TOSHIBA

TOSHIBA Bar Code Printer

SAP ABAP Printer Driver

Operating Manual

First Edition: Jun. 29, 2018

TOSHIBA TEC CORPORATION

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Introduction

Thank you for purchasing the TOSHIBA bar code printer.

SAP PDL Driver for Toshiba Barcode printers is a SAP Smart Forms printing solution to Toshiba barcode printers. It allows users to use a driver for a Page Description Language (PDL) that is implemented in ABAP and resided in the SAP environment to print Toshiba printer without 3rd party solutions. With this device driver, TEC Printer Command Language (TPCL) is send to the Toshiba barcode printer directly from SAP – providing greater performance and efficiency.

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1. General Description

1.1 SAP Environment

Please refer to the SAP Notes: 1097563 for the updated information about the overview of SAP PDL driver.

1.2 Solution Overview

This solution is primarily for Smart Forms printing for Toshiba Barcode printers. The solution is achieved by converting the SAP generic output formats to Toshiba printer specific commands using

- Device Type files
- ABAP Based PDL device driver
- Users define Smart Styles for printing items include
    • Fonts
    • Barcodes
- Use Smart Forms to design the form layout. Form layout shall contain
    • Embedded text,
    • Embedded images,
    • Barcodes.
- Define Output Device that points to the given Device Type
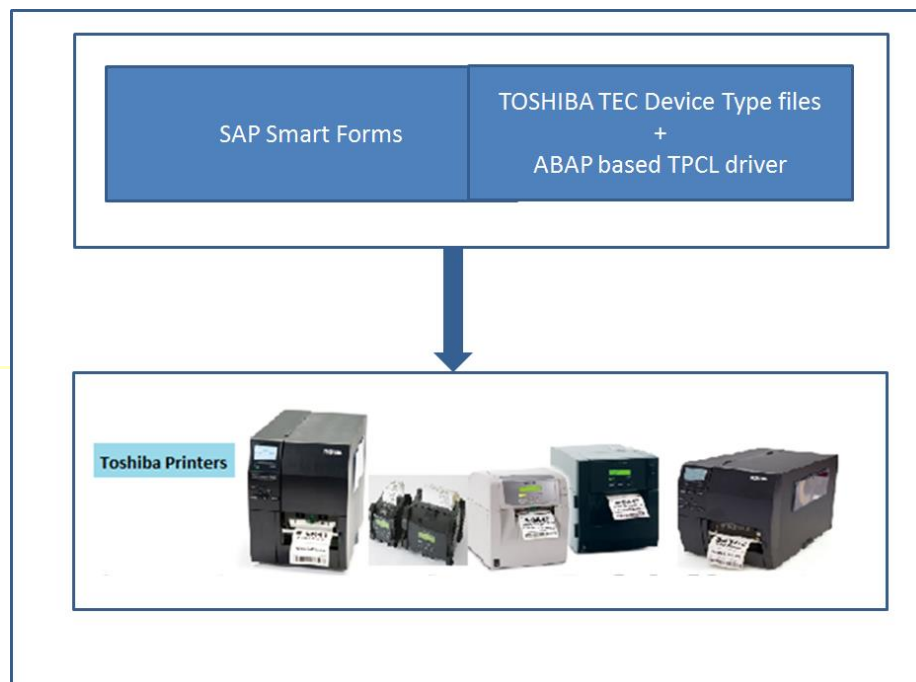- Print the Smart Forms using the output device.

Figure 1:   Overview of Solution

Please refer to the SAP Notes: 1135105   for the updated information about the Toshiba Barcode PDL Driver.
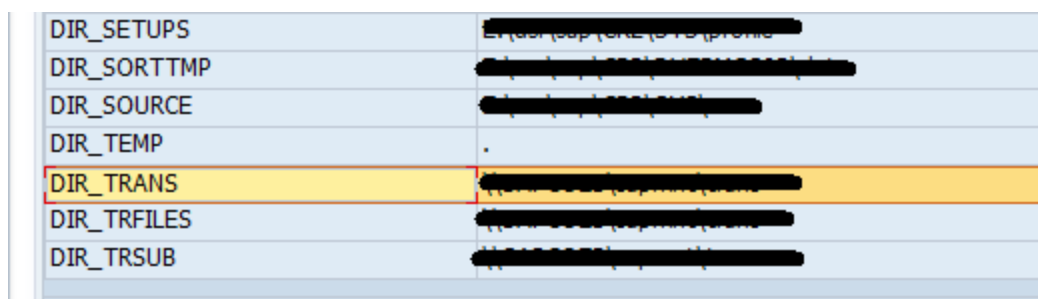
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1.3 Trademark

SAP, ABAP are trademarks or registered trademarks of SAP in Germany and/or other countries.

2. Installation Procedure

2.1 Importing transport files to SAP system

1. Copy the transport files to the proper locations in SAP system:
   a. Copy the K*.PVD to the Cofile folder located at \usr\sap\trans\cofile
   b. Copy the R*.PVD to the Data folder located at \usr\sap\trans\data

2. Logon to the SAP ECC Dev System and open transaction AL11. Find your DIR_TRANS directory.
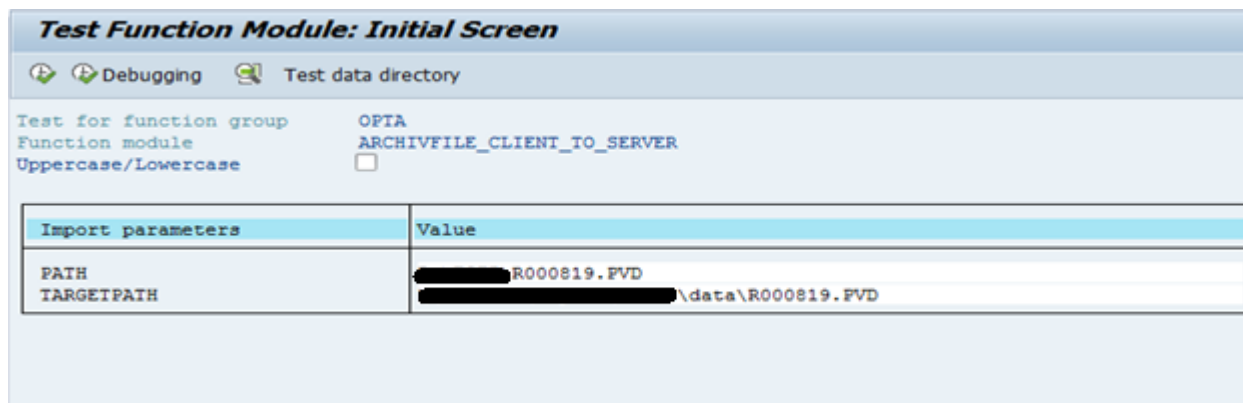

Figure 2: Referring DIR_TRANS directory

3. Go to transaction CG3Z. Then import header and data of your request into external system. For example. if the PVD files are K000819.PVD for header part and R000819.PVD for data part, then path should be like this;

For header of request:
       Source file on front end   :   PVD file path of K000xxx.PVD
       Target file on application server :   DIR_TRANS \cofiles\K000xxx.PVD
For data of request:
       Source file on front end   :   PVD file path of R000xxx.PVD
       Target file on application server :   DIR_TRANS \data\R000xxx.PVD

Figure 3: Uploading the Data file to SAP system

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Figure 4: Uploading the Cofile file to SAP system

4. Go to transaction **STMS**. Click **Import Overview** button and double-click to appropriate queue, which you want to import the request. Then, from the Menu bar click **Extras** Then **Other Requests** then **Add**.
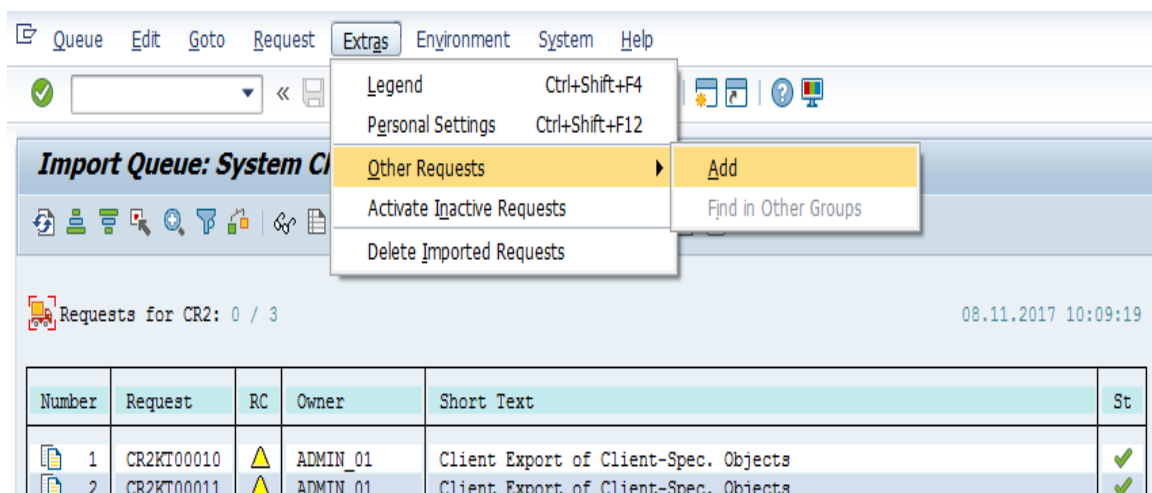

Figure 5 : Transaction STMS

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Figure 6: Adding transport request for PDL driver
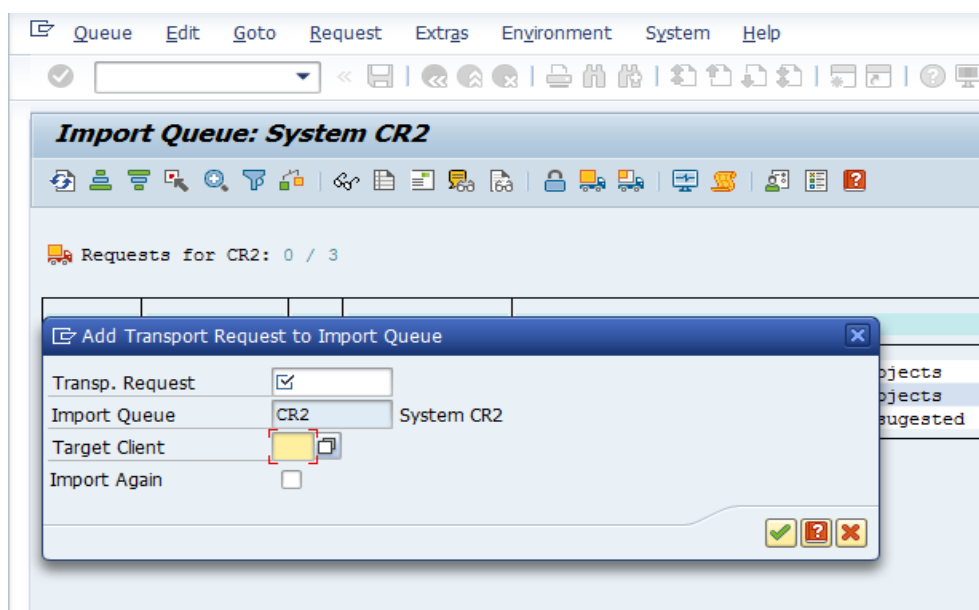
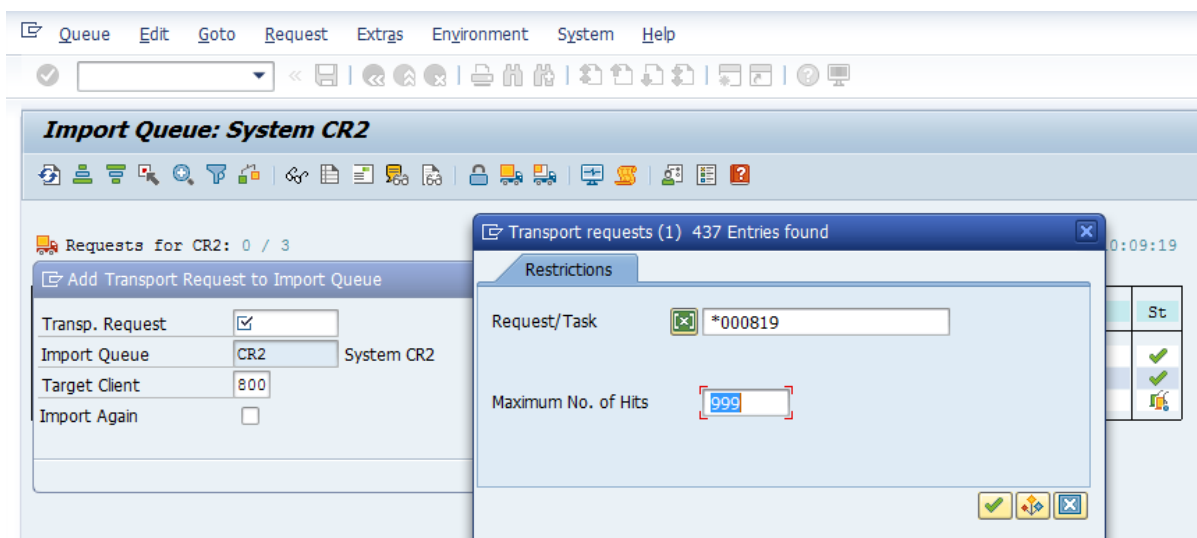Figure 7: Enter target client and search for transport request

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Figure 8: Search for the desired transport request using the *wildcard selection
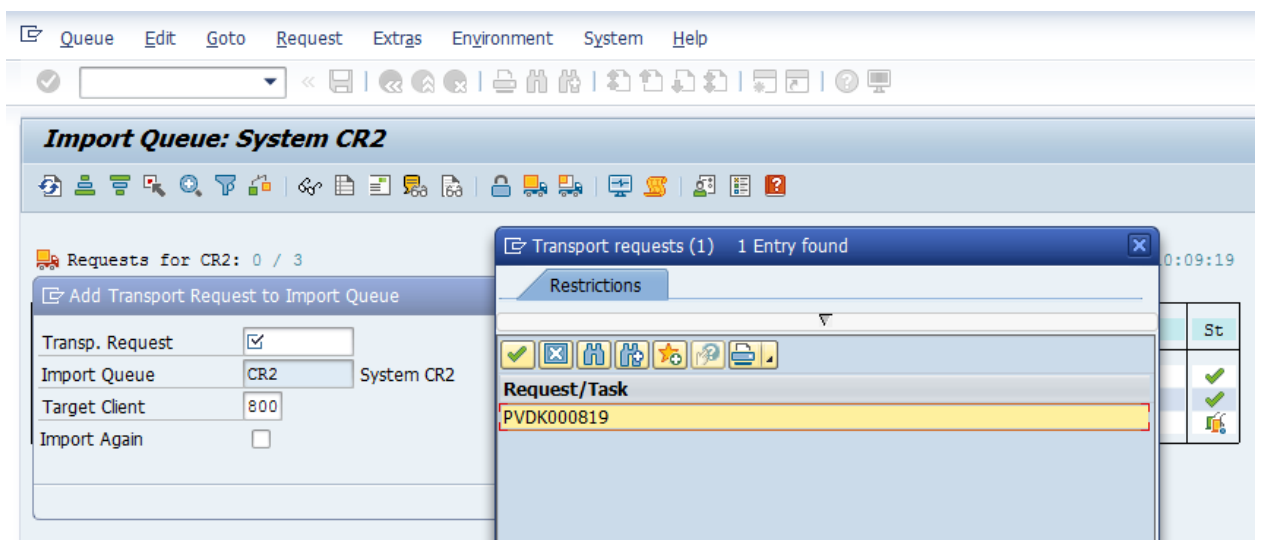

Figure 9: Select the transport request name
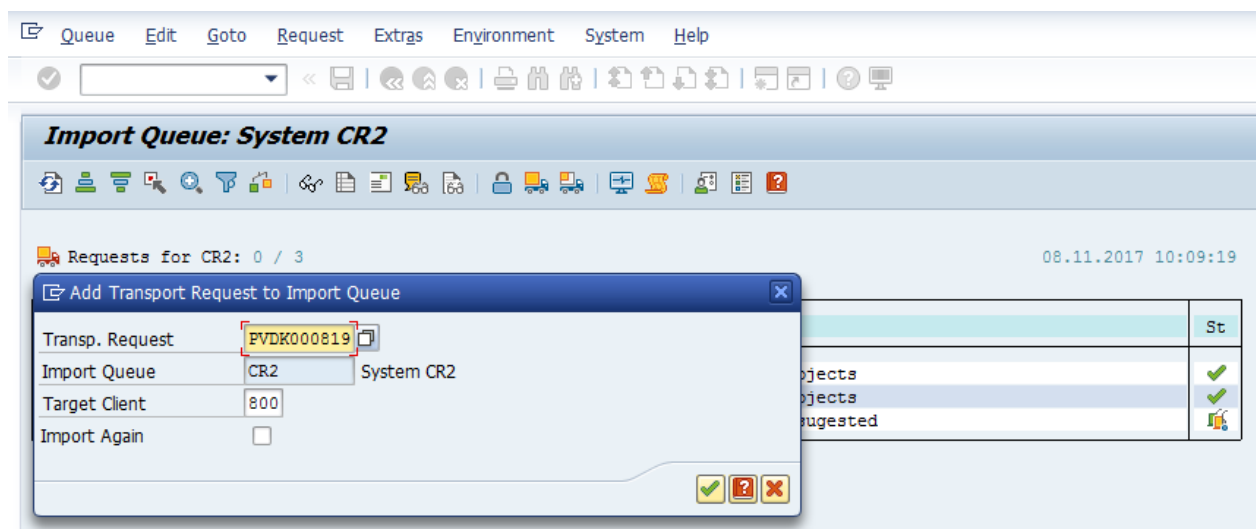
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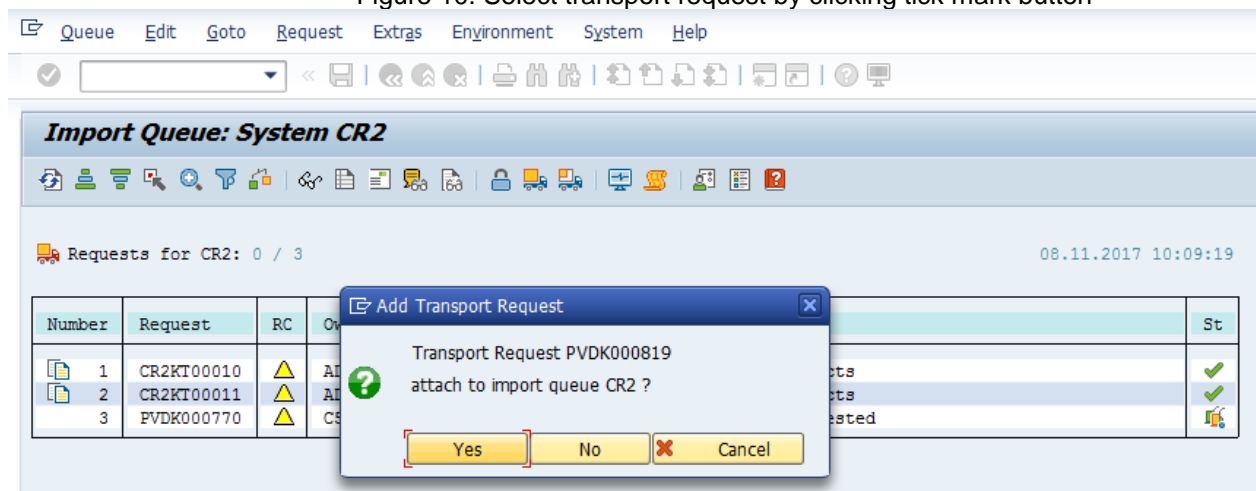Figure 10: Select transport request by clicking tick mark button

Figure 11: Confirm transport request by pressing 'Yes' button

5. Importing the transport request to the target client from the import queue by selecting the transport request and click the Import request button.
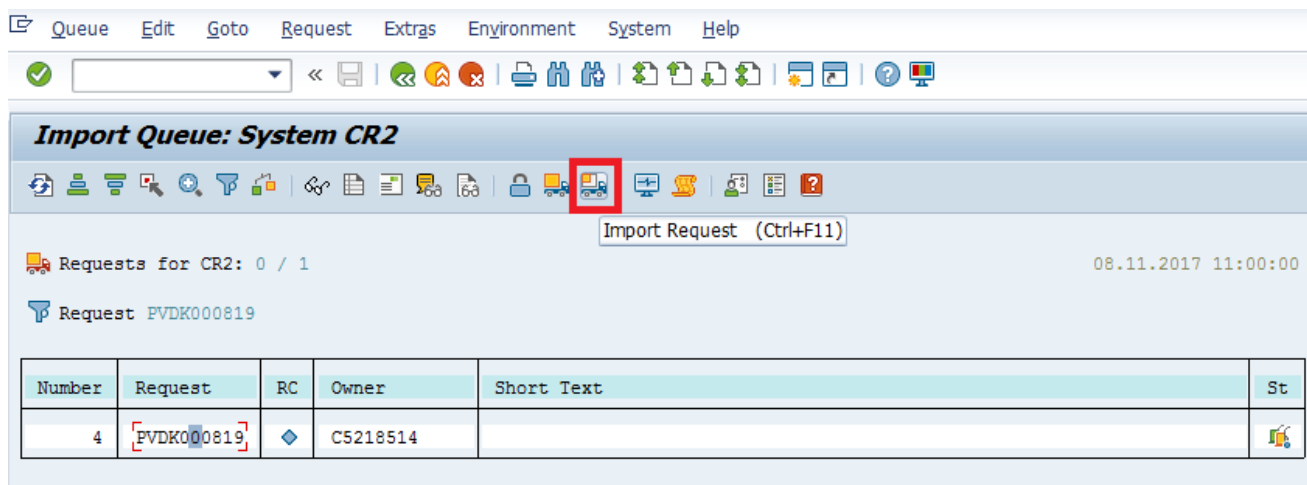
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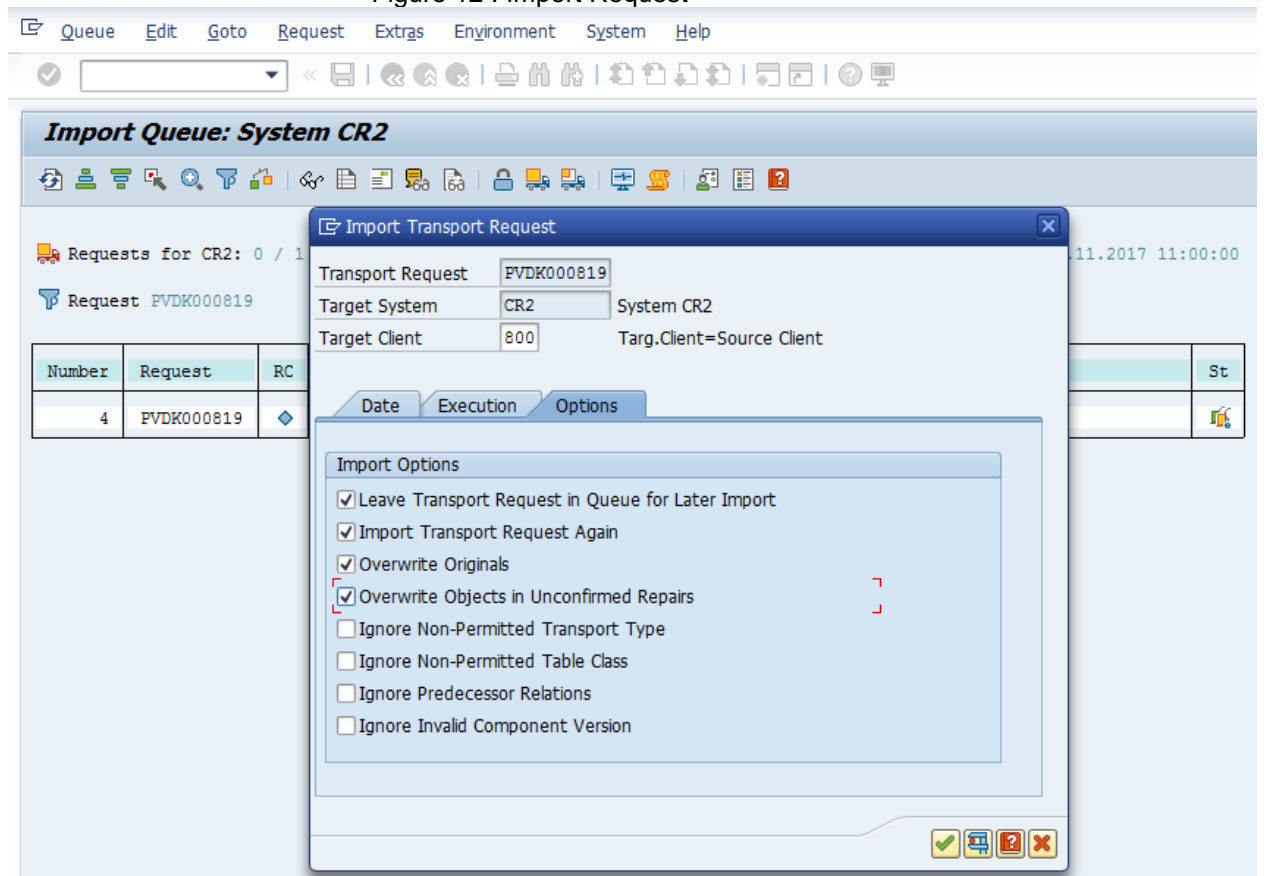
Figure 12 : Import Request

Figure 13: Select the import options and confirm the import by clicking the tick button

*Please note the images containing PVDK000819 is for illustartion purpose only, actual PVD file name could be different .

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2.2   Importing Device Type files

The Toshiba Device Types can be uploaded into the SAP system by Importing through SPAD transaction.
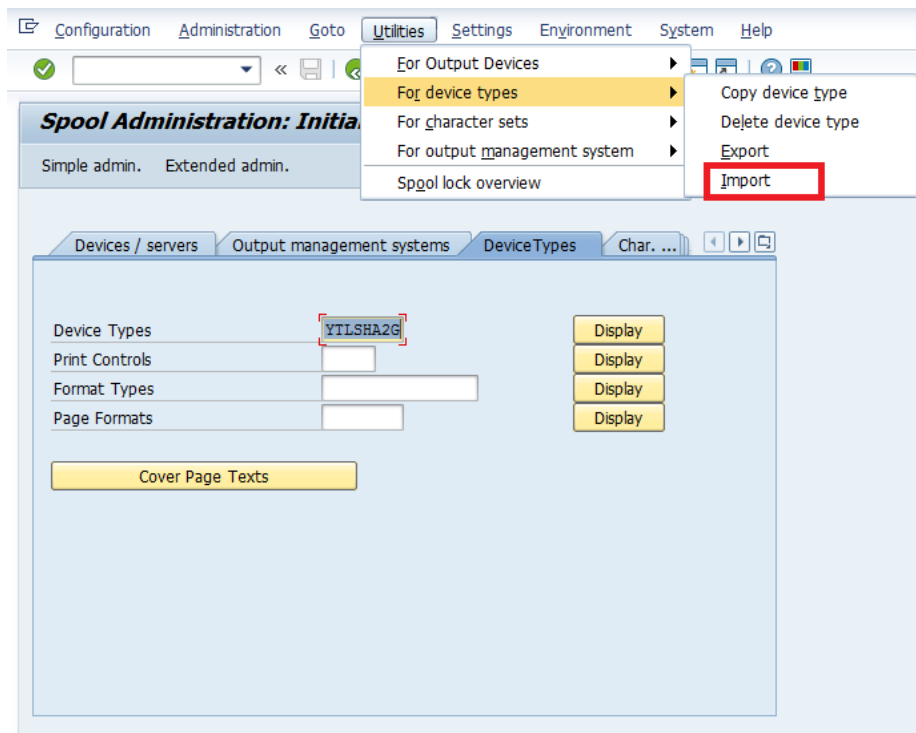

Figure 14: Importing Device Type file-1

Select Import as per above Figure 14. The following screen will be displayed:
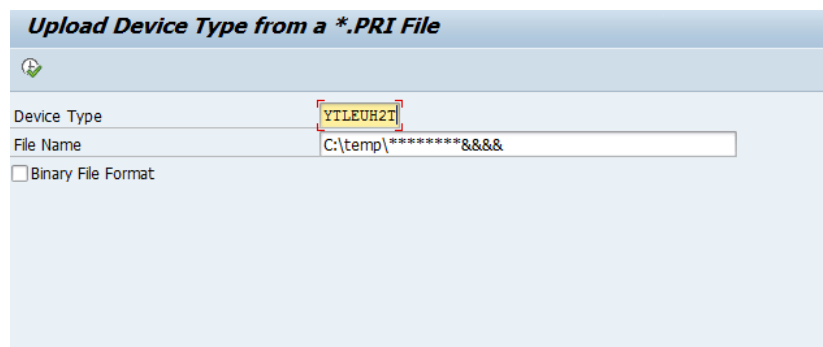
Figure 15: Importing Device Type file-2

Execute the program by clicking 'F8' to import the device type and select the device type files (.PRI files) from the list and click 'Save' button.

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Figure 16: Selecting device type file.

Note: The device type name must start with 'YTL' for Toshiba Device type. It should contain 8 characters. The object name must match with the file name of the device type (without the extension).

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3. Output Device Creation

Go to the Spool Administration application by using transaction code 'SPAD'.
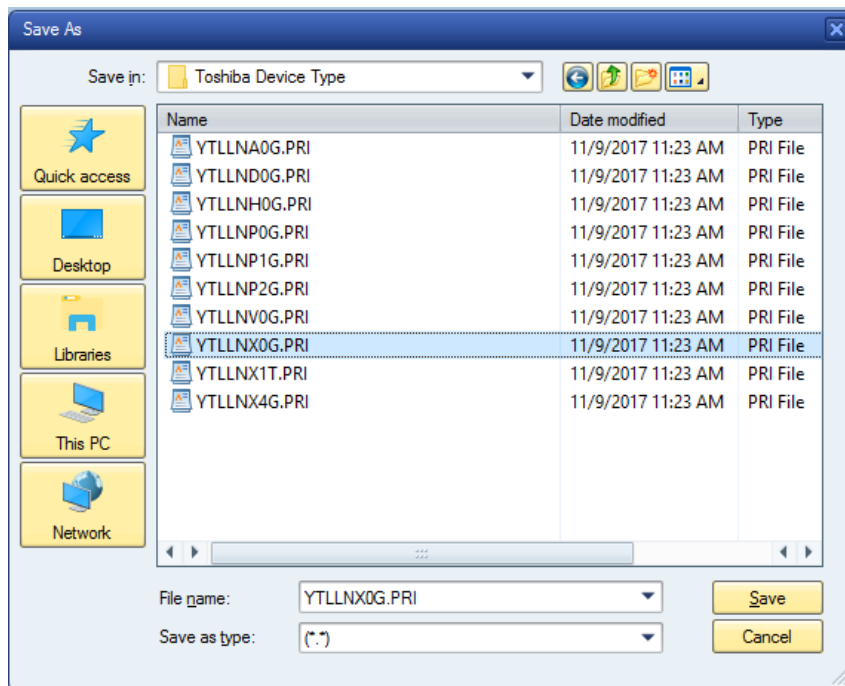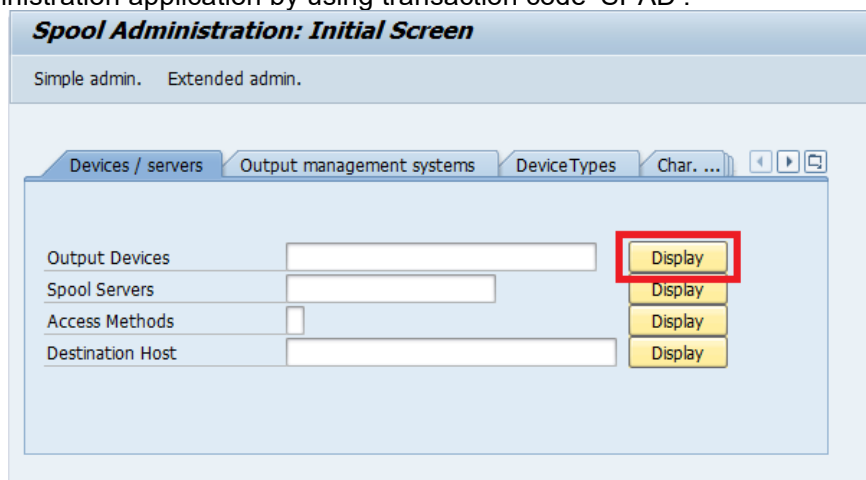

Figure 17: click on "Display" button for 'Output Devices'
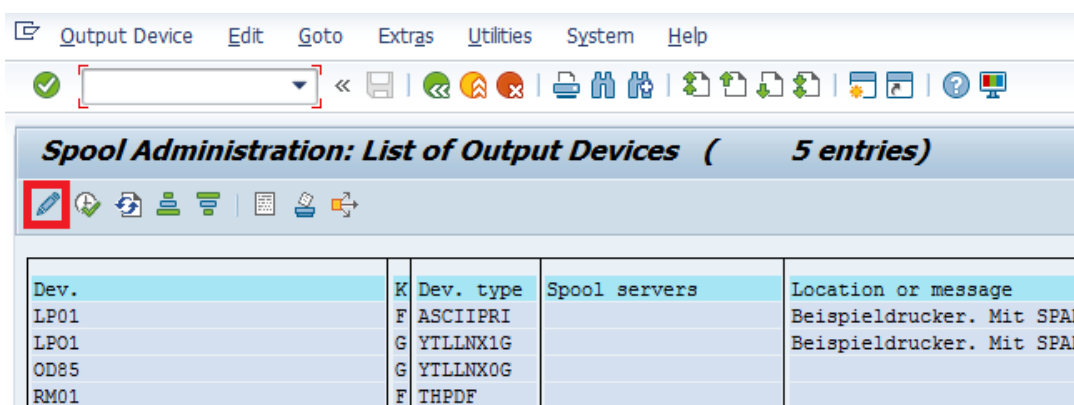
Figure 18: Click on the 'Edit' button to change from Display mode to Edit mode
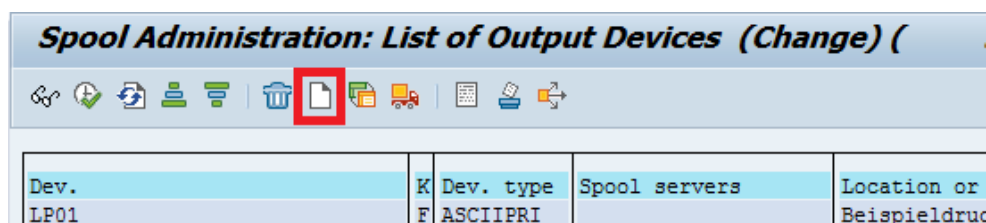
Figure 19: Click on the 'Create' button to create a new Output Device.

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Figure 20: Select the uploaded Device Type into the SAP system
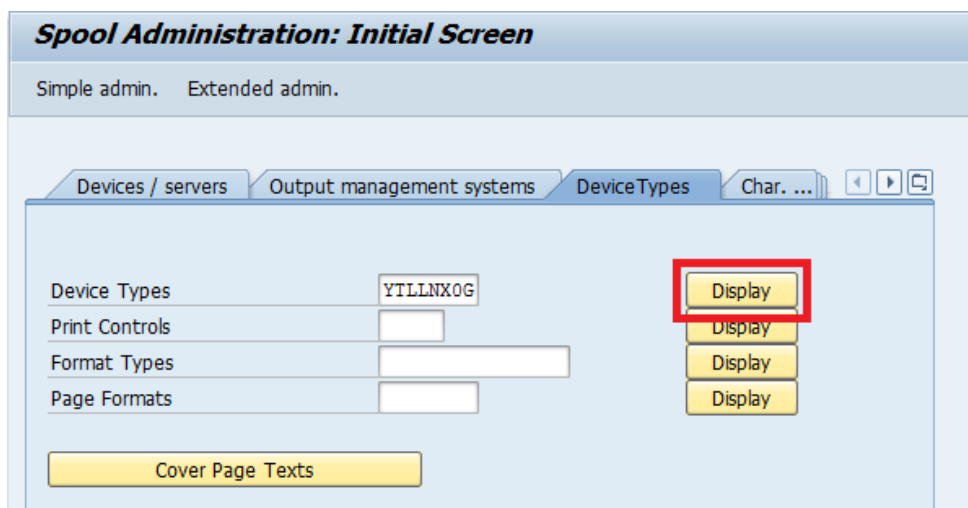
Figure 21: Defining Access Method

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3.1 Accessing Device Types

Go to the Spool Administration application by using transaction code 'SPAD'. Enter the Device type name and click 'Display' button.

Figure 22: Spool Administration

Figure 23: Displaying Device Type definition

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4. Toshiba PDL driver Functions
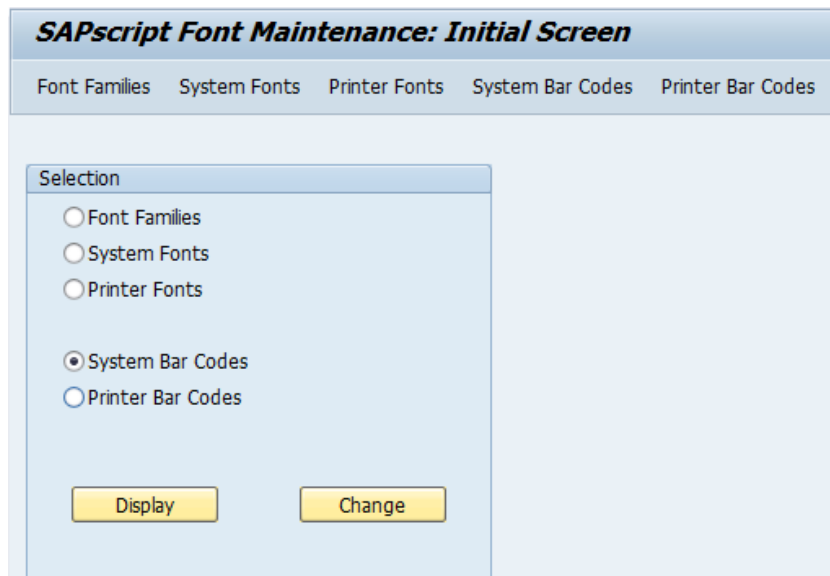
4.1 Barcode

Both SAP traditional and new barcode technology are supported. (Please refer to SAP notes: 430887 and 645158 for more information about the barcode technology).
To create Barcode definition, user needs to create the required barcode definition as System Barcode in SE73. Then link the barcode definition to the print control as Printer Barcode.

4.1.1 Defining Barcode
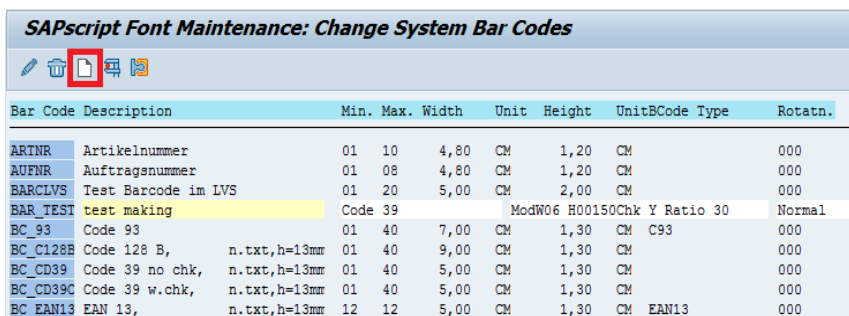
Before a Barcode can be used in the Smart Forms, the definition of the Barcode must be made.

Run the transaction code 'SE73' (SAP Script Font Maintenance) to get the following screen.

Figure 24 : System Barcode selection

Select the radio button 'System Bar Codes' and click the 'Change' button to go to the following screen.

Figure 25 : New Barcode creation

Click the 'Create' button or press 'F5' key to create a new System Barcode definition. A pop-up will show asking to select the New or Old Bar code technology.

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4.1.2 New Barcode Technology

The 'New Barcode Technology' supports the following barcodes:
- Code39
- Code93
- Interleaved 2 of 5
- Code128

The following instruction provides how to create Barcode definitions using New Barcode Technology.
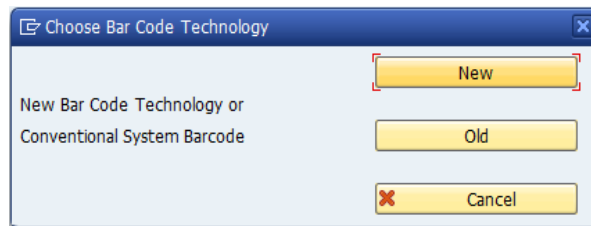
Figure 26 : Select the 'New' button from the pop-up.
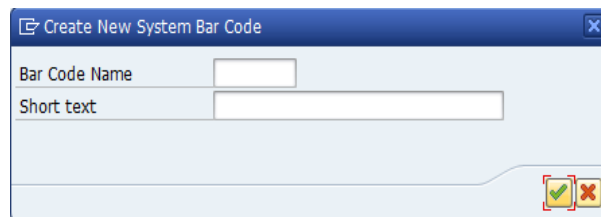
Figure 27 : Entering Barcode information

For Toshiba barcode, it is recommended to define a Barcode name with prefix 'YT'. For example, to define a new Code93 barcode, the following Barcode name can be used: YTBCOD93. Enter some description on the textbox for 'Short text'. Press the tick button to continue.
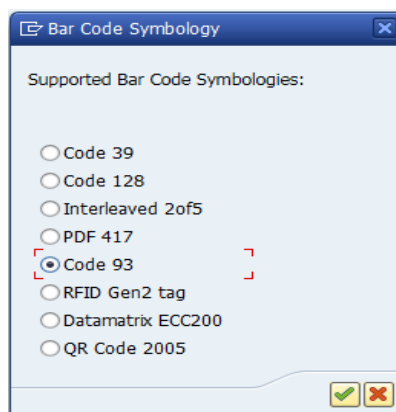
Figure 28 : Selecting Bar code type

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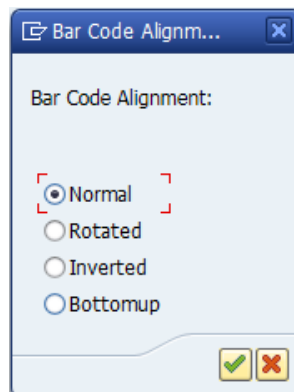
Figure 29 : Select the Bar code Alignment as 'Normal' for zero rotation
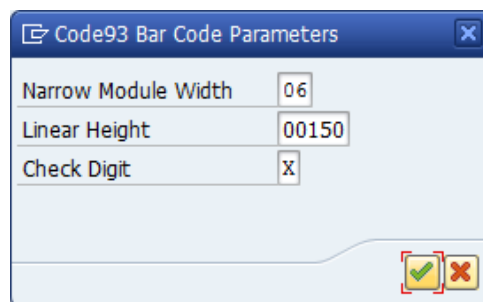
Figure 30: Entering Bar code information
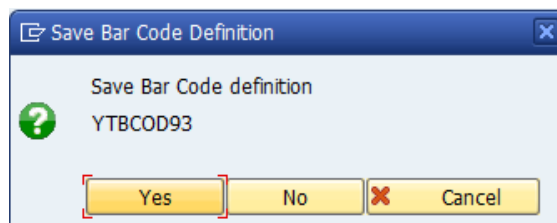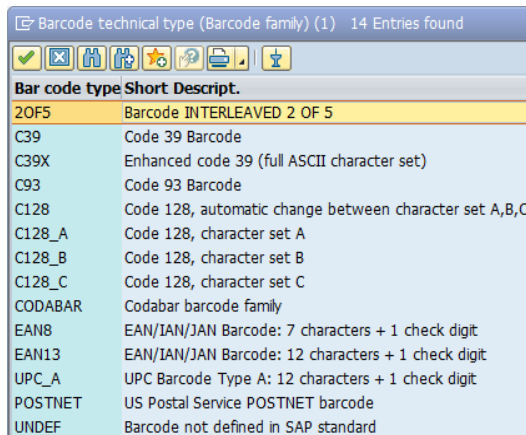
Figure 31 : Saving the Bar code definition

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4.1.3 Old Barcode Technology
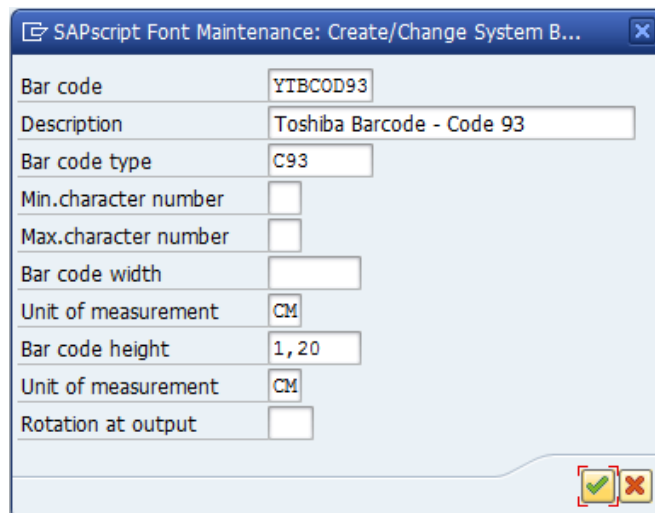
Click the 'Old' button (as in Figure 26, while choosing Bar Code Technology) to define a Barcode with Old Barcode Technology.

Old Barcode Technology supports the following types of Barcode's.

Bar code type	Short Descript.
2OF5	Barcode INTERLEAVED 2 OF 5
C39	Code 39 Barcode
C39X	Enhanced code 39 (full ASCII character set)
C93	Code 93 Barcode
C128	Code 128, automatic change between character set A,B,C
C128_A	Code 128, character set A
C128_B	Code 128, character set B
C128_C	Code 128, character set C
CODABAR	Codabar barcode family
EAN8	EAN/IAN/JAN Barcode: 7 characters + 1 check digit
EAN13	EAN/IAN/JAN Barcode: 12 characters + 1 check digit
UPC_A	UPC Barcode Type A: 12 characters + 1 check digit
POSTNET	US Postal Service POSTNET barcode
UNDEF	Barcode not defined in SAP standard

Figure 32 : Standard Barcodes

SAPscript Font Maintenance: Create/Change System B...	
Bar code	YTBCOD93
Description	Toshiba Barcode - Code 93
Bar code type	C93
Min.character number	
Max.character number	
Bar code width	
Unit of measurement	CM
Bar code height	1,20
Unit of measurement	CM
Rotation at output	

Figure 33 : Defining Barcode with Old Barcode Technology

Maintain the Barcode height and other details and click Confirm button. Other parameters like Barcode module width and check digit   can be passed through Print control.

Print controls are also defined to pass additional information to the Barcode Definition. User have to select the print control which carries the required information and link the barcode definition to the print control as Printer Bar codes.

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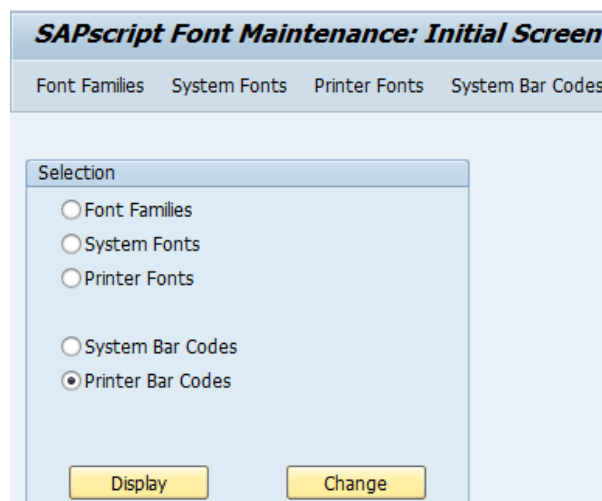
Barcode Type	SAP Print Control	TPCL Command
CODE 93	SB001-SB012	ESC XB :<Check digit, Module Width>
JAN/EAN8	SB041-SB052	ESC XB :<Check digit, Module Width>
JAN/EAN13	SB071-SB082	ESC XB :<Check digit, Module Width>
Postnet	SB111-SB122	ESC XB :<Check digit, Module Width>
UUC/EAN128 (GS1-128 Barcode)	SB141-SB152	ESC XB :<Check digit, Module Width>
UPC-A	SB171-SB182	ESC XB :<Check digit, Module Width>
UPC-E	SB211-SB222	ESC XB :<Check digit, Module Width>
CODE128 (with auto code selection)	SB241-SB252	ESC XB :<Check digit, Module Width>
CODE128 A	SB271-SB282	ESC XB :<Check digit, Module Width>
CODE128 B	SB311-SB322	ESC XB :<Check digit, Module Width>
CODE128 C	SB341-SB352	ESC XB :<Check digit, Module Width>
Customer barcode	SB371-SB382	ESC XB :<Check digit, Module Width>
RM4SCC	SB411-SB422	ESC XB :<Check digit, Module Width>
KIX CODE	SB441-SB452	ESC XB :<Check digit, Module Width>
NW-7 (Codabar, Ratio 1:3)	SB471-SB482	ESC XB :<Check digit, Narrow bar width, Narrow space width, Wide bar width, Wide space width, Character to Character >
NW-7 (Codabar, Ratio 1:2)	SB511-SB522	ESC XB :<Check digit, Narrow bar width, Narrow space width, Wide bar width, Wide space width, Character to Character >
NW-7 (Codabar, Ratio 2:5)	SB541-SB552	ESC XB :<Check digit, Narrow bar width, Narrow space width, Wide bar width, Wide space width, Character to Character >
Interleaved 2 of 5 (Ratio 1:3)	SB571-SB582	ESC XB :<Check digit, Narrow bar width, Narrow space width, Wide bar width, Wide space width, Character to Character >

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Barcode Type	SAP Print Control	TPCL Command
Interleaved 2 of 5 (Ratio 1:2)	SB611-SB622	ESC XB :<Check digit, Narrow bar width, Narrow space width, Wide bar width, Wide space width, Character to Character >
Interleaved 2 of 5 (Ratio 2:5)	SB641-SB652	ESC XB :<Check digit, Narrow bar width, Narrow space width, Wide bar width, Wide space width, Character to Character >
Code 39 (Ratio 1:3)	SB671-SB682	ESC XB :<Check digit, Narrow bar width, Narrow space width, Wide bar width, Wide space width, Character to Character >
Code 39 (Ratio 1:2)	SB711-SB722	ESC XB :<Check digit, Narrow bar width, Narrow space width, Wide bar width, Wide space width, Character to Character >
Code 39 (Ratio 2:5)	SB741-SB752	ESC XB :<Check digit, Narrow bar width, Narrow space width, Wide bar width, Wide space width, Character to Character >
MSI	SB771-SB782	ESC XB :<Check digit, Narrow bar width, Narrow space width, Wide bar width, Wide space width, Character to Character >
Industrial 2 of 5	SB811-SB822	ESC XB :<Check digit, Narrow bar width, Narrow space width, Wide bar width, Wide space width, Character to Character >
MATRIX 2 of 5 for NEC	SB841-SB852	ESC XB :<Check digit, Narrow bar width, Narrow space width, Wide bar width, Wide space width, Character to Character >

Table 1: Print controls for Old Barcode Technology

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4.1.4   Defining Printer Barcodes
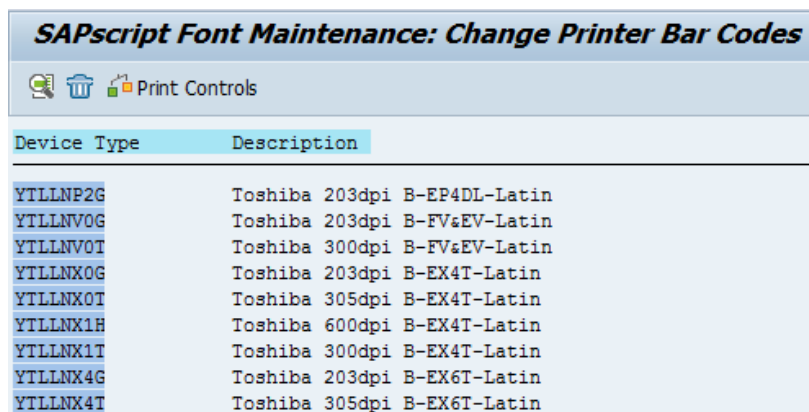
Once the System Barcode (Old Technology) has been defined, then proceed to define the printer barcode.

Figure 34 : Defining Printer Bar Codes

Choose the 'Printer Barcode's and then click the 'Change' button to create a Printer Barcode definition.

Figure 35 : Device List for Printer Barcodes

Select the desired Toshiba Device type which starts with prefix 'YTL'and double click on it.

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Figure 36 : Printer Barcode List in the device type

Figure 37 : Selecting System Bar code from entry list

Select the System Barcode, which has been defined previously from the entry list. Then key in the required Print Control. Note: Key in the same print control for both 'Bar code prefix' and 'Bar code suffix'.

In need of printing standard barcodes defined in Old barcode technology, define the required standard barcodes in Transaction SE73 Printer Bar Codes.

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4.1.5 Customized Barcode with UNDEF Barcodes

If the printer-resident is not supported in SAP, customized print control can be added into the device type and "UNDEF" barcode type can be used to map to the print control. UNDEF is only in Old Barcode Technology. To start with UNDEF, go to SE73->System Bar codes to define a Barcode using the Conventional System Barcode (choose 'Old')

Example : Barcode with UNDEF

   a.   Create System Barcode Definition
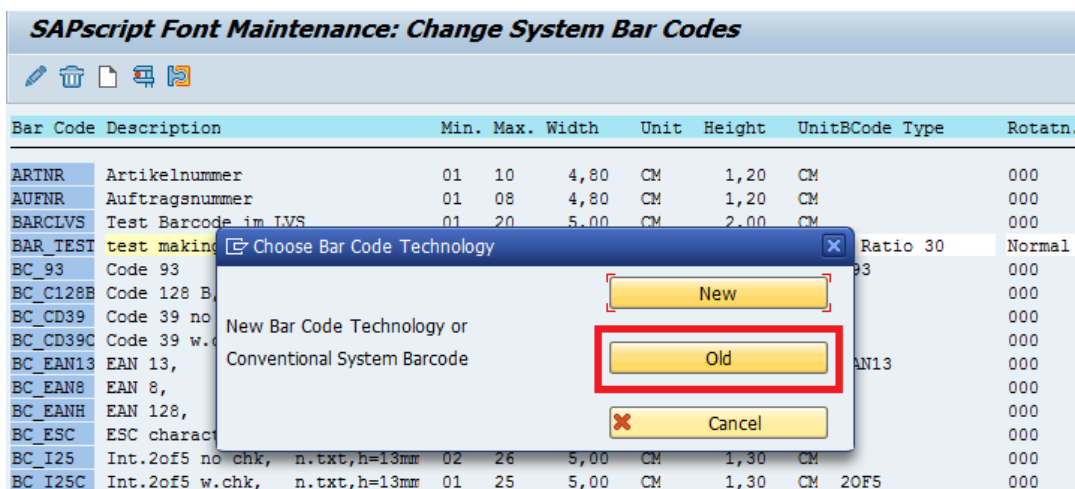
Figure 38 : UNDEF barcode definition
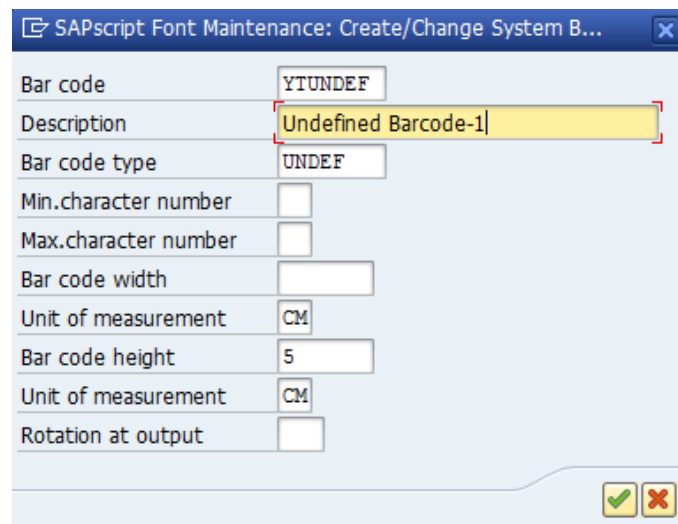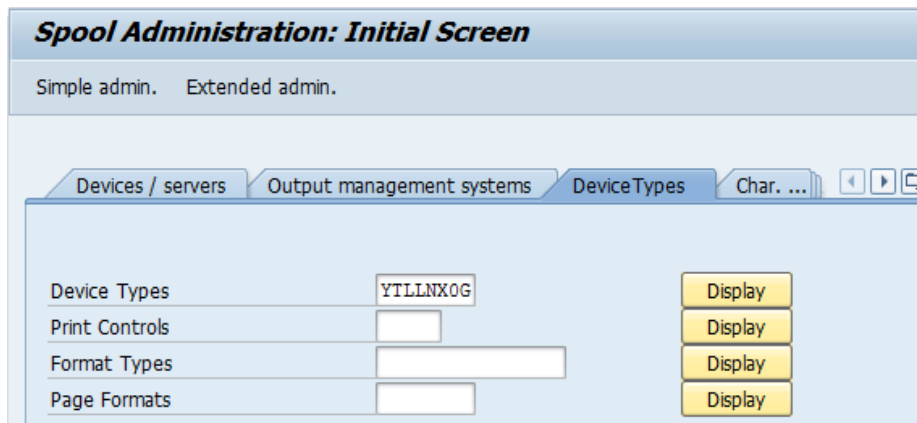
Figure 39 : Customized Barcode Definition

Maintain the Barcode height and other details and click Confirm button. Other parameters like Barcode module width and check digit   can be passed through Print control.

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b. Create Print Control in device type
Go to transaction SPAD->Full Administration->Device Types to open the Print Controls tab of the device type and click Display.
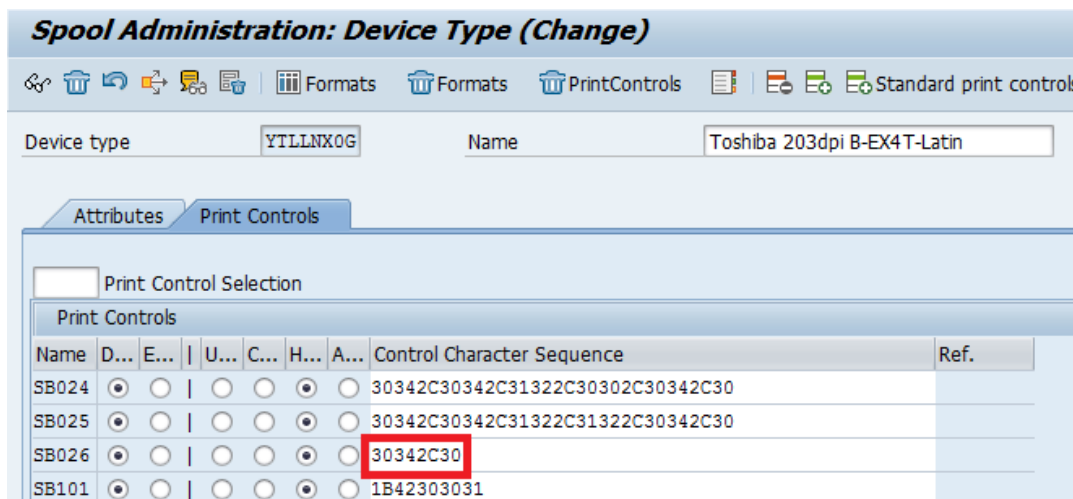
Figure 40 : Device type Selection

Add a new barcode print control (Prefix SB) and input the hex value of Control Character Sequence. In this example, the hex value of "30342C30" is entered for Print Control SB026.

Figure 41: Defining Print Control in Device type

This print control defines part of Toshiba Barcode command for Undefined Bar code with hex value '30342C30' stands for '04, 0' in ASCII text where '04' value is the module width in dots and '0' value is the Rotational angle of Bar code.
The Barcode Height will be extracted from the Barcode Definition. The Barcode Data will be supplied from Smart Forms.

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c.   Mapping of Barcode Definition to Print Control
     Go to SE73->Printer Bar Codes
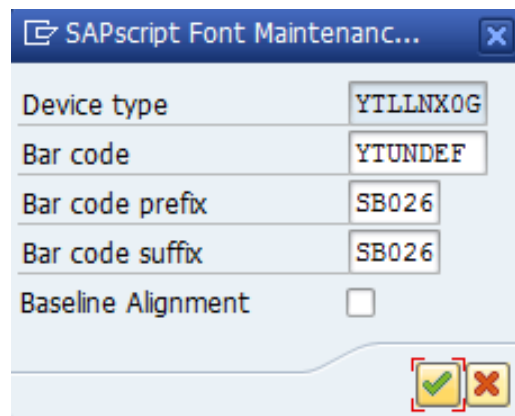
Figure 42: Selecting Printer Bar codes

Figure 43: Mapping of Print Control

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Figure 44 : Select the Barcode Definition created previously, and map it to the print controls.

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4.2 Fonts

Toshiba Barcode PDL driver supports the following fonts.

CHARACTER SET & FONTS	TPCL FONT	TPCL COMMANDS	PRINT CONTROLS (based on TPCL)	VALUE
Latin 1 (ISO8859-1) device types				
Helvetica	Helvetica (Medium)	[ESC]PCaaa;bbbb,cccc,d,e,G,ii,j [ESC]PCaaa;bbbb,cccc,d,e,H,ii,j [ESC]PCaaa;bbbb,cccc,d,e,I,ii,j	NA	Refer Table 3
Times	Times Roman (Medium)	[ESC]PCaaa;bbbb,cccc,d,e,A,ii,j [ESC]PCaaa;bbbb,cccc,d,e,B,ii,j	NA	Refer Table 3
CodePage 850 device types				
Helvetica	Helvetica (Medium)	[ESC]PCaaa;bbbb,cccc,d,e,G,ii,j [ESC]PCaaa;bbbb,cccc,d,e,H,ii,j [ESC]PCaaa;bbbb,cccc,d,e,I,ii,j	NA	Refer Table 3
Times	Times Roman (Medium)	[ESC]PCaaa;bbbb,cccc,d,e,A,ii,j [ESC]PCaaa;bbbb,cccc,d,e,B,ii,j	NA	Refer Table 3
COURIER BOLD	Courier (Bold)	[ESC]PCaaa;bbbb,cccc,d,e,R,ii,j	SF001	1,1,R
Simplified Chinese (GB2312) device types				
CNSONG	Outline Font Format Command	[ESC]PCaaa;bbbb,cccc,d,e,r,ii,j	SF001	1,1,r

Table 2-a : Font Table

TOSHIBA TEC CORPORATION

CHARACTER SET & FONTS	TPCL FONT	TPCL COMMANDS	PRINT CONTROLS (based on TPCL)	VALUE
Japanese (Shift-JIS)				
DBGothic, DBMincho, JPMincho	Kanji (16 x 16 dots) (Square Gothic):	[ESC]PCaaa;bbbb,cccc,d,e,U(a),ii,j	SF002	1,1,U
	Kanji (24 x 24 dots) (Square Gothic)	[ESC]PCaaa;bbbb,cccc,d,e,V(a),ii,j	SF003	1,1,V
	Kanji (32 x 32 dots) (Square Gothic)	[ESC]PCaaa;bbbb,cccc,d,e,W(a),ii,j	SF004	1,1,W
	Kanji (48 x 48 dots) (Square Gothic)	[ESC]PCaaa;bbbb,cccc,d,e,X(a),ii,j	SF005	1,1,X
Helvetica	Helvetica (Medium)	[ESC]PCaaa;bbbb,cccc,d,e,G,ii,j [ESC]PCaaa;bbbb,cccc,d,e,H,ii,j [ESC]PCaaa;bbbb,cccc,d,e,I,ii,j	NA	Refer Table 3
Times	Times Roman (Medium)	[ESC]PCaaa;bbbb,cccc,d,e,A,ii,j [ESC]PCaaa;bbbb,cccc,d,e,B,ii,j	NA	Refer Table 3
COURIER BOLD	Courier (Bold)	[ESC]PCaaa;bbbb,cccc,d,e,R,ii,j	SF001	1,1,R

Table 2-b : Font Table

TOSHIBA TEC CORPORATION

SAP FONTS	TPCL Font	DPI	Smart style point size	Font and Magnification value	TPCL Command
Helvetica	Helvetica (Medium)	203	0-5 points	Helvetica (Medium)/ 9 point (0.5 times)	ESC PC : 05,05,G
			6-9 points	Helvetica (Medium)/ 9 point(1 time)	ESC PC : 1,1,G
			10-14 points	Helvetica (Medium)/ 15 point((0.5 times)	ESC PC : 05,05,H
			15 points	Helvetica (Medium)/ 15 point (1 time)	ESC PC : 1,1,H
			16-17 points	Helvetica (Medium)/ 18 point(0.5 times)	ESC PC : 05,05,I
			>=18 points	Helvetica (Medium)/ 18 point(1 time)	ESC PC : 1,1,I
		300/305	0-3 points	Helvetica (Medium)/ 6 point (0.5 times)	ESC PC : 05,05,G
			4-6 points	Helvetica (Medium)/ 6 point(1 time)	ESC PC : 1,1,G
			7-9 points	Helvetica (Medium)/ 10 point((0.5 times)	ESC PC : 05,05,H
			10 points	Helvetica (Medium)/ 10 point (1 time)	ESC PC : 1,1,H
			11 points	Helvetica (Medium)/ 12 point((0.5 times)	ESC PC : 05,05,I
			>=12 points	Helvetica (Medium)/ 12 point(1 time)	ESC PC : 1,1,I
		600	0-1 points	Helvetica (Medium)/ 3 Point(0.5 times)	ESC PC : 05,05,G
			2-3 points	Helvetica (Medium)/ 3 Point(1 times)	ESC PC : 1,1,G
			4-5 points	Helvetica (Medium)/ 5 Point(1 times)	ESC PC : 1,1,H
			>= 6 points	Helvetica (Medium)/ 6 Point(1 times)	ESC PC : 1,1,I

Table 3-a : Helve and Times Font Information

TOSHIBA TEC CORPORATION

SAP FONTS	TPCL Font	DPI	Smart style point size	Font and Magnification value	TPCL Command
Times	Times Roman (Medium)	203	0-6 points	Times Roman (Medium) /12 points(0.5 times)	05,05,A
			7-12 points	Times Roman (Medium)/ 12 points (1 times)	ESC PC : 1,1,A
			13-14 points	Times Roman (Medium)/ 15 points (0.5 times)	ESC PC : 05,05,B
			>=15 points	Times Roman (Medium) /15 points(1 times)	ESC PC : 1,1,B
		300/305	0-4 points	Times Roman (Medium) /8 points(0.5 times)	ESC PC : 05,05,A
			5-8 points	Times Roman (Medium) /8 points(1 times)	ESC PC : 1,1,A
			9 points	Times Roman (Medium)/ 10 points (0.5 times)	ESC PC : 05,05,B
			>=10 points	Times Roman (Medium) /10 points(1 times)	ESC PC : 1,1,B
		600	0-2 points	Times Roman (Medium)/ 4 points (0.5 times)	ESC PC : 05,05,A
			3-4 points	Times Roman (Medium) /5 points(1 times)	ESC PC : 1,1,A
			>=5 points	Times Roman (Medium)/ 5 points (1 times)	ESC PC : 1,1,B

Table 3-b : Helve and Times Font Information

TOSHIBA TEC CORPORATION

SAP Fonts	Size (dots)	TPCL Font Size for 203 DPI(Points)	TPCL Font Size for 300 DPI(Points)	TPCL Font Size for 600 DPI(Points)
DBGothic, DBMincho, JPMincho	For Kanji (16 x 16 dots)	6	4	2
	For Kanji (24 x 24 dots)	9	6	3
	For Kanji (32 x 32 dots)	11	8	4
	For Kanji (48 x 48 dots)	17	12	6
CNSONGP	For Chinese (24 x 24 dots)	9	6	3

Table 4 : Japanese, Chinese Font Information

To support Japanese or Chinese character set, Fonts should be installed in printer. Also there is a variation in the font size for Japanese Characters shown on the Smart Forms print preview.

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4.3   Printer Parameter in Smart forms

User can pass the printer parameter settings defined in a Smart Form to the device driver by using the Command nodes.

Open the Smart form using transaction code 'SMARTFORMS'. Right click on the Window node->Create->Flow Logic->Command to display Command node feature.
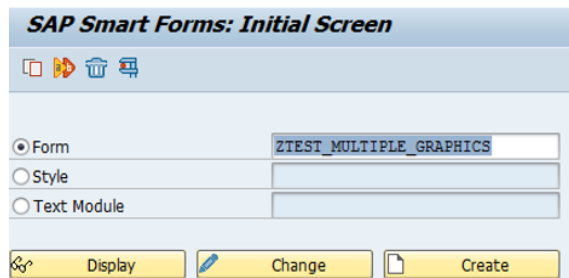
Figure 45 : Enter the Smartform name in Form field and press Change button.
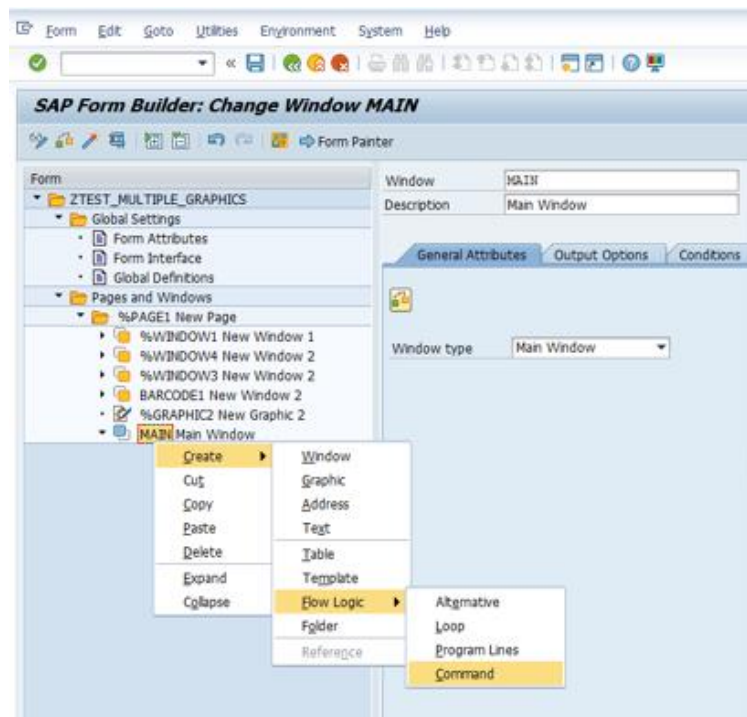
Figure 46 : Creating Command Node in Smart form by right clicking the Main Window.

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Figure 47 : Sample Command Parameters

Under the 'Output Options', user to define the parameters for printer settings in the Name-Value pairs format. The value provided must be enclosed within the single quote character ('1').

The following are the available printer parameters supported by Toshiba PDL driver:

Parameter Name	Function	TPCL Command
BAR_TEXT	Print numerals under barcode	Command : ESC XB Value : **p**
CUT_INTERVAL	Designates the number of labels to be printed before cut.	Command : ESC XS Value : **bbb**
CUT_OPERATION	Ejects (or cuts) the label presently left between the print head and the cutter, and returns the next label to the original position.	Command : ESC IB
ISSUE_MODE	Issue mode	Command : ESC XS Value : **d**
ISSUE_SPEED	Issue speed	Command : ESC XS Value : **e**
LABEL_POSITION	Position fine adjust command	Command : ESC AX Value : **abbb,cddd,eff**

Table 5-a : Parameter Table

TOSHIBA TEC CORPORATION

Parameter Name	Function	TPCL Command
LABEL_SIZE	Label size set command	Command : ESC D Value : **bbbb,cccc**
PRINT_DENSITY	Print density fine adjust command	Command : ESC AY Value : **abb,c**
PRINT_DIRECTION	Printing direction	Command : ESC XS Value : **g**
PRINT_END_POS	Maximum pitch length calculation	Command : ESC D Value : Effective Length + PRINT_END_POS (input)
PRINT_QUANTITY	Number of labels to be issued	Command : ESC XS Value : **aaaa**
RIBBON_PARA	Whether to use ribbon	Command : ESC XS Value : **f**
ROTATE_180_x	180 degree rotation for text	Command : ESC PC Value (PC) : **ii**
ROTATE_270_x	270 degree rotation for text	Command : ESC PC Value (PC) : **ii**
ROTATE_90_x	90 degree Rotation for text	Command : ESC PC Value (PC) : **ii**
SENSOR_TYPE	Type of sensor	Command : ESC XS Value : **c**
START_POINT	X and Y Position to draw a barcode , text or graphics	Command :ESC PC, ESC SG and ESC XB Value (PC) : **bbbb,cccc** Value (XB) : **bbbb,cccc** Value (SG) : **aaaa,bbbb**

Table 5-b : Parameter Table

TOSHIBA TEC CORPORATION

4.3.1 Printer Parameter Descriptions

Parameter 1:	**BAR_TEXT**
Description:	BAR TEXT parameter decides Whether or not to print numerals under barcodes.
TPCL command:	**ESC XB: p**
	0: Not printed
	1: Printed
Default value:	0
Input Example:	BAR_TEXT = '1'
Note:	Bar text cannot be set for the postal codes (Customer bar code, POSTNET, RM4SCC, and KIX CODE).

Parameter 2:	**CUT_INTERVAL**
Description:	Designates the number of labels to be printed before cut.
TPCL command:	**ESC XS: bbb**
	000 to 100 (no cut when 000)
Default value:	000
Input Example:	CUT_INTERVAL = '001'
Note:	Only possible when the Cutter Unit is installed. Input value should follow the conditions given in TPCL manual.

Parameter 3:	**CUT_OPERATION**
Description:	Ejects (or cuts) the label presently left between the print head and the cutter, and returns the next label to the original position.
TPCL command:	**ESC IB**
	There is no parameter value for ESC IB command
Default value:	None
Input Example:	CUT_OPERATION = '1'
Note	Cut operation (ESC IB) will be executed only if the input value is '1'.

Parameter 4:	**ISSUE_MODE**
Description:	Issue mode
TPCL command:	**ESC XS: d**
	C: Batch mode
	D: Strip mode (with back feed and the strip sensor enabled.)
	E: Strip mode (with back feed enabled, the strip sensor ignored,
	the applicator supported)
Default value:	C
Input Example:	ISSUE_MODE = 'C'
Note:	Based on the printer model and accessories. Input value should follow the conditions given in TPCL manual.

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Parameter 5:	**ISSUE_SPEED**
Description:	Issue speed
TPCL command:	**ESC XS: e**
	Based on the printer model parameter value will vary
Default value:	1
Input Example:	ISSUE_SPEED = '6'
Note:	Default value for issue speed for Mobile model and desktop model is '1'. Input value should follow the conditions given in TPCL manual.

Parameter 6:	**LABEL_POSITION**
Description:	Position fine adjust command
TPCL command:	**ESC AX: abbb,cddd,eff**
	a: Whether the print start position is shifted forward or backward
	+: Forward
	–: Backword
	bbb: Feed amount fine adjustment value
	000 to 500 (in 0.1 mm units)
	c: Whether the cut position/strip position is shifted forward or backward
	+: Forward
	–: Backward
	ddd: Fine adjustment value for the cut position/strip position
	000 to 500 (in 0.1 mm units)
	e: Whether the back feed amount is increased or decreased.
	+: Increase
	–: Decrease
	ff: Back feed amount fine adjustment value
	00 to 99 (in 0.1 mm units)
Default value:	None
Input Example:	LABEL_POSITION = '+001,+001,+01'
Note:	There is no default value for this parameter, this parameter will be added to the print job only if the free Param is entered by the end user. Input value should follow the conditions given in TPCL manual.

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Parameter 7:	**LABEL_SIZE**
Description:	Label size set command
TPCL command:	**ESC D: bbbb,ccccc**
	bbbb: Effective print width
	Fixed to 4 digits (in 0.1 mm units)
	cccc: Effective print length
	4 or 5 digits (in 0.1 mm units)
Default value:	None
Input Example:	LABEL_SIZE ='152004980'
	Where '1520' is Effective print width and '04980' is Effective print length
Limitations:	There is no default value for this parameter. Input values should follow the conditions given in TPCL manual. Based on the input from the user pitch length will be calculated and for this calculation there is a dependency with printer model.

Parameter 8:	**PRINT_DENSITY**
Description:	Print density fine adjust command
TPCL command:	**ESC AY: abb,c**
	a: Whether to increase or decrease the print density
	+: Increase (darker)
	–: Decrease (lighter)
	bb: Print density fine adjustment value
	When parameter a is set to "+": 00 to 10 (in units of 1 step)
	When parameter a is set to "–": 00 to 20 (in units of 1 step)
	c: Print method
	0: Thermal transfer
	1: Direct thermal
Default value:	None
Input Example:	PRINT_DENSITY = '+03,1'
Note:	There is no default value for this parameter, this parameter will be added to the print job only if the free Param is entered by the end user. Input value should follow the conditions given in TPCL manual.

Parameter 9:	**PRINT_DIRECTION**
Description:	Printing direction
TPCL command:	**ESC XS: g**
	0: Printing bottom first
	1: Printing top first
	2: Bottom first mirror printing
	3: Top first mirror printing
Default value:	1
Input Example:	PRINT_DIRECTION = '2'
Note:	Input value should follow the conditions given in TPCL manual.

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Parameter 10:   **PRINT_END_POS**

Description: Maximum pitch length calculation

TPCL command: **ESC D**

Default value: None

Input Example: PRINT_END_POS= '55'

Note: Based on the input value from user, we will calculate maximum pitch length.ie, Value: Effective Print Length + PRINT_END_POS (input in mm units).

In case PRINT_END_POS free PARAM is not defined, PITCH length needs to be calculated based on the device specifications. This command will be effective only when SENSOR_TYPE is "NO sensor".

Parameter 11:   **PRINT_QUANTITY**

Description: Number of labels to be issued

TPCL command: **ESC XS: aaaa**

          0001 to 9999

Default value: 0000

Input Example: PRINT_QUANTITY= '%PAGE1:3,%PAGE2:3'

Note: If this print command is not specified, the page is printed once.

Example of the value: '%PAGE1:3,%PAGE2:2' means : Subsequent page number can be added with a comma separator. '%PAGE1' is printed 3 times and page '%PAGE2' is printed 2 times.

Parameter 12:   **RIBBON_PARA**

Description: Whether to use ribbon

TPCL command: **ESC XS: f**

          0: Without ribbon

          1: With ribbon (ribbon saving function enabled)

          2: With ribbon (ribbon saving function disabled)

          3: Without ribbon (head up function enabled)

Default value: Desktop Model: '1' and Mobile Model: '0'

Input Example: RIBBON_PARA= '3'

Note: Input value should follow the conditions given in TPCL manual.

Parameter 13:   **ROTATE_180_x**

Description: 180 degree rotation for text

TPCL command: **ESC PC: Value (PC) - ii**

          Based on TPCL manual.

Default value: 0

Input Example: **Text: ROTATE_180_1 =** 'MAIN,1' ,   where '1' indicates rotation for text and 'MAIN' is the name of window to be rotated.

Limitations: Input value should follow the conditions given in TPCL manual. 'X' is any number to make sure the command name is not repeated in the Smart forms. For rotation while designing the smart form we required to keep one component (Text) in one window.

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Parameter 14:	**ROTATE_270_x**
Description:	270 degree rotation for text
TPCL command:	**ESC PC: Value (PC) - ii**
	Based on TPCL manual.
Default value:	0
Input Example:	**Text: ROTATE_270_1 =** 'MAIN,1' , where '1' indicates rotation for text and 'MAIN' is the name of window to be rotated.
Limitations:	Input value should follow the conditions given in TPCL manual. 'X' is any number to make sure the command name is not repeated in the Smart forms. For rotation while designing the smart form we required to keep one component (Text) in one window.

Parameter 15:	**ROTATE_90_x**
Description:	90 degree rotation for text
TPCL command:	**ESC PC: Value (PC) - ii**
	Based on TPCL manual.
Default value:	0
Input Example:	**Text: ROTATE_90_1 =** 'MAIN,1' , where '1' indicates rotation for text and 'MAIN' is the name of window to be rotated.
Limitations:	Input value should follow the conditions given in TPCL manual. 'X' is any number to make sure the command name is not repeated in the Smart forms. For rotation while designing the smart form we required to keep one component (Text) in one window.

Parameter 16:	**SENSOR_TYPE**
Description:	Type of sensor
TPCL command:	**ESC XS: C**
	0: No sensor
	1: Reflective sensor
	2: Transmissive sensor (when using normal labels)
	3: Transmissive sensor (when using preprinted labels)
	4: Reflective sensor (when using a manual threshold value)
Default value:	2
Input Example:	SENSOR_TYPE= '3'
Note:	Based on the printer model and accessories. Input value should follow the conditions given in TPCL manual.

Parameter 17:	START_POINT
Description:	X and Y Position to draw a barcode, text or graphics
TPCL command:	**ESC PC, ESC SG and ESC XB**
	Value (PC): bbbb,cccc , Value (XB) : bbbb,cccc and Value (SG) : aaaa,bbbb
	Based on TPCL manual.
Default value:	None
Input Example:	START_POINT = '000100001'
Note:	Based on the free PARAM input value there may be a chance for the design change in physical output with Smart forms.

The above spool attributes are passed from Smart form to the device driver by the FREE_PARAMS attribute (which is an internal table) of the interface IF_PDL_ADRV implemented in the PDL device driver while printing. Based on the spool attributes logic will be developed in the device driver using TPCL commands.

If the spool attributes are not maintained in the Smart form, then the default values will be passed to the TPCL command while printing.

It is important to refer to the printer settings of the printer models to understand the correct range of value that can be used for the Parameter values. Note that the Smart Form Parameter Names are case-sensitive. Parameters for printer settings should be used carefully. Invalid input may result in unexpected outcome of the printout.

*: Cut is only possible when the Cutter Unit is installed.

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5. Limitations

- When printing a Smart Form, user is adviced to examine the actual printout of the form from the printer, rather than just relying on the print preview image.

- 2D barcodes and Code128 Manual are not supported.

- Outline fonts are not supported.

- Only Monochrome bitmaps are supported and images cannot be rotated while printing.

- Image compression is not supported.

- Following cases may occur while printing Smart Forms:

  a) The printer Fonts sizes may not match with the font sizes in Smart form.

  b) Printing different Smart styles font information in same text line will result in printing the complete line in first Smart style font.

  c) If an object is placed outside the print area or the print start position of an object is placed within the print area but the end position is outside the print area, the part beyond the print area will be printed starting on the left end of the new line.