TOSHIBA

TOSHIBA Barcode Printer

BX400/600 Series

A-BRID Stand-alone Printing Function External Specification

0.1 Edition July, 2024

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1. INTRODUCTION

1.1 Purposes

This specification describes of the A-BRID stand-alone printing function.

1.2 Scope

This function applies to all models with A-BRID.

1.3 Related Specification

1.3.1 Requirements

Not specified particularly

1.3.2 Specifications

A-BRID Panel Screen Operation Specification
A-BIRD Web Utility External Specification

1.4 Definitions, Acronyms and Abbreviations

Term	Explanation
A-BRID	Generic name of the next-generation barcode printer platform Auto-ID x e-BRIDGE
BCP	Barcode printer This indicates the barcode printer with no other devices (including options and networks) attached.
BCS	Barcode Printer System This indicates not only the barcode printer but also the entire system configuring the barcode printer solutions, such as a Windows PC or a cloud server.
Custom application	Custom Application This is equivalent to the embedded applications for the MFPs.
Custom application framework	Framework to manage and execute the custom application on the BCP.
FW	Firmware
SDK	Software Development Kit
Web Utility	This is a function equivalent to TopAccess for the MFPs. You can display the information on the BCP as well as configure the settings from the browser of a PC.
eCC	e-BRIDGE Cloud Connect Cloud service provided by Toshiba Tec for service maintenance purposes
QML	Qt Modeling Language QML is a declarative language, such as CSS or JSON, based on JavaScript to design the user interface of the application.
BCPAPI	API (Application Programming Interface) for the Toshiba Tec barcode printers.
TPCL	Tec Printer Control Language PDL (Printer Description Language) for the Toshiba Tec barcode printers. This is a computer language used to transfer the contents to be printed to the barcode printer.

2. OVERVIEW

2.1 Requirements Overview

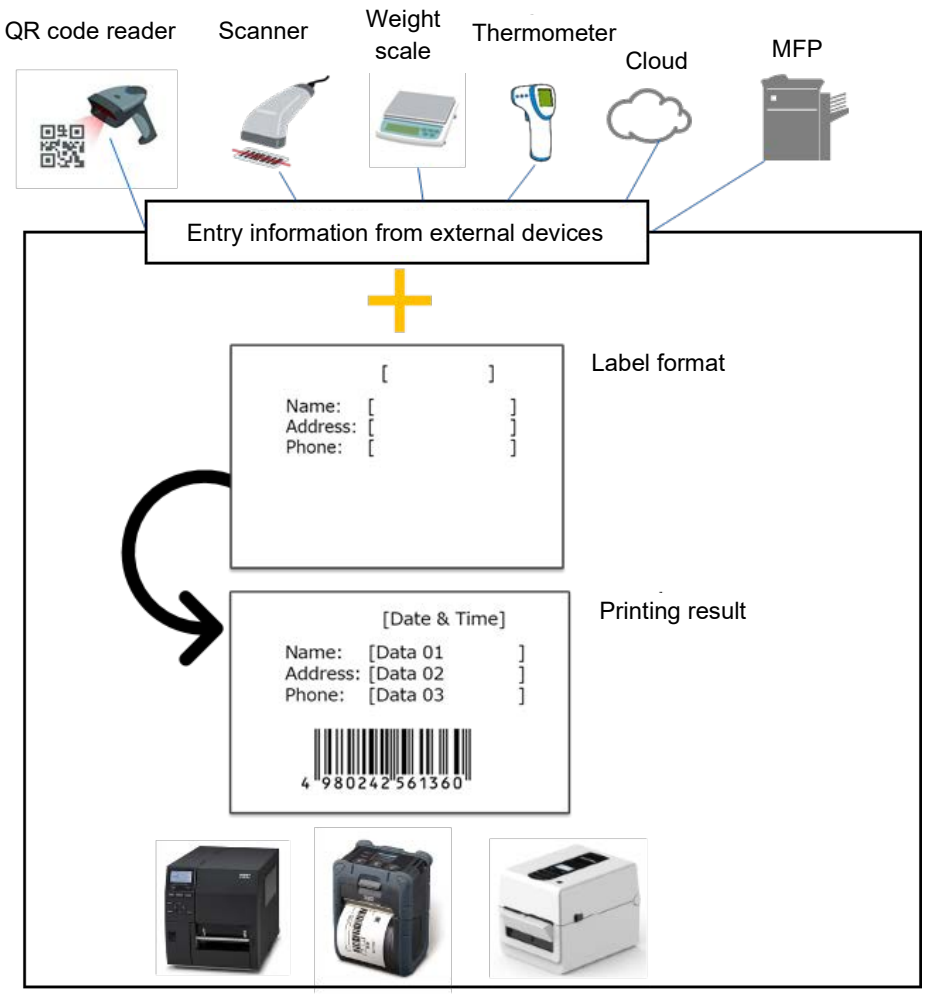
2.1.1 Stand-alone printing

The current issues are described as below.

- Currently, when printing labels which use data read by a barcode reader, the BCP is required to be connected to an infrastructure such as a Windows PC.
- It is not possible to directly link the BCP and various entry devices, such as weight scales, thermometers, clouds and MFPs.

To deal with the above issues, the stand-alone printing function sets out the following items.

- With only the printer, entry information from the external devices without using a special infrastructure such as a Windows PC.
  * External devices: Barcode/QR code readers, weight scales, thermometers, clouds, MFPs
- Labels can be printed by using entry information from the external devices.
- The label format (design) can be freely customized.
- The entry information from the external devices can be linked with each element in the label format.

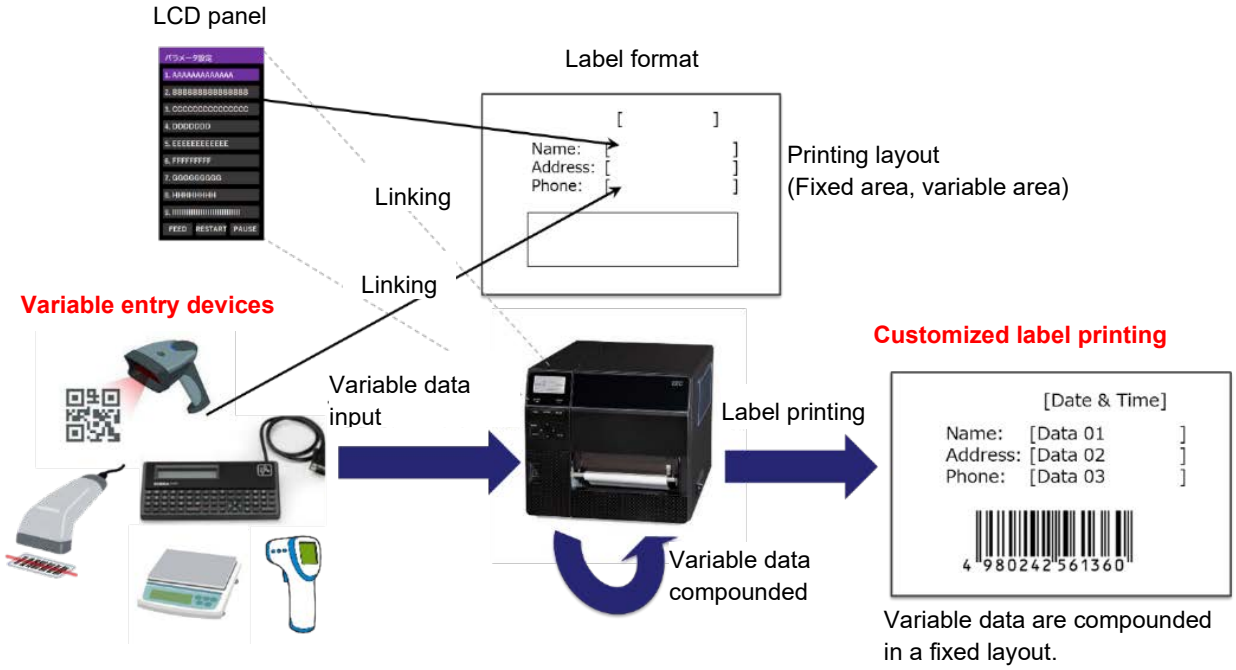


2.2 Function Overview

Stand-alone printing has the following features.

1. UI customization of the LCD panel
2. Receiving variable input data from multiple entry devices
3. Customization of the label format (printing layout)
4. Linking variable input data with each element in the label format
5. Linking variable input data with the reference values (DB access)
6. Customization of label printing execution parameters

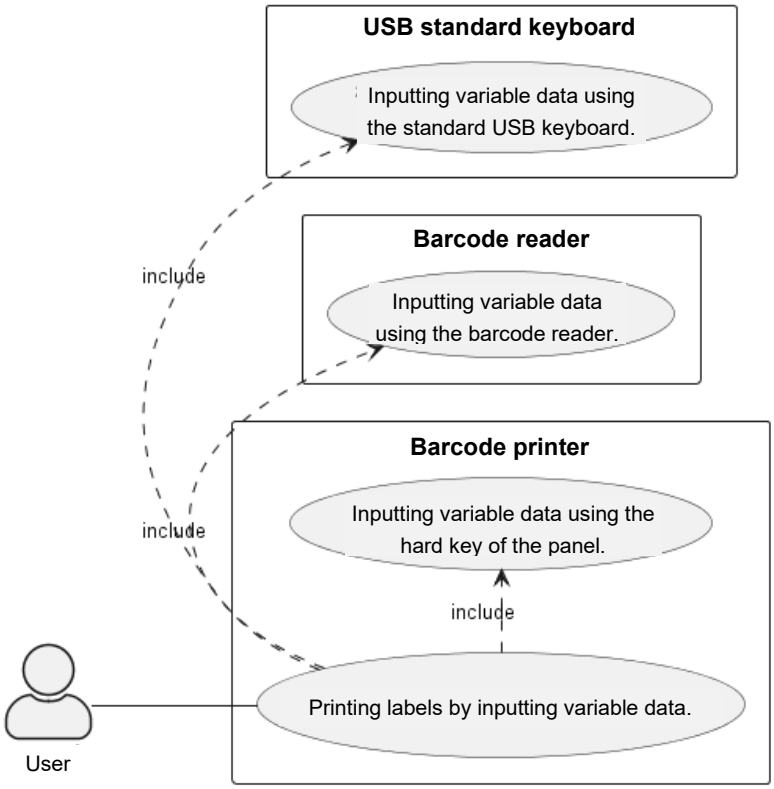
To satisfy these features, custom applications are supported as ones which can be easily customized. For details about the custom application management function regarding the creation, edition, installation, uninstallation, startup and quitting of the custom application, refer to the Custom Application Management External Specification.



2.2.1 Use case

The following table shows the use case of the stand-alone printing function.
Models with the A-BRID first version support only the basic features. Non-supported features will be considered to be supported from models with the A-BRID second or later version.

No.	Use case	Status at the first release
1	Printing labels by inputting data using the hard keys of the BCP.	Supported
2	Printing labels by inputting data using a barcode reader (RS-232C).	Not supported
3	Printing labels by inputting data using a barcode reader (USB).	Supported
4	Printing labels by inputting data using a barcode reader (Bluetooth).	Not supported
5	Printing labels by inputting data using a standard USB keyboard.	Supported
6	Printing labels by inputting data using a weight scale.	Not supported
7	Printing labels by inputting data using a thermometer.	Not supported
8	Printing labels by inputting data using a cloud system.	Not supported
9	Printing labels by inputting data using an MFP.	Not supported
10	Printing labels by inputting data using a POS.	Not supported



3. SETTING AND OPERATION CONDITIONS

3.1 Related Diagnostic Codes

Not specified particularly

3.2 Related UI Initial Settings

3.3 Factory Default and Decommission

There is no kind of effect.

3.4 Interface

3.4.1 Summary

There is no kind of effect.

3.4.2 UI

3.4.2.1 Panel

A customized screen with the stand-alone printing function is displayed.
In the customized screen, variable data required for label printing can be inputted using the hard keys.
Moreover, variable data sent from other entry devices such as a barcode printer can be displayed on the LCD panel.

3.4.2.2 Web Utility

There is no kind of effect.

3.4.2.3 Printer, NW-Fax driver GUI

There is no kind of effect.

3.4.2.4 Adjustment mode

There is no applicable feature in A-BRID.

3.4.3 Function list

There is no kind of effect.

3.4.4 External I/F

3.4.4.1 MIB

There is no kind of effect.

3.4.4.2 Stage2

There is no applicable feature in A-BRID.

3.4.4.3 eBR2

There is no applicable feature in A-BRID.

3.4.4.4 eCC (e-Bridge Cloud Connect)

Supporting of the inputting variable data from a cloud is examined in models with the A-BRID second or later version.

3.4.4.5 Remote command

There is no applicable feature in A-BRID.

3.4.4.6 Export and import

There is no applicable feature in A-BRID.

3.4.4.7 Cloning

This is explained in the Custom Application Management Function External Specification.

3.4.4.8 Backup and restore

There is no applicable feature in A-BRID.

3.4.5 Other I/F

3.4.5.1 BCP API

The following API categories which can be used from the custom application are provided.

API category	Function
Print Rendering	API to generate label format designs This API consists of the following element classes. (Widget class) Label class TextBox Field class Line Filed class Barcode class QRcode class Required elements will be added to the Canvas class. (This is not supported by the models with the A-BRID first version.) TPCL-format data are generated when rendering is performed in the Canvas class. (This is not supported by the models with the A-BRID first version.) Only the TPCL files are accepted by the models with the A-BRID first version.
Print Job	API to manage printing jobs This API manages the following items. Starting, pausing, restarting and canceling jobs Job status notification events Printing labels generated by the Print Rendering API.
Print Job Parameter	API to manage the print execution parameters This is not supported by the models with the A-BRID first version.
Operational USB Device	API to obtain the information on the USB storage devices and to manage their installation status
Device Capability	API to obtain the abilities of the BCP e.g.: Installation information on the optional hardware
AppStorage	File/Folder API of the application storage
BCPAPIVersion	API to manage the framework version of BCPAPI
Device Control	API to control the LED lighting of the panel or control the feeding
Session	API to manage the session information on the Home application.

3.4.5.2 EWB (Embedded Web Browser)

There is no applicable feature in A-BRID.

4. FUNCTIONS

4.1 Custom Application for Stand-alone Printing

Application developers can create custom applications with the stand-alone printing function.
(The stand-alone printing function can be implemented as a custom application.)

The custom application is in a Qt application format. The programming language of the Qt application is QML (JavaScript) and C++.
The following items can be customized by the programming.

1. UI customization of the LCD panel
2. Receiving variable input data from multiple entry devices
3. Customization of the label format (printing layout)
4. Linking variable input data with each element in the label format
5. Linking variable input data with the reference values (DB access)
6. Customization of label printing execution parameters

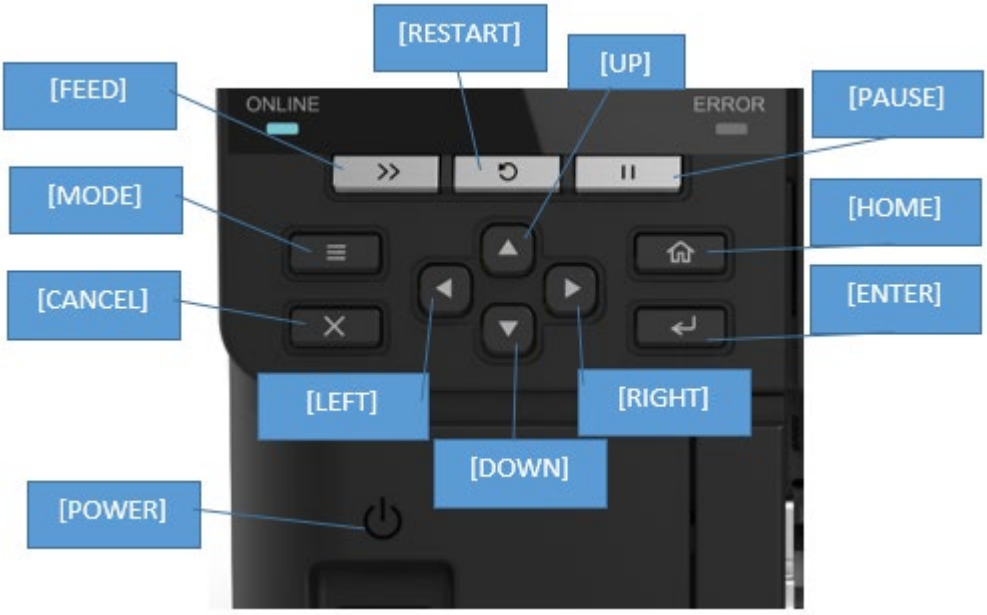
4.2 Customization of the LCD Panel

When application developers create the custom application with the stand-alone printing function, they can also customize the panel screens of the application.

The following shows examples of the customized panel screens of the custom application.

4.2.1 Inputting of variable data by the hard key operation

Users can input text and values by the hard key operation of the panel.



4.2.2 Displaying the variable data inputted from multiple entry devices

Users can input variable data by the reading operation of multiple entry devices such as a barcode printer.
With the custom application, data scanned by entry devices can be displayed on the panel.
Users can confirm the variable data inputted from entry devices on the panel.

4.2.3 Localization of panel display text

Text displayed on the panel screen of the custom application is localized.
The supported languages and the switching method comply with the panel external specification of the BCP.
After the display language setting is switched, the selected language will be reflected in the panel display from the first time you start the custom application.
As for restrictions, the displayed text may be cut off if it is too long for some languages.

4.3 Receiving of Variable Data from Multiple Entry Devices

The following table shows the entry devices for stand-alone printing, supported by models with the A-BRID first version.

Use case	Status at the first release
Barcode reader (RS-232C)	Not supported
Barcode reader (USB HID)	Supported
Barcode reader (Bluetooth)	Not supported
Standard USB keyboard	Supported
Weight scale	Not supported
Thermometer	Not supported
RFID reader	Not supported
MFP (e-BRIDGE) manufactured by Toshiba Tec	Not supported
POS	Not supported

Only one USB port is embedded in models with the A-BRID first release. However, connection to multiple USB devices in one go is supported by using a USB hub.
Moreover, hot plugging (*1) of the USB storage device is not supported by models with the A-BRID first release.

* 1: Hot plugging is a function to add or remove USB storage devices without shutting down the system of the BPC or turning the power of the BCP off.

Upon calling BCPAPI, the custom application can judge the availability of the entry device currently being used. If the entry device to be used is not installed, the custom application can display an error on the panel screen.

4.4 Customization of the Label Format (Printing Layout)

When application developers create the custom application with the stand-alone printing function, they can also customize the label format (printing layout).

The label format consists of the following items.

1. Label backing paper (label width)
2. Lines
3. Text
4. Barcode or QR code images

Upon calling BCPAPI, the custom application can create the label format. BCPAPI provides an API for basic label format drawing.

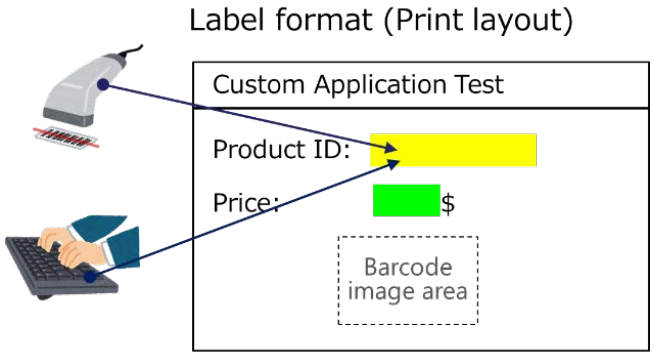
One custom application can have multiple label formats. Users can select one label format from among them to perform label printing.

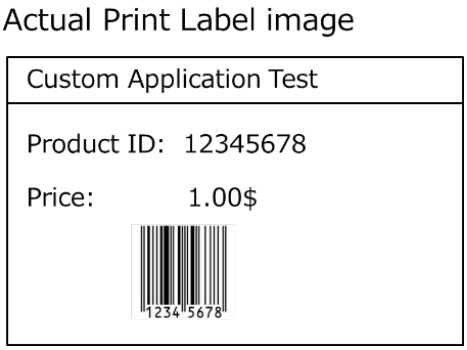
4.5 Localization of Text for Label Printing

Localization of text used for label printing is not supported.

4.6 Linking of Variable Input Data with Each Element in the Label Format

When application developers create the custom application with the stand-alone printing function, they can also link the variable input data with each element in the label format.
In the following example figure, “Product ID” is linked with “Barcode reader entry” or “Standard keyboard entry”.





4.7 Linking of Variable Input Data with the Reference Values (DB Access)

When application developers create the custom application with the stand-alone printing function, they can use a database defining the linkage of the variable input data and the reference values specified beforehand.

For example, the custom application has a database which defines the linkage of the “Product ID” and “Price”.

Product ID	Price ($)
11111111	1.00
22222222	2.34
33333333	3.66
12345678	5.00

For example, this will be created in a JSON format as below.

```
[
  {"ProductId":"11111111","Price":"1.00"},
  {"ProductId":"22222222","Price":"2.34"},
  {"ProductId":"33333333","Price":"3.66"},
  {"ProductId":"12345678","Price":"5.00"}
]
```

The custom application can assign the reference value (“Price”) to the variable input data (Product ID) and apply it for label printing.

4.8 Customization of the Label Printing Execution Parameters

When application developers create the custom application with the stand-alone printing function, they can also customize the label printing execution parameters.

Upon calling BCPAPI, the custom application can configure the label printing execution parameters, such as the number of prints.

4.9 Print Status Management

Upon calling BCPAPI, the custom application can manage the stopping or restarting of printing jobs.
The custom application can also receive the notification of the printing job status from BCPAPI.

4.10 LCD Color Pattern Switching

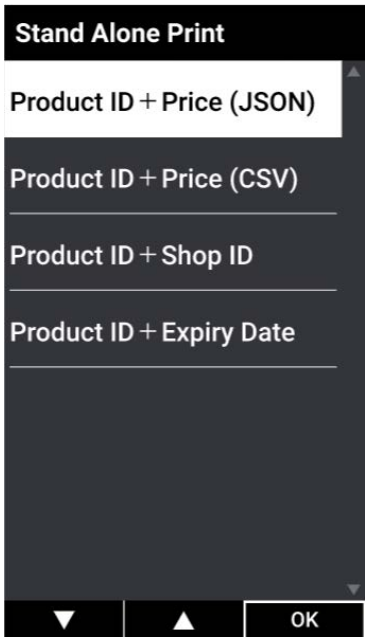
From SDK for the BX420 and BX430 series, the stand-alone printing supports the LCD color pattern switching function of the application menu displayed on the panel. Depending on the value specified for 08-1040, the color pattern can be switched as below.

08 code	Setting item	Explanation
1040	LCD color pattern	0: Light (Base: White, Text: Black) 1: Dark (Base: Black, Text: White)

Screen sample

When “0” is set

When “1” is set



4.11 Error Processing

4.11.1 If a required entry device is not connected at the startup of the custom application

If a required entry device (e.g.: barcode reader) is not connected at the startup of the custom application, it can display an error on the panel screen.

4.11.2 If data reading from an entry device has failed

If data reading from an entry device (e.g.: barcode reader) has failed, the custom application can display an error on the panel screen.

4.11.3 Label printing error

If an error (e.g.: running out of paper) has occurred during printing, the custom application can display an error on the panel screen.

4.12 Operating Specifications of the Sample Application Screen

There are four label templates of the sample application. Users can select one of them and perform label printing.

Template type	Function
Template 1	Product ID: Reads by a barcode reader. Price: Searches by the linkage of the product the price defined in a JSON file. Number of prints: Inputs by the hard keys of the panel.
Template 2	Product ID: Reads by a barcode reader. Price: Searches by the linkage of the product the price defined in a csv file. Number of prints: Inputs by the USB keyboard.
Template 3	Divides text read by a barcode reader to 10 digits. The first 4 digits are the store number and other 6 digits are the product ID. Number of prints: Inputs by the USB keyboard.
Template 4	Product ID: Reads by a barcode reader. Expiration date: Calculates by using the current date and time (+6 hours). Number of prints: Inputs by the USB keyboard.

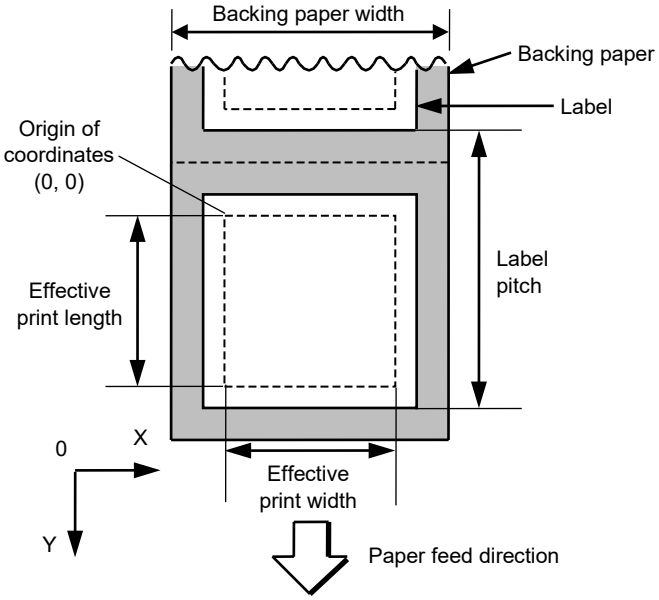
For details about the screen transition and hard key assignment, refer to the attached excel file.

StandalonePrintAppHardkeyContro

4.13 Label Template Print Specifications of the Sample Application

The table below shows the label template print specifications of the sample application.

	Label pitch	Effective print width	Effective print length
Label template 1	72.0 mm	104.0 mm	70.0 mm
Label template 2	65.6 mm	104.0 mm	63.6 mm
Label template 3	68.1 mm	104.0 mm	66.1 mm
Label template 4	68.1 mm	104.0 mm	66.1 mm



[Print direction: Bottom first]

4.14 Combinations and Compatibilities

4.14.1 Functions and settings

Not specified particularly

4.14.2 Version combinations and compatibilities

Network printing jobs cannot be printed while the custom application is being operated.

4.14.3 Parallel operation

Not specified particularly

4.15 Logs and Notification

4.15.1 Job log, page log (real-time log) and image log

Logs are recorded on the print job log when printing is performed from the customer application with the stand-alone printing function.
Details of the logs to be recorded comply with the specifications for the BCP.

4.15.2 Message log and notification

There is no kind of effect.

4.15.3 Others

The following features are not applicable for A-BRID.

- Error History Log
- Power ON_OFF log
- FW Upgrade Log

5. NON-FUNCTIONAL DEFINITIONS

5.1 Performance Definitions

Not specified particularly

5.2 Security Definitions

Not specified particularly

5.3 Portability and Machine Dependence

Not specified particularly

6. CPL (Contractual & Product Liability) PROCESS

The print distance count, number of cuts and charge count will be increased when printing is performed from the custom application with the stand-alone printing function.

7. RESTRICTIONS

When printing is executed while the custom application calls BCPAPI, the emulation setting is changed to “Disable” (TPCL).

8. BSI DRAFTING

Without using a special infrastructure such as a Windows PC, label printing can be customized by the information inputting with a barcode reader, USB keyboard or hard key operation on the panel.

9. RELATED OPTIONS (EXTERNAL OPTIONS AND SYSTEM OPTIONS)

There are no special notes for the optional devices and licenses.

10. APPENDIX

10.1 Function Matrix

Large classification Dims. SRS folders	Middle classification Dimensions items to make relations	Examples	Relation
Copy	Basic	General copy functions/processes, Copy specific (Undefined size, Sync.mode, etc.)	
	Job mode	Job Build, Proof, Storage(File, e-Filing)	
Print	Basic	LPD banner, Separator page, Cover page	
	Print job mode	Private, Hold, Schedule, Invalid, Proof	
	Print client type	RAW, Windows, CUPS/Unix Filter, MAC-PPD, USB Direct, BIP, EFI, IPP	
	Mobile print	AirPrint, Mopria, ZeroInstall, eBPC	
	Multi-Station	Location free (with Server(eMS), Server-less)	
Scan	Basic	General Scan functions/processes	
	Store, Send	ToFile, ToBox, ToEmail	
	External	Remote Scan, DPWS (push/pull), AirPrint(Scan), Mopria(Scan), EWB Scan, eBPC	
	Preview	Scan Preview	
	OCR	OCR, Barcode	
e-Filing	Input	to Box	
	Edit	on Web Utility	
	Output	to Print, to e-mail	
Fax	Basic	General FAX functions/processes	
	Common function	Common function	
	Polling	Polling receive, Poring transmission	
	Send	Redial, Recovery transmission, Multi. transmission, Batch transmission	
	Receive	Secure receive	
	F-Code	F-Code (Confidential box, Bulletin board, Forward, Local print, etc.)	
	Receive Forward	forward to Box, File, e-mail, IFax, Fax, Report transmission	
	NW-FAX_NW-IPFAX_NW-IFAX	NW-Fax (PC-Fax), Mobile(AirPrint(FaxOut)), IP-Fax(T.38)	
List	List	User/Admin List,	
	Report	Journals(Manual/Auto),Transactional Reports,	
	Fax List	Fax Mode List	
	9S List	9S Mode List (print/csv)	
Common	Job control	Suspend, Resume, Job Skip, Deletion, Interrupt Print/Copy, Job queue reordering	
	Home button	Home button, Job template	
	Image calibration	Gamma, DSDF Calibration	
	Power control	Sleep, Super sleep, Hibernation	
	General of printing	General print control independent of job type	
	General of scanning	General scan control independent of job type, Omit blank page	
	Operation mode	Synchronous, Asynchronous, Completion	
	General of engine/devices control	Setting/Adjustment, Detachment, H/W status handling, New devices	
	Papers	Manuscript/Print, Paper sizes/types, Custom-size, Undefined-size, Photo-size, Business-card, User-paper-type, Basis-weight, Postcard, Envelopes, etc.	
	Color mode	Full, Black/Gray, Twin/Mono, ACS, (Print side/Scan side)	
	Image processing	Original mode, Image synthesis, im in general, HSP(Hardcopy Security Print	
	Page memory	Shift, Centering, Coordinates, Rotation, Filling	
	Admin notification	System Message, Job, Application, License	
	Service notification	Fax, e-mail(incl.xml)	
	Auto supply order	Auto Supply Order (Fax, e-mail)	
	Production line mode functions	Production line mode/functions, Aging mode/functions	
	Service mode function	Service mode/functions for field	
	Export, Import	Export/Import (Template, Address book, Log (csv/xml), Dept. / User Info / Counter/Quota), etc.)	
	Cloning	Cloning	
	Backup, Restore	Backup/Restore (HDD, SRAM, e-Filing, etc.)	
	Reset, Initialize	Factory default, Decommission	
	License control	License install, Dongle	
	System updating	System updating (ROM/SRAM/HDD)	
Log	Job Log	Job Log/Page Log(real-time log), Image log	
	Message Log	Message Log	
	Application Log	Application Log	
	Survey logs	Error History Log, Sensor log, Logs to collect something for service/developer	
Counters	Electric charge counter/quota	Electric counter, Total, Dept./User Counter, Color/Black Quota, Job Quota, Counter backup	
	External counter	External counter(Coin, Card, Key)	
	Real-time log	Real time Log (page log)	
	Uncharged counters	PM counters, Something survey counters (ACS, etc.)	
Authentication	Department, User, Project management	Department/User management, Project code	
	Authentication per function	Authentication per function	

	Role, Group, Permission	Role/Group, Permission	
	Black free	Black Free	
	Other	Email Authentication, Email Address Setting, HomeDirectory, Shared User, etc	
Security	High security mode	High security mode	
	Certificate	Device certificate, Client certificate, CA certificate	
	Password policy	Password Policy (Policy 1-5)	
	Other	NTP, Filtering, Security Stamp, Hardcopy Security Print, etc	
	Basic	Other functions related on security	
Interface	Operation panel	Panel, Shared Home	X
	Web Utility	Web Utility	X
	Stage2	Stage2 (EFMS, Open Platform I/F)	
	MIB	MIB (EFMS, Client)	
	eBR2	eBR2 (RDMS)	
	ECC	ECC	
	API	BCPAPI, Built-in Application	X
	EWB	EWB (Web, Protocol)	
	Network	Protocol, Network service, NTP, Filtering	
Model	Model specific (A4)	Unique funcs for A4 models	
	Model specific (Low end)	Unique funcs for Slim-eBN, Entry/LowCost models, SSD models	
	Model specific (B/W)	Unique funcs for Black&White models	
	Model specific (Eco)	Unique funcs for Eco-Hybrid models Erasable print, Re-use paper, Toner erase	
	Model specific (OEM)	Unique funcs for OEM(in/out) models	
Tools	Tools	Production line tools, Maintenance tools	
Applications	Applications	Client applications(Launcher, Installer, PD, EFMS, etc), Server applications(eMS, LCS, eCC, RDMS, etc), Embedded applications	
Solution	Solution collaboration	MDS collaboration	

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BS230051A0-EN