

# FTP2176000N0 FCLPrintLib iOS Function Specifications

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FCL COMPONENTS LIMITED

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## 1. Application

These specifications provide for the specification of FCL Component iOS library FTP2176000N0.

Library set Name : FTP2176000N0\_FCLPrintLib\_iOS\_Vxxx      xxx: file version  
(Release file name) (FTP2176000N0\_FCLPrintLib\_iOS\_Vxxx.zip)  
File list : libFTP2176000N0\_IOS.a  
          FTP2176000N0\_IOSLibrary.h  
          FTPIOSCommonHeader.h  
          A1NC40217-6000N0\_xx.pdf  
          A1NC40217-6000N0~6\_xx.pdf  
  
Operating System : iOS 11 – 17  
                  iPadOS 13 – 17  
Architecture : arm64  
Applicable printer : FTP-62HWSL000

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## 2. Outline

This specification describes the details of all methods in the library and example of use.

### 3. How to connect with a printer for Bluetooth

- (1) Turn on the printer power.
- (2) Open the Bluetooth properties ([settings] – [general] – [Bluetooth])
- (3) Tap [Bluetooth] switch to “ON”.
- (4) When printer name (e.g. FTP-62HWSL000) is displayed, tap it to connect.
- (5) If PINCODE input screen is displayed, input the PIN code registered into the printer.
- (6) If “Connected” is displayed, connection is completed.

## 4. How to use the Library

How to import the Library into your project. (In the case of Xcode7)

- (1) Copy “FTP2176000N0\_IOSLibrary.h”, “FTPIOSCommonHeader.h” and “libFTP2176000N0\_IOS.a” to your project folder.
- (2) Import tree files to your project on Xcode.  
From “Add Files to (your project)” on right-click menu, add “FTP2176000N0\_IOSLibrary.h”, “FTPIOSCommonHeader.h” and “libFTP2176000N0\_IOS.a”.
- (3) Select the project name from [Project Navigator].  
Select [Targets] -> [Build Phase], and click the + of [Link Binary With Libraries].  
Add “ExternalAccessory.framework”.
- (4) Select the project name from [Project Navigator].  
Select [Targets] -> [Info] -> [Custom iOS Target Properties].  
Add “Supported external accessory protocols” Key.  
Click the triangle of this key and enter the supported protocol for [Item x] (x is the number).  
Refer to [“startPrinter:protocolName:series:” method](#) for the supported protocol.
- (5) Import “FTP2176000N0\_IOSLibrary.h” file on your source code as follows.  
#import “FTP2176000N0\_IOSLibrary.h”

### – Basically print process –

- (1) Connect with a printer from Bluetooth settings screen on iOS. (If Bluetooth on iOS turned off, or printer was disconnected.)
- (2) Call “alloc” method and “init” method of FTP2176000N0\_IOSLibrary class to create a new instance and initialize.  
e.g.) `FTP2176000N0_IOSLibrary* ftpLib = [[FTP2176000N0_IOSLibrary alloc] init];`
- (3) Call “startPrinter:” method to communicate a printer.
- (4) Call any printing method to print.  
If page print mode is used, “startPage:” method must be called first. Next, call “setAbsolutePosition:” or “setRelativePosition:” method which specifies the print point, then call “printCharacterString:” or “printBarcode:” method etc. Finally, “printPage:” method is called to start printing.
- (5) Call “closePrinter” method to end.

## 5. Method reference

"libFTP2176000N0\_IOS.a" included in this driver set is a library file for the printer to control from application.

Application by calling the method of this library, enables image printing and status acquisition of the printer.

Class name : FTP2176000N0\_IOSLibrary

Inheritance : NSObject

### – Method list –

No	Method	Feature
Initializing methods		
1	– startPrinter:protocolName:series:	Open the specified Bluetooth session to communicate with printer.
2	– closePrinter	Close the Bluetooth session.
Printing methods		
3	– detectMark	Execute the mark detection.
4	– dotfeedPaper:	Feed the forward direction by specified dot-lines.
5	– linefeedPaper:	Feed the forward direction by specified lines.
6	– printBarcode:data:height:narrow:wide:hri:	Print the barcode.
7	– printBitimage:width:height:compression:	Print the bit-image data.
8	– printCharacterString:	Print the character string.
9	– printCustomerBarcode:size:	Print the Customer barcode.
10	– printGS1DataBar:DataBarType: module:numberOfSegments:	Print the GS1 DataBar.
11	– printMaxiCode:mode: number:count:symbolCount:	Print the Maxi code.
12	– printPage:	Start the printing of page print mode.
13	– printPDF417Code:columnsOrSteps:width: height:errorLevel:	Print the PDF417 code.
14	– printPicture:dithering:width:height:	Convert a picture to bit-image format and print.
15	– printQRCode:modulemagnification:errorLevel: concatenation:code:division:parity:masking:	Print the QR code.
16	– printRegisteredImage:mode:	Print the registered bit-image data.
17	– startPage:	Start the page print mode.
Print setting methods		
18	– registBitimage:width:height:data:	Register the bit-image onto the flash memory of printer.
19	– registPicture:image:dithering:width:height:	Convert a picture to bit-image format and register the bit-image onto the flash memory of printer.
20	– setAbsolutePosition:	Specify the absolute coordinate of a print point.

21	– setCharacterStyle:kanjiSize:fontHSize: fontVSize:bold:bwReverse:underline:space: leftOfKanji:rightOfKanji:	Specify the character style.
22	– setInternationalCharacterCode:country:	Set the international character code.
23	– setLineFeedAmount:page:	Set the single line pitch.
24	– setOrientation:	Specify the print direction.
25	– setPaperType:feedBeforePrintPage: feedAfterMarkDetection:autoFeedLength:	Set the paper type and amount of feed after mark detection.
26	– setPrintSpeed:	Set the print speed.
27	– setRelativePosition:	Specify the relative coordinate of a print point.
28	– setRotation:	Set the rotation of the string.
Device setting methods		
29	– setAutoPowerOffTime:	Set the automatic power-off time.
30	– setBluetoothSecurityMode:encryption:PINCode: deviceName:	Set the Bluetooth security mode.
31	– setPrintQuality:energy:halfPitch: thermalHeadDivision:	Set the print quality, energy adjustment and half-pitch printing.
Printer information retrieving methods		
32	– getPrinterData:	Retrieve the printer information.
33	– waitPrintEnd:	Wait till print process will end.

## – Instance Method –

### (1) startPrinter:protocolName:series:

– (int)startPrinter:(NSString \*)*model* protocolName:(NSString \*)*protocolName* series:(int)*series*;

Start the session to communicate with a printer.

#### Parameter

*model*: Specify the modelNumber  
(e.g. 62HWSL000\_XXXXXX)

*protocolName*: Specify the protocol (com.fujitsu.fcl.ftp-62hwsI000-00)

*series*: Specify the printer series.

<i>series</i>	Printer series	Printable width(dots)
FTP_62hwsI000	FTP-62HWSL000	384

#### Return Value

Error\_Success : Success

Error\_NoDevice : Printer is not detected.

Error\_AlreadyConnectedPrinter : Printer is already connected.

Error\_AlreadyConnectedPrinterOtherDevice : Printer is already connected by other instance.

Error\_IllegalParameter : Parameter is out of range.

#### Explanation

- The printer corresponding to specified *model* and *protocolName* is searched and communication with a printer is established.
- The instance variable in this library is initialized. For initial value, refer to "[The initial value of each settings](#)".
- When the printer disconnected (for example, power of printer turn off), execute this method again after the printer re-connection from Bluetooth setting screen on iOS. In that case, all variable in library are initialized.
- When this method is executed after printer connection, this method returns "Error\_AlreadyConnectedPrinter".
- "PrinterEvent\_ConnectedPrinter" is posted by "[Notification](#)" when the printer becomes connected and available.

(2) closePrinter:  
– (int)closePrinter;

Close the printer session.

#### Parameter

None

#### Return Value

Error\_Success : Success

#### Explanation

- The printer session is closed.
- When page print mode, a session is closed after canceling the data of page print mode.
- If printer session is closed during data transmission and printing or registration process, the data error may occur and it may become a factor of malfunction. Therefore this method recommends executing after the completion of printer processing using notification of “Notification” function.

(3) detectMark:  
– (int)detectMark;

Execute the mark detection.

#### Parameter

None

#### Return Value

Error_Success	: Success
Error_NoDevice	: Printer is not detected.

#### Explanation

- The paper is fed to the next mark position.
- When line print mode, the mark is not detected within current page length, it becomes mark undetection state and stops paper feeding. This page length is specified “setLineFeedAmount:” method.
- When page print mode, mark detection is executed after printing page print mode data.
- If the data of page print mode is none, mark detection is only executed.
- After printing the data of page print mode, the data is cleared, and page print mode is continued, and print position moves to upper left corner.  
In the page print mode, if a mark is not detected within 204 mm from the position where the mark detection operation is executed after this command is received, an error occurs, and paper feed stops.

#### (4) dotfeedPaper:

– (int)dotfeedPaper:(int)*nDotLineFeed*,

Feed the forward direction by the specified dot-lines.

#### Parameter

*nDotLineFeed*: Specify the feed lines per dot-line. (0 to 255)

#### Return Value

Error_Success	: Success
Error_IllegalParameter	: Parameter is out of range.
Error_NoDevice	: Printer is not detected.

#### Explanation

- The paper is feed forward direction by the specified dot-lines.
- When the page print mode, actually paper is not fed and only move to print position. In that case, only vertical print position is moved.
- When specified *nDotLineFeed* == 0, if data is in print buffer, only printing the data in buffer and if data is not in print buffer, the paper is not fed.

(5) `linefeedPaper`:

– (int)`linefeedPaper`:(int)*nLineFeed*,

Feed the forward direction by the specified lines.

**Parameter**

*nLineFeed*: Specify the feed lines. (0 to 255)

**Return Value**

<code>Error_Success</code>	: Success
<code>Error_IllegalParameter</code>	: Parameter is out of range.
<code>Error_NoDevice</code>	: Printer is not detected.

**Explanation**

- The paper is feed forward direction by the specified lines.
- The height of a line is set up by “`setLineFeedAmount`.” method. When the page print mode, actually paper is not fed and only move to print position.
- When specified *nLineFeed* == 0, if data is in print buffer, only printing the data in buffer and if data is not in print buffer, the paper is not fed.

(6) printBarcode:data:height:narrow:wide:rotate:

– (int)printBarcode:(int)*symbol* data:(NSData \*)*data* height:(int)*height* narrow:(int)*narrowBar* wide:(int)*wideBar* hri:(int)*hri*;

Print the barcode.

#### Parameter

*symbol*. Specify the kind of Barcode.

<i>Symbol</i>	Barcode type
Barcode_Upca	UPC-A
Barcode_Upce	UPC-E
Barcode_Ean8	EAN 8 (JAN 8)
Barcode_Ean13	EAN 13 (JAN 13)
Barcode_Itf	ITF (Interleaved 2 of 5)
Barcode_Codabar	CODABAR
Barcode_Code39	CODE39
Barcode_Code128	CODE128

*data*. Specify the data of Barcode.

*height*. Specify the height of Barcode. (1 to 255)

*narrowBar*. Specify the width of narrow bar of Barcode. (1 to 255)

*wideBar*. Specify the width of wide bar of Barcode. (1 to 255)

*hri*. Specify HRI position.

<i>hri</i>	The position of HRI
HRI_None	No HRI
HRI_Below	Below barcode

#### Return Value

Error_Success	: Success
Error_NoDevice	: Printer is not detected.
Error_IllegalParameter	: Parameter is out of range.
Error_PageModeOutSide	: Barcode is outside from printable region when page print mode.

#### Explanation

- When page print mode, barcode data is only sent to page print mode buffer, actually not be printed.
- HRI character size is set automatically to fit the barcode width.
- If specified the rotation by “setRotation:” method, the character also moves to match the rotation of the barcode.
- When UPC-A or UPC-E or EAN 8(JAN 8) or EAN 13(JAN 13) or CODE128 is specified, “*wideBar*” parameter is ignored.

- The conditions of each barcode which can be printed are shown below. If the parameter is out of range, barcode cannot be read normally with a scanner.

Barcode type	Available data	Number of data
UPC-A	"0 to 9"	11 or 12
UPC-E		11 or 12
EAN8 (JAN8)		7 or 8
EAN13(JAN13)		12 or 13
CODE39	"0 to 9" , "A to Z", space, "\$ % + - * . /"	1 or more
ITF	"0 to 9"	2 or more
CODABAR	"0 to 9", "A to D" , "\$ + - . / :"	3 or more
CODE128	Code Set A: 0x00 to 0x5F Code Set B: 0x20 to 0x7F Code Set C: 0x00 to 0x63 ( excluding the character data "{" )	3 or more

- When two or more barcodes exist in the same line, they may be unable to print even if this method returns "Error\_Success".
- When specifying CODE39, a start character and a stop character are automatically added.
- When specifying ITF, it is necessary the number of characters is even number.
- If odd number is specified, this method returns "Error\_IllegalParameter".
- When specifying CODABAR, The start and end character need to be either from 'A' to 'D'.
- When specifying UPC-E, data conversion is based on the following table.  
A UPC-A left code is the 2 to 6th characters from the head, and a UPC-A right code is the 7 - 11th characters from the head. The compressed code is actually printed as UPC-E.  
When the first character is not zero or not based on the following table, this method returns "Error\_IllegalParameter".  
e.g.) 05810000226 => 58226  
09859363583 => Illegal Parameter

Maker code Left code of UPC-A					Item code Right code of UPC-A					Compressed code					
F1	F2	F3	F4	F5	A1	A2	A3	A4	A5	Z1	Z2	Z3	Z4	Z5	Z6
0-9	0-9	0	0	0	0	0	0-9	0-9	0-9	F1	F2	A3	A4	A5	0
0-9	0-9	1	0	0	0	0	0-9	0-9	0-9	F1	F2	A3	A4	A5	1
0-9	0-9	2	0	0	0	0	0-9	0-9	0-9	F1	F2	A3	A4	A5	2
0-9	0-9	3-9	0	0	0	0	0	0-9	0-9	F1	F2	F3	A4	A5	3
0-9	0-9	0-9	1-9	0	0	0	0	0	0-9	F1	F2	F3	F4	A5	4
0-9	0-9	0-9	0-9	1-9	0	0	0	0	5-9	F1	F2	F3	F4	F5	A5

•When printing CODE128, a character is set up as follows.

1. The head of data need to be either of "{A", "{B", "{C". Following data is set to CODE A, CODE B, CODEC.
2. In order to set the function code, specify "{1", "{2", "{3", or "{4". Each becomes FUNC1, FUNC2, FUNC3, FUNC4.  
When CODE C is specified, only FUNC1 is valid. If parameter is specified except for FUNC1, this method returns "Error\_IllegalParameter".
3. In order to print "{" in CODE B, specify "{{".
4. In order to set SHIFT code, specify "{S". The code set of following one character shifts like CODE A <--> CODE B.  
When setting SHIFT in CODE C, this method returns "Error\_IllegalParameter".

•The printable characters of each CODE are shown in the following tables.

value dec	value hex	CODE A	CODE B	CODE C
0	0	NUL		0
1	1	SOH		1
2	2	STX		2
3	3	ETX		3
4	4	EOT		4
5	5	ENQ		5
6	6	ACK		6
7	7	BEL		7
8	8	BS		8
9	9	HT		9
10	0A	LF		10
11	0B	VT		11
12	0C	FF		12
13	0D	CR		13
14	0E	SO		14
15	0F	SI		15
16	10	DLE		16
17	11	DC1		17
18	12	DC2		18
19	13	DC3		19
20	14	DC4		20
21	15	NAK		21
22	16	SYN		22
23	17	ETB		23
24	18	CAN		24
25	19	EM		25
26	1A	SUB		26
27	1B	ESC		27
28	1C	FS		28
29	1D	GS		29
30	1E	RS		30

value dec	Value hex	CODE A	CODE B	CODE C
64	40	@	@	64
65	41	A	A	65
66	42	B	B	66
67	43	C	C	67
68	44	D	D	68
69	45	E	E	69
70	46	F	F	70
71	47	G	G	71
72	48	H	H	72
73	49	I	I	73
74	4A	J	J	74
75	4B	K	K	75
76	4C	L	L	76
77	4D	M	M	77
78	4E	N	N	78
79	4F	O	O	79
80	50	P	P	80
81	51	Q	Q	81
82	52	R	R	82
83	53	S	S	83
84	54	T	T	84
85	55	U	U	85
86	56	V	V	86
87	57	W	W	87
88	58	X	X	88
89	59	Y	Y	89
90	5A	Z	Z	90
91	5B	[	[	91
92	5C	\	\	92
93	5D	]	]	93
94	5E	^	^	94

value dec	value hex	CODE A	CODE B	CODE C
31	1F	US		31
32	20	SP	SP	32
33	21	!	!	33
34	22	"	"	34
35	23	#	#	35
36	24	\$	\$	36
37	25	%	%	37
38	26	&	&	38
39	27	'	'	39
40	28	(	(	40
41	29	)	)	41
42	2A	★	★	42
43	2B	+	+	43
44	2C	,	,	44
45	2D	–	–	45
46	2E	.	.	46
47	2F	/	/	47
48	30	0	0	48
49	31	1	1	49
50	32	2	2	50
51	33	3	3	51
52	34	4	4	52
53	35	5	5	53
54	36	6	6	54
55	37	7	7	55
56	38	8	8	56
57	39	9	9	57
58	3A	:	:	58
59	3B	;	;	59
60	3C	<	<	60
61	3D	=	=	61
62	3E	>	>	62
63	3F	?	?	63

value dec	value hex	CODE A	CODE B	CODE C
95	5F	_	_	95
96	60		,	96
97	61		a	97
98	62		b	98
99	63		c	99
100	64		d	
101	65		e	
102	66		f	
103	67		G	
104	68		h	
105	69		i	
106	6A		j	
107	6B		k	
108	6C		l	
109	6D		m	
110	6E		n	
111	6F		o	
112	70		p	
113	71		q	
114	72		r	
115	73		s	
116	74		t	
117	75		u	
118	76		v	
119	77		w	
120	78		x	
121	79		y	
122	7A		z	
123	7B		{	
124	7C			
125	7D		}	
126	7E		~	
127	7F			

Send data		Special character	meaning
hex	ASCII		
7Bh+31h	{1	FNC1	Function character
7Bh+32h	{2	FNC2	
7Bh+33h	{3	FNC3	
7Bh+34h	{4	FNC4	
7Bh+41h	{A	CODE A	Code set select character
7Bh+42h	{B	CODE B	
7Bh+43h	{C	CODE C	
7Bh+53h	{S	SHIFT	Shift character
7Bh+7Bh	{{	'{'	Specified '{'

- When the size of barcode (include HRI size) becomes more than a page size, this method returns “Error\_IllegalParameter”.

Print mode	rotation	Print direction	Max width and max height
Line print mode	0 degree	–	Printable width(dots)
Page print mode	0 degree	Left to Right	width: (size.width) of startPage: method height: (size.height – 1) of startPage: method
		Right to Left	
		Up to Bottom	width: (size.height) of startPage: method height: (size.width – 1) of startPage: method
		Bottom to Up	
	180 degrees rotate	Left to Right	width: (size.width – 1) of startPage: method height: (size.height – 1) of startPage: method
		Right to Left	
		Up to Bottom	width: (size.height – 1) of startPage: method height: (size.width – 1) of startPage: method
		Bottom to Up	
	Right 90 degrees rotate	Left to Right	width: (size.height) of startPage: method height: (size.width – 1) of startPage: method
		Right to Left	
		Up to Bottom	width: (size.width) of startPage: method height: (size.height – 1) of startPage: method
		Bottom to Up	
	Left 90 degrees rotate	Left to Right	width: (size.height – 1) of startPage: method height: (size.width – 1) of startPage: method
		Right to Left	
		Up to Bottom	width: (size.width – 1) of startPage: method height: (size.height – 1) of startPage: method
		Bottom to Up	

- When page print mode, if the barcode width and height are within the page size, this method returns “Error\_Success”. But it is not printed depending on the printing position (printing position by “setRelativePosition:” or “setAbsolutePosition:” method).
- When barcode width becomes 864 dots or more dots, not related to an angle or print direction, this method returns “Error\_IllegalParameter”.
- When page print mode, set up the quiet zone (blank region around barcode) specified. By each barcode specification. If other image or character data is overlapped on barcode or quiet zone, the barcode cannot be read normally by the barcode reader.

(7) printBitImage:width:height:compression:

- (int)printBitImage:(NSData \*)*data* width:(int)*widthDots* height:(int)*heightDots* compression:(BOOL)*dataCompression*;

Print the bit-image data.

**Parameter**

<i>data</i> :	Specify the bit-image data.
<i>widthDots</i> :	Specify the width per dot-line. (Range: refer Explanation)
<i>heightDots</i> :	Specify the height per dot-line. (Range: refer Explanation)
<i>dataCompression</i> :	Specify whether data compression is valid. NO    PackBits compression is invalid. YES   PackBits compression is valid.

**Return Value**

Error_Success	: Success
Error_IllegalParameter	: Parameter is out of range.
Error_NoDevice	: Printer is not detected.
Error_PageModeOutSide	: Barcode is outside from printable region when page print mode.

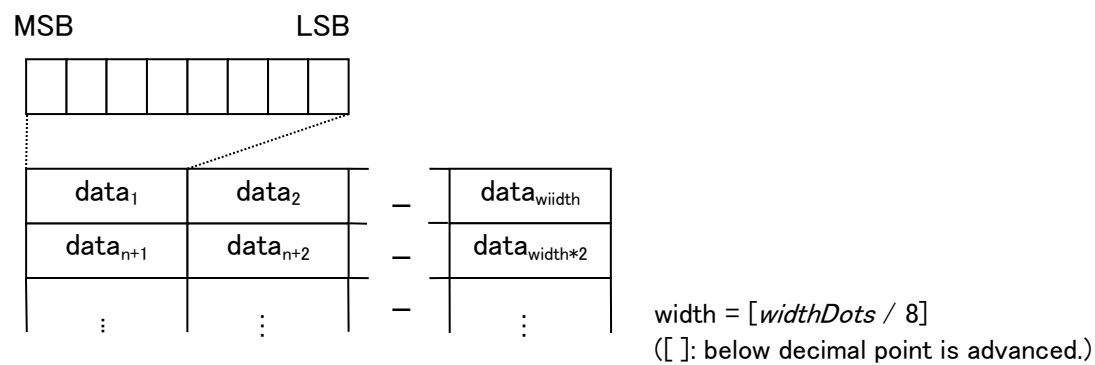
**Explanation**

- When line print mode, the print start position becomes a left end.  
When page print mode, the print start position becomes a left end of page print mode region specified by “startPage:” method. When the print direction is specified by the “setOrientation:” method, it becomes a left end to a print direction.
- The setting range of *widthDots* and *heightDots* is shown below.

Print mode	parameter	Range
Line print mode	<i>widthDots</i>	1 to Printable width(dots)
	<i>heightDots</i>	1 to 1023
Page print mode Print direction: left to right or right to left	<i>widthDots</i>	1 to Printable width(dots)
	<i>heightDots</i>	1 to 1919
Page print mode Print direction: bottom to up, or up to bottom	<i>widthDots</i>	FTP-62HWSL000 : 1 to 1920
	<i>heightDots</i>	1 to printable width(dots) – 1

- When page print mode, barcode data is only sent to page print mode buffer, actually not printing.
- When bitimage size becomes the outside of page print mode region specified “startPage:” method, this method returns “Error\_IllegalParameter” and not be printed.

•The bit image format is shown below.



- number of “data” = [widthDots / 8] \* heightDots  
([ ]: below decimal point is advanced.)
- When data size becomes large by PackBits compression, this method sends bitimage without compressing.
  - When line print mode, regardless of the setting of “setPrintSpeed:” method, the maximum printing speed is 10 mm/sec.

#### (8) printCharacterString:

– (int)printCharacterString:(NSString \*)*string*;

Print the character string.

#### Parameter

*string*: Specify the character string. (Max 4096 characters)

#### Return Value

Error_Success	: Success
Error_IllegalParameter	: Parameter is out of range.
Error_NoDevice	: Printer is not detected.

#### Explanation

- The specified character string is printed.
- The character string over printing width is started next line and printed. When page print mode, the character string over the height specified “size.height” of “startPage:” method is not printed.
- When the number of character specified by “*string*” is out of range, it does not printed and return IllegalParameter.
- This method converts the character string specified “*string*” to shift-JIS code. Therefore the printed character string may differ from character string displayed on iOS.
- The character which can not be converted in this method, '?' will be printed instead of the character.

(9) printCustomerBarcode:size:

– (int)printCustomerBarcode:(NSData \*)*data* size:(int)*size*;

For Japan only.

(10) printGS1DataBar:dataBarType:module:numberOfSegments:

– (int)printGS1DataBar:(NSData \*)*data* dataBar:(int)*gs1DataBarType* module:(int)*moduleSize* numberOfSegments:(int)*segments*;

Print the GS1 DataBar.

#### Parameter

*data*: Specify the data of GS1 DataBar.

*gs1DataBarType*: Specify the kind of GS1 DataBar.

<i>gs1DataBarType</i>	Type
GS1Databar_14	GS1 DataBar-14
GS1Databar_14_T	GS1 DataBar-14 Truncated
GS1Databar_14_S	GS1 DataBar-14 Stacked
GS1Databar_14_SO	GS1 DataBar-14 Stacked Omnidirectional
GS1Databar_L	GS1 DataBar Limited
GS1Databar_E	GS1 DataBar Expanded

*moduleSize*: Specify the module size per dot. (0 to 32)  
(Recommended value is 2 or 3.)

*segments*: Specify the number of symbol segments per one line in  
GS1 DataBar Expanded. (2 to 22: only even number)

#### Return Value

Error_Success	: Success
Error_NoDevice	: Printer is not detected.
Error_IllegalParameter	: Parameter is out of range.
Error_PageModeOutSide	: GS1 DataBar is outside from printable region when page print mode.

#### Explanation

- When page print mode, GS1 DataBar data is only sent to page print mode buffer, actually not be printed

- The conditions of each barcode which can be printed are shown below. In the case of the data which cannot be printed, this method judges and returns “Error\_IllegalParameter”.

GS1 DataBar (excluding Expanded)								
	0	1	2	3	4	5	6	7
0				0				
1				1				
2				2				
3				3				
4				4				
5				5				
6				6				
7				7				
8				8				
9				9				
A								
B								
C								
D								
E								
F								

GS1 DataBar Expanded								
	0	1	2	3	4	5	6	7
0			SP	0		P		p
1			!	1	A	Q	a	q
2			“	2	B	R	b	r
3				3	C	S	c	s
4				4	D	T	d	t
5			%	5	E	U	e	u
6			&	6	F	V	f	v
7			‘	7	G	W	g	w
8			(	8	H	X	h	x
9			)	9	I	Y	i	y
A			*	:	J	Z	j	z
B			+	;	K		k	
C			,	<	L		l	
D		FNC1	—	=	M		m	
E			.	>	N		n	
F			/	?	O	_	o	

- Each specification of GS1 DataBar is as follows. The data length following specification is a return value of [data length].  
(dx is byte data in “data”, the 1st byte is d1, following bytes are d2, d3, ...dx.)

#### [GS1 DataBar-14]

- Data length is 13 or 14.
- When data length is 13, the data of (d1 to d13) and check digit are printed.
- When data length is 14, the 14th data (d14) is canceled, the data of (d1– d13) and check digit are printed.

#### [GS1 DataBar-14 Truncated]

- Only height differs between GS1 DataBar Truncated and GS1 Databar-14.
- Specifications excluding height are the same as GS1 Databar-14.

#### [GS1 DataBar-14 Stacked]

- It is the stack type symbol which is composed of upper step and low step.
- One separation pattern is added between steps.
- Specifications excluding symbol composition are the same as GS1 Databar-14.

#### [GS1 DataBar-14 Stacked Omnidirectional]

- It is the stack type symbol which is composed of upper step and low step.
- Three separation patterns are added between steps.
- Specifications excluding symbol composition are the same as GS1 Databar-14.

#### [GS1 DataBar Limited]

- Data length is 13 or 14.
- When the 1st byte is not 0 or 1, GS1 DataBar is not printed, the remaining data are ignored.

- When data length is 13, the data of (d1 to d13) and check digit are printed.
- When data length is 14, the 14th data (d14) is canceled, the data of (d1 to d13) and check digit are printed.
- A check digit is calculated by the modulus 10 from (d1 to d13).

[GS1 DataBar Expanded]

- It is the stack type symbol which is composed of one to eleven steps.
- Three separation patterns are added between steps.
- Data length is be able to set maximum of 77 bytes, the maximum data length which this GS1 DataBar can actually print is changed by the coding method.
- GS1 DataBar is not printed when the printable maximum data length is exceeded.
- This GS1 DataBar is composed of four to twenty-two segments.

- When the width of barcode becomes more than a page size, this method returns “Error\_IllegalParameter”.

Print mode	rotation	Print direction	Max width and max height
Line print mode	0 degree	–	Printable width(dots)
Page print mode	0 degree	Left to Right	width: (size.width) of startPage: method height: (size.height – 1) of startPage: method
		Right to Left	
		Up to Bottom	width: (size.height) of startPage: method height: (size.width – 1) of startPage: method
		Bottom to Up	
	180 degrees rotate	Left to Right	width: (size.width – 1) of startPage: method height: (size.height – 1) of startPage: method
		Right to Left	
		Up to Bottom	width: (size.height – 1) of startPage: method height: (size.width – 1) of startPage: method
		Bottom to Up	
	Right 90 degrees rotate	Left to Right	width: (size.height) of startPage: method height: (size.width – 1) of startPage: method
		Right to Left	
		Up to Bottom	width: (size.width) of startPage: method height: (size.height – 1) of startPage: method
		Bottom to Up	
	Left 90 degrees rotate	Left to Right	width: (size.height – 1) of startPage: method height: (size.width – 1) of startPage: method
		Right to Left	
		Up to Bottom	width: (size.width – 1) of startPage: method height: (size.height – 1) of startPage: method
		Bottom to Up	

- When page print mode, if the barcode width and height are within the page size, this method returns “Error\_Success”. But it is not printed depending on the printing position (printing position by “setRelativePosition:” or “setAbsolutePosition:” method).
- When barcode width becomes 864 dots or more dots, not related to an angle or print direction, this method returns “Error\_IllegalParameter”.

(11) printMaxiCode:mode:number:count:

– (int)printMaxiCode:(NSData \*)*data* mode:(int)*symbolMode* number:(int)*symbolNumber* count:(int)*symbolCount*;

Print the Maxi code.

#### Parameter

*data*: Specify the data of Maxi code.

*symbolMode*: Specify the symbol mode.

<i>symbolMode</i>	Mode
MaxiCodeMode_2	Mode 2
MaxiCodeMode_3	Mode 3
MaxiCodeMode_4	Mode 4
MaxiCodeMode_5	Mode 5
MaxiCodeMode_6	Mode 6

*symbolNumber*: Specify the symbol number of Maxi code. (1 to 8)

*symbolCount*: Specify the symbol count of Maxi code. (1 to 8)

#### Return Value

Error_Success	: Success
Error_NoDevice	: Printer is not detected.
Error_IllegalParameter	: Parameter is out of range.
Error_PageModeOutSide	: Maxi code is outside from printable region when page print mode.

#### Explanation

- When page print mode, barcode data is only sent to page print mode buffer, actually not be printed.

- The conditions of each bar code which can be printed are shown below.  
If the parameter is out of range, Maxi code cannot be read normally with a scanner.

Mode	Valid data range	Number of data
Mode2	Primary Message Number "0 to 9" Secondary Message 0x00 to 0xFF	18 to 85
Mode3	Primary Message Postal code "0 to 9" , "A to Z" , space, " "#\$%&'()*+,-./ " Country code Service code Number "0 to 9" Secondary Message 0x00 to 0xFF	18 to 85
Mode4, Mode5	0x00 to 0xFF	1 to 80
Mode6	0x00 to 0xFF	1 to 80

- When page print mode, if the Maxi code width and height are within the page size, this method returns "Error\_Success". But it is not printed depending on the printing position (printing position by "setRelativePosition:" or "setAbsolutePosition:" method).
- When page print mode, set up the quiet zone (blank region around Maxi code) specified by each Maxi code specification. If other image or character data is overlapped on Maxi code or quiet zone, the barcode cannot be read normally by the barcode reader.

(12) printPage:

– (int)printPage(int)*mode*;

Start the printing.

#### Parameter

*mode*

Specify the operation after page print mode printing.

<i>mode</i>	Operation
EndPageMode	The data of page print mode is cleared after printing and shift to line print mode.
PageDataKeep	The data of page print mode is not cleared after printing and keep the page print mode.
PageDataClear	The data of page print mode is cleared after printing and keep the page print mode.
CancelPageMode	The data of page print mode is cleared without printing, and shift to line print mode.

#### Return Value

Error_Success	: Success
Error_NoDevice	: Printer is not detected.
Error_IllegalParameter	: Parameter is out of range.
Error_NotPageMode	: Current print mode is not page print mode.

#### Explanation

- Print of the page print mode data is started.
- When print line mode, this method returns “Error\_NotPageMode”.
- When the paper with a mark is set up by “setPaperType:” method and “*mode*” parameter is EndPageMode or PageDataClear, mark detection is executed after printing.
- Print speed depends on the data of page mode. Please refer to explanation of “setPrintSpeed:” method.

(13) printPDF417Code:columnsOrSteps:width:height:errorLevel:

– (int)printPDF417Code:(NSData \*)*data* columnsOrSteps:(int)*columnsOrSteps*  
width:(int)*moduleWidth* height:(int)*moduleHeight* errorLevel:(int)*errorCorrectionLevel*;

Print the PDF417 code.

#### Parameter

<i>data</i> :	Specify the data of Maxi code.
<i>columnsOrSteps</i> :	Specify the number of columns or steps. Number of columns (1 to 30) Number of Steps (3+N to 90+N : N == 128)
<i>moduleWidth</i> :	Specify the module width per dot. (1 to 30)
<i>moduleHeight</i> :	Specify the module height per dot (1 to 30)
<i>errorCorrectionLevel</i> :	Specify the error correction level (0 to 8)

#### Return Value

Error_Success	: Success
Error_NoDevice	: Printer is not detected.
Error_IllegalParameter	: Parameter is out of range.
Error_PageModeOutSide	: PDF417 code is outside from printable region when page print mode.

#### Explanation

- When page print mode, barcode data is only sent to page print mode buffer, actually not be printed.
- The conditions of each bar code which can be printed are shown below. If the parameter is out of range, PDF 417 code cannot be read normally with a scanner.

Valid data range	Number of data
0x00 to 0xFF	1 to 2710

- When page print mode, set up the quiet zone (blank region around 2D code) specified by each 2D code specification. If other image or character data is overlapped on 2D code or quiet zone, the barcode cannot be read normally by the barcode reader.

- When the width of PDF417 code becomes more than a page size, this method returns “Error\_IllegalParameter”.

Print mode	rotation	Print direction	Max width and max height
Line print mode	0 degree	–	Printable width(dots)
Page print mode	0 degree	Left to Right	width: (size.width) of startPage: method height: (size.height – 1) of startPage: method
		Right to Left	
		Up to Bottom	width: (size.height) of startPage: method height: (size.width – 1) of startPage: method
		Bottom to Up	
	180 degrees rotate	Left to Right	width: (size.width – 1) of startPage: method height: (size.height – 1) of startPage: method
		Right to Left	
		Up to Bottom	width: (size.height – 1) of startPage: method height: (size.width – 1) of startPage: method
		Bottom to Up	
	Right 90 degrees rotate	Left to Right	width: (size.height) of startPage: method height: (size.width – 1) of startPage: method
		Right to Left	
		Up to Bottom	width: (size.width) of startPage: method height: (size.height – 1) of startPage: method
		Bottom to Up	
	Left 90 degrees rotate	Left to Right	width: (size.height – 1) of startPage: method height: (size.width – 1) of startPage: method
		Right to Left	
		Up to Bottom	width: (size.width – 1) of startPage: method height: (size.height – 1) of startPage: method
		Bottom to Up	

- When page print mode, if the barcode width and height are within the page size, this method returns “Error\_Success”. But it is not printed depending on the printing position (printing position by “setRelativePosition:” or “setAbsolutePosition:” method).
- When barcode width becomes 864 dots or more dots, not related to an angle or print direction, this method returns “Error\_IllegalParameter”.

(14) printPicture:dithering:width:height:

- (int)printPicture:(UIImage \*)*image* dithering:(int)*dithering* width:(int)*widthDots* height:(int)*heightDots*;

The picture is printed.

#### Parameter

*image*: Specify the UIImage class object such as graphics or picture.

*dithering*: Specify the dithering pattern.

<i>Dithering</i>	Dithering pattern
Dither_Bayer_2x2	Bayer 2x2
Dither_Bayer_4x4	Bayer 4x4
Dither_Bayer_8x8	Bayer 8x8
Dither_Bayer_16x16	Bayer 16x16
Dither_Clustared_2x2	Clustered 2x2
Dither_Clustared_4x4	Clustered 4x4
Dither_Clustared_8x8	Clustered 8x8
Dither_NoDithering	No dithering

*widthDots*: Specify the width of output size per dot-line.

*heightDots*: Specify the height of output size per dot-line.

#### Return Value

Error\_Success : Success  
Error\_NoDevice : Printer is not detected.  
Error\_IllegalParameter : Parameter is out of range.  
Error\_PageModeOutSide : Image is outside from printable region when page print mode.  
Error\_IllegalImage : Unsupported image format.

#### Explanation

• The specified picture is printed.

• The setting range of *widthDots* and *heightDots* is shown below.

Print mode	Parameter	Setting range
Line print mode	<i>widthDots</i>	0 to Printable width(dots)
	<i>heightDots</i>	0 to 1920
Page print mode Print direction: left to right or right to left	<i>widthDots</i>	0 to Printable width(dots)
	<i>heightDots</i>	0 to 1919
Page print mode Print direction: bottom to up or up to bottom	<i>widthDots</i>	FTP-62HWSL000 : 0 to 1919
	<i>heightDots</i>	0 to printable width(dots) – 1

- The parameters are within the setting range, the data becomes the outside of the page mode region specified “startPage:” method, this method returns “Error\_IllegalParameter”.
- When *widthDots* and *heightDots* are specified 0, an aspect ratio is not changed and one pixel of picture is printed as one dot of the printer. If the size of specified picture is outside the printable region, the size of picture is reduced and printed without changing an aspect ratio.
- When *widthDots*(*heightDots*) is 0 , and *heightDots*(*widthDots*) is specified within the setting range, the width (height) is changed within the range that does not exceed the maximum of width (height) so that an aspect ratio becomes the minimum.
- When *widthDots* or *heightDots* is outside a setting range, this method returns “Error\_IllegalParameter”.
- The supported image formats are JPEG, GIF, TIFF, BMP, and PNG. However, the supported object of UIImage class are only 24 bit/pixel or 32 bit/pixel.
- Moreover, it may be not supported by format of compression. In the case of the format which cannot be supported, this method returns “Error\_IllegalImage”.
- When line print mode, regardless of the setting of “setPrintSpeed:” method, the maximum printing speed is 10 mm/sec.
- When page print mode, image data is only sent to page print mode buffer, actually not be printed.
- In the case of *dither* == Dither\_NoDithering, *image* will be printed without performing dithering process. If the RGB information of each pixel is 0, it is printed in black. Otherwise it will be printed in white.  
Therefore, it is recommended to specify a size that is a dot-by-dot.
- When line print mode, the print start position becomes a left end.
- When page print mode, the print start position becomes a left end of page mode region specified by “startPage:” method. When the print direction is specified by the “setOrientation:” method, it becomes a left end to a print direction.
- When page print mode, if the specified width and height are within the page size, this method returns “Error\_Success”. But it is not printed depending on the printing position (printing position by “setRelativePosition:” or “setAbsolutePosition:” method).

(15) `printQRCode:magnification:errorLevel:concatenation:code:division:parity:masking:`  
 – (int)`printQRCode:(NSData *)data` `magnification:(int)moduleMagnification`  
`errorLevel:(int)errorCorrectionLevel` `concatenation:(BOOL)qrConcatenation`  
`code:(int)codeNumber` `division:(int)divisionNumber` `parity:(unsigned char)dataParity`  
`masking:(int)masking;`

Print the QR code.

#### Parameter

*data.* Specify the QR code data.  
*moduleMagnification.* Specify the module magnification.

<i>moduleMagnification</i>	Module magnification
QRModule_3x3	triple (3 x 3 dot per module)
QRModule_4x4	quadruple (4 x 4 dot per module)

*errorCorrectionLevel.* Specify the error correction level

<i>errorCorrectionLevel</i>	Error correction level
QRLevel_H	Super high reliability
QRLevel_Q	High reliability
QRLevel_M	Standard
QRLevel_L	High density

*qrConcatenation:* Specify the concatenation mode  
 NO: normal mode  
 YES: concatenation mode

*codeNumber:* Specify the code number. (1 to 16)

*divisionNumber:* Specify the number of divisions. (1 to 16)

*dataParity:* Specify the value which carried out XOR of all the data (before division) per byte. This parameter is ignored when concatenation mode is not specified.

*masking:* Specify the masking.

<i>masking</i>	Masking
0 to 7	Mask number
Masking_None	None
Masking_Auto	Automatic mask selection

#### Return Value

Error\_Success : Success  
 Error\_NoDevice : Printer is not detected.  
 Error\_IllegalParameter : Parameter is out of range.  
 Error\_PageModeOutSide : QR code is outside from printable region when page print mode.

## Explanation

- When page print mode, barcode data is only sent to page print mode buffer, actually not be printed.
- When concatenation mode is not specified, *codeNumber*, *divisionNumber* and *dataParity* are ignored.
- The conditions of each QR code which can be printed are shown below.
- If the parameter is out of range, QR code cannot be read normally with a scanner.

Input mode	Mode selector	Available data
Numeric	0x10	"0 to 9"
Alphanumeric character	0x11	"0 to 9", "A to Z", space, "\$, %, *, +, -, ., /, :"
8-bit bytes (binary)	0x12	0x00 to 0xFF
Shift-JIS Japanese	0x13	First byte: 0x81 to 0x9F, 0xE0 to 0xEA Second bytes: 0x40 to 0x7E, 0x80 to 0xFC

- The first byte of *data* is mode selector (0x10 to 0x13). The second and subsequent of *data* bytes is the data.
- When input mode is 8-bit bytes, specify the length of 8-bit bytes data after mode selector (0x12). The length of 8-bit bytes data is two byte BCD code.
- When barcode width becomes 864 dots or more dots, not related to an angle or print direction, this method returns "Error\_IllegalParameter".
- Set up the quiet zone (blank region around QR code) specified by each QR code specification. If other image or character data is overlapped on QR code or quiet zone, the barcode cannot be read normally by the barcode reader.

- When the width of QR code becomes more than a page size, this method returns “Error\_IllegalParameter”.

Print mode	rotation	Print direction	Max width and max height
Line print mode	0 degree	–	Printable width(dots)
Page print mode	0 degree	Left to Right	width: (size.width) of startPage: method height: (size.height – 1) of startPage: method
		Right to Left	
		Up to Bottom	width: (size.height) of startPage: method height: (size.width – 1) of startPage: method
		Bottom to Up	
	180 degrees rotate	Left to Right	width: (size.width – 1) of startPage: method height: (size.height – 1) of startPage: method
		Right to Left	
		Up to Bottom	width: (size.height – 1) of startPage: method height: (size.width – 1) of startPage: method
		Bottom to Up	
	Right 90 degrees rotate	Left to Right	width: (size.height) of startPage: method height: (size.width – 1) of startPage: method
		Right to Left	
		Up to Bottom	width: (size.width) of startPage: method height: (size.height – 1) of startPage: method
		Bottom to Up	
	Left 90 degrees rotate	Left to Right	width: (size.height – 1) of startPage: method height: (size.width – 1) of startPage: method
		Right to Left	
		Up to Bottom	width: (size.width – 1) of startPage: method height: (size.height – 1) of startPage: method
		Bottom to Up	

- When page print mode, if the QR code width and height are within the page size, this method returns “Error\_Success”. But it is not printed depending on the printing position (printing position by “setRelativePosition:” or “setAbsolutePosition:” method).

(16) printRegisteredImage:mode:

– (int)printRegisteredImage:(int)*number* mode:(int)*printMode*;

Print the registered image.

**Parameter**

*number*: Specify the ID of registered image.

*printMode*: Specify the dithering pattern.

<i>printMode</i>	Print mode
PrintSize_Normal	A registered image is printed without changing size.
PrintSize_Wx2	A registered image is printed with the double width size.
PrintSize_Hx2	A registered image is printed with the double height size.
PrintSize_X4	A registered image is printed with the double width and height size.

**Return Value**

Error\_Success : Success

Error\_NoDevice : Printer is not detected.

Error\_IllegalParameter : Parameter is out of range.

**Explanation**

- When unregistered ID is specified by *number*, this method returns “Error\_Success”, but does not print.
- When page print mode, image data is only sent to page print mode buffer, actually not be printed.
- When the height of the image data is more than 256 dot-lines, the data for 255 dot-lines of top is printed.

(17) startPage:  
– (int)startPage:(CGRect)*rect*;

Start the page print mode.

#### Parameter

*rect*: Specify the page print mode region per dot as follows.  
origin.x : Specify the horizontal start position.  
FTP-62HWSL000 : 0 to 383  
origin.y : Specify the vertical start position.  
FTP-62HWSL000 : 0 to 1919  
size.width : Specify the horizontal length.  
FTP-62HWSL000 : 1 to 384  
size.height : Specify the vertical length.  
FTP-62HWSL000 : 1 to 1920

#### Return Value

Error_Success	: Success
Error_NoDevice	: Printer is not detected.
Error_IllegalParameter	: Parameter is out of range.
Error_AlreadyPageMode	: Print mode is already page print mode.

#### Explanation

- Page print mode is started with specifying the page print mode region.
- The value below decimal point is omitted in each parameter.
- When the value of (origin.x + size.width) exceeds printable width(dots) or (origin.y + size.height) exceeds maximum width, this method returns "Error\_IllegalParameter".
- In starting page print mode, print position is set at the upper left corner of print mode region. Top line of the page print mode area is unprintable, please start the printing from the top of the next line, etc., using the "dotfeedPaper" method. Since the reference position of character string or barcode is on basis of lower-left point, specify that they are within page print mode region using line-feed or "setAbsolutePosition:" or "setRelativePosition:" method.
- When page print mode, print data is only sent to page print mode buffer, actually not be printed. Printing will begin by executing "printPage:" method.
- If this method is executed when page print mode, this method returns "Error\_AlreadyPageMode".

(18) registBitimage:width:height:data:  
 – (int)registBitimage:(int)*imageID* width:(int)*widthBytes* height:(int)*heightDots* data:(NSData \*)*data*;

Register the bit image data.

**Parameter**

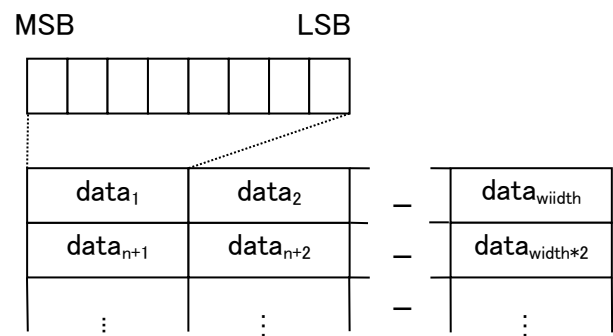
<i>imageID</i> :	Specify the registering image ID. (1 to 255)
<i>widthBytes</i> :	Specify the width per byte. (1 to Printable width(mm))
	<i>heightDots</i> : Specify the height per dot. (1 to 512)
<i>data</i> :	Specify the bit-image data.

**Return Value**

Error_Success	: Success
Error_NoDevice	: Printer is not detected.
Error_IllegalParameter	: Parameter is out of range.

**Explanation**

- The bit image is registered onto the flash memory of printer.
- When the size of *data* is different from value of (*widthBytes* \* *heightDots*), this method returns “Error\_IllegalParameter”.
- When *data* is nil or return value of [*data* length] is 0, if specified *imageID* is already registered, the data of *imageID* is deleted.
- The total memory capacity of this printer is 192 K bytes. The data exceeding this capacity cannot be registered.
- The bit image format is shown below.



The number of data (return value of [*data* length]) = *widthBytes* \* *heightDots*

(19) registPicture:image:dithering:width:height:

- (int)registPicture:(int)*imageID* (UIImage \*)*image* dithering:(int)*dithering* width:(int)*widthDots* height:(int)*heightDots*;

Register the picture or graphic data.

**Parameter**

- imageID*: Specify the registering image ID. (1 to 255)
- image*: Specify UIImage class object such as graphic or picture.
- dithering*: Specify the dithering pattern.

<i>Dithering</i>	<i>Dithering pattern</i>
Dither_Bayer_2x2	Bayer 2x2
Dither_Bayer_4x4	Bayer 4x4
Dither_Bayer_8x8	Bayer 8x8
Dither_Bayer_16x16	Bayer 16x16
Dither_Clustared_2x2	Clustered 2x2
Dither_Clustared_4x4	Clustered 4x4
Dither_Clustared_8x8	Clustered 8x8
Dither_NoDithering	No dithering

- widthDots*: Specify the width of output size per dot-line.  
Range : 0 to Printable width(dots)
- heightDots*: Specify the height of output size per dot-line.  
Range : 0 to 255

**Return Value**

- Error\_Success : Success
- Error\_NoDevice : Printer is not detected.
- Error\_IllegalParameter : Parameter is out of range.
- Error\_IllegalImage : Unsupported image format.

**Explanation**

- The UIImage class object such as graphic or picture is registered.
- When *widthDots* and *heightDots* are specified 0, an aspect ratio is not changed and one pixel of picture is printed as one dot of the printer. If the size of specified picture is outside the printable region, the size of picture is reduced and printed without changing an aspect ratio.
- When *widthDots*(*heightDots*) is 0 , and *heightDots*(*widthDots*) is specified within the setting range, the width (height) is changed within the range that does not exceed the maximum of width (height) so that an aspect ratio becomes the minimum.

- When *widthDots* or *heightDots* is outside a setting range, this method returns "Error\_IllegalParameter".
- The supported image formats are JPEG, GIF, TIFF, BMP, and PNG. However, the supported object of UIImage class are only 24 bit/pixel or 32 bit/pixel.
- Moreover, it may be not supported by format of compression. In the case of the format which cannot be supported, this method returns "Error\_IllegalImage".
- *widthDots* is able to be specified per dot, the image data is registered per byte. Therefore, an insufficient dot is filled with blank when the right end byte is less than 8 dots.
- In the case of *dither* == Dither\_NoDithering, *image* will be registered without performing dithering process. If the RGB information of each pixel is 0, it is registered in black. Otherwise it will be registered in white. Therefore, it is recommended to specify a size that is a dot-by-dot.
- When specified *imageID* is already registered, the data of *imageID* is overwritten.
- The total memory capacity of this printer is 192 K bytes. The data exceeding this capacity cannot be registered.

(20) **setAbsolutePosition:**

– (int)setAbsolutePosition:(CGPoint)*point*;

Specify the printing position by absolute coordinate.

**Parameter**

*point*:

Specify the printing position as follows.

x : Specify the horizontal position by absolute coordinate.

y : Specify the vertical position by absolute coordinate.

**Return Value**

Error\_Success : success

Error\_NoDevice : printer is not detected.

Error\_IllegalParameter : Parameter is out of range.

Error\_NotPageMode : current print mode is not page print mode.

Error\_PageModeOutSide : printing position is outside from printable region when page print mode.

**Explanation**

• The printing position by absolute coordinate is specified.

• The setting range is as follows.

Print direction	parameter	Setting range
Left to Right	x	0 to Printable width(dots) – 1
Right to Left	y	FTP-62HWSL000:0 to 1919
Bottom to Up	x	FTP-62HWSL000:0 to 1919
Up to Bottom	y	0 to Printable width(dots) – 1

• The basis of starting point is determined by “setOrientation:” method. For example, when print direction is left to right, starting point is upper-left corner.

• Even if parameter is within setting range, specified printing position is outside, this method returns “Error\_PageModeOutSide”.

• The value below a decimal point is omitted in each parameter of *point*.

• When print line mode, this method returns “Error\_NotPageMode”.

(21) setCharacterStyle:kanjiSize:fontHSize:fontVSize:bold:bwReverse:underline:space:  
leftOfKanji:rightOfKanji

- (int)setCharacterStyle:(int)*size* kanjiSize:(int)*kanjiSize* fontHSize:(int)*fontHSize*  
fontVSize:(int)*fontVSize* bold:(bool)*bold* bwReverse:(BOOL)*blackWhiteReverse*  
underLine:(int)*underLine* space:(int)*space* leftOfKanji:(int)*leftOfKanji* rightOfKanji:(int)*rightOfKanji*;

Specify the character decoration.

#### Parameter

*size*: Specify the ANK font size as follows.

<i>size</i>	ANK font size
Font_8x16	8 x 16 dots
Font_12x24	12 x 24 dots
Font_16x16	16 x 16 dots
Font_24x24	24 x 24 dots

*kanjiSize*: Specify the Kanji font size as follows.

<i>kanjiSize</i>	Kanji font size
Font_16x16	16 x 16 dots
Font_24x24	24 x 24 dots

*fontHSize*: Specify the horizontal magnification.

*fontVSize*: Specify the vertical magnification.

<i>fontHSize</i> <i>fontVSize</i>	Magnification
FontDSize_05	0.5
FontDSize_10	1
FontDSize_15	1.5
FontDSize_20	2
FontDSize_25	2.5
FontDSize_30	3
FontDSize_35	3.5
FontDSize_40	4

*bold*: Specify the bold font.

This printer does not support bold font. Specify NO.

*blackWhiteReverse*: Specify the black and white reverse font.

YES Specify the black and white reverse font.

NO Cancel the black and white reverse font.

*underLine*: Specify the under line.

<i>underline</i>	Under line
UnderLine_None	None
UnderLine_1Dot	1dot underline
UnderLine_2Dot	2 dots underline

<i>space:</i>	Specify the space between ANK characters. This parameter does not affect to Kanji space setting. (0 to 32)
<i>leftOfKanji:</i>	Specify the left space of Kanji. (0 to 32) This printer does not support the left space of Kanji. Specify the 0.
<i>rightOfKanji:</i>	Specify the right space of Kanji. (0 to 32)

## Return Value

Error_Success	: Success
Error_NoDevice	: Printer is not detected.
Error_IllegalParameter	: Parameter is out of range.

## Explanation

- The character decoration is specified.
- The space between characters by *space* is set up to the right side of character.
- The space between characters and the right and left space of Kanji character are set as according to the line print mode and page print mode respectively.
- The number of dots of one character becomes the value which added the number of dots of the font and the space between characters. Therefore, when there is no space of one character from right end of printable region, current position moves to left end of next line.
- The amount of spaces between characters is also expanded when the double size is specified.
- If FontDSize\_05 is set in fontHSize or fontVSize, there is a possibility that the font design collapses.
- Specified *rightOfKanji* in 4-dot units. Less than 4 dot is ignored.
- If specified value other than Rotation\_None by "setRotation:" method, underlines is disabled. When enabling underline, specified Rotation\_None by "setRotation:" method.

(22) setInternationalCharCode:country:

– (int)setInternationalCharCode:(int)*characterCode* country:(int)*country*;

Specify the character code table and internal character code.

**Parameter**

*characterCodeTable*: Specify the character code table.

<i>characterCodeTable</i>	Character code table
CharCode_Katakana	Katakana
CharCode_ExpandedGraphics	Expanded graphics

*country*: Specify the international character code set.

<i>Country</i>	International character code
CharacterSet_USA	USA
CharacterSet_French	France
CharacterSet_German	Germany
CharacterSet_UK	UK
CharacterSet_Denmark	Denmark
CharacterSet_Sweden	Sweden
CharacterSet_Italy	Italy
CharacterSet_Spain	Spain
CharacterSet_Japan	Japan
CharacterSet_Norway	Norway
CharacterSet_Denmark_2	Denmark2
CharacterSet_Spain_2	Spain2
CharacterSet_Ratin_America	Latin America
CharacterSet_Japan_2	Japan2

**Return Value**

Error\_Success : Success  
Error\_NoDevice : Printer is not detected.  
Error\_IllegalParameter : Parameter is out of range.

**Explanation**

- The character code table and international character code are specified.

(23) `setLineFeedAmount:page:`

– (int)`setLineFeedAmount:(int)dotLines page:(int)page;`

Specify the feed amount of one line and number of lines in a page.

**Parameter**

<i>dotLines:</i>	Specify the feed amount of one line per dot-line. (0 to 255)
<i>page:</i>	Specify the number of lines in one page (1 to 48)

**Return Value**

<code>Error_Success</code>	: Success
<code>Error_NoDevice</code>	: Printer is not detected.
<code>Error_IllegalParameter</code>	: Parameter is out of range.

**Explanation**

- The feed amount of one line and number of lines in a page are specified.
- The length of (*dotLines* \* *page*) is the length of one page. When page print mode, the length of one page is specified by “startPage:” method.
- When line print mode, at least the paper is fed by the height of kind of character, if only linefeed (no print character), the page is fed by specified the feed amount.
- For example, when specifying the character whose character height is 24 dots and the amount of feed lines is set as 10 dots, the paper is fed by 24 dots, if only linefeed, the paper is fed by 10 dots.
- When page print mode, the print position is always moved by specified feed amount.

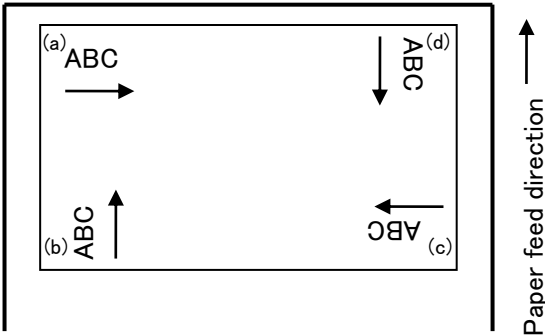
(24) setOrientation:  
- (int)setOrientation:(int)orientation;

Specify the direction of printing.

Parameter

orientation. Specify the direction of printing.  
After this method executing, the print start position is set in page print mode region specified by “startPage:” method

orientation	Direction	Print start position
Orientation_None	Left to Right	Upper left corner (a)
Orientation_L90	Bottom to Up	Bottom left corner (b)
Orientation_180	Right to Left	Bottom right corner (c)
Orientation_R90	Up to Bottom	Upper right corner (d)



Return Value

Error\_Success : Success  
Error\_NoDevice : Printer is not detected.  
Error\_IllegalParameter : Parameter is out of range.

Explanation

- The direction of printing is specified.
- When the direction is bottom-to-up or up-to-bottom, (size.width) of “startPage:” method becomes the height, (size.height) becomes the width.
- The direction setting is valid in page print mode only, in line print mode the setting is changed internally.
- When page print mode data exists, this method is executed after printing page print mode data. In that case, page print mode data is cleared.

(25) setPaperType:feedBeforePrintPage:feedAfterMarkDetection:autoFeedLength:  
 – (int)setPaperType:(int)*paperType* feedBeforePrintPage:(int)*feedBeforePrintPage*  
 feedAfterMarkDetection:(int)*feedAfterMarkDetection* autoFeedLength:(int)*autoFeedLength*;

Specify the kind of paper and feed lines after mark detection.

#### Parameter

*paperType* Specify the paper type.

<i>paperType</i>	Paper type
PaperType_ContinuousPaper	Continuous Paper
PaperType_Label	Label

*feedBeforePrintPage* Specify the paper feed amount of at the start of printing by “startPrinter:protocolName:series:” method. Specify by dot-line units. (–24 to 255)

*feedAfterMarkDetection* Specify the feed amount after mark detection per dot-line. (0 to 255)

*autoFeedLength* This printer does not support this parameter. Specify the 0.

#### Return Value

Error\_Success : Success

Error\_NoDevice : Printer is not detected.

Error\_IllegalParameter : Parameter is out of range.

#### Explanation

- The kind of paper and some feed lines are specified.
- When label is specified, at most about 203 mm of paper feed is performed until a mark is detected at the time of paper set..
- If *feedBeforePrintPage* > 0, paper feed is performed in the forward direction. If *feedBeforePrintPage* < 0, paper feed is performed in the backward direction.

(26) `setPrintSpeed:`  
– (int) `setPrintSpeed:(int)speed`

Specify the printing speed.

#### Parameter

*speed*: Specify the printing speed. (5 to 120)

#### Return Value

<code>Error_Success</code>	: Success
<code>Error_NoDevice</code>	: Printer is not detected.
<code>Error_IllegalParameter</code>	: Parameter is out of range.

#### Explanation

- The printing speed is specified.
- Since specified print speed is the maximum speed, depending on consist of printing print speed falls.
- When barcode or 2Dcode is printed in page print mode, print speed is falls as follows.
  - In the case of maximum print speed is 30 mm/sec
    - GS1DataBar (Stacked type)
    - Maxi code
    - PDF417
    - QR code by 3 x 3 dot per module
    - When the bar code of the bar becomes perpendicular to paper feed direction by the combination of the “`setOrientation:`” method or “`setRotation:`” method.
  - In the case of maximum print speed is 80 mm/sec
    - QR code by 4 x 4 dot per module
- If the bar code and 2D code is included multiple, print speed will be limited to the lowest value.

(27) setRelativePosition:

– (int) setRelativePosition:(CGPoint)*point*;

Specify the printing position by relative coordinate.

**Parameter**

*point*:

Specify the printing position as follows.

x : Specify the horizontal position by relative coordinate.

y : Specify the vertical position by relative coordinate.

**Return Value**

Error\_Success : Success

Error\_NoDevice : Printer is not detected.

Error\_IllegalParameter : Parameter is out of range.

Error\_NotPageMode : Current print mode is not page print mode.

Error\_PageModeOutSide : Printing position is outside from printable region when page print mode.

**Explanation**

• The printing position by relative coordinate is specified.

• The setting range of *point* is as follows.

Print direction	parameter	Setting range
Left to Right	x	FTP-62HWSL000: -383 to 383
Right to Left	y	FTP-62HWSL000: -1919 to 1919
Bottom to Up	x	FTP-62HWSL000: -1919 to 1919
Up to Bottom	y	FTP-62HWSL000: -383 to 383

• Even if parameter is within setting range, specified printing position is outside, this method will return “Error\_Success”.

• The value below a decimal point is omitted in each parameter of *point*.

• When print line mode, this method returns “Error\_NotPageMode”.

(28) setRotation:

– (int)setRotation:(int)*rotation*,

Specify the rotation of the character string and the barcode.

**Parameter**

*rotation.*

Specify the rotation.

<i>rotation</i>	Angle
Rotation_None	0 degree rotation
Rotation_L90	Left 90 degrees rotation
Rotation_180	180 degrees rotation
Rotation_R90	Right 90 degrees rotation

**Return Value**

Error\_Success : Success  
Error\_NoDevice : Printer is not detected.  
Error\_IllegalParameter : Parameter is out of range.

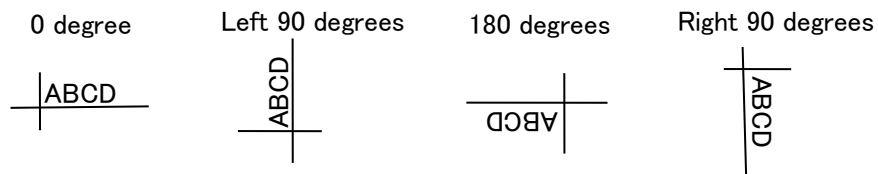
**Explanation**

• The rotation setting is valid in page print mode only, in line print mode the setting is changed internally.

• Methods that this feature is effective is as follows.

printBarcode:data:height:narrow:wide:hri:
printCharacterString:
printGS1DataBar:dataBarType:module:numberOfSegments:
printMaxiCode:mode:number:count:symbolCount:
printPDF417Code:columnsOrSteps:width:height:errorLevel:rotate:
printQRCode:magnification:errorLevel:concatenation:code:division:parity:masking:
printRegisteredImage:mode:

• Starting point is the lower left end of the character string and the barcode. It is as follows.



• It revolves relatively to print way designation by “setRotation:” method.

• The space between ANK characters, the left space of Kanji and the right space of Kanji by “setCharacterStyle...” method are not rotated. If specified value other than “Rotation\_None”, underlines is disabled.

(29) setAutoPowerOffTime:

– (int) setAutoPowerOffTime:(int)*minutes*

Specify the auto power off time.

**Parameter**

*minutes*: Specify the auto power off time per minute. (0 to 120)

**Return Value**

Error_Success	: Success
Error_NoDevice	: Printer is not detected.
Error_IllegalParameter	: Parameter is out of range.

**Explanation**

- The auto power off time is specified.
- When “*minutes*” is specified 0, auto power off is canceled.

(30) setBluetoothSecurityMode:encryption:PINCode:deviceName:

- (int) setBluetoothSecurityMode:(int)*security* encryption:(BOOL)*encryptionOn*  
PINCode:(NSString)*PINCode* deviceName:(NSString \*)*deviceName*

Specify the Bluetooth security mode.

#### Parameter

*security*. Specify the Bluetooth security mode.

<i>Security</i>	Security mode
BTSecurityLevel_1	Security mode 1
BTSecurityLevel_3	Security mode 3
BTSecurityLevel_4	Security mode 4

*encryption*. Specify the encryption.  
YES Data is encrypted.  
NO Data is not encrypted.

*PINCode*. Specify the Bluetooth PIN code.

<i>PINCode</i>	Setting range
Length of character string	4 to 16
Available characters	20H, 21H, 23H to 7EH

*deviceName*. Specify the Bluetooth device name.

<i>deviceName</i>	Setting range
Length of character string	2 to 40
Available characters	20H, 21H, 23H to 7EH

#### Return Value

Error\_Success : Success  
Error\_NoDevice : Printer is not detected.  
Error\_IllegalParameter : Parameter is out of range.

#### Explanation

- The Bluetooth security mode is specified.
- The setting is available after the power of printer is OFF to ON.
- When *security* is specified BTSecurityLevel\_1, data is not encrypted. When *security* is specified BTSecurityLevel\_4, data is encrypted.

(31) setPrintQuality:energy:halfPitch:thermalHeadDivision:

– (int)setPrintQuality:(int)*paperType* energy:(int)*energy* halfPitch:(BOOL)*halfPitch*  
thermalHeadDivision:(int)*division*;

Specify the items related to print quality.

#### Parameter

*paperType*:

Specify the print quality. Refer to explanation.

*energy*:

Specify the energy adjustment.

<i>energy</i>	energy adjustment
Default_Energy	Default
0 to 127	Custom

*halfPitch*:

Specify the half pitch print mode.

YES half pitch print mode.

NO normal pitch print mode.

*division*

Specify the driving division of the thermal print head.

<i>division</i>	The number of driving division
Division_Auto	Automatic division
Division_Fixed_6	Fixed 6 division

#### Return Value

Error\_Success

: Success

Error\_NoDevice

: Printer is not detected.

Error\_IllegalParameter

: Parameter is out of range.

#### Explanation

• Specify the items related to print quality. Please adjust each parameter with the paper and environment to be used.

• *paperType* is specified the value of the following.

When *energy* == Default\_Energy, the energy adjustment is set automatically. When adjusting this, refer the following value.

<i>paperType</i>	<i>energy</i>	Paper type
2	31	
3	36	PD150R
4	38	TP50KJ-R
5	35	
7	35	HW54S

• When half pitch mode, two pulses are applied on a heat-generating resistor with a delay of a half dot line in the forward feed direction. If this mode is used, gap of dots between heat-generating resistors will be eliminated and print quality will improve.

• When *division* == Division\_Auto, the driving division of the thermal print head is automatically executed.

(32) `getPrinterData:`

– (int) `setPrinterData:(int)dataType`

Retrieve the printer status or information.

**Parameter**

*dataType*: Specify the retrieving information.

<i>dataType</i>	Information
PrinterData_Status	Printer status
PrinterData_FirmwareVersion	Firmware version

**Return Value**

Error\_Success : Success  
Error\_NoDevice : Printer is not detected.  
Error\_IllegalParameter : Parameter is out of range.

**Explanation**

- The printer status or information is retrieved.
- Retrieved information is received by "[Notification](#)".

(33) waitPrintEnd:

– (int) waitPrintEnd:(int) *timeOut*

Wait until the print is completed.

**Parameter**

*timeOut*:

Specify the timeout in seconds for waiting until print or command is completed.(1 to 1800)

Default\_TimeOut: default timeout is 180 seconds.

**Return Value**

Error_Success	: Success
Error_NoDevice	: Printer is not detected.
Error_IllegalParameter	: Parameter is out of range.
Error_Timeout	: Timeout occurs.

**Explanation**

- This method waits until the printing is completed.
- This method does not return until print is completed or timeout occurs.
- When not printing, this method returns immediately.
- When the printing is not completed until specified “timeout” time after this method is executed, this method returns “Error\_Timeout”.
- The time to the completion of printing differs depending on print data. Moreover, if this method is executed on main thread, main thread will stop temporarily until it returns processing. Therefore, please evaluate fully at real environment.

## 6. Receive Notification

### How to receive Notification

“NSNotificationCenter” class notifies the notification by completion of each method, and information by “getPrinterData:” method.

(1) Registration of receiving notifications by “Notification” function.

- (void)addObserver:(id)notificationObserver selector:(SEL)notificationSelector  
name:(NSString \*)notificationName object:(id)notificationSender;

#### Parameter

<i>notificationObserver.</i>	Specify the object receiving notification.
<i>selector.</i>	Specify the method receiving notification.
<i>name.</i>	Specify “FCLReceivedNotificationForMultiplePrinters”.
<i>object.</i>	Specify nil.

(e.g.)

```
[[NSNotificationCenter defaultCenter] addObserver:self  
selector:@selector(_sessionDataReceived:)  
name:@"FCLReceivedNotificationForMultiplePrinters" object:nil];
```

(2) How to receive notifications. (In the case of “\_sessionDataReceived” method is used as “*selector*”)

```
– (void)_sessionDataReceived:(NSNotification *)notification{  
    NSDictionary* notificationDictionary = nil;  
    NSNumber* notificationType = nil;  
    NSString* notificationPrinterModel = nil;  
    NSData* notificationData = nil;  
  
    notificationDictionary = [notification userInfo];  
    notificationType = [notificationDictionary objectForKey:@"notificationType"];  
    notificationPrinterModel = [notificationDictionary  
                                objectForKey:@"printerModelNumber"];  
    notificationData = [notificationDictionary objectForKey:@"data"];  
  
}
```

#### Explanation

- The printer information is received.

*notificationType:* The kind of notification

<i>notificationType</i>	The kind of notification
PrinterData_Status	The result of each method, or printer status
PrinterData_FirmwareVersion	Firmware version
PrinterEvent_ConnectedPrinter	The printer becomes connected.
PrinterEvent_DisconnectedPrinter	The printer is disconnected.

*printerModelNumber:* modelNumber of the printer

*data:* Data of the printer

[*notificationType* == PrinterData\_Status]

Result and printer status of each method are shown.

1st byte: Printing result

1st byte	Result
Error_Success	Success
Error_PrinterError	Printer error occurs.

2nd byte: Printing result

Bit	Status	Content
0	Not used	0: Fixed
1	Not used	0: Fixed
2	Not used	1: Fixed
3	On/Off line status	0: Online                      1: Offline
4	Not used	0: Fixed
5	Not used	0: Fixed
6	Paper feed via FEED key	0: Paper feed suspended    1: Paper feeding
7	Not used	0: Fixed

3rd byte: Error information

Bit	Status	Content
0	Low battery	0: Not occurred              1: Occurred
1	Receive data error	0: No error                  1: Error
2	Cover open	0: Not occurred              1: Occurred
3	Not used	0: Fixed
4	Mark not detected	0: Not occurred              1: Occurred
5	Hardware error	0: Not occurred              1: Occurred
6	Head temperature error	0: Not occurred              1: Occurred
7	Power voltage error	0: Not occurred              1: Occurred

Hardware error is MCU operation abnormality, thermal head over heat, thermal head unconnected, blown fuse, registration error.

4th byte: Error information

Bit	Status	Content
0	Not used	0: Fixed
1	Not used	0: Fixed
2	No paper	0: Not occurred      1: Occurred
3 – 7	Not used	0: Fixed

5th byte: ID (128 to 255)

This value is incremented by every method execution.  
The next of 255 is set to 128.

When the error (e.g. Power voltage error) occurs only for a moment during communication or printing, “Error\_Success” may be returned although printing goes wrong. Therefore, please check the status at all time.

[*notificationType* == PrinterData\_FirmwareVersion]

The data composition of a firmware version is as follows.

(e.g. Main program version : V1.00, boot program version : V1.01)

“612HB0 1.00 1.01”

([36]<sub>16</sub> [32]<sub>16</sub> [48]<sub>16</sub> [42]<sub>16</sub> [30]<sub>16</sub> [20]<sub>16</sub> [31]<sub>16</sub> [2E]<sub>16</sub> [30]<sub>16</sub> [30]<sub>16</sub> [20]<sub>16</sub> [31]<sub>16</sub> [2E]<sub>16</sub> [30]<sub>16</sub> [31]<sub>16</sub>)

[*notificationType* == PrinterEvent\_CennectedPrinter]

If the printer connection is succeed after startPrinter method execution, this notification will be received.

[*notificationType* == PrinterEvent\_DisconnecetedPrinter]

Receive when the printer is disconnected.

This is not notified of at the time of “closePrinter:” method execution.

## – The initial value of each settings –

The settings or parameters are initialized when “startPrinter:” method is executed.

Method	Settings or parameters	Initial value
startPage:	Print mode	Line print mode
setAbsolutePosition: setRelativePosition:	Current print position	Horizontal: 0 Vertical: 0
setCharacterStyle:kanjiSize:fontH Size:fontVSize:bold:bwReverse:un derline:space:leftOfKanji:rightOfK anji	ANK font size	12 x 24 dots
	Kanji font size	24 x 24 dots
	fontHSize fontVSize	Magnification 1 x
	Bold	None
	Black white reverse	None
	Underline	None
	ANK space	0
	Left space of Kanji Right space of Kanji	0 0
setInternationalCharacterCode:c ountry:	Character code table	Katakana
	International character code	Japan
setLineFeedAmount:page:	Feed amount of one line	26 dots
	Number of lines in one page	44 lines
setOrientation:	Print direction	Left to right
setPaperType:feedBeforePrintPa ge:feedAfterMarkDetection:autoF eedLength:	Paper type	Label
	Paper feed amount of at the start of printing	0
	Feed amount after mark detection	0
	Automatic feed length	80(160 dot-lines)
setPrintQuality:energy:halfPitch:t hermalHeadDivision:	Print quality	7
	Energy adjustment	35
	Half pitch print mode	Half pitch printing
	Driving division of the thermal print head	Automatic division
setPrintSpeed:	Print speed	120
setRotation:	Rotation	0 degree rotation
setAutoPowerOffTime:	Auto power off time	Not changed
setBluetoothSecurityMode: PINCode:deviceName;	Bluetooth security mode	Not changed
	encryption	Not changed
	Bluetooth PIN code	Not changed
	Bluetooth device name	Not changed

## – Error Code –

The Error Code which this LIBRARY returns is described.

Constant value	Contents
Error_Success	Success
Error_Failed	Printer off-line.
Error_NoDevice	Printer is not detected.
Error_NoExistFile	File is no exist.
Error_IllegalFileFormat	File format is illegal.
Error_IllegalImage	Unsupported image format.
Error_IllegalParameter	Parameter is out of range.
Error_PageModeOutSide	Print data is outside from printable region when page print mode.
Error_NotPageMode	Current print mode is not page print mode.
Error_IllegalFontDataSize	Font data size is incorrect.
Error_MarkNoDetect	Mark is not detected.
Error_AlreadyPageMode	Print mode is already page print mode.
Error_AlreadyConnectedPrinter	Printer is already connected.
Error_PrinterError	Printer error occurs.
Error_MemoryAllocation	Memory allocation is failed in Library.
Error_TimeOut	Time-out occurs.
Error_AlreadyConnectedPrinterOtherDevice	Printer is already connected by other instance.

## – Notes –

- This library serves as asynchronous operation (exclude “waitPrintEnd:” method). Even when the return value of each method is “Error\_Success”, actual printing may not be successful.
- This library is built for iOS device. Therefore, it does not operate on an iOS simulator.
- When line print mode, if data is less than one line, print data is buffered in printer and not printed. To print immediately in this case, please execute “linefeedPaper:” method, or send the line-feed code ( “\n”) by “printCharacterString:” method.
- This library supports only on the main thread. Please create the instance on the main thread.
- It is not possible to load this library at the same time from two or more apps.
- The number of Bluetooth devices that can be connected on the iOS will vary depending on the environment.
- By iOS specification, communication may stop when transmitting a continuous large amount of data. Please confirm if you want to send the data across multiple pages in a row. If the communication is stopped, please reconnect method.
- When app in the background state such as the click of a button, the communication is disconnected. If the communication during data transmission has been disconnected, pairing of iOS device and the printer may be needed once again. If the continuation of the communication in the background state is required, append the following to Info.plist in the app project file. However, there are cases where battery consumption is higher. Therefore, please evaluate fully at real environment.

```
<key>UIBackgroundModes</key>
<array>
    <string>external-accessory</string>
</array>
```

## Function specifications revision number history table

Version number	Revision day	Pages	Contents of version	Remarks
1	20170729	-----		
2	20240201		Change the company name. Change support operating system and architecture. Remove Bitcode.	

### Library revision number history table

Version	Revision day	Contents of version	Remarks
3.00	20151228	First release	
4.00	20240201	Change the company name. Change support operating system and architecture. Remove Bitcode.	