HITACHI
Inspire the Next

HITACHI IJ Printer

Model UX2

Communication User's Manual
（EtherNet/IP）

EtherNet/IP ODVA

- Before using the printer, thoroughly read this communication user's manual for optimum printer use.
- After reading this communication user's manual, properly keep it for future reference.

Hitachi Industrial Equipment Systems Co., Ltd.

To export the product, check the export control-related regulations, such as the Foreign Exchange and Foreign Trade Law and the Export Administration Regulations, and follow the necessary procedures.
If you have any questions, contact your Hitachi sales representative.

January 2025 (rev.N)

■Note

・For details of EtherNet/IP and notes, please refer to EtherNet/IP related equipment manual etc.
・IJ Printer software is certified with EtherNet/IP authentication Composite test revision: CT18. Please note that the revision contents released from ODVA after CT19 are not verified for operation.

■Trademark

"Ethernet" is a registered trademark of Xerox Corporation, USA.
"EtherNet/IP" is the product name of ODVA (Open DeviceNet Vendor Association).

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1. EtherNet/IP function

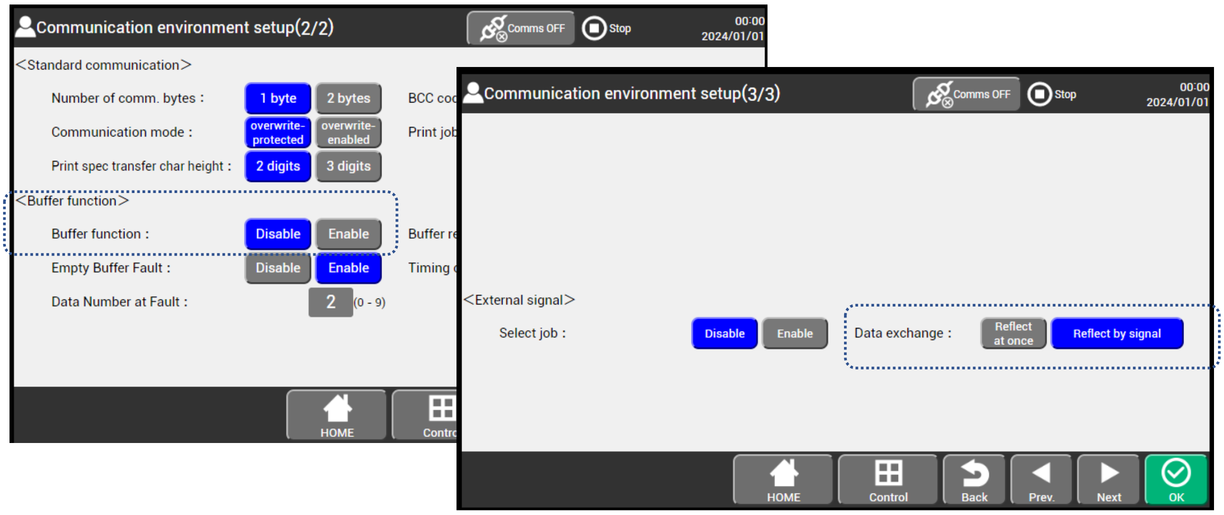
1.1. Overview

It is a function to communicate with an IJ Printer via Ethernet from an external device using the network environment.
EtherNet/IP is an industrial multi-vendor network using Ethernet, and its communication specification is adopted as an open standard in various industrial equipment.
EtherNet/IP communication has two communication functions: “Message communication (Explicit communication)” that communicates at a fixed cycle.
For the EtherNet/IP communication, it is necessary to develop a communication program on the external device side.

1.2. Usage precautions

(1) Functions listed below are not operational during the use of this function.

No.	Function Items	Remarks
1	Buffer function	The setting is fixed to [Disable]. It is possible to confirm the setting on “Communication environment setup 2/2”
2	Data exchange	The setting is fixed to [Reflect at once]. This function is available when using External Signal Function A (SOP-05). It is possible to confirm the setting on “Communication environment setup 2/2”
3	Special communication (SOP-04)	Not available with the left option
4	External signal (SOP-05)	Not available with the left option
5	Barcode reader connection (SOP-08)	Not available with the left option
6	Special features (SOP-15-nn)	Not available with the left option
7	User pattern 500 characters (SOP-25)	Not available with the left option



2. EDS File

If you need EDS file, please contact your nearest local distributor.

3. Explicit message communication specification

Specify the following Access code, Class code, and attribute to control the operation of the IJ Printer. Instance is fixed to “1”.

3.1. Access code

There are three types of access codes, “Set”, “Get”, and “Service”.

List of Access Code

No.	Access Code	Detail
1	0x32 (Set)	Set the information specified for the IJ Printer.
2	0x33 (Get)	Acquire information set in the IJ Printer.
3	0x34 (Service)	Executes the function of the IJ Printer.

(1) 0x32(Set)

The address of the target item and the setting content are transmitted from the external device to the IJ Printer. The IJ Printer updates the setting contents of the specified address.

(2) 0x33(Get)

The target address is transmitted from the external device to the IJ Printer. The IJ Printer notifies the content of the specified address.

(3) 0x34(Service)

The target address is transmitted from the external device to the IJ Printer. The IJ Printer performs the specified function.

(4) Other Code

When setting values other than 0x32 (Set), 0x33 (Get), 0x34 (Service), unsupported "0x2e" is transmitted.

Example) When setting the character string to "ABC".

	№						
	1	2	3	4	5	6	7
Designated code:	0x32	0x67	0x71	0x41	0x42	0x43	0x00

№	Designated code and content	Code type
1	0x32 = Set	Access code
2	0x67 = Print format function	Class code
3	0x71 = Print character string setting	Attribute
4	0x41 = Character string "A"	ASCII code (Hexadecimal)
5	0x42 = Character string "B"	ASCII code (Hexadecimal)
6	0x43 = Character string "C"	ASCII code (Hexadecimal)
7	0x00 = Termination code	Termination code

3.2. Class code

The class code has the following settings.

List of Class Code

Class Code	Function	Detail
0x7A	Index func.	Set/Get IJ Printer item information
0x66	Print data management func.	Set/Get value of print data management
0x67	Print format func.	Set/Get value of print format
0x68	Print specification func.	Set/Get value of print specification function
0x69	Calendar func.	Set/Get value of calendar function
0x6B	User pattern func.	Set/Get user pattern
0x6C	Substitution rules func.	Set/Get substitution rules
0x71	Environment setting func.	Set/Get environment setting value
0x73	Unit Information func.	Set/Get unit information
0x74	Operation management func.	Set/Get operation management information
0x75	IJ Printer operation func.	Set value of IJ Printer operation function
0x79	Count func.	Set/Get value of count function

Example) When getting the character height.

	№		
	1	2	3
Designated code：	0x33	0x68	0x64

№	Designated code and content			Code type
1	0x33	=	Get	Access code
2	0x68	=	Printing specification function	Class code
3	0x64	=	Getting of character height	Attribute

3.3. Index function (Class code = 0x7A)

The index function is a management function of EtherNet/IP communication. There are functions such as specifying columns and lines.
For the initial value of index function, refer to index function list below.
By turning off the power of the IJ Printer, it returns to the initial value of index function.
* Please note that the data range in the following table is written as decimal numbers, but the actual I/O data is in hexadecimal number, and when data type is character the I/O data shall be UTF-8 codes. "Data Range" means the range of input data.

List of Index Functions

Address		Function Name	Data Range	Initial Value	Input data			Notes
Attribute	Access				Data	Data Length (byte)	Data Type	
0x64	Set	Start/Stop management flag	2	2	2	1	int	2: Confirmation
	Get		0 to 1	0	Null	Null	Null	0: no un-reflected data 1: has un-reflected data
0x65	Set	Automatic reflection	0 to 1	0	0/1	1	int	0: Automatic reflect 1: non-automatic reflects
	Get				Null	Null	Null	
0x66	Set	Item count	1 to 100	1	Item No.	1	int	
	Get				Null	Null	Null	
0x67	Set	Column	1 to 100	1	Colum No.	1	int	
	Get				Null	Null	Null	
0x68	Set	Line	1 to 6	1	Line No.	1	int	
	Get				Null	Null	Null	
0x69	Set	Character position （For Inter-character space)	1 to 1000	1	Character position	2	int	
	Get				Null	Null	Null	
0x6A	Set	Print data job number	1 to 2000	1	Job number	2	int	
	Get				Null	Null	Null	
0x6B	Set	Print data group data	1 to 99	1	Group No.	1	int	
	Get				Null	Null	Null	
0x6C	Set	Substitution rules setting	1 to 99	1	Rule No.	1	int	
	Get				Null	Null	Null	
0x6D	Set	User pattern size	1 to 19	1	Size	1	int	
	Get				Null	Null	Null	
0x6E	Set	Count block	1 to 8	1	Block No.	1	int	
	Get				Null	Null	Null	
0x6F	Set	Calendar block	1 to 8	1	Block No.	1	int	
	Get				Null	Null	Null	

Example) When specifying the first column.

№			
1	2	3	4
0x32	0x7A	0x67	0x03

Designated code: 0x32 0x7A 0x67 0x03

№	Designated code and content	Code type
1	0x32 = Set	Access code
2	0x7A = Index function	Class code
3	0x67 = column	Attribute
4	0x03 = column number	Data

3.4. Print data management function (Class code = 0x66)

The print data management function includes functions such as calling and deleting print data.

<u>List of Print Data Management Functions</u>

Address		Function Name	Data Range	Input Data			Notes
Attribute	Access			Data	Data Length (Byte)	Data Type	
0x64	Service	Select job	1 to 2000 (1 to 300)	Job No.	2	short	2000：with Upgrade key 300: without Upgrade key
0x65 *1	Service	Store print data	Group： 0 to 99	Group No + Job name	1	short	2000：with Upgrade key 300: without Upgrade key If there is the same job name, it will be overwritten regardless of job No.
			Job name： Max 12 char. (Numeral, alphabetic, Kanji, Kana)		1 to 48	char	
0x67	Service	Delete print data	1 to 2000 (1 to 300)	Job No.	2	short	2000：with Upgrade key 300: without Upgrade key
0x69 *1	Service	Setting of print data name	Job No. 1 to 2000 (1 to 300)	Job No. + Job name	2	short	2000: with Upgrade key 300: without Upgrade key
			Job name： Max 12 char. (Numeral, alphabetic, Kanji, Kana)		1 to 48	char	
0x6A	Get	Getting list of 10 jobs from the specified job	0 to 2000 (1 to 300)	Specified job No	2	int	2000：with Upgrade key 300: without Upgrade key
0x6B	Service	Setting of Job No.	1 to 2000 (1 to 300)	Before changing Job No. + After changing Job No.	4	short short	2000：with Upgrade key 300: without Upgrade key
0x6C *1	Service	Change/Create group name	Group： 1 to 99	Group No.+ Group Name	1	short	
			Group name： Max 12 char. (Numeral, alphabetic, Kanji, Kana)		1 to 48	char	
0x6D	Service	Group deletion	1 to 99	Group No.	1	int	
0X6F	Get	Getting list of 10 job Groups from the specified group No.	1 to 99	Specified Group No	1	int	
0x70	Service	Change group number	1 to 99	Before changing Group No.+ After changing Group name No	1	int	

*1: Currently unsupported function

Example) When deleting print data. (Job No.300)

№				
1	2	3	4	5
0x34	0x66	0x67	0x01	0x2c

Designated code: 0x34 0x66 0x67 0x01 0x2c

№	Designated code and content			Code type
1	0x34	=	Service	Access code
2	0x66	=	Print data management function	Class code
3	0x67	=	Deletion of print data	Attribute
4	0x01	=	Job number 16 Hex	Data
5	0x2C	=	Job number 16 Hex	Data

※300（Decimal）=012C（Hexadecimal）

3.5. Print format function (Class code = 0x67)

The print format function includes functions such as column and step settings.

List of Print Format Functions (1/2)

Address		Function Name	Data Range	Input			Notes
Attribute	Access			Data	Data Length (Byte)	Data Type	
0x64	Get	Get job name	-	Null	Null	Null	
0x65	Get	Get print Item	-	Null	Null	Null	
0x66	Get	Get number of columns	-	Null	Null	Null	
0x67	Get	Get format type	-	Null	Null	Null	Format number 1: Individual setup 3: Free layout
0x69	Service	Insert column	-	Null	Null	Null	Set item number in "Column" of index function.
0x6A	Service	Delete column	-	Null	Null	Null	Set item number in "Column" of index function.
0x6B	Service	Add column	-	Null	Null	Null	
0x6C *1	Set	To overall	0 to 1	Setting	1	int	0: Non uniformity mode 1: Uniformity mode
0x6D	Set	Format setup	1 or 3	Format number	1	int	Format number 1: Individual setup 3: Free layout
0x6E	Service	Adding print items	-	Null	Null	Null	
0x6F	Service	Deletion of print items	-	Null	Null	Null	Set item number in "Item Count" of index function.
0x71	Set	Setting of print character string	Up to 750 digits (Unicode) + Terminatio n code	Print contents	1 to 751	char	Set item number in "Item Count" of index function.
	Get	Getting of print character string		Null	Null	Null	
0x72	Set	Setting of line count	1 to 6	Line count	1	short	Set item number in "Column" of index function.
	Get	Getting of line count		Null	Null	Null	
0x73	Set	Setting of line spacing	0 to 4 (When line is 5 or 6, 0 to 2)	Line spacing	1	int	Set item number in "Column" of index function.
	Get	Getting of line spacing		Null	Null	Null	
0x74	Set	Setting of dot matrix	1 to 16	Dot matrix	1	int	Set item number in "Item Count" of index function. Please refer to "5.4 Dot matrix Code (Explicit message communication)" for dot matrix.
	Get	Getting of dot matrix		Null	Null	Null	
0x75	Set	Setting of Inter-character space	0 to 28	Inter-character space	1	char	Set item number in "Item Count" of index function.
	Get	Getting of Inter-character space		Null	Null	Null	
0x76	Set	Setting of character bold	1 to 9	Bold	1	int	
	Get	Getting of character bold		Null	Null	Null	
0x77	Set	Setting of barcode type	0 to 34	Barcode Number	1	int	Set item number in "Item Count" of index function. Please refer to "5.5 Barcode (Explicit message communication)" for barcode.
	Get	Getting of barcode type		Null	Null	Null	
0x78	Set	Setting of readable code	0 to 2	Readable code number*	1	int	Set item number in "Item Count" of index function. *Readable code number 0: No identification code 1: Size 5 x 5 2: Size 5 x 7
	Get	Getting of readable code		Null	Null	Null	

*1: Currently unsupported function

List of Print Format Functions (2/2)

Address		Function Name	Data Range	Input			Notes
Attribute	Access			Data	Data Length (Byte)	Data Type	
0x79	Set	Setting of prefix code	0 to 99	Prefix code	1	int	Only available when EAN prefix is "1: Print format"
	Get	Getting of prefix code		Null	Null	Null	Set item number in "Item Count" of index function.
0x7A	Set	Setting of the X and Y coordinate values of free layout	X: 0 to 31999 Y: 0 to 29	Coordinate X+Y	X:2 Y:1	short	Set item number in "Item Count" of index function. The order is X, Y
	Get	Getting of the X and Y coordinate values of free layout		Null	Null	Null	
0x7B	Set	Setting of adjust inter-character space count	Character count: 1 to 1000 Adjust value: 0 to 99	"Character count" + "Adjust value"	3	int	Set item number in "Character position" of index function.
	Get	Getting of adjust inter-character space count		Character count	2	int	
0x8A	Set	Add character at the end of current string	Up to 750 digits (Unicode)	String to be added Unicode	Max 750	int	Set item number in "Item Count" of index function.
0x8D	Set	Setting of calendar offset	0 to 1	Calendar offset	1	char	0: Offset from yesterday 1: From today
	Get	Getting of calendar offset		Null	Null	Null	
0x8E	Get	Getting of DIN print	0 to 1	DIN print	Null	Null	0: Disable 1: Enable
	Set	Setting of DIN print			1	char	
0x8F	Set	Setting of EAN prefix	0 to 1	EAN prefix	1	char	0: Edit job 1: Print format
	Get	Getting of EAN prefix		Null	Null	Null	
0x90	Set	Setting of barcode printing	0 to 1	Barcode printing	1	char	0: Normal 1: Reverse
	Get	Getting of barcode printing		Null	Null	Null	
0x91	Set	Setting of QR error correction level	0 to 1	QR error correction level	1	char	0: M (15%) 1: Q (25%)
	Get	Getting of QR error correction level		Null	Null	Null	

Example) When Line spacing setting format.

	№			
	1	2	3	4
Designated code:	0x32	0x67	0x6D	0x02

№	Designated code and content	Code type
1	0x32 = Set	Access code
2	0x67 = Print data format function	Class code
3	0x6D = Format setting	Attribute
4	0x02 = Format number (16 Hex)	Data

3.6. Print specification function (Class code = 0x68)

The print specification function includes functions such as character height and particle usage rate settings.

List of Print Specification Functions (1/2)

Address		Function Name	Data Range	Input Data			Notes
Attribute	Access			Data	Data Length (Byte)	Data type	
0x64	Get	Getting of character height	0 to 99	Null	Null	Null	
	Set	Setting of character height		Character height	1	unsigned short	
0x65	Get	Getting of Ink drop use	1 to 16	Null	Null	Null	
	Set	Setting of Ink drop use		Ink drop use	1	unsigned char	
0x66	Get	Getting of High-Speed print	Nozzle diameter (65µm) 0 to 4, 6 (40µm) 0, 2 to 3 (55µm) 0 to 7	Null	Null	Null	High-Speed print mode Nozzle diameter(65µm) 0:HM, 1: NM, 2: QM, 3:SM, 4: D1, 6: D3 Nozzle diameter(40µm) 0:HM, 2:QM, 3:SM Nozzle diameter(55µm) 0:M1, 1: M2, 2: M3, 3:M4, 4: M5, 5: M6, 6:M7, 7: D1
	Set	Setting of High-Speed print		High-Speed print Mode *	1	unsigned char	
0x67	Get	Getting of character width	0 to 3999	Null	Null	Null	
	Set	Setting of character width		character width	2	unsigned char	
0x68	Get	Getting of character orientation	0 to 3	Null	Null	Null	
	Set	Setting of character orientation		Character orientation	1	unsigned int	Character orientation 0: Normal/Forward 1: Normal/Reverse 2: Inverted/Forward 3: Inverted/Reverse
0x69	Get	Getting of print start delay count	0 to 9999	Null	Null	Null	
	Set	Setting of print start delay count		Print start delay count	2	short	
0x6A	Get	Getting of print start delay (Reverse) count	0 to 9999	Null	Null	Null	
	Set	Setting of print start delay (Reverse) count		Print start delay count	2	short	
0x6B	Get	Getting of product speed matching	0 to 3	Null	Null	Null	
	Set	Setting of product speed matching		Product speed matching Mode	1	unsigned char	Product speed matching Mode 0: None 1: Encoder 2: Auto 3: Encoder(enhance)
0x6C	Get	Getting of pulse rate division factor	0 to 999	Null	Null	Null	
	Set	Setting of pulse rate division factor		Pulse rate division Factor	2	unsigned short	
0x6D	Get	Getting of speed compensation	0 to 1	Null	Null	Null	Setting of Print star delay 0: Enable 1: Disable
	Set	Setting of speed compensation		Speed compensation Number	1	unsigned int	
0x6E	Get	Getting of line speed	0 to 9999	Null	Null	Null	
	Set	Setting of line speed		Line Speed	2	unsigned short	

<u>List of Print Specification Functions (2/2)</u>

Address		Function Name	Data Range	Input Data			Notes
Attribute	Access			Data	Data Length (Byte)	Data type	
0x6F	Get	Getting the distance between the print head and the print object	0 to 99	Null	Null	Null	
	Set	Setting the distance between the print head and the print object		distance	1	unsigned int	
0x70	Get	Getting of print target width	0 to 9999	Null	Null	Null	
	Set	Setting of print target width		width	2	unsigned int	
0x71	Get	Getting of actual print width	0 to 9999	Null	Null	Null	
	Set	Setting of actual print width		width	2	unsigned int	
0x72	Get	Getting of repeat printing count	0 to 9999	Null	Null	Null	0：Non 9999： No limitation
	Set	Setting of repeat printing count		printing count	2	unsigned int	
0x73	Get	Getting of repeat printing intervals	0 to 99999	Null	Null	Null	
	Set	Setting of repeat printing intervals		printing intervals	3	unsigned int	
0x74	Get	Getting of target sensor timer	0 to 999	Null	Null	Null	
	Set	Setting of target sensor timer		sensor timer	2	unsigned char	
0x75	Get	Getting of target sensor filter	0 to 1	Null	Null	Null	
	Set	Setting of target sensor filter		sensor filter	1	unsigned char	sensor filter 0: Time setup 1: Until end of print
0x76	Get	Getting of target sensor filter setting value	0 to 9999	Null	Null	Null	
	Set	Setting of target sensor filter setting value		setting value	2	unsigned short	
0x77 *1	Get	Getting of ink drop charge rule	0 to 2	Null	Null	Null	0: Standard (Single scan/interlaced) 1: Mixed single scan and interlaced 2: Dot mixed interlaced
	Set	Setting of ink drop charge rule		Ink drops charge rule	1	unsigned char	
0x78	Get	Getting of print start position adjustment value	0 to 50	Null	Null	Null	
	Set	Setting of print start position adjustment value		Adjust value	2	short	
0x79	Get	Getting of leading character width control	0 to 1	Null	Null	Null	
	Set	Setting of leading character width control		Leading character width control	1	unsigned char	Leading character width control 0: Disable 1: Enable
0x7A	Get	Getting of first row width of leading character width control	0 to 32	Null	Null	Null	
	Set	Setting of first row width of leading character width control		First row width	1	unsigned char	
0x7B	Get	Getting of second row width of leading character width control	0 to 32	Null	Null	Null	
	Set	Setting of second row width of leading character width control		Second row width	1	unsigned char	

*1: Currently unsupported function

Example) When setting character height.

	№			
	1	2	3	4
Designated code：	0x32	0x68	0x64	0x15

№	Designated code and content			Code type
1	0x32	=	Set	Access code
2	0x68	=	Printing specification function	Class code
3	0x64	=	Character height setting	Attribute
4	0x15	=	Character height 21（10 Hex）	Data

3.7. Calendar function (Class code = 0x69)

The calendar function includes necessary functions such as setting of offsets (year) and acquisition of zero suppression (year).

List of Calendar Functions (1/3)

Address		Function Name	Data Range	Input data			Notes
Attribute	Access			Data	Digit	Data Type	
0x65	Get	Getting of shift code condition	1 to 48	block number	Null	Null	Set item number in "Item Count" of index function.
0x66	Get	Getting of first calendar block number	1 to 8	Null	Null	Null	Set item number in "Item Count" of index function.
0x67	Get	Getting of calendar block number in item	1 to 8	Null	Null	Null	Set item number in "Item Count" of index function.
0x68	Get	Getting of offset value (Year)	0 to 99	Null	Null	Null	Set item number in "Calendar block" of index function.
	Set	Setting of offset value (Year)		Offset value (Year)	1	Unsigned short	
0x69	Get	Getting of offset value (Month)	0 to 99	Null	Null	Null	Set item number in "Calendar block" of index function.
	Set	Setting of offset value (Month)		Offset value (Month)	1	unsigned short	
0x6A	Get	Getting of offset value (Day)	0 to 1999	Null	Null	Null	Set item number in "Calendar block" of index function.
	Set	Setting of offset value (Day)		Offset value (Day)	2	unsigned short	
0x6B	Get	Getting of offset value (Hour)	-23 to 99	Null	Null	Null	Set item number in "Calendar block" of index function.
	Set	Setting of offset value (Hour)		Offset value (Hour)	2	short	
0x6C	Get	Getting of offset value (Minute)	-59 to 99	Null	Null	Null	Set item number in "Calendar block" of index function.
	Set	Setting of offset value (Minute)		Offset value (Minute)	1	short	
0x6D	Get	Getting of Zero-suppression value (Year)	0 to 2	Null	Null	Null	Set item number in "Calendar block" of index function. Mode No. 0: Zero-suppression disabled 1: Enable (space) 2: Enable (character justification)
	Set	Setting of Zero-suppression value (Year)		Mode No.	1	unsigned char	
0x6E	Get	Getting of Zero-suppression value (Month)	0 to 2	Null	Null	Null	Set item number in "Calendar block" of index function. Mode No. 0: Zero-suppression disabled 1: Enable (space) 2: Enable (character justification)
	Set	Setting of Zero-suppression value (Month)		Mode No.	1	unsigned char	
0x6F	Get	Getting of Zero-suppression value (Day)	0 to 2	Null	Null	Null	Set item number in "Calendar block" of index function. Mode No. 0: Zero-suppression disabled 1: Enable (space) 2: Enable (character justification)
	Set	Setting of Zero-suppression value (Day)		Mode No.	1	unsigned char	

List of Calendar Functions(2/3)

<table>
<tr><th colspan="2">Address</th><th rowspan="2">Function Name</th><th rowspan="2">Data Range</th><th colspan="3">Input data</th><th rowspan="2">Notes</th></tr>
<tr><th>Attribute</th><th>Access</th><th>Data</th><th>Digit</th><th>Data Type</th></tr>
<tr><td rowspan="2">0x70</td><td>Get</td><td>Getting of Zero-suppression value (Hour)</td><td rowspan="2">0 to 2</td><td>Null</td><td>Null</td><td>Null</td><td rowspan="2">Set item number in "Calendar block" of index function.
Mode No.
0: Zero-suppression disabled
1: Enable (space)
2: Enable (character justification)</td></tr>
<tr><td>Set</td><td>Setting of Zero-suppression value (Hour)</td><td>Mode No.</td><td>2</td><td>unsigned char</td></tr>
<tr><td rowspan="2">0x71</td><td>Get</td><td>Getting of Zero-suppression value (Minute)</td><td rowspan="2">0 to 2</td><td>Null</td><td>Null</td><td>Null</td><td rowspan="2">Set item number in "Calendar block" of index function.
Mode No.
0: Zero-suppression disabled
1: Enable (space)
2: Enable (character justification)</td></tr>
<tr><td>Set</td><td>Setting of Zero-suppression value (Minute)</td><td>Mode No.</td><td>1</td><td>short</td></tr>
<tr><td rowspan="2">0x72</td><td>Get</td><td>Getting of Zero-suppression value (Weeks)</td><td rowspan="2">0 to 2</td><td>Null</td><td>Null</td><td>Null</td><td rowspan="2">Set item number in "Calendar block" of index function.
Mode No.
0: Zero-suppression disabled
1: Enable (space)
2: Enable (character justification)</td></tr>
<tr><td>Set</td><td>Setting of Zero-suppression value (Weeks)</td><td>Mode No.</td><td>1</td><td>short</td></tr>
<tr><td rowspan="2">0x73</td><td>Get</td><td>Getting of Zero-suppression value (Day of Week)</td><td rowspan="2">0 to 2</td><td>Null</td><td>Null</td><td>Null</td><td rowspan="2">Set item number in "Calendar block" of index function.
Mode No.
0: Zero-suppression disabled
1: Enable (space)
2: Enable (character justification)</td></tr>
<tr><td>Set</td><td>Setting of Zero-suppression value (Day of Week)</td><td>Mode No.</td><td>1</td><td>short</td></tr>
<tr><td rowspan="2">0x74</td><td>Get</td><td>Getting of Substitution rules (Year)</td><td rowspan="2">0 to 1</td><td>Null</td><td>Null</td><td>Null</td><td rowspan="2">Set item number in "Calendar block" of index function.
Mode No.
0: Disable
1: Enable</td></tr>
<tr><td>Set</td><td>Setting of Substitution rules (Year)</td><td>Mode No.</td><td>1</td><td>unsigned char</td></tr>
<tr><td rowspan="2">0x75</td><td>Get</td><td>Getting of Substitution rules (Month)</td><td rowspan="2">0 to 1</td><td>Null</td><td>Null</td><td>Null</td><td rowspan="2">Set item number in “Item Count” and "Calendar block" of index function.
Mode No.
0 : Disable
1: Enable</td></tr>
<tr><td>Set</td><td>Setting of Substitution rules (Month)</td><td>Mode No.</td><td>1</td><td>unsigned char</td></tr>
<tr><td rowspan="2">0x76</td><td>Get</td><td>Getting of Substitution rules (Day)</td><td rowspan="2">0 to 1</td><td>Null</td><td>Null</td><td>Null</td><td rowspan="2">Set item number in "Calendar block" of index function.
Mode No.
0: Disable, 1: Enable</td></tr>
<tr><td>Set</td><td>Setting of Substitution rules (Day)</td><td>Mode No.</td><td>1</td><td>unsigned char</td></tr>
<tr><td rowspan="2">0x77</td><td>Get</td><td>Getting of Substitution rules (Hour)</td><td rowspan="2">0 to 1</td><td>Null</td><td>Null</td><td>Null</td><td rowspan="2">Set item number in "Calendar block" of index function.
Mode No.
0: Disable
1: Enable</td></tr>
<tr><td>Set</td><td>Setting of Substitution rules (Hour)</td><td>Mode No.</td><td>1</td><td>unsigned char</td></tr>
</table>

<u>List of Calendar Functions (3/3)</u>

Address		Function Name	Data Range	Input data			Notes
Attribute	Access			Data	Digit	Data Type	
0x78	Get	Getting of Substitution rules (Minute)	0 to 1	Null	Null	Null	Set item number in "Calendar block" of index function. Mode No. 0: Disable 1: Enable
	Set	Setting of Substitution rules (Minute)		Mode No.	1	unsigned char	
0x79	Get	Getting of Substitution rules (Weeks)	0 to 1	Null	Null	Null	Set item number in "Calendar block" of index function. Mode No. 0: Disable 1: Enable
	Set	Setting of Substitution rules (Weeks)		Mode No.	1	unsigned short	
0x7A	Get	Getting of Substitution rules (Day of week)	0 to 1	Null	Null	Null	Set item number in "Calendar block" of index function. Mode No. 0: Disable 1: Enable
	Set	Setting of Substitution rules (Day of week)		Mode No.	1	unsigned short	
0x7B	Get	Getting of the time count start value	Max 3 digits	Null	Null	Null	Numeral, alphabetic, symbols, User pattern (Fixed size)
	Set	Setting of the time count start value		start value	1 to 21	unsigned char	
0x7C	Get	Getting of the time count end value	Max 3 digits	Null	Null	Null	Numeral, alphabetic, symbols, User pattern (Fixed size)
	Set	Setting of the time count end value		end value	1 to 21	unsigned char	
0x7D	Get	Getting of reset value of the time count.	Max 3 digits	Null	Null	Null	Numeral, alphabetic, symbols, User pattern (Fixed size)
	Set	Setting of reset value of the time count.		reset value	1 to 21	unsigned char	
0x7E	Get	Getting of reset time value	0 to 23	Null	Null	Null	
	Set	Setting of reset time value		Reset Time	1	unsigned char	
0x7F	Get	Getting of the update interval value of the time count	1 to 6	Null	Null	Null	1:5min, 2: 6min 3:10min, 4:15min 5:20min, 6:30min
	Set	Setting of the update interval value of the time count		renewal period value	1	unsigned char	
0x80	Get	Getting of shift start time (Hour) value	1 to 48 (start time: 0 to 23)	block number	Null	Null	
	Set	Setting of shift start time (Hour) value		block number + string value	1	unsigned char	
0x81	Get	Getting of shift start time (Minute) value	1 to 48 (start time: 0 to 59)	block number	Null	Null	
	Set	Setting of shift start time (Minute) value		block number + string value	1	unsigned char	
0x82	Get	Getting of shift end time (Hour) value	1 to 48	block number	Null	Null	
0x83	Get	Getting of shift end time (Minute) value	1 to 48	block number	Null	Null	
0x84	Get	Getting of shift string value	String:Max 10 digits block number: 1 to 48	block number	Null	Null	
	Set	Setting of shift string value		block number + string value	block number:1 String: 1 to 70	unsigned char	

Example) When getting leading calendar block number

№		
1	2	3

Designated code: 0x33 0x69 0x66

№	Designated code and content	Code type
1	0x33 = Get	Access code
2	0x69 = Calendar function	Class code
3	0x66 = Get first calendar block number	Attribute

3.8. User pattern function (Class code = 0x6B)

User pattern function sets and acquires user pattern data.

List of User Pattern Functions

Address		Function Name	Data Range	Input Data			Notes
Attribute	Access			Data	Data Length (Byte)	Data Type	
0x64	Get	Getting of user pattern (Fixed)	Dot Matrix: 1 to 19 Position No.: 0 to 199	Dot Matrix + Position No.	2	unsigned short + unsigned char	Refer to Communication User's Manual (Serial) "1.3.7 User Pattern Character Transmission".
	Set	Setting of user pattern (Fixed)		Dot Matrix + Position No. + Pattern	Dot Matrix:1 to 19 Position No.:0 to 199 Pattern: Max 998 bytes		
0x65	Get	Getting of user pattern (Free)	Vertical size: 1 to 32 Horizontal size: 1 to 320 Position No.: 0 to 49	Position No	0 to 49	unsigned short + unsigned char	Refer to Communication User's Manual (Serial) "1.3.7 User Pattern Character Transmission".
	Set	Setting of user pattern (Free)		Vert. size + Hori. size + Position No. + Pattern	Vertical size: 1 Horizontal size: 2 Position No.: 1 Pattern: Max 996 bytes		

Example) When getting user pattern (Fixed) (Dot Matrix 4x5, pattern number 0)

	№				
	1	2	3	4	5
Designated code:	0x33	0x6B	0x64	0x01	0x00

№	Designated code and content	Code type
1	0x33 = Get	Access code
2	0x6B = User pattern function	Class code
3	0x64 = Get user pattern (fixed) content	Attribute
4	0x01 = Dot Matrix 4x5	Data（Character size code）
5	0x00 = register pattern number	Data

3.9. Substitution Rules function (Class code = 0x6C)

The calendar function includes functions such as obtaining the substitution rule number and the substitution rule name.

<u>List of Substitution Rules Functions(1/2)</u>

Address		Function Name	Data Range	Input data			Notes
Attribute	Access			Data	Data Length (Byte)	Data Type	
0x64 *1	Set	Setting of substitution rules number	1 to 99	substitution rules number	1	unsigned char	Set item number in "Substitution rules setting" of index function.
	Get	Getting of substitution rules number		Null	Null	Null	
0x65 *1	Set	Setting of substitution rules name	Max 12	substitution rules number	1 to 48	unsigned char	Set item number in "Substitution rules setting" of index function.
	Get	Getting of substitution rules name		Null	Null	Null	
0x66 *1	Set	Setting of the start year	2000 to 2099	start year	2	unsigned char	Set item number in "Substitution rules setting" of index function.
	Get	Getting of the start year		Null	Null	Null	
0x67 *1	Set	Setting the character string of the substitution rules value (Year)	Number: 0 to 23 Character: Max 2	Number+ Character	Number: 1 Character: 1 to 14	Number : unsigned short Character : unsigned char	Set item number in "Substitution rules setting" of index function.
	Get	Getting the character string of the substitution rules value (Year)		Null	Null	Null	
0x68 *1	Set	Setting the character string of the substitution rules value (Month)	Number: 1 to 12 Character: Max 3	Number+ Character	Number: 1 Character: 1 to 21	Number : unsigned short Character : unsigned char	Set item number in "Substitution rules setting" of index function.
	Get	Getting the character string of the substitution rules value (Month)		Null	Null	Null	
0x69 *1	Set	Setting the character string of the substitution rules value (Day)	Number: 1 to 31 Character: Max 3	Number+ Character	Number: 1 Character: 1 to 21	Number : unsigned short Character : unsigned char	Set item number in "Substitution rules setting" of index function.
	Get	Getting the character string of the substitution rules value (Day)		Null	Null	Null	
0x6A *1	Set	Setting the character string of the substitution rules value (Hour)	Number: 0 to 23 Character: Max 2	Number+ Character	Number: 1 Character: 1 to 14	Number : unsigned short Character : unsigned char	Set item number in "Substitution rules setting" of index function.
	Get	Getting the character string of the substitution rules value (Hour)		Null	Null	Null	

List of Substitution Rules Functions(2/2)

Address		Function Name	Data Range	Input data			Notes
Attribute	Access			Data	Data Length (Byte)	Data Type	
0x6B *1	Set	Setting the character string of the substitution rules value (Minute)	Number: 0 to 59 Character: Max 2	Number+ Character	Number: 1 Character: 1 to 14	Number : unsigned short Character : unsigned char	Set item number in "Substitution rules setting" of index function.
	Get	Setting the character string of the substitution rules value (Minute)		Null	Null	Null	
0x6C *1	Set	Setting the character string of the substitution rules value (Week Number)	Number: 1 to 53 Character: Max 3	Number+ Character	Number: 1 Character: 1 to 21	Number : unsigned short Character : unsigned char	Set item number in "Substitution rules setting" of index function.
	Get	Getting the character string of the substitution rules value (Week Number)		Null	Null	Null	
0x6D *1	Set	Setting the character string of the substitution rules value (The day of the week)	Number: 1 to 7 Character: Max 3	Number+ Character	Number: 1 Character: 1 to 21	Number : unsigned short Character : unsigned char	Set item number in "Substitution rules setting" of index function.
	Get	Getting the character string of the substitution rules value (The day of the week)		Null	Null	Null	

*1: Currently unsupported function

Example) When setting substitution rules value (Year)

	№						
	1	2	3	4	5	6	7
Designated code:	0x32	0x6C	0x67	0x00	0x41	0x42	0x00

№	Designated code and content			Code type
1	0x32	=	Set	Access code
2	0x6C	=	Substitution rules function	Class code
3	0x67	=	Substitution rules value (Year) setting	Attribute
4	0x00	=	Year number	Data (Number)
5	0x41	=	Unicode of character “A”	Data (Character)
6	0x42	=	Unicode of character “B”	Data (Character)
7	0x00	=	Termination code	Termination code

3.10. Environment setting function (Class code = 0x71)

The environment setting function includes functions such as acquiring current time setting and the setting value of the circulation control.

List of Environment Setting Functions

Address		Function Name	Data Range	Input Data			Notes
Attribute	Access			Data	Data Length (Byte)	Data Type	
0x65	Get	Getting of current time	Year: (2000 to 2037) Month:(1 to 12) Day: (1 to 31) Hour: (0 to 23) Minute:(0 to 59) S e c: (0 to 59)	-	-	-	
	Set	Setting of current time		-	7	struct	
0x66	Get	Getting of calendar date and time		-	-	-	
	Set	Setting of calendar date and time		-	7	struct	
0x67	Get	Getting of calendar date and time availability (Getting of current time availability.)	1 to 2	-	-	-	Setting value 1: Same as current time 2.clock stop
	Set	Setting of calendar date and time availability (Getting of current time availability.)		Setting Value	1	Unsigned char	
0x68	Get	Getting of clock system	1 to 2	-	-	-	Setting value 1:24-hour clock 2.12-hour clock
	Set	Setting of clock system		Setting Value	11	Unsigned char	
0x69	Get	Getting of user environment information	-	Null	Null	Null	
0x6A	Get	Getting of circulation control setting value	-	Null	Null	Null	
0x6B	Service	Setting of usage time of the circulation control	Filter number : 1 to 5 Usage time : 0 to 65099	Filter number +Usage time	2	Unsigned char	Filter Number 1 : Ink filter 2 : Recovery filter 3 : Circulation filter 4 : Makeup filter 5 : Air filter

Example) When getting current time

№		
1	2	3
0x33	0x71	0x65

Designated code : 0x33 0x71 0x65

№	Designated code and content			Code type
1	0x33	=	Get	Access code
2	0x71	=	Environment setting function	Class code
3	0x65	=	Getting of current time	Attribute

3.11. Unit information function (Class code = 0x73)

The unit information acquisition function includes functions such as model name and ink name acquisition.

List of Unit Information Functions

Address		Function Name	Data Range	Input Data		
Attribute	Access			Data	Data Length (Byte)	Data Type
0x64	Get	Getting of unit information	Up to 32 bytes	-	64	unsigned char
0x6B	Get	Getting of model name information	Up to 32 bytes	Model	32	unsigned char
0x6C	Get	Getting of serial number	0 to 99999999	serial number	4	unsigned char
0x6D	Get	Getting of ink name	Up to 28 digits	Ink + makeup name	28	unsigned char
0x6E	Get	Getting of input mode information	1 to 3, 5	input mode	2	unsigned char
0x6F	Get	Getting of maximum character count	240 to 1000	maximum character count	2	unsigned short
0x70	Get	Getting of maximum registered job count	300 to 2000	maximum registered job count	2	unsigned short
0x71	Get	Getting of barcode information	0 to 1	Presence or absence 2D barcode	2	unsigned short
0x72	Get	Getting of usable character size information	0 to 7	usable character size	2	unsigned char
0x73	Get	Getting of the maximum calendar and count number	3, 8	maximum calendar and count number	2	unsigned char
0x74	Get	Getting of maximum substitution rule count	48, 99	maximum substitution rule count	2	unsigned char
0x75	Get	Getting of shift code and time count information	0 to 1	Presence or absence shift code and time count	2	unsigned char
0x76	Get	Getting of chimney and DIN print information	0 to 1	Presence or absence chimney and DIN print	2	unsigned char
0x77	Get	Getting of maximum number of input line count	2 to 6	maximum number of input line count	2	unsigned char
0x78	Get	Getting of basic software version information	-	-	-	unsigned char
0x79	Get	Getting of controller software version information	-	-	-	unsigned char
0x7A *1	Get	Getting of engine M software version information	-	-	-	unsigned char
0x7B *1	Get	Getting of engine S software version information	-	-	-	unsigned char
0x7C *1	Get	Getting of first language version information	-	-	-	unsigned char
0x7D *1	Get	Getting of second language version information	-	-	-	unsigned char
0x7E *1	Get	Getting of software option version information	-	-	-	unsigned char

*1: Only node view, this is a non-supported node on this model.

Example) When getting serial number of IJ Printer

№		
1	2	3
0x33	0x73	0x6C

Designated code: 0x33 0x73 0x6C

№	Designated code and content			Code type
1	0x33	=	Get	Access code
2	0x73	=	Unit information function	Class code
3	0x6C	=	Get serial number	Attribute

3.12. Operation management function (Class code = 0x74)

The operation management function includes functions such as operation time and alarm time acquisition.

List of Operation Management Functions

Address		Function Name	Data Range	Input Data		
Attribute	Access			Data	Data Length (Byte)	Data Type
0x64	Get	Getting of operating management information	-	-	-	-
0x65	Get	Getting of ink operating time	0 to 9999	operating time	2	unsigned short
	Set	Setting Getting of ink operating time		Null	Null	Null
0x66	Get	Getting of alarm time	0 to 9999	alarm time	2	unsigned short
	Set	Setting of alarm time		Null	Null	Null
0x67	Get	Getting of print count	0 to 999999999	print count	4	unsigned short
	Set	Setting of print count		Null	Null	Null
0x68	Get	Getting of communication environment information	-	-	-	unsigned short
0x69	Get	Getting of cumulative operation time	-	-	-	unsigned short
0x6A	Get	Getting of ink and makeup name	-	-	-	unsigned short
0x6B	Get	Getting of ink viscosity	-	-	-	unsigned short
0x6C	Get	Getting of ink pressure	-	-	-	unsigned short
0x6D	Get	Getting of ambient temperature	-	-	-	unsigned short
0x6E	Get	Getting of deflection voltage	-	-	-	unsigned short
0x6F	Get	Getting of "Excitation V-ref." setup value	-	-	-	unsigned short
0x70	Get	Getting of excitation frequency	-	-	-	unsigned short
0x71	Get	Getting of ink level	0x0E (Empty) 0x01 ~ 0x06 0x0F (Full)	ink level	1	unsigned char
0x72	Get	Getting of makeup level		makeup level	1	unsigned char

Example) When getting ink operation time of IJ Printer

	№		
	1	2	3
Designated code:	0x33	0x74	0x65

№	Designated code and content			Code type
1	0x33	=	Get	Access code
2	0x74	=	Operation management function	Class code
3	0x65	=	Get ink operation time	Attribute

3.13. IJ Printer operation function (Class code = 0x75)

The IJ Printer operation function includes functions such as remote operation and deflection voltage control.

List of IJ Printer Operation Functions

Address		Function Name	Data Range	Input data			Notes
Attribute	Access			Data	Data Length (Byte)	Data Type	
0x64	Get	Getting of remote operation information	-	Null	Null	Null	
0x66	Get	Getting of fault and warning history	1 to 90 1 to 10	Start No + count	2	const int	
0x67	Get	Getting of operating condition	1 to 11	Null	Null	Null	1: Stop 2: Standby 3: Ready 4: Starting 5: Stopping 6: Warming up 7: Cover open 8: Service 9: Error 10: Ink warming up 11: Sleep
0x68	Get	Getting of warning condition	0 to 1	Null	Null	Null	0: No warning 1: On warning condition
0x6A	Get	Getting of date and time information on occurrence of an fault or warning.	-	Error No.	1	const unsigned int	
0x6B	Get	Getting of error code	-	Null	Null	Null	
0x6C	Service	Start Remote Operation	-	Null	Null	Null	
0x6D	Service	Stop Remote Operation	-	Null	Null	Null	
0x6E	Service	Deflection voltage control	-	Null	Null	Null	
0x6F	Set	Setting of online/offline state	0 to 1	state	1	int	0: Off-line 1: On-line
	Get	Getting of online/offline state		Null	Null	Null	
0x70	Service	Remote Auto Circulation	-	Null	Null	Null	

Example) When controlling deflection voltage

	№		
	1	2	3
Designated code:	0x34	0x75	0x6E

№	Designated code and content			Code type
1	0x34	=	Service	Access code
2	0x75	=	IJ Printer operation function	Class code
3	0x6E	=	Deflection voltage control	Attribute

3.14. Count function (Class code = 0x79)

The count function includes functions such as count condition range specification and update unit specification.

List of Count Functions (1/2)

Address		Function Name	Data Range	Input data			Notes
Attribute	Access			Data	Data Length (Byte)	Data Type	
0x66	Get	Getting of the number of count blocks in the item	1 to 8	Null	Null	Null	Set item number in "Item Count" of index function.
0x67	Get	Getting of the initial value	String 20 digits	Null	Null	Null	Set item number in "Count block" of index function.
	Set	Setting of the initial value		Initial value	1 to 140	unsigned char	
0x68	Get	Getting of the range 1 value	String 20 digits	Null	Null	Null	Set item number in "Count block" of index function.
	Set	Setting of the range 1 value		Setting value	1 to 140	unsigned char	
0x69	Get	Getting of the range 2 value	String 20 digits	Null	Null	Null	Set item number in "Count block" of index function.
	Set	Setting of the range 2 value		Setting value	1 to 140	unsigned char	
0x6A	Get	Getting of the update value (In progress)	0 to 999998	Null	Null	Null	Set item number in "Count block" of index function.
	Set	Setting of the update value (In progress)		update value	1 to 6	unsigned char	
0x6B	Get	Getting of the update value (Unit)	1 to 999999	Null	Null	Null	Set item number in "Count block" of index function.
	Set	Setting of the update value (Unit)		update value	1 to 6	unsigned char	
0x6C	Get	Getting of increment value	1 to 99	Null	Null	Null	Set item number in "Count block" of index function.
	Set	Setting of increment value		Increment value	1	unsigned char	
0x6D	Get	Getting of direction value	1 to 2	Null	Null	Null	Set item number in "Count block" of index function. direction value 1 : Up 2 : Down
	Set	Setting of direction value		direction value	1	1	
0x6E	Get	Getting of the value of jump from	String 20 digits	Null	Null	Null	Set item number in "Count block" of index function.
	Set	Setting of the value of jump from		Setting value	1 to 140	unsigned char	
0x6F	Get	Getting of the value of jump to	String 20 digits	Null	Null	Null	Set item number in "Count block" of index function.
	Set	Setting of the value of jump to		Setting value	1 to 140	unsigned char	
0x70	Get	Getting of reset value	String 20 digits	Null	Null	Null	Set item number in "Count block" of index function.
	Set	Setting of reset value		Setting value	1 to 140	unsigned char	
0x71 *1	Get	Getting of the type of reset signal (Option)	0 to 2	Null	Null	Null	Set item number in "Count block" of index function. Signal value 0 : None 1 : Signal 1 2 : Signal 2
	Set	Setting of the type of reset signal (Option)		type of reset signal	1	unsigned char	

*1: Currently unsupported function

List of Count Functions (2/2)

Address		Function Name	Data Range	Input data			Notes
Attribute	Access			Data	Data Length (Byte)	Data Type	
0x72 *1	Get	Getting of availability of external count (Option)	0 to 1	Null	Null	Null	Set item number in "Count block" of index function. external count setting 0: Disable 1: Enable
	Set	Setting of availability of external count (Option)		external count setting	1	unsigned char	
0x73	Get	Getting of availability of Zero-suppression	0 to 1	Null	Null	Null	Set item number in "Count block" of index function. Zero-suppression 0: Disable 1: Enable
	Set	Setting of availability of Zero-suppression		Zero-suppression setting	1	unsigned char	
0x74	Get	Getting of the count multiplier	0 to 9999999999	Null	Null	Null	Set item number in "Count block" of index function.
	Set	Setting of the count multiplier		count multiplier	10	unsigned char	
0x75	Get	Getting of count skip	String 5 digits	Null	Null	Null	Set item number in "Count block" of index function.
	Set	Setting of count skip		Count Skip Characters	1 to 7	unsigned char	

*1: Currently unsupported function

Example) When setting initial value to “AAA”

	№						
	1	2	3	4	5	6	7
Designated code:	0x32	0x79	0x67	0x41	0x41	0x41	0x00

№	Designated code and content	Code type
1	0x32 = Set	Access code
2	0x79 = Count function	Class code
3	0x67 = Getting of the Initial value	Attribute
4	0x41 = Character（Unicode） "A" 0041	Data(Character）
5	0x41 = Character（Unicode） "A" 0041	Data(Character）
6	0x41 = Character（Unicode） "A" 0041	Data(Character）
7	0x00 = Termination code	Termination code

4. Implicit message communication specification (Cyclic communication)

Data communication is performed at the communication cycle set in PRI (Requested Packet Interval) using cyclic communication specified by EtherNet/IP. As IJ Printer supports the connection type "Exclusive Owner", by connecting to the external device, transmission from the IJ Printer (target) to the external device (originator) (T->O communication) and transmission from the external device to the IJ Printer (O->T communication) is possible. Please set RPI to 200ms or more.

4.1. T->O communication (Transmission from the IJ Printer to the external device)

The IJ Printer setting value is periodically sent to the external device. The data size is 400 bytes. Refer to the table "T ->O communication data map" for the data contents. The endian used in cyclic communication can be changed using O->T communication (the initial value is little endian).

T->O Communication Data Map (1/2)

No.	Function Name	Content	Data Type	Size (byte)	Value	Data Update
1	TO_Online_Status	Connection status	WORD	2	0=Offline 1=Online	Target
2	TO_CCPU_Status	IJ Printer status	WORD	2	1bit: Stop 2bit: Standby 3bit: Ready 4bit: Starting 5bit: Stopping 6bit: Drop adjust 7bit: Cover open 8bit: Service 9bit: Fault 10bit: Ink heating 11bit: Sleep	Target
3	TO_Warning_Flag	Warning state	WORD	2	0=No warning 1=Warning	Target
4	TO_EIP_OT_CanSend_Flag	EtherNet/IP transmission possible flag (for O->T)	WORD	2	0x0000=Not able to send 0xFFFF=Able to send	Non-target
5	TO_EIP_OT_ChangeCompleted_Flag	EtherNet/IP change flag (for O->T)	WORD	2	0x0000=Changing 0xFFFF=Changed	Non-target
6	TO_DataUpdate	T->O communication data update ON/OFF	WORD	2	0x0000=Update data 0xFFFF=Not update data	Non-target
7	TO_Endianness_Flag	Endian state	WORD	2	0x0000=Little endian 0xFFFF=Big endian	Non-target
8	TO_DriveTime	Driving time	WORD	2	0 to 9999	Target
9	TO_PrintString	Print content	WORD	200	Printed content character encoding：UTF8	Target
10	TO_PrintCount	Print count	DWORD	4	0 to 999999999	Target
11	TO_padding0	(Registration)	WORD	2		Target
12	TO_padding1	(Registration)	WORD	100		Target
13	TO_ErrInfo1	Error information Latest 1st	WORD	2	Error code of the occurring error	Target
14	TO_ErrInfo2	Error information Latest 2nd	WORD	2	Error code of the occurring error	Target
15	TO_ErrInfo3	Error information Latest 3rd	WORD	2	Error code of the occurring error	Target
16	TO_ErrInfo4	Error information Latest 4th	WORD	2	Error code of the occurring error	Target
17	TO_ErrInfo5	Error information Latest 5th	WORD	2	Error code of the occurring error	Target

T->O Communication Data Map(2/2)

No.	Function Name	Content	Data Type	Size (byte)	Value	Data Update
18	TO_WarInfo1	Warning information Latest 1st	WORD	2	Warning code of the occurring warning	Target
19	TO_WarInfo2	Warning information Latest 2nd	WORD	2	Warning code of the occurring warning	Target
20	TO_WarInfo3	Warning information Latest 3rd	WORD	2	Warning code of the occurring warning	Target
21	TO_WarInfo4	Warning information Latest 4th	WORD	2	Warning code of the occurring warning	Target
22	TO_WarInfo5	Warning information Latest 5th	WORD	2	Warning code of the occurring warning	Target
23	TO_padding2	(Registration)	WORD	2		Target
24	TO_NickNameNo	Nickname number	DWORD	4	Nickname number of print data being displayed 0 to 2000	Target
25	TO_CurrentTimeYear	CurrentTimeYear	WORD	2	2000 to 2037	Target
26	TO_CurrentTimeMonth	CurrentTimeMonth	WORD	2	1 to 12	Target
27	TO_CurrentTimeDay	CurrentTimeDay	WORD	2	1 to 31	Target
28	TO_CurrentTimeHour	CurrentTimeHour	WORD	2	0 to 23	Target
29	TO_CurrentTimeMinute	CurrentTimeMinute	WORD	2	0 to 59	Target
30	TO_CurrentTimeSecond	CurrentTimeSecond	WORD	2	0 to 59	Target
31	TO_padding3	(Registration)	WORD	40		Target

■Note

When transferring data of 2 bytes or more, it is necessary to specify the order (endian) of the data when viewed in bytes. The method of arranging data from the last byte (in order of low-order byte, high-order byte) is called little endian, and the method of arranging data from the first byte (in order of high-order byte, low-order byte) is called big endian.

* In case of setting "03h"(16 Hex)

● In case Little endian

7bit	6bit	5bit	4bit	3bit	2bit	1bit	0bit	7bit	6bit	5bit	4bit	3bit	2bit	1bit	0bit
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
high-order byte								low-order byte							

● In case Big endian

7bit	6bit	5bit	4bit	3bit	2bit	1bit	0bit	7bit	6bit	5bit	4bit	3bit	2bit	1bit	0bit
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
high-order byte								low-order byte							

4.2. O->T communication (Transmission from the external device to the IJ Printer)

According to the procedure determined from the external device, the following functions can be used to transmit data.

(1) Calling the print data
Specify the job number and then call the registered print data.

(2) Edit the print content
Specify the item number and then edit the print content.

(3) Switching the T->O communication print contents
Change the number of print items that will be sent to an external device via the T->O communication.

(4) Update setting of the T->O communication data
Switch update/stop state of the data to be transmitted via T->O communication. The data that can be switched is the data which “Data Update” in “T->O Communication Data Map” is “Target”.

■Note

When using cyclic communication and message communication at the same time, please use this function to stop cyclic communication data update and use message communication.
Item No. 9 on following table “O->T Communication Data Map” show how to select ON or OFF of data update.

For the data map to be sent to IJ Printer, please refer to the following table “O->T Communication Data Map”. Besides, for the transmission procedure of each function, please refer to “4.2.1 O->T communication transmission procedure”.

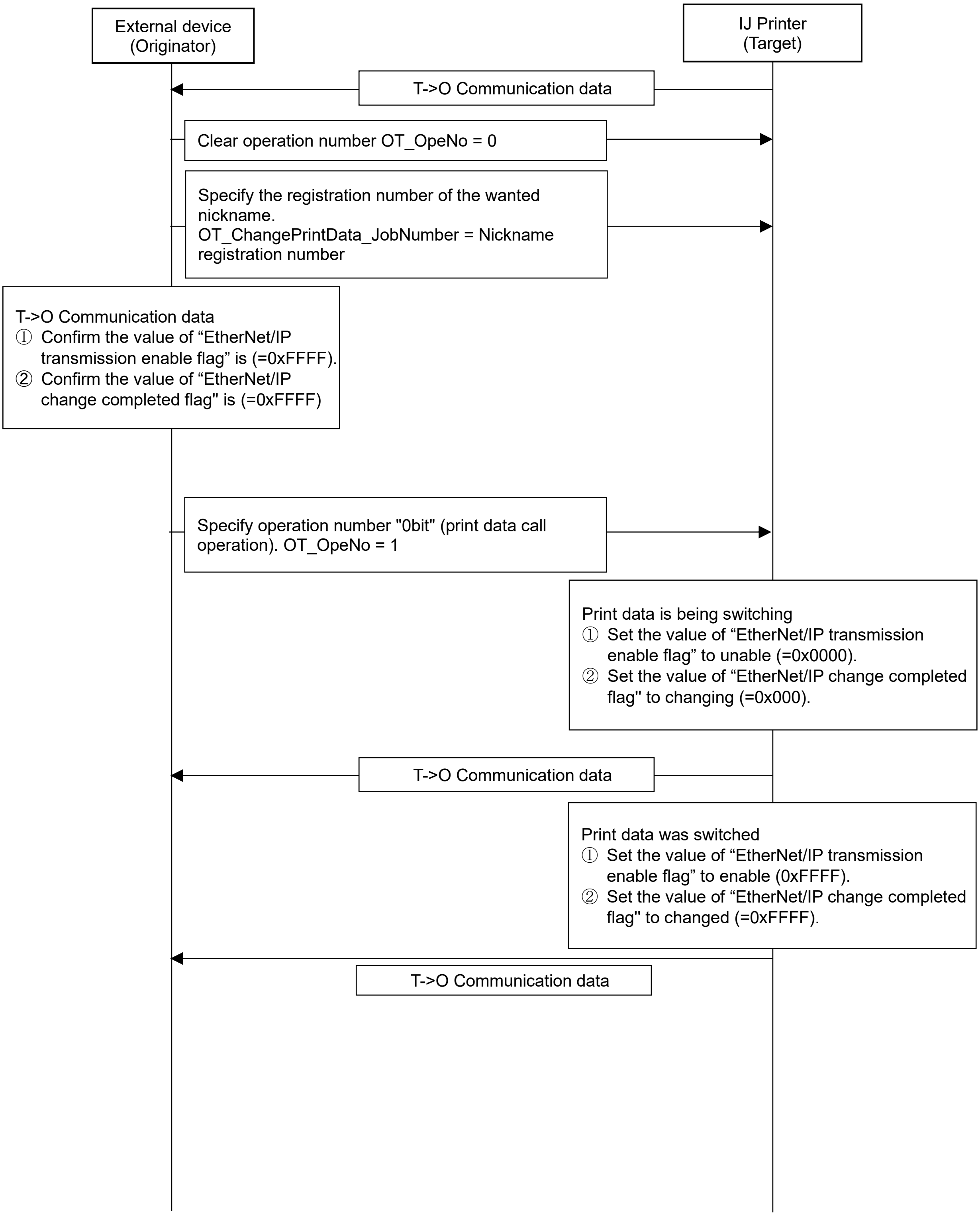
Processes (1) to (4) are executed by starting the target bit in the data map “operation number (OT_OpeNo)”. Multiple operations cannot be specified at the same time.
By entering 0x0000 or 0xFFFF in the data map “Endian switching setting value (OT_Set_Endianness)”, the endian that cyclic communication handles can be switched. Operation number for endian switching can be changed simultaneously with operations (1) to (4). The initial value of endian is little endian.
O->T communication data is cleared by switching the LAN function item on the communication environment setting screen or turning off the IJ Printer power.

<u>O->T Communication Data Map</u>

No.	Function Name	Content	Data Type	Size (byte)	Value
1	OT_OpeNo	Operation Number	WORD	2	0bit (=1): calling print data 1bit (=2): editing print data 2bit (=4): T->O print content switching 3bit (=8): T->O communication data update setting 4bit (=16): change current time
2	OT_Set_Endianness	endian switching	WORD	2	0x0000 = Little endian 0xFFFF = Big endian
3	OT_padding0	(Registration)	WORD	2	
4	OT_padding1	(Registration)	WORD	2	
5	OT_ChangePrintData_JobNumber	[OT_OpeNo=1] JobNumber	DWORD	4	1 to 2000
6	OT_InputPrintData_IndexItemNo	[OT_OpeNo=2] IndexItemNo	DWORD	4	1 to 100
7	OT_InputData	[OT_OpeNo=2] InputData	WORD	200	Character encoding: UTF8 Maximum number of characters: 200 (1 byte characters only: 200 characters. 2 bytes characters only: 100 characters.)
8	OT_TO_PrintString_IndexItemNo	[OT_OpeNo=4] IndexItemNo	DWORD	4	1 to 100
9	OT_TO_DataUpdate	[OT_OpeNo=8] ON/OFF setting value	WORD	2	0x0000 = Update data 0xFFFF= Not update data
10	OT_padding2	(Registration)	WORD	2	
11	OT_padding3	(Registration)	WORD	2	
12	OT_CurrentTimeYear	[OT_OpeNo=16] CurrentTimeYear	WORD	2	2000 to 2037
13	OT_CurrentTimeMonth	[OT_OpeNo=16] CurrentTimeMonth	WORD	2	1 to 12
14	OT_CurrentTimeDay	[OT_OpeNo=16] CurrentTimeDay	WORD	2	1 to 31
15	OT_CurrentTimeHour	[OT_OpeNo=16] CurrentTimeHour	WORD	2	0 to 23
16	OT_CurrentTimeMinute	[OT_OpeNo=16] CurrentTimeMinute	WORD	2	0 to 59
17	OT_CurrentTimeSecond	[OT_OpeNo=16] CurrentTimeSecond	WORD	2	0 to 59
18	OT_padding4	(Registration)	WORD	2	
19	OT_padding5	(Registration)	WORD	40	

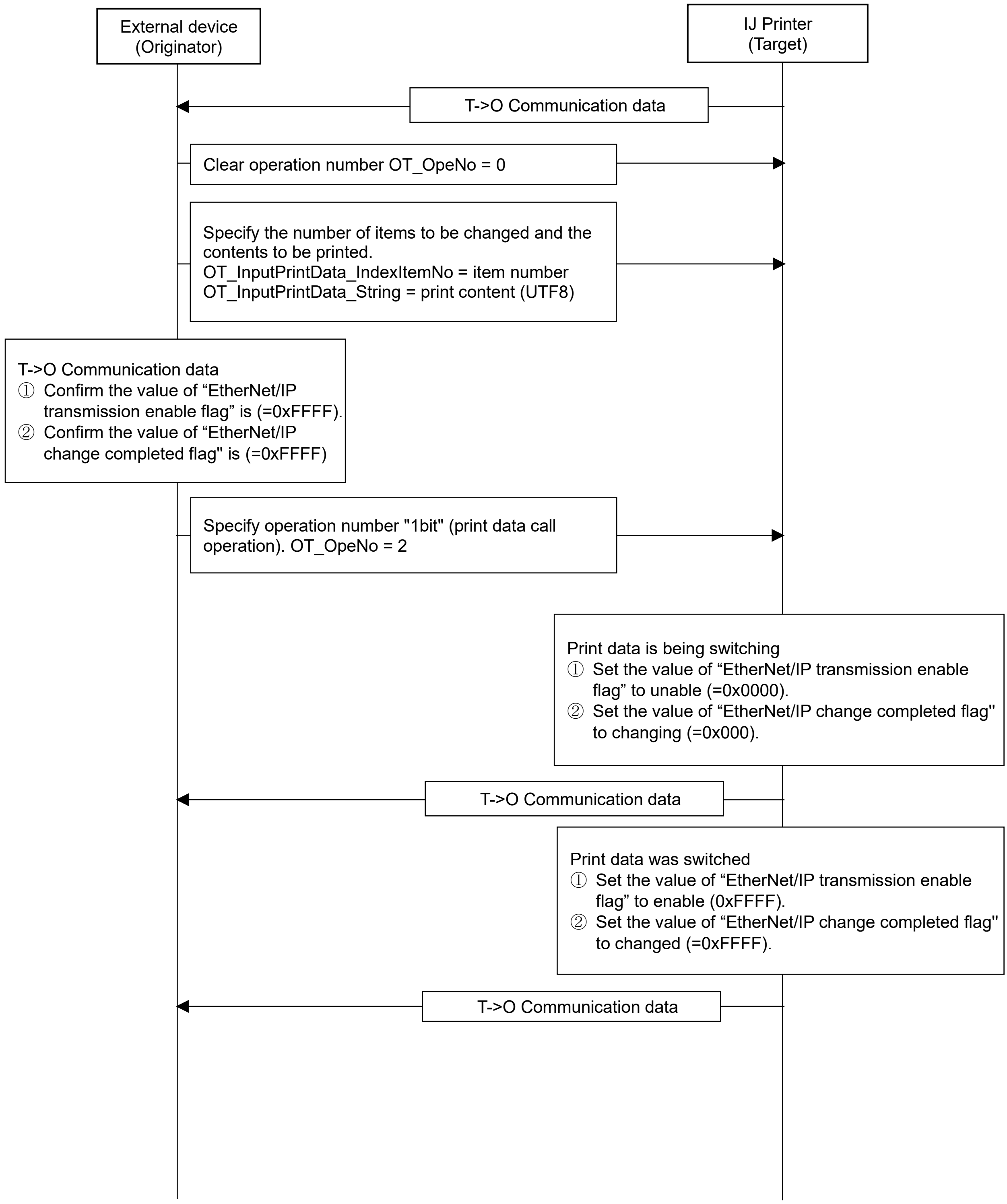
4.2.1. O->T Communication Transmission Procedure

(1) Calling print data
When calling the print contents by using O->T communication, data transmission will follow the following procedure.



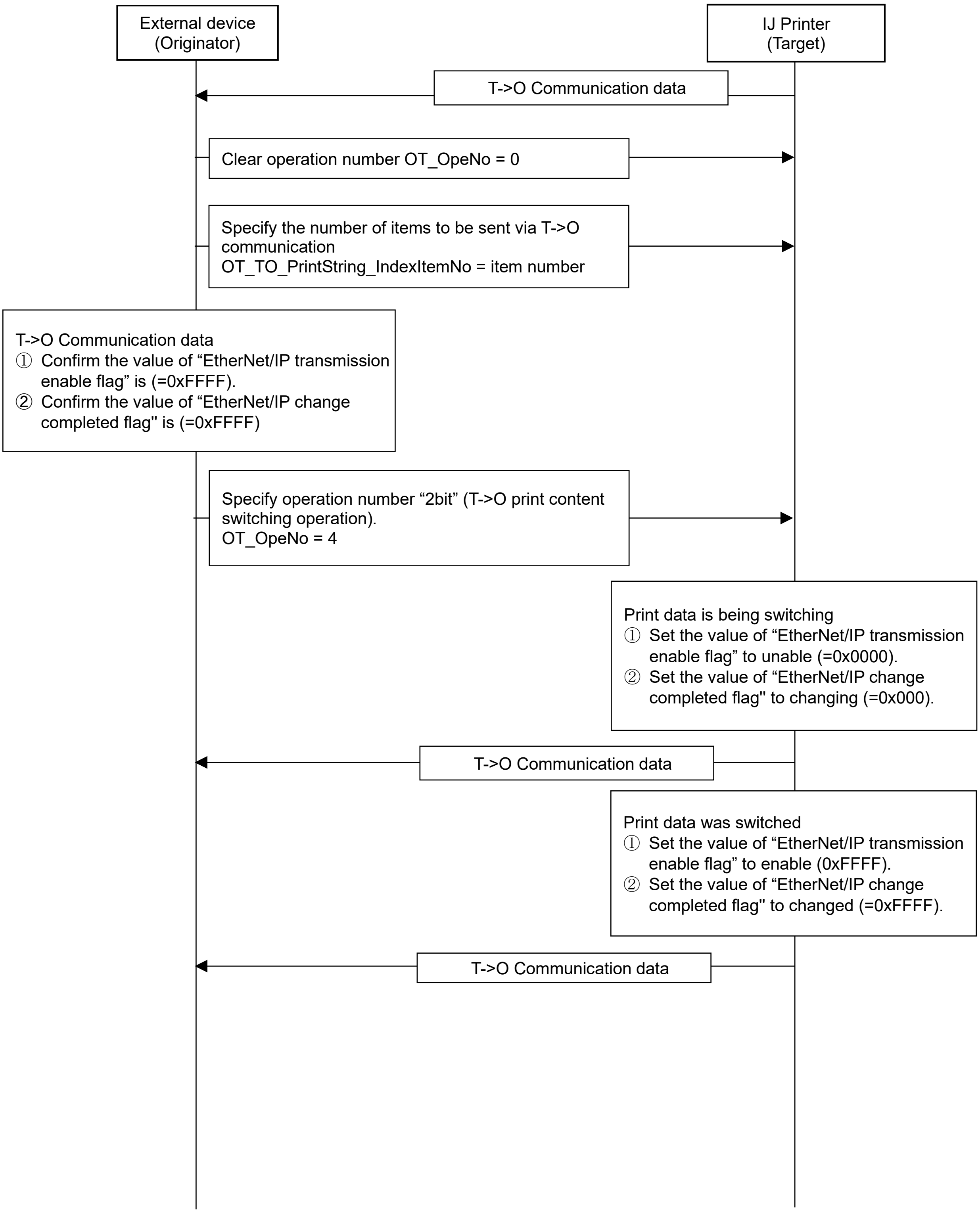
(2) Editing print data

When changing print contents using O-> T communication, data transmission will be as follows.



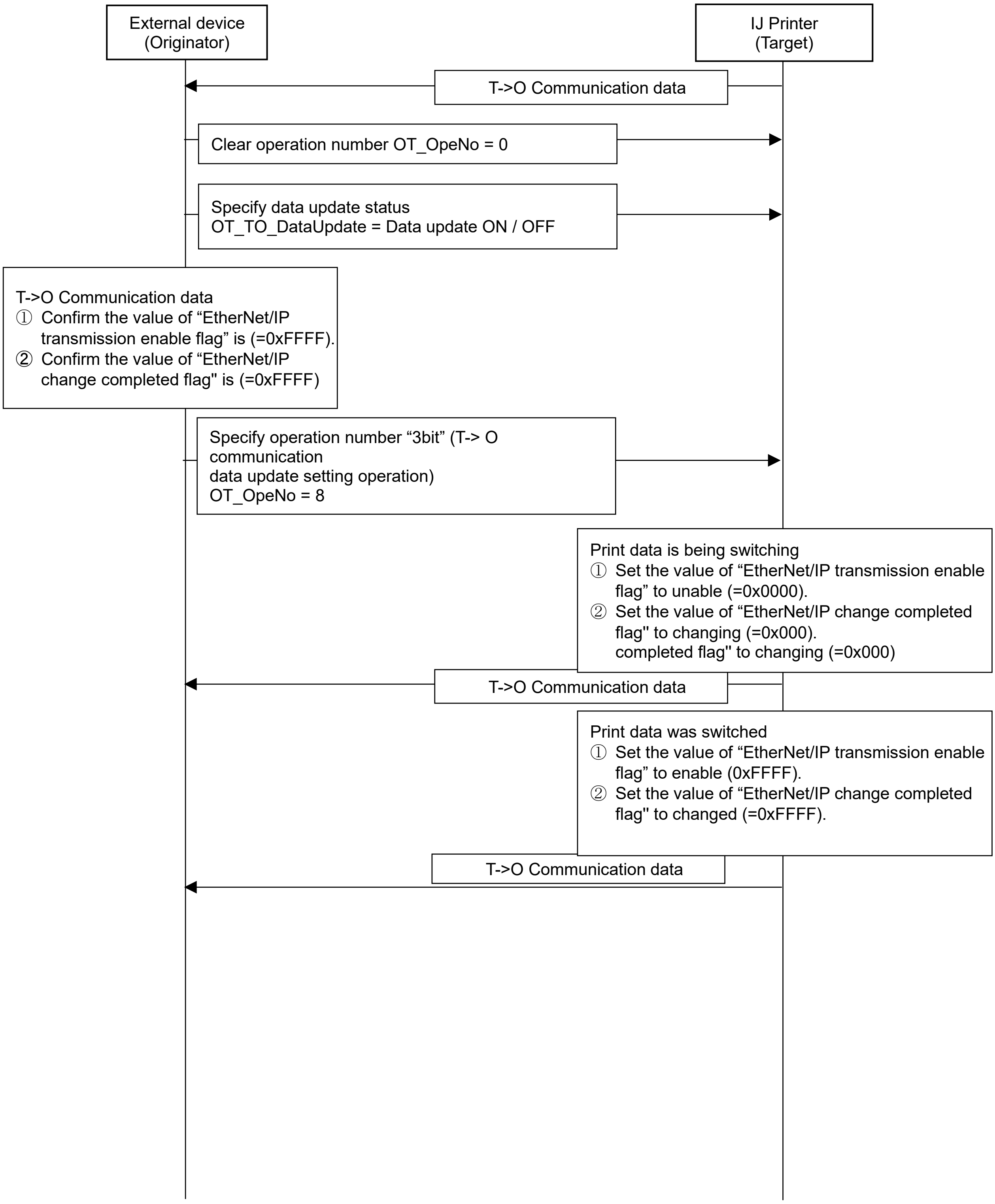
(3) Switch the print content by T->O communication

When using O->T communication to switch the print contents acquired by T->O communication, data transmission will be as follows.



(4) T->O communication data update setting

When changing the T->O communication data update setting via O->T communication, data transmission will be as follows.



5. IJ Printer detail code

5.1. Automatic reflection of Index function (Explicit message communication)

5.1.1. Instruction

Automatic reflect can be set to 2 values: 0 or 1.

The default value of automatic reflection is 0, the automatic reflex will return to default value once IJ Printer is turned off. Also, the setting values which are not reflected on IJ Printer will be cleared automatically once IJ Printer is turned off.

Value	Automatic reflect setting	Contents
0	Enable	The setting value which is sent from external device through EtherNet/IP will be reflected on IJ Printer directly after IJ Printer receives it.
1	Disable	The setting value which is sent from external device through EtherNet/IP will be reflected on IJ Printer after IJ Printer receives "Start/Stop management flag = 2". This function makes possible to change multiple IJ Printer's setting at the same time.

5.1.2. Examples

Case 1) Automatic reflection value is 0.

- Original setting of the IJ Pinter is as follows:
  Character height of IJ Printer is "90". Character width of IJ Printer is "2".
  LAN function is set as EtherNet/IP communication. IJ Printer is in online state.

Step 1: Send command "change character height to 16" to IJ Printer.
(Sending command: "0x32" "0x68" "0x64" "0x10")
↓ Setting value
The character height of IJ Printer changes to 16(0x10)
↓
Step 2: Send command "change character width to 50" to IJ Printer
(Sending command: "0x32" "0x68" "0x67" "0x32")
↓ Setting value
The character width of IJ Printer changes to 50(0x32).

Case 2) Automatic reflection value is 1.

- Original setting of the IJ Pinter is as follows:
  Character height of IJ Printer is “90”. Character width of IJ Printer is “2”.
  LAN function is set as EtherNet/IP communication. IJ Printer is in online state.

Step 1: Send command “disable automatic reflection” to IJ Printer.
(Sending command: “0x32” “0x7A” “0x65” “0x01”)

↓ Setting value

Step 2: Send command “change character height to 16” to IJ Printer.
(Sending command: “0x32” “0x68” “0x64” “0x10”)

↓ Setting value

Character height of IJ Printer doesn’t change.

↓

Step 3: Send command “change character width to 50” to IJ Printer.
(Sending command: “0x32” “0x68” “0x67” “0x32”)

↓ Setting value

Character width of IJ Printer doesn’t change.

↓

Step 4: Send confirmation command start/stop management flag = 2 to IJ Printer.
(Sending command: “0x32” “0x7A” “0x64” “0x02”)

↓ Setting value

The character height of IJ Printer changes to 16(0x10) and character width of IJ Printer changes to 50(0x32).

5.2. Job editing (Explicit message communication)

5.2.1. Instruction

There are 2 job editing function:

1. Set print character string. (0x32 0x67 0x71)
2. Add characters at the end of current print string. (0x32 0x67 0x8A)

You can edit print job from the first character by using *"Set print character string"* function. Also, you can use *"Add characters at the end of current print string"* function to add characters to current print job without changing the current existing characters.

5.2.2. Examples

Case 1) Edit job from the first character

Original setting of the IJ Pinter is as follows:

Current print job is "ABC123"

Step 1: Send command "change current job to Test1" to IJ Printer.

(Sending command: "0x32" "0x67" "0x71" <u>"0x54" "0x65" "0x72" "0x73" "0x31" "0x00"</u>)

↓ Setting value

Current print job changes to "Test1"

↓

Step 2: Send command "change current job to Test2" to IJ Printer.

(Sending command: "0x32" "0x67" "0x71" <u>"0x54" "0x65" "0x72" "0x73" "0x32" "0x00"</u>)

↓ Setting value

Current print job changes to "Test2"

Case 2) Add characters to current print job

Original setting of the IJ Pinter is as follows:

Current print job is "ABC123"

Step 1: Send command "Add Test1 to current job" to IJ Printer.

(Sending command: "0x32" "0x67" "0x8A" <u>"0x54" "0x65" "0x72" "0x73" "0x31" "0x00"</u>)

↓ Setting value

Current print job change to "ABC123Test1"

↓

Step 2: Send command "Add Test2 to current job" to IJ Printer.

(Sending command: "0x32" "0x67" "0x8A" <u>"0x54" "0x65" "0x72" "0x73" "0x31" "0x00"</u>)

↓ Setting value

Current print job change to "ABC123Test1Test2"

The function "Set print character string" has length limitation of setting value, with "Add characters at the end of current print string" function, users can edit job of up to 1000 characters.

5.3. Special characters (Explicit message communication / Implicit message communication (Cyclic communication))

5.3.1. Calendar characters

Calendar characters are supported by function “Set print character string” and “Add characters at the end of current print string”. To distinguish from the general characters, calendar characters need to be stored in “{}" as follows.

YYYYMMDDhhmm is expressed as {{YYYYMMDDhhmm}}.
YYYY/MM/DD/hh:mm is expressed as {{YYYY}/{MM}/{DD}/{hh}:{mm}}.

- **Example**

Case 1) Edit job which contains calendar characters

Original setting of the IJ Printer is as follows:

Current print job is “ABC123”

Step 1: Send command “change current job to calendar characters YYMMDDhh” to IJ Printer.
(Sending command: “0x32” “0x67” “0x71” “0x7B” “0x7B” “0x59” “0x59” “0x4D” “0x4D” “0x44” “0x44” “0x68” “0x68” “0x7D” “0x7D” “0x00”)

↓ Setting value

Current print job changes to “YYMMDDhh” (Calendar characters)

↓

Step 2: Send command “add current job with calendar characters mm” to IJ Printer.
(Sending command: “0x32” “0x67” “0x8A” “0x7B” “0x7B” “0x6D” “0x6D” “0x7D” “0x7D” “0x00”)

Setting value

↓

Current print job changes to “YYMMDDhhmm” (Calendar characters)

Character code list

{	}	Year : Y	Month : M	Day : D	Hour : h
0x7B	0x7D	0x59	0x4D	0x44	0x68
Minute : m	Second : s	Total number of days : T	Weeks : W	Day of Week : 7	
0x6D	0x73	0x54	0x57	0x37	

Specified number of max digits for calendar characters

Year	Month	Day	Hour	Minute	Second	Total number of days	Weeks	Day of week
4 digits	3 digits	3 digits	2 digits	2 digits	2 digits	3 digits	3 digits	3 digits

5.3.2. Count characters

Count characters are supported by function "Set print character string" and "Add characters at the end of current print string". To distinguish from the general characters, count characters need to be stored in "{}" as follows.

CCCC is expressed as {{CCCC}}.
C/C/C/C is expressed as {{C}/{C}/{C}/{C}}.

- **Example**

Case 1) Edit job which contains count characters

Original setting of the IJ Printer is as follows:
Current print job is ABC123

Step 1: Send command "change current job to count characters CCCC" IJ Printer.
(Sending command: "0x32" "0x67" "0x71" "0x7B" "0x7B" "0x43" "0x43" "0x43" "0x43" "0x7D" "0x7D" "0x00") ← Setting value

↓

Current print job changes to "CCCC" (Count characters)

↓

Step 2: Send command "Add current job with count characters CC" IJ Printer.
(Sending command: "0x32" "0x67" "0x8A" "0x7B" "0x7B" "0x43" "0x43" "0x7D" "0x7D" "0x00") ← Setting value

↓

Current print job changes to "CCCCCC" (Count characters)

5.3.3. Fixed user pattern characters

Fixed user patterns are supported by function "Set print character string" and "Add characters at the end of current print string". To distinguish from the general characters, fixed user pattern characters are represented as {X/pattern number} as follows.

{X/0} {X/1} {X/2} … {X/198} {X/199}

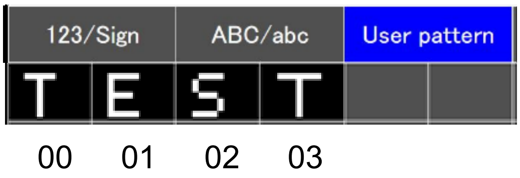
● **Example**

Case 1) Edit job which contains fixed user pattern characters

Original setting of the IJ Printer is as follows:

Current print job is "ABC123"

Step1： Save "User pattern(Fixed pattern)"

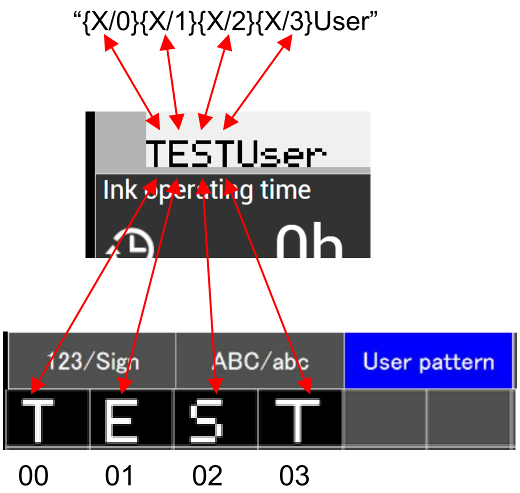


Step2: Send command "change current job with fixed user pattern characters to 00 01 02 03 User" to IJ Printer.

(Sending command: "0x32" "0x67" "0x71" <u>"0x7B" "0x58" "0x2F" "0x30" "0x7D" "0x7B" "0x58" "0x2F" "0x32" "0x7D" "0x7B" "0x58" "0x2F" "0x30" "0x7D" "0x55" "0x73" "0x65" "0x72" "0x00"</u>)

Setting value

Current print job changes to:



5.3.4. Free user pattern characters

Free user patterns are supported by function “Set print character string” and “Add characters at the end of current print string”. To distinguish from the general characters, free user pattern characters are written as “{Z/pattern number}” as follows.

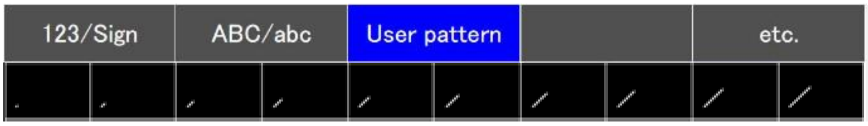
{Z/0} {Z/1} {Z/2} … {Z/48} {Z/49}

● **Example**

Case 1) Edit job which contains free user pattern characters

Original setting of the IJ Printer is as follows:
Current print job is “ABC123”

Step1： Save “user pattern（Free）size”



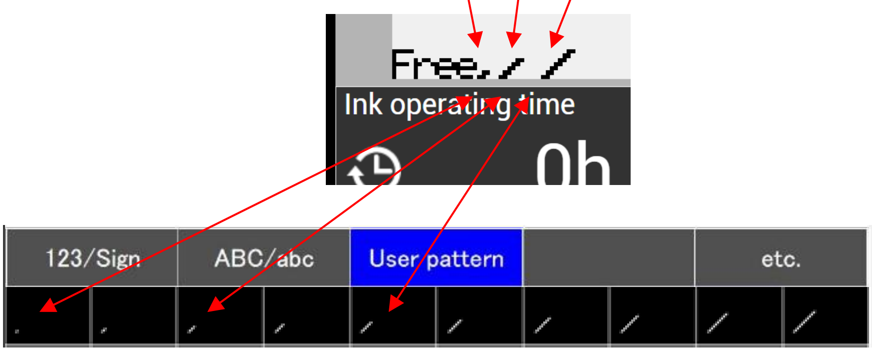
00 01 02 03 04 05 06 07 08 09

Step2: Send command “change current job with free user pattern characters to Free00 02 04” to IJ Printer.
(Sending command: “0x32” “0x67” “0x71” “0x46” “0x72” “0x65” “0x65” “0x7B” “0x5A” “0x2F” “0x30” “0x7D” “0x7B” “0x5A” “0x2F” “0x32” “0x7D” “0x7B” “0x5A” “0x2F” “0x34” “0x7D” “0x00”)

Setting value

Current print job changes to:

“Free{Z/0}{Z/2}{Z/4}”

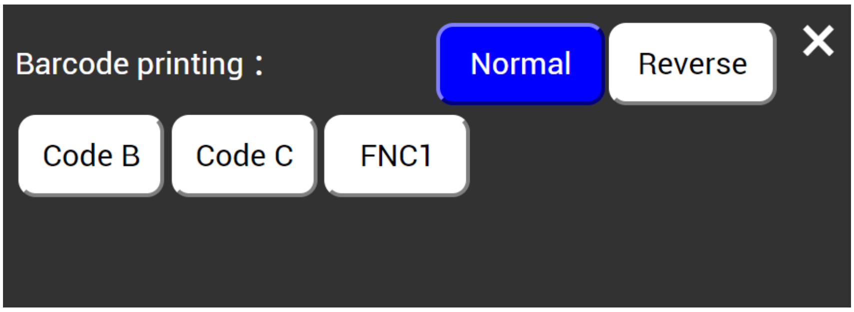


5.3.5. Special keys for barcode

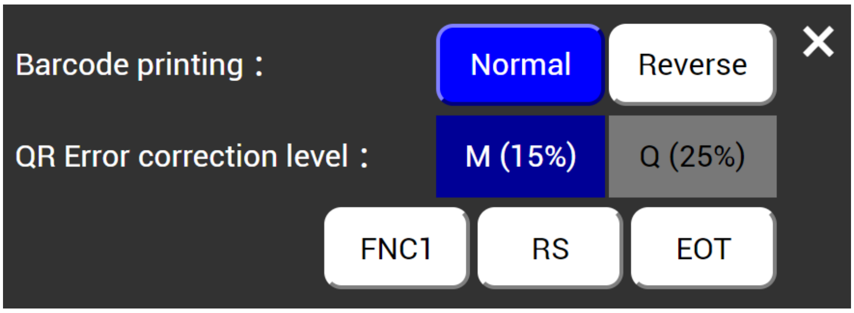
Special keys for barcode are supported by function “Set print character string” and “Add characters at the end of current print string”.

{codeb}{codec}{fnc1}{rs}{eot}
{CODEB}{CODEC}{FNC1}{RS}{EOT}

※ In case Code128(CodeB)



※ In case QR33



- **Example**

Case 1) Edit job which contains barcode

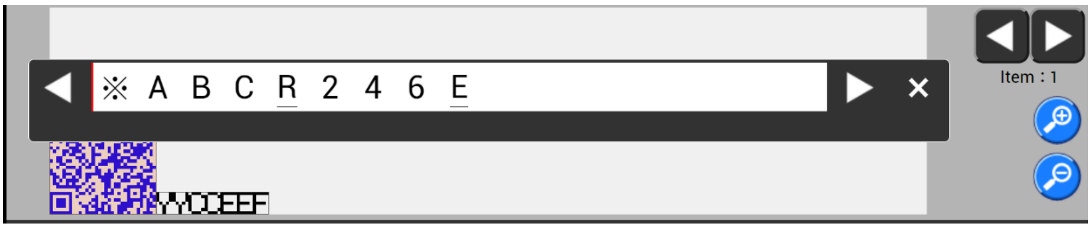
Original setting of the IJ Printer is as follows:

Current print job is “QR (33x33) YYCCEEF”

Step 1 : Send command “set barcode characters as ※ABCR246E” to IJ Printer.
(Sending command: “0x32” “0x67” “0x71” “0x7B” “0x66” “0x6E” “0x63” “0x31” “0x7D” “0x41” “0x42” “0x43” “0x7B” “0x72” “0x73” “0x7D” “0x32” “0x34” “0x36” “0x7B” “0x65” ”0x6F” ”0x74” “0x7D” “0x00”)

Setting value

Current print job changes to:



5.3.6. Dedicated characters

Dedicated characters for barcode are supported by function “Set print character string” and “Add characters at the end of current print string”.

Dedicated characters(Special Kanji／Traditional SP Kanji)

制造	生产 / 生産	批号 / 批號	供货 / 供貨	合格	年	月	日	品名	名称 / 名稱
{S/01}	{S/02}	{S/03}	{S/04}	{S/05}	{S/06}	{S/07}	{S/08}	{S/09}	{S/10}
食用	饮用 / 飲用	期至	时 / 時	期限	日期	使用	有效	保质 / 保質	个 / 個
{S/11}	{S/12}	{S/13}	{S/14}	{S/15}	{S/16}	{S/17}	{S/18}	{S/19}	{S/20}
元	g	有限	公司						
{S/21}	{S/22}	{S/23}	{S/24}						

- **Example**

Case 1) Edit job which contains dedicated characters

Original setting of the IJ Printer is as follows:
Current print job is ABC123

Step 1: Send command “change current job to dedicated characters 制造” IJ Printer.
(Sending command: “0x32” “0x67” “0x71” “0x7B” “0x53” “0x2F” “0x30” “0x31” “0x7D” “0x00”)

Setting value

5.3.7. Punctuation characters

Punctuation characters for barcode are supported by function “Set print character string” and “Add characters at the end of current print string”.

Dedicated characters

'	.	:	,	Space	;	!
{'}	{.}	{:}	{,}	{ }	{;}	{!}

- **Example**

Case 1) Edit job which contains count characters

Original setting of the IJ Printer is as follows:
Current print job is ABC123

Step 1: Send command “change current job to Punctuation characters {'}” IJ Printer.
(Sending command: “0x32” “0x67” “0x71” “0x7B” “0x27” “0x7D” “0x00”)

Setting value

5.4. Dot matrix code (Explicit message communication)

List of Dot Matrix

Dot Matrix Code Dot Matrix	Dot Matrix Code Dot Matrix
1	Size4x5
2	Size5x5
3	Size5x7
4	Size9x7
5	Size7x10
6	Size10x12
7	Size12x16
8	Size18x24
9	Size24x32
10	Size11x11 *1
11	Size48x48(QR33)
12	Size30x40
13	Size36x48
14	Size5x3_Chimney
15	Size5x5_Chimney
16	Size7x5_Chimney

*1: This can be set when "Kana" or "Special Kanji " or "Traditional SP Kanji" is selected as the input mode.

5.5. Barcode (Explicit message communication)

List of Barcode

Barcode No.	Barcode Type	Barcode Attribute
0	None	—
1	Code39	—
2	ITF	—
3	NW-7	—
4	EAN-13(JAN-13)	No identification code
		Identification Code (5x5)
		Identification Code (5x7)
5	DM	(8x32)
6		(16x16)
7		(16x36)
8		(16x48)
9		(18x18)
10		(20x20)
11		(22x22)
12		(24x24)
13	Code128	Code set B
14		Code set C
15	UPC-A	No identification code
		Identification Code (5x5)
		Identification Code (5x7)
16	UPC-E	No identification code
		Identification Code (5x5)
		Identification Code (5x7)
17	EAN-8(JAN-8)	No identification code
		Identification Code (5x5)
		Identification Code (5x7)
18	QR	(21x21)
19		(25x25)
20		(29x29)
21		(33x33)
22	EAN-13add-on5 (JAN-13add-on5)	Identification Code (5x5)
		Identification Code (5x7)
23	Micro QR (15x15)	—
24	GS1DataBarLimited.	No identification code
		Identification Code (5x5)
		Identification Code (5x7)
25	GS1DataBarOmniderec.	No identification code
		Identification Code (5x5)
		Identification Code (5x7)
26	GS1DataBarStacked.	No identification code
		Identification Code (5x5)
		Identification Code (5x7)
27	DM (14x14)	(14x14)
28	DotCode	(7/8 dot)
29		(10 dot)
30		(12 dot)
31		(14 dot)
32		(16 dot)
33	DM (12x12)	(12x12)
34	DM (12x26)	(12x26)

5.6. External communication error code

List of External Communication Error Codes

Error Code	Content	Confirm item
101	The data length of the attached data or the transmission data is invalid.	Check the message format
102	The value of the transmitted data exceeds the specification range.	Check whether the data length is within the specification range.
111	Execute the function while the IJ printer status is invalid.	Check the state of IJ Printer.
112	The sent data cannot be reflected.	Check the state of IJ Printer.
201	The sent print format is invalid.	Check the procedure of operation and print data information of Set/Get.
202	Execute the function while the IJ printer status is invalid.	Check the state of IJ Printer.