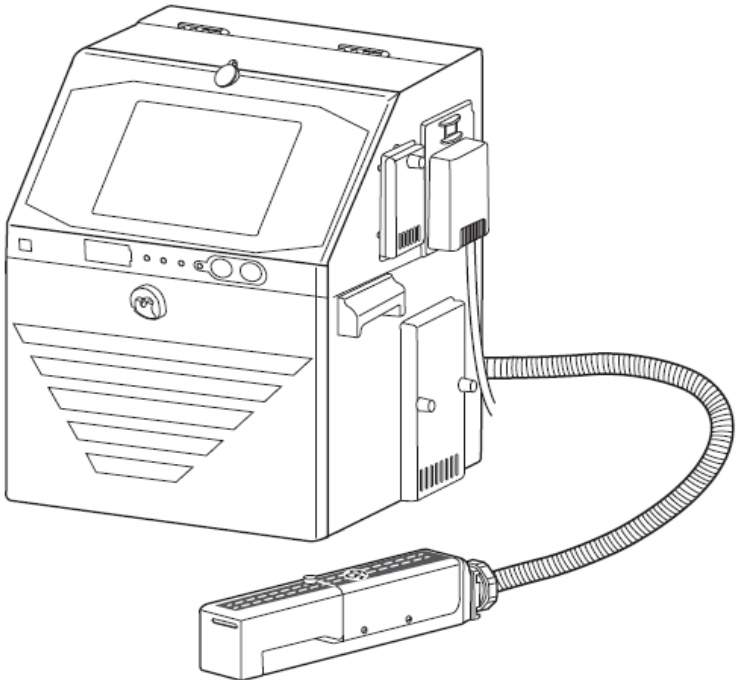
2nd edition

Instruction Manual for LAN Communication Modbus

Ethernet Communication

HITACHI IJ Printer

Model UX Twin-Nozzle



Thank you for purchasing the Hitachi IJ Printer Model UX Twin Nozzle.
This instruction manual describes the Ethernet communication (LAN Communication Modbus) function. For other features of the printer, please refer to Instruction manual or Technical manual.
If the printer is improperly handled or maintained, it may not operate smoothly and may become defective or cause an accident. It is therefore essential that you read this manual to gain a complete understanding of the printer and use it correctly.
After thoroughly reading the manual, properly store it for future reference.

HITACHI

Table of Contents

1. Ethernet communication (LAN communication Modbus) function

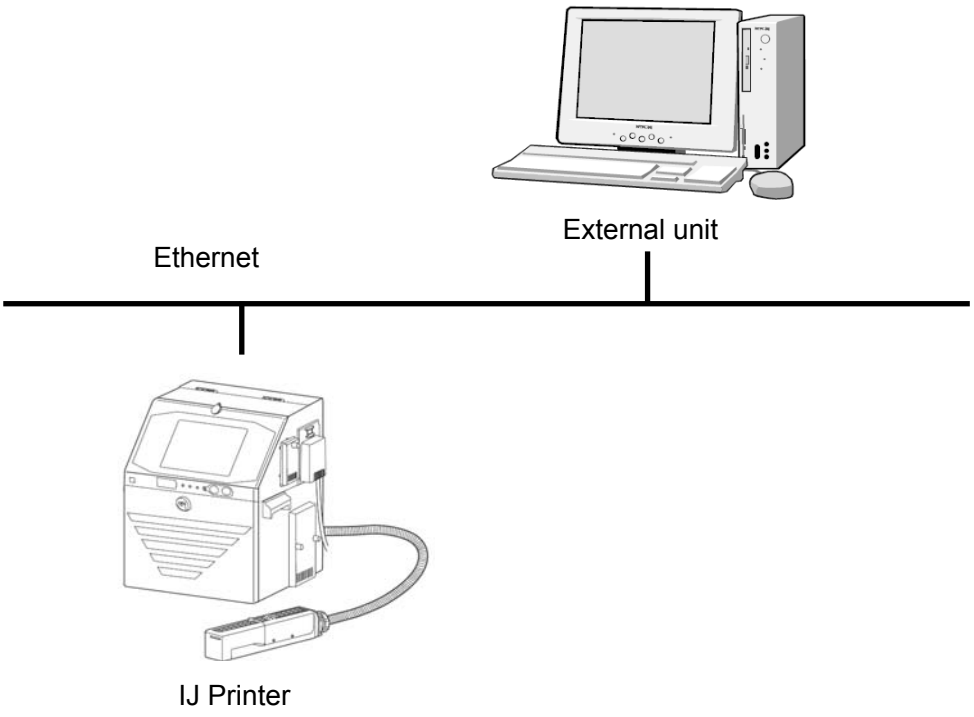
(1) Overview

- Function for Ethernet communication between the IJ Printer and external unit employing a LAN environment.
- Type of Ethernet communication can be selected from Modbus communication.
- Modbus communication require development of a communication program on the external unit side.
  For the development purpose of communication program, IJP control library will be provided as a development kit.

List of functions

No.	Function name	Description
1	Modbus communication	Supports Modbus protocol. Because Modbus protocol is one type of protocol commonly used by industrial equipment, if Modbus communication is employed for other unit, you can create a communications program for the external unit using this asset. When the communication program is newly developed, its development schedule will be shortened with use of IJP control library.

(2) Configuration diagram



Standard specifications

Item	Specifications
Ethernet standards	IEEE802.3 compatible, 10BASE-T, 100BASE-T
Protocol	TCP/IP
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

(1) Connect to Intranet LAN

No.	Work	Remarks
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.	

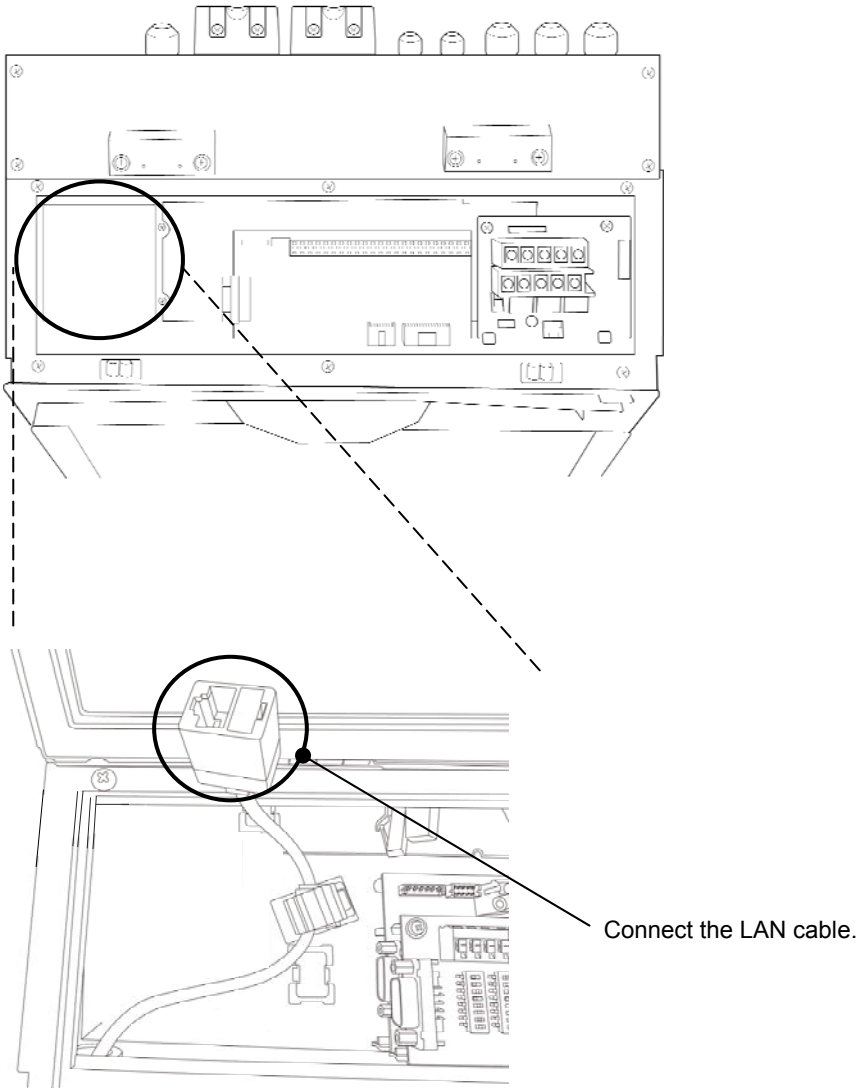
(2) Connect from outside the company

No.	Work	Remarks
1	After concluding a contract with a provider, you should obtain a fixed IP address from the provider.	
2	If using a telephone line, a contract for service such as ADSL is required. If not using a telephone line, a mobile environment is required. You also need a router that supports a mobile card.	
3	Set the network settings as instructed by the provider's manual.	

2.2 IJ Printer preparations

No.	Work	Remarks
1	Connect the IJ Printer to the Ethernet (computer or hub, etc.) with a LAN cable.	Refer to 2.3 LAN cable connection.
2	Set the communication environment on the IJ Printer's screen.	Refer to 2.4 Setting the communication environment.
3	Conduct a connection test if necessary.	Refer to 3.Connection test.

2.3 LAN cable connection



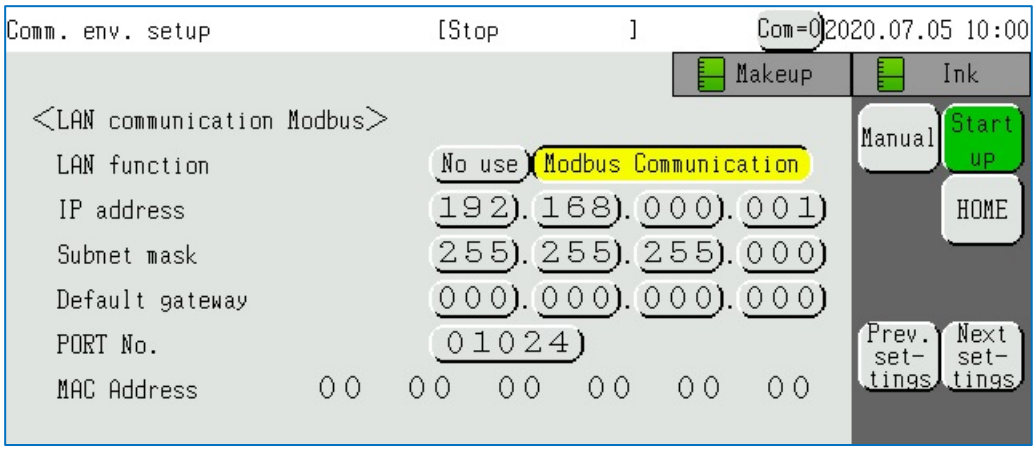
[I/O section (with cover removed)]

2.4 Setting the communication environment

- Set the LAN function on communication environment setup screen to "Modbus communication".

Setting item of communication environment setup screen

Setting item	Description
LAN function	● No use: Modbus communication function cannot be used. ● Modbus Communication: Modbus communication function can be used.
IP address	Sets IJ Printer's IP address.
Subnet mask	Sets IJ Printer's Subnet mask.
Default gateway	Sets IJ Printer's Default gateway.
PORT No.	Sets IJ Printer's PORT No.
MAC address	Displays IJ Printer's MAC address.



Example communication environment setup screen

2.5 Usage precautions

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

List of functions which are not operational during the use of this function

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

(2) Functions listed below are not supported by this function.

List of functions which are not supported by this function

No	Function
1	More than one of Calendar/Count blocks can not be set in one item.
2	Barcode can not be set in Calendar/Count block.
3	"Overall setup" of "Format setup" can Not be used.
4	"5x5(Nozzle1)" and "5x7(Nozzle1)" of "EAN readable code" can Not be used.
5	Kanji characters can not be used.

Glossary

Term	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. Port numbers 502 or 1024-65535 are used as the sub-address.
MAC address (Media Access Control address)	MAC address is the one to identify the device on a network. MAC address consists of 12 digits such as 01-23-45-67-89-AB.

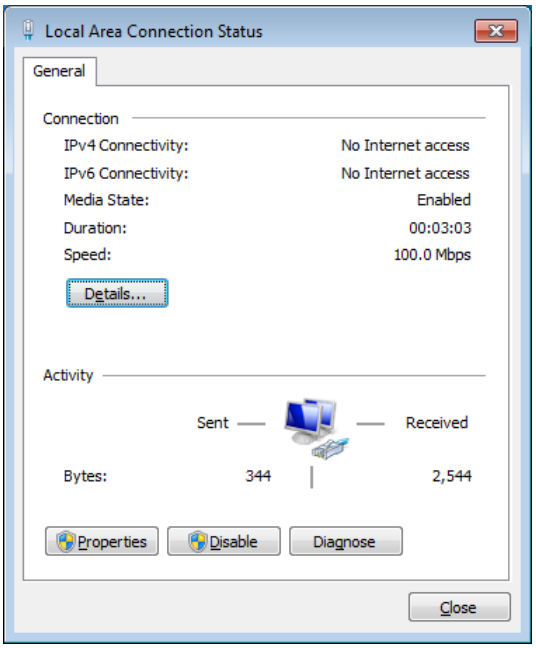
3. Connection test

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

3.1 Procedure for connection test

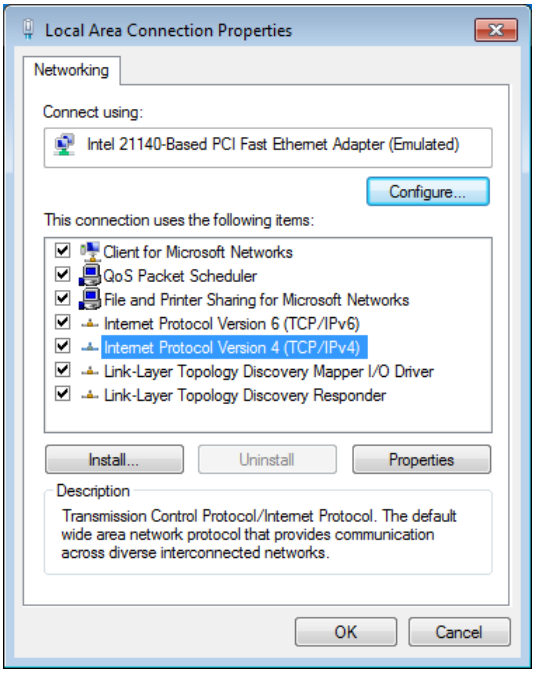
1 Directly connect the IJ Printer to the PC with a LAN cable.

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.

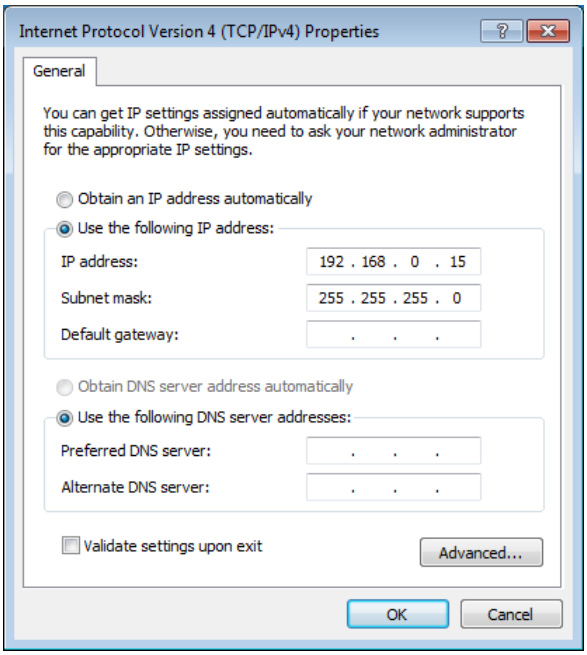


(Example using Windows 7 OS)

3 Click [Properties].

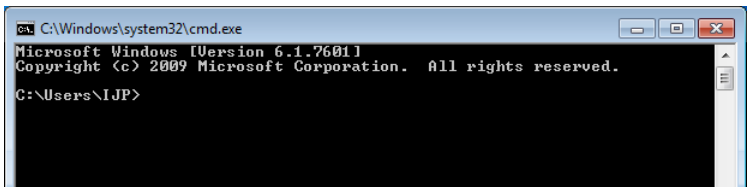


4 Click [Internet Protocol Version 4 (TCP/IPv4)].

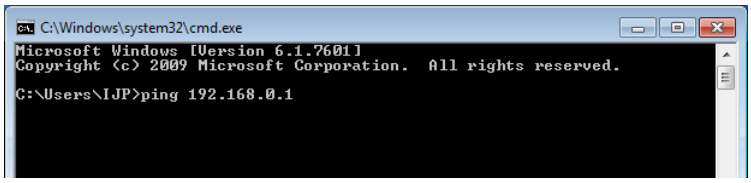


5 Select [Use the following IP address], and enter an IP address other than 192.168.0.1 and 192.168.0.255 (the example shown in the figure uses 192.168.0.15) and then enter 255.255.255.0 in the Subnet mask field. Click [OK].

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



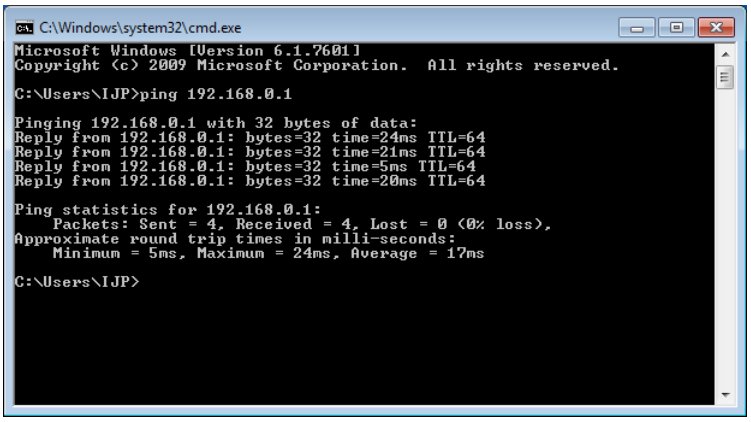
Select [Start Menu] > [All Programs] > [Accessories] > [Command prompt] to open the Command Prompt window.



Type the following command:

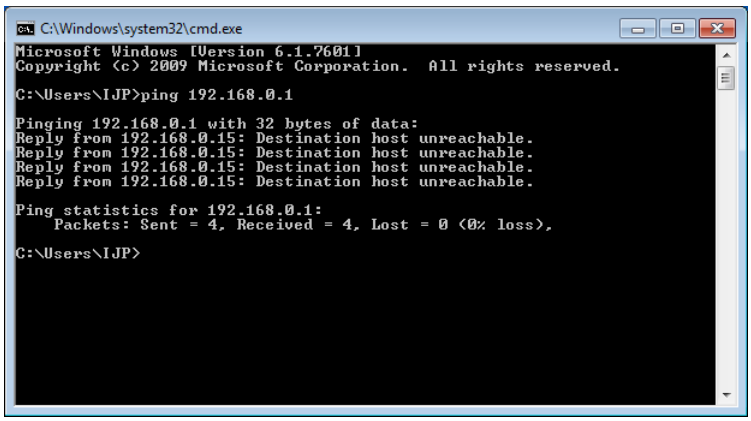
Ping 192.168.0.1

Note:
This command is not case sensitive.



Byte=32 time=24ms ..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:

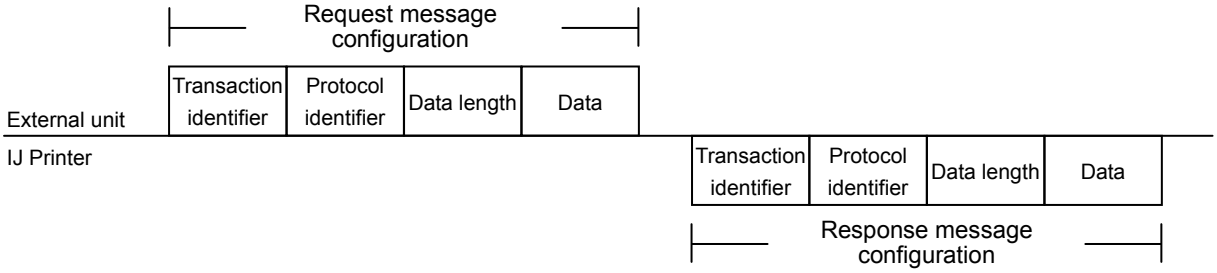
[Check points]
* Have the communication settings of the IJ Printer been changed?
* Are the network settings of the external unit correct?

4. Modbus communication

4.1 Overview

- Function that supports Modbus protocol. Modbus protocol specifications have been globally disclosed; Modbus protocol is one of the most common types of communication protocol.
- Modbus protocol does not support messages autonomously output by the IJ Printer such as status or printing contents.

4.2 Transmission procedure



No.	Name	Size	Setting range	Description
1	Transaction identifier	2 bytes	0x0000 to 0xFFFF	The IJ Printer returns the transaction identifier received from external unit as it is. You should use the identifier to manage messages for external unit.
2	Protocol identifier	2 bytes	0x0000	Sets protocol identifier. Set protocol identifier to 0x0000. The IJ Printer returns the protocol identifier received from external unit as it is.
3	Data length	2 bytes	0x0000 to 0x00FF	Sets number of bytes for request data and response data.
4	Data	3 to 255 bytes	-	Because message format differs according to the function code specified, data size is variable refer to 4.3 Message format for details.

4.3 Message format

(1) Function code

The IJ Printer supports the function code given in the following table.

Function code

No.	Function code	Function
1	0x10	Write Multiple Registers
2	0x06	Write Single Register
3	0x03	Read Holding Registers
4	0x04	Read Input Registers

(2) Device address

Addresses are color-coded as shown in 4.4 Data configuration.
IJ Printer operates as described below with the device address which is specified.

Operation when a data is written

№	Color of address	Device address	Description
1		0x01	Write into device.
		0x02	Write into device.
		0x03	Write into device.
2		0x01	Write into Nozzle 1.
		0x02	Write into Nozzle 2.
		0x03	Error response.
3		0x01	Write into Nozzle 1.
		0x02	Write into Nozzle 2.
		0x03	Write into both Nozzle 1 and Nozzle 2.

Operation when a data is read

№	Color of address	Device address	Description
1		0x01	Read from device.
		0x02	Read from device.
		0x03	Read from device.
2		0x01	Read from Nozzle 1.
		0x02	Read from Nozzle 2.
		0x03	Error response.
3		0x01	Read from Nozzle 1.
		0x02	Read from Nozzle 2.
		0x03	Read from Nozzle 1.

: Unique data of IJ Printer as a device.
: Data existing for each Nozzle of IJ Printer.

(3) Message format for Write Multiple Registers (Function code: 0x10)

- Writes contents in the Holding Register to reflect it in the IJ Printer.
- The maximum number of bytes that can be written in the Holding Register per time is 246 bytes; if this number is exceeded, you must divide the data into smaller segments while updating the starting address each time.
- When the writing operation onto Holding Registers is made more than once, 0x0001 (Start) shall be written first on the control flag which is placed in the first address 0x0000 of Holding Registers. Then conduct writing more than once and finally write 0x0002 (Stop) onto the control flag. When 0x0002 (Stop) is written on the control flag, the data being written on Holding Registers will be reflected to IJ printer.

Request message configuration

No.	Name	Size	Range	Description
1	Device address	1 byte	0x01 to 0x03	Sets device address.
2	Function code	1 byte	0x10	Sets function code (Write Multiple Registers).
3	Start address	2 bytes	0x0000 to 0xFFFF	Sets writing start address. Address is set in word units.
4	No. of words to be written	2 bytes	1 to 123	Sets number of words to be written.
5	No. of bytes to be written	1 byte	1 to 246	Sets number of bytes to be written.
6	Data to be written	2 to 246 bytes	0x0000 to 0xFFFF	Sets data to be written (variable length of 2 to 246 bytes). 0x00 is added to the end when data of uneven byte length is set.

Response message data configuration (normal)

No.	Name	Size	Range	Description
1	Device address	1 byte	0x01 to 0x03	Sets device address received as it is.
2	Function code	1 byte	0x10	Sets function code received as it is.
3	Start address	2 bytes	0x0000 to 0xFFFF	Sets start address received as it is.
4	No. of words to be written	2 bytes	1 to 123	Sets No. of words to be written received as it is.

Response message data configuration (abnormal)

No.	Name	Size	Range	Description
1	Device address	1 byte	0x01 to 0x03	Sets device address received as it is.
2	Function code	1 byte	0x90	Adds 0x80 to function code received.
3	Error code	1 byte	0x01 to 0x03	Sets error code. Error code differs according to cause.

(4) Message format for Write Single Register (Function code: 0x06)

- Write a content in the Holding Register to reflect it in the IJ Printer.
- The number of bytes that can be written in the Holding Register per time is fixed to 2 bytes.

Request message configuration

No.	Name	Size	Range	Description
1	Device address	1 byte	0x01 to 0x03	Sets device address.
2	Function code	1 byte	0x06	Sets function code (Write Single Register).
3	Writing address	2 bytes	0x0000 to 0xFFFF	Sets writing address. Address is set in word units.
4	Data to be written	2 bytes	0x0000 to 0xFFFF	Sets data to be written.

Response message data configuration (normal)

No.	Name	Size	Range	Description
1	Device address	1 byte	0x01 to 0x03	Sets device address received as it is.
2	Function code	1 byte	0x06	Sets function code received as it is.
3	Writing address	2 bytes	0x0000 to 0xFFFF	Sets writing address received as it is.
4	Data to be written	2 bytes	0x0000 to 0xFFFF	Sets data to be written received as it is.

Response message data configuration (abnormal)

No.	Name	Size	Range	Description
1	Device address	1 byte	0x01 to 0x03	Sets device address received as it is.
2	Function code	1 byte	0x86	Adds 0x80 to function code received.
3	Error code	1 byte	0x01 to 0x03	Sets error code. Error code differs according to cause.

(5) Message format for Read Holding Registers (Function code: 0x03)

- This function will be used to read the item data of IJ printer, which is readable and writable.
- The maximum number of bytes that can be read in the Holding Register per time is 250 bytes; if this number is exceeded, you must divide the data into smaller segments while updating the starting address each time.

Request message configuration

No.	Name	Size	Range	Description
1	Device address	1 byte	0x01 to 0x03	Sets device address.
2	Function code	1 byte	0x03	Sets function code (Read Holding Registers).
3	Start address	2 bytes	0x0000 to 0xFFFF	Sets reading start address. Address is set in word units.
4	No. of words to be read	2 bytes	1 to 125.	Sets number of words to be read.

Response message data configuration (normal)

No.	Name	Size	Range	Description
1	Device address	1 byte	0x01 to 0x03	Sets device address received as it is.
2	Function code	1 byte	0x03	Sets function code received as it is.
3	No. of bytes to be read	1 byte	2 to 250	Sets number of data bytes to be read.
4	Data to be read	2 to 250 bytes	0x0000 to 0xFFFF	Sets data to be read (variable length of 2 to 250 bytes).

Response message data configuration (abnormal)

No.	Name	Size	Range	Description
1	Device address	1 byte	0x01 to 0x03	Sets device address received as it is.
2	Function code	1 byte	0x83	Adds 0x80 to function code received.
3	Error code	1 byte	0x01 to 0x03	Sets error code. Error code differs according to cause.

(6) Message format for Read Input Registers (Function code: 0x04)

- This function will be used to read the item data of IJ printer, which is read only, or used to read the status of IJ printer.
- The maximum number of bytes that can be read in the Input Register per time is 250 bytes; if this number is exceeded, you must divide the data into smaller segments while updating the starting address each time.

Request message configuration

No.	Name	Size	Range	Description
1	Device address	1 byte	0x01 to 0x03	Sets device address.
2	Function code	1 byte	0x04	Sets function code (Read Input Registers).
3	Start address	2 bytes	0x0000 to 0xFFFF	Sets reading start address. Address is set in word units.
4	No. of words to be read	2 bytes	1 to 125	Sets number of words to be read.

Response message data configuration (normal)

No.	Name	Size	Range	Description
1	Device address	1 byte	0x01 to 0x03	Sets device address received as it is.
2	Function code	1 byte	0x04	Sets function code received as it is.
3	No. of bytes to be read	1 byte	2 to 250	Sets number of data bytes to be read.
4	Data to be read	2 to 250 bytes	0x0000 to 0xFFFF	Sets data to be read (variable length of 2 to 250 bytes).

Response message data configuration (abnormal)

No.	Name	Size	Range	Description
1	Device address	1 byte	0x01 to 0x03	Sets device address received as it is.
2	Function code	1 byte	0x84	Adds 0x80 to function code received.
3	Error code	1 byte	0x01 to 0x03	Sets error code. Error code differs according to cause.

(7) Error code

Error code

No.	Name	Code	Conditions
1	Illegal function code	0x01	Function code not yet supported is set.
2	Illegal address	0x02	Illegal address is set.
3	Illegal data	0x03	Illegal data is set.

4.4 Data configuration

Data configuration of Holding Registers and Input Registers for IJ Printer is indicated.

(1) Holding Registers

Holding Registers are the area which is written by Write Multiple Registers (0x10) or Write Single Register (0x06) and read by Read Holding Registers (0x03).

The item data which can be set to IJ printer or can be obtained from IJ printer are all placed in Holding Registers.

Holding Registers can be read and be written by one (1) word (2 bytes) fixed at every address.

Holding Register data configuration (1/13)

Word address	Classification	Item name	Setting range	Contents
00 00	Index	Start/Stop control flag	1 , 2	Start/Stop flag is used when Holding Register is written more than once. First write “1” and write Holding Registers more than once and finally write “2”. Then all the written contents will be reflected to IJ Printer. Start/Stop flag is not used when Holding Register is written only once. [1:Start; 2:Stop]
00 01 … 00 07		Reserve_1 … Reserve_7	-	"Reserve" is not initially provided, but may be added in future.
00 08		Number of the printing items	1 to 50	Set the number of the printing items used.
00 09 … 00 0F		Reserve_1 … Reserve_7	-	"Reserve" is not initially provided, but may be added in future.
00 10		Specify Print message registration number	0 to 2000	Set Print message information at Input Register address 0x0E40, which Print message registration number is specified here. When “0” is specified, the print message information of the print message which is being edited will be set.
00 11		Specify Character position for the Inter-character space obtained	1 to 500	Set Inter-character space at Input Register address 0x0EF1, which Character position is specified here.
00 12		Specify Substitution rules number	1 to 99	Set Substitution rules data at Holding Register address 0x1AC0, which Substitution rules number is specified here.
00 13		Specify User pattern character size	1 to 13	Set User pattern registration information at Holding Register address 0x2D00, which Character size is specified here. 1:4x5, 2:5x5, 3:5x8(5x7), 4:9x8(9x7), 5:7x10, 6:10x12, 7:12x16, 8:18x24, 9:24x32, 10:11x11, 11:5x3(chimney), 12:5x5(chimney), 13:7x5(chimney),
00 14		Specify Group number	1 to 99	Set Group information at Input Register address 0x0ED0, which Group number is specified here.
00 15 … 00 1F		Reserve_1 … Reserve_11	-	"Reserve" is not initially provided, but may be added in future.

Holding Register data configuration (2/13)

Word address	Classification	Item name	Setting range	Contents
00 20	Print contents	Character count(Print item 1)	1 to 500	Sets the character count for each print item.
00 21		Character count(Print item 2)	1 to 500	
…		…	…	
00 50		Character count(Print item 49)	1 to 500	
00 51		Character count(Print item 50)	1 to 500	
00 52 … 00 83		Reserve_1 … Reserve_50	-	"Reserve" is not initially provided, but may be added in future.
00 84		Attribute(1st digit)	0x0000 to 0xFFFF	Set the characters of Print contents. Character codes are the same as those which are used in Standard communication. Please refer to Technical Manual, Section 5 Communication, for details. In case of setting Calendar/Count characters, set to Character attribute, or if they are NOT Calendar/Count characters, set to Character code.
00 85		Character code(1st digit)	0x0020 to 0xFFFF	
…		…	…	
04 6A		Attribute(500th digit)	0x0000 to 0xFFFF	
04 6B		Character code(500th digit)	0x0020 to 0xFFFF	
04 6C … 0F FF		Reserve_1 … Reserve_2964	-	"Reserve" is not initially provided, but may be added in future.
10 00	Printings erasure	Printing erase item number	1 to 50	Sets the printing item number to erase printing contents.
10 01 … 10 05		Reserve_1 … Reserve_5	-	"Reserve" is not initially provided, but may be added in future.
10 06	Print data recall	Print data message number	1 to 2000	Set the registered print message number to be recalled.
10 07 … 10 0B		Reserve_1 … Reserve_5	-	"Reserve" is not initially provided, but may be added in future.
10 0C	Print data registration	Group number	0 to 99	Register the being edited print message by the specified Group number or by the registered print message number or by the message name.
10 0D		Print data message number	1 to 2000	
10 0E		Message name(1st digit)	0x0020 to 0xFFFF	
10 0F		Message name(2nd digit)	0x0020 to 0xFFFF	
…		…	…	
10 18		Message name(11th digit)	0x0020 to 0xFFFF	
10 19		Message name(12th digit)	0x0020 to 0xFFFF	
10 1A … 10 1F		Reserve_1 … Reserve_6	-	"Reserve" is not initially provided, but may be added in future.
10 20	Print format	Line count / print format uniformity	0 , 1	Line count of all columns are made uniform based on the first column.
10 21		Insert column	1 to 50	Adds a column directly before the editing objective column.
10 22		Delete column	1 to 50	Deletes all the print items of the editing objective column.
10 23		Add column	1 to 50	Adds a column at the end.
10 24		Individual column setup (Column position)	1 to 50	Changing the number of lines of the editing objective column.
10 25		Individual column setup (Line count)	1 to 4	
10 26 10 27		Reserve_1 Reserve_2	-	"Reserve" is not initially provided, but may be added in future.

Holding Register data configuration (3/13)

Word address	Classification	Item name	Setting range	Contents
10 28	Print format	Adjust Inter-character space (Start)	1 to 500	Inter-character space can be set in character units.
10 29		Adjust Inter-character space (End)	1 to 500	
10 2A		Adjust Inter-character space (Setting value)	0 to 28	
10 2B … 10 3E		Reserve_1 … Reserve_20	-	"Reserve" is not initially provided, but may be added in future.
10 3F		Format Setup	1 to 3	Sets the Format Setup. 1:Individual setup , 2:Overall setup 3:Free layout
10 40		Line count	1 to 4	Sets the line count of the print item 1.
10 41		Line spacing	0 to 2	Sets the line spacing of the print item 1.
10 42		Character size	1 to 13	Sets the character size of the print item 1. 1:4x5 , 2:5x5 , 3:5x8(5x7) 4:9x8(9x7) , 5:7x10 , 6:10x12 7:12x16 , 8:18x24 , 9:24x32 10:11x11 , 11:5x3(chimney) 12:5x5(chimney), 13:7x5(chimney)
10 43		Inter-character space	0 to 28	Sets the inter-character space of the print item 1.
10 44		Bold	1 to 9	Sets the bold of the print item 1.
10 45		Bar code	0 to 26	Sets the bar code of the print item 1. 0:none , 1:Code 39 , 2:ITF 3:NW-7 , 4:EAN-13 , 5:DM8x32 6:DM16x16 , 7:DM16x36 8:DM16x48 , 9:DM18x18 10:DM20x20 , 11:DM22x22 12:DM24x24 13:Code 128 (Code set B) 14:Code 128 (Code set C) 15:UPC-A , 16:UPC-E , 17:EAN-8 18:QR21x21 , 19:QR25x25 20:QR29x29 , 22:EAN-13add-on 5 23:MicroQR15x15 24:GS1 DataBar (Limited) 25:GS1 DataBar (Omnidirectional) 26:GS1 DataBar (Stacked)
10 46		EAN readable code	0 to 4	Sets the EAN readable code of the print item 1. ・When Print format is set to "Individual" or "Overall" 0:none , 1:5x5 , 2:5x7 ・When Print format is set to "Free layout" 0:none , 1:5x5 , 2:5x7 3:5x5(Nozzle1) , 4:5x7(Nozzle1)
10 47		EAN Prefix	0 to 99	Sets the EAN prefix of the print item 1.
10 48		Calendar block No.	0 to 8	When writing, setting is NOT required. When reading, Block information can be obtained item by item.
10 49		Calendar block count	0 to 8	
10 4A		Count block No.	0 to 8	
10 4B		Count block count	0 to 8	
10 4C		Horizontal (X)	0 to 31998	Valid when Free layout is set. Sets the coordinate of the print item 1.
10 4D		Vertical (Y)	0 to 29	

Holding Register data configuration (4/13)

Word address	Classification	Item name	Setting range	Contents
10 4E … 10 57	Print format	Reserve_1 … Reserve_10	-	"Reserve" is not initially provided, but may be added in future.
10 58 10 6F		Print format(Print item 2)	-	Item 2 through 50 will be set in the same configuration as those of Item 1 (Address: from 0x1040 to 0x1057).
…		…		
14 D8 14 EF		Print format(Print item 50)		
14 F0 … 19 9F		Reserve_1 … Reserve_1200	-	"Reserve" is not initially provided, but may be added in future.
19 A0	Print specification	Character height	0 to 99	Sets the character height.
19 A1		Ink drop use	1 to 16	Sets the ink drop use.
19 A2		High-speed print	0 to 3	Sets the high-speed print. 0:HM , 1:NM , 2:QM , 3:SM
19 A3		Character width	0 to 3999	Sets the character width.
19 A4		Character orientation	0 to 3	Sets the character orientation.
19 A5		Print start delay	0 to 9999	Sets the print start delay.
19 A6		Reverse direction	0 to 9999	Sets the reverse direction.
19 A7		Product speed matching	0 to 3	Sets the product speed matching. 0:None , 1:Encoder , 2:Auto 3:Encoder(enhance)
19 A8		Pulse rate division factor	1 to 999	Sets the pulse rate division factor.
19 A9		Speed compensation	0 , 1	Sets the speed compensation. 0:Disable , 1:Enable
19 AA		Line speed	0 to 9999	Sets the line speed. Set value is multiplied by 1/10 and reflected to IJ Printer. . (Example : 1234 = 123.4 m/min.)
19 AB		Distance between print head and work	0 to 99	Sets the distance between print head and work.
19 AC		Print Target width	0 to 9999	Sets the print Target width.
19 AD		Actual Print width	0 to 9999	Sets the actual Print width.
19 AE		Repeat count	0 to 9999	Sets the repeat count.
19 AF 19 B0		Repeat intervals	0 to 99999	Sets the repeat intervals.
19 B1		Target sensor timer	0 to 999	Sets the target sensor timer.
19 B2		Target sensor filter	0 , 1	Sets the target sensor filter. 0:Time setup , 1:Until end of print.
19 B3		Target sensor filter value	0 to 9999	Sets the target sensor filter value.
19 B4		Ink Drop Charge Rule	0 to 2	Sets the ink drop charge rule. 0:Standard 1:Mixed single scan and interlaced 2:Dot mixed interlaced
19 B5		Speed compensation fine control	-50 to 50	Sets the speed compensation fine control.
19 B6 … 19 BF		Reserve_1 … Reserve_10	-	"Reserve" is not initially provided, but may be added in future.

Holding Register data configuration (5/13)

Word address	Classification	Item name	Setting range	Contents
19 C0	Calendar condition	Offset(Year)	0 to 99	Sets the offset of the Calendar block 1.
19 C1		Offset(Month)	0 to 99	
19 C2		Offset(Day)	0 to 1999	
19 C3		Offset(Hour)	-23 to 99	
19 C4		Offset(Minute)	-59 to 99	
19 C5		Zero-suppression(Year)	0 to 2	Sets the zero-suppression of the Calendar block 1. 0:Disable , 1:Enable(Space) 2:Enable(Character fill)
19 C6		Zero-suppression(Month)	0 to 2	
19 C7		Zero-suppression(Day)	0 to 2	
19 C8		Zero-suppression(Hour)	0 to 2	
19 C9		Zero-suppression(Minute)	0 to 2	
19 CA		Substitution rules(Year)	0 , 1	Sets the substitution rules of the Calendar block 1. 0:Disable , 1:Enable
19 CB		Substitution rules(Month)	0 , 1	
19 CC		Substitution rules(Day)	0 , 1	
19 CD		Substitution rules(Hour)	0 , 1	
19 CE		Substitution rules(Minute)	0 , 1	
19 CF		Substitution rules No.	1 to 99	Sets the substitution rules No. of the Calendar block 1.
19 D0		Substitution rules (Week number)	0 , 1	Sets the substitution rules of the Calendar block 1.
19 D1		Zero-suppression (Week number)	0 to 2	Sets the zero-suppression of the Calendar block 1.
19 D2		Substitution rules (Day of week)	0 , 1	Sets the substitution rules of the Calendar block 1.
19 D3		Zero-suppression (Day of week)	0 to 2	Sets the zero-suppression of the Calendar block 1.
19 D4		Output during calendar updating Trigger (Function item for SOP-05)	1	[1] Fixed
19 D5 … 19 DF		Reserve_1 … Reserve_11	-	"Reserve" is not initially provided, but may be added in future.
19 E0 19 FF		Calendar condition (Calendar block 2)	-	Block 2 through 8 will be set in the same configuration as those of Block 1 (Address: from 0x19C0 to 0x19DF).
…		…		
1A A0 1A BF		Calendar condition (Calendar block 8)		

Holding Register data configuration (6/13)

Word address	Classification	Item name	Setting range	Contents
1A C0	Substitution rule	Substitution rules No.	1 to 99	Substitution rules will be registered with the specified Substitution rules number, Start year and Substitution rules setup items.
1A C1		Starting year	2000 to 2099	
1A C2		Substitution character(Year)	0x0020 to 0xFFFF	
…		…	…	
1A F3		Substitution character(Year)	0x0020 to 0xFFFF	
1A F4		Substitution character(Month)	0x0020 to 0xFFFF	
…		…	…	
1B 17		Substitution character(Month)	0x0020 to 0xFFFF	
1B 18		Substitution character(Day)	0x0020 to 0xFFFF	
…		…	…	
1B 74		Substitution character(Day)	0x0020 to 0xFFFF	
1B 75		Substitution character(Hour)	0x0020 to 0xFFFF	
…		…	…	
1B A4		Substitution character(Hour)	0x0020 to 0xFFFF	
1B A5		Substitution character(Minute)	0x0020 to 0xFFFF	
…		…	…	
1C 1C		Substitution character(Minute)	0x0020 to 0xFFFF	
1C 1D		Substitution character (Week number)	0x0020 to 0xFFFF	
…		…	…	
1C BB		Substitution character (Week number)	0x0020 to 0xFFFF	
1C BC		Substitution character (Day of week)	0x0020 to 0xFFFF	
…		…	…	
1C D0		Substitution character (Day of week)	0x0020 to 0xFFFF	
1C D1 … 1C D3		Reserve_1 … Reserve_3	-	"Reserve" is not initially provided, but may be added in future.
1C D4	Time count condition	Range (Lower limit) (1st digit)	0x0020 to 0xFFFF	Sets the range (Lower limit).
…		…	…	
1C D6		Range (Lower limit) (3rd digit)	0x0020 to 0xFFFF	
1C D7		Range (Upper limit) (1st digit)	0x0020 to 0xFFFF	Sets the range (Upper limit).
…		…	…	
1C D9		Range (Upper limit) (3rd digit)	0x0020 to 0xFFFF	
1C DA		Reset(1st digit)	0x0020 to 0xFFFF	Sets the reset.
…		…	…	
1C DC		Reset(3rd digit)	0x0020 to 0xFFFF	
1C DD		Reset time	0 to 23	Sets the reset time.
1C DE		Renewal period	0 to 5	Sets the renewal period. 0:5 minutes, 1:6 minutes 2:10 minutes, 3:15 minutes 4:20 minutes, 5:30 minutes
1C DF		Reserve_1	-	"Reserve" is not initially provided, but may be added in future.

Holding Register data configuration (7/13)

Word address	Classification	Item name	Setting range	Contents
1C E0	Shift code setup	Start hour	0 to 23	Sets the start time of the shift code rule 1.
1C E1		Start minute	0 to 59	
1C E2		End hour	0 to 23	Sets the end time of the shift code rule 1.
1C E3		End minute	0 to 59	
1C E4		Shift code character (1st digit)	0x0020 to 0xFFFF	Sets the shift code character of the shift code rule 1.
…		…	…	
1C ED		Shift code character (10th digit)	0x0020 to 0xFFFF	
1C EE		Reserve_1	-	"Reserve" is not initially provided, but may be added in future.
1C EF		Reserve_2		
1C F0		Shift code rule (Rule 2)	-	Shift code 2 through 48 will be set in the same configuration as those of Shift code 1 (Address: from 0x1CE0～0x1CEF).
1C FF				
…		…		
1F D0		Shift code rule (Rule 48)		
1F DF				
1F E0	Count condition	Value(1st digit)	0x0020 to 0xFFFF	Sets the value of the count block 1.
…		…	…	
1F F3		Value(20th digit)	0x0020 to 0xFFFF	
1F F4		Range (Lower limit) (1st digit)	0x0020 to 0xFFFF	Sets the range (Lower limit) of the count block 1.
…		…	…	
20 07		Range (Lower limit) (20th digit)	0x0020 to 0xFFFF	
20 08		Range (Upper limit) (1st digit)	0x0020 to 0xFFFF	Sets the range (Upper limit) of the count block 1.
…		…	…	
20 1B		Range (Upper limit) (20th digit)	0x0020 to 0xFFFF	
20 1C		Update (In progress)	0 to 999998	Sets the update (In progress) of the count block 1.
20 1D				
20 1E		Update (Units)	1 to 999999	Sets the update (Units) of the count block 1.
20 1F				
20 20		Increment	1 to 99	Sets the increment of the count block 1.
20 21		Direction	0 , 1	Sets the direction of the count block 1. 0:up, 1:down
20 22		Jump (from) (1st digit)	0x0020 to 0xFFFF	Sets the jump (from) of the count block 1.
…		…	…	
20 35		Jump (from) (20th digit)	0x0020 to 0xFFFF	
20 36		Jump (to) (1st digit)	0x0020 to 0xFFFF	Sets the jump (to) of the count block 1.
…		…	…	
20 49		Jump (to) (20th digit)	0x0020 to 0xFFFF	
20 4A		Reset (1st digit)	0x0020 to 0xFFFF	Sets the reset of the count block 1.
…		…	…	
20 5D		Reset (20th digit)	0x0020 to 0xFFFF	
20 5E		Reset signal (Function item for SOP-05)	0 to 2	Sets the reset signal of the count block 1. 0:Disable , 1:Signal 1 , 2:Signal 2
20 5F		External signal count (Function item for SOP-05)	0 , 1	Sets the external signal count of the count block 1. 0:Disable , 1:Enable

Holding Register data configuration (8/13)

Word address	Classification	Item name	Setting range	Contents
20 60	Count condition	Zero-suppression	0 , 1	Sets the zero-suppression of the count block 1. 0:Disable , 1:Enable
20 61		Multiplier(1st digit)	0x0020 to 0x0039	Sets the multiplier of the count block 1. Numeric:0x0031～0x0039 Decimal point:0x002E Space:0x0020
…		…	…	
20 6A		Multiplier(10th digit)	0x0020 to 0x0039	
20 6B		Count skip(1st digit)	0x0020 to 0xFFFF	Sets the count skip of the count block 1.
…		…	…	
20 6F		Count skip(5th digit)	0x0020 to 0xFFFF	
20 70 … 20 73		Reserve_1 … Reserve_4	-	"Reserve" is not initially provided, but may be added in future.
20 74		Count condition (Count block 2)	-	Block 2 through 8 will be set in the same configuration as those of Block 1 (Address: from 0x1FE0 to 0x2073).
21 07				
…		…		
23 EC		Count condition (Count block 8)		
24 7F				
24 80	Adjust print parameters	Calendar offset	0 , 1	Sets the calendar offset. 0:Offset from yesterday 1:From today
24 81		DIN print	0 , 1	Sets the DIN print. 0:Disable , 1:Enable
24 82		EAN Prefix	0 , 1	Sets the EAN prefix. 0:Edit message , 1:Print format
24 83		Barcode printing	0 , 1	Sets the barcode printing. 0:Normal , 1:Reverse
24 84		QR Error correction level	0 , 1	Sets the QR error correction level. 0:M (15%) , 1:Q (25%)
24 85 … 24 8F		Reserve_1 … Reserve_11	-	"Reserve" is not initially provided, but may be added in future.
24 90	On-line / Off-line	On-line / Off-line	0 , 1	Change the on-line or off-line. 0:Offline , 1:Online
24 91 … 24 93		Reserve_1 … Reserve_3	-	"Reserve" is not initially provided, but may be added in future.
24 94	Remote operation	Remote operation	0 to 4	Specifies remote operation to IJP. 0:Operation start 1:Operation stop 2:Deflection voltage control (ON) 3:Deflection voltage control (OFF) 4:Fault clear
24 95 … 24 97		Reserve_1 … Reserve_3	-	"Reserve" is not initially provided, but may be added in future.

Holding Register data configuration (9/13)

Word address	Classification	Item name	Setting range	Content
24 98	Date / time setup	Current time(year)	2000 to 2099	Sets the current time.
24 99		Current time(month)	1 to 12	
24 9A		Current time(day)	1 to 31	
24 9B		Current time(hour)	0 to 23	
24 9C		Current time(minute)	0 to 59	
24 9D		Current time(second)	0 to 59	
24 9E		Calendar time control	0 , 1	Sets the calendar time control. 0:same as current time 1:clock stop
24 9F		Calendar time(year)	2000 to 2099	Sets the calendar time.
24 A0		Calendar time(month)	1 to 12	
24 A1		Calendar time(day)	1 to 31	
24 A2		Calendar time(hour)	0 to 23	
24 A3		Calendar time(minute)	0 to 59	
24 A4		Calendar time(second)	0 to 59	
24 A5		Clock system	0 , 1	Sets the clock system. 0:24-hour clock , 1:12-hour clock
24 A6 … 24 AF		Reserve_1 … Reserve_10	-	"Reserve" is not initially provided, but may be added in future.
24 B0	User environment setup (Future subject)	Repeat print sensor mode	0 , 1	Sets the repeat print sensor mode. 0:signal ON , 1:OFF-ON transition
24 B1		Change Character orientation	0 to 3	Sets the change character orientation. 0:Disable 1:Reverse direction printing 2:normal or inverted 3:Character orientation 0 or 3
24 B2		Change mode	0 , 1	Sets the change mode. 0: OFF=normal/forward 1: OFF=inverted/reverse
24 B3		Reverse print	0 , 1	Sets the reverse print. 0:right-justified , 1:left-justified
24 B4		Print signal type	0 , 1	Sets the print signal type. 0:print.complete 1:print.-in-progress
24 B5		Print data changeover error	0 , 1	Sets the print data changeover error. 0:Disable , 1:Enable
24 B6		Char. Size menu 1	0 , 1	Sets the Char. Size menu 1. 0:5x8 , 1:5x7
24 B7		Char. Size menu 2	0 , 1	Sets the Char. Size menu 2. 0:9x8 , 1:9x7
24 B8		Excitation V-ref. warning	0 , 1	Sets the excitation V-ref. warning. 0:Disable , 1:Enable
24 B9		Print characters one by one	0 , 1	Sets the print characters one by one. 0:Disable , 1:Enable
24 BA		Continue message print (Function item for SOP-15-20)	0 , 1	Sets the continue message print. 0:Disable , 1:Enable
24 BB		Start message number (Function item for SOP-15-20)	0 to 2000	Sets the number of registered print message to be printed.
24 BC		End message number (Function item for SOP-15-20)	0 to 2000	
24 BD … 25 7F		Reserve_1 … Reserve_195	-	"Reserve" is not initially provided, but may be added in future.

Holding register data configuration (10/13)

Word address	Classification	Item name	Setting range	Contents
25 80	Touch screen setup	Display	0 to 2	Sets the display. 0:OFF in 3 min. , 1:OFF in 30 min. 2:Always ON
25 81		Keyboard layout	0 , 1	Sets the keyboard layout. 0:ABC , 1:QWERTY
25 82		ICON Display	0 , 1	Sets the ICON display. 0:Disable , 1:Enable
25 83		Clock display format	0 to 2	Sets the clock display format. 0:YYYY.MM.DD , 1:DD.MM.YYYY 2:MM.DD.YYYY
25 84		Confirmation window for Manual Control Menu	0 , 1	Sets the confirmation window for manual control menu. 0:Display , 1:Non display
25 85		Arabic input method	0 , 1	Sets the Arabic input method. 0:to the left , 1:to the right
25 86 … 25 8F		Reserve_1 … Reserve_10	-	"Reserve" is not initially provided, but may be added in future.
25 90 … 25 AF	Reserve	Reserve_1 … Reserve_32	-	"Reserve" is not initially provided, but may be added in future.
25 B0	Operation management	Ink operating time	0 to 9999	Sets the ink operating time.
25 B1		Ink alarm time	0 to 9999	Sets the ink alarm time.
25 B2		Print count	0 to 999999999	Sets the print count.
25 B3				
25 B4 … 25 B7		Reserve_1 … Reserve_4	-	"Reserve" is not initially provided, but may be added in future.
25 B8	Circulation control	Ink filter use time	0 to 65099	Sets the ink filter use time.
25 B9		Reserve_1	-	"Reserve" is not initially provided, but may be added in future.
25 BA		Recovery filter 1 use time	0 to 65099	Sets the recovery filter 1 use time.
25 BB		Air filter use time	0 to 65099	Sets the air filter use time.
25 BC		Reserve_1	-	"Reserve" is not initially provided, but may be added in future.
25 BD		Recovery filter 2 use time	0 to 65099	Sets the recovery filter 2 use time.
25 BE		Air filter L use time	0 to 65099	Sets the air filter L use time.
25 BF		Air filter R use time	0 to 65099	Sets the air filter R use time.
25 C0 … 25 DF		Reserve_1 … Reserve_32	-	"Reserve" is not initially provided, but may be added in future.

Holding Register data configuration (11/13)

Word address	Classification	Item name	Setting range	Contents
25 E0	Manage messages	Number to change the message name	1 to 2000	Changes the message name of stored message of the selected number.
25 E1		Message name(1st digit)	0x0020 to 0xFFFF	
25 E2		Message name(2nd digit)	0x0020 to 0xFFFF	
…		…	…	
25 EB		Message name(11th digit)	0x0020 to 0xFFFF	
25 EC		Message name(12th digit)	0x0020 to 0xFFFF	
25 ED … 25 EF		Reserve_1 … Reserve_3	-	"Reserve" is not initially provided, but may be added in future.
25 F0		Number to delete the stored message	1 to 2000	Deletes the stored message of the selected number.
25 F1 … 25 FF		Reserve_1 … Reserve_15	-	"Reserve" is not initially provided, but may be added in future.
26 00		Number before the change	1 to 2000	Changes the stored number of stored messages of the selected number.
26 01		Number after the change	1 to 2000	
26 02 … 26 0F		Reserve_1 … Reserve_14	-	"Reserve" is not initially provided, but may be added in future.
26 10	Manage group	Group number	1 to 99	Creates the group of the selected number and name.
26 11		Group name(1st digit)	0x0020 to 0xFFFF	
26 12		Group name(2nd digit)	0x0020 to 0xFFFF	
…		…	…	
26 1B		Group name(11th digit)	0x0020 to 0xFFFF	
26 1C		Group name(12th digit)	0x0020 to 0xFFFF	
26 1D … 26 1F		Reserve_1 … Reserve_3	-	"Reserve" is not initially provided, but may be added in future.
26 20		Number to change the group name	1 to 99	Changes the group name of stored group of the selected number.
26 21		Group name(1st digit)	0x0020 to 0xFFFF	
26 22		Group name(2nd digit)	0x0020 to 0xFFFF	
…		…	…	
26 2B		Group name(11th digit)	0x0020 to 0xFFFF	
26 2C		Group name(12th digit)	0x0020 to 0xFFFF	
26 2D		Number before the change	1 to 99	Changes the stored number of stored groups of the selected number.
26 2E		Number after the change	1 to 99	
26 2F		Number to delete the stored group	1 to 99	Deletes the stored group of the selected number.

Holding Register data configuration (12/13)

Word address	Classification	Item name	Setting range	Contents
26 30	Edit substitution rule	Substitution rule No.	1 to 99	Sets the number and the name of Substitution rule 1. (Read only. Write operation is the future subject.)
26 31		Substitution rule name (1st digit)	0x0020 to 0xFFFF	
26 32		Substitution rule name (2nd digit)	0x0020 to 0xFFFF	
…		…	…	
26 3B		Substitution rule name (11th digit)	0x0020 to 0xFFFF	
26 3C		Substitution rule name (12th digit)	0x0020 to 0xFFFF	
26 3D … 26 3F		Reserve_1 … Reserve_3	-	"Reserve" is not initially provided, but may be added in future.
26 40		Substitution rule(Rule 2)	-	Substitution rules 02 through 99 will be set in the same configuration as those of Substitution rules 01 (Address: from 0x2630 to 0x263F). (Read only. Write operation is the future subject.)
26 4F				
…		…		
2C 50		Substitution rule(Rule 99)		
2C 5F				
2C 60 … 2C 6F	Reserve	Reserve_1 … Reserve_16	-	"Reserve" is not initially provided, but may be added in future.
2C 70	Printing Job Management (Future subject)	Printing job function	0 , 1	Sets the printing job function. 0:Disable , 1:Enable
2C 71		Control status	0 , 1	Sets the control status. 0:stop , 1:start
2C 72		Print count	0 to 99999	Sets the print count.
2C 73				
2C 74 … 2C 7F		Reserve_1 … Reserve_12	-	"Reserve" is not initially provided, but may be added in future.
2C 80 … 2C FF	Reserve	Reserve_1 … Reserve_128	-	"Reserve" is not initially provided, but may be added in future.
2D 00	User pattern **(Fixed size)**	User pattern registration 01	0x0000 to 0xFFFF	Status of User pattern registration (Registered or NOT) is set by bit information ON or OFF. User pattern registration 01 shows 16 status of User pattern registration 000 through 015 starting from the upper bit. Subsequently, the same data structure as that of User pattern registration 01 will follow.
2D 01		User pattern registration 02	0x0000 to 0xFFFF	
…		…	…	
2D 0B		User pattern registration 12	0x0000 to 0xFFFF	
2D 0C		User pattern registration 13	0x0000 to 0xFFFF	
2D 0D … 2D 1F		Reserve_1 … Reserve_19	-	"Reserve" is not initially provided, but may be added in future.
2D 20		Pattern data	0x0000 to 0xFFFF	User pattern data will be set, size by size and moved up to front. Please note that the address of User pattern data will be different size by size. Please refer to 4.5.(2) Details of User pattern data (Fixed-size and Free-size), for details.
2D 21		Pattern data	0x0000 to 0xFFFF	
…		…	…	
64 FE		Pattern data	0x0000 to 0xFFFF	
64 FF		Pattern data	0x0000 to 0xFFFF	

Holding Register data configuration (13/13)

Word address	Classification	Item name	Setting range	Contents
65 00	User pattern **(Free size)**	Pattern data registration 01	0x0000 to 0xFFFF	Status of User pattern registration (Registered or NOT) is set by bit information ON or OFF. User pattern registration 01 shows 16 status of User pattern registration 000 through 015 starting from the upper bit. Subsequently, the same data structure as that of User pattern registration 01 will follow.
65 01		Pattern data registration 02	0x0000 to 0xFFFF	
65 02		Pattern data registration 03	0x0000 to 0xFFFF	
65 03		Pattern data registration 04	0x0000 to 0xFFFF	
65 04 … 65 0F		Reserve_1 … Reserve_12	-	"Reserve" is not initially provided, but may be added in future.
65 10		Vertical size (User pattern character 00)	1 to 32	Sets the dot size and pattern data of the user pattern data. User pattern data (Free-size) is controlled by the fixed address. User pattern data (Free size) of the registered User pattern character 00 will be set here from 0x6510 to 0x6791.
65 11		Horizontal size (User pattern character 00)	1 to 320	
65 12		Pattern data (User pattern character 00)	0x0000 to 0xFFFF	
65 13		Pattern data (User pattern character 00)	0x0000 to 0xFFFF	
…		…	…	
67 90		Pattern data (User pattern character 00)	0x0000 to 0xFFFF	
67 91		Pattern data (User pattern character 00)	0x0000 to 0xFFFF	
67 92		User pattern data (User pattern character 01)	-	User pattern data (Free size) of the registered User pattern character 01 through 49 will be set in the same configuration as those of User pattern data of the registered User pattern character 01 (Address: from 0x6510 to 0x6791) Please refer to 4.5 (2) Details of User pattern data (Fixed-size and Free-size), for details.
67 93				
6A 12				
6A 13				
…		…		
DF F2		User pattern data (User pattern character 49)		
DF F3				
E2 72				
E2 73				
E2 74 … E2 7F		Reserve_1 … Reserve_12	-	"Reserve" is not initially provided, but may be added in future.
E2 80 … FF FF	Reserve	Reserve_1 … Reserve_7552	-	"Reserve" is not initially provided, but may be added in future.

(2) Input Registers

Input Registers are the area read by Read Input Registers (0x04).

The item data is placed, which can be obtained from IJ Printer.

Input Registers can be read by one (1) word (2 bytes) at every address.

Input Register data configuration (1/9)

Word address	Classification	Item name	Setting range	Contents
00 00	Unit status	Communication connection status	0x0030 , 0x0031	Gets the communication connection status. 0x0030:Offline , 0x0031:Online
00 01		Receive enable/disable status	0x0030 , 0x0031	Gets the receive enable/disable status. 0x0030:Reception not possible 0x0031:Reception possible
00 02		Operation status	0x0000 to 0xFFFF	Gets the operation status. Status can be obtained by use of the same code as that of the Status output of SOP-04 (Special Communication Function A). Refer to Software Option Specification SOP-04 for details.
00 03		Warning status	0x0000 to 0xFFFF	
00 04		Analysis information 1 (Function code)	0x0000 to 0xFFFF	Cause will be obtained when the external communication error occurred during Modbus communication. Refer to 4.5 (1) Details of Analysis information for details. ・Analysis information 1 Function code is obtained when error is caused. ・Analysis information 2 Classification code is obtained when error is caused. ・Analysis information 3 Error factor is obtained when error is caused. ・Analysis information 4 [0x0000] Fixed
00 05		Analysis information 2 (Classification code)	0x0000 to 0xFFFF	
00 06		Analysis information 3 (Error factor)	0x0000 to 0xFFFF	
00 07		Analysis information 4 (Preparation for future)	0x0000 to 0xFFFF	
00 08 … 00 0F		Reserve_1 … Reserve_8	-	"Reserve" is not initially provided, but may be added in future.
00 10	Unit information	Type name(1st digit)	0x0030 to 0x007A	Gets the type name. Model name UX-D860W is obtained when it is used.
00 11		Type name(2nd digit)	0x0030 to 0x007A	
…		…	…	
00 1E		Type name(15th digit)	0x0030 to 0x007A	
00 1F		Type name(16th digit)	0x0030 to 0x007A	
00 20 00 21		Serial number	00000000 to 99999999	Gets the serial number.
00 22		Ink name(1st digit)	0x0030 to 0x007A	Gets the ink name. Ink type 1067K is obtained when it is used.
00 23		Ink name(2nd digit)	0x0030 to 0x007A	
…		…	…	
00 2A		Ink name(9th digit)	0x0030 to 0x007A	
00 2B		Ink name(10th digit)	0x0030 to 0x007A	

Input Register data configuration (2/9)

Word address	Classification	Item name	Setting range	Contents
00 2C	Unit information	Input mode	1 , 2	Gets the input mode. 1:Default , 2:Local Language
00 2D		Maximum message length (Characters)	500	Gets the maximum message length (Characters).
00 2E		Maximum registers	2000	Gets the maximum registers.
00 2F		2D code print	1	Gets the 2D code print. 1:supported
00 30		Character size	0x0007	Gets the Settable sizes. Bit information is obtained for availability of Character size of 4x5 or 18x24 or 24x32. 0x0001:4x5, 0x0002:18x24 0x0004:24x32
00 31		Maximum calendar/count block count	8	Gets the maximum calendar/count block count.
00 32		Replacement items	99	Gets the replacement items.
00 33		Shift code/Time count	1	Gets the shift code/time count. 1:supported
00 34		Chimney/DIN print	1	Gets the chimney/DIN print. 1:supported
00 35		Maximum column	4	Gets the maximum column.
00 36 … 00 4F		Reserve_1 … Reserve_26	-	"Reserve" is not initially provided, but may be added in future.
00 50	Operation management	Ink operating time	0 to 9999	Gets the ink operating time.
00 51		Ink alarm time	0 to 9999	Gets the ink alarm time.
00 52		Print count	0 to 999999999	Gets the print count.
00 53				
00 54		Cumulative operation time	0 to 999999	Gets the cumulative operation time.
00 55				
00 56		Ink/makeup ink type	1 to 999	Gets the ink/makeup ink type.
00 57		Ink viscosity	0 to 999	Gets the ink viscosity.
00 58		Ink pressure (nozzle 1)	0 to 999	Gets the ink pressure. Ink pressure multiplied by 1000 is obtained. (Example : 255 = 0.255 MPa)
00 59		Ambient temperature	-99 to 100	Gets the ambient temperature.
00 5A		Deflection voltage (nozzle 1)	0 to 99	Gets the deflection voltage. Deflection Voltage multiplied by 10 is obtained. (Example : 57 = 5.7 kV)
00 5B		Excitation V-ref. (nozzle 1)	0 to 27	Gets the excitation V-ref.
00 5C		Excitation frequency	0 to 1000	Gets the excitation frequency. Excitation frequency multiplied by 10 is obtained. (Example : 689 = 68.9 kHz)
00 5D		Reserve_1		"Reserve" is not initially provided, but may be added in future.
00 5E		Reserve_2		
00 5F		Ink pressure (nozzle 2)	0 to 999	Gets the ink pressure. Ink pressure multiplied by 1000 is obtained. (Example : 255 = 0.255 MPa)
00 60		Deflection voltage (nozzle 2)	0 to 99	Gets the deflection voltage. Deflection Voltage multiplied by 10 is obtained. (Example : 57 = 5.7 kV)
00 61		Excitation V-ref. (nozzle 2)	0 to 27	Gets the excitation V-ref.

Input Register data configuration (3/9)

Word address	Classification	Item name	Setting range	Contents
00 62 … 00 6F	Operation management	Reserve_1 … Reserve_14	-	"Reserve" is not initially provided, but may be added in future.
00 70	View alarm history	Fault/warning message count	0 to 90	Gets the fault/warning message count.
00 71 … 00 73		Reserve_1 … Reserve_3	-	"Reserve" is not initially provided, but may be added in future.
00 74		Generation time(year)	2000 to 2099	Gets the generation time of the message 1.
00 75		Generation time(month)	1 to 12	
00 76		Generation time(day)	1 to 31	
00 77		Generation time(hour)	0 to 23	
00 78		Generation time(minute)	0 to 59	
00 79		Generation time(second)	0 to 59	
00 7A		Fault/warning No.	1 to 999	Gets the fault/warning No. of the message 1.
00 7B		Reserve_1	-	"Reserve" is not initially provided, but may be added in future.
00 7C		Fault/warning message 2	-	Fault/warning history 02 through 90 are obtained in a same way as that of Fault warning history 01 (Address: from 0x0074 to 0x007B)
00 83				
…		…		
03 3C		Fault/warning message 90		
03 43				
03 44 … 0A FF	Reserve	Reserve_1 … Reserve_1980	-	"Reserve" is not initially provided, but may be added in future.
0B 00	Communication environment setup	State at power-up	0 to 2	Gets the state at power-up. 0:Comm. port is OFF 1:Comm. port is ON 2:OFF fixed
0B 01		Communication and signal error	0 , 1	Gets the communication and signal error. 0:Warning, 1:Fault
0B 02		Baud rate(Standard port)	0 to 10	Gets the baud rate of the standard port. 0:150bps, 1:300bps, 2:600bps 3:1200bps, 4:2400bps 5:4800bps, 6:9600bps 7:19200bps, 8:38400bps 9:57600bps, 10:115200bps
0B 03		Data length(Standard port)	0 , 1	Gets the data length of the standard port. 0:7 bits, 1:8 bits
0B 04		Parity bit(Standard port)	0 to 2	Gets the parity bit of the standard port. 0:Disable, 1:Odd, 2:Even
0B 05		Stop bits(Standard port)	0 , 1	Gets the stop bits of the standard port. 0:1 bit, 1:2 bits
0B 06		Baud rate(Secondary port)	0 to 10	Gets the baud rate of the secondary port.
0B 07		Data length(Secondary port)	0 , 1	Gets the data length of the secondary port.
0B 08		Parity bit(Secondary port)	0 to 2	Gets the parity bit of the secondary port.
0B 09		Stop bits(Secondary port)	0 , 1	Gets the stop bits of the secondary port.

Input Register data configuration (4/9)

Word address	Classification	Item name	Setting range	Contents
0B 0A	Communication environment setup	Baud rate(Private port)	0 to 10	Gets the baud rate of the private port.
0B 0B		Data length(Private port)	0 , 1	Gets the data length of the private port.
0B 0C		Parity bit(Private port)	0 to 2	Gets the parity bit of the private port.
0B 0D		Stop bits(Private port)	0 , 1	Gets the stop bits of the private port.
0B 0E		Number of comm. bytes	0 , 1	Gets the number of comm. bytes. 0:1 byte , 1:2 bytes
0B 0F		BCC code handling	0 , 1	Gets the BCC code handling. 0:Disable , 1:Enable
0B 10		Communication mode	0 , 1	Gets the communication mode. 0:overwrite-protected 1:overwrite-enabled
0B 11		Print message transfer ACK	0 , 1	Gets the print message transfer ACK. 0:t=fixed , 1:t=async.
0B 12		Print spec transfer char height	0 , 1	Gets the print spec transfer char height. 0:2 digits , 1:3 digits
0B 13		Buffer function (Function item for Communication buffer)	0 , 1	Gets the buffer function. 0:Disable , 1:Enable
0B 14		Buffer repeat count (Function item for Communication buffer)	1 to 9999	Gets the buffer repeat count.
0B 15		Empty Buffer Fault (Function item for Communication buffer)	0 , 1	Gets the empty buffer fault. 0:Disable , 1:Enable
0B 16		Timing of Fault (Function item for Communication buffer)	0 , 1	Gets the timing of fault. 0:Print Start, 1:Print. Complete
0B 17		Data Number at Fault (Function item for Communication buffer)	0 to 9	Gets the data number at fault.
0B 18		Start output (Function item for SOP-04)	0 , 1	Gets the start output. 0:Disable , 1:Enable
0B 19		Output kind (Function item for SOP-04)	0 to 2	Gets the output kind. 0:Disable , 1:Print data , 2:Code
0B 1A		Condition (Function item for SOP-04)	0 , 1	Gets the condition. 0:Every time 1:Different from last time
0B 1B		Status output (Function item for SOP-04)	0 , 1	Gets the status output. 0:Disable , 1:Enable
0B 1C		Output item(Start item) (Function item for SOP-04)	1 to 50	Gets the output item. (nozzle 1)
0B 1D		Output item(End item) (Function item for SOP-04)	1 to 50	
0B 1E		Output comm. ENQ (Function item for SOP-04)	0 , 1	Gets the output comm. ENQ. 0:Disable , 1:Enable
0B 1F		Output port (Function item for SOP-04)	0 , 1	Gets the output port. 0:Standard port 1:Secondary port
0B 20		Select message (Function item for SOP-05)	0 , 1	Gets the select message. 0:Disable , 1:Enable
0B 21		Data exchange (Function item for SOP-05)	0 , 1	Gets the data exchange. 0:Reflect at once 1:Reflect by signal
0B 22 … 0B 24		Reserve_1 … Reserve_3	-	"Reserve" is not initially provided, but may be added in future.

Input Register data configuration (5/9)

Word address	Classification	Item name	Setting range	Contents
0B 25	Communication environment setup	Output item(Start item) (Function item for SOP-04)	101 to 150	Gets the output item. (nozzle 2)
0B 26		Output item(End item) (Function item for SOP-04)	101 to 150	
0B 27		Output number of nozzle 2 (Function item for SOP-04)	0 , 1	Gets the output number of nozzle 2. 0:Item 51 , 1:Item 101
0B 28 … 0B BF		Reserve_1 … Reserve_152	-	"Reserve" is not initially provided, but may be added in future.
0B C0	Circulation control	Ink concentration control	0 , 1	Gets the ink concentration control. 0:Disable , 1:Enable
0B C1 … 0B CF		Reserve_1 … Reserve_15	-	"Reserve" is not initially provided, but may be added in future.
0B D0		Ink filter use time	0 to 65099	Gets the ink filter use time.
0B D1		Makeup filter 1 use time	0 to 65099	Gets the makeup filter 1 use time.
0B D2		Recovery filter 1 use time	0 to 65099	Gets the recovery filter 1 use time.
0B D3		Air filter use time	0 to 65099	Gets the air filter use time.
0B D4		Circulation filter use time	0 to 65099	Gets the circulation filter use time.
0B D5		MGV filter 1 use time	0 to 65099	Gets the MGV filter 1 use time.
0B D6		Supply pump use time	0 to 65099	Gets the supply pump use time.
0B D7		Heating unit use time	0 to 65099	Gets the heating unit use time.
0B D8		MV1 use time	0 to 65099	Gets the MV1 use time.
0B D9		MV2 use time	0 to 65099	Gets the MV2 use time.
0B DA		MV3 use time	0 to 65099	Gets the MV3 use time.
0B DB		MV4 use time	0 to 65099	Gets the MV4 use time.
0B DC		MV5 use time	0 to 65099	Gets the MV5 use time.
0B DD		MV6 use time	0 to 65099	Gets the MV6 use time.
0B DE		MV7 use time	0 to 65099	Gets the MV7 use time.
0B DF		MV8 use time	0 to 65099	Gets the MV8 use time.
0B E0		MV9 use time	0 to 65099	Gets the MV9 use time.
0B E1		Reserve_1	-	"Reserve" is not initially provided, but may be added in future.
0B E2		Reserve_2		
0B E3		Ink consumption	0 to 999999	Gets the ink consumption.
0B E4				
0B E5		Makeup consumption	0 to 999999	Gets the makeup consumption.
0B E6				
0B E7		Print count	0 to 999999999	Gets the print count.
0B E8				
0B E9		R air filter use time	0 to 65099	Gets the R air filter use time.
0B EA		MGV filter 2 use time	0 to 65099	Gets the MGV filter 2 use time.
0B EB		Recovery filter 2 use time	0 to 65099	Gets the recovery filter 2 use time.
0B EC		Circulation unit use time	0 to 65099	Gets the circulation unit use time.
0B ED		Reserve_1	-	"Reserve" is not initially provided, but may be added in future.
0B EE		MV23 use time	0 to 65099	Gets the MV23 use time.
0B EF		MV25 use time	0 to 65099	Gets the MV25 use time.
0B F0		MV28 use time	0 to 65099	Gets the MV28 use time.
0B F1		MV29 use time	0 to 65099	Gets the MV29 use time.

Input Register data configuration (6/9)

Word address	Classification	Item name	Setting range	Contents
0B F2	Circulation control	Makeup pump use time	0 to 65099	Gets the makeup pump use time.
0B F3		Circulation pump use time	0 to 65099	Gets the circulation pump use time.
0B F4		Recovery pump 1 use time	0 to 65099	Gets the recovery pump 1 use time.
0B F5		Recovery pump 2 use time	0 to 65099	Gets the recovery pump 2 use time.
0B F6		Makeup filter 2 use time	0 to 65099	Gets the makeup filter 2 use time.
0B F7		Air filter L use time	0 to 65099	Gets the air filter L use time.
0B F8		Air filter R use time	0 to 65099	Gets the air filter R use time.
0B F9 … 0C 1F		Reserve_1 … Reserve_39	-	"Reserve" is not initially provided, but may be added in future.

Input Register data configuration (7/9)

Word address	Classification	Item name	Setting range	Contents
0C 20		Basic software(1st digit)	0x0020 to 0xFFFF	Gets the basic software version. When the version is V01.00, "V01.00 Basic software" is obtained.
0C 21		Basic software(2nd digit)	0x0020 to 0xFFFF	
…		…	…	
0C 3E		Basic software(31st digit)	0x0020 to 0xFFFF	
0C 3F		Basic software(32nd digit)	0x0020 to 0xFFFF	
0C 40		Controller software(1st digit)	0x0020 to 0xFFFF	Gets the controller software version. When the version is V01.00, "V01.00 Controller software" is obtained.
0C 41		Controller software(2nd digit)	0x0020 to 0xFFFF	
…		…	…	
0C 5E		Controller software(31st digit)	0x0020 to 0xFFFF	
0C 5F		Controller software(32nd digit)	0x0020 to 0xFFFF	
0C 60		Print controller software M (1st digit)	0x0020 to 0xFFFF	Gets the print controller software M version. When the version is V01.00, "V01.00 Engine software M" is obtained.
0C 61		Print controller software M (2nd digit)	0x0020 to 0xFFFF	
…		…	…	
0C 7E		Print controller software M (31st digit)	0x0020 to 0xFFFF	
0C 7F		Print controller software M (32nd digit)	0x0020 to 0xFFFF	
0C 80		Print controller software S (1st digit)	0x0020 to 0xFFFF	Gets the print controller software S version. When the version is V01.00, "V01.00 Engine software S" is obtained.
0C 81		Print controller software S (2nd digit)	0x0020 to 0xFFFF	
…		…	…	
0C 9E		Print controller software S (31st digit)	0x0020 to 0xFFFF	
0C 9F		Print controller software S (32nd digit)	0x0020 to 0xFFFF	
0C A0	View software version	1st language(1st digit)	0x0020 to 0xFFFF	Gets the language version. When the version is V01.00 English language, "V01.00 Language 02" is obtained. The last 2-digit shows Language number. 【Language No.】 01:Japanese 02:English 03:Simple Chinese 04:Traditional Chinese 05:Korean 06:Thai 07:Italian 08:Dutch 09:Spanish 10:German 11:French 12:Vietnamese 13:Swedish 14:Arabic 15:Russian 16:Greek 17:Czech 18:Danish 19:Portuguese 20:Polish 21:Serbian 22:Turkish 23:Hungarian 24:Bulgarian 25:Catalan 26:Finnish 27:Romanian 28:Norwegian 29:Slovenian
0C A1		1st language(2nd digit)	0x0020 to 0xFFFF	
…		…	…	
0C BE		1st language(31st digit)	0x0020 to 0xFFFF	
0C BF		1st language(32nd digit)	0x0020 to 0xFFFF	
0C C0		2nd language(1st digit)	0x0020 to 0xFFFF	
0C C1		2nd language(2nd digit)	0x0020 to 0xFFFF	
…		…	…	
0C DE		2nd language(31st digit)	0x0020 to 0xFFFF	
0C DF		2nd language(32nd digit)	0x0020 to 0xFFFF	

Input Register data configuration (8/9)

Word address	Classification	Item name	Setting range	Contents
0C E0	View software version	Software option01(1st digit)	0x0020 to 0xFFFF	Gets the software option version and symbol. When SOP-04 is installed and its version is V01.00, “V01.00 SOP-04” is obtained.
0C E1		Software option01(2nd digit)	0x0020 to 0xFFFF	
…		…	…	
0C FE		Software option01(31st digit)	0x0020 to 0xFFFF	
0C FF		Software option01(32nd digit)	0x0020 to 0xFFFF	
…		…	…	
0E 00		Software option10(1st digit)	0x0020 to 0xFFFF	
0E 01		Software option10(2nd digit)	0x0020 to 0xFFFF	
…		…	…	
0E 1E		Software option10(31st digit)	0x0020 to 0xFFFF	
0E 1F		Software option10(32nd digit)	0x0020 to 0xFFFF	
0E 20		Print controller software T (1st digit)	0x0020 to 0xFFFF	Gets the print controller software T version. When the version is V01.00, “V01.00 Engine software T” is obtained.
0E 21		Print controller software T (2nd digit)	0x0020 to 0xFFFF	
…		…	…	
0E 3E		Print controller software T (31st digit)	0x0020 to 0xFFFF	
0E 3F		Print controller software T (32nd digit)	0x0020 to 0xFFFF	
0E 40	Manage messages	Print data message number	1 to 2000	When Print message registration number is specified at Holding Register address 0x0010, its Group number and Message name are obtained.
0E 41		Group number	0 to 99	
0E 42		Message name(1st digit)	0x0020 to 0xFFFF	
…		…	…	
0E 4D		Message name(12th digit)	0x0020 to 0xFFFF	
0E 4E … 0E 52		Reserve_1 … Reserve_5	-	"Reserve" is not initially provided, but may be added in future.
0E 53		Print message registration (001)	0x0000 to 0xFFFF	Status of Print message registration (Registered or NOT) is obtained by bit information ON or OFF. Print message registration (001) shows 16 statuses of Print message registrations 1 through 16 starting from the upper bit. Subsequently, the same data structure as those of Print message registration (001) will follow.
…		…	…	
0E CF		Print message registration (125)	0x0000 to 0xFFFF	
0E D0	Manage group	Group number	0 to 99	When Group number is specified at Holding Register address 0x0014, its Group name is obtained.
0E D1		Group name(1st digit)	0x0020 to 0xFFFF	
…		…	…	
0E DC		Group name(12th digit)	0x0020 to 0xFFFF	
0E DD … 0E E8		Reserve_1 … Reserve_12	-	"Reserve" is not initially provided, but may be added in future.
0E E9		Group registration (1)	0x0000 to 0xFFFF	Status of Group registration (Registered or NOT) is obtained by bit information ON or OFF. Group registration (1) shows 16 statuses of Group registrations 1 through 16 starting from the upper bit. Subsequently, the same data structure as those of Group registration (1) will follow.
…		…	…	
0E EF		Group registration (7)	0x0000 to 0xFFFF	

Input Register data configuration (9/9)

Word address	Classification	Item name	Setting range	Contents
0E F0	Various data	Current message data length	0 to 1000	Gets the message data length (Character count x 2) of the current message.
0E F1		Inter-character space (Character units)	0 to 28	When Character position is specified at Holding Register address 0x0011, its Inter-character space will be obtained.
0E F2		Calendar block count	0 to 8	Gets the calendar block count of the current message.
0E F3		Calendar characters count (Calendar block 1)	0 to 20	Gets the calendar characters count for 8 blocks of the current message.
0E F4		Calendar characters count (Calendar block 2)	0 to 20	
…		…	…	
0E F9		Calendar characters count (Calendar block 7)	0 to 20	
0E FA		Calendar characters count (Calendar block 8)	0 to 20	
0E FB		Time count block No.	0 to 8	Gets the time count block No. of the current message.
0E FC		Shift code block No.	0 to 8	Gets the shift code block No. of the current message.
0E FD		Shift code rule count	0 to 48	Gets the shift code rule count of the current message.
0E FE		Count block count	0 to 8	Gets the count block count of the current message.
0E FF		Count characters count (Count block 1)	0 to 20	Gets the count characters count for 8 blocks of the current message.
0F 00		Count characters count (Count block 2)	0 to 20	
…		…	…	
0F 05		Count characters count (Count block 7)	0 to 20	
0F 06		Count characters count (Count block 8)	0 to 20	
0F 07 … 0F 0F		Reserve_1 … Reserve_9	-	"Reserve" is not initially provided, but may be added in future.
0F 10		Inter-character space (1st digit)	0 to 28	Gets the inter-character space for 500 characters of the current message.
0F 11		Inter-character space (2nd digit)	0 to 28	
…		…	…	
11 02		Inter-character space (499th digit)	0 to 28	
11 03		Inter-character space (500th digit)	0 to 28	
11 04 … 12 FF		Reserve_1 … Reserve_508	-	"Reserve" is not initially provided, but may be added in future.
13 00	Printing Job Management (Future subject)	Print completion count	0 to 99999	Gets the print completion count.
13 01				
13 02		Print completion status	0 to 2	Gets the print completion status. 0:Non-completion 1:Print completion 2:Fault
13 03 … 13 0F		Reserve_1 … Reserve_13	-	"Reserve" is not initially provided, but may be added in future.

4.5 Detail of Data configuration

(1) Details of Analysis information

When an error occurs in the external communication being conducted, the error cause can be obtained from the analysis information of IJ printer status available at Input Registers.

- Analysis information 1 (Function Code): Functional code of the communication message which resulted in error.
- Analysis information 2 (Classification code): Functional classification of the communication message which resulted in error.
- Analysis information 3 (Error factor): Cause which resulted in error.
- Analysis information 4 (Preparation for future): Reserved area for future use. 0x0000 fixed.

Code table of Analysis information

No.	item	code	Content
1	Analysis information 1 (Function code)	0x0010	Write on Holding Register
		0x0006	Write one word on Holding Register
		0x0003	Read Holding Register
		0x0004	Read Input Register
		Other than the above	Function code which is NOT available
2	Analysis information 2 (Classification code)	0x0000	No classification assigned
		0x0001	Index
		0x0002	Print description
		0x0003	Delete of Print contents
		0x0004	Print data Recall
		0x0005	Print data Register
		0x0006	Print format
		0x0007	Print specification
		0x0008	Calendar conditions
		0x0009	Substitution rules.
		0x000A	Time count
		0x000B	Shift code
		0x000C	Count conditions
		0x000D	Various print setup
		0x000E	Online/Offline
		0x000F	Remote operation
		0x0010	Time control
		0x0011	User environment setup (Preparation for future)
		0x0012	Touch screen setup
		0x0014	Operation management
		0x0015	Circulation control
		0x0016	Print data management
		0x0017	Group control
		0x0018	Editing Substitution rules
		0x001A	Print job control (Preparation for future)
		0x001B	User pattern (Fixed size)
		0x001C	User pattern (Free size)
3	Analysis information 3 (Error factor)	0x0001	Invalid Function code
		0x0002	Invalid Address
		0x0003	Invalid Data size
		0x0004	Invalid CRC code
		0x0005	Invalid Offline
		0x0006	Invalid Message repeat print
		0x0007	Communication is NOT allowed when Ink ejection is stopped.
		0x0010	Invalid data
4	Analysis information 4 (Preparation for future)	0x0000	0x0000 fixed.

(2) Details of User pattern data (Fixed-size and Free-size)

In case of Fixed-size, User pattern data will be placed at variable address depending on the character size specified. The Pattern data length of one character is shown below size by size. According to Pattern data length, User pattern data will be placed in Holding Registers and moved up to front.

In case of Free-size, User pattern data of one character consists of its dot size and the pattern data and is placed at fixed address.

When User pattern is newly registered, the applicable flag of Pattern data registration shall be ON.

Character size vs. Pattern data length (bytes)

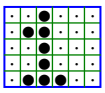
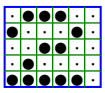
No.	Character size	Pattern data length (bytes)
1	4x5	4 words(8 bytes)
2	5x5	4 words(8 bytes)
3	5x8(5x7)	4 words(8 bytes)
4	9x8(9x7)	8 words(16 bytes)
5	7x10	8 words(16 bytes)
6	10x12	16 words(32 bytes)
7	12x16	16 words(32 bytes)
8	18x24	36 words(72 bytes)
9	24x32	64 words(128 bytes)
10	11x11	16 words(32 bytes)
11	5x3(chimney)	3 words(5 bytes)
12	5x5(chimney)	3 words(5 bytes)
13	7x5(chimney)	4 words(7 bytes)
14	Free size	640 words(1280 bytes)

* The parenthesized number show the available number of bytes as pattern data.

The below-mentioned is an example of “Holding Registers” where User patterns are registered. User pattern registration 01 shows 16 status of User pattern registration 000 through 015 starting from the upper bit. Subsequently, the same data structure as that of User pattern registration 01 will follow.

The construction rule of User pattern data is the same as that of User pattern character transmission of Standard communication.

（Registration No. 000）（Registration No. 001）

Example of Holding Register setup

Word address	Classification	Item name	Setting data	Content
2D 00	User pattern (fixed size)	Pattern data registered or Not 01	0xC000	Registration status for Registered Char. 000 and 001are set to ON.
2D 01		Pattern data registered or Not 02	0x0000	
…		…	…	
2D 20		Pattern data (Registered Char. 000)	0x0009	Pattern data of Registered Character 000 will be set.
2D 21		Pattern data (Registered Char. 000)	0x1F01	
2D 22		Pattern data (Registered Char. 000)	0x0000	
2D 23		Pattern data (Registered Char. 000)	0x0000	
2D 24		Pattern data (Registered Char. 001)	0x0913	Pattern data of Registered Character 001 will be set.
2D 25		Pattern data (Registered Char. 001)	0x1515	
2D 26		Pattern data (Registered Char. 001)	0x0900	
2D 27		Pattern data (Registered Char. 001)	0x0000	
…		…	…	…

4.6 Modbus communication rule for IJ Printer

The Modbus communication rule for IJ printer is described. Please read them carefully and fully understand and use the IJ printer.

(1) When IJ Printer is Offline, Offline/Online switching and Read Input Registers are only available. In case of Read Holding Registers or Write Multiple/Single Register(s), please place IJ Printer Online.

(2) When Holding Registers which overlap the plural functional classifications are read/written by one communication message, it will NOT work correctly. If reading/writing operation of the Registers overlaps their functional classification, please separate the message into plural messages so that one message will NOT overlap plural functional classifications.

(3) When IJ Printer receives Modbus communication, IJ Printer will reflect the contents of the message each time of communication. If plural writing operations are conducted, please use Start/Stop control flag which are placed at the leading address of Holding Registers.

(4) Start/Stop control flag will be used when the data more than 247 bytes are written on Holding Registers or when the writing operation is made on the Registers of which addresses are NOT consecutive.
When the Start (0x0001) is written on Start/Stop control flag, the written data is held and there will be NO writing operation onto Holding Registers.
When the Stop (0x0002) is written on Start/Stop control flag, all the data held on Holding Registers will be reflected to IJ Printer.

(5) Character codes are the same as those which are used in Standard communication.
Please refer to Technical Manual, Section 5 Communication, for details.
In Modbus communication, Shift code characters and Time count characters can be also used and communicated. They are shown in the table below.

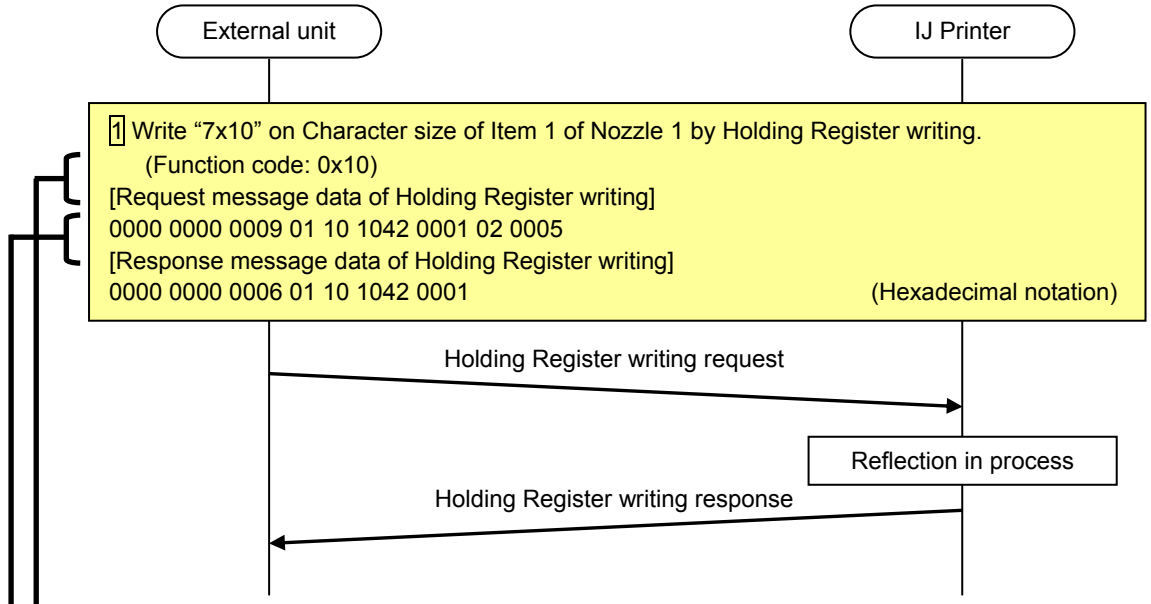
Shift code character	0xF25B	Time count character	0xF25C
Shift code start character	0xF26B	Time count start character	0xF26C
Shift code end character	0xF27B	Time count end character	0xF27C

(6) If the external signal was input for Print Data Recall, etc. when Read Holding Registers was conducted more than once, there is a possibility that the data before external signal input and the data after external signal input are mixed and the read result would be an unexpected data. Therefore, when Modbus communication and the external signals are used together, it is recommended to control the input timing of the external signal so that they will NOT overlap.

4.7 Examples of Transmission procedure

(1) When you change Character size of Item 1 of Nozzle 1 to “7x10”:

Step 1. Write 7x10 on Character size of Item 1 of Nozzle 1 by Holding Register writing.



Contents of Request message

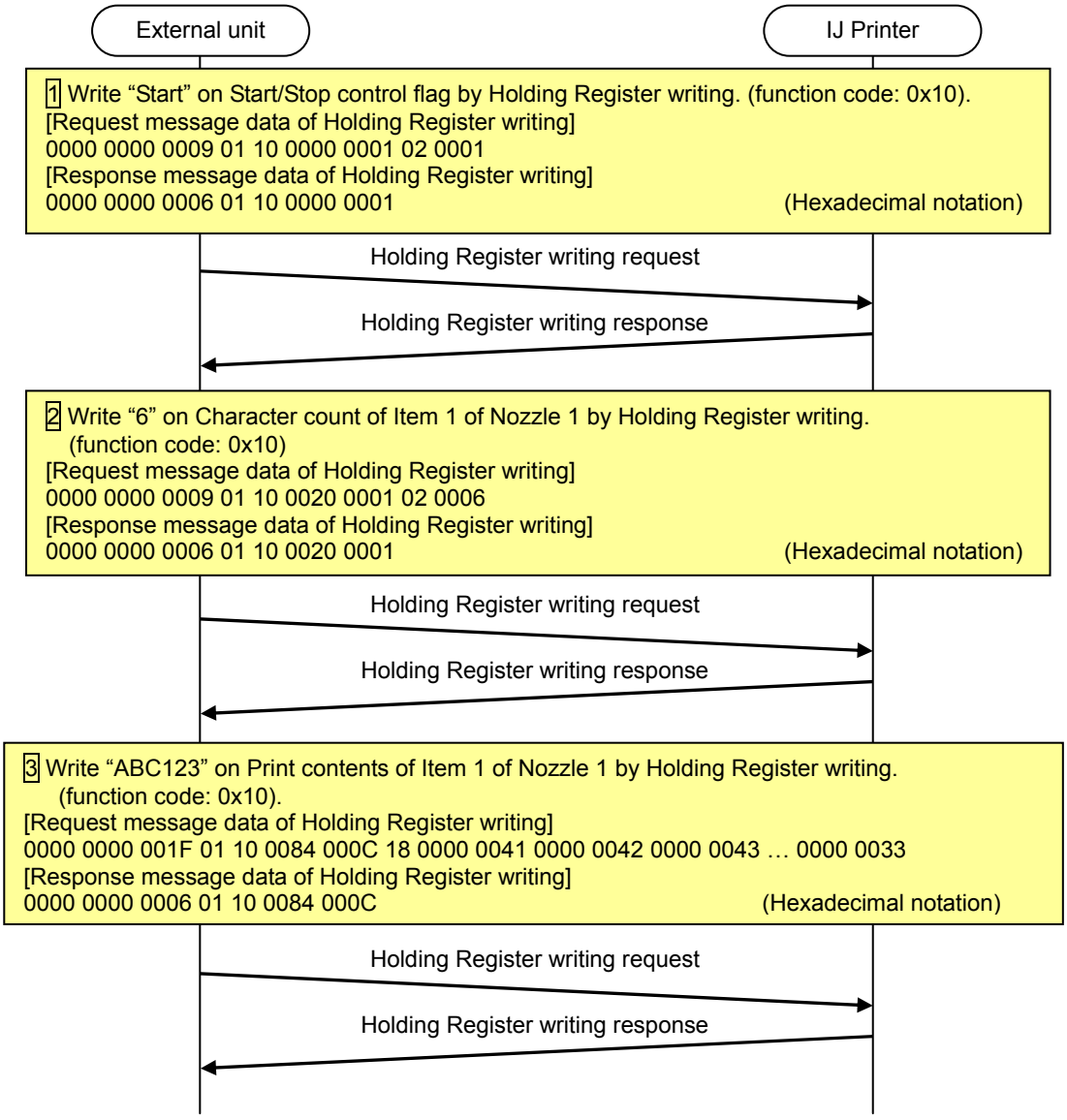
No.	Name		Request data
1	Transaction identifier		0x0000
2	Protocol identifier		0x0000
3	Data length		0x0009
4	Data	Device address	0x01
5		Function code	0x10
6		Start address	0x1042
7		No. of words to be written	0x0001
8		No. of bytes to be written	0x02
9		Data to be written	0x0005

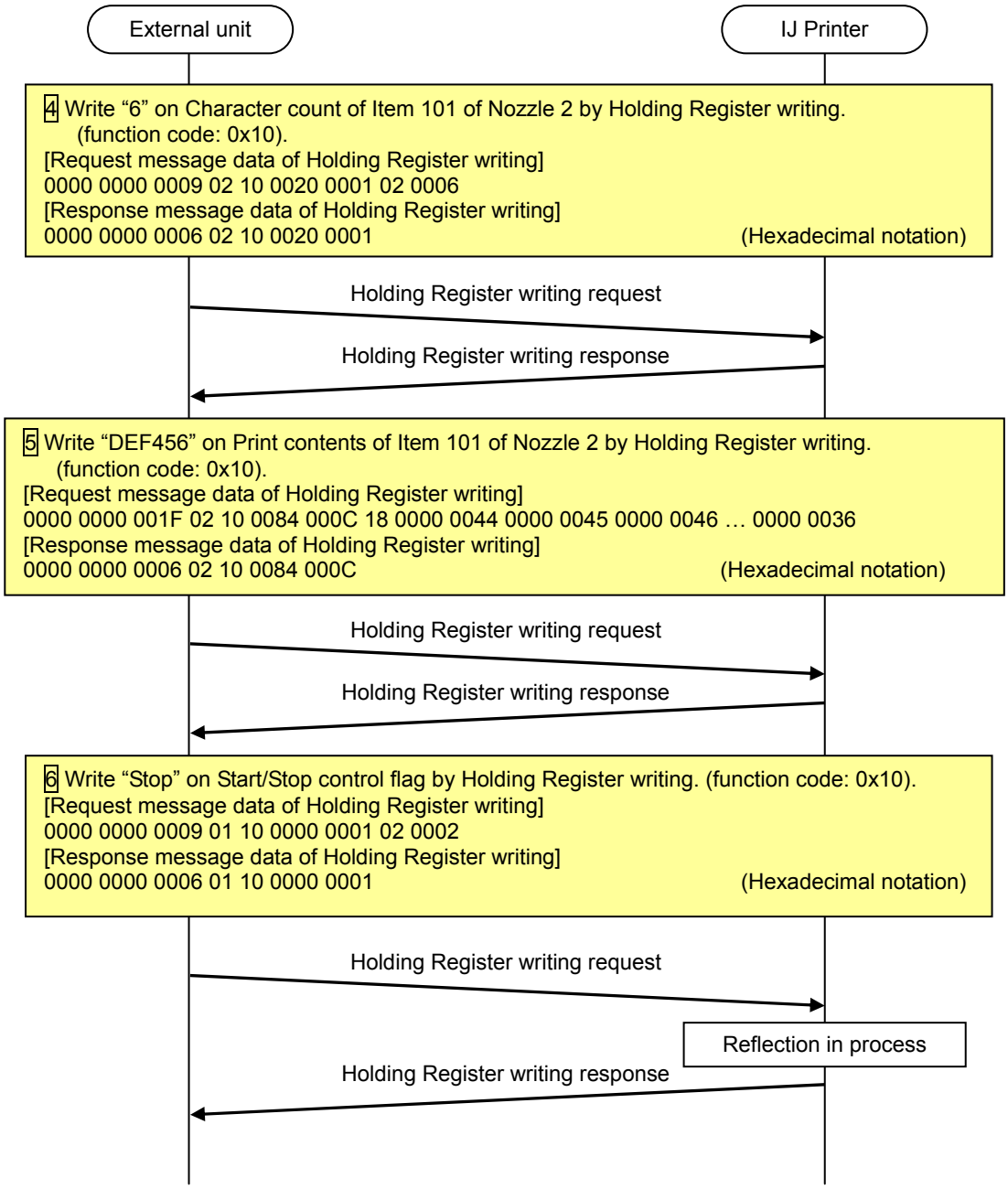
Contents of Response message

No	Name		Response data
1	Transaction identifier		0x0000
2	Protocol identifier		0x0000
3	Data length		0x0006
4	Data	Device address	0x01
5		Function code	0x10
6		Start address	0x1042
7		No. of words to be written	0x0001

(2) When you set Print contents of Item 1 of Nozzle 1 to "ABC123" and the print contents of Item 101 of Nozzle 2 to "DEF456":

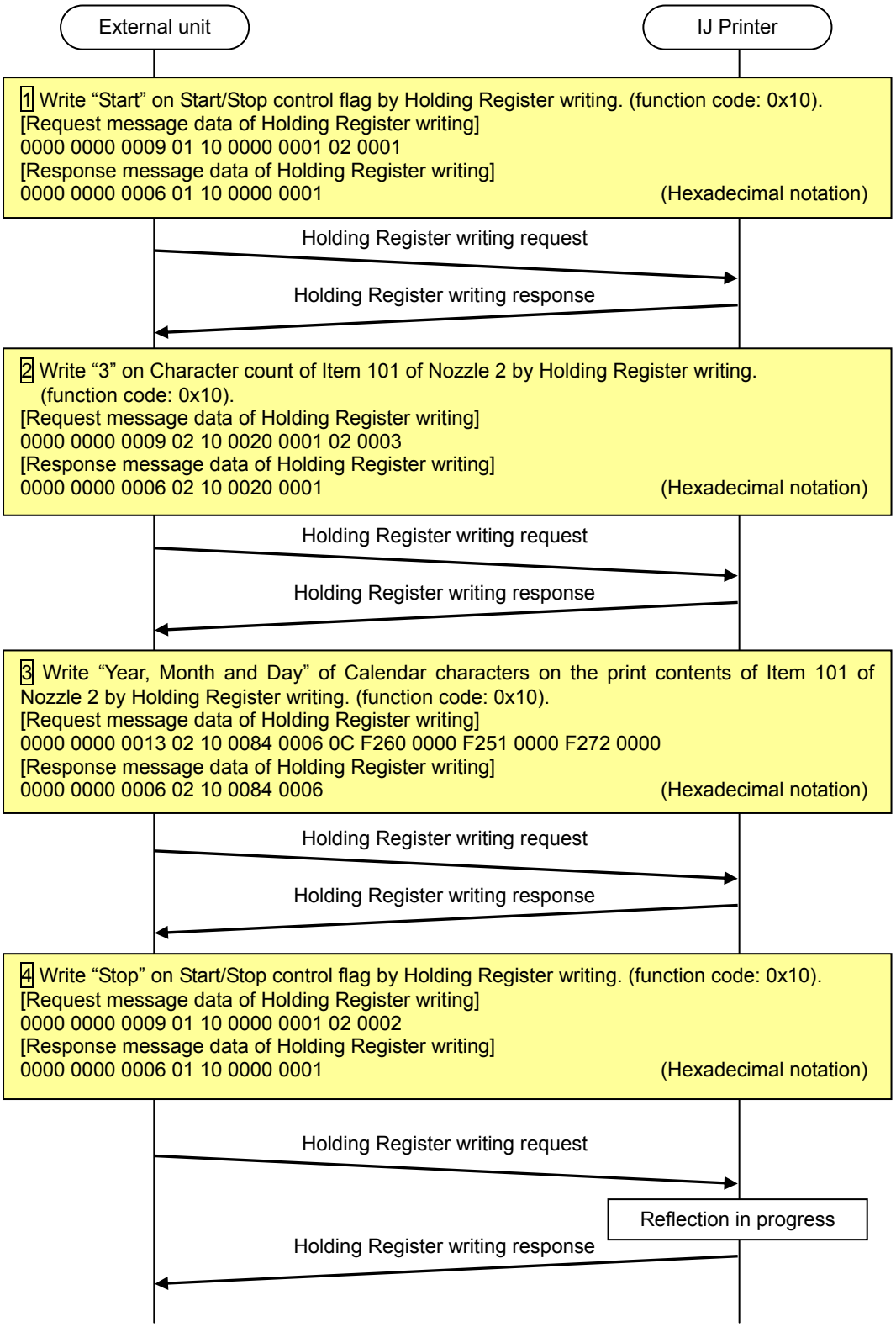
Step 1. Write “Start” on Start/Stop control flag by Holding Register writing.
Step 2. Write “6” on Character count of Item 1 of Nozzle 1 by Holding Register writing.
Step 3. Write “ABC123” on Print contents of Item 1 of Nozzle 1 by Holding Register writing.
Step 4. Write “6” on Character count of Item 101 of Nozzle 2 by Holding Register writing.
Step 5. Write “DEF456” on Print contents of Item 101 of Nozzle 2 by Holding Register writing.
Step 6. Write “Stop” on Start/Stop control flag by Holding Register writing.




External unit
IJ Printer
4 Write “6” on Character count of Item 101 of Nozzle 2 by Holding Register writing.
(function code: 0x10).
[Request message data of Holding Register writing]
0000 0000 0009 02 10 0020 0001 02 0006
[Response message data of Holding Register writing]
0000 0000 0006 02 10 0020 0001 (Hexadecimal notation)
Holding Register writing request
Holding Register writing response
5 Write “DEF456” on Print contents of Item 101 of Nozzle 2 by Holding Register writing.
(function code: 0x10).
[Request message data of Holding Register writing]
0000 0000 001F 02 10 0084 000C 18 0000 0044 0000 0045 0000 0046 … 0000 0036
[Response message data of Holding Register writing]
0000 0000 0006 02 10 0084 000C (Hexadecimal notation)
Holding Register writing request
Holding Register writing response
6 Write “Stop” on Start/Stop control flag by Holding Register writing. (function code: 0x10).
[Request message data of Holding Register writing]
0000 0000 0009 01 10 0000 0001 02 0002
[Response message data of Holding Register writing]
0000 0000 0006 01 10 0000 0001 (Hexadecimal notation)
Holding Register writing request
Reflection in process
Holding Register writing response

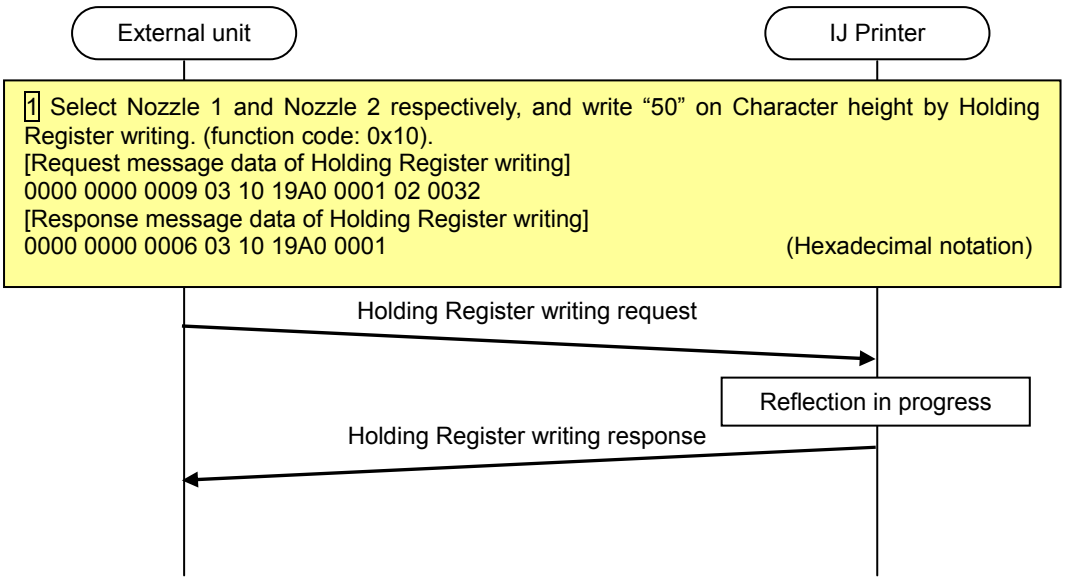
(3) When you set Print contents of Item 101 of Nozzle 2 to “Year, Month and Day” of Calendar characters:

Step 1. Write “Start” on Start/Stop control flag by Holding Register writing.
Step 2. Write “3” on Character count of Item 101 of Nozzle 2 by Holding Register writing.
Step 3. Write “Year, Month and Day” of Calendar characters on Print contents of Item 101 of Nozzle 2 by Holding Register writing.
Step 4. Write “Stop” on Start/Stop control flag by Holding Register writing.



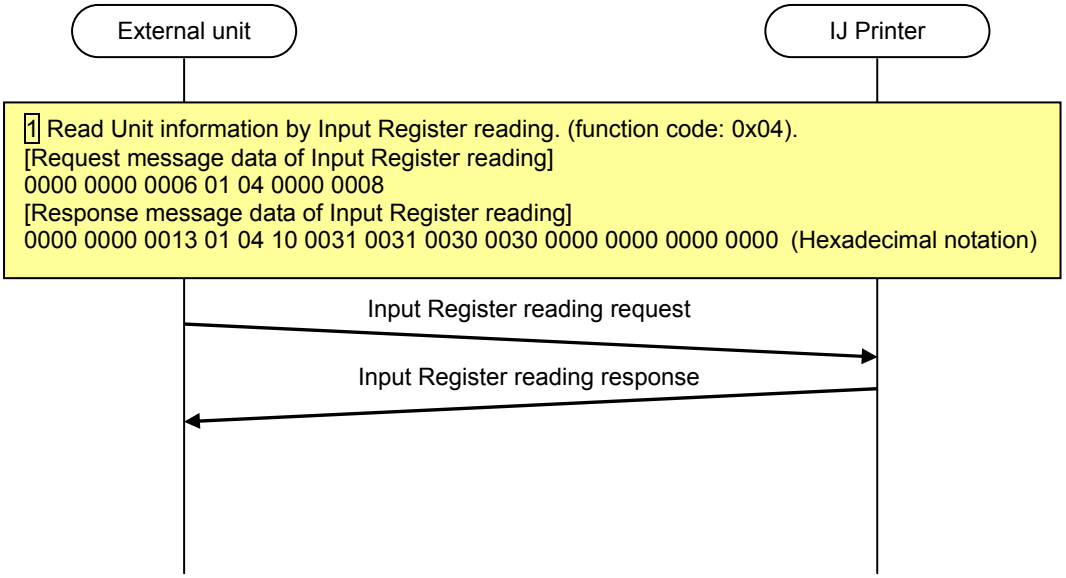
(4) When you change Character height of both Nozzle 1 and Nozzle 2 to 50:

Step 1. Select Nozzle 1 and Nozzle 2 respectively, and write “50” on Character height by Holding Register writing.



(5) When you get Unit information of IJ Printer:

Step 1. Read Unit information by Input Register reading.



5 Troubleshooting guide

In case IJ Printer does not work correctly, please troubleshoot referring to the table below:

Phenomenon	Check	Solution
External device can NOT communicate to IJ Printer.	Is LAN cable properly connected to IJ Printer?	Confirm IJ Printer connection, referring to “2.3 LAN cable connection”.
	Is IJ Printer’s main power switch turned ON?	Power ON IJ Printer’s main power switch.
	Is IJ Printer’s plug surely inserted into Power outlet? Is Power outlet activated?	First turn OFF the main switch. Confirm if the power outlet is activated or not. And then, insert the plug into the outlet.
	Is IJ Printer connected to LAN of the same network segment?	Set IJ Printer to an IP address of the same network segment.
	Is IP address which was set to IJ Printer the duplicate of other device on the network?	If there is a possibility of the duplicate IP address, please disconnect LAN cable and change IP address.
	Is communication blocked by the security software?	Please temporarily disable Firewall protection of Windows or the security software, retry.
	Is IP address or Port number properly set for external device?	Confirm setting of external device.
When IJ Printer is powered ON again, the data which was supposed to be changed is NOT changed.	Did you power OFF IJ Printer after ink ejection was stopped?	IJ Printer saves the data when ink ejection is stopped. Please power OFF IJ Printer after ink ejection stop process is complete. Data will NOT be held when data change is made via communication during stand-by.