UX2

IJ Printer Option Specifications

Special Communication Function A

2nd edition

(1) This manual includes the specifications of “Special communication function A” for model UX2 type IJ printers.

<Contents>

Hardware	Function
Serial communication Ethernet communication	①Output of print contents ②Output of print completion code ③Status output ④Communication with Hitachi Print Verification System ⑤Print start output

(2) Before using this function, thoroughly read this manual for optimum function use. After reading the manual, properly keep it for future reference.

(3) Understand in advance that the specifications and contents of description are subject to change without notice

(4) Refer to the Communication Manual (Serial communication), including print data transmission, print content call transmission, etc.

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1. Overview

List of Functions of Outputs to External Device

Function	Condition for function to be valid	Output timing	Transmission content
Print content Output	Online and ready status	When printing is completed	Print content
	Online	When requested	
Print completion code output	Online and ready status	When printing is completed	Print completion code
Status output	(No restriction)	When status varies or when requested	Status
Print start output	Online and ready status	When printing is started	Print start code

1.1 Print Content Output

(1) Output when printing is completed

- Immediately after printing is completed, the content will be output.
- The output conditions can be specified.
  (Set them on the Communication environment setup screen.)
  ① The print content will be output each time printing is completed.
  ② The print content will also be output when there is any change in content.
- Range of print item to output can be specified.
  (Set them on the Communication environment setup screen.)

(2) Output when “Inquiry on print content” is given from external device

- The output content can be selected.
  (The output content can be selected by the header of output request.)
  ① The content of previous printing will be output.
  ② The content of subsequent printing will be output.
- Range of print item to output can be specified.
  (Set them on the Communication environment setup screen.)

1.2 Print Completion Code Output

(1) Immediately after each printing operation is completed, the print completion code will always be output.

1.3 Status Output

(1) The status will be output under the following conditions:

- When any change occurs in status
  (specify “Enable” for Communication environment “Status output”).
- When “Inquiry on status” is given from external device
  (this does not affect Communication environment “Status output Enable/Disable”).

(2) Categories of status

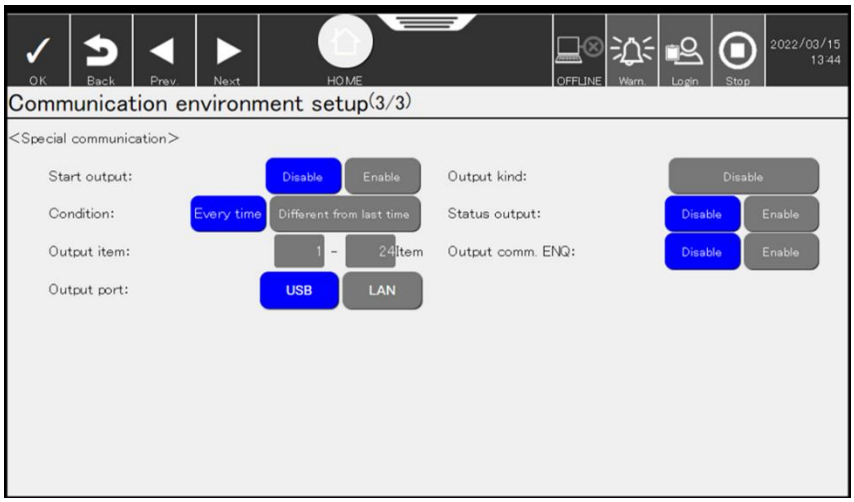
№	Category	Content
1	Communication connection status	• Online (Com=1) • Offline (Com=0)
2	Reception enable/disable status	• Reception enable • Reception disable
3	Operation status	• Stop • Standby, Cover open, Drop adjust, Starting • Ready • Stopping } No fault
		• Category of fault
4	Warning status	• No warning
		• Category of warning

1.4 Print Start Output

(1) Immediately after each printing operation starts, the print start code will always be output.

(2) Transmission data do not include the ENQ code. The STX code is transmitted first.
See Section 2.4.

1.5 Setting Conditions for Print Content Output



Communication environment setup (3rd screen)

(1) Select the start output from “Disable” or “Enable”.
Specifying “Disable” will result in status not being output.

(2) Select the content to be output when printing is completed from “Print data” or “Code”.
Specifying “Disable” will result in no output when printing is completed.

(3) If the “Print data” output is specified, select the output condition, either “Every time” or “Different from last time”. If “Code” is specified, the condition will be fixed at “Every time”.

(4) Select the status output from “Disable” or “Enable”.
Specifying “Disable” will result in status not being output.
However, if inquiry on status is given, the status will be output regardless of the setting value (0 or 1) of “Status Output”.

(5) Select the range of item to output.
Print contents of selected range are output.

(6) Select the ENQ output from “Disable” or “Enable” for Output comm. ENQ.
Specifying “Disable” will result in ENQ not being output.

(7) Set the Output port. If “USB” is selected, print contents will be output from the USB port via RS-232C Serial communication. If “LAN” is selected, print contents will be output from the LAN port via Ethernet communication.

When “LAN” is selected, please set the items of LAN communication such as IP address, Subnet mask, etc. (Please refer to Communication User’s Manual (Common) for details)

Following table shows the types of communications which can be used depending on the combination of LAN or Output port settings. Please set the items that match your environment.

*Tunnel communication (Output) can be selected when Output port is set to LAN.

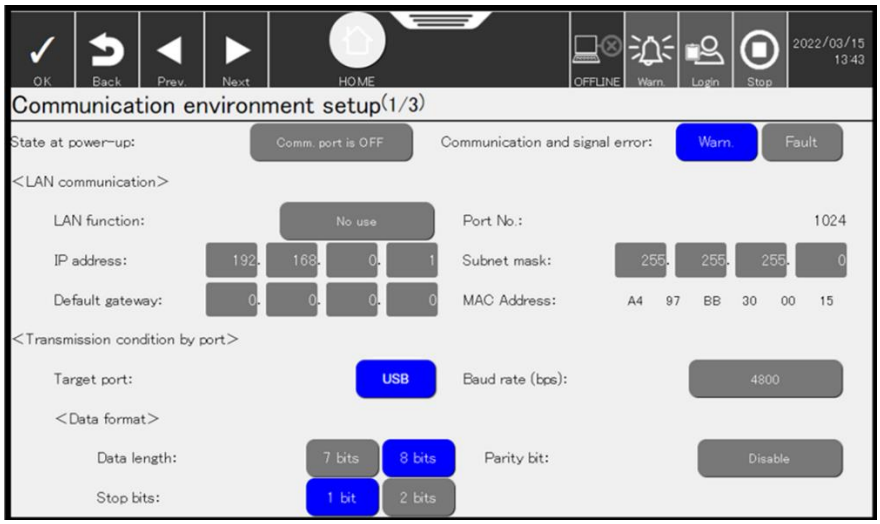
Chart of LAN function and Output port combination

	Communication environment settings		Serial communication		Ethernet communication	
	LAN function	Output port	Print content output transmission, Print data recall transmission, etc.	Special communication function A	Print content output transmission, Print data recall transmission, etc.	Special communication function A
1	Not used	USB	○Supported	○Supported	×Not supported	×Not supported
2	Tunnel communication	USB	×Not supported	○Supported	○Supported	×Not supported
3	Tunnel communication (Output)	LAN	○Supported	×Not supported	×Not supported	○Supported
4	Tunnel communication	LAN	×Not supported	×Not supported	○Supported	○Supported

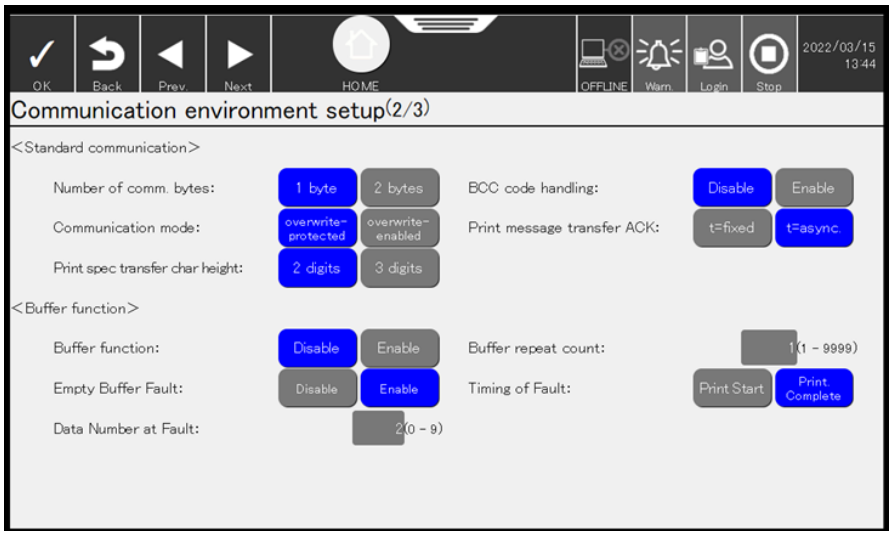
1.6 Communication with Hitachi Print Verification System

(1) It is possible to inspect the print result of IJ printer by connecting to the Print Verification System. When connecting with Print Verification System, limit the number of characters to 10 or less per print item on IJP. And using “saved numbers” should be from 1 to 150.

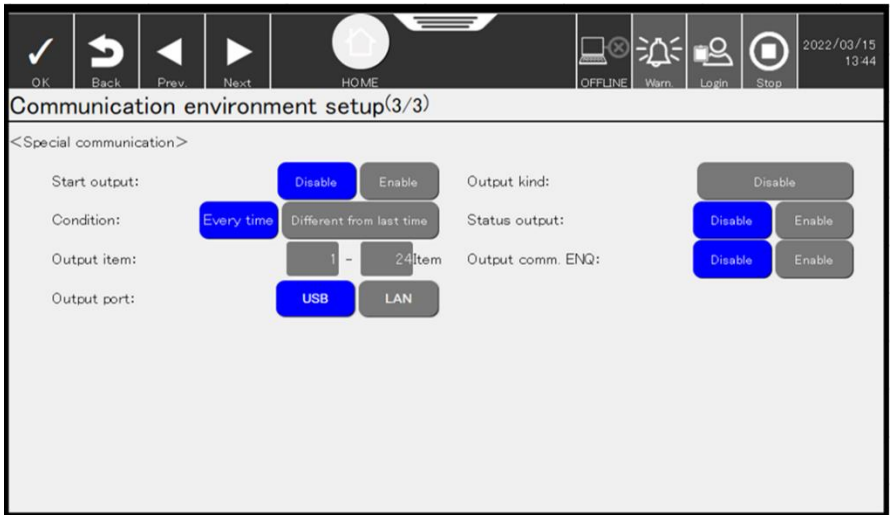
(2) Set the communication setting on “communication environment setup” screen as same as the setting of Print Verification System.



Communication environment setup (1/3) (default setting)



Communication environment setup (2/3) (default setting)



Communication environment setup (3/3) (default setting)

(3) When turning on the power, turn on the Print Verification System first, after that turn on the IJ printer. When turning off the power, turn off the IJ printer first, after that turn off the Print Verification System.

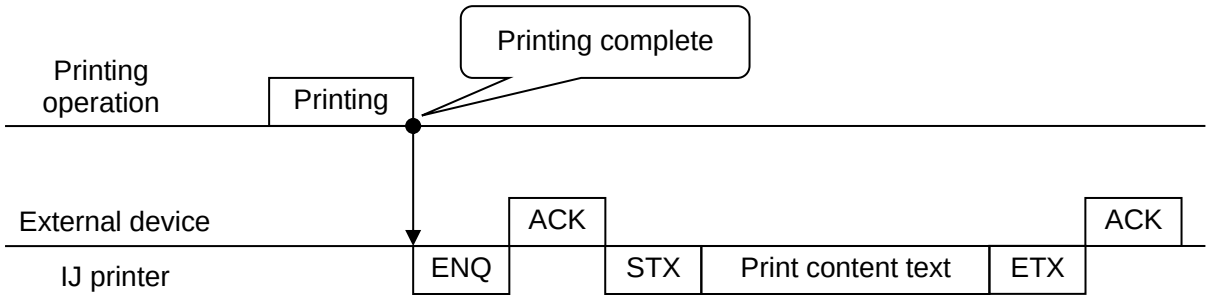
(4) To connect to the Print Verification System with the LAN setting for the Output port, please purchase a converter that converts Ethernet communication to RS-232C Serial communication.

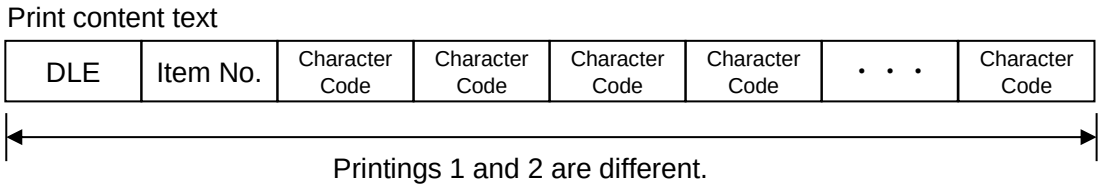
2. Transmission Procedure

Data will be transmitted to external device according to the specifications of values set in communication mode.

2.1 Print Contents Output

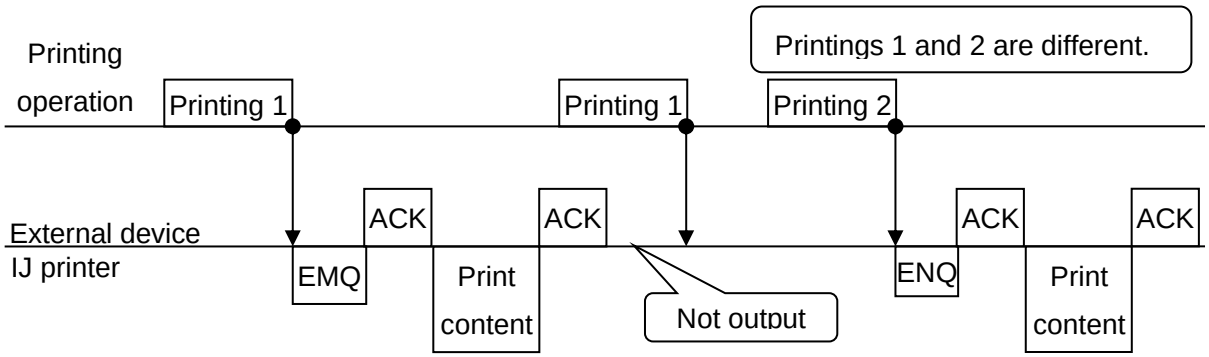
(1) Each time printing is completed, the printed contents will be output to external device.





- Print items with no character input will not be output.
- Items are sequentially output beginning with the first one set as “Output item”. However, items not used for printing are not included.
- Even if the orientation of characters is reversed, output will be performed from the first digit of print item.
- Double-byte characters, such as JIS kanji and punctuation characters, are also output, according to the settings in communication mode.
- ENQ will not be output if “Disable” is set for “Output comm. ENQ”.

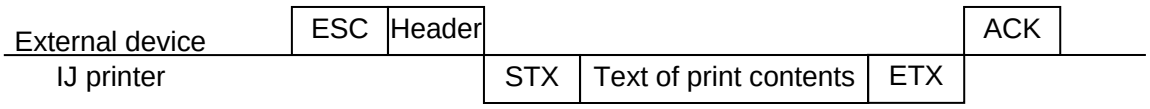
(2) If there is any change in print contents, the changed print contents will be printed, and then output.



(3) Print contents are output whenever any inquiry on them is received from external device.

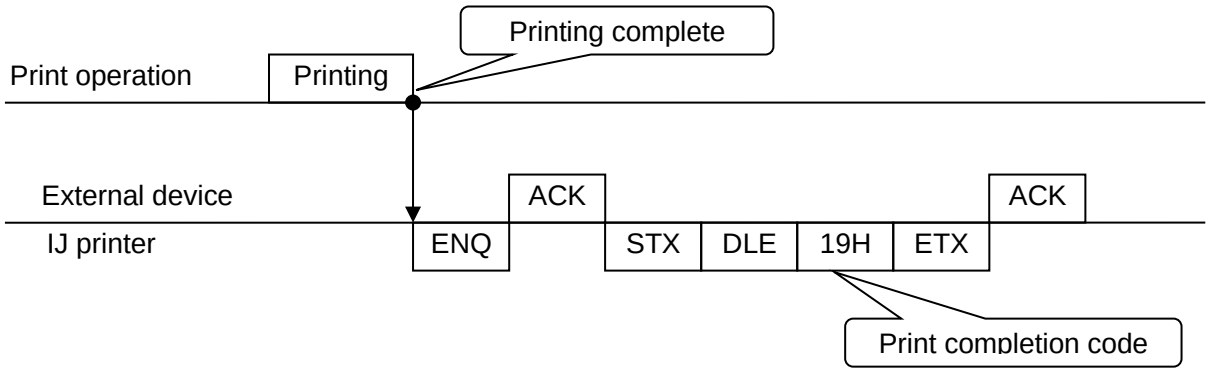
- If inquiry on print contents “ESC, header” is received by IJ printer from external device, the print contents will be output.
- The details of output will be different for each header:

Header	Details of output
2EH	Previously printed contents
2FH	Contents that will subsequently be printed



2.2 Print Completion Code Output

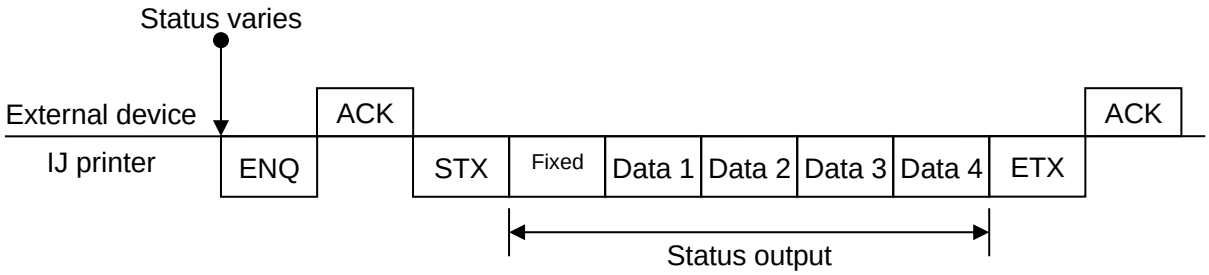
- Each time printing is completed, the IJ printer will output the print completion code to external device.
- ENQ will not be output if “Disable” is set for “Output comm. ENQ”.



2.3 Status Output

(1) Each time the status of IJ printer varies, the status data will be output.

ENQ will not output if “Disable” is set for “Output comm. ENQ”.

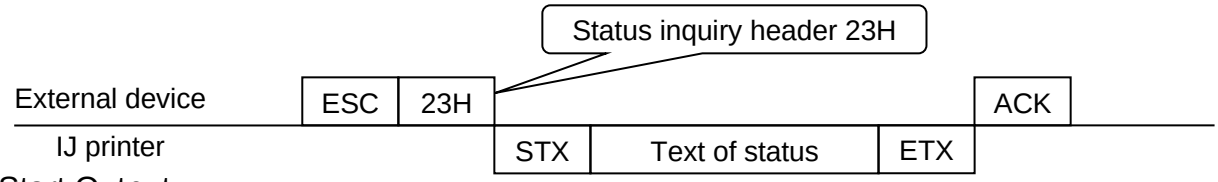


Categories of Status (each data item consists of 1 byte)

Data No.	Category of status	Details
Data 1	Communication connection status	・Online (Com=1) ・Offline (Com=0)
Data 2	Receive enable/disable status	・Receive enable ・Receive disable
Data 3	Operation status	・Stop ・Standby, cover open, Drop adjust, Starting ・Ready ・Stopping ・Type of fault
Data 4	Warning status	・No warning ・Type of warning

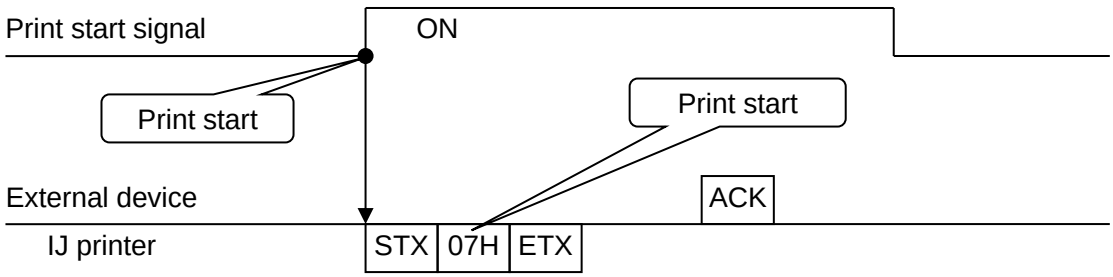
(2) Status is output when any inquiry on it is received from external device.

- If inquiry on status “ESC, header” is received by IJ printer from external device, the status will be output.



2.4 Print Start Output

- Immediately after each printing operation starts, the print start code will always be output to external device.



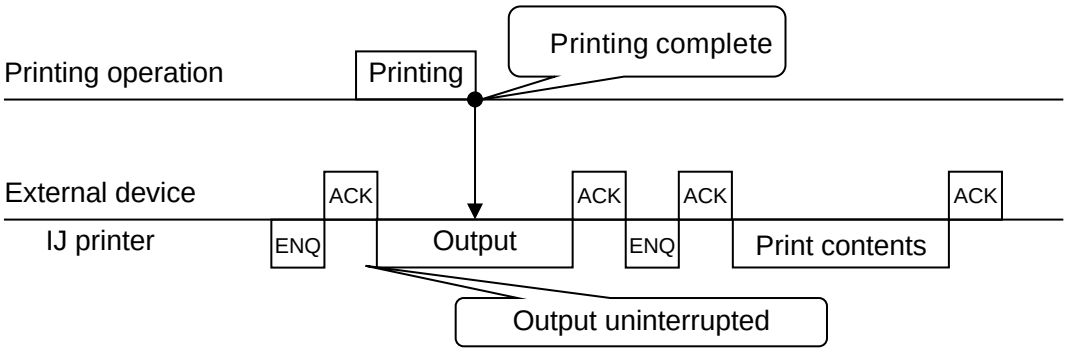
- Regardless of “Output comm. ENQ” setting, transmission data do not include the ENQ code. The STX code is transmitted first.

3. Examples of Special Communication Timing

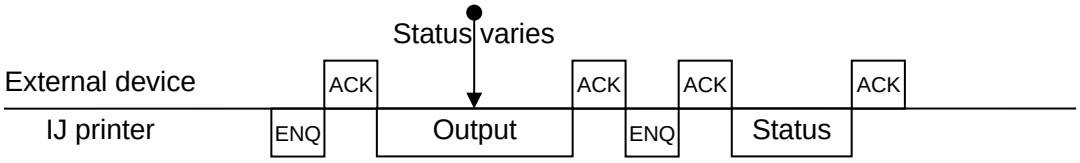
3.1 When, during output, subsequent output is necessary:

(1) If printing is completed before output has finished, the output will be uninterrupted and print contents (completion code) will be output.

- Even if the print contents, print completion code or status output is being output, it will be uninterrupted midway when printing is complete. The output on inquiry will also be uninterrupted in the same way when printing is complete.

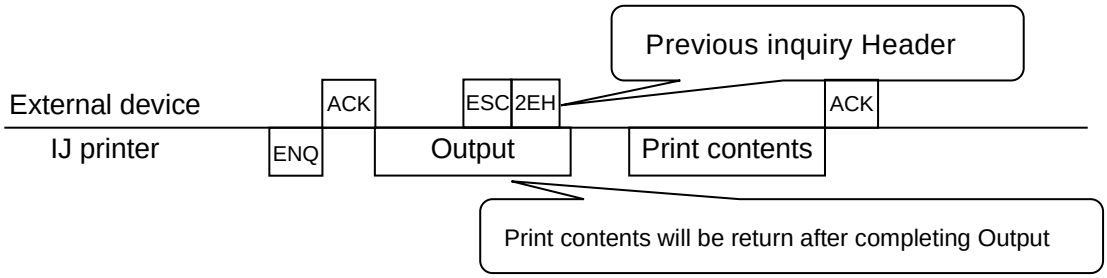


(2) If the status varies during output, the output will be executed to the end, and then the status will be output.

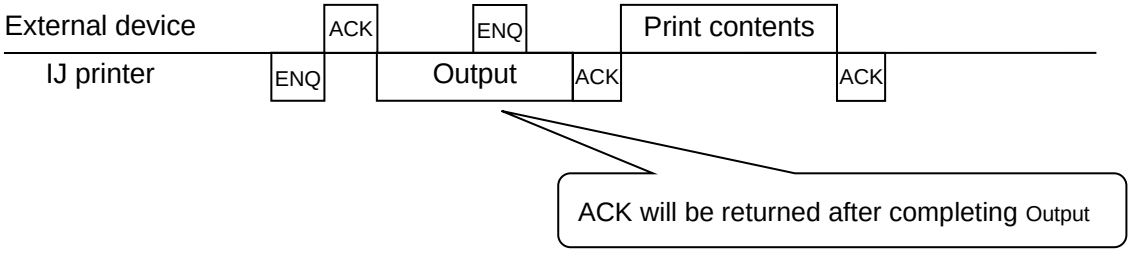


3.2 If, during output, data is transmitted from external device:

(1) If any inquiry (inquiry on print contents, status) is received before output is completed, the output will be interrupted, and the answer with respect to the inquiry will be executed.

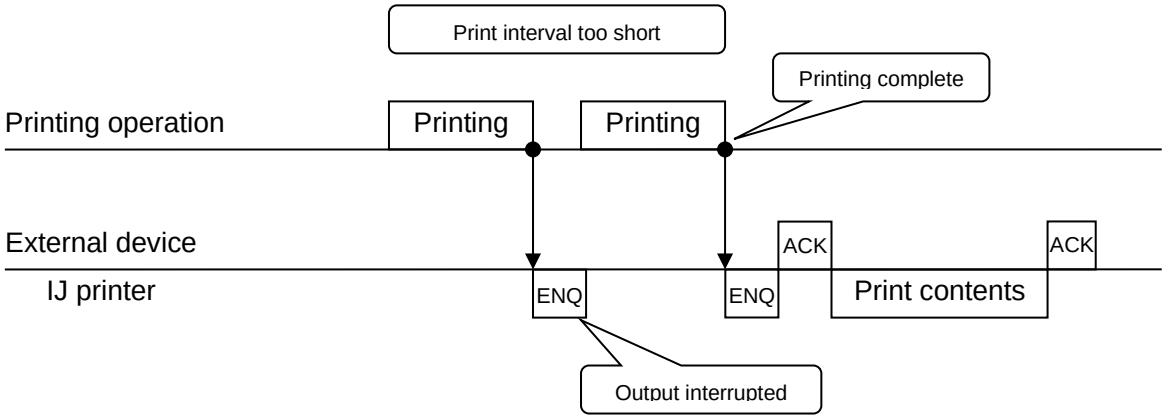


(2) If “ENQ” is received from external device before the output is finished, the output will be interrupted, “ACK” will be returned, and then the printer will switch to reception status.



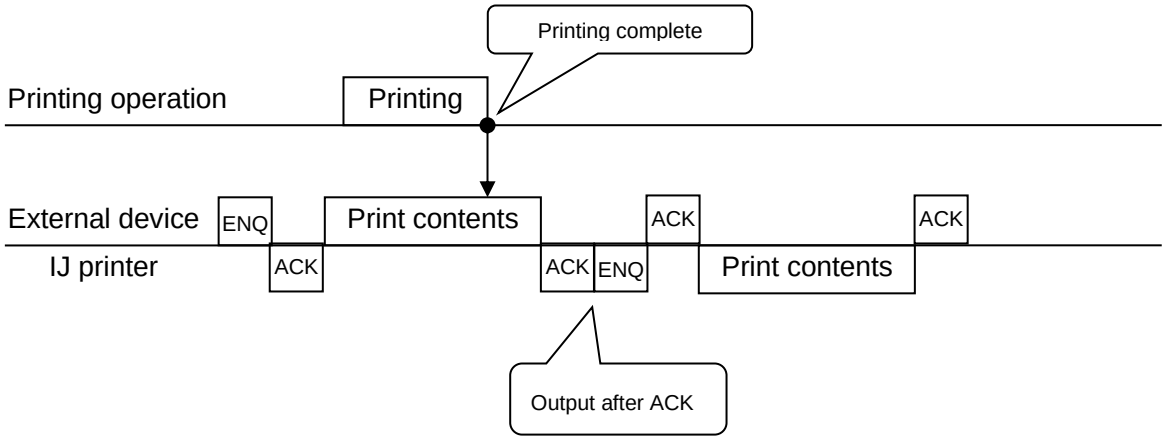
3.3 If print interval is short:

(1) If print interval is too short, the previous output may be interrupted by subsequent output, and only “ENQ” will be transmitted.

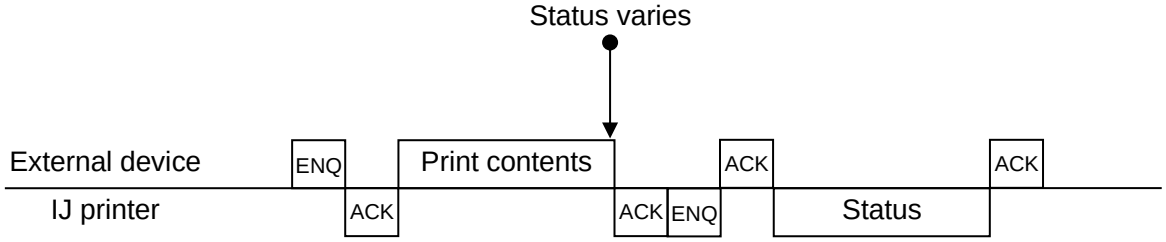


3.4 If output is necessary during receive:

(1) If printing is completed during receive from external device, the print contents (completion code) will be output after receiving has finished.



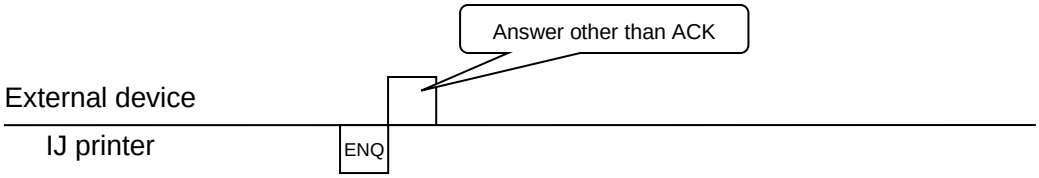
(2) If the status varies during receive from external device, the status will be output after receive has finished.



3.5 Abnormal answers from external device

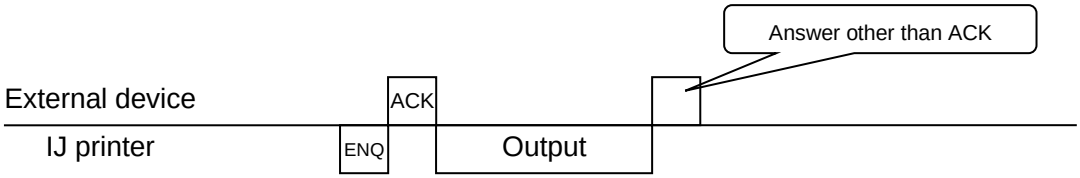
(1) If answer other than ACK is returned to ENQ:

- No data is output to external device. The printer is not in status waiting for any response.



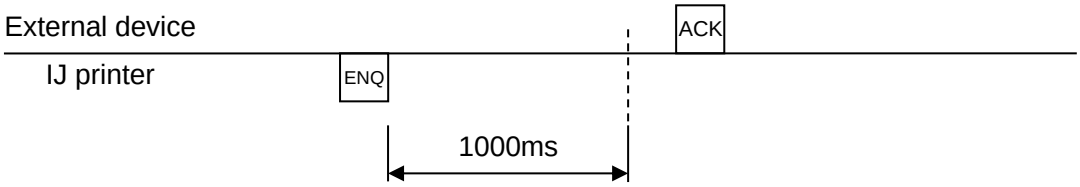
(2) If answer other than ACK is returned to status output:

- The process is the same as when receiving ACK.



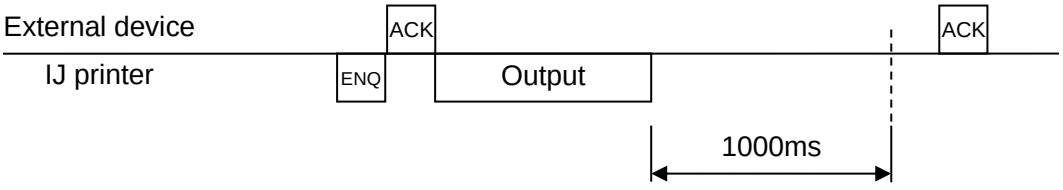
(3) If no answer is returned to ENQ for at least 1000 ms:

- No data is output to external device. The printer is not in status waiting for any response.



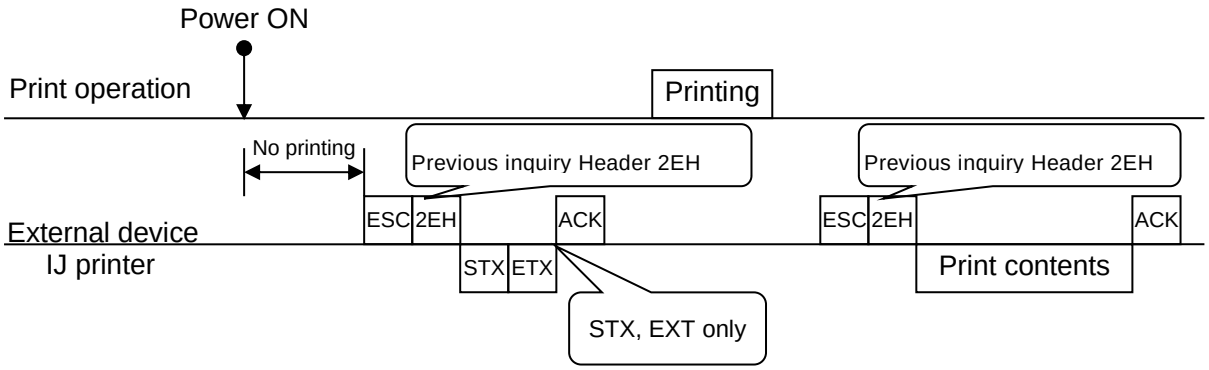
(4) If no answer is returned to status output for at least 1000 ms:

- The process is the same as when receiving ACK within 1000 ms.



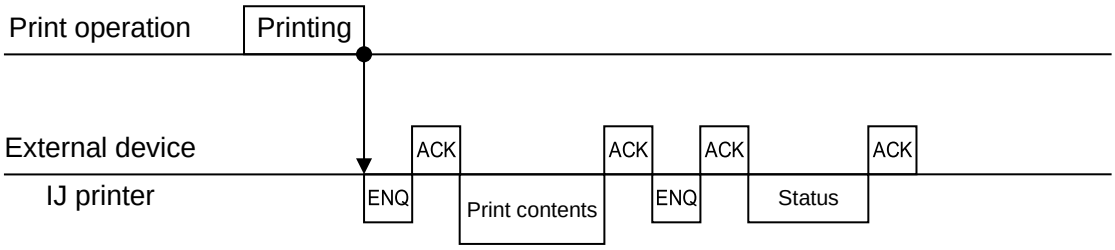
3.6 Supplement of print content output

(1) There are no “previous print contents” in the status where nothing has been printed after power has been turned on. At this time, no print content (only STX, ETX) will be output to inquiry on “previous print contents”.

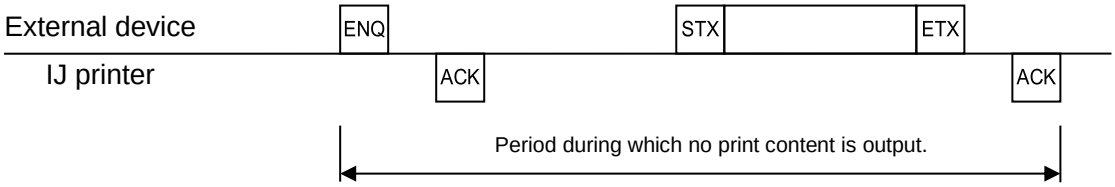


(2) The print contents (completion code) will be output when printing is finished normally: They will not be output when fault occurs during printing or when printing is not completed normally.

(3) When printing is completed in the overwrite-protected mode, the print contents (completion code) will be output, and then the status will be output.



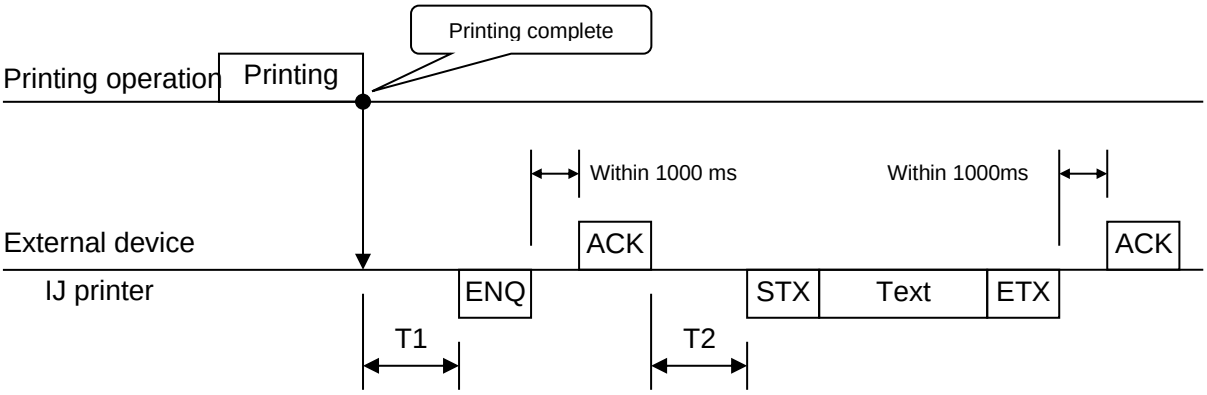
(4) No print contents will be output during receiving of communications from external device. They will be output after ACK is transmitted following ETX.



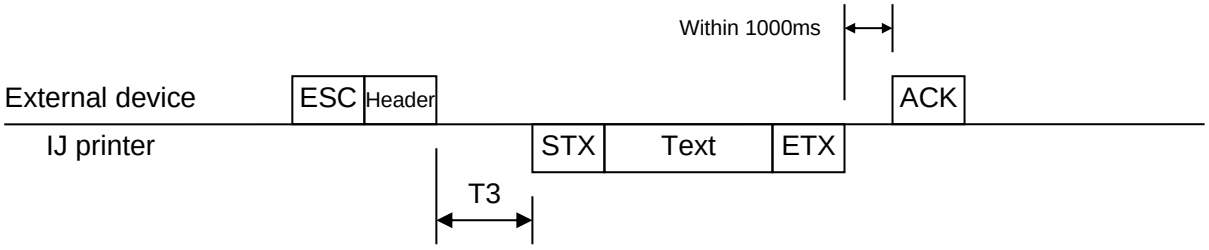
4. Response Time

4.1 Print Content Output, Print Completion Code Output

(1) Output to print completion



(2) Output to inquiry on print contents



Response time

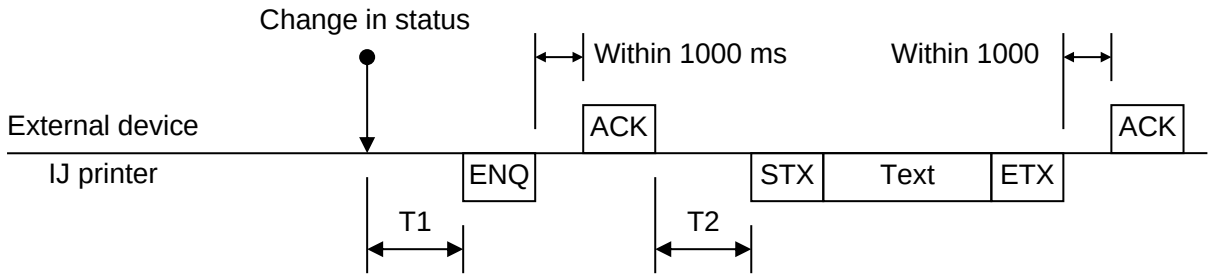
Item	Time (ms)	
	Within 24 items	25 items or more
T1	10	10
T2	10	40
T3	10	40

If the transfer rate is 150 – 1200 bps, the response time will increase by 10 ms.

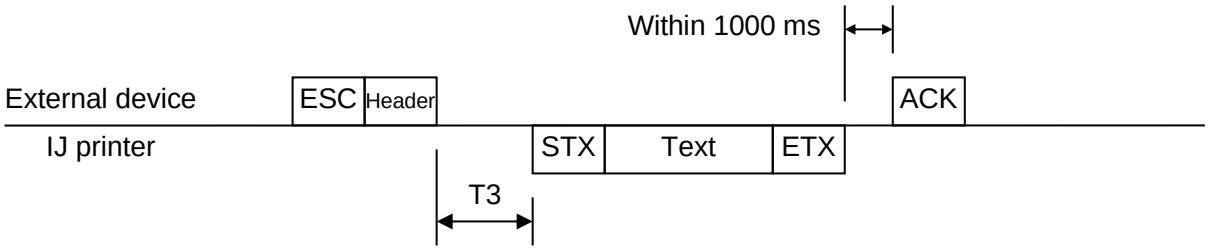
If the printer is in status other than Ready, the response time T3 will increase by 80 ms.

4.2 Status Output

(1) Output to change in status



(2) Output to inquiry on status

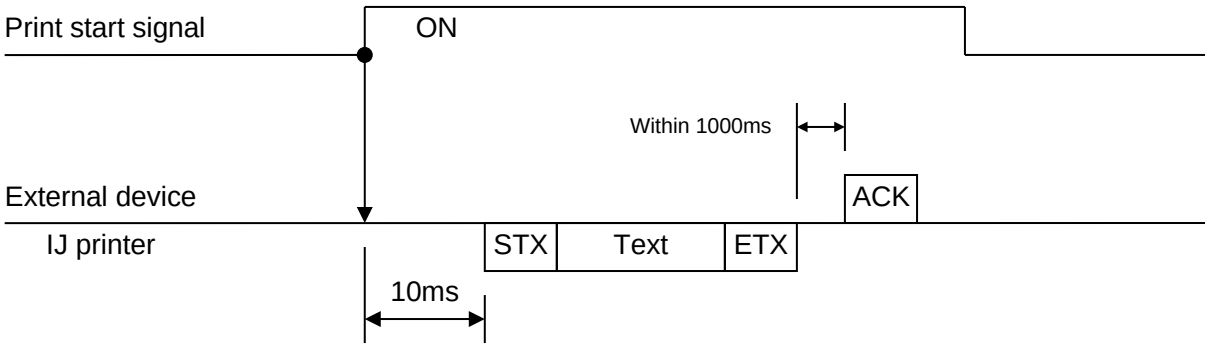


Response time

Item	Time (ms)
T1	10
T2	10
T3	10

If the transfer rate is 150 – 1200 bps, the response time will increase by 10 ms.

4.3 Print Start Output



- When the print start delay of the print specifications screen is set, the print start output is delayed for it.

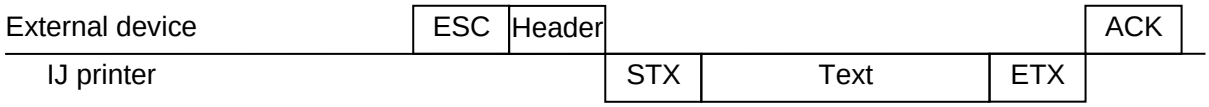
Response time

Item	Time (ms)	
	Within 24 items	25 items or more
T1	30	50

If the transfer rate is 150 – 1200 bps, the response time will increase by 10 ms.

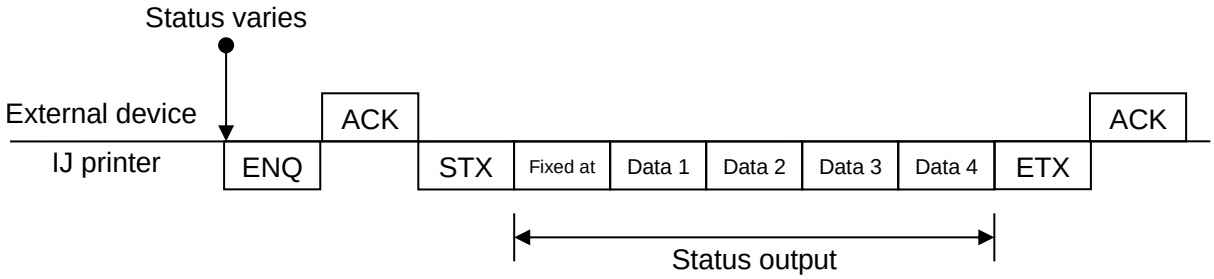
5. Code Tables

5.1 Inquiry



Category of inquiry	output content	Header code
Inquiry on status	status	23H
Inquiry on print contents	Previous print content	2EH
	Subsequent print content	2FH

5.2 Status



Status Output Code Table (1/1)

Data No.	Category of status	Code	Details
Data 1	Communication connection status	30H	Offline (Com=0)
		31H	Online (Com=1)
Data 2	Reception enable/disable status	30H	Reception not possible
		31H	Reception possible
Data 3	Operation status	30H	Stop
		31H	Standby, cover open, Drop adjust, Starting ink heating
		32H	Ready
		49H	Stopping
		-	(See separate table for faults)
Data 4	Warning status	30H	No warning
		-	(See separate table for warnings)

Data 3 (Operation Status) Fault Code Table (1/2)

Code	Details	Remarks
33H	Deflection Voltage Fault	
34H	Main Ink Tank Too Full	
35H	Blank Print Items	
36H	Ink Drop Charge Too Low	
37H	Ink Drop Charge Too High	
38H	Print Head Cover Open	
39H	Target Sensor Timer Out	
3AH	SYSTEM OPERATION ERROR C	
3BH	Target Spacing Too Close	
3CH	Detector Position Improper	
3DH	SYSTEM OPERATION ERROR M	
3EH	Charge Voltage Fault	
3FH	Barcode Short On Numbers	
41H	Multi DC Power Supply Fan Fault	
42H	Deflection Voltage Leakage	
43H	Print Overlap Fault	
44H	Ink Low Fault	
45H	Makeup Low Fault	
46H	Print Data Changeover In Progress M	
47H	Excessive Format Count	
48H	Makeup Replenishment Time-out	
4AH	Ink Replenishment Time-out	
4BH	No Ink Drop Charge	
4CH	Ink Heating Unit Temperature Too High	
4DH	Ink Heating Unit Temperature Sensor Fault	
4EH	Ink Heating Unit Over Current	
4FH	Internal Communication Error C	
50H	Internal Communication Error M	
51H	Internal Communication Error S	
52H	SYSTEM OPERATION ERROR S	
53H	Memory Fault C	
54H	Memory Fault M	
55H	Ambient Temperature Sensor Fault	
56H	Print Controller Cooling Fan Fault	
59H	Print Data Changeover In Progress S	
5AH	Print Data Changeover In Progress V	
5DH	Memory Fault S	
5EH	Pump Motor Fault	
5FH	Inside Temperature Sensor Fault	

Data 3 (Operation Status) Fault Code Table (2/2)

Code	Details	Remarks
60H	External Communication Error	
61H	External Signal Error	
62H	Memory Fault OP	
63H	Ink Heating Unit Temperature Low	
64H	Model-key Fault	
65H	Language-key Fault	
66H	Communication Buffer Fault	
67H	Shutdown Fault	
68H	Count Overflow	
69H	Invalid Data Change Timing	
6AH	Invalid Count Data Change Timing	
6BH	Invalid Print Start Timing	
6CH	Ink Shelf Life Information	
6DH	Makeup Shelf Life Information	
6EH	Continue Message Print Setting Invalid	
70H	Special Output Response Fault	
71H	Print Data Changeover Error C	
72H	Print Data Changeover Error M	
73H	Charge Voltage Too Low	
74H	Ink Level Sensor Broken 1	
75H	Makeup Level Sensor Broken 1	
76H	Ink Level Sensor Broken 3	
77H	Makeup Level Sensor Broken 3	
78H	Ink Low Fault 2	
79H	Makeup Low Fault 2	
7AH	Circulation Route Pressure Is High	
7BH	Free Layout Printing Failure	
7CH	SYSTEM OPERATION ERROR S	
7DH	Ink Drop Charge Error	
7EH	Vision sensor Connection Error	
7FH	Print Contents Inconsistency Error	
80H	Makeup Route Pressure Is High	
82H	Makeup Replenishment Time-out	
85H	Cleaning Solvent Container Sensor Non-detection Error	
86H	Print Head Removal Error	
87H	Air Pump Motor Fault	

Data 4 (Warning status) Warning Code Table (1/1)

Code	Details	Remarks
31H	Ink Low Warning	
32H	Makeup Low Warning	
33H	Ink Shelf Life Expired	
34H	Battery Low M	
35H	Ink Pressure High	
36H	Product Speed Matching Error	
37H	External Communication Error nnn	
38H	Ambient Temperature Too High	
39H	Ambient Temperature Too Low	
3BH	External Signal Error nnn	
3CH	Ink Pressure Low	
3DH	Excitation V-ref. Review	
3EH	Viscosity Reading Instable	
3FH	Viscosity Readings Out of Range	
40H	Ink Viscosity High	
41H	Ink Viscosity Low	
42H	Excitation V-ref. Review 2	
44H	Battery Low C	
45H	Calendar Content Inaccurate	
46H	Excitation V-ref. Char. height Review	
49H	Model-key Failure	
4AH	Language-key Failure	
4CH	Upgrade-key Fault	
50H	Circulation System Cooling Fan Fault	
51H	Inside Temperature Too High	
53H	Special Output Response Error	
54H	RFID Reader Failure	
55H	IC card read error	
56H	Makeup Ejection Pressure Low	
57H	Ink Level Sensor Broken 2	
58H	Makeup Level Sensor Broken 2	
59H	Ink Low Warning 2	
5AH	Makeup Low Warning 2	
5BH	Stirrer Motor M fault	
5CH	Stirrer Motor S fault	
5EH	Makeup Low Warning Running	
5FH	Parts Life Expired	
60H	Parts Life Expired	
61H	Touch Screen Calibration Fault	
62H	Ink Low Warning 3	
63H	Makeup Low Warning 3	

6. Supplementary item

6.1 Cautions regarding compatibility with previous models

(1) IJ Printer UX2 model can set maximum of 11 characters per 1 print item.

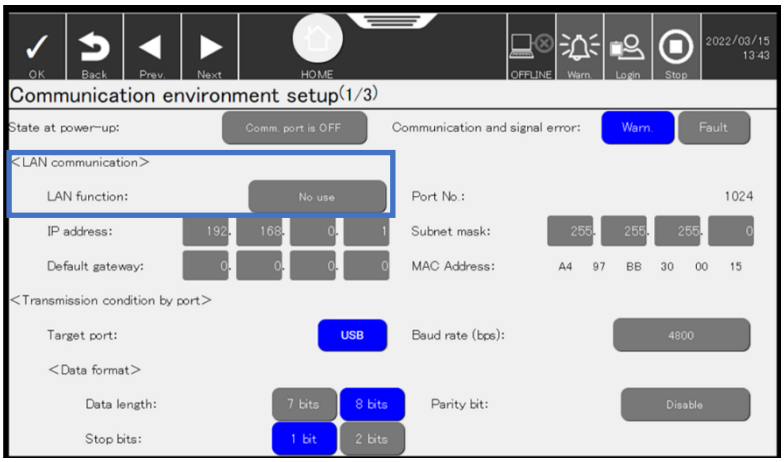
Therefore, maximum of 11 characters are output per 1 print item for Print Item Output.

When maintaining the compatibility with previous models (Before PXR model), please set character number to 10 or less per 1 print item.

6.2 Notes when using this option

(1) This option cannot be used together with OPC-UA communication and EtherNet/IP communication.

(2) When LAN function other than “No use” is selected on communication environment setup (1/3), Fault/Warning message are not come when an external communication error is detected in serial communication. When IJ printer detect an external communication error, IJ printer send NAK (15H) to External device. Please monitor the code with External device.



6.3 Notes when using LAN function for Output port

(1) The response time for the inquiries may delay depending on the network environment.

(2) Only one external device can be connected via Ethernet.

(3) If LAN is set for Output port, Modbus communication cannot be used at the same time.

(4) The Output function does not operate if there are no connections made.