TOSHIBA

TOSHIBA Bar Code Printer

B-SX600 Series

Command Manual

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TOSHIBA TEC CORPORATION

TABLE OF CONTENTS

■ COMMAND LIST

The following is the list of the commands for the B-SX600 series.

Command	Response	Description	Effective range
/TII		Image data setting	Printer driver – Printer
/TID		Image data send	Printer driver – Printer
/TCB	/RCB	Calibration request/response	Printer driver – Printer
/TAI		Printer operation information set	Printer driver – Printer
/TPI		Page information setting	Printer driver – Printer
/TAT		Home position setting	Printer driver – Printer
/TSP		Print/Feed	Printer driver – Printer
/TES	/RES	Error information request/response	Printer driver – Printer
/TSA		Correction data setting	Printer driver – Printer
/TGA	/RGA	Correction data request/response	Printer driver – Printer
/TSB	/RSB	Sensor status request/response	Printer driver – Printer
/TSL	/RSL	Analog sensor status request/response	Tool – Printer
/TVR	/RVR	Version information request/response	Printer driver – Printer
/TGS	/RGS	Servicing information request/response	Printer driver – Printer
/TSS		Servicing information setting	Printer driver – Printer
/TTH	/RTH	Head test request/response	Printer driver – Printer
/TEC		Cut/Pee-off enable flag setting	Printer driver – Printer
/TPN		Page number set	Printer driver – Language monitor
/TDI		Driver information setting	Printer driver – Language monitor
/TJI		Document information setting	Language monitor – Printer
/TSD	/RSD	Special data request/response	Printer

NOTE: The effective range is the range where the command is used.

1. IMAGE DATA SET COMMAND

Format

Byte/bit	7	6	5	4	3	2	1	0		Remarks
0	Header								‘/’	
1									‘T’	
2	Command identifier								‘I’	
3									‘I’	
4	Reserved								00h	image.buf
to									00h	
7									00h	
8	Image length [line]									image.length
9										
10	Image width [word]									image.width
11										
12	X-direction offset [dot]									image.xoffset
13										
14	Y-direction offset [dot]									image.yoffset
15										
16	Image mode									image.mode
17										
18	Reserved (Ribbon save information)								00h	image.rsp
to									00h	
21									00h	
22	Reserved (Verification information)								00h	image.vsp
to									00h	
25									00h	
26	Reserved (Print length at portrait orientation)								00h	image.total_length
27									00h	

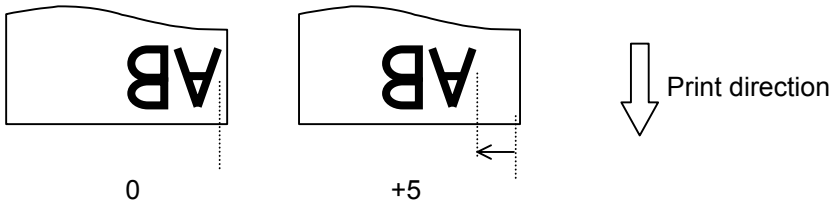
Function

Sets the image buffer information used for printing and re-organizes the image buffer.

Explanation

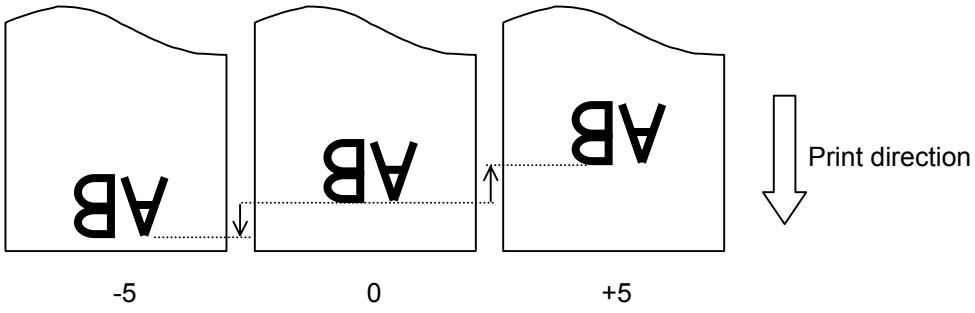
- The data in the image buffer is not cleared.
- Set the print length in units of lines, and it must be equal to or less than the image buffer length.
- Set the print width in units of words (16 dots), and it must be equal to or less than the one-sixteenth (1/16) of the image buffer width.
- Set the X-direction offset in units of dots, and it must be within the range from 0 to ‘image buffer width minus 1’.
  When any value other than 0 is set for the X-direction offset, the print position of an image will shift to the right by the specified dots, as viewed from the printer back. If performing an X-direction offset caused a part of the image to be positioned outside of the print head width, such part will not be printed.

Example)



- Set the Y-direction offset in units of lines, and it must be within the range from '– max. page length' to the max. page length.
  When a positive value is set for the Y-direction offset, the print position of an image will shift backward, and when a negative value is set, an image will shift forward, as viewed from the media outlet. If performing a Y-direction offset caused a part of the image to be positioned outside of the range of a page, such part will not be printed.

Example)



- The image mode is specified by the following bit pattern.

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	Reserved						BS	BW	WR	BR	UD	0	0	0	1

The BS, BW, WR, BR, and UD specify the data arrangement in the image buffer. Print data is stored in the image buffer in the order of transmission from the lowest address, so this is also specify the print data transmission order.

Bit	Value	Image buffer structure	Transmission order
BS	0	Lower address represents upper address	From the highest byte
	1	Lower address represents upper address	From the lowest byte
BW	0	Reverse print invalid	From the highest byte
	1	Reverse print valid	From the lowest byte
WR	0	Lower address represents left word	From the left-most word, as viewed from the printer back.
	1	Lower address represents right word	From the right-most word, as viewed from the printer back.
BR	0	Lower address represents the left (as viewed from the printer back)	The LSB is left bit as viewed from the printer back.
	1	Lower address represents right (as viewed from the printer back)	The MSB is right bit, as viewed from the printer back.
UD	0	Lower address represents backward (Media roll side)	From the line closer to the media roll.
	1	Lower address represents forward. (Media outlet side)	From the line closer to the media outlet.

- Relation between the print image rotation and image mode flag

	Normal	Mirror
0	0-degree rotation, 0x0001 | IMG_LRB | IMG_LRW	0-degree rotation, 0x0001
90	90-degree rotation, 0x0001 | IMG_LRB | IMG_LRW	90-degree rotation, 0x0001
180	0-degree rotation, 0x0001 | IMG_UD	0-degree rotation, 0x0001 | IMG_UD | IMG_LRB | IMG_LRW
270	90-degree rotation, 0x0001 | IMG_UD	90-degree rotation, 0x0001 | IMG_UD | IMG_LRB | IMG_LRW

2. PRINT DATA SEND COMMAND

Format

Byte/bit	7	6	5	4	3	2	1	0		Remarks
0	Header								‘/’	
1									‘T’	
2	Command identifier								‘I’	
3									‘D’	
4	Offset before compression									Equivalent to the argument “offset”
to										
7										
8	Data size before compression (n)									Equivalent to the argument “size”
to										
11										
12	Compression mode									
13										
14	Compression parameter 1 (Offset after compression)									
to										
17										
18	Compression parameter 2 (Data size after compression)									
to										
21										
22	Bitmap (First word)									
23										
to										
nx2+20	Bitmap (Last word)									
nx2+21										

Function

Sends image data.

Explanation

The compression mode is specified by the following bit pattern.

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
CM	Reserved											Compression method			

The CM bit specifies the other fields, as follows.

CM	Compression	Compression method	Compression parameters 1 and 2
0	No	Invalid	Invalid
1	Yes	Valid	Valid

The meaning of the compression mode field

0	Undefined
1	Pack Bits (Not applicable)
2 to 7	Undefined
8	GrPDK Adaptive Compress (Not applicable)
9 to 15	Undefined

■ **Specification not affected by enabling/disabling the compression**

- Data to be transmitted must comply with the arrangement specified by the Image Data Set Command.
- For the offset before compression, set the offset for the write start position in the image buffer in units of words. Therefore, the offset before compression must be a multiple of 2
- Data size before compression must be specified in units of words.
- The maximum data size before compression equals to the maximum image buffer size (in units of words).

■ **Specification in the case data is not compressed.**

- Compression parameters 1 and 2 are ignored.
  NOTE: Without compression, data is raw rasterized data, not equal to “no compression” of GrPDK.

■ **Specification in the case data is compressed**.

- The values and meanings of the compression method are separately defined.
- The meaning of the compression parameters 1 and 2 are different depending on the compression methods, and they are separately defined.

For example, in some compression method, compression parameters 1 and 2 can be used as the data size after compression and the offset after compression, respectively.
For the offset after compression, the offset for the write start position in the virtual image buffer, where a compressed image is stored, is set in units of bytes.
For the data size after compression, set the data size of the compressed image in units of bytes.
Compressed data must be equal to or smaller than the max. image buffer size when decompressed.
In the case compressed data is sent to the printer without decompression, it must be equal to or smaller than the max. image buffer size after decompressed.

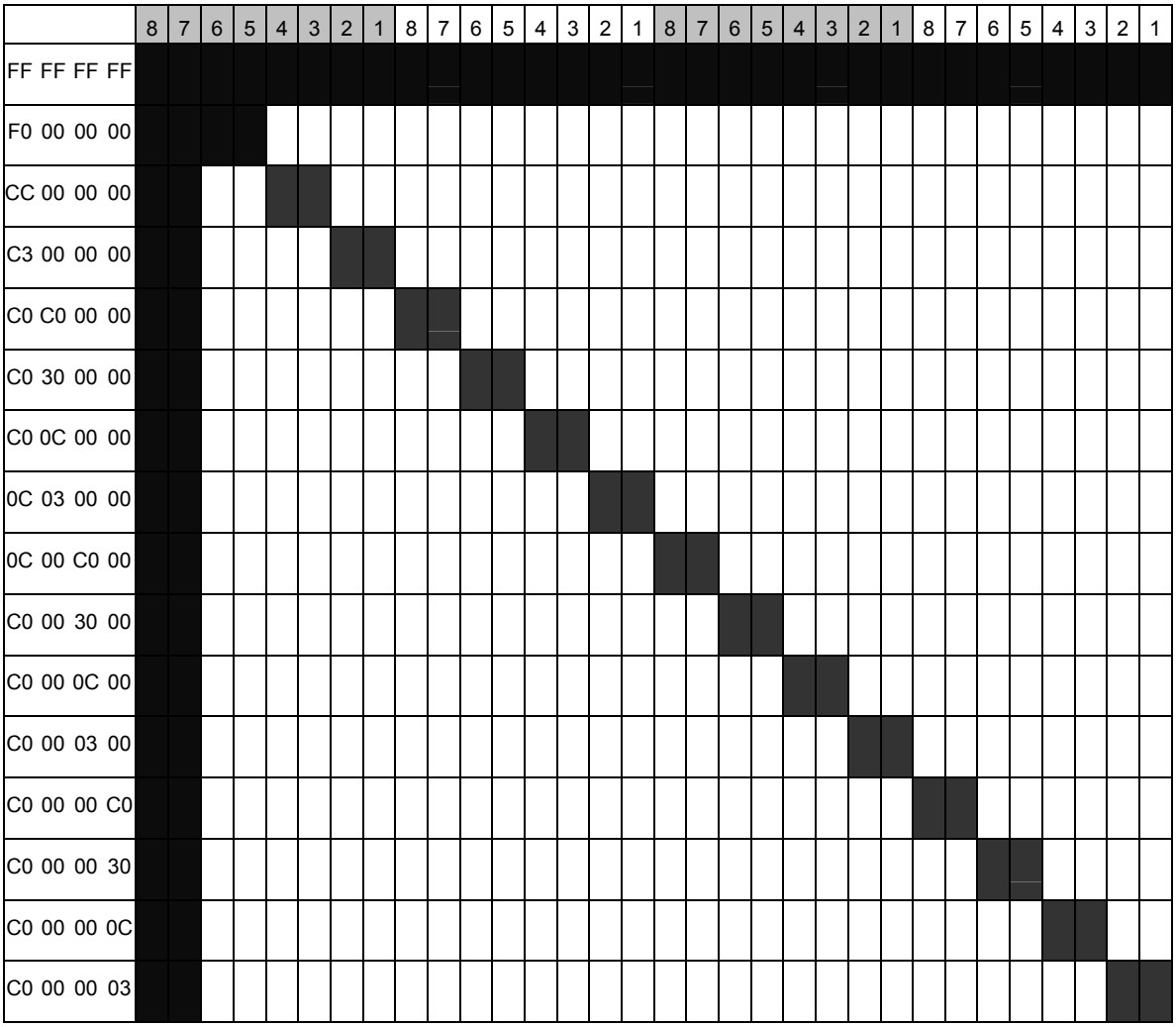
This command is supposed to be passed to the printer by way of several components in the print sub-system. Therefore, it is possible to send compressed data to a certain stage, decompress it on the way, and send the decompressed data to the printer after that. It is also possible to send compressed data to the printer if the printer can decompress it.

If any of the components in the print sub-system that receives this command can decompress received data, that component is allowed to do it and send the decompressed data to the next component. In that case, the CM bit of the compression mode in this command needs to be cleared.
A component that cannot decompress the received data passes it to the next component. If the data cannot be sent to the next component for some reason, an “Unsupported compression method” error results.
In the case the upper component that receives this error is supporting the compression method, the upper component is allowed to decompress the data and send it again.

Bitmap format

When image data is sent to the printer without being compressed, the following image will be comprised of the bitmap structure below.

FF FF FF FF F0 00 00 00 CC 00 00 00 C3 00 00 00 CO CO 00 00 CO 30 00 00 CO 0C 00 00 CO 03 00 00
CO 00 C0 00 CO 00 30 00 CO 00 0C 00 CO 00 03 00 CO 00 00 C0 CO 00 00 30 CO 00 00 0C CO 00 00 03



NOTE:

Unless “0” is set for the offset before compression and the image size is set for the data size before compression, the rest of the image will remain because it is not rewritten.

3. CALIBRATION REQUEST/RESPONSE COMMAND

Format

● Request command

Byte/bit	7	6	5	4	3	2	1	0	
0	Header								'/'
1									'T'
2	Command identifier								'C'
3									'B'

● Response command

Byte/bit	7	6	5	4	3	2	1	0		Remarks
0	SMONID									Refer to /TJI.
to										
3										
4	DOCID									Refer to /TJI.
to										
7										
8	Header								'/'	
9									'R'	
10	Command identifier								'C'	
11									'B'	
12	Sensor mark detection method									measured.sensor_type Refer to /TPI.
13										
14	Actually measured media pitch [line]									measured.measured_length
15										
16	Actually measured media pitch excluding sensor mark [line]									measured.lead_cnt
17										
18	Threshold for leading end detection (unit of A/D conversion)									measured.vtl
19	Threshold for trailing end detection (unit of A/D conversion)									measured.vth

Function

Measures the media pitch in accordance with the programmed page information, and returns the result.

Explanation

- For the sensor mark detection method, the value set in the Page Information Set Command is returned.
- Unlike the /TPI command, the threshold value is always expressed in units of A/D conversion.
- When 8th to 11th bytes (counted from "0") read from the printer are "/RCB", this is judged as a response to the request.

4. PRINTER OPERATION SET COMMAND

Format

Byte/bit	7	6	5	4	3	2	1	0		Remarks
0	Header								'/'	
1									'T'	
2	Command identifier								'A'	
3									'I'	
4	Page offset [line]									action.page_offset
5										
6	Table				Duty					action.print_method
7	HC	Reserved	0	0	MP	HE	Reserved	DTP		
8	Print speed									action.print_speed
9	Feed speed									action.feed_speed
10	Print tone								00h	action.print_density
11										
12	Reserved (sort feed/print length)								00h	action.sep_length
13									00h	
14	Tear-off delay time									action.ondemand_time
15										
16	Cut method								00h	action.cut_method
17									00h	
18	Reserved (verification method)								00h	action.vfy_method
19									00h	
20	Reserved (verification position)								00h	action.vfy_position
21									00h	
22	Option usage									action.option_usage
23									00h	

Function

Sets the printer operation parameters.

Explanation

- When MP (Multi Pulse) bit is "1", the upper 8 bits represent "Table" and "Duty".
- When MP (Multi Pulse) bit is "0", the upper 8 bits represent "Material Table".
- When the MP is "1", the HC must be set to "0".
  HC: Heat History Control
  Material Table: Media material number registered to the printer

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Table				Duty				H=0	Reserved	0	0	MP=1	HE	Reserved	DTP
Material Table								HC	Reserved	0	0	MP=0	HE	Reserved	DTP

- DTP: When the bit 0 is set to "1", DTP (Direct Thermal Print) is specified, and when "0", TTP (Thermal Transfer Print) is specified, respectively.

- MP (Multi Pulse) and HE (High Energy) specify the method to apply the energy to the print head. For the Multi Pulse method, the energy table is specified by “Table”, and strobe duty is specified by “Duty”, respectively.

MP	HE	Print energy apply method
0	0	Single pulse, Normal energy
0	1	Single pulse, High energy
1	X	Multi pulse

- Set the tear-off delay time in units of msec.
- Option usage

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Reserved					TAP	Rsv	STK	Reserved							

- Conversion from metric to inch for the print speed and feed speed
  Ips = (n+1) x 0.25

- The “TAP” and “STK” are not applicable to the B-SX600.

5. PAGE INFORMATION SET COMMAND

Format

Byte/bit	7	6	5	4	3	2	1	0		Remarks
0	Header								'/'	
1									'T'	
2	Command identifier								'P'	
3									'I'	
4	Sensor mark detection method									measured.sensor_type
5										
6	Media pitch [line]									measured.measured_length
7										
8	Page length [line]									measured.lead_cnt
9										
10	Sensor level L									measured.vtl
11	Sensor Level H									measured.vth

Media pitch: Length of media from a sensor mark to the next sensor mark. Sensor mark includes gap, black mark, notch, and center hole.

Page length: Length equals to the media pitch minus the sensor mark length.

Function

Sets page information.

Explanation

- Sensor mark detection method is specified by the following bits:

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Reserved		PRP		0	0	0	1	CN	EA	0	MA	TL	Rsv	Sensor	

- PRP (Pre-print), CN (Count), MA (Manual), TL (Threshold/Level) bits specify a sensor mark detection method which is appropriate for the purpose of use.

Sensor mark detection method							
PRP		CN	EA	MA	TL	Media feed mode	Usage
X	X	1	X	X	X	Fixed length feed mode	Continuous paper
X	X	0	1	X	X	Easy feed mode	Die-cut labels
X	X	0	0	X	X	Strict feed mode	Die-cut labels, notched labels

- Sensor bits specify the sensor type to be used.

Sensor		Sensor	Media
0	0	Transmissive sensor	Die-cut label, Notched tag paper
0	1	Reflective sensor	Media with black marks
1	0	Transmissive media center sensor	Die-cut label, Tag paper with center holes

- Set the media pitch and page length in units of lines, and it must fall within the range from the minimum media pitch to the maximum.

- Sensor levels L and H should be specified in accordance with media feed mode.

Media feed mode	Sensor level L	Sensor level H
Fixed length feed mode (Count mode)	Invalid	
Easy feed mode and Strict feed mode (Level mode)	Threshold for the leading edge detection [Unit of A/D conversion]	Threshold for the trailing edge detection [unit of A/D conversion]

6. HOME POSITION SET COMMAND

Format

Byte/bit	7	6	5	4	3	2	1	0		Remarks
0	Header								'/'	
1									'T'	
2	Command identifier								'A'	
3									'T'	
4	The number of pages to feed									Equivalent to the argument "pages"
5										
6	Operation mode									Equivalent to the argument "mode"
7										

Function

Feeds the media to the print start position based on the parameter settings in the Page Information Set Command and Printer Operation Set Command.

Explanation

- Operation mode is specified by the following bits:

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
NF	0	0	Reserved			0	PB	Reserved				Ondmnd		BK	CT

- Each bit has the following meaning.

Bit	Value	Operation
NF	0	Feed
	1	No feed
PB	0	No reverse feed to the home position before printing
	1	Reverse feed from the peel-off position to the home position before printing
Ondmnd	0, 0	No tear-off operation
	0, 1	Feed to the tear-off position
	1, 0	Feed to the cut position
	1, 1	Feed to the peel-off position
BK	0	No reverse feed
	1	Reverse feed
CT	0	No cut operation
	1	Cut operation

After feeding the media to the home position, a command to cut off the previous page is cleared.

7. PRINT START COMMAND

Format

Byte/bit	7	6	5	4	3	2	1	0		Remarks
0	Header								'/'	
1									'T'	
2	Command identifier								'S'	
3									'P'	
4	Operation mode									Equivalent to the argument "mode"
5										
6	Reserved								00h	
to									00h	
9									00h	
10	Operation after printing								00h	Equivalent to the argument "more"
11										

Explanation

- Operation mode is specified by the following bits:

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Action				Reserved				Reserved		AB	CT	0	0	0	0

- The printer operates according to the Action bits. When the CT bit is "1", the trailing end of the printed media is cut.

Action	Operation
1	Print
2	Feed or cut
3	Reverse feed
6	Change of cut instruction
7	Job completion action
Others	Undefined

- If a cut operation has been specified, the boundary of the applicable page will be cut when it reaches the cutter position.

- Since the image buffer is not cleared after a printing is completed, it is possible to reprint the same print data without sending the data again.

- When the AB bit is "1", the printer feeds the page to be printed in the reverse direction from the tear-off position so that the sensor can detect the sensor mark again, then feeds it to the home position. To use this function, "No cut operation" and "No tear-off operation" must be specified.

- The operation after printing differs depending on the models.

- The operation after printing is specified by the following bits:

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	Reserved							Reserved			NP	Ondmnd		BK	0

- The operation after printing is determined by the Ondemand and BK bits.

Bit	Value	Operation
Ondmnd	0, 0	Stop at the normal position
	0, 1	Feed to the tear-off position
	1, 0	Feed to the cut position
	1, 1	Feed to the peel-off position
NP	0	Cut while printing
	1	No cut while printing
BK	0	No reverse feed
	1	Reverse feed

8. STATUS REQUEST/RESPONSE COMMAND

Format

● Request command

Byte/bit	7	6	5	4	3	2	1	0	
0	Header								‘/’
1									‘T’
2	Command identifier								‘E’
3									‘S’

● Response command

Byte/bit	7	6	5	4	3	2	1	0		Remarks
0	SMONID									Refer to /TJI.
to										
3										
4	DOCID									Refer to /TJI.
to										
7										
8	Header								‘/’	
9									‘R’	
10	Command identifier								‘E’	
11									‘S’	
12	Error									Equivalent to the return value “get_pe_errno”
13										
14	End of print									Equivalent to the return value “chk_print_completed”
15										

Function

Sends the printer status and print job status to the host.

Explanation

- Errors and print job statuses to be detected by the printer are as follows:
- When 8th to 11th bytes (counted from “0”) read from the printer are “/RES”, this is judged as a response to the request.

Error code	Meaning	Remarks
0	Normal	
1	Paper jam	
2	Paper end	
3	Ribbon end	
4	Print head is overheating.	
5	Side cover is opened.	
6	Print head unit is opened.	
7	Calibration failed.	
8	Print head broken element is detected.	

Error code	Meaning	Remarks
9	Ribbon has been loaded while the direct thermal printing method is selected.	
11	Print head uninstalled/improperly installed	
12	Media near end	
13	Front cover is opened	
14	Ribbon break	
15	Ribbon near end	
16	Ribbon feed error	
33	Paper jam in the peel-off unit	
41	Paper jam in the cutter unit	
71	Printer is in operation	
73	Page information unspecified	
74	Operation information unspecified	
75	Image information unspecified	
77	The cover is opened.	
79	Pause	
82	Print table not supported	
85	Send buffer overflow	Used by the printer side only.
87	Checking the print head	
129	Remove the label.	
180	Waiting for a command from an external device.	

End of print	Meaning
0	Not completed.
1	Completed.

9. FINE ADJUSTMENT COMMAND

Format

Byte/bit	7	6	5	4	3	2	1	0		Remarks
0	Header								'/'	
1									'T'	
2	Command identifier								'S'	
3									'A'	
4	Fine adjustment identifier									Equivalent to the argument "id"
5										
6	Fine adjustment value									Equivalent to the argument "value"
7										

Function

Sets a fine adjustment value.

Explanation

- Fine adjustment identifier and the value are specified by the following bits:

Value	Fine adjustment
1	Distance between the reflective sensor and the print head
2	Distance between the transmissive sensor and the print head
3	Distance between the print head and the cutter
5	Distance between the print head and the tear-off position
6	Distance between the print head and the peel-off position
7	Print start position
8	Distance between the transmissive media center sensor and the print head

- The identifier must be quoted from the "moduleif.h" of the printer firmware.

```
#define ADJ_RS2HD       1
#define ADJ_TS2HD       2
#define ADJ_HD2CT       3
#define ADJ_CS2CT       4
#define ADJ_HD2OD       5
#define ADJ_HD2PL       6
#define ADJ_1STDOT      7
#define ADJ_CH2HD       8
#define ADJ_HD2VFY      9
#define ADJ_VFRHPOS     10
#define ADJ_RATIO2      11
#define ADJ_RATIO3      12
#define ADJ_APPC        13
#define ADJ_JAMERR      21
#define ADJ_RSTEPS      22
#define IGN_PPREND      23
#define ADJ_HDMOVE      24
#define ADJ_VFYTHRESH   25
#define ADJ_AQL         26
```

10. FINE ADJUSTMENT VALUE REQUEST/RESPONSE COMMAND

Format

● Request command

Byte/bit	7	6	5	4	3	2	1	0		Remarks
0	Header								'/'	
1									'T'	
2	Command identifier								'G'	
3									'A'	
4	Fine adjustment identifier									Equivalent to the argument "id"
5										

● Response command

Byte/bit	7	6	5	4	3	2	1	0		Remarks
0	SMONID									Refer to /TJI.
To										
3										
4	DOCID									Refer to /TJI.
To										
7										
8	Header								'/'	
9									'R'	
10	Command identifier								'G'	
11									'A'	
12	Fine adjustment identifier									Equivalent to the argument "id"
13										
14	Fine adjustment value									Equivalent to the return value
15										

Function

Obtains the fine adjustment values currently set to the printer. For the fine adjustment identifier and the value, refer to the Fine Adjustment Command.

Explanation

- When 8th to 11th bytes (counted from "0") read from the printer are "/RGA", this is judged as a response to the request.

11. SENSOR STATUS REQUEST/RESPONSE COMMAND

Format

● Request command

Byte/bit	7	6	5	4	3	2	1	0	
0	Header								'/'
1									'T'
2	Command identifier								'S'
3									'B'

● Response command

Byte/bit	7	6	5	4	3	2	1	0		Remarks
0	SMONID									Refer to /TJI.
to										
3										
4	DOCID									Refer to /TJI.
to										
7										
8	Header								'/'	
9									'R'	
10	Command identifier								'S'	
11									'B'	
12	Result									Equivalent to the return value.
13										

Function

Obtains the status of each sensor.

Explanation

- The result is specified by the following bits.

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Reserved				FC	SC	HU	HL	CO	CL	CR	Reserved	PN	PL	RE	PE

- The response indicates the real-time A/D-converted status of the sensors at the time this command is sent to the printer.

- The CO bit indicates an OR value of the status of the all covers (FC, SC, HU, and HL).

- The “left end” and “right end” indicated by the CL and CR bits are the positions as viewed from the printer back side.

Bit	Value	Operation
FC	1	The front cover is opened.
	0	The front cover is closed.
SC	1	The side cover is opened.
	0	The side cover is closed.
HU	1	The print head unit is opened.
	0	The print head unit is closed.
HL	1	The print head unit is unlocked.
	0	The print head unit is locked.
CO	1	Any of the FC, SC, HU, and HL is opened.
	0	All of the FC, SC, HU, and HL are closed.
CL	1	The disc cutter is positioned at the left end, as viewed from the printer back.
	0	The disc cutter is not positioned at the left end, as viewed from the printer back.
CR	1	The disc cutter is positioned at the right end, as viewed from the printer back.
	0	The disc cutter is not positioned at the right end, as viewed from the printer back.
PN	1	Paper near end
	0	Sufficient paper
PL	1	Printed label has been removed.
	0	Printed label has not been removed.
RE	1	No ribbon
	0	Ribbon has been loaded.
PE	1	Media end
	0	Media has been loaded.

- When 8^{th} to 11^{th} bytes (counted from “0”) read from the printer are “/RSB”, this is judged as a response to the request.

NOTE:
When the opened cover is closed, this possibly means a replacement of the paper or ribbon has been done. When the host detects a cover close, it is desired that the printer feeds the paper to the home position.

12. ANALOG SENSOR STATUS REQUEST/RESPONSE COMMAND

Format

● Request command

Byte/bit	7	6	5	4	3	2	1	0	
0	Header								'/'
1									'T'
2	Command identifier								'S'
3									'L'
4	Sensor identifier								
5									

● Response command

Byte/bit	7	6	5	4	3	2	1	0		Remarks
0	SMONID									Refer to /TJI.
To										
3										
4	DOCID									Refer to /TJI.
To										
7										
8	Header								'/'	
9									'R'	
10	Command identifier								'S'	
11									'L'	
12	Sensor identifier									
13										
14	Result									Equivalent to the return value.
15										

Function

Obtains the status of each analog sensor.

Explanation

- The response indicates the real-time A/D-converted status of the sensor specified by the sensor identifier at the time this command is sent to the printer.

- The sensor identifier is specified by the following bits.

Sensor identifier	Description	Unit of measure
0	Print head thermistor	ºC (±)
1	Transmissive media edge sensor	mV
2	Reflective sensor	mV
3	Ambient temperature thermistor	ºC (±)
4	Reserved	
5	Reserved	
6	Transmissive media center sensor	mV
7	Reserved	
8	Reserved	

- When 8th to 11th bytes (counted from “0”) read from the printer are “/RSL”, this is judged as a response to the request.

13. PRINTER VERSION REQUEST/RESPONSE COMMAND

Format

● Request command

Byte/bit	7	6	5	4	3	2	1	0	
0	Header								'/'
1									'T'
2	Command identifier								'V'
3									'R'

● Response command

Byte/bit	7	6	5	4	3	2	1	0		Remarks
0	SMONID									Refer to /TJI.
to										
3										
4	DOCID									Refer to /TJI.
to										
7										
8	Header								'/'	
9									'R'	
10	Command identifier								'V'	
11									'R'	
12	Version									Equivalent to the return value.
13										

Function

Obtains the printer version.

Explanation

- The printer version to be returned is 2-byte binary data, so "0x1234" means "V12.34.
- When 8th to 11th bytes (counted from "0") read from the printer are "/RVR", this is judged as a response to the request.

14. SERVICE INFORMATION REQUEST/RESPONSE COMMAND

Format

● Request command

Byte/bit	7	6	5	4	3	2	1	0	
0	Header								'/'
1									'T'
2	Command identifier								'G'
3									'S'

● Response command

Byte/bit	7	6	5	4	3	2	1	0		Remarks
0	SMONID									Refer to /TJI.
To										
3										
4	DOCID									Refer to /TJI.
To										
7										
8	Header								'/'	
9									'R'	
10	Command identifier								'G'	
11									'S'	
12	Operating time (sec.)									Service_total.pwon_time
To										
15										
16	Feed amount (mm)									Service_total.feed_length
to										
19										
20	Total print distance									Service_total.print_lines
to										
23										
24	Cut count (times)									Service_total.num_of_cut
To										
27										

Function

Obtains the current service information.

Explanation

- When 8th to 11th bytes (counted from "0") read from the printer are "/RGS", this is judged as a response to the request.

15. SERVICE INFORMATION SET COMMAND

Format

Byte/bit	7	6	5	4	3	2	1	0		Remarks
0	Header								'/'	
1									'T'	
2	Command identifier								'S'	
3									'S'	
4	Operating time (sec.)									Service_total.pwon_time
to										
7										
8	Feed amount (mm)									Service_total.feed_length
to										
11										
12	Total printing distance									Service_total.print_lines
to										
15										
16	Cut count (times)									Service_total.num_of_cut
to										
19										

Function

Sets the service information.

16. PRINT HEAD TEST REQUEST/RESPONSE COMMAND

Format

● Request command

Byte/bit	7	6	5	4	3	2	1	0		
0	Header								'/'	
1									'T'	
2	Command identifier								'T'	
3									'H'	
4	The number of printable dots (n)									
5										
6	Block designation									Equivalent to the argument "block".
7										
8	Test result size									
to										
11										

● Response command

Byte/bit	7	6	5	4	3	2	1	0		Remarks
0	SMONID									Refer to /TJI.
To										
3										
4	DOCID									Refer to /TJI.
to										
7										
8	Header								'/'	
9									'R'	
10	Command identifier								'T'	
11									'H'	
12	Tested block									Equivalent to the value returned to the argument "resultp".
13										
14	Average dot resistance (ohm)									Equivalent to "TRIC_HR_HEADER.avg".
15										
16	Max. dot resistance (ohm)									Equivalent to "TRIC_HR_HEADER.max".
17										
18	Min. dot resistance (ohm)									Equivalent to "TRIC_HR_HEADER.min".
19										
20	Leak current (μA)									Equivalent to "TRIC_HR_HEADER.leak".
21										
22	Resistance/dot (ohm)									Equivalent to "TRIC_HR_HEADER.dot_res[ ]".
to										
2xn+21										
2xn+22	Test result by dots									Equivalent to "TRIC_HR_HEADER. (dodt_map[ ]).
to										

Function

Conducts a print head test according to the page information.

Explanation

- For the number of printable dots, the number of printable dots among the print head is set. (Note 2)
- The print head is divided into 16 blocks, and the blocks to be tested are specified dot by dot. The MSB is corresponding to the left block, and the LSB is corresponding to the right block, respectively. The dot of the block to be tested is set to 1.
- For the test result size, set the size (byte) of test result data to be received. This must be a multiple of 2.
- The data size required to receive the all print head test results is obtained by:

  sizeof(TRIC_TH_ANS) // fixed length part (14 bytes)
  + sizeof(UWORD) * n // Resistance per dot
  + sizeof(UWORD) * WORDS_FROM_DOTS(n) // Test result by dots

- The tested block in a response is also represented by dots, too.
- The resistance of each dot is returned in units of 2 bytes, from the left-most dot.
- For the result bitmap for each dot, the MSB of the lead byte represents the left end of the print head. The bit corresponding to a normal dot is set to 1.
- When 8^{th} to 11^{th} bytes (counted from "0") read from the printer are "/RTH", this is judged as a response to the request.

NOTES:

1. The number of printable dots of the printer needs to be returned in response to a print head test request command so that the print sub system components (language monitor, port monitor, etc.) other than the printer driver do not depend on the printer.

2. This does not mean that unusable dots are uncounted. For example, when the printer is provided with a 4-inch wide print head of which max. print width is 3.5 inches, the number of printable dots will be the value equivalent to 3.5-inch wide print head.

17. CUT/PEEL-OFF ENABLE FLAG SET COMMAND

Format

Byte/bit	7	6	5	4	3	2	1	0	
0	Header								'/'
1									'T'
2	Command identifier								'E'
3									'C'
4	Option								
5									
6	Flag 1								
7									
8	Flag 2								
9									

Function

Obtains the information whether the cutter or peel-off unit is enabled or not.

Explanation

- The Option is specified by the following value
  0: No option
  1: Peel-off unit
  2: Cutter unit
- Flag 1 is effective only for the printer with a cutter or peel-off unit. The value and the meaning are as follows.

Flag	Peel-off model	Cutter model
0	Disabled.	Disabled.
1	Enabled.	Enabled.

- Flag 2 is effective only when Flag 1 is set to 1. The following table shows the value and the meaning.

Flag	Peel-off model	Cutter model
0	The printer does not feed a next label to the print start position after a peel-off operation.	Not used.
1	The printer feeds a next label to the print start position after a peel-off operation.	Not used.

18. PAGE NUMBER SET COMMAND

Format

Byte/bit	7	6	5	4	3	2	1	0	
0	Header								'/'
1									'T'
2	Command identifier								'P'
3									'N'
4	Page number								
5									

Function

Sets the page numbers.
This command is used only between the printer driver and the language monitor, and not sent to the port monitor.

19. DRIVER INFORMATION SET COMMAND

Format

Byte/bit	7	6	5	4	3	2	1	0	
0	Header								'/'
1									'T'
2	Command identifier								'D'
3									'I'
4	Data size (n)								
5									
6	Data type								
7									
8	Data (n bytes)								
to									
n+7									

Function

This command is issued by the printer driver to notify the language monitor of the printer driver information including the window handle.

Explanation

- This command is used only between the printer driver and the language monitor, and not sent to the port monitor.
- To meet the future increase of the data volume, the data size and data type are provided.

Data size	Data size	Data	Remarks
0	4	The upper word is 0. The lower word is the window handle of the printer driver (or application program)	The language monitor checks this command for every document. When this command is not issued, the language monitor sends a response via the ReadPort, not via the status monitor.
1	2	Model (installed option) ID	0: Standard (B-SX600-HS11/HS12-QM-R) 1: Peel-off (B-SX600-HH11/HH12-QM-R) 2: Cutter (B-SX600-HC11/HC12-QM-R)
2	24	Timeout value (msec.) 4 byte each x 6 1. ReadIntervalTimeout 2. ReadTotalTimeoutMultiplier 3. ReadTotalTimeoutConstant 4. WriteTotalTimeoutMultiplier 5. WriteTotalTimeoutContant 6. WriteTimeOut	If the port monitor does not respond to this command within the specified timeout, the language monitor stops obtaining the status and proceeds to the next task.

Data size	Data size	Data	Remarks
3	4	Status getting cycle (msec.)	When this value is 0, the language monitor does not obtain a status. When this value is other than 0, the language monitor obtains a status at a specified cycle.
4	8	SMONID, DOCID	The first 4 bytes: Unique number issued by the SMONID status monitor The last 4 bytes: Unique number the DOCID driver issues for every document
5	4	Whether the language monitor message box is displayed or not.	1: Displayed. 0: Not displayed.
6	Variable	Computer name which sent a print instruction	Used to display an error message box on the client. The size is variable.
7	4	Whether the session management command is sent or not.	1: Sent. 0: Not sent.
8	4	Whether a synchronous printing is performed or not.	1: Yes 0: No
9	Variable	User name that sent a print instruction	Used to display an error message box on the client session. The size is variable.

20. DOCUMENT INFORMATION SET COMMAND

Format

Byte/bit	7	6	5	4	3	2	1	0	
0	Header								'/'
1									'T'
2	Command identifier								'J'
3									'I'
4	Data size (n)								
5									
6	Data type								
7									
8	Data (n bytes)								
to									
n+7									

Function

This command is issued by the language monitor to notify the printer of the print job (document) information.

Explanation

- To meet the future increase of the data volume, the data size and data type are provided.

Data type	Data size	Data	Remarks
3	4	Whether to obtain a status and a response	Other than 0: Yes 0: No
4	8	SMONID, DOCID	The first 4 bytes: Unique number issued by the SMONID status monitor. The last 4 bytes: Unique number the DOCID driver issues for every document

- When the data type received from the /TJI is 4, the printer clears the page counter in the printer.
- More than one Type 4 data of the /TJI must not be sent in a same document.

21. SPECIAL DATA REQUEST/RESPONSE COMMAND

Format

● Request command

Byte/bit	7	6	5	4	3	2	1	0	
0	Header								'/'
1									'T'
2	Command identifier								'S'
3									'D'
4	Data ID								
to									
7									
8	Max. size of a response								
to									
11									
12	Data size (n)								
to									
15									
16	Data								
16+n-1									

● Response command

Byte/bit	7	6	5	4	3	2	1	0		Remarks
0	SMONID									Refer to /TJI.
to										
3										
4	DOCID									Refer to /TJI.
to										
7										
8	Header								'/'	
9									'R'	
10	Command identifier								'S'	
11									'D'	
12	Data ID									
to										
15										
16	Transmission result									
to										
19										
20	Data size (n)									
to										
23										
24	Data									
24+n-1										

Function

Obtains any specific information.

Explanation

- The contents of special data can be determined between the sender and receiver, and basically the data is not disclosed.
- If the data does not meet the specification, it is discarded.
- To prevent changes of data by malicious users, any security features, such as authentication should be included in the data. (Because the printer firmware is transmitted.)
- Data ID

ID	Data contents
0	Printer firmware image*

*: The ambiguous expression, “printer firmware”, enables the printer to use the data however it likes.

- Max. size of a response
  If the size is 0, the printer must not return a response.
  If other than 0, the printer must return a response within the specified number of bytes, including at least the header.

- Even if the printer has a response exceeding the max. size of a response, it must send the response within the specified size and does not need to notify the host. This is because the size of a response is specified as a format and the host should know that. In the case of a variable length response, it can include the information that indicates the data size.

NOTE:
Do not increase data ID without careful consideration.

■ STATUS

In addition to a response to a command, the printer sends a status or information to the host in the case an event occurs in the printer.

ASYNCHRONOUS STATUS COMMAND

Format

Byte/bit		Remarks
0	SMONID	Refer to /TJI.
1		
2		
3		
4	DOCID	
5		
6		
7		
8	Error/Print completion	Error: Lower 15 bits Print completion: Highest 1 bit The value is equal to “/RES”.
9		
10	Total number of pages	
11		
12		
13		

Explanation

- Status is queued each time an event occurs.
- Status will change according to the events occurring asynchronously.
- A status size is fixed to 14 bytes.
- A status indicates the print job progress (the number of printed pages) as well as an error.
- The length of a response is variable, but it can be found by analyzing the part that follows the header.
- A response is queued.
- It is easy to judge whether a status or a response.
- A status is generated each time an error occurs or the printer completes printing a page.
- When no status or response remains in the send buffer, no data will be returned in response to the status read.
  In this case, ReadPort of the port monitor seems to return a successful reading, not an error.
- When 8^{th} and 9^{th} bytes (counted from “0”) read from the printer are not “/R”, this is judged as a status, not a response.