Crystal Image through Imaging Innovation

PIXELPLUS

SURROUND VIEW MONITORING SYSTEM

PI5008K Calibration API Reference

Preliminary Datasheet

Rev 0.5

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Contents

1. Type

typedef void	PP_VOID;
typedef char	PP_CHAR;
typedef unsigned char	PP_U8;
typedef short	PP_S16;
typedef unsigned short	PP_U16;
typedef int	PP_S32;
typedef unsigned int	PP_U32;
typedef enum {PP_FALSE, PP_TRUE}	PP_BOOL;
#define null	PP_NULL

2. Calibration API

2.1. Enumeration

2.1.1. PP_OFFCALIB_CAMERA_PATTERN_TYPE_SEL_E;

[Syntax]

```
typedef enum ppOFFCALIB_CAMERA_PATTERN_TYPE_SEL_E
{
    eCALIB_PATTERN_MAIN = 0,
    eCALIB_PATTERN_SUB,
    eMAX_CALIB_PATTERN
}PP_OFFCALIB_CAMERA_PATTERN_TYPE_SEL_E;
```

[Description]

Target Pattern Type (Main/Sub)

[Member]

Member	Description
eCALIB_PATTERN_MAIN	Main Pattern
eCALIB_PATTERN_SUB	Sub Pattern

2.1.2. PP_OFFCALIB_CAMERA_CAPTURE_CH_E;

[Syntax]

```
typedef enum ppOFFCALIB_CAMERA_CAPTURE_CH_E
{
    eCALIB_CAMERA_FRONT = 0,
    eCALIB_CAMERA_LEFT,
    eCALIB_CAMERA_RIGHT,
    eCALIB_CAMERA_BACK,
    eCALIB_CAMERA_ALL,
    eMAX_CALIB_CAMERA_CHANNEL
}PP_OFFCALIB_CAMERA_CAPTURE_CH_E;
```

[Description]

Target Camera Channel to be captured

[Member]

Member	Description
eCALIB_CAMERA_FRONT	Front Camera Channel
eCALIB_CAMERA_LEFT	Left Camera Channel
eCALIB_CAMERA_RIGHT	Right Camera Channel
eCALIB_CAMERA_BACK	Rear Camera Channel
eCALIB_CAMERA_ALL	All Camera Channel

2.1.3. PP_OFFCALIB_PROCESS_STEP_E

[Syntax]

```
typedef enum ppOFFCALIB_PROCESS_STEP_E
{
    eOFFCALIB_WAIT_CMD=0, // 0x0
```

```
    eOFFCALIB_START, //0x01
    eOFFCALIB_CAPTURE,//0x02
    eOFFCALIB_GET_CNF,//0x03
    eOFFCALIB_GET_WOLRD_POINT,//0x04
    eOFFCALIB_FIND_PATTERN,//0x05
    eOFFCALIB_GET_INTRINSIC_PARAM,//0x06
    eOFFCALIB_GET_CAMERA_POSITION,//0x07
    eOFFCALIB_GET_FEATURE_POINT,//0x08
    eOFFCALIB_END,//0x09
} PP_OFFCALIB_PROCESS_STEP_E;
```

[Description]

Offline Calibration Process Step

[Member]

Member	Description
eOFFCALIB_WAIT_CMD	Waiting for user command
eOFFCALIB_START	Run Offline Calibration
eOFFCALIB_CAPTURE	Capture camera inputs to run Offline Calibration
eOFFCALIB_GET_CNF	Get pattern information to be recognized
eOFFCALIB_GET_WOLRD_POINT	Get point of pattern in world coordinate
eOFFCALIB_FIND_PATTERN	Recognize pattern of captured Image
eOFFCALIB_GET_INTRINSIC_PARAM	Get camera intrinsic data
eOFFCALIB_GET_CAMERA_POSITION	Find feature point of pattern and extract position and angle of cameras
eOFFCALIB_GET_FEATURE_POINT	Shows extacted feature point on the screen. User can change feature point if necessary
eOFFCALIB_END	Finish Offline Calibration Free memory to be allocated.

2.1.4. PP_SECTION_VIEWGEN_PROCESS_STEP_E

[Syntax]

```
typedef enum ppSECTION_VIEWGEN_PROCESS_STEP_E
{
    eSVIEWGEN_WAIT_CMD=0, // 0x00
    eSVIEWGEN_START ,//0x01

    eSVIEWGEN_PREPARE_MAKE,// 0x02
    eSVIEWGEN_GET_FB_LUT,// 0x03
    eSVIEWGEN_GET_LR_LUT,// 0x04

    eSVIEWGEN_UPDATE,// 0x05
    eSVIEWGEN_END, // 0x06

} PP_SECTION_VIEWGEN_PROCESS_STEP_E;
```

[Description]

Section View Generation Process Step

[Member]

Member	Description
eSVIEWGEN_WAIT_CMD	Waiting mode
eSVIEWGEN_START	Section View Generation Start
eSVIEWGEN_PREPARE_MAKE	Get data to generate Each Section
eSVIEWGEN_GET_FB_LUT	Generate FB lut of Each Section
eSVIEWGEN_GET_LR_LUT	Generate LR lut of Each Section
eSVIEWGEN_UPDATE	Sampling the FB/LR lut of each Section view and replacing the result with exisiting Flash Data(LUT)
eSVIEWGEN_END	Finish Viewgeneration Initialize used variables and buffers

2.2. Structure

2.2.1. PP_OFFCALIB_CAP_YUV_INFO_S

[Syntax]

```
typedef struct ppOFFCALIB_CAP_YUV_INFO_S
{
    PP_U32 u32YuvBufAddr;
    PP_U32 u32YuvBufSize;
    PP_U8   u8Yonly;
} PP_OFFCALIB_CAP_YUV_INFO_S;
```

[Description]

Address and size Structure of buffer to store captured YUV image

[Member]

Member	Description
u32YuvBufAddr	Captured Yuv Image Buffer Address
u32YuvBufSize	Captured Yuv Image Buffer Size
u8Yonly	0:UYVY 1:Y only

2.2.2. PP_OFFCALIB_CAP_BUF_INFO_S

[Syntax]

```
typedef struct ppOFFCALIB_CAPTURE_BUF_INFO_S
{
    PP_U32 u32Capture_Buf_Addr[eMAX_CALIB_CAMERA_CHANNEL];
    PP_U32 u32Capture_Buf_Size[eMAX_CALIB_CAMERA_CHANNEL];
} PP_OFFCALIB_CAPTURE_BUF_INFO_S;
```

[Description]

Address and size of buffer to store captured YUV image

[Member]

Member	Description

u32Capture_Buf_Addr[eMAX_CALIB_CAMERA_CHANNEL]	Captured Yuv Image Buffer Address
u32Capture_Buf_Size[eMAX_CALIB_CAMERA_CHANNEL]	Captured Yuv Image Buffer Size

2.2.3. PP_OFFCALIB_PCV_PARAM_S

[Syntax]

```
typedef struct ppOFFCALIB_PCV_PARAM_S
{
    PCV_OFF_LINE_CALIB_PATTERN_PARAM stPatternParam[eMAX_CALIB_CAMERA_CHANNEL];
    PCV_OFF_LINE_CALIB_CAMERA_PARAM stCamParam[eMAX_CALIB_CAMERA_CHANNEL];
} PP_OFFCALIB_PCV_PARAM_S;
```

[Description]

Save pattern and camera information used for Offline Calibration

[Member]

Member	Description
stPatternParam	attern Parameter for each camera channel
stCamParam	Parameter of each camera

2.2.4. PP_OFFCALIB_OUT_INFO_S

[Syntax]

```
typedef struct ppOFFCALIB_OUT_INFO_S
{
    PP_OFFCALIB_PROCESS_STEP_E eOffcalib_Progress_Step;
    PP_OFFCALIB_CAMERA_CAPTURE_CH_E eCh_sel;

    PP_U32 u32Try_cnt;

    PP_OFFCALIB_CAPTURE_BUF_INFO_S stOffcalib_Capture_Buf;
```

```
    PP_OFFCALIB_PCV_PARAM_S stPcv_Param;
} PP_OFFCALIB_OUT_INFO_S;
```

[Description]

Save the result of Offline Calibration

[Member]

Member	Description
eOffcalib_Progress_Step	Save current process step of Offline Calibration
eCh_sel	Camera Channel to be captured
u32Try_cnt	Decide whether Offline Calibration is operated
stOffcalib_Capture_Buf	Capture Buffer information
stPcv_Param	Save required information to run Offline Calibration and output data

2.2.5. PP_CNF_TAG_CAMERA_PARAM_S

[Syntax]

```
typedef struct ppCNF_TAG_CAMERA_PARAM_S
{
    PP_U32 tag;
    PP_U32 length;

    PP_U32 width;
    PP_U32 height;

    PP_F32 fx;
    PP_F32 fy;
```

```
PP_F32 cx;
PP_F32 cy;

PP_U32 distortTableSize;
PP_F32 distortTable[100];

PP_F32 posx;
PP_F32 posy;
PP_F32 posz;

PP_F32 angx;
PP_F32 angy;
PP_F32 angz;

PP_U32 patternType;
PP_F32 patternW;//width
PP_F32 patternL;//length
PP_F32 patternSW; //side width
PP_F32 patternSL; //side length

PP_F32 patternSquareSize;

PP_U32 patternRoi0Left;
PP_U32 patternRoi0Right;
PP_U32 patternRoi0Top;
PP_U32 patternRoi0Bottom;

PP_U32 patternRoi1Left;
```

```
    PP_U32 patternRoi1Right;
    PP_U32 patternRoi1Top;
    PP_U32 patternRoi1Bottom;

    PP_U32 patternRoi2Left;
    PP_U32 patternRoi2Right;
    PP_U32 patternRoi2Top;
    PP_U32 patternRoi2Bottom;

    PP_U32 patternRoi3Left;
    PP_U32 patternRoi3Right;
    PP_U32 patternRoi3Top;
    PP_U32 patternRoi3Bottom;
}PP_CNF_TAG_CAMERA_PARAM_S;
```

[Description]

Camera Intrinsic Data, Position & Angle of Camera, And ROI Area for Calibration.
this data is contained in the SVMConfig.bin that generated by the PC tool.

Please refre to the documentations for details.
(PI5008K_ViewGenerationTool_v1.21.00_UserGuide_en.pptx / Page26.Appendix)
(PI5008K_SVM_Configuration_File_Format_v1.21.00.pptx)

[Member]

Please refre to the documentations for details.
(PI5008K_ViewGenerationTool_v1.21.00_UserGuide_en.pptx / Page26.Appendix)
(PI5008K_SVM_Configuration_File_Format_v1.21.00.pptx)

2.2.6. PP_CNF_TAG_BLEND_PARAM_S

[Syntax]

```
typedef struct ppCNF_TAG_BLEND_PARAM_S
{
    PP_U32 tag;
    PP_U32 length;

    PP_S32 shadowAreaFront;
    PP_S32 shadowAreaLeft;
    PP_S32 shadowAreaRear;
    PP_S32 shadowAreaRight;

    PP_S32 alpha0DivAngFront_2d;
    PP_S32 alpha0DivAngRear_2d;
    PP_S32 alpha0BlendAreaFront_2d;
    PP_S32 alpha0BlendAreaRear_2d;

    PP_S32 alpha1DivAngFront_2d;
    PP_S32 alpha1DivAngRear_2d;
    PP_S32 alpha1BlendAreaFront_2d;
    PP_S32 alpha1BlendAreaRear_2d;

    PP_S32 alpha0DivAngFront_3d;
    PP_S32 alpha0DivAngRear_3d;
    PP_S32 alpha0BlendAreaFront_3d;
    PP_S32 alpha0BlendAreaRear_3d;

    PP_S32 alpha1DivAngFront_3d;
    PP_S32 alpha1DivAngRear_3d;
    PP_S32 alpha1BlendAreaFront_3d;
    PP_S32 alpha1BlendAreaRear_3d;
```

```
}PP_CNF_TAG_BLEND_PARAM_S;
```

[Description]

data for Blend Area of the SVMconfig.bin that generated by the PC tool

Please refre to the documentations for details.
(PI5008K_ViewGenerationTool_v1.20.00_UserGuide_en.pptx / Page24.Appendix)
((PI5008K_SVM_Configuration_File_Format_v1.21.00.pptx)

)

[Member]

Please refre to the documentations for details.
(PI5008K_ViewGenerationTool_v1.20.00_UserGuide_en.pptx / Page24.Appendix)
((PI5008K_SVM_Configuration_File_Format_v1.21.00.pptx)

)

2.2.7. PP_CNF_TAG_2D_SURFACE_PARAM_S

[Syntax]

```
typedef struct ppCNF_TAG_2D_SURFACE_PARAM_S
{
    PP_U32 tag;
    PP_U32 length;

    PP_U32 wx;
    PP_U32 wy;
    PP_U32 centerx;
    PP_U32 centery;
```

```
}PP_CNF_TAG_2D_SURFACE_PARAM_S;
```

[Description]

data for 2d surface of the SVMconfig.bin that generated by the PC tool

Please refre to the documentations for details.
(PI5008K_ViewGenerationTool_v1.20.00_UserGuide_en.pptx / Page24.Appendix)
((PI5008K_SVM_Configuration_File_Format_v1.21.00.pptx)

[Member]

Please refre to the documentations for details.
(PI5008K_ViewGenerationTool_v1.20.00_UserGuide_en.pptx / Page24.Appendix)
(PI5008K_SVM_Configuration_File_Format_v1.21.00.pptx)

2.2.8. PP_CNF_TAG_3D_SURFACE_PARAM_S

[Syntax]

```
typedef struct ppCNF_TAG_3D_SURFACE_PARAM_S
{
    PP_U32 tag;
    PP_U32 length;

    PP_F32 wx;
    PP_F32 wy;
    PP_F32 wz;

    PP_F32 rx;
    PP_F32 ry;
    PP_F32 rz;
```

```
    PP_U32 zOffset;

    PP_U32 cx;
    PP_U32 cy;

}PP_CNF_TAG_3D_SURFACE_PARAM_S;
```

[Description]

data for 3d surface of the SVMconfig.bin that generated by the PC tool

Please refre to the documentations for details.
(PI5008K_ViewGenerationTool_v1.20.00_UserGuide_en.pptx / Page24.Appendix)
(PI5008K_SVM_Configuration_File_Format_v1.21.00.pptx)

[Member]

Please refre to the documentations for details.
(PI5008K_ViewGenerationTool_v1.20.00_UserGuide_en.pptx / Page24.Appendix)
(PI5008K_SVM_Configuration_File_Format_v1.21.00.pptx)

2.2.9. PP_CNF_TAG_STATIC_PGL_PARAM_S

[Syntax]

```
typedef struct ppCNF_TAG_STATIC_PGL_PARAM_S
{
    PP_U32 tag;
    PP_U32 length;

    PP_U32 numPoint;
    PP_U32 distMin;
    PP_U32 distNearMax;
    PP_U32 distMiddleMax;
```

```
    PP_U32 distFarMax;

    PP_U32 width;


}PP_CNF_TAG_STATIC_PGL_PARAM_S;
```

[Description]

data for STATIC PGL of the SVMconfig.bin that generated by the PC tool

Please refre to the documentations for details.
(PI5008K_ViewGenerationTool_v1.20.00_UserGuide_en.pptx / Page24.Appendix)
(PI5008K_SVM_Configuration_File_Format_v1.21.00.pptx)

[Member]

Please refre to the documentations for details.
(PI5008K_ViewGenerationTool_v1.20.00_UserGuide_en.pptx / Page24.Appendix)
(PI5008K_SVM_Configuration_File_Format_v1.21.00.pptx)

2.2.10. PP_CNF_TAG_DYNAMIC_PGL_PARAM_S

[Syntax]

```
typedef struct ppCNF_TAG_DYNAMIC_PGL_PARAM_S
{
    PP_U32 tag;

    PP_U32 length;


    PP_U32 numPoint;

    PP_U32 wheelBase;

    PP_U32 wheelBaseCy;

    PP_U32 distLRMin;

    PP_U32 distSideMin;
```

```
    PP_U32 distLRMax;

    PP_U32 distSideMax;

    PP_U32 width;


}PP_CNF_TAG_DYNAMIC_PGL_PARAM_S;
```

[Description]

data for DYNAMIC PGL of the SVMconfig.bin that generated by the PC tool

Please refre to the documentations for details.
(PI5008K_ViewGenerationTool_v1.20.00_UserGuide_en.pptx / Page24.Appendix)
(PI5008K_SVM_Configuration_File_Format_v1.21.00.pptx)

[Member]

Please refre to the documentations for details.
(PI5008K_ViewGenerationTool_v1.20.00_UserGuide_en.pptx / Page24.Appendix)
(PI5008K_SVM_Configuration_File_Format_v1.21.00.pptx)

2.2.11. PP_CNF_TAG_MD_SUBVIEW_PARAM_S

[Syntax]

```
typedef struct ppCNF_MD_SUBVIEW_PARAM_S

{

    PP_U32 tag;

    PP_U32 length;


    PP_U32 viewCount;


    PP_CNF_MD_SUBVIEW_PARAM_S subView[8]; // smoh check modif array num


}PP_CNF_MD_SUBVIEW_PARAM_S;
```

[Description]

data for SECTION of the SVMconfig.bin that generated by the PC tool

Please refre to the documentation for details.

(PI5008K_ViewGenerationTool_v1.20.00_UserGuide_en.pptx / Page24.Appendix)
(PI5008K_SVM_Configuration_File_Format_v1.21.00.pptx)

[Member]

Please refre to the documentation for details.
(PI5008K_ViewGenerationTool_v1.20.00_UserGuide_en.pptx / Page24.Appendix)
(PI5008K_SVM_Configuration_File_Format_v1.21.00.pptx)

2.2.12. PP_CNF_TAG_MD_VIEW_PARAM_S

[Syntax]

```
typedef struct ppCNF_TAG_MD_VIEW_PARAM_S
{
    PP_U32 tag;
    PP_U32 length;

    PP_U32 viewCount;

    PP_CNF_MD_SUBVIEW_PARAM_S subView[8];
}PP_CNF_TAG_MD_VIEW_PARAM_S;
```

[Description]

data for VIEW PARAM of the SVMconfig.bin that generated by the PC tool

Please refre to the documentation for details.
(PI5008K_ViewGenerationTool_v1.20.00_UserGuide_en.pptx / Page24.Appendix)
(PI5008K_SVM_Configuration_File_Format_v1.21.00.pptx)

The number of subview arrays must be the same as viewcount.

[Member]

Please refre to the documentation for details.
(PI5008K_ViewGenerationTool_v1.20.00_UserGuide_en.pptx / Page24.Appendix)
(PI5008K_SVM_Configuration_File_Format_v1.21.00.pptx)

2.2.13. PP_CNF_SWING_VIEW_PARAM_S

[Syntax]

```
typedef struct ppCNF_SWING_VIEW_PARAM_S
{
    PP_F32 virCamPosX;
    PP_F32 virCamPosY;
    PP_F32 virCamPosZ;
    PP_F32 virCamAngX;
    PP_F32 virCamAngY;
    PP_F32 virCamAngZ;

}PP_CNF_SWING_VIEW_PARAM_S;
```

[Description]

data for VIEW PARAM of the SVMconfig.bin that generated by the PC tool

Please refre to the documentation for details.
(PI5008K_ViewGenerationTool_v1.20.00_UserGuide_en.pptx / Page24.Appendix)
(PI5008K_SVM_Configuration_File_Format_v1.21.00.pptx)

Angle And Position information of the virtual camera related with swingview.

[Member]

Please refre to the documentation for details.
(PI5008K_ViewGenerationTool_v1.20.00_UserGuide_en.pptx / Page24.Appendix)
(PI5008K_SVM_Configuration_File_Format_v1.21.00.pptx)

2.2.14. PP_CNF_TAG_SWING_VIEW_PARAM_S

[Syntax]

```
typedef struct ppCNF_TAG_SWING_VIEW_PARAM_S
{
    PP_U32 tag;
    PP_U32 length;

    PP_U32 morphing;
    PP_U32 staticViewOnly;
    PP_U32 staticViewFBLRLut;
    PP_U32 nonftlSave;
    PP_U32 degreeInterval;
    PP_U32 flbInterval;
    PP_U32 staticView[360];
    PP_CNF_SWING_VIEW_PARAM_S CamParam[360];

}PP_CNF_TAG_SWING_VIEW_PARAM_S;
```

[Description]

data for VIEW PARAM of the SVMconfig.bin that generated by the PC tool

Please refre to the documentation for details.
(PI5008K_ViewGenerationTool_v1.20.00_UserGuide_en.pptx / Page24.Appendix)
(PI5008K_SVM_Configuration_File_Format_v1.21.00.pptx)

Swing view properties and swing view information.

[Member]

Please refre to the documentation for details.
(PI5008K_ViewGenerationTool_v1.20.00_UserGuide_en.pptx / Page24.Appendix)
(PI5008K_SVM_Configuration_File_Format_v1.21.00.pptx)

2.2.15. PP_CNF_TOTAL_BIN_FORMAT_S

[Syntax]

```
typedef struct ppCNF_TOTAL_BIN_FORMAT_S
{
    PP_CNF_TAG_CAMERA_PARAM_S frontCamera;
    PP_CNF_TAG_CAMERA_PARAM_S rearCamera;
    PP_CNF_TAG_CAMERA_PARAM_S leftCamera;
    PP_CNF_TAG_CAMERA_PARAM_S rightCamera;

    PP_CNF_TAG_BLEND_PARAM_S blend;

    PP_CNF_TAG_2D_SURFACE_PARAM_S Surface_2d;

    PP_CNF_TAG_3D_SURFACE_PARAM_S Surface_3d;

    PP_CNF_TAG_CYLINDRICAL_SURFACE_PARAM_S Surface_Cylindrical;

    PP_CNF_TAG_STATIC_PGL_PARAM_S staticParkingGuide;

    PP_CNF_TAG_DYNAMIC_PGL_PARAM_S dynamicParkingGuide;

    PP_CNF_TAG_MD_VIEW_PARAM_S mdViewHeader;

    PP_CNF_TAG_SWING_VIEW_PARAM_S swingView;

}PP_CNF_TOTAL_BIN_FORMAT_S;
```

[Description]

Total Structure of the SVMconfig.bin that generated by the PC tool

Please refre to the documentation for details.
(PI5008K_ViewGenerationTool_v1.20.00_UserGuide_en.pptx / Page24.Appendix)
(PI5008K_SVM_Configuration_File_Format_v1.21.00.pptx)

[Member]

Please refre to the documentation for details.
(PI5008K_ViewGenerationTool_v1.20.00_UserGuide_en.pptx / Page24.Appendix)
(PI5008K_SVM_Configuration_File_Format_v1.21.00.pptx)

2.2.16. PP_VIEWGEN_PROCESS_INFO_S

[Syntax]

```
typedef struct ppVIEWGEN_PROCESS_INFO_S
{
    PP_SECTION_VIEWGEN_PROCESS_STEP_E eSViewgen_Progress_Step;
} PP_VIEWGEN_PROCESS_INFO_S;
```

[Description]

Current process information of Section View generation

[Member]

Member	Description
eSViewgen_Progress_Step	Current step of Section View generation

2.3. API

2.3.1. pcvMalloc

[Syntax]

```
PP_VOID *pcvMalloc(PP_U32 IN size);
```

[Description]

memory allocation function which is used inside of offline calibration & view generation library

[Parameter]

Member	Description
PP_U32 IN size	memory size to be allocated

[Return]

Member	Description
PP_VOID *ptr	pointer address

2.3.2. pcvFree

[Syntax]

PP_VOID pcvFree(PP_VOID IN *ptr);

[Description]

Memory free function which is used inside of offline calibration and view generation library.

[Parameter]

Member	Description
PP_VOID IN *ptr	Memory address to be freed

[Return]

Member	Description
-	

2.3.3. PPAPI_Lib_Ext_Malloc

[Syntax]

PP_VOID *PPAPI_Lib_Ext_Malloc(PP_U32 IN size);

[Description]

Function to allocate Calibration Reserved memory

[Parameter]

Member	Description
PP_U32 IN size	memory size to be allocated

[Return]

Member	Description
PP_VOID *ptr	pointer address

2.3.4. PPAPI_Lib_Ext_Free

[Syntax]

PP_VOID PPAPI_Lib_Ext_Free(PP_VOID IN *ptr);

[Description]

Function to free allocated Calibration Reserved memory

[Parameter]

Member	Description
PP_VOID IN *ptr	memory address to be freed

[Return]

Member	Description
-	

2.3.5. PPAPI_Lib_Debug_Memory

[Syntax]

PP_VOID PPAPI_Lib_Debug_Memory(PP_VOID);

[Description]

Output the current status of Calibration Reserved Memory

[Parameter]

Member	Description
-	

[Return]

Member	Description
-	

2.3.6. PPAPI_Offcalib_Get_Pattern_Select

[Syntax]

```
PP_OFFCALIB_CAMERA_PATTERN_TYPE_SEL_E
PPAPI_Offcalib_Get_Pattern_Select(PP_VOID);
```

[Description]

Select Pattern Type(Main/Sub)

[Parameter]

Member	Description
-	

[Return]

Member	Description
eCALIB_PATTERN_MAIN	Main Pattern
eCALIB_PATTERN_SUB	Sub Pattern

2.3.7. PPAPI_Viewgen_Get_View_Blend_Param

[Syntax]

```
PP_RESULT_E
PPAPI_Viewgen_Get_View_Blend_Param(PCV_SVM_VIEW_BLEND_PARAM IN
*view_blend_param);
```

[Description]

Get blend parameter for View Generation

[Parameter]

Member	Description
PCV_SVM_VIEW_BLEND_PARAM IN *view_blend_param	Structure Pointer to save Blend Paramtert

[Return]

Member	Description
eSUCCESS	0, success
eERROR_FAILURE	1, fail (input buffer == NULL)

2.3.8. PPAPI_Viewgen_Get_View_Sur_2D_Param

[Syntax]

```
PP_RESULT_E
PPAPI_Viewgen_Get_View_Sur_2D_Param(PCV_SVM_VIEW_SURFACE_2D_PARAM IN
*view_sur_2d_param);
```

[Description]

Get 2D Surface Parameters for View Generation

[Parameter]

Member	Description
PCV_SVM_VIEW_SURFACE_2D_PARAM IN *view_sur_2d_param	Structure Pointer to save 2D surface

[Return]

Member	Description
eSUCCESS	0, success
eERROR_FAILURE	1, fail (input buffer == NULL)

2.3.9. PPAPI_Viewgen_Get_View_Sur_3D_Param

[Syntax]

```
PP_RESULT_E
PPAPI_Viewgen_Get_View_Sur_3D_Param(PCV_SVM_VIEW_SURFACE_3D_PARAM IN
*view_sur_3d_param);
```

[Description]

Get 3D Surface Parameters for View Generation

[Parameter]

Member	Description
PCV_SVM_VIEW_SURFACE_3D_PARAM IN *view_sur_3d_param	Structure Pointer to save 3D Surface

[Return]

Member	Description
eSUCCESS	0, success
eERROR_FAILURE	1, fail (input buffer == NULL)

2.3.10. PPAPI_Offcalib_Get_Cam_Intrinsic_Param

[Syntax]

PP_S32 PPAPI_Offcalib_Get_Cam_Intrinsic_Param(PCV_OFF_LINE_CALIB_CAMERA_PARAM IN * imp,PP_U8 IN camera_ch);

[Description]

Get Camera Intrinsic Data for Offline Calibration

[Parameter]

Member	Description
PCV_OFF_LINE_CALIB_CAMERA_PARAM IN * imp	structure pointer to save intrinsic data
PP_U8 IN camera_ch	camera channel

[Return]

Member	Description
eSUCCESS	0, success
eERROR_FAILURE	1, fail

2.3.11. PPAPI_Offcalib_Debug_Print_FeaturePoint

[Syntax]

```
PP_VOID
PPAPI_Offcalib_Debug_Print_FeaturePoint(PCV_OFF_LINE_CALIB_PATTERN_PARAM
IN * pat_param);
```

[Description]

For Feature Point Debugging

[Parameter]

Member	Description
PCV_OFF_LINE_CALIB_PATTERN_PARAM IN * pat_param	structure Calibration Pattern Param

[Return]

Member	Description

2.3.12. PPAPI_Offcalib_Debug_Print_Position

[Syntax]

```
PP_VOID
PPAPI_Offcalib_Debug_Print_Position(PCV_OFF_LINE_CALIB_CAMERA_PARAM IN *
imp);
```

[Description]

For Camera Position Debugging

[Parameter]

Member	Description
PCV_OFF_LINE_CALIB_CAMERA_PARAM IN * imp	structure pointer to save intrinsic data

[Return]

Member	Description

2.3.13. PPAPI_Offcalib_Get_Cnf

[Syntax]

PP_RESULT_E PPAPI_Offcalib_Get_Cnf(PCV_OFF_LINE_CALIB_PATTERN_PARAM IN * pat_param,PP_U8 IN camera_ch);

[Description]

Get pattern information for Offline Calibration

[Parameter]

Member	Description
PCV_OFF_LINE_CALIB_PATTERN_PARAM IN * pat_param	structure pointer to save pattern data
PP_U8 IN camera_ch	camera channel

[Return]

Member	Description
eSUCCESS	0, success
eERROR_FAILURE	1, fail

2.3.14. PPAPI_Offcalib_Save_Cam_Ch

[Syntax]

PP_VOID PPAPI_Offcalib_Save_Cam_Ch(PP_OFFCALIB_CAMERA_CAPTURE_CH_E IN ch);

[Description]

Save camera channel for which Offline Calibration will be done

[Parameter]

Member	Description
PP_OFFCALIB_CAMERA_CAPTURE_CH_E IN ch	camera channel

[Return]

Member	Description
-	

.

2.3.15. PPAPI_Offcalib_Get_Cam_Ch

[Syntax]

PP_OFFCALIB_CAMERA_CAPTURE_CH_E PPAPI_Offcalib_Get_Cam_Ch(PP_VOID)

[Description]

Get camera information for which Offline Calibration is being executed

[Parameter]

Member	Description
-	

[Return]

Member	Description
PP_OFFCALIB_CAMERA_CAPTURE_CH_E	camera channel

2.3.16. PPAPI_Offcalib_Set_Step_Send_Cmd

[Syntax]

PP_VOID PPAPI_Offcalib_Set_Step_Send_Cmd(PP_OFFCALIB_PROCESS_STEP_E IN step);

[Description]

Save Offline Calibartion step

[Parameter]

Member	Description
PP_OFFCALIB_PROCESS_STEP_E IN step	step

[Return]

Member	Description
-	

.

2.3.17. PPAPI_Offcalib_Get_Step_Send_Cmd

[Syntax]

PP_OFFCALIB_PROCESS_STEP_E PPAPI_Offcalib_Get_Step_Send_Cmd(PP_VOID);

[Description]

Get Offline Calibartion step

[Parameter]

Member	Description
-	

[Return]

Member	Description

PP_OFFCALIB_PROCESS_STEP_E	step

2.3.18. PPAPI_Offcalib_BMP_Image_Save_SD

[Syntax]

PP_VOID PPAPI_Offcalib_BMP_Image_Save_SD(PP_OFFCALIB_CAP_YUV_INFO_S IN *YuvBufInfo,PP_OFFCALIB_CAMERA_CAPTURE_CH_E IN ch);

[Description]

Save BMP image to SD card (Black & White Image)

[Parameter]

Member	Description
PP_OFFCALIB_CAP_YUV_INFO_S IN *YuvBufInfo	allocaed buffer address and size
PP_OFFCALIB_CAMERA_CAPTURE_CH_E IN ch	camera channel that user want to capture BMP image

[Return]

Member	Description
-	

2.3.19. PPAPI_Offcalib_Capture_YUV_Image_Save_SD

[Syntax]

PP_VOID PPAPI_Offcalib_Capture_YUV_Image_Save_SD(PP_OFFCALIB_CAP_YUV_INFO_S IN *YuvBufInfo,PP_OFFCALIB_CAMERA_CAPTURE_CH_E IN ch);

[Description]

Save captured image of Offline Calibration to SD Card

[Parameter]

Member	Description

PP_OFFCALIB_CAP_YUV_INFO_S IN *YuvBufInfo	Captured YUV buffer information
PP_OFFCALIB_CAMERA_CAPTURE_CH_E IN ch	Select Camera Channel select to be captured

[Return]

Member	Description
-	

2.3.20. PPAPI_Offcalib_Capture_YUV_Image

[Syntax]

PP_VOID PPAPI_Offcalib_Capture_YUV_Image(PP_OFFCALIB_CAP_YUV_INFO_S IN *YuvBufInfo,PP_OFFCALIB_CAMERA_CAPTURE_CH_E IN ch);

[Description]

Capture YUV image for Offline Calibration

[Parameter]

Member	Description
PP_OFFCALIB_CAP_YUV_INFO_S IN *YuvBufInfo	Buffer information to save captured Image
PP_OFFCALIB_CAMERA_CAPTURE_CH_E IN ch	Camera Channel to be saved

[Return]

Member	Description
-	

2.3.21. PPAPI_Viewgen_Get_Cam_Param

[Syntax]

PP_S32 PPAPI_Viewgen_Get_Cam_Param(PCV_SVM_VIEW_CAMERA_PARAM IN * camera_param,PP_U8 IN camera_ch);

[Description]

Get Intrinsic data and Extrinsic Data fuction for Section View Generation

[Parameter]

Member	Description
PCV_SVM_VIEW_CAMERA_PARAM IN * camera_param	Camera Param Structure Pointer for Section View Generation
PP_U8 IN camera_ch	Camera Channel select want to get info

[Return]

Member	Description
0	success
-1	fail

2.3.22. PPAPI_Offcalib_Capture_YUV_Imgae_Save_Buf

[Syntax]

PP_VOID PPAPI_Offcalib_Capture_YUV_Imgae_Save_Buf(PP_OFFCALIB_CAP_YUV_INFO_S IN *YuvBufInfo,PP_OFFCALIB_CAMERA_CAPTURE_CH_E IN ch);

[Description]

Function to copy captured yuv data to global buffer

[Parameter]

Member	Description
PP_OFFCALIB_CAP_YUV_INFO_S IN *YuvBufInfo	capturd yuv buffer info
PP_OFFCALIB_CAMERA_CAPTURE_CH_E IN ch	camera channel that want to save

[Return]

Member	Description
-	

2.3.23. PPAPI_Viewgen_Get_External_Value

[Syntax]

PP_RESULT_E PPAPI_Viewgen_Get_External_Value(PP_VOID);

[Description]

Get configuration Data to generate view mode.

Allocate buffers for Intrinsic & Extrinsic data, Blend value, 2D/3D surface data and required for library.

[Parameter]

Member	Description
-	

[Return]

Member	Description
eSUCCESS	0, success
eERROR_FAILURE	1, fail

2.3.24. PPAPI_Viewgen_Make_Top_2d_FB_LUT

[Syntax]

PP_VOID PPAPI_Viewgen_Make_Top_2d_FB_LUT(PP_VOID);

[Description]

Generate FB lut for 2D Top View

[Parameter]

Member	Description
-	

[Return]

Member	Description
-	

2.3.25. PPAPI_Viewgen_Make_Top_2d_LR_LUT

[Syntax]

PP_VOID PPAPI_Viewgen_Make_Top_2d_LR_LUT(PP_VOID);

[Description]

Generate LR lut of 2D Top View

[Parameter]

Member	Description
-	

[Return]

Member	Description
-	

2.3.26. PPAPI_Viewgen_Make_RS_3D_FB_LUT

[Syntax]

PP_VOID PPAPI_Viewgen_Make_ RS_3D_FB _LUT(PP_VOID);

[Description]

Generate FB lut for 3D view which is displayed on the right side of screen.

[Parameter]

Member	Description
-	

[Return]

Member	Description
-	

2.3.27. PPAPI_Viewgen_Make_RS_SD_FB_LUT

[Syntax]

PP_VOID PPAPI_Viewgen_Make_ RS_SD_FB _LUT(PP_VOID);

[Description]

Generate FB lut for SD view which is displayed on the right side of screen.

[Parameter]

Member	Description
-	

[Return]

Member	Description
-	

2.3.28. PPAPI_Viewgen_Make_RS_UNDIS_FB_LUT

[Syntax]

PP_VOID PPAPI_Viewgen_Make_ RS_UNDIS_FB _LUT(PP_VOID);

[Description]

Generate FB lut for UNDISTORT CAM view which is displayed on the right side of screen.

[Parameter]

Member	Description
-	

[Return]

Member	Description

-	

2.3.29. PPAPI_Viewgen_Make_RS_CYLIND_FB_LUT

[Syntax]

PP_VOID PPAPI_Viewgen_Make_ RS_CYLIND_FB _LUT(PP_VOID);

[Description]

Generate FB lut for CYLINDARICAL view which is displayed on the right side of screen.

[Parameter]

Member	Description
-	

[Return]

Member	Description
-	

2.3.30. PPAPI_Viewgen_Make_RS_3D_LR_LUT

[Syntax]

PP_VOID PPAPI_Viewgen_Make_RS_3D_LR_LUT(PP_VOID);

[Description]

Generate LR lut for 3D view which is displayed on the right side of screen.

[Parameter]

Member	Description
-	

[Return]

Member	Description

-	

2.3.31. PPAPI_Viewgen_Make_RS_SD_LR_LUT

[Syntax]

PP_VOID PPAPI_Viewgen_Make_RS_SD_LR_LUT(PP_VOID);

[Description]

Generate LR lut for SD view which is displayed on the right side of screen.

[Parameter]

Member	Description
-	

[Return]

Member	Description
-	

2.3.32. PPAPI_Viewgen_Make_RS_UNDIS_LR_LUT

[Syntax]

PP_VOID PPAPI_Viewgen_Make_RS_UNDIS_LR_LUT(PP_VOID);

[Description]

Generate LR lut for UNDISTORT CAM view which is displayed on the right side of screen.

[Parameter]

Member	Description
-	

[Return]

Member	Description
-	

2.3.33. PPAPI_Viewgen_Make_RS_CYLIND_LR_LUT

[Syntax]

PP_VOID PPAPI_Viewgen_Make_RS_CYLIND_LR_LUT(PP_VOID);

[Description]

Generate LR lut for CYLINDALICAL view which is displayed on the right side of screen.

[Parameter]

Member	Description
-	

[Return]

Member	Description
-	

2.3.34. PPAPI_Viewgen_Free_Global_Values

[Syntax]

PP_VOID PPAPI_Viewgen_Free_Global_Values(PP_VOID);

[Description]

Free 2d,3d surface buffer used by all sections

[Parameter]

Member	Description
-	

[Return]

Member	Description
-	

2.3.35. PPAPI_Viewgen_Free_2DTOP_Values

[Syntax]

PP_VOID PPAPI_Viewgen_Free_2DTOP_Values(PP_VOID);

[Description]

Free Section of buffer used to create 2D TOP section LUT

[Parameter]

Member	Description
-	

[Return]

Member	Description
-	

2.3.36. PPAPI_Viewgen_Free_3D_Values

[Syntax]

PP_VOID PPAPI_Viewgen_Free_3D_Values(PP_VOID);

[Description]

Free Section of buffer used to create 3D section LUT

[Parameter]

Member	Description
-	

[Return]

Member	Description
-	

2.3.37. PPAPI_Viewgen_Free_UNDIS_Values

[Syntax]

PP_VOID PPAPI_Viewgen_Free_UNDIS_Values(PP_VOID);

[Description]

Free Section of buffer used to create CAM section LUT

[Parameter]

Member	Description
-	

[Return]

Member	Description
-	

2.3.38. PPAPI_Viewgen_Free_CYLIND_Values

[Syntax]

PP_VOID PPAPI_Viewgen_Free_CYLIND_Values(PP_VOID);

[Description]

Free Section of buffer used to create CYLINDARICAL section LUT

[Parameter]

Member	Description
-	

[Return]

Member	Description
-	

2.3.39. PPAPI_Section_Viewgen_Preapare_Make

[Syntax]

PP_RESULT_E PPAPI_Section_Viewgen_Prepare_Make(PP_U32 section_num);

[Description]

Prepare to create Section LUT

[Parameter]

Member	Description
PP_U32 section_num	Section Number to create the LUT

[Return]

Member	Description
eSUCCESS	0,success
eERROR_FAILURE	1,fail

2.3.40. PPAPI_Section_Viewgen_Set_Step_Send_Cmd

[Syntax]

PP_VOID PPAPI_Section_Viewgen_Set_Step_Send_Cmd(PP_SECTION_VIEWGEN_PROCESS_STEP_E IN step);

[Description]

The section view process step is saved in this function.

if you specify an input step, the value is stored in

“Viewgen_Process_Info.eSViewgen_Progress_Step”,

and the stored step can be called via the Get function.

[Parameter]

Member	Description

PP_SECTION_VIEWGEN_PROCESS_STEP_E IN step	Section View Process step

[Return]

Member	Description
eSUCCESS	0,success
eERROR_FAILURE	1,fail

2.3.41. PPAPI_Section_Viewgen_Get_Step_Send_Cmd

[Syntax]

PP_SECTION_VIEWGEN_PROCESS_STEP_E PPAPI_Section_Viewgen_Get_Step_Send_Cmd(PP_VOID)

[Description]

Get the Section view process step value.

[Parameter]

Member	Description
-	

[Return]

Member	Description
PP_SECTION_VIEWGEN_PROCESS_STEP_E	section viewgeneration process step

2.3.42. PPAPI_Section_Viewgen_Update

[Syntax]

PP_VOID PPAPI_Section_Viewgen_Update(PP_U32 IN u32Section_num, PP_U32 IN FB_ADDR,PP_U32 IN LR_ADDR);

[Description]

Update Section LUT

[Parameter]

Member	Description
PP_U32 IN u32Section_num	section number you want to update
PP_U32 IN FB_ADDR	FB lut Address (not yet sampled)
PP_U32 IN LR_ADDR	LR lut Address (not yet sampled)

[Return]

Member	Description
-	

2.3.43. PPAPI_Lib_Progressbar_Processing

[Syntax]

```
PP_VOID PPAPI_Lib_Progressbar_Processing(PP_VOID);
```

[Description]

Control Progressbar global values

[Parameter]

Member	Description
-	

[Return]

Member	Description
-	

2.3.44. PPAPI_Lib_Calib_Initialize

[Syntax]

PP_VOID PPAPI_Lib_Calib_Initialize(PP_VOID);

[Description]

Load SVMconfig.bin data from Flash.

It saved in “Calib_Cnf_Bin”

[Parameter]

Member	Description
-	

[Return]

Member	Description
-	

2.3.45. PPAPI_Section_Viewgen_Get_ViewType

[Syntax]

PP_U32 PPAPI_Section_Viewgen_Get_ViewType(PP_U32 section_num);

[Description]

If you input Section number, Can get type of Section.

[Parameter]

Member	Description
PP_U32 section_num	Section view number

[Return]

Member	Description
PP_U32	View type (0 : 2D, 1 : 3D, 2 : SD,

	3:Cam ,4 : 360 View)

2.3.46. PPAPI_Section_Viewgen_Get_CamType

[Syntax]

PP_U32 PPAPI_Section_Viewgen_Get_CamType (PP_U32 section_num);

[Description]

If you input Section number, Can get Camera type of Input Section.

[Parameter]

Member	Description
PP_U32 section_num	Section view number

[Return]

Member	Description
PP_U32	Camera Type (0:front, 1:left, 2:rear, 3:right, 4:all)

2.3.47. pvMemMangCALIBMalloc

[Syntax]

PP_VOID *pvMemMangCALIBMalloc(size_t xWantedSize);

[Description]

memory allocation within preset calibration reserved memory area

[Parameter]

Member	Description
size_t xWantedSize	wanted size to allocate

[Return]

Member	Description
PP_VOID *	allocated pointer address

2.3.48. vMemMangCALIBFree

[Syntax]

PP_VOID vMemMangCALIBFree(PP_VOID *pv);

[Description]

free allocated calibration memory

[Parameter]

Member	Description
PP_VOID *pv	allocated pointer address

[Return]

Member	Description
-	

2.3.49. xMemMangCALIBGetFreeSize

[Syntax]

size_t xMemMangCALIBGetFreeSize(PP_VOID);

[Description]

get free size of calibration reserved memory area

[Parameter]

Member	Description
-	

[Return]

Member	Description
size_t	free size of calibration reserved memory area

2.3.50. xMemMangCALIBGetMinimumEverFreeSize

[Syntax]

```
size_t xMemMangCALIBGetMinimumEverFreeSize( PP_VOID );
```

[Description]

get minimum free size of calibration reserved memory area

[Parameter]

Member	Description
-	

[Return]

Member	Description
size_t	minimum free size of calibration reserved memory area

2.3.51. prvMemMangCalibInit

[Syntax]

```
PP_VOID prvMemMangCALIBInit( PP_VOID );
```

[Description]

Initialize Memory Manager of Calibration Reserved Memory Area

[Parameter]

Member	Description
-	

[Return]

Member	Description
-	

2.3.52. PPAPI_Viewgen_SectionLUT_Update

[Syntax]

STATIC PP_BOOL PPAPI_Viewgen_SectionLUT_Update(PP_U32 IN u32SectionIndex, PP_SVMMEM_SECTION_DATA_E IN enSectionType, PP_U32* IN pu32SectionData, PP_U32 u32SectionDataSize)

[Description]

update sapling LUT Data

[Parameter]

Member	Description
PP_U32 IN u32SectionIndex	section number

PP_SVMMEM_SECTION_DATA_E IN enSectionType	eSVMMEM_SECTION_DATA_FB_ODD = 0,
	// front & rear odd lut
	eSVMMEM_SECTION_DATA_FB_EVEN=1,
	// front & rear even lut
	eSVMMEM_SECTION_DATA_LR_ODD=2,
	// left & right odd lut
	eSVMMEM_SECTION_DATA_LR_EVEN=3,
	// left & right even lut
	eSVMMEM_SECTION_DATA_BC_ODD=4,
	// brightness control odd lut
	eSVMMEM_SECTION_DATA_BC_EVEN=5,
	// brightness control even lut
	eSVMMEM_SECTION_DATA_IMG_ODD=6,
	// odd shadow image

	eSVMMEM_SECTION_DATA_IMG_EVEN=7, // even shadow image
PP_U32* IN pu32SectionData	sampling lut address
PP_U32 u32SectionDataSize	sampling lut size

[Return]

Member	Description
PP_TRUE	1
PP_FALSE	0

2.3.53. PPAPI_Viewgen_SectionLUT_GetSamplingDataSize

[Syntax]

STATIC PP_U32 PPAPI_Viewgen_SectionLUT_GetSamplingDataSize(PP_U16 IN u16SectionWidth, PP_U16 IN u16SectionHeight)

[Description]

Sampling LUT Data

[Parameter]

Member	Description
PP_U16 IN u16SectionWidth	section width
PP_U16 IN u16SectionHeight	section height

[Return]

Member	Description
u32Size	size of sampling lut

3. Revision History

Version	Date	Description
v0.1	20180608	1st draft
v0.2	20180719	
v0.3	20180726	
v0.4	20181107	
v0.5	20181204	