nd chart speed
SY	Copying the Setting data	2	Copy-from channel Copy-to channel
SS	Setting the recording cycle	1	Recording Cycle (Multipoint type only)

2. 1. 2 Setting of INPUT RANGE/RECORD SPAN

The input range and record span of each channel is set up as follows.

＜Format＞

SR(CH),(Mode),(Pr1),(Pr2),(Pr3),(Pr4),(Pr5),(Pr6),(Pr7)(CR)(LF)

CH: Specify the channel number to set.

Mode: The input mode is set up.

Pr_N: The number of Pr_N varies depend on the contents of Mode.

（1）　Setting of the record skip.

The record of the channel, which specified with CH is stopped.

(The pen of pen type recorder is fixed on the zero point.)

CH：Setting Channel 01～06(The pen type is 01～02.).

Mode：SKIP

Example）SR05,SKIP(CR)(LF)

The 5th channel doesn't record.

（2）　Setting of the Voltage, the Current, the Thermocouple or the RTD input range.

CH：Setting Channel 01～06(The pen type is 01～02.).

Mode：VOLT,TC or RTD

Pr1：Range

Pr2：Left end(Zero Input Value) ⎫

Pr3：Right end(Span Input Value) ⎬ Refer to table 2.2.

Example）SR02,TC,K,0,3000(CR)(LF)

The input of 2nd channel is recorded in Thermocouple type K 0.0-300.0 ℃

（3）　The setting of Difference/Sum/Mean operation.

CH：Setting Channel 01～06(The pen type is 01～02.).

Mode：DELT,SIGM or MEAN

Pr1：Refference Channel

・Choose a smaller channel than CH.

・The reference channel must be VOLT, TC, RTD or SCL mode.

Pr2：Left end(Zero Input Value) ⎫

Pr3：Right end(Span Input Value) ⎬ Refer to table 2.2.

Example）SR05,02,DELT,0,3000(CR)(LF)

The output of the 5th channel shows a difference between the input of the 5th channel and the 2nd channel (CH5-CH2). In this case, the input range of 5th channel becomes the same as 2nd channel.

― 7 ―

(4)   The setting of Scaling.

CH：Setting Channel 01～06(The pen type is 01～02.).

Mode：SCL

Pr1：VOLT, TC, RTD

Pr2：Scaling Mode ⎤

Pr3：Left End(Zero Input Value) ⎬ Refer to table 2.2.

Pr4：Right End(Span Input Value) ⎦

Pr5：Scaling Left End

Pr6：Scaling Right End

Pr7：Decimal point position（0～4）

Example）SR04,SCL,RTD,PT,0, 3000,0,30000,2(CR)(LF)

> **[CAUTION]**
>
> Pr5 - 7 can be omitted. If you omit the parameters, three parameters must be omitted
>
> simultaneously.

(5)   The setting of Square Root

CH：Setting Channel 01～06(The pen type is 01～02.).

Mode：SQRT

Pr1：Range（Only VOLT Input）

Pr2：Left End(Zero Input Value) ⎤

Pr3：Right End(Span Input Value) ⎬ Refer to table 2.2.

Pr4：Scaling Left End

Pr5：Scaling Right End

Pr6：Decimal point position（0～4）

Example）SR03,SQRT,mA,400,2000,0,10000,2(CR)(LF)

> **[CAUTION]**
>
> Pr5 - 7 can be omitted. If you omit the parameters, three parameters must be omitted
>
> simultaneously.

(6)   The setting of Decade

CH：Setting Channel 01～06(A pen type is 01～02.).

Mode：DECAD

Pr1：Range（Only VOLT Input）

Pr2：Left End(Zero Input Value) ⎤

Pr3：Right End(Span Input Value) ⎬ Refer to table 2.2.

Pr4：Scaling Left End

Pr5：Scaling Right End

Example）SR01,DECAD,10mV,0,1000,10E+01,10E+06(CR)(LF)

Table 2.2 Setting range

Input Range	Range or Scaling Mode	Zero Input Value (Left End)	Span Input Value (Right End)	Decimal Point (Fixation)	Note
VOLT	10mV	-1000	1000	2	±10mV
	20mV	0	2000	2	0～20mV
	50mV	0	5000	2	0～50mV
	200mV	-2000	2000	1	±200mV
	1V	-1000	1000	3	±1V
	5V	0	5000	3	0～5V
	10V	-10000	10000	2	±10V
	mA	400	2000	2	4～20mA
TC	B	0	18200	1	0～1820℃
		320	33080	1	32～3308°F
	R	0	17600	1	0～1760℃
		320	32000	1	32～3200°F
	S	0	17600	1	0～1760℃
		320	32000	1	32～3200°F
	K	-2000	13700	1	−200～1370℃
		-3280	24980	1	−328～2498°F
	E	-2000	8000	1	−200～800℃
		-3280	14720	1	−328～1472°F
	J	-2000	11000	1	−200～1100℃
		-3280	20120	1	−328～2012°F
	T	-2000	4000	1	−200～400℃
		-3280	7520	1	−328～752°F
	C	0	23200	1	0～2320℃
		320	42080	1	32～4208°F
	Au-Fe	10	3000	1	1～300K
	N	0	13000	1	0～1300℃
		320	23720	1	32～2372°F
	PR40-20	0	18800	1	0～1880℃
		320	34160	1	32～3416°F
	PLII	0	13900	1	0～1390℃
		320	25340	1	32～2534°F
	U	-2000	4000	1	−200～400℃
		-3280	7520	1	−328～752°F
	L	-2000	9000	1	−200～900℃
		-3280	16520	1	−328～1652°F
RTD	Pt100	-2000	6500	1	−200～650℃
		-3280	12020	1	−328～1202°F
	JPt100	-2000	6300	1	−200～630℃
		-3280	11660	1	−328～1166°F

Example）When decimal point position is "1", the input value "1000" is recognized as "100.0".

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2. 1. 3　Setting of Alarm

The Alarm of each channel is set up as follows.

＜Format＞

SA（CH），（LEVEL），（ON/OFF），（TYPE），（VALUE），（RLY　ON/OFF），（RLY　No.）（CR）（LF）

Item	Contents	Setting Range	Note
CH	Channel number	01〜06（multi） 01〜02（pen）	
LEVEL	Alarm Level	1〜4	
ON/OFF	Alarm ON／OFF	ON　or　OFF	It can be omitted.
TYPE	Alarm Type	H：Upper-limit L：Lower-limit	It can be omitted.
VALUE	Set Value		It can be omitted.
RLY　ON/OFF	Relay ON／OFF	ON　or　OFF	It can be omitted.
RLY　No.	Relay No.	I01〜I06（multi） I01〜I03（pen）	It can be omitted.

Part of underline can be omitted.

2. 1. 4　Setting of the Unit

The Unit of each channel is set up as follows.

＜Format＞

SN（CH），（UNIT）（CR）（LF）

CH：Setting Channel 01〜06(The Pen type is 01〜02.).

UNIT：The Unit is set up with the code as shown in table 2.3.(Within 6 characters.)

When you use the code beyond $7F_{HEX}$, the data length must be used as 8 bit.

Please refer to the chapter 7.2.7 of the instruction manual (HXPRM10mnCT001E, HXPRM10mnCT002E) for the data length setting.

2. 1. 5　Setting of the 1st chart speed

The 1st chart speed is set up as follows.

＜Format＞

SC（CHART SPEED）（CR）（LF）

The chart speed is chosen from the following table.

CHART SPEED （Multipoint type）

0	1	2	3	4	5	10	15	20	25
30	40	50	60	75	80	90	100	120	150
160	180	200	240	300	360	375	450	600	720
750	900	1200	1500						

CHART SPEED （Pen type）

5	10	15	20	25	30	40	50	60
80	90	100	120	150	160	180	200	240
360	375	450	600	720	750	900	1200	1500
2400	3000	3600	4500	4800	5400	6000	7200	9000
12000								

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2．1．6　Setting of the date/time

The date/time of the internal watch of the recorder is set up as follows.

＜Format＞

SD（DATE），（TIME）（CR）（LF）

DATE：YY/MM/DD

（YY）Year　00～99

（MM）Month　01～12

（DD）Day　01～31

TIME：HH:MM:SS

（HH）Hour　00～23

（MM）Minute　00～59

（SS）Second　00～59

2．1．7　Copying the Setting Data of the channel

The setup data of the channel can be copied on other channels.

＜Format＞

SY（CHS），（CHD）（CR）（LF）

CHS：Copy-from Channel 01～05(The Pen type is 01 only.)

CHD：Copy-to Channel (CHS < CHD)

The copy-to channel must set larger value than copy-from channel.

2．1．8　Setting of the Printing cycle(Multipoint type only)

The Printing cycle of the recorder is set up as follows.

＜Format＞

SS（PRINTING CYCLE）（CR）（LF）

PRINTING CYCLE: 10,20,30 and 60 (sec)

2．1．9　Setting of the Zone　Recording

The Zone Recording of each channel is set up as follows.

＜Format＞

SZ（CH），(LEFTPOSITION)，(RIGHTPOSITION)(CR)(LF)

CH：Setting Channel 01～06(The Pen type is 01～02.).

LEFTPOSITION:0～95%

RIGHTPOSITION:5～100%

Part of underline can be omitted. The original setup is inherited when it omits.

2. 1. 10　Setting of the Partial Compression/Expansion

The Partial Compression/Expansion recording of each channel is set up as follows.

＜Format＞

SP（CH）,(ON/OFF),(BOUNDARY POSITION),(BOUNDARY VALUE)(CR)(LF)

CH：Setting Channel 01～06(The Pen type is 01～02.).

ON/OFF：Partial Compression/Expansion function ON　or　OFF

BOUNDARY　POSITION：　1～99%

BOUNDARY　VALUE：

CH is VOLT,TC,RTD,DELT,SIGM or MEAN mode: In the span data

CH is SCALE,SQRT,DECAD mode: In the scale data

Part of underline can be omitted. The original setup is inherited when it omits.

2. 2. 11　Setting of the Digital Print ON/OFF

The Digital Print ON/OFF of each channel is set up as follows.

＜Format＞

SF（CH）,(ON/OFF)(CR)(LF)

CH：Setting Channel 01～06(The Pen type is 01～02.).

ON/OFF：ON　or　OFF

2. 1. 12　Setting of the Tag Character

The Tag Character of each channel is set up.

＜Format＞

ST（CH）,(TAG)(CR)(LF)

CH：Setting Channel 01～06(The Pen type is 01～02.).

TAG：The Tag Character is set up with the character code shown by the table 2.3.

(Multipoint type is within 7 characters. Pen type is within 5 characters.)

When you use the character code beyond $7F_{HEX}$, the data length of communication

function must be used as 8 bit. Please refer to the chapter 7.2.7 of the instruction manual

(HXPRM10mnCT001E, HXPRM10mnCT002E) for the data length setting.

2. 1. 13　Setting of the Comment Character

The Comment Character to print by the Digital Input is set up.

＜Format＞

SG（Cn）,(COMMENT)(CR)(LF)

Cn：Comment Number（1～3）

COMMENT：A Comment Character is set up with the character code shown by the table 2.3.

(Multipoint type is within 16 characters. Pen type is within 12 characters.)

When you use the character code beyond $7F_{HEX}$, the data length of communication

function must be used as 8 bit. Please refer to the chapter 7.2.7 of the instruction

manual (HXPRM10mnCT001E, HXPRM10mnCT002E) for the data length setting.

Character Code Table

Table 2.3 Character Code Table

	2＊	3＊	4＊	5＊	6＊	7＊	A＊	B＊	C＊	D＊	E＊	F＊
＊0	SP	0	@	P		p	$_0$	^{0}		Π		π
＊1	!	1	A	Q	a	q	$_1$	^{1}	A	P	α	ρ
＊2	″	2	B	R	b	r	$_2$	^{2}	B	Σ	β	σ
＊3	#	3	C	S	c	s	$_3$	^{3}	Γ	T	γ	τ
＊4	$	4	D	T	d	t	$_4$	^{4}	Δ	Y	δ	υ
＊5	%	5	E	U	e	u	$_5$	^{5}	E	Φ	ε	φ
＊6	&	6	F	V	f	v	$_6$	^{6}	Z	X	ζ	χ
＊7	′	7	G	W	g	w	$_7$	^{7}	H	Ψ	η	ψ
＊8	(	8	H	X	h	x	$_8$	^{8}	Θ	Ω	θ	ω
＊9	)	9	I	Y	i	y	$_9$	^{9}	I		ι	
＊A	＊	:	J	Z	j	z			K		κ	
＊B	＋	;	K	[	k	{	$_+$	$^+$	Λ		λ	
＊C	,	<	L	¥	l	|	±	∓	M	⊿	μ	
＊D	－	=	M	]	m	}			N	◢	ν	
＊E	.	>	N	^	n	‾	$_-$	$^-$	Ξ	▷	ξ	
＊F	／	?	O	＿	o		$_\circ$	$^\circ$	O	◣	o	

Example）The character code "43$_{HEX}$" represents as the character "C".

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2. 2 Control command

2. 2. 1 Control command list

Table 2.4 Control command list

Command	Control Item	The number of parameter	The explanation of operation
PS0	Recording Start	—	This command is the same as RUN key.
PS1	Recording Stop	—	
MP0	Manual Print starting	—	This command is the same as key operation of "Manual Print".
MP1	Manual Print stop	—	
LS0	List Print starting	—	This command is the same as key operation of "List Print".
LS1	List Print stop	—	
SU0	Engineering List Print starting	—	This command is the same as key operation of "Engineering List Print".
SU1	Engineering List Print stop	—	
UD0	Chooses an Auto Display	—	When choosing the manual display, channel number can be set. But, the channel number can be omitted. Exp.)Display the measurement value of 5th channel. UD *1, 05*(CR)(LF)
UD1	Chooses a Manual Display	1	
UD2	Chooses a Date Display	—	
UD3	Chooses a Time Display	—	
UD4	Chooses a Display OFF	—	
PR0	Communication comment print out (Sync printout)	2	The printout of characters which is received by the communication. The parameter consist of printout colors and the printout characters.
PR1	Communication comment print out (Async printout)	2	
BO0	Byte output order (High byte earlier)	2	This command only affects the binary mode. (Please refer to the chapter 8 of the instruction manual for details.) (HXPRM10mnCT001E, HXPRM10mnCT002E)
BO1	Byte output order (Low byte earlier)	2	
TS0	Chooses of the measurement value output	—	This command chooses send data. The send data actually uses LF command, FM command. (Please refer to the chapter 8 of the instruction manual for details.) (HXPRM10mnCT001E, HXPRM10mnCT002E)
TS1	Chooses of the setting value output.(Refer to Chapter 3)	—	
TS2	Chooses of the decimal point position and the unit character output.	—	
FM0	The ASCII output of the measurement data.	2	This command outputs a measure-ment value. The parameter consists of the output starting channel and output ending channel. (Please refer to the chapter 8 of the instruction manual for details.) (HXPRM10mnCT001E, HXPRM10mnCT002E)
FM1	The Binary output of the measurement data.	2	
LF	The output of the setting value, the unit character and the decimal point position.	2	This command outputs a setting value. The parameter consists of the output starting channel and output ending channel. (Please refer to the chapter 8 of the instruction manual for details.) (HXPRM10mnCT001E, HXPRM10mnCT002E)

2.2.2 Recording Start/Stop

This command starts or stops recording of the recorder.

<Format>

PS0(CR)(LF) ···The recorder starts the record.

PS1(CR)(LF) ···The recorder stops the record.

2.2.3 Manual Print Start/Stop

This command starts or stops printing of the "Manual print".

<Format>

MP0(CR)(LF) ···The manual print is started.

MP1(CR)(LF) ···The manual print is stopped.

2.2.4 List Print Start/Stop

This command starts or stops printing of the "List print".

<Format>

LS0(CR)(LF) ···The list print is started.

LS1(CR)(LF) ···The list print is stopped.

2.2.5 Engineering list Print Start/Stop

This command starts or stops printing of the "Engineering list print".

<Format>

SU0(CR)(LF) ···The Engineering list print is started.

SU1(CR)(LF) ···The Engineering list print is stopped.

2.2.6 Choice of the display contents.

This command chooses the display mode of the recorder.

The Auto Display, the Manual Display, the Date Display, the Time Display and Display OFF can be chosen.

When receiving this command, the display of recorder changes automatically.

<Format>

UD0(CR)(LF)   ·····Auto Display

UD1, (CH)(CR)(LF)   ·····Manual Display

UD2(CR)(LF)   ·····Date Display

UD3(CR)(LF)   ·····Time Display

UD4(CR)(LF)   ·····Display OFF

CH：The manual display channel 01～06(The Pen type is 01～02.).

The underline part can be omitted.

2．2．7 Communication comment print out

This command prints the character strings, which is received by the communication. Please refer to table 2.3 for the character code. When you use the character code beyond $7F_{HEX}$, the data length of communication function must be used as 8 bit. Please refer to the chapter 7.2.7 of the instruction manual (HXPRM10mnCT001E, HXPRM10mnCT002E) for the data length setting.

＜Format＞

PR0，(COLOR)，(TEXT)(CR)(LF) ・・・・・The Sync printout.

PR1，(COLOR)，(TEXT)(CR)(LF) ・・・・・The Async printout.

COLOR：Choose a printout color. (The Pen type is only PRP.)

PRP：Purple RED：Red BLK：Black GRN：Green BRN：Brown BLU：Blue

TEXT：Maximum character number of Multipoint type is 47.

Maximum character number of Pen type is 21.

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3 DATA TRANSMISSION

3. 1 Getting the Set Value

When the recorder receives "(TS1)＋(ESC T)＋(LF)", the recorder sends the setting value continuously according to the following table 3.1.
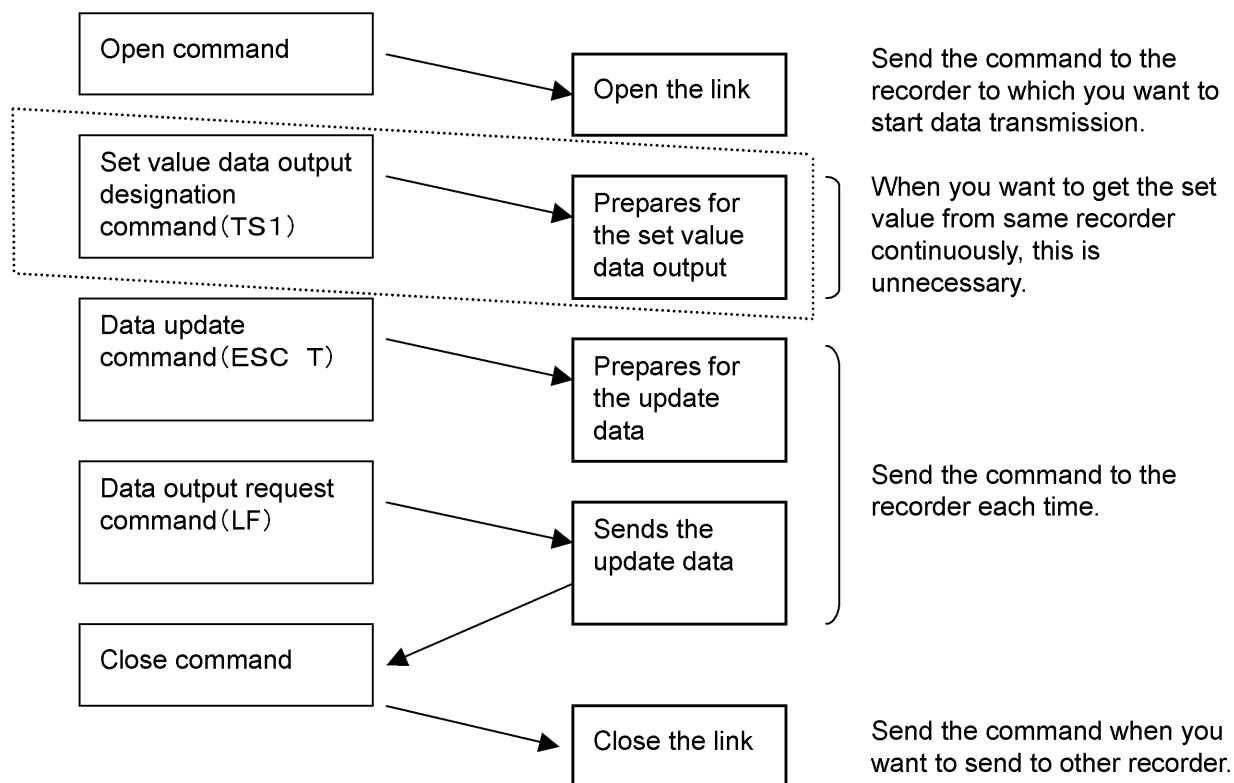
The output formats of each command are as same as that of format when it set up.

Table 3.1   Order of the set value transmission

Order	Command	Description
1	PS	Recording/Stop
2	SR	Input range, recording span
3	SN	Unit
4	SA	Alarm
5	SC	1st chart speed
6	SS	Analog printing period
7	SZ	Zone recording
8	SP	Partial compression/expansion recording
9	SF	Digital printing
10	ST	Tag character
11	SG	Comment character
12	SE	2nd chart speed
13	UD	Display indication mode
14	EN	End

Send the set value in this order

3. 2 Data Reception Example

Open command	→	Open the link	Send the command to the recorder to which you want to start data transmission.
Set value data output designation command(TS1)	→	Prepares for the set value data output	When you want to get the set value from same recorder continuously, this is unnecessary.
Data update command(ESC T)	→	Prepares for the update data	Send the command to the recorder each time.
Data output request command(LF)	→	Sends the update data	
Close command	→	Close the link	Send the command when you want to send to other recorder.

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4 NOTE OF DATA COMMUNICATION

4．1　Half-Duplex Transmission

The recorder side is the half-duplex transmission. The recorder cannot receive the data while sending the data. When the host computer sends the next data, all the receiving data must be completed.

4．2　Multiple access

Don't open another recorder when one recorder is opened on the same line.

4．3　Continuation of Opening the Link

Don't take interval for a long time, after sending the open command. The syntax error may occur when not sending data some time.　Be sure to send the close command "ESC　C" when you do not use the communication.　If the syntax error occurs, send the status output command "ESC　S" to reset the error.

(※ The close command cannot reset the syntax error.)

4．4　Outputting the Status

When the open-link recorder has a data error on its link, the recorder saves the error in the internal status area as a communication error.　The "ESC　S" command can reads this status.　Issuing this command clears the on-going error. Refer to chapter 8.5 in the instruction manual.

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Be sure to reset the error when data set to recorder. When no error reset, you may not be able to judge command, which the error specify.