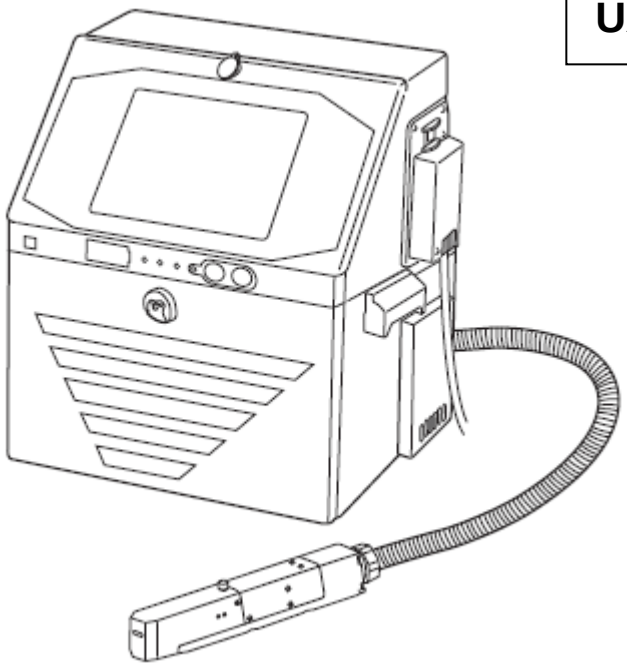
7th Edition

EtherNet/IP Communication Users Manual

HITACHI IJ Printer

Model UX

UX-161W/WP
UX-151W/WP



EtherNet/IP
ODVA

Thank you for purchasing Hitachi IJ Printer.
This instruction manual describes the EtherNet/IP communication function.
For other features of the printer, please refer to Instruction manual or Technical manual.
After thoroughly reading the manual, properly store it for future reference.

HITACHI

■Notice

・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: CT16. Please note that the revision contents released from ODVA after CT17 are not verified for operation.

■Trademark

"Ethernet" is a registered trademark of Xerox Corporation, USA.
"Windows" is registered trademarks of Microsoft Corporation, USA, in the USA and other countries.
"EtherNet/IP" is the product name of ODVA (Open DeviceNet Vendor Association).

Table of Contents

1. EtherNet/IP function

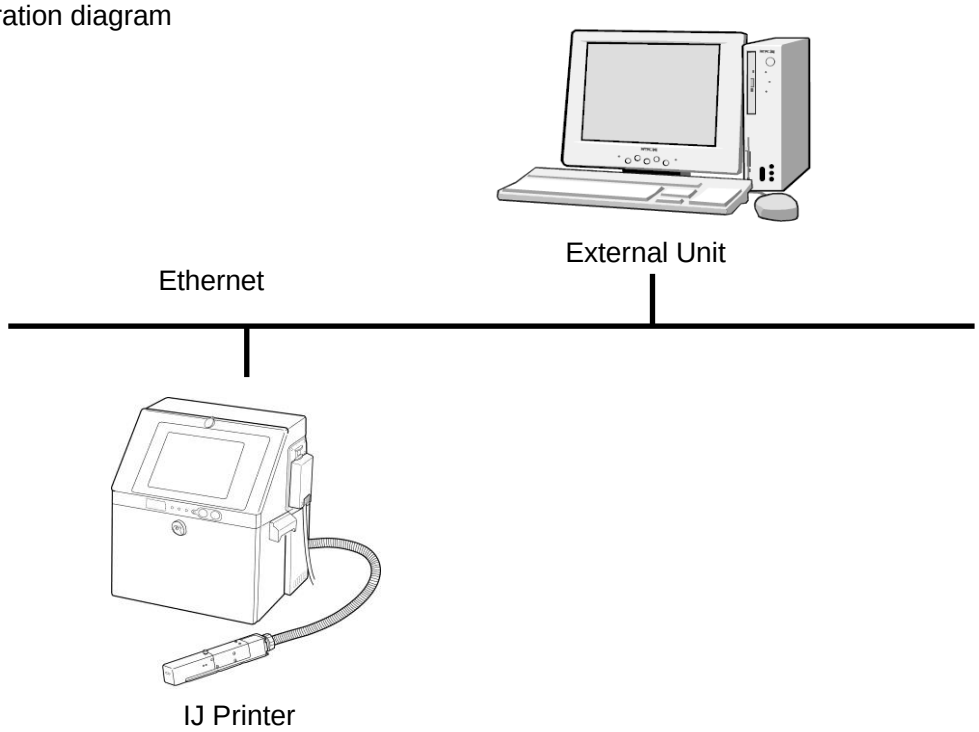
(1) Overview

- ●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 (Explict communication)” that communicates at an arbitrary timing and “Cyclic communication (Implicit 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.

List of Function

No.	Function Name	Detail
1	Ethernet/IP Communication	Supports EtherNet/IP protocol. Because EtherNet/IP protocol is one type of protocol commonly used by industrial equipment, if EtherNet/IP communication is employed for other unit, you can create a communications program for the external unit using this asset.

(2) Configuration diagram



Standard Specification

Item	Specifications
Ethernet standards	IEEE802.3 compatible, 10BASE-T, 100BASE-T
Protocol	TCP/IP, UDP
Connection cable	Category 5 UTP or STP cable

(3) Notice

The time from when the signal is transmitted from an external unit to when the IJ Printer receives the signal cannot be strictly defined in the same way as with serial communications.

2. Preparations

● If connecting the IJ Printer with external unit, use a LAN connection cable.

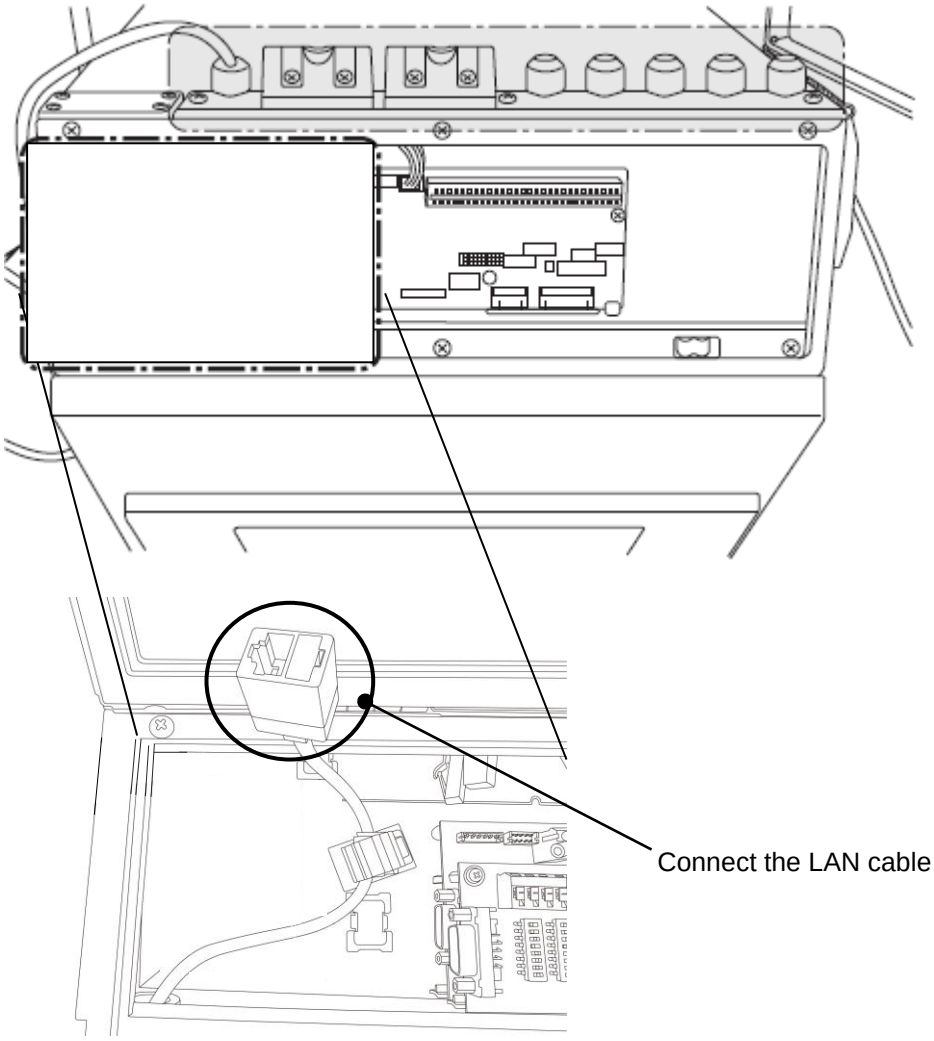
2.1 Network connection preparations

No.	Task	Notes
1	You should obtain the IP address from the Information Systems Department of your company.	
2	You should consult with the Information Systems Department of your company concerning network settings such as gateway.	

2.2 IJ Printer preparations

No.	Task	Notes
1	Connect the IJ Printer to the Ethernet (computer or hub, etc.) with a LAN cable.	Refer to 2.3 LAN cable connection.
2	Conduct a connection test if necessary.	Refer to 3. Connection test.
3	Set the communication environment on the IJ Printer's screen.	Refer to 4. Setting the communication environment.

2.3 LAN cable connection



[I/O section (with cover removed)]

2.4 Usage precautions

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

No	Screen	Item	Notes
1	Comm. env. setup	Buffer function	[Disable]Fixed
2		Data exchange	[Reflect at once]Fixed

Terminology	Explanation
IP address (Internet protocol address)	The IP address is a 32-bit ID number allotted to equipment connected to the Internet. The 32-bit number of the IP address is usually divided into four 8-bit segments for display. The IP address consists of a "network address" that identifies the network and a "host address" that identifies the individual pieces of equipment connected in the network.
Subnet mask	The subnet mask is a 32-bit number that defines what bits of the IP address are used for the network address. The network address segment of the IP address is determined by calculating the logical AND of the IP address and subnet mask.
Default gateway	The default gateway is equipment such as a router that functions as the "gateway" to the network. When there is communication between different networks and there is no unique path for the equipment to be accessed, the default gateway is used to connect them.
Port number	The port No. is the sub-address that specifies one of several programs running on equipment specified by the IP address.
MAC address	It is a number registered to identify the device on the network. The MAC address consists of 12 digits like 01-23-45-67-89-AB

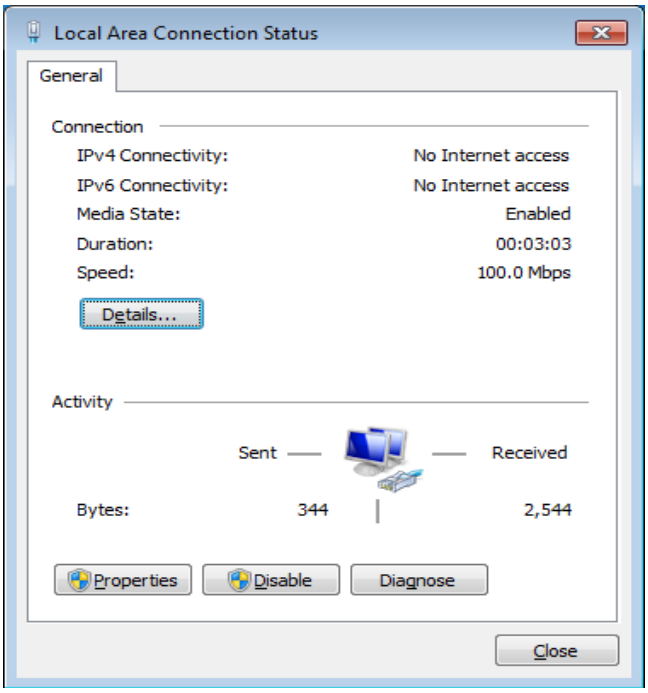
3. Connection test

Directly connect the IJ Printer to a PC and check the connection.

3.1 Procedure for connection test

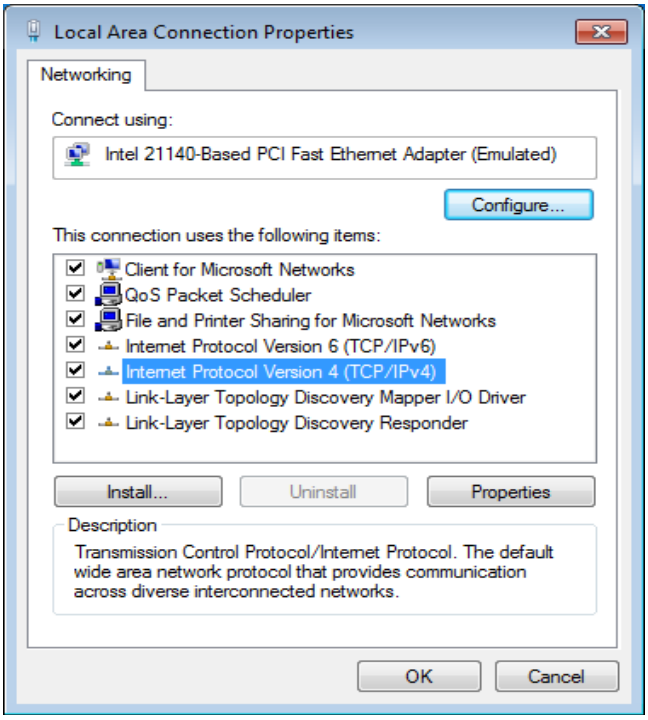
1 Directly connect the IJ Printer to the PC with a LAN cable.

2 Set the network settings of external unit by steps 2 to 5.
Click the Start menu, and double-click [Control Panel] > [View network status and tasks] > [Change adapter settings] > [Local Area Connection].
The following window is then displayed.

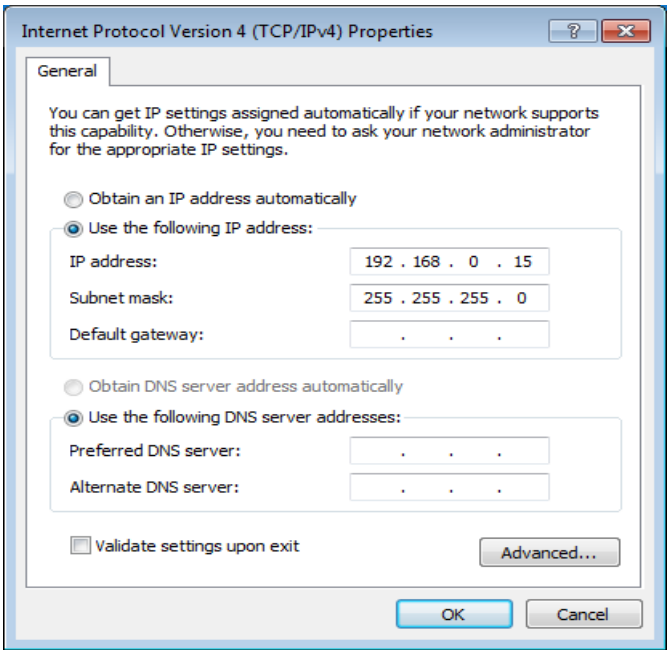


(Example using Windows 7 OS)

3 Click [Properties].

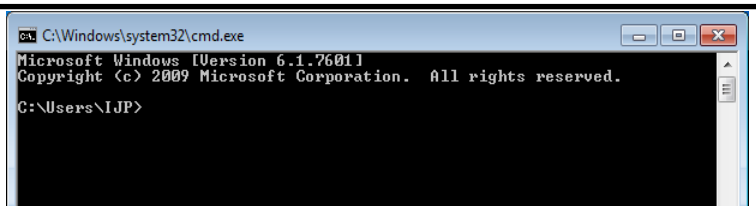


4 Click [Internet Protocol Version 4 (TCP/IPv4)].

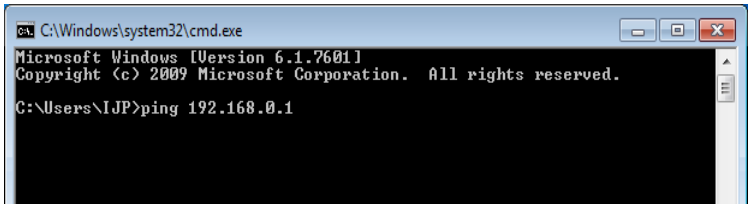


5 Select [Use the following IP address], and enter an IP address other than 192.168.0.1 and 192.168.0.255 (the example shown in the figure uses 192.168.0.15) and then enter 255.255.255.0 in the Subnet mask field. Click [OK].

6 Follow the steps below to confirm that the network connection is properly established. The following steps describe procedures for Windows 7.

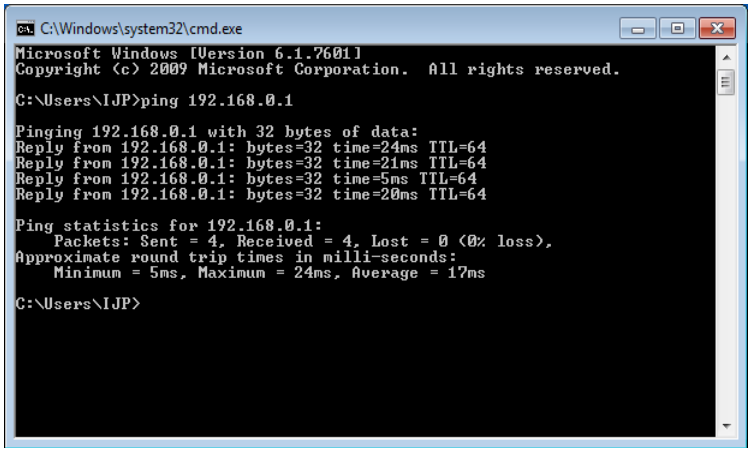


Select [Start Menu] > [All Programs] > [Accessories] > [Command prompt] to open the Command Prompt window.

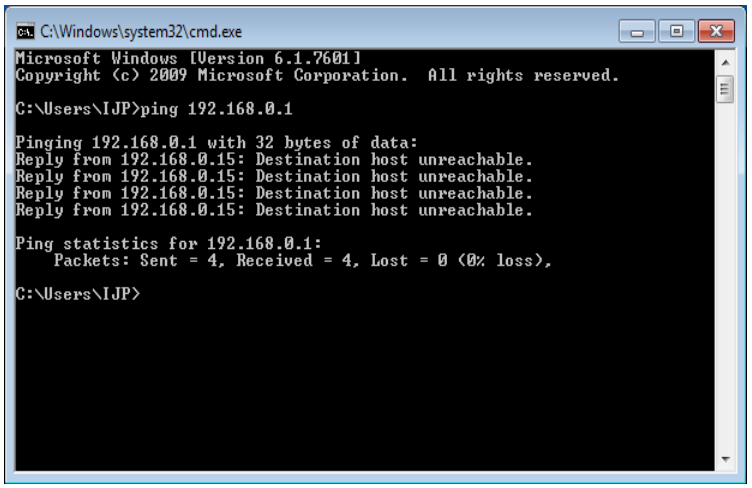


Type the following command:
Ping 192.168.0.1

Note:
This command is not case sensitive.



Byte=32 time=24 ..in four consecutive lines*1 then external unit settings are completed.
*1:
In default, the ping command returns the response for four times. For details of the ping command, type the following command: ping/help



If "Destination host unreachable." response is returned for the ping command, it means communication has not been established between the IJ Printer and external unit. Re-check the following:

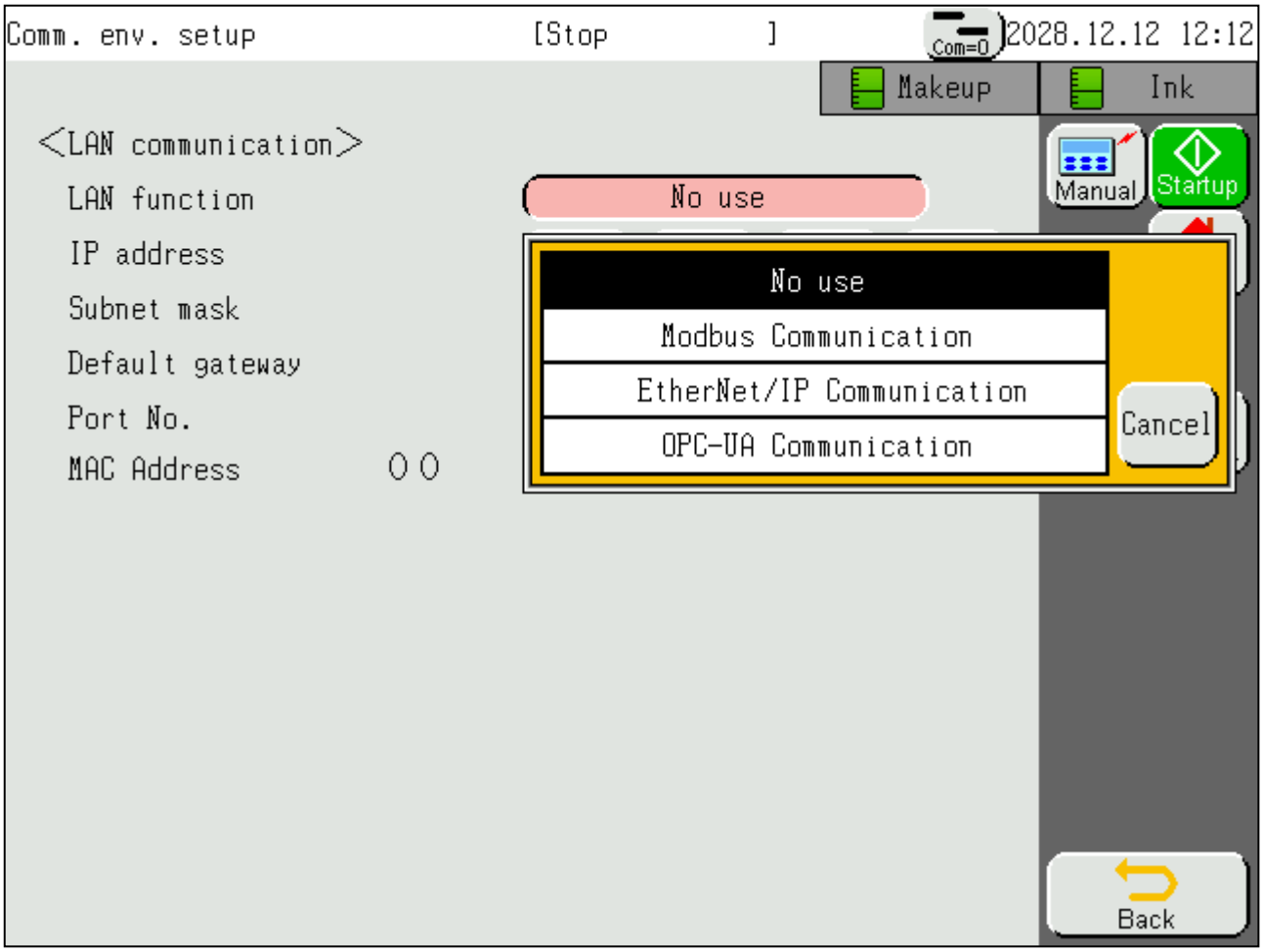
[Check points]
* Have the communication settings of the IJ Printer been changed?
* Are the network settings of the external unit correct?

4. Setting the communication environment

● Set the LAN function on communication environment setup screen to "EtherNet/IP communication".

Setting item of communication environment setup screen

Setting item	Description
LAN function	● No use: LAN function cannot be used. ● Modbus Communication : Modbus communication function can be used. ● EtherNet/IP Communication : EtherNet/IP communication function can be used. ● OPC-UA Communication : OPC-UA communication function can be used.



Example of communication environment setup screen

5. EDS File

Please obtain it from the enclosed CD.

//IJP-Common/UX161.eds

Implicit message communication (Cyclic communication) should be used with device version 1.2 or later. Please confirm the EDS file first. Please check "MajRev" and "MinRev" in [Device].

```
[Device]
        :
    MajDev = 1;
    MinDev = 2;
        :
```

6. 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”.

6.1 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

6.2 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 pattarn func.	Set/Get user pattern
0x6C	Substitution rules func.	Set/Get substitution rules
0x71	Enviroment 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

6.3 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 unreflected data 1:has unreflected data
0x65	Set	Automatic reflection	0 to 1	0	0/1	1	int	0:Automatic reflect 1:Non-automatic reflect
	Get				Null	Null	Null	
0x66	Set	Item count	1 to 100	1	Item No.	2	int	
	Get				Null	Null	Null	
0x67	Set	Column	1 to 100	1	Colum No.	2	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 message number	1 to 2000	1	Message 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 specifyingthe the first column.

№			
1	2	3	4

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

6.4 Print data management function (Class code = 0x66)

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

List of Print Data Management Functions

Address		Function Name	Data Range	Input Data			Notes
Attribute	Access			Data	Data Length (Byte)	Data Type	
0x64	Service	Select message	1 to 2000	Message No.	2	short	
0x65	Set	Store print data	Max 15 byte	Type + Group No + Nickname + "00"		short +char	Type range 0 to 1(0:New and save 1:Overwrite) Group No 0 to 99(0 means No group)
0x67	Set	Delete print data	1 to 2000	Message No.	2	short	
0x69	Set	Setting of print data name	Max 15 byte	Number+ unicode (Print data name)+ "00"		short +char	
0x6A	Get	Getting list of 10 messages from the specified message	0 to 2000	Number of the specified message	2	int	
0x6B	Set	Setting of print data number	1 to 2000	Data No + New No.	4	short+short	
0x6C	Set	Change/Create group name	Max 14 byte	Group No.+unicode(Group Name)+00		short+char	
0x6D	Set	Group deletion	1 to 99	Group No.	1	int	
0X6F	Get	Getting list of 10 messege group from the specified group	1 to 99	Group No.	1	int	
0x70	Set	Change group number	1 to 99	Group No.	2	int	

Example) When deleting print data.

№				
1	2	3	4	5

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

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

※300（Decimal）=012C（Hexadecimal）

6.5 Print format function (Class code = 0x67)

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

List of Print Format Functions

Address		Function Name	Data Range	Input			Notes
Attribute	Access			Data	Data Length (Byte)	Data Type	
0x64	Get	Get message name	-	Null	Null	Null	
0x65	Get	Get print Item	-	Null	Null	Null	
0x66	Get	Get number of columns	1 to 100	Null	Null	Null	
0x67	Get	Get format type	1 to 3	Null	Null	Null	1 : Individual setup 2 : Overall setup 3 : Free layout
0x69	Service	Insert column	0 to 99	Null	Null	Null	Set item number in "Column" of index function.
0x6A	Service	Delete column	0 to 99	Null	Null	Null	Set item number in "Column" of index function.
0x6B	Service	Add column	-	Null	Null	Null	
0x6C	Set	To overall	0 to 1	Setting	1	int	0 : Enable 1 : Disable
0x6D	Set	Format setup	0 to 2	Format number *	1	int	*Format number 0 : Individual setup 1 : Overall setup 2 : Free layout
0x6E	Service	Adding print items	-	Null	Null	Null	
0x6F	Service	Deletion of print items	1 to 100	Null	Null	Null	Set item number in "Item Count" of index function.
0x71	Set	Setting of print character string	Up to 750 digits (Unicode)	Char. string Unicode+"00"	Max 750	char	Set item number in "Item Count" of index function.
	Get	Getting of print charcter string		Null	Null	Null	
0x72	Get	Getting of line count	Line Count (1 to 6)	Null	Null	Null	Set item number in "Column" of index function.
	Set	Setting of line count		Line count	1	short	
0x73	Get	Getting of line spacing	0 to 2	Null	Null	Null	Set item number in "Column" of index function.
	Set	Setting of line spacing		Line spacing	1	int	
0x74	Get	Getting of dot matrix	1 to 16	Null	Null	Null	Set item number in "Item Count" of index function. Please refer to "7.1 Dot matrix Code" for dot matrix.
	Set	Setting of dot matrix		Dot matrix	1	int	
0x75	Get	Getting of Inter-character space	0 to 26	Null	Null	Null	Set item number in "Item Count" of index function.
	Set	Setting of Inter-character space		Inter-charcter space	1	char	
0x76	Get	Getting of charcter bold	Bold(1 to 9)	Null	Null	Null	Set item number in "Item Count" of index function.
	Set	Setting of charcter bold	1 to 9	Bold	1	int	
0x77	Get	Getting of barcode type	0 to 27	Null	Null	Null	Set item number in "Item Count" of index function. Please refer to "7.2 Barcode " for barcode.
	Set	Setting of barcode type		Barcode Number	1	int	

Address		Function Name	Data Range	Input			Notes
Attribute	Access			Data	Data Length (Byte)	Data Type	
0x78	Get	Getting of readable code	0 to 2	Null	Null	Null	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
	Set	Setting of readable code		Readable code number *	1	int	
0x79	Get	Getting of prefix code	0 to 99	Null	Null	Null	Set item number in "Item Count" of index function.
	Set	Setting of prefix code		Prefix code	1	int	
0x7A	Get	Getting of the X and Y coordinate values of free layout	X : 0 to 65535 Y : 0 to 47	Coordinate X, Y	Null	Null	Set item number in "Item Count" of index function. The order is X, Y
	Set	Setting of the X and Y coordinate values of free layout			X:2 Y1	short	
0x7B	Get	Getting of adjust inter-charcter space count	0 to 99	Charcter count	2	int	Set item number in "Character position" of index function.
	Set	Setting of adjust inter-charcter space count	Adjust value: 0 to 99 Charcter count: 1 to 1000	“Adjust value”+ “Charcter count”	3	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	Get	Getting of calendar offset	0~1	calendar offset	Null	Null	0:Offset from yesterday 1:From today
	Set	Setting of calendar offset			1	char	
0x8E	Get	Getting of DIN print	0~1	DIN print	Null	Null	0: Disable 1: Enable
	Set	Setting of DIN print			1	char	
0x8F	Get	Getting of EAN prefix	0~1	EAN prefix	Null	Null	0: Edit message 1: Print format
	Set	Setting of EAN prefix			1	char	
0x90	Get	Getting of barcode printing	0~1	Barcode printing	Null	Null	0: Normal 1: Reverse
	Set	Setting of bardcode printing			1	char	
0x91	Get	Getting of QR error correction level	0~1	QR error correction level	Null	Null	0: M (15%) 1: Q (25%)
	Set	Setting of QR error correction level			1	char	

Example) When 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（Free layout=2）	Data

6.6 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

Address		Function Name	Data Range	Input Data			Notes
Attribute	Access			Data	Data Length (Byte)	Data type	
0x64	Get	Getting of charcter height	0 to 99	Null	Null	Null	
	Set	Setting of charcter 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	0 to 3	Null	Null	Null	
	Set	Setting of High-Speed print		High-Speed print Mode *	1	unsigned char	*High-Speed print mode 0:HM 1:NM 2:QM 3:SM
0x67	Get	Getting of charcter width	0 to 3999	Null	Null	Null	
	Set	Setting of charcter width		charcter 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 2	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
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	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	

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 99	Null	Null	Null	
	Set	Setting of print target width		width	1	unsigned int	
0x71	Get	Getting of actual print width	0 to 99	Null	Null	Null	
	Set	Setting of actual print width		width	1	unsigned int	
0x72	Get	Getting of repeat count	0 to 9999	Null	Null	Null	
	Set	Setting of repeat count		repeat count	2	unsigned int	
0x73	Get	Getting of repeat intervals	0 to 99999	Null	Null	Null	
	Set	Setting of repeat intervals		repeat 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	0,1	Null	Null	Null	
	Set	Setting of target sensor filter		sensor filter *	1	1	*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	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 drop charge rule	1	1	
0x78	Get	Getting of print start position adjustment value	-50 to +50	Null	Null	Null	
	Set	Setting of print start position adjustment value		Adjust value	2	short	

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 進数）	Data

6.7 Calendar function (Class code = 0x69)

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

List of Calendar Functions

Address		Function Name	Data Range	Input data			Notes
Attribute	Access			Data	Digit	Data Type	
0x65	Get	Getting of shift code condition	Null	Null	Null	Null	
0x66	Get	Getting of first calendar block number	0 to 8	Null	Null	Null	Set item number in "Item Count" of index function.
0x67	Get	Getting of calender block number in item	0 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)	2	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 disableed 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 disableed 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 disableed 1 : Enable(space) 2 : Enable(character justification)
	Set	Setting of Zero-suppression value (Day)		Mode No. *	1	unsigned char	

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

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 (Minite)		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 char	
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 char	
0x7B	Get	Getting of the time count start value	String 3 digits	Null	Null	Null	
	Set	Setting of the time count start value		3 digits (Unicode)	3	unsigned char	
0x7C	Get	Getting of the time count end value	String 3 digits	Null	Null	Null	
	Set	Setting of the time count end value		3 digits (Unicode)	3	unsigned char	
0x7D	Get	Getting of reset value of the time count.	String 3 digits	Null	Null	Null	
	Set	Setting of reset value of the time count.		3 digits (Unicode)	3	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	
	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	0 to 23	Null	Null	Null	Set item number in "Calendar block" of index function.
	Set	Setting of shift start time (Hour) value		Start Time (Hour)	1	unsigned char	
0x81	Get	Getting of shift start time (Minute) value	0 to 59	Null	Null	Null	Set item number in "Calendar block" of index function.
	Set	Setting of shift start time (Minute) value		Start Time (Minute)	1	unsigned char	
0x82	Get	Getting of shift end time (Hour) value	0 to 23	Null	Null	Null	Set item number in "Calendar block" of index function.
0x83	Get	Getting of shift end time (Minute) value	0 to 59	Null	Null	Null	Set item number in "Calendar block" of index function.
	Set	Setting of shift end time (Minute) value		End Time (Hour)	1	unsigned char	
0x84	Get	Getting of string value	Up to10 digits		Null	Null	Set item number in index function.
	Set	Setting of string value		String (Unicode)	Max 10	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

6.8 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 Technical manual "5.3.8 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)	Vert. size + Hori. size + Position No.	4	unsigned short + unsigned char	Refer to Technical manual "5.3.8 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（Charcter size code）
5	0x00 = register pattern number	Data

6.9 Substitution rules function (Class code = 0x6C)

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

List of Substitution Rules Functions

Address		Function Name	Data Range	Input data			Notes
Attribute	Access			Data	Data Length (Byte)	Data Type	
0x64	Get	Getting of substitution rules number	1 to 99	Null	Null	Null	Set item number in "Substitution rules setting" of index function.
	Set	Setting of substitution rules number		Number	1	unsigned char	
0x65	Get	Getting of substitution rules name	-	Null	Null	Null	Set item number in "Substitution rules setting" of index function.
	Set	Setting of substitution rules name	up to 13 digits	Charcter+ "00"	1	unsigned char	
0x66	Get	Gettinig of the start year	-	Null	Null	Null	Set item number in "Substitution rules setting" of index function.
	Set	Settinig of the start year	2000 to 2099	Year Data	2	unsigned char	
0x67	Get	Getting the character string of the substitution rules value(Year)	0 to 23	Null	Null	Null	Set item number in "Substitution rules setting" of index function.
	Set	Setting the character string of the substitution rules value(Year)		Number+ Charcter+ "00"	Max 3	unsigned short unsigned char	
0x68	Get	Getting the character string of the substitution rules value(Month)	1 to 12	Null	Null	Null	Set item number in "Substitution rules setting" of index function.
	Set	Setting the character string of the substitution rules value(Month)		Number+ Charcter+ "00"	Max 4	unsigned short unsigned char	
0x69	Get	Getting the character string of the substitution rules value(Day)	1 to 31	Null	Null	Null	Set item number in "Substitution rules setting" of index function.
	Set	Setting the character string of the substitution rules value(Day)		Number+ Charcter+ "00"	Max 3	unsigned short unsigned char	
0x6A	Get	Getting the character string of the substitution rules value(Hour)	0 to 23	Null	Null	Null	Set item number in "Substitution rules setting" of index function.
	Set	Setting the character string of the substitution rules value(Hour)		Number+ Charcter+ "00"	Max 3	unsigned short unsigned char	
0x6B	Get	Getting the character string of the substitution rules value(Minute)	0 to 59	Null	Null	Null	Set item number in "Substitution rules setting" of index function.
	Set	Setting the character string of the substitution rules value(Minute)		Number+ Charcter+ "00"	Max 4	unsigned short unsigned char	
0x6C	Get	Getting the character string of the substitution rules value(Week Number)	1 to 53	Null	Null	Null	Set item number in "Substitution rules setting" of index function.
	Set	Setting the character string of the substitution rules value(Week Number)		Number+ Charcter+ "00"	Max 4	unsigned short unsigned char	
0x6D	Get	Getting the character string of the substitution rules value (The day of the week)	1 to 7	Null	Null	Null	Set item number in "Substitution rules setting" of index function.
	Set	Setting the character string of the substitution rules value (The day of the week)		Number+ Charcter+ "00"	Max 4	unsigned short unsigned char	

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(Charcter)
6	0x42 = Unicode of character “B”	Data(Charcter)
7	0x00 = Termination code	Termination code

6.10 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: 2000-2037 Month:1-12 Day: 1 - 31 Hour: 0 - 23) Minute:0-59 Sec:0-59	-	-	-	
	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. (Setting 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	-	-	-	-	
0x6A	Get	Getting of circulation control setting value	-	-	-	-	
0x6B	Set	Setting of usage time of the circulation control	0 to 65099	Usage time	2	unsigned char	
0x6C	Set	Reset of usage time of the circulation control	-	-	-	-	

Example) When getting current time

№		
1	2	3
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

6.11 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	-	-	64 byte	unsigned char
0x6B	Get	Getting of model name information	Up to 12 byte	-	-	unsigned char
0x6C	Get	Getting of serial number	Up to 8 digits	-	-	unsigned char
0x6D	Get	Getting of ink name	Up to 28 digits	-	-	unsigned char
0x6E	Get	Getting of input mode information	1 to 2	-	-	unsigned char
0x6F	Get	Getting of maximum character count	240, 1000	-	-	unsigned short
0x70	Get	Getting of maximum registered message count	300, 2000	-	-	unsigned short
0x71	Get	Getting of barcode information	1 to 2	-	-	unsigned short
0x72	Get	Getting of usable character size information	-	-	-	unsigned char
0x73	Get	Getting of the maximum calendar and count numeber	3,8	-	-	unsigned char
0x74	Get	Getting of maimum substitution rule count	48,99	-	-	unsigned char
0x75	Get	Getting of shift code and time count information	0,99	-	-	unsigned char
0x76	Get	Getting of chimney and DIN print information	-	-	-	unsigned char
0x77	Get	Getting of maximum number of input line count	-	-	-	unsigned char
0x78	Get	Getting of basic software version information	-	-	-	unsigned char
0x79	Get	Getting of controller software version information	-	-	-	unsigned char
0x7A	Get	Getting of engine M software version information	-	-	-	unsigned char
0x7B	Get	Getting of engine S software version information	-	-	-	unsigned char
0x7C	Get	Getting of first langage version information	-	-	-	unsigned char
0x7D	Get	Getting of second langage version information	-	-	-	unsigned char
0x7E	Get	Getting of software option version information	-	-	-	unsigned char

Example) When getting serial number of IJ Printer

№		
1	2	3

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

6.12 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	-	-	-	unsigned short
0x65	Set	Setting of ink operating time	0 to 9999	time	2	unsigned short
	Get	Getting of ink operating time	-	-	-	unsigned short
0x66	Set	Setting of alarm time	0 to 9999	time	2	unsigned short
	Get	Getting of alarm time	-	-	-	unsigned short
0x67	Set	Setting of print count	0 to 9999	time	2	unsigned short
	Get	Getting of print count	-	-	-	unsigned short
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

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

6.13 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	0: No remote operation 1: Start remote operation 2: Stop remote operation 3: Deflection voltage control
0x66	Get	Getting of falut and warning history	1 to 90 1 to 10	Start No + count *	Null	const int	* Start No means the queue number and "count" means how many you want to get.
0x67	Get	Getting of operating condition	-	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
0x68	Get	Getting of warning condition	-	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.	1 to 90	Error No.	1	const unsigned int	
0x6B	Get	Getting of error code	1 to 90	Error No.	1	const unsigned int	
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	Get	Getting of online/offline state	0 to 1	state	1	int	0: Off-line 1: On-line
	Set	Setting of online/offline state		state	1	int	

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

6.14 Count function (Class code = 0x79)

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

List of Count Functions

Address		Function Name	Data Range	Input data			Notes
Attribute	Access			Data	Digit	Data Type	
0x66	Get	Getting of the number of count blocks in the item	0 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	Up to 20 bytes	unsigned char	
0x68	Get	Getting of count condition range 1	String 20 digits	Null	Null	Null	Set item number in "Count block" of index function.
	Set	Setting of count condition range 1		Initial value	20 bytes	unsigned char	
0x69	Get	Getting of count condition range 2	String 20 digits	Null	Null	Null	Set item number in "Count block" of index function.
	Set	Setting of count condition range 2		Initial value	20 bytes	unsigned char	
0x6A	Get	Getting of update unit (Halfway)	0 to 999999	Null	Null	Null	Set item number in "Count block" of index function.
	Set	Setting of undate unit (Halfway)		Setting value	20 bytes	unsigned char	
0x6B	Get	Getting of update unit (Unit)	0 to 999999	Null	Null	Null	Set item number in "Count block" of index function.
	Set	Setting of undate unit (Unit)		Setting value	20 bytes	unsigned char	
0x6C	Get	Getting of increment value	0 to 99	Null	Null	Null	Set item number in "Count block" of index function.
	Set	Setting of increment value		Setting value	2	unsigned char	
0x6D	Get	Getting of direction value	1 to 2	Null	Null	Null	Set item number in "Count block" of index function. * Setting value 1 : Up 2 : Down
	Set	Setting of direction value		Setting 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	20 bytes	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	20 bytes	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	20 bytes	unsigned char	
0x71	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)		Signal value *	1	unsigned char	
0x72	Get	Getting of availability of external count (Option)	0 to 1	Null	Null	Null	Set item number in "Count block" of index function. *Setting Value 0 : Disable 1 : Enable
	Set	Setting of availability of external count (Option)		Setting value *	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. *Setting Value 0 : Disable 1 : Enable
	Set	Setting of availability of Zero-suppression		Setting value *	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		Setting value	Up to 10 bytes	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		Setting value	Up to 4 bytes	unsigned char	

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(Charcter）
5	0x41 = Character（Unicode） "A" 0041	Data(Charcter）
6	0x41 = Character（Unicode） "A" 0041	Data(Charcter）
7	0x00 = Termination code	Termination code

7. 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.

7.1 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 360 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

#	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	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_Change Completed_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	Registered area	Target
12	TO_padding1	(Registration)	WORD	100	Registered area	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
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

#	Function Name	Content	Data Type	Size (byte)	Value	Data Update
23	TO_padding2	(Registration)	WORD	2	Registered area	Target
24	TO_NickNameNo	Nickname number	DWORD	4	Nickname number of print data being displayed (0 to 2000)	Target
25	TO_FinalPrintYear	Year	WORD	2	Current time: Year	Target
26	TO_FinalPrintMonth	Month	WORD	2	Current time: Month	Target
27	TO_FinalPrintDay	Day	WORD	2	Current time: Day	Target
28	TO_FinalPrintHour	Hour	WORD	2	Current time: Hour	Target
29	TO_FinalPrintMinute	Minute	WORD	2	Current time: Minute	Target
30	TO_FinalPrintSecond	Second	WORD	2	Current time: Second	Target

7.2 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 message 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”. 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.

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 “7.2.1 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.

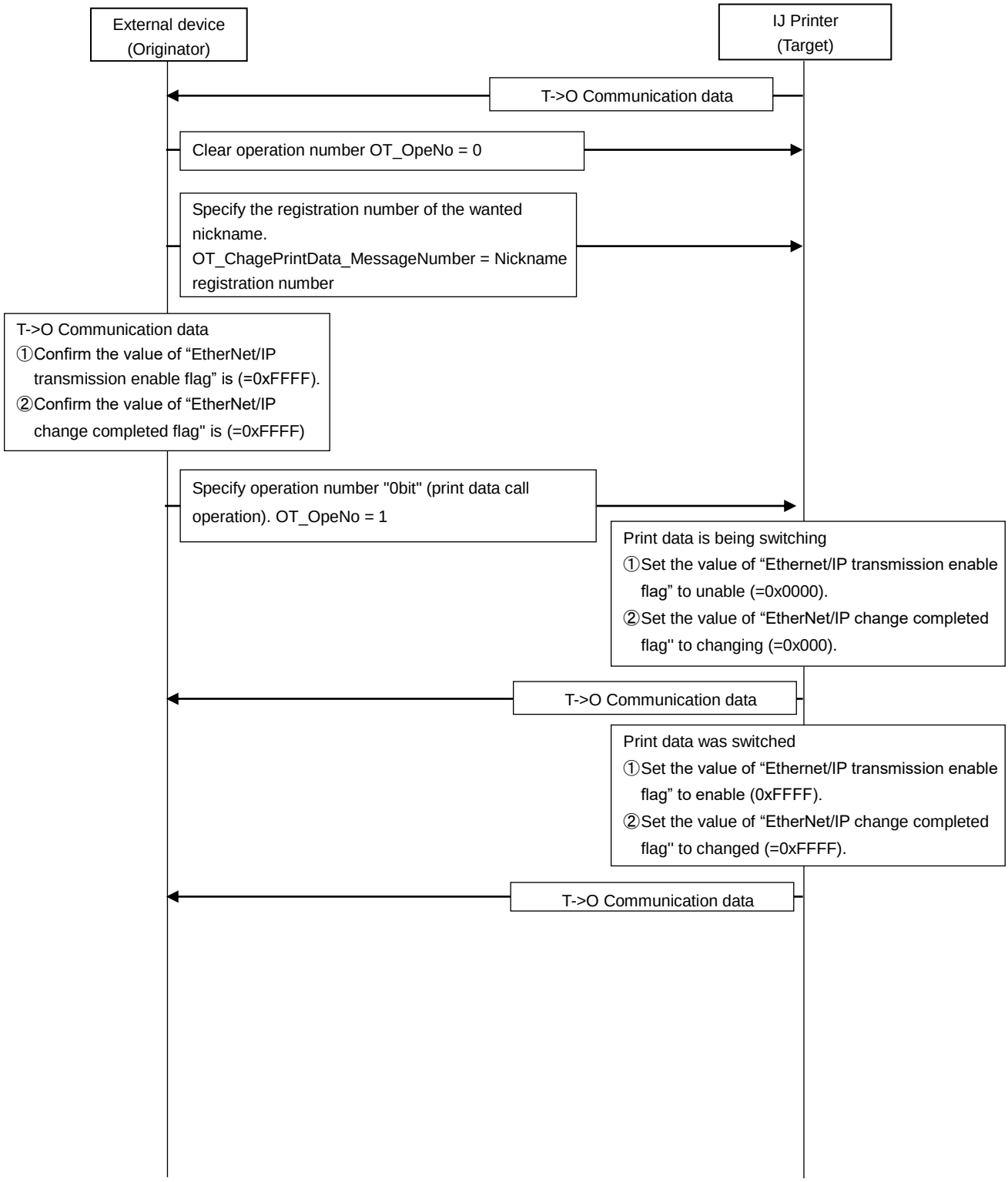
O->T Communication Data Map

#	Function Name	Content	Data Type	Size (byte)	Value
1	OT_OpeNo	Operation Number	WORD	2	Perform each operation with the bit rising. Multiple simultaneous operations are not possible. 0bit(=1): Operation of calling print data 1bit(=2): Operating of editing print data 2bit(=4): Operation of T->O print content switching 3bit(=8): Operation of T->O communication data update setting
2	OT_Set_Endianness	Setting value for endian switching	WORD	2	0x0000=Little endian 0xFFFF=Big endian
3	OT_padding0	(Registration)	WORD	2	Registered area
4	OT_padding1	(Registration)	WORD	2	Registered area
5	OT_ChagePrintData_ MessageNumber	Setting value/message number for print data switching	DWORD	4	0 to 2000
6	OT_InputPrintData_ IndexItemNo	Setting value/item number for inputting print content	DWORD	4	1 to 100
7	OT_InputPrintData_ String	Setting value/print content for inputting print content	WORD	200	Character encoding: UTF8 Maximum number of characters: 100
8	OT_TO_PrintString_ IndexItemNo	Setting value/print content for T->O print content switching	DWORD	4	1 to 100
9	OT_TO_DataUpdate	ON/OFF setting value for T->O print content switching	WORD	2	0x0000 = Update data 0xFFFF= Not update data
10	OT_padding2	(Registration)	WORD	2	Registered area
11	OT_padding3	(Registration)	WORD	2	Registered area

7.2.1 O->T Communication Transmission Procedure

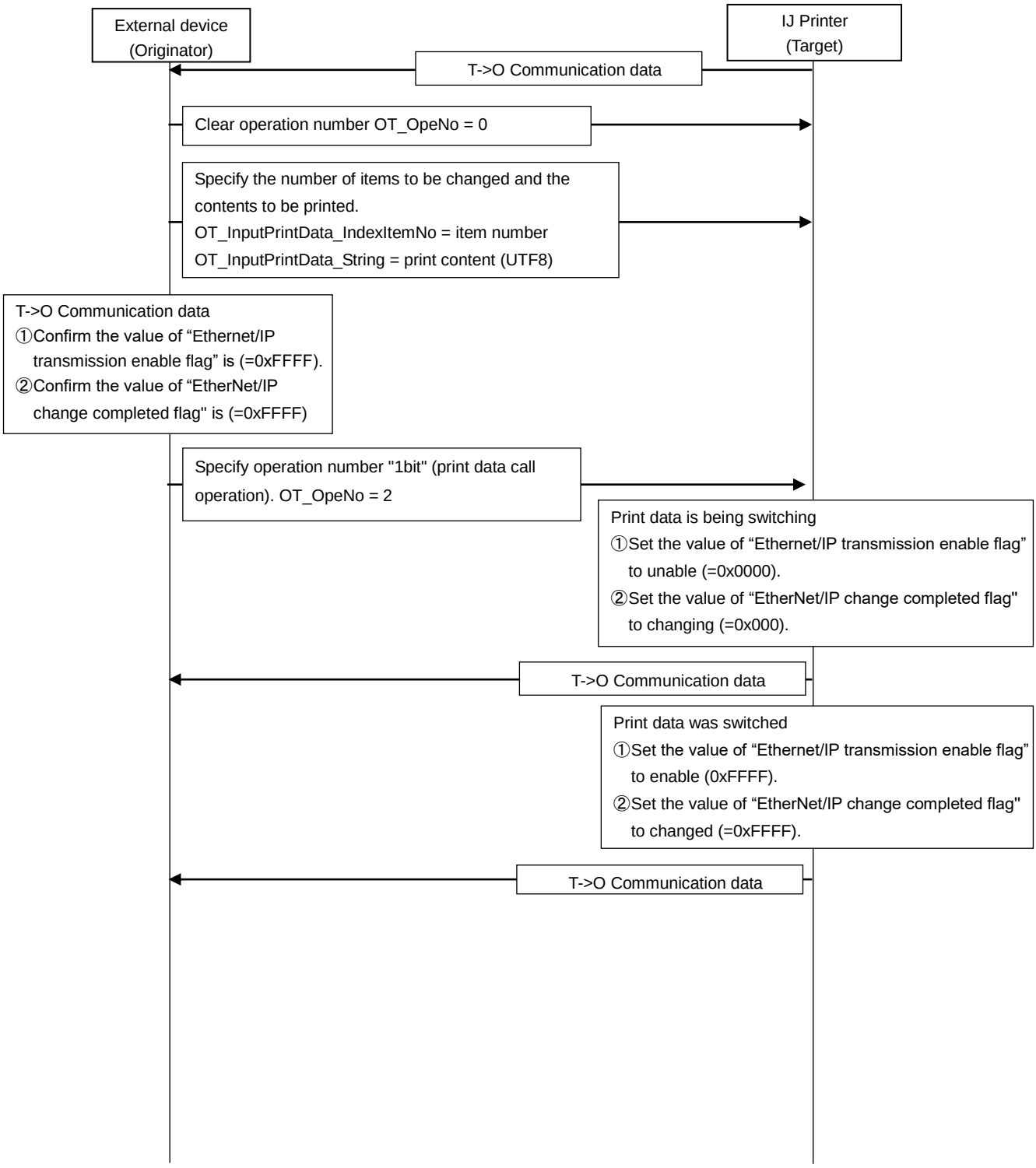
(1) Calling print data

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

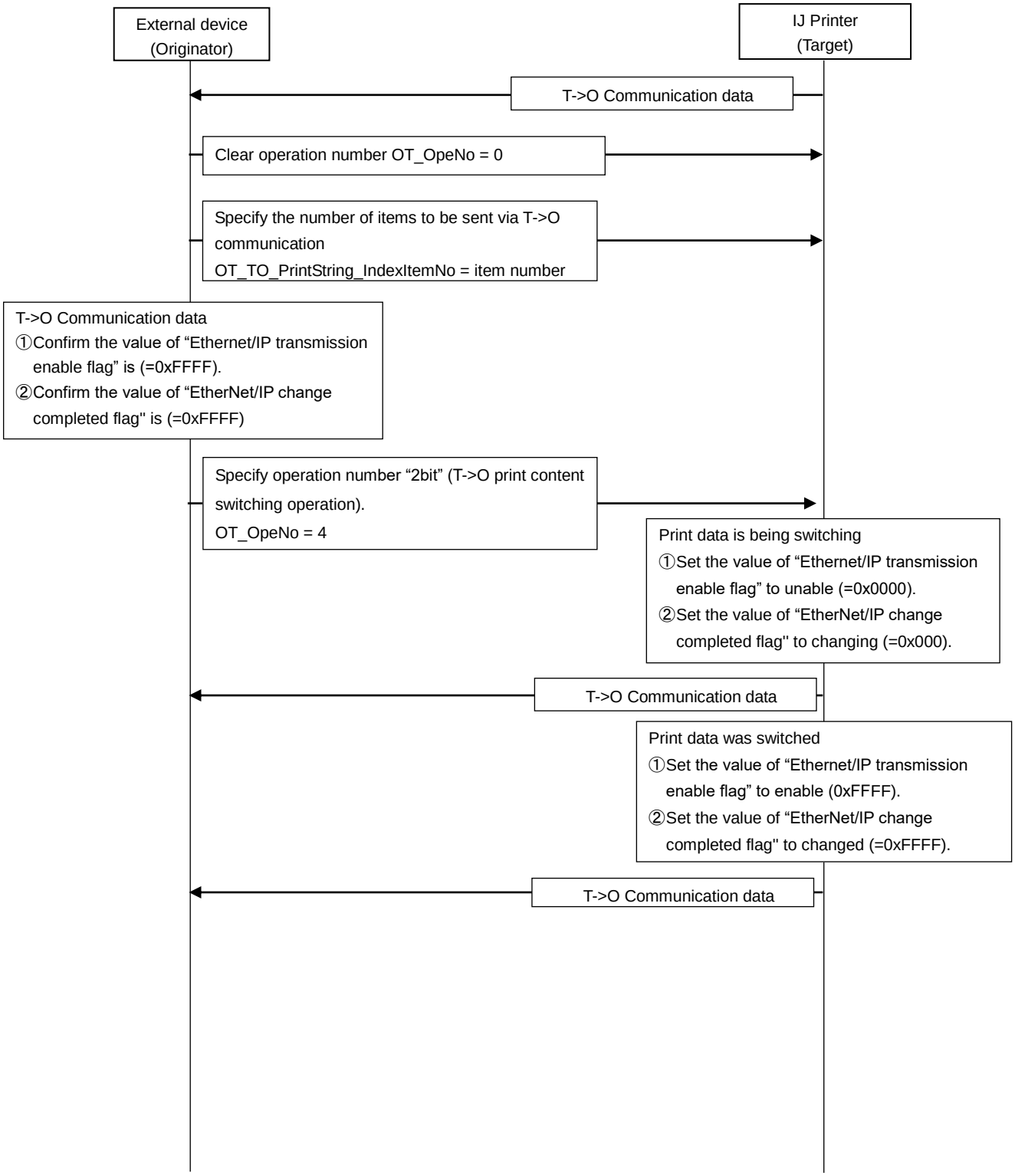


(2) Editing print data

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

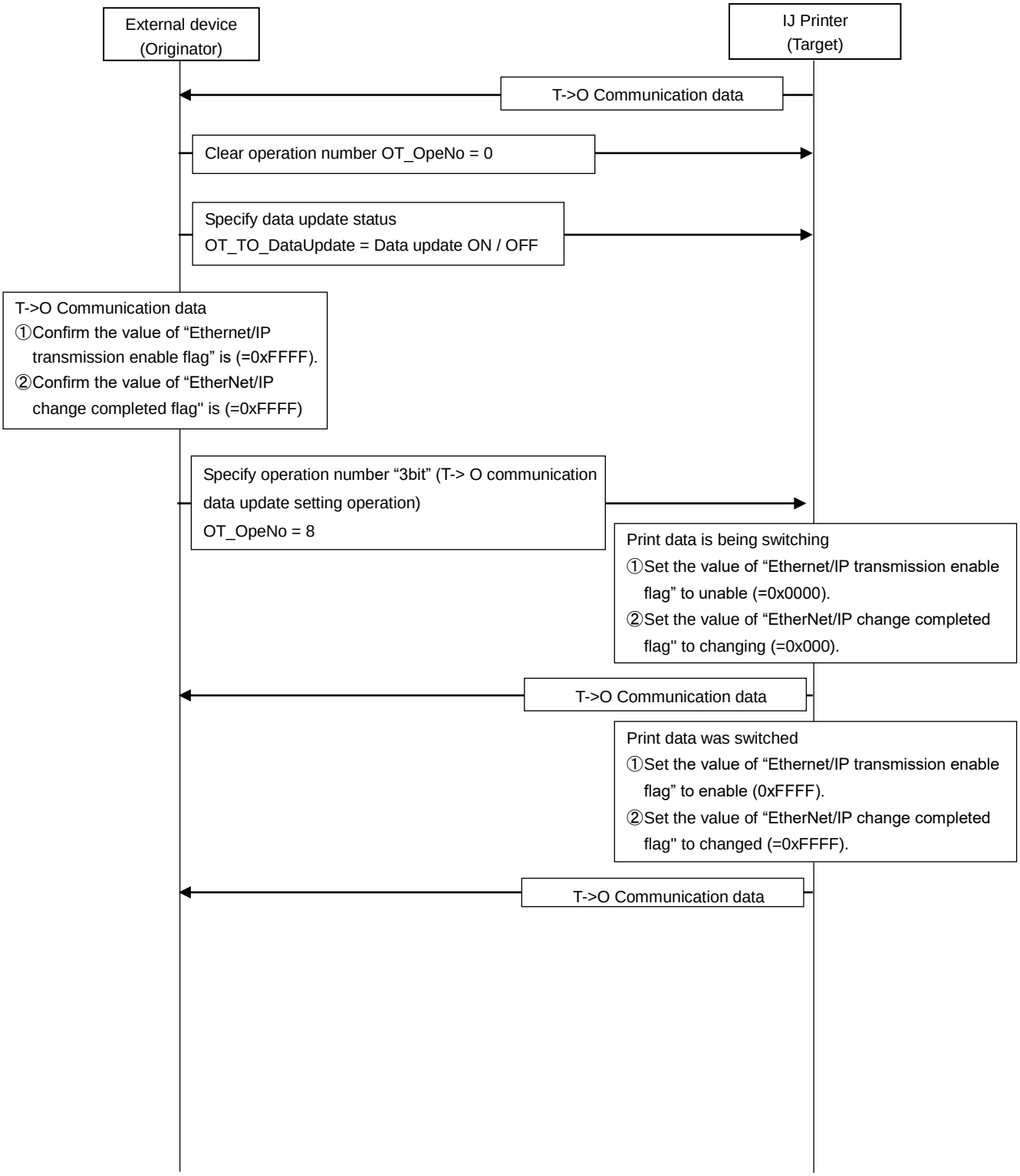


(3) Switch the print content by T->O communication
When using O->T communication to switch the print contents acquired by T->O communication, data transmission will be as follows.



(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.



8. IJ Printer detail code

8.1 Automatic reflection of Index function (Explicit message communication)

8.1.1 Instruction

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

The value 0 means automatic reflect is enabled. In this situation, the setting value which is sent from external device through EtherNet/IP will be reflected on IJ Printer directly after IJ Printer receives it.

The value 1 means automatic reflect is disabled. In this situation, the setting value which is sent from external device through EtherNet/IP will not be reflected on IJ Printer directly, the setting will be hold in IJ Printer memory until IJ Printer receives start/stop management flag = 2, then the setting will be reflected in IJ Printer. With this function users can change multiple settings of IJ Printer at the same time.

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.

8.1.2 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.
(“0x32” “0x68” “0x64” with setting value “0x10”)

↓

●The character height of IJ Printer changes to 16(0x10)

↓

Step 2: Send command “change character width to 50” to IJ Printer
(“0x32” “0x68” “0x67” with setting value “0x32”)

↓

●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.
(“0x32” “0x7A” “0x65” with setting value “1”)

↓

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

↓

○Character height of IJ Printer doesn’t change.

↓

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

↓

○Character width of IJ Printer doesn’t change.

↓

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

↓

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

8.2 Message editing (Explicit message communication)

8.2.1 Instruction

There are 2 message 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 message from the first character by using *"Set print character string"* function. Also, you can use *"Add characters to the end of current print message"* function to add characters to current print message without changing the current existing characters.

8.2.2 Examples

Case 1) Edit message from the first character

●Original setting of the IJ Pinter is as follows:
Current print message: ABC123

Step 1: Send command "change current message to Test1" to IJ Printer.
("0x32" "0x67" "0x71" with setting value "0x54" "0x65" "0x72" "0x73" "0x31" "0x00")
↓
●Current print message changes to: Test1

Unicode of Test1+ ending code

↓
Step 2: Send command "change current message to Test2" to IJ Printer.
("0x32" "0x67" "0x71" with setting value "0x54" "0x65" "0x72" "0x73" "0x32" "0x00")
↓
●Current print message changes to: Test2

Unicode of Test2+ ending code

Case 2) Add characters to current print message

●Original setting of the IJ Pinter is as follows:
Current print message: ABC123

Step 1: Send command "Add Test1 to current message" to IJ Printer.
("0x32" "0x67" "0x8A" with setting value "0x54" "0x65" "0x72" "0x73" "0x31" "0x00")
↓
●Current print message change to: ABC123Test1

Unicode of Test1+ ending code

↓
Step 2: Send command "Add Test2 to current message" to IJ Printer.
("0x32" "0x67" "0x8A" with setting value "0x54" "0x65" "0x72" "0x73" "0x31" "0x00")
↓

Unicode of Test2+ ending code

●Current print message 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 messages of up to 1000 characters.

8.3 Special characters (Explicit message communication / Implicit message communication (Cyclic communication))

8.3.1 Calendar characters

Calendar characters are supported by function *"Set print character string"* and *"Add characters at the end of current message".* 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 {{YY}/{MM}/{DD}/{hh}:{mm}}.

Example

Case 1) Edit message which contains calendar characters

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

Step 1: Send command "change current message to calendar characters YYMMDDhh " to IJ Printer.
("0x32" "0x67" "0x71" with setting value "0x7B" "0x7B" "0x59" "0x59" "0x4D" "0x4D" "0x44" "0x44" "0x68" "0x68" "0x7D" "0x7D" "0x00")

Unicode of {{YYMMDDhh}} + ending code

↓

●Current print message changes to calendar characters : YYMMDDhh

↓

Step 2: Send command "add current message with calendar characters mm" to IJ Printer.
("0x32" "0x67" "0x8A" with setting value "0x7B" "0x7B" "0x6D" "0x6D" "0x7D" "0x7D" "0x00")

Unicode of {{mm}} + ending code

↓

●Current print message changes to calendar characters: YYMMDDhhmm

8.3.2 Count characters

Count characters are supported by function *"Set print character string"* and *"Add characters at the end of current message".* 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 message which contains count characters

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

Step 1: Send command "change current message to count characters CCCC" IJ Printer.
("0x32" "0x67" "0x71" with setting value "0x7B" "0x7B" "0x43" "0x43" "0x43" "0x43" "0x7D" "0x7D" "0x00")

Unicode of {{CCCC}} + ending code

↓

●Current print message changes to count characters : CCCC

↓

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

Unicode of {{CC}} + ending code

↓

●Current print message changes to count characters: CCCCCC

8.3.3 Fixed user pattern characters

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

{X/0} {X/2} {X/3} … {X/197}{X/198}

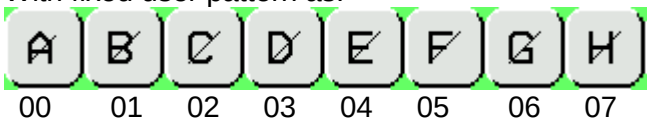
Example

Case 1) Edit message which contains fixed user pattern characters

●Original setting of the IJ Printer is as follows:

Current print message: ABC123

With fixed user pattern as:



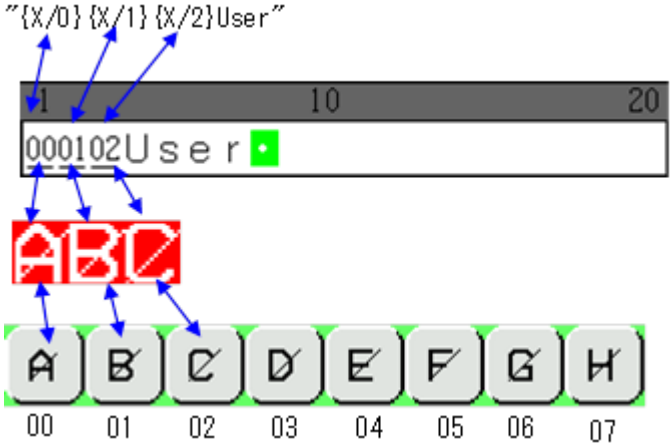
Step 1: Send command "change current message with fixed user pattern characters to 00 01 02User" to IJ Printer.

("0x32" "0x67" "0x71" with setting value "0x7B" "0x58" "0x2F" "0x30" "0x7D" "0x7B" "0x58" "0x2F" "0x31" "0x7D" "0x7B" "0x58" "0x2F" "0x32" "0x7D" "0x54" "0x73" "0x65" "0x72" "0x00")

↓

Unicode of{X/0}{X/1}{X/2}User + ending code

●Current print message changes to:



8.3.4 Free user pattern characters

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

{Z/0} {Z/2} {Z/3} … {Z/197}{Z/198}

Example

Case 1) Edit message which contains free user pattern characters

●Original setting of the IJ Printer is as follows:

Current print message: ABC123

With user pattern as:

00 01 02 03 04 05 06 07 08 09

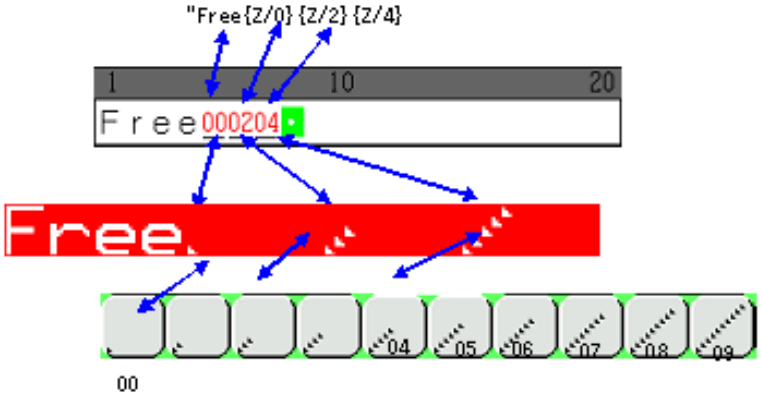
Step 1: Send command "change current message with free user pattern characters to Free00 02 04" to IJ Printer.

("0x32" "0x67" "0x71" with setting value "0x46" "0x72" "0x65" "0x65""0x7B" "0x5A" "0x2F" "0x30" "0x7D" "0x7B" "0x5A" "0x2F" "0x32" "0x7D" "0x7B" "0x58" "0x2F" "0x34" "0x7D" "0x00")

↓

Unicode of Free{X/0}{X/2}{X/4}+ ending code

●Current print message changes to:



8.3.5 Special keys for barcode

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

Those keys are represented as {fnc1}{codeb}{codec}{rs} {eot} or {FNC1}{CODEB}{CODEC}{RS} {EOT}.

Example

Case 1) Edit message which contains barcode

●Original setting of the IJ Printer is as follows:

Current print message is: QR (33x33) YYCCEEF

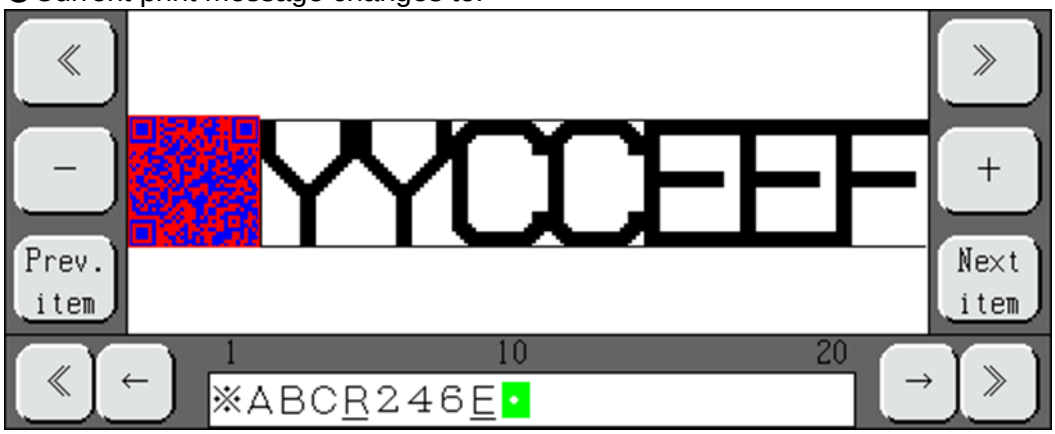
Step 1: Send command “set barcode characters as ＊ABCR246E” to IJ Printer.

(“0x32” “0x67” “0x71” with setting value “0x7B” “0x66” “0x6E” “0x63”“0x31” “0x7D” “0x41” “0x42” “0x43” “0x7B” “0x72” “0x73” “0x7D” “0x32” “0x34” “0x36” “0x7B” “0x65” ”0x6F” ”0x74” “0x7D” “0x00”)

↓

Unicode of {fnc1}ABC{rs}246{eot}+ ending code

●Current print message changes to:



8.4 Dot matrix code (Explicit message communication)

List of 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 : It can be set when the language input mode is "regional language" and "Japanese kanji" or "Chinese kanji" has been downloaded.

8.5 Barcode (Explicit message communication)

List of Barcode

Barcode No.	Barcode Type	Barcode Attribute
0	None	–
1	Code 39	–
2	ITF	–
3	NW-7	–
4	EAN-13(JAN-13)	No identification code
		Identification Code (5 x 5)
		Identification Code (5 x 7)
5	DM	(8 x 32)
6		(16 x 16)
7		(16 x 36)
8		(16 x 48)
9		(18 x 18)
10		(20 x 20)
11		(22 x 22)
12		(24 x 24)
13	Code 128	Code set B
14		Code set C
15	UPC-A	No identification code
		Identification Code (5 x 5)
		Identification Code (5 x 7)
16	UPC-E	No identification code
		Identification Code (5 x 5)
		Identification Code (5 x 7)
17	EAN-8(JAN-8)	No identification code
		Identification Code (5 x 5)
		Identification Code (5 x 7)
18	QR	(21 x 21)
19		(25 x 25)
20		(29 x 29)
21		(33 x 33)
22	EAN-13add-on5 (JAN-13add-on5)	Identification Code (5 x 5)
		Identification Code (5 x 7)
23	Micro QR (15 x 15)	–
24	GS1DataBarLimited.	No identification code
		Identification Code (5 x 5)
		Identification Code (5 x 7)
25	GS1DataBarOmnidirec.	–
26	GS1DataBarStacked.	No identification code
		Identification Code (5 x 5)
		Identification Code (5 x 7)
27	DM(14 x 14)	(14 x 14)

8.6 External communication error code

List of External Communication Error Codes

Error Code	Content	Confirm item
102	・IJ Printer has already executed a command by another communication. ・Settings by communication have not been confirmed.	・Check the procedure for simultaneous use of message communication and cyclic communication. ・Check whether the confirmation process by communication is complete.
103	An invalid value is setting for IJ Printer.	Check the communication format.
200	Communication is being tried when the IJ Printer is offline.	Check the online state of IJ Printer. Set the IJ Printer to online status.
206	IJ Printer is tried to start in a state other than pause.	Check the state of IJ Printer.
208	Ink is being stopped when the IJ Printer is paused.	Check the state of IJ Printer.
209	The deflection voltage is being settled when the IJ Printer is the standby or ready state.	Check the state of IJ Printer.