CPDImageFilter.framework
Ver.7.00

Ver.2.00 or later :Universal Binary

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1.Outline of CPDImageFilter.framework

This framework changes a image data with Unsharpmask enhancement and contrast control.

2.Modular construction

Framework files ------ CPDImageFilter.framework
Header file --- CPDImageFilter.h

(1) CPDImageFilter.framework : Framework files
(2) CPDImageFilter.h : Header file
<CP-D70DW>
CP70_01.csv /CP70_02.csv/CP70_COL.lut
<CP-K60DW>
- CP60_01.csv : Operation file *1
- CP60_03.csv
- CP60_COL.lut : Color table file *1
<CP-D80DW>
CP80D_01.csv(for Fine), CP80D_02.csv(for SuperFine), CP80D_03.csv(for UltraFine),
CP80D_04.csv (for rewinding of SuperFine) : Operation file for CP80D series printers*1
CP80D_COL.lut : Color table file for CP80D series printers *1
<CP-D90DW>
CP90_3_1.csv, CP90_3_2.csv *1
CP90D_COL.lut *1
CP90PAN01.dat, CP90PAN02.dat *1
(3) app :executable module for sample application

*1 :Place these files in the same directory of Framework files.

- K60MAT02.raw :matte data for CPK60D series printers *2
- D80MAT02.raw : matte data for CPD80D series printers *2

*2 : Please cut out according to print size.

3.Corresponding OS

MacOSX (**10.3.9,10.4.11,10.5.8,10.6.8,10.7,10.8,10.9,10.10,10.11,10.12,10.13)**

4.Functions and Structures

4.1.Functions

(1)CP95ChangeImage function

Function	short CP95ChangeImage(CPDBandImageParams* pBandImage, const CPDContrastTable* pContTbl, double unsRad, double unsAmo, short unsThres);	
Feature	CP95ChangeImage function changes a image data with Unsharpmask enhancement and contrast control.	
Argument	Parameter	notes
	pBandImage	A pointer which indicates CPDBandImageParams structure which sets transmitting image data information.
	pContTbl	A pointer which indicates CPDContrastTable structure which sets contrast table. In the case NULL is specified, the contrast correction function is not used.
	unsRad	Set radius of Unsharpmask. *1 Radius: 0.1-120.0
	unsAmo	Set amount of Unsharpmask. *1 Amount: 0.00-5.00
	unsThres	Set threshold of Unsharpmask. * Threshold: 0-255
Return numeric	Refer to "5.Error items."	

*1 :Refer to 7.1.Reference example of Unsharpmask

(2)CPColorChange function

Function	**short CPColorChange (short PrtType, CPDBandImageParams* pBandImage);**	
Feature	**CPColorChange function changes color of a image data.**	
Argument	**Parameter**	**notes**
	PrtType	**Set a printer type. 0 :CP3020D 1 :CP9550DW 2 :CP3020DA**
	pBandImage	**A pointer which indicates CPDBandImageParams structure which sets transmitting image data information.**
Return numeric	**Refer to "5.Error items."**	

(3)CP98ChangeImage function

Function	**short CP98ChangeImage(const CPDBandImageParams* pinBandImage, const CPAImageEffectParams* piep, Point printPixel, void* poutBits);**	
Feature	**CP98ChangeImage function converts 8bit image data to 16bit data for CP9800DW.**	
Argument	**Parameter**	**notes**
	pinBandImage	**A pointer which indicates CPDBandImageParams structure which sets transmitting image data information.**
	piep	**A pointer which indicates CPAImageEffectParams structure which sets various parameters. In the case NULL is specified, Error_FuncParamError is occurred.**
	printPixel	**Transferred pixels.**
	poutBits	**A pointer which indicates 16bit output data. The order of Y->M->C. Refer to "7.2. poutBits"**
Return numeric	**Refer to "5.Error items."**	

*** CP98ChangeImage function corresponds to the SuperFine Mode.**
The Mode changes by the version of CPAImageEffectParams structure.

(4)CP70ChangeImage function

Function	**Short CP70ChangeImage(const CPDBandImageParams* pinBandImage, const CPAImageEffectParams* piep, Point printPixel, void* poutBits, unsigned char *poutSpeed);**	
Feature	**CP70ChangeImage function converts 8bit image data to 16bit data for CP-D70DW series.**	
Argument	**Parameter**	**Notes**
	pinBandImage	**A pointer which indicates CPDBandImageParams structure which sets transmitting image data information.**
	Piep	**A pointer which indicates CPAImageEffectParams structure which sets various parameters. In the case NULL is specified,Error_FuncParamError is occurred.**
	printPixel	**Transferred pixels.**
	poutBits	**A pointer which indicates 16bit output data. The order of Y->M->C. Refer to "7.2.poutBits"**
	poutSpeed	**A pointer which indicates the output value which sets print speed. 0 : Standard 1 : Reserved (Do not use) Default:0**
Return numeric	**Refer to "5.Error items."**	

(5)CP60ChangeImage function

Function	**Short CP60ChangeImage(const CPDBandImageParams* pinBandImage, const CPAImageEffectParams* piep, Point printPixel, void* poutBits, unsigned char *poutSpeed, unsigned char *prewind);**	
Feature	**CP60ChangeImage function converts 8bit image data to 16bit data for CP-K60DW series.**	
Argument	**Parameter**	**Notes**
	pinBandImage	**A pointer which indicates CPDBandImageParams structure which sets transmitting image data information.**
	piep	**A pointer which indicates CPAImageEffectParams structure which sets various parameters. In the case NULL is specified,Error_FuncParamError is occurred.**
	printPixel	**Transferred pixels.**
	poutBits	**A pointer which indicates 16bit output data.The order of Y->M->C. Refer to “7.2.poutBits”**
	poutSpeed	**A pointer which indicates the output value which sets print speed. 0 : Standard 1 : Reserved (Do not use) Default:0**
	Prewind	**A pointer which indicates the output value which sets ink rewind. 0 :ink rewind for 10x15 print 1:not rewind**
Return numeric	**Refer to "5.Error items."**	

(6)CP80ChangeImage function

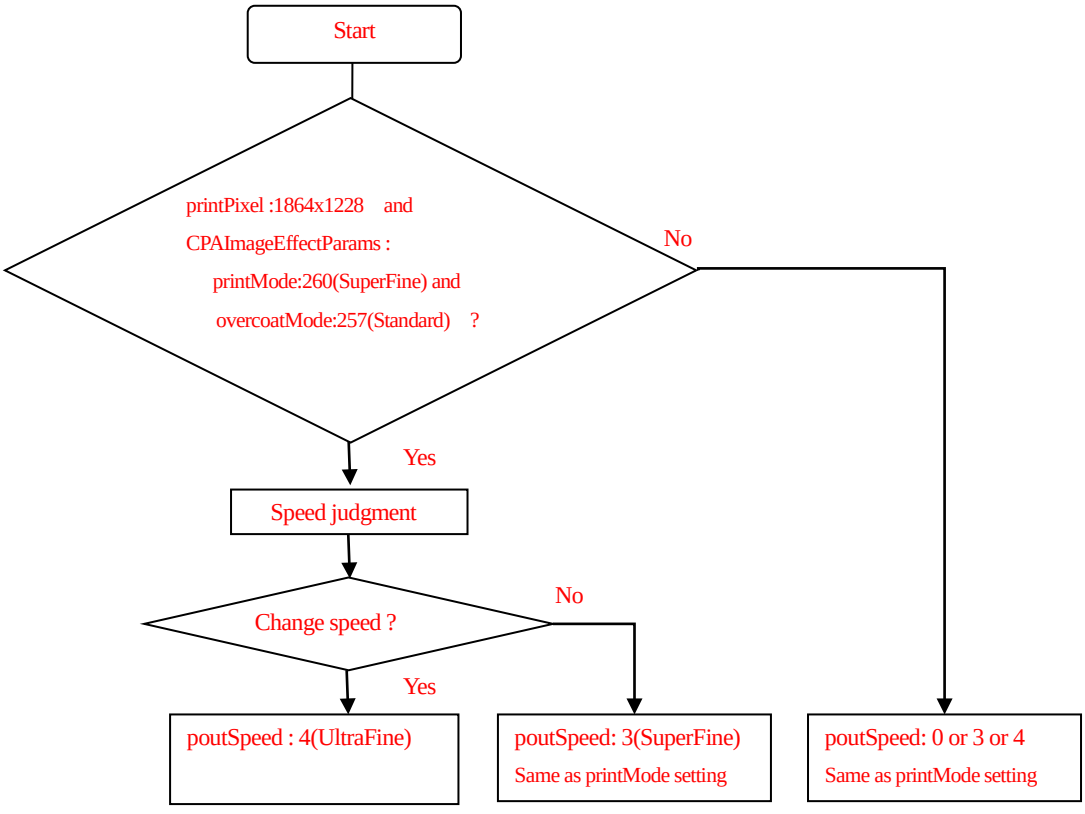
Function	**Short CP80ChangeImage(const CPDBandImageParams* pinBandImage, const CPAImageEffectParams* piep, Point printPixel, void* poutBits, unsigned char *poutSpeed);**	
Feature	**CP80ChangeImage function converts 8bit image data to 16bit data for CP-D80DW series.**	
Argument	**Parameter**	**Notes**
	pinBandImage	**A pointer which indicates CPDBandImageParams structure which sets transmitting image data information.**
	piep	**A pointer which indicates CPAImageEffectParams structure which sets various parameters. In the case NULL is specified,Error_FuncParamError is occurred.**
	printPixel	**Transferred pixels.**
	poutBits	**A pointer which indicates 16bit output data.The order of Y->M->C. Refer to "7.2.poutBits"**
	poutSpeed *1	**A pointer which indicates the output value which sets print speed. 0:Fine 3:Superfine 4:UltraFine Default:0**
Return numeric	**Refer to "5.Error items."**	

***1 In KG size printing, if SuperFine is specified by the printMode parameter of the CPAImageEffectParams structure, the speed judgment processing will operate. This may cause the actual printing speed to be changed to UltraFine depending on the image. Please check the poutSpeed output of the CP80ChangeImage function and set this value to the speed parameter in the protocol.**

This process works when the overcoatMode parameter of the CPAImageEffectParams structure is standard.

Please set the overcoatMode and set the same value to the OP mode parameter in the protocol.

The following figure shows the execution condition and results of speed judgment processing.



(7)CP90PanoramaChangeImage function

Function	**Short CP90PanoramaChangeImage(const CPDBandImageParams* pinBandImage, const CPAImageEffectParams* piep, Point printPixel, unsigned char *pcombinationNum, unsigned char *ppixelY1, unsigned char *ppixelY2, void* poutBits1, void* poutBits2, void* poutBits3);**	
Feature	**The CP90PanoramaChangeImage function divides input image data of 8 bit panorama size, performs image processing, and converts it to 16 bit data for sending to the printer.**	
Argument	**Parameter**	**Notes**
	pinBandImage	**A pointer which indicates CPDBandImageParams structure which sets transmitting image data information.**
	Piep	**A pointer which indicates CPAImageEffectParams structure which sets various parameters. In the case NULL is specified,Error_FuncParamError is occurred.**
	printPixel	**Transferred pixels.**
	pcombinationNum	**Number of panorama combinations. Indicates the division number of the panorama image (2 or 3).**
	ppixelY1	**Size other than the final image of the panorama.**
	ppixelY2	**Size of final image of panorama.**
	poutBits1	**A pointer which indicates 16bit output data of the first division image. The order of C->M->Y by dot transfer. Refer to “7.2.poutBits”**
	poutBits2	**A pointer which indicates 16bit output data of the second division image. The order of C->M->Y by dot transfer. Refer to “7.2.poutBits”**
	poutBits3	**A pointer which indicates 16bit output data of the third division image. The order of C->M->Y by dot transfer. Refer to “7.2.poutBits” This parameter is only for 3 divisions.**
Return numeric	**Refer to "5.Error items."**	

***Execute this function twice for panorama printing.**

In the first time, we will acquire the number of divided panoramas pcombinationNum, the divided image size, and the necessarymemory size.

At the first execution, specify pointers of poutbit1, poutbit2 and poutbit3 as NULL.

In the second time, the function is executed by specifying the required memory size based on the panorama division number and the division image size acquired at the first execution of the function.

By the second execution, image data divided for panorama printing and processed is acquired.

Please refer to the sample code for how to use the function.

<Setting the function parameters to the protocol parameters>

	Protocol parameter	Pamaneters of CP90PanoramaChangeImage function	Notes
SP command *1	PrintPixel.x	1852	Panorama print paper size X (Fixed 1852)
	PrintPixel.y	ppixelY1 or ppixelY2	Panorama print paper size Y(divided image) < In the case of two division > For 1st image-> ppixelY1 For 2nd image-> ppixelY2 < In the case of three division > For 1st image-> ppixelY1 For 2nd image-> ppixelY1 For 3rd image-> ppixelY2
	Panorama Mode	pcombinationNum	Panorama print divided image number < In the case of two division > 2 < In the case of three division > 3
	PrintPixel y of first print	ppixelY1	Transfer size other than the final image (Fixed 2428)
	PrintPixel y of last print	ppixelY2	Transfer size of final image 1852x4232 size : 2404 1852x6036 size : 2380
	Panorama Image No.	*Set up according to the transfer image order in the upper application	< In the case of two division > For 1st image(poutBits1) ->1 For 2nd image(poutBits2) ->2 < In the case of three division > For 1st image(poutBits1) ->1 For 2nd image(poutBits2)->2 For 3rd image(poutBits3) ->3
ZT command *2	Image data X	1852	Transfer image data size Horizontal direction (1852)
	Image data Y	ppixelY1 or ppixelY2	Transfer image data size Horizontal direction < In the case of two division > For 1st image-> ppixelY1 For 2nd image-> ppixelY2 < In the case of three division > For 1st image-> ppixelY1 For 2nd image-> ppixelY1 For 3rd image-> ppixelY2
	Image data	poutBits1 or poutBits2 or poutBits3	Transfer image data < In the case of two division > For 1st image ->poutBits1 For 2nd image->poutBits2 < In the case of three division > For 1st image->poutBits1 For 2nd image->poutBits2 For 3rd image->poutBits3

*1 Refer to 3.1 PRINT SETTING of “DIGITAL COLOR PRINTER I/F PROTOCOL SPECIFICATION MODEL: CP-D90DW”

*2 Refer to 3.2.IMAGE DATA TRANSFER and PRINT of “DIGITAL COLOR PRINTER I/F PROTOCOL SPECIFICATION MODEL: CP-D90DW”

4.2.Structures

(1)CPDBandImageParams structure

```
typedef struct tagCPDBandImageParams{
void*           baseAddr;
long            RowBytes;
RECT            bounds;
}CPDBandImageParams, *PCPDBandImageParams;
```

Parameter	Notes
baseAddr	A pointer which indicates image data. The order of R->G->B.
RowBytes	Number of bits a line of image data. RowButes = ImageDataWidth * 3 It scans below from the upper left in the case of a positive numeric. In this case, the address in the upper left of image data is usually set in baseAddr. It scans up from the lower left in case of a negative numeric. In this case, the address at the lower left of image data is usually set in baseAddr.
Bounds	Coordinates of the destination of a transmission are specified. The bounds cannot be set in the odd number. (except CP-D90D series)

(2) CPDContrastTable structure

```
typedef struct tagCPDContrastTable{
unsigned char   r[256];
unsigned char   g[256];
unsigned char   b[256];
}CPDContrastTable, *PCPDContrastTable;
```

Parameter	Notes
R	the contrast table for red
G	the contrast table for green
B	the contrast table for blue

(3)CPAImageEffectParams structure

```
typedef struct tagCPAImageEffectParams{
      unsigned long ver;
      short reserved1;
       short DLLColorTable;
       short reserved2;
        const CPDContrastTable* pContTbl;
        short sharpness0;
        const unsigned char* reserved3;
        short reserved4;
        short gamma;
        short printMode;
        short reserved6;
        const CPDGammaTable* pGammaTbl;
        short overcoatMode;
        const CPDGammaTable* pGammaTbl1;
        const CPDGammaTable* pGammaTbl2;
        const CPDGammaTable* pGammaTbl3;
        const CPDGammaTable* pGammaTbl4;
  }CPDImageEffectParams, *PCPAImageEffectParams;
```

Parameter	Notes			
Ver	**104**		**103**	**102**
reserved1	**reserved**	**reserved**	**reserved**	←
DLLColorTable	**Color table**	**Color table**	**Color table**	←
reserved2	**reserved**	**reserved**	**reserved**	←
pContTbl	**A pointer which indicates the Contrast table**	**A pointer which indicates the Contrast table**	**A pointer which indicates the Contrast table**	←
Sharpness0	**Not supported**	**Sharpness**	**Sharpness**	←
reserved3	**reserved**	**reserved**	**Reserved**	←
reserved4	**reserved**	**reserved**	**Reserved**	←
Gamma	**Not supported**	**Gamma**	**Gamma**	←
printMode	**printMode**	**printMode**	**printMode**	―(Un-corresponding)
reserved6	**reserved**	**reserved**	**Reserved**	←
pGammaTbl	**Not supported**	**Not supported**	**Gamma table**	←
overcoatMode	**Not supported**	**overcoatMode**	**Not supported**	―(Un-corresponding)
pGammaTbl1	**Not supported**	**Gamma table of Fine mode**	**Not supported**	**Not supported**
pGammaTbl2	**Not supported**	**Gamma table of Super Fine mode**	**Not supported**	**Not supported**
pGammaTbl3	**Not supported**	**Gamma table of UltraFine mode**	**Not supported**	**Not supported**
pGammaTbl4	**Not supported**	**Gamma table of extra SuperFine mode**	**Not supported**	**Not supported**

Parameters v.s. Printer type

Parameter	CP-D90D Series	CP-D80D Series	CP-K60D Series	CP-D70D Series		CP9810D Series		CP9800D series
ver	104		103		102	103	102	102
DLLColorTable	-1:none 0 : Table0	-1:none 0 : Table0	-1:none 0 : Table0	— (No operation)	←	-1:none 0 : Table0	←	←
pContTbl	CPDContrast Table structure	CPDContrastTable structure	CPDContrastTable structure	←	←	←	←	←
Sharpness0	0	-1: none 0-8 Default:4	-1: none 0-8 Default:4	←	←	-1: none 0-9 Default:6	←	←
gamma	-1	-1 :none PGamma_5: user setting 0x105*3 Pgamma_1 -Pgamma_4: auto set 0x101- 0x104	-1 :none PGamma_5: user setting 0x105*1 Pgamma_1 -Pgamma_4: auto set 0x101- 0x104	— (No operation)	←	-1:none PGamma_1:257(0x101): warm black PGamma_2:258(0x102): cool black	←	←
printMode	PPrintMode_5 =261(0x105) :*5	PPrintMode_1= 257(0x101): Fine PPrintMode_4= 260(0x104): SuperFine PPrintMode_5= 261(0x105): UltraFine *4	PPrintMode_1= 257(0x101): Fine PPrintMode_5= 261(0x105): UltraSuperFine *2	— (No operation)	— (Un-corresponding)	-1:none PPrintMode_1:257(0x101): Fine PPrintMode_2:258(0x102): Fine PPrintMode_3:259(0x103): SuperFine	— (Un-corresponding)	←
pGammaTbl	— (Un-corresponding)	Not supported	CPDGammaTable structure Null : gamma none *1	— (Un-corresponding)	←	←	←	←
overcoatMode	Not supported	POverCoat_Standard=257(0x101):Standard POverCoat_Matte2 =259(0x103):Matte*4	Not supported	— (Un-corresponding)	←	←	←	←
pGammaTbl1- pGammaTbl4	— (Un-corresponding)	CPDGammaTable structure Null : gamma none *3	— (Un-corresponding)	— (Un-corresponding)	— (Un-corresponding)	— (Un-corresponding)	— (Un-corresponding)	— (Un-corresponding)

***In the case of CP9810D Series, when CPAImageEffectParams structure version is before ver.102, the parameter of picture compensation is changed by gamma parameter,and when the CPAImageEffectParams structure version is after ver.103, the parameter of picture compensation is changed by gamma and printMode parameters.**

***1:When set Pgamma_5(user setting), pGammaTbl is available.(CP-K60D series printers)**

***2: When Fine is set ,dll operate with CP60_01.csv file.When UltraFine is set ,dll operate with CP60_03.csv file.**

When set UltraFine on the old FW, dll set printMode Fine and operate with CP60_03.csv file.(CP-K60D series)

***3:When set Pgamma_5(user setting), pGammaTbl1- pGammaTbl4 are available.(CP-D80D series printers)**

***4:When KG size and SuperFine is specified, it may be necessary to change the actual printing speed to UltraFine depending on the image. Please check the poutSpeed output of the CP80ChangeImage function and set the poutSpeed output value to the Speed parameter in the protocol.**

This process is necessary when overcoatMode is standard

Please set the overcoatMode and set the same overcoatMode when protocol is specified

***5:Please set this value fixed.**

5. Error items

Item	No.	Notes
Error_NoError	0	There is no error.
Error_Something	1	There are some errors.
Error_FuncParamError	201	Illegal argument of DLL function.
Error_MemAllocError	202	Failed to allocate memory to DLL

6. Sample

The sample program is made with XCode.

<Sample program(App) operation method>
Change to a directory on a sample program(App) drive using Terminal.

(1) CP95ChangeImage function
(a)Set contrast table data
Execute the following command.
./App f1 /Users/user_name/image.raw 2152 1416 /Users/user_name/contrasttable.bin 0.5 1.0 20

/Users/user_name/image.raw :Image data file (RAW file format(RGB, top-down))
2152 :width of Image data
1416 :high of Image data
/Users/user_name/contrasttable.bin :Contrast table data
0.5 :unsRad
1.0 :unsAmo
20 :unsThres

Processing result :output.raw (the same directory as the sample program(App))

(b)Set no contrast table data
Execute the following command.
./App f1 /Users/user_name/image.raw 2152 1416 - 0.5 1.0 20

/Users/user_name/image.raw :Image data file (RAW file format(RGB, top-down))
2152 :width of Image data
1416 :high of Image data
- : without Contrast table data
0.5 :unsRad
2.0 :unsAmo
20 :unsThres

Processing result :output.raw (the same directory as the sample program(App))

(2) CPColorChange function
Execute the following command.
./App f2 /Users/user_name/image.raw 2152 1416 0

/Users/user_name/image.raw :Image data file (RAW file format(RGB, top-down))
2152 :width of Image data
1416 :high of Image data
0 : printer type (0:CP3020D, 1:CP9550DW, 2:CP3020DA)

Processing result :output.raw (the same directory as the sample program(App))

(3) CP98ChangeImage function

Execute the following command. (CPAImageEffectParams structure ver.103)
./App f3 /Users/user_name/image.raw 1868 1228 103 0 /Users/user_name/contrasttable.bin 6 257 259 1868 1228

Execute the following command. **(CPAImageEffectParams structure ver.102)**
./App f3 /Users/user_name/image.raw 1868 1228 103 0 /Users/user_name/contrasttable.bin 6 257 259 1868 1228

/Users/user_name/image.raw:Image data file (RAW file format(RGB, top-down))
1868 :width of Image data
1228 :high of Image data
103 :version
0 :DLLColorTable (-1:none, 0:Table0)
/Users/user_name/contrasttable.bin :Contrast table data
***When you do not use a contrast table data, please set like CP95ChangeImage function.**
6 :Sharpness0 (-1:none, 0-9)
257 :gamma (-1:none, 257(0x101):PGamma_1, 258(0x102):PGamma_2)
259 :printMode (-1:none, 257(0x101): PPrintMode_1,258(0x102):PPrintMode_2,259(0x103): PPrintMode_3)
*** It sets up only at CPAImageEffectParams structure ver.103.**
1868 :width of Print Image data
1228 :high of Print Image data

Processing result :output.raw (the same directory as the sample program(App))

(4) CP70ChangeImage function

Execute the following command. (CPAImageEffectParams structure ver.103 and ver.102)
./App f4 /Users/user_name/image.raw 1864 1228 103 /Users/user_name/contrasttable.bin 6 1864 1228

/Users/user_name/image.raw:Image data file (RAW file format(RGB, top-down))
1864 :width of Image data
1228 :high of Image data
103 :version
/Users/user_name/contrasttable.bin :Contrast table data
***When you do not use a contrast table data, please set like CP95ChangeImage function.**
6 :Sharpness0 (-1:none, 0-8)
1864 :width of Print Image data
1228 :high of Print Image data

Processing result :output.raw (the same directory as the sample program(App))

(5) CP60ChangeImage function

Execute the following command. (CPAImageEffectParams structure ver.103)
./App f5 /Users/user_name/image.raw 1864 1218 103 0 /Users/user_name/contrasttable.bin
4 257 gammatable-file-path 257 1864 1218

/Users/user_name/image.raw:Image data file (RAW file format(RGB, top-down))
1864 :width of Image data
1218 :high of Image data
103 :version
0 :DLLColorTable (-1:none, 0:Table0)
/Users/user_name/contrasttable.bin :Contrast table data
***When you do not use a contrast table data, please set like CP95ChangeImage function.**
4 :Sharpness0 (-1:none, 0-8)
257 :gamma (-1:none, 257(0x101):PGamma_1, 258(0x102):PGamma_2,
259(0x103):PGamma_3, 260(0x104):PGamma_4, 261(0x105):PGamma_5)
gammatable-file-path: Gamma data file
- : without Gamma data file
257 :printMode (257(0x101): PPrintMode_1, 261(0x105): PPrintMode_5)

1864 :width of Print Image data
1218 :high of Print Image data

Processing result :output.raw (the same directory as the sample program(App))

(6) CP80ChangeImage function

Execute the following command. (CPAImageEffectParams structure ver.104)

./App f6 /Users/user_name/image.raw 1864 1228 104 0 /Users/user_name/contrasttable.bin 4 257 gammatable-file-path 257 1864 1228 257 /Users/user_name/gammatable1.bin /Users/user_name/gammatable2.bin /Users/user_name/gammatable3.bin /Users/user_name/gammatable4.bin

/Users/user_name/image.raw:Image data file (RAW file format(RGB, top-down))
1864 :width of Image data
1228 :high of Image data
104 :version
0 :DLLColorTable (-1:none, 0:Table0)
/Users/user_name/contrasttable.bin :Contrast table data
***When you do not use a contrast table data, please set like CP95ChangeImage function.**
(- : without Contrast Table data)
4 :Sharpness0 (-1:none, 0-8)
257 :gamma (-257 :gamma (-1:none, 257(0x101):PGamma_1, 258(0x102):PGamma_2, 259(0x103):PGamma_3, 260(0x104):PGamma_4, 261(0x105):PGamma_5)
-:Not Supported (gammatable-file-path)
257 :printMode (257(0x101): PPrintMode_1, 260(0x104): PPrintMode_4, 261(0x105): PPrintMode_5)
1864 :width of Print Image data
1228 :high of Print Image data
/Users/user_name/gammatable1.bin : gammatable-file-path1 Gamma data file1
(- : without Gamma data file1)
/Users/user_name/gammatable2.bin : gammatable-file-path2 Gamma data file2
(- : without Gamma data file2)
/Users/user_name/gammatable3.bin : gammatable-file-path3 Gamma data file3
(- : without Gamma data file3)
/Users/user_name/gammatable4.bin : gammatable-file-path4 Gamma data file4
(- : without Gamma data file4)

Processing result :output.raw (the same directory as the sample program(App))

(7) CP90PanoramaChangeImage function

Execute the following command. (CPAImageEffectParams structure ver.104)

./App f7 /Users/user_name/image.raw 1852 6036 104 0 /Users/user_name/contrasttable.bin 261 1852 6036

/Users/user_name/image.raw:Image data file (RAW file format(RGB, top-down))
1852 :width of Image data (1852)
6036 :high of Image data (4232,6036)
104 :version
0 :DLLColorTable (-1:none, 0:Table0)
/Users/user_name/contrasttable.bin :Contrast table data
***When you do not use a contrast table data, please set like CP95ChangeImage function.**
(- : without Contrast Table data)
261 :printMode (261(0x105): PPrintMode_5)
1852 :width of Print Image data (1852)
*** the same value as width of Image data**
6036 :high of Print Image data (4232,6036)
*** the same value as high of Image data**

Processing result :output1.raw, output2.raw, output3.raw (the same directory as the sample program(App))

7. Notes

7.1.Reference example of Unsharpmask

	Parameter of CP95ChangeImage function (Unsharpmask)		
	unsRad	unsAmo	unsThres
Soft	0.5	0.2	20
↑	0.5	0.6	20
	0.5	0.8	20
Normal	0.5	1.0	20
↓	0.4	1.4	16
	0.4	1.8	13
Hard	0.2	3.0	2

7.2.poutBits

(1)CP-K60D series

buffer size (bytes): printPixel.v x printPixel.h x 3 x 2

Print size (data size)	printPixel.v		printPixel.h		buffer size of poutBits (bytes) (*1)
9x13 (127mm×89mm)	1568dots	0620h	1076dots	0434h	10123776
10x15 (152mm×102mm)	1864dots	0748h	1228dots	04C2h	13622784
13x18 (127mm×178mm)	1568dots	0620h	2128dots	0850h	20020224
15x20 (152mm×203mm)	1864dots	0748h	2422dots	0976h	27088896

(*1)When the data size(bytes) of each color is not a multiple of 512(bytes), insufficient data is padded with 0.

(2)CP-D70D series

buffer size (bytes): printPixel.v x printPixel.h x 3 x 2

Print size (data size)	printPixel.v		printPixel.h		buffer size of poutBits (bytes) (*1)
9x13 (127mm×89mm)	1568dots	0620h	1076dots	0434h	10123776
10x15 (152mm×102mm)	1864dots	0748h	1228dots	04CCh	13734912
13x18 (127mm×178mm)	1568dots	0620h	2128dots	0850h	20020224
15x20 (152mm×203mm)	1864dots	0748h	2422dots	0976h	27088896

(*1)When the data size(bytes) of each color is not a multiple of 512(bytes), insufficient data is padded with 0.

(3)CP9810D/CP9800D Series

buffer size (bytes): printPixel.v x printPixel.h x 3 x 2

Print size (data size)	printPixel.v		printPixel.h		buffer size of poutBits (bytes)
9x13 (133mm×91mm)	1572dots	0624h	1076dots	0434h	10148832
10x15 (158mm×104mm)	1868dots	074Ch	1228dots	04CCh	13763424
13x18 (133mm×180mm)	1572dots	0624h	2128dots	0850h	20071296
15x20 (158mm×205mm)	1868dots	074Ch	2422dots	0976h	27145776
15x21 (158mm×215mm)	1868dots	074Ch	2564dots	0A04h	28737312
15x23 (158mm×231mm)	1868dots	074Ch	2730dots	0AAAh	30597840
15×8.5(158mm×85mm)	1868dots	074Ch	1028dots	0404h	11521824
15×8.9(158mm×89mm)	1868dots	074Ch	1076dots	0434h	12059808

(4)CP-D80D series

buffer size (bytes): printPixel.v x printPixel.h x 3 x 2

Print size (data size)	printPixel.v		printPixel.h		buffer size of poutBits (bytes) (*1)
10x15 (152mm×102mm)	1864dots	0748h	1228dots	04CCh	13734912
13x18 (127mm×178mm)	1568dots	0620h	2128dots	0850h	20020224
15x20 (152mm×203mm)	1864dots	0748h	2422dots	0976h	27088896
15x15 Square(152mm×152mm)	1864dots	0748h	1820dots	071Ch	20355072
13x13 Square(127mm×127mm)	1568dots	0620h	1524dots	05F4h	14338560

(*1)When the data size(bytes) of each color is not a multiple of 512(bytes), insufficient data is padded with 0.

Image data Transfer (DataTransfer)

Yellow data

ESC	'Z'	'T'	Data type	+	*XS (2byte)*	*YS (2byte)*	*DX (2byte)*	*DY (2byte)*
1Bh	5Ah	54h	01h		00h 00h	00h 00h	printPixel.v	printPixel.h

+ | *DATA1 (2byte)* | *DATA2 (2byte)* | … | *DATA N (2byte)* |

Magenta data

ESC	'Z'	'T'	Data type	+	*XS (2byte)*	*YS (2byte)*	*DX (2byte)*	*DY (2byte)*
1Bh	5Ah	54h	01h		00h 00h	00h 00h	printPixel.v	printPixel.h

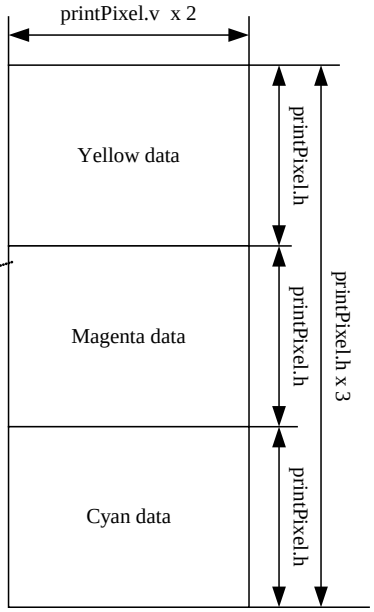
+ | *DATA1 (2byte)* | *DATA2 (2byte)* | … | *DATA N (2byte)* |

Cyan data

ESC	'Z'	'T'	Data type	+	*XS (2byte)*	*YS (2byte)*	*DX (2byte)*	*DY(2byte)*
1Bh	5Ah	54h	01h		00h 00h	00h 00h	printPixel.v	printPixel.h

+ | *DATA1 (2byte)* | *DATA2 (2byte)* | … | *DATA N (2byte)* |

<poutBits memory space>



(5)CP-D90D series

buffer size (bytes): Image data X x Image data Y x 3 x 2

Print size (data size) (dots size)	Division transfer image data size					
	Division image data poutBits1-3	Image data X (of ZT command)		Image data Y (of ZT command)		buffer size of poutBits1-3(bytes)
15x36(152x356mm) (1852x4232 dots)	poutBits1	1852dots	073Ch	2428dots (ppixelY1)	097Ch	26979936
	poutBits2	1852dots	073Ch	2404dots (ppixelY2)	0964h	26713248
15x51(152x508mm) (1852x6036 dots)	poutBits1	1852dots	073Ch	2428dots (ppixelY1)	097Ch	26979936
	poutBits2	1852dots	073Ch	2428dots (ppixelY1)	097Ch	26979936
	poutBits3	1852dots	073Ch	2380dots (ppixelY2)	094Ch	26446560

CMY data (poutBits1 or poutBits2 or poutBits3) following the ZT command

ESC	'Z'	'T'	Data type	00h	09h	+	*XS (2byte)*	*YS (2byte)*	*Image data X (2byte)*	*Image data Y (2byte)*	*Reserved*	*Dummy (497byte)*
1Bh	5Ah	54h	01h	00h	09h		00h 00h	00h 00h	073Ch	ppixelY1 or ppixelY2	00h	00h

+	*DATA C0 (2byte)*	*DATA M0 (2byte)*	*DATA Y0 (2byte)*	...	*DATA CN (2byte)*	*DATA MN (2byte)*	*DATA YN (2byte)*

Image Data pixel size(N) = 1852 x ppixelY1 or 1852 x ppixelY2

Image Data byte size = N x 2 x 3 byte

***Point sequential system**

Revision history

2018.8.3 Ver.6.00 =>Ver.7.00
(1) Add (6)CP80ChangeImage function
(2) Add (7)CP90PanoramaChangeImage function
(3) Corresponding OS 10.3.9,10.4.11,10.5.6 =>10.3.9,10.4.11,10.5.8,10.6.8,10.7,10.8,10.9,10.10,10.11,10.12,10.13

2013.11.22 Ver.5.00 =>Ver.6.00
(1) Add CP60ChangeImage function.
(2) Corresponding OS 10.3.9,10.4.11,10.5.6 =>10.3.9,10.4.11,10.5.8,10.6.8,10.7,10.8,10.9)

2010.8.2 Ver.4.00 =>Ver.5.00
(1) Add CP70ChangeImage function.
(2) Corresponding OS 10.3.9,10.4.11,10.5.6 =>10.3.9,10.4.11,10.5.8,10.6.2

2009.2.26 Ver.3.00 =>Ver.4.00
(1)CP98ChangeImage function corresponds to the SuperFine Mode.
The Mode changes by the version of CPAImageEffectParams structure.
When CPAImageEffectParams structure version is before ver.102, the parameter of picture compensation is changed by gamma parameter,and when the CPAImageEffectParams structure version is after ver.103, the parameter of picture compensation is changed by gamma and printMode parameters.
(2) Corresponding OS 10.3.9,10.4.10 =>10.3.9,10.4.11,10.5.6

2007.10.9 Ver.2.00 =>Ver.3.00
(1)Add CP98ChangeImage function.
(2) Corresponding OS 10.3.9,10.4.5 =>10.3.9,10.4.10

2006.4.3 :Ver.1.20 =>Ver.2.00
(1) Universal binary
(2) Corresponding OS 10.3.6,10.4.2 =>10.3.9,10.4.5
(3) error in writing
- (1)CP95ChangeImage function,(2)CPColorChange function
  bandImage =>pBandImage
- (1)CPDBandImageParams structure
  rowBytes =>RowBytes
- (2)CPDContrastTable structure
  BYTE =>unsigned char