



mamba RealTime Api Reference Manual

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Contents

| | | |
|----------|--|-----------|
| 1 | Data Structures | 4 |
| 2 | File List | 4 |
| 3 | MB_Image Struct Reference | 4 |
| 3.1 | Detailed Description | 4 |
| 3.2 | Field Documentation | 4 |
| 3.2.1 | BITPPIX | 4 |
| 3.2.2 | NUMCOL | 4 |
| 3.2.3 | PIXARRAY | 4 |
| 3.2.4 | PLINES | 5 |
| 4 | MBRT_VideoAcq Struct Reference | 7 |
| 5 | mambaCommon.h File Reference | 8 |
| 5.1 | Detailed Description | 8 |
| 5.2 | Define Documentation | 8 |
| 5.2.1 | MB_X_LEFT | 8 |
| 5.2.2 | MB_X_RIGHT | 9 |
| 5.2.3 | MB_Y_BOTTOM | 9 |
| 5.2.4 | MB_Y_TOP | 9 |
| 5.3 | Typedef Documentation | 9 |
| 5.3.1 | PIX32 | 9 |
| 5.3.2 | PIX8 | 9 |
| 5.3.3 | PLINE | 9 |
| 5.3.4 | PLINE32 | 9 |
| 5.3.5 | Sint16 | 9 |
| 5.3.6 | Sint32 | 9 |
| 5.3.7 | Sint8 | 9 |
| 5.3.8 | Uint16 | 9 |
| 5.3.9 | Uint32 | 9 |
| 5.3.10 | Uint8 | 9 |
| 6 | mambaRTApi.h File Reference | 10 |
| 6.1 | Detailed Description | 10 |
| 6.2 | Enumeration Type Documentation | 10 |
| 6.2.1 | MBRT_eventcode | 10 |
| 6.3 | Function Documentation | 10 |
| 6.3.1 | MBRT_CreateDisplay | 10 |
| 6.3.2 | MBRT_CreateVideoAcq | 11 |
| 6.3.3 | MBRT_DestroyDisplay | 11 |
| 6.3.4 | MBRT_DestroyVideoAcq | 11 |
| 6.3.5 | MBRT_GetAcqSize | 11 |
| 6.3.6 | MBRT_GetImageFromAcq | 11 |
| 6.3.7 | MBRT_PaletteDisplay | 11 |
| 6.3.8 | MBRT_PollDisplay | 12 |
| 6.3.9 | MBRT_StartAcq | 12 |
| 6.3.10 | MBRT_StopAcq | 12 |
| 6.3.11 | MBRT_UpdateDisplay | 12 |
| 7 | mambaRTApi_loc.h File Reference | 13 |
| 7.1 | Detailed Description | 13 |
| 7.2 | Variable Documentation | 13 |
| 7.2.1 | color_palette | 13 |
| 7.2.2 | isPalettized | 13 |
| 7.2.3 | MBRT_acqDevice | 13 |
| 7.2.4 | MBRT_screen | 13 |

| | | |
|-----------|---|-----------|
| 7.2.5 | standard_palette | 13 |
| 8 | MBRT_Display.cpp File Reference | 14 |
| 8.1 | Detailed Description | 14 |
| 8.2 | Function Documentation | 14 |
| 8.2.1 | MBRT_CreateDisplay | 14 |
| 8.2.2 | MBRT_DestroyDisplay | 15 |
| 8.2.3 | MBRT_PaletteDisplay | 15 |
| 8.2.4 | MBRT_PollDisplay | 15 |
| 8.2.5 | MBRT_UpdateDisplay | 15 |
| 8.3 | Variable Documentation | 15 |
| 8.3.1 | color_palette | 15 |
| 8.3.2 | isPalettized | 15 |
| 8.3.3 | MBRT_screen | 15 |
| 8.3.4 | standard_palette | 15 |
| 9 | MBRT_error.cpp File Reference | 16 |
| 9.1 | Detailed Description | 16 |
| 9.2 | Function Documentation | 16 |
| 9.2.1 | MBRT_StrErr | 16 |
| 9.3 | Variable Documentation | 16 |
| 9.3.1 | err_str | 16 |
| 10 | MBRT_error.h File Reference | 17 |
| 10.1 | Detailed Description | 17 |
| 10.2 | Enumeration Type Documentation | 17 |
| 10.2.1 | MBRT_errcode | 17 |
| 10.3 | Function Documentation | 17 |
| 10.3.1 | MBRT_StrErr | 17 |
| 11 | MBRT_VideoAcq.cpp File Reference | 18 |
| 11.1 | Detailed Description | 18 |
| 11.2 | Define Documentation | 18 |
| 11.2.1 | RETURN_ON_ERR | 18 |
| 11.3 | Function Documentation | 18 |
| 11.3.1 | MBRT_CreateVideoAcq | 18 |
| 11.3.2 | MBRT_DestroyVideoAcq | 18 |
| 11.3.3 | MBRT_GetAcqSize | 19 |
| 11.3.4 | MBRT_GetImageFromAcq | 19 |
| 11.3.5 | MBRT_StartAcq | 19 |
| 11.3.6 | MBRT_StopAcq | 19 |
| 11.4 | Variable Documentation | 19 |
| 11.4.1 | MBRT_acqDevice | 19 |

List of Figures

| | | |
|---|---|---|
| 1 | Image structure and variables | 6 |
|---|---|---|

Data Structure Index

1 Data Structures

Here are the data structures with brief descriptions:

| | |
|----------------------|----------|
| MB_Image | 4 |
| MBRT_VideoAcq | 7 |
| File Index | |

2 File List

Here is a list of all documented files with brief descriptions:

| | |
|------------------------------|-----------|
| mambaCommon.h | 8 |
| mambaRTApi.h | 10 |
| mambaRTApi_loc.h | 13 |
| MBRT_Display.cpp | 14 |
| MBRT_error.cpp | 16 |
| MBRT_error.h | 17 |
| MBRT_VideoAcq.cpp | 18 |
| Data Structure Documentation | |

3 MB_Image Struct Reference

```
#include <mambaCommon.h>
```

Data Fields

- unsigned int **BITPPIX**
- unsigned int **NUMCOL**
- **PLINE * PLINES**
- **PIX8 * PIXARRAY**

3.1 Detailed Description

Images structure with the depth (**BITPPIX**); the pixels array (**PIXARRAY**) and entry point array to each line of the image (**PLINES**)

3.2 Field Documentation

3.2.1 unsigned int **MB_Image::BITPPIX**

The depth of the image

3.2.2 unsigned int **MB_Image::NUMCOL**

number of colors used

3.2.3 **PIX8*** **MB_Image::PIXARRAY**

pixel array

3.2.4 `PLINE*` `MB_Image::PLINES`

accessors to pixel lines

The documentation for this struct was generated from the following file:

- `mambaCommon.h`

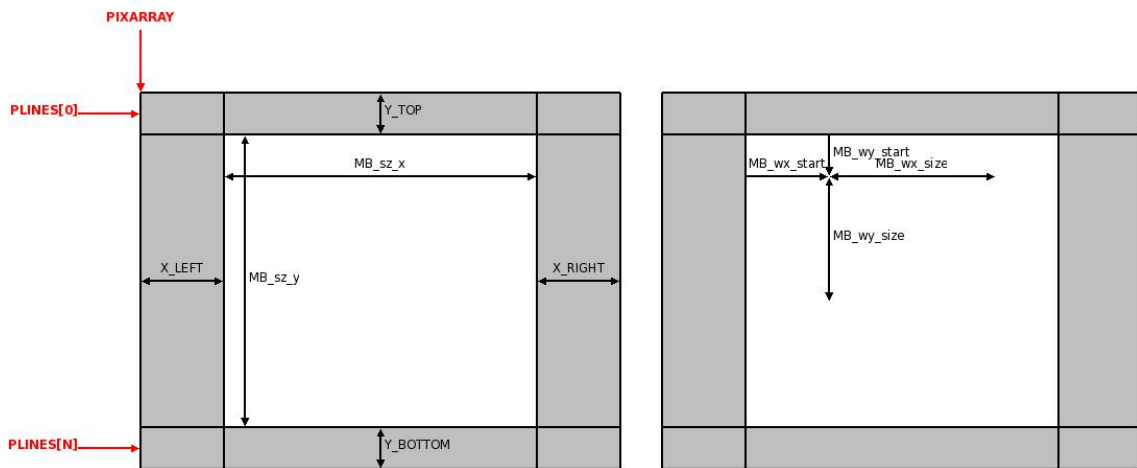


Figure 1: Image structure and variables

4 MBRT_VideoAcq Struct Reference

Data Fields

- IGraphBuilder * **pGraph**
- ICaptureGraphBuilder2 * **pBuild**
- IBaseFilter * **pCap**
- ISampleGrabber * **pGrab**
- IMediaControl * **pCtrl**
- int **devnum**
- int **w**
- int **h**
- int **size**
- void * **buffer**

The documentation for this struct was generated from the following file:

- **mambaRTApi_loc.h**

File Documentation

5 mambaCommon.h File Reference

```
#include <stdint.h>
```

Data Structures

- struct `MB_Image`

Defines

- `#define MB_X_LEFT(im) X_LEFT`
- `#define MB_X_RIGHT(im) X_RIGHT`
- `#define MB_Y_TOP(im) Y_TOP`
- `#define MB_Y_BOTTOM(im) Y_BOTTOM`

Typedefs

- `typedef uint8_t UInt8`
- `typedef uint16_t UInt16`
- `typedef uint32_t UInt32`
- `typedef int8_t Sint8`
- `typedef int16_t Sint16`
- `typedef int32_t Sint32`
- `typedef uint8_t PIX8`
- `typedef PIX8 * PLINE`
- `typedef int32_t PIX32`
- `typedef PIX32 * PLINE32`

5.1 Detailed Description

Date:

31-03-2009

This file contains the various definitions, macro, struct that are commons between the various modules of the library

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5.2 Define Documentation

5.2.1 `#define MB_X_LEFT(im) X_LEFT`

Getting image frame offset from left

5.2.2 `#define MB_X_RIGHT(im) X_RIGHT`

Getting image frame offset from right

5.2.3 `#define MB_Y_BOTTOM(im) Y_BOTTOM`

Getting image frame offset from bottom

5.2.4 `#define MB_Y_TOP(im) Y_TOP`

Getting image frame offset from top

5.3 Typedef Documentation

5.3.1 `typedef int32_t PIX32`

Signed 32-bit pixels value type

5.3.2 `typedef uint8_t PIX8`

grey-scale pixels value type

5.3.3 `typedef PIX8* PLINE`

Pixels line pointers type

5.3.4 `typedef PIX32* PLINE32`

32-bit pixels line pointers type

5.3.5 `typedef int16_t Sint16`

Signed 16 bit value type

5.3.6 `typedef int32_t Sint32`

Signed 32 bit value type

5.3.7 `typedef int8_t Sint8`

Signed 8 bit value type

5.3.8 `typedef uint16_t Uint16`

Unsigned 16 bit value type

5.3.9 `typedef uint32_t Uint32`

Unsigned 32 bit value type

5.3.10 `typedef uint8_t Uint8`

Unsigned 8 bit value type

6 mambaRTApi.h File Reference

```
#include "mambaCommon.h"
#include "MBRT_error.h"
#include <dshow.h>
```

Enumerations

- enum MBRT_eventcode { NO_EVENT, EVENT_CLOSE, EVENT_PROCESS }

Functions

- MBRT_errcode MBRT_CreateVideoAcq (int device)
- MBRT_errcode MBRT_DestroyVideoAcq (void)
- MBRT_errcode MBRT_GetAcqSize (int *acq_w, int *acq_h)
- MBRT_errcode MBRT_GetImageFromAcq (MB_Image *dest)
- MBRT_errcode MBRT_StartAcq ()
- MBRT_errcode MBRT_StopAcq ()
- MBRT_errcode MBRT_CreateDisplay (int w, int h)
- MBRT_errcode MBRT_DestroyDisplay (void)
- MBRT_errcode MBRT_UpdateDisplay (MB_Image *src, double wfps, double *ofps)
- MBRT_errcode MBRT_PaletteDisplay (Uint8 *palette)
- MBRT_errcode MBRT_PollDisplay (MBRT_eventcode *event_code)

6.1 Detailed Description

Date:

03-27-2009

This file contains the various definitions, global variables macro, struct and functions created for the library.

6.2 Enumeration Type Documentation

6.2.1 enum MBRT_eventcode

Type definition for display event code

Enumerator:

- NO_EVENT* No events
- EVENT_CLOSE* Close event occurs when the user closes the window or presses esc inside it
- EVENT_PROCESS* Event to toggle on/off the process

6.3 Function Documentation

6.3.1 MBRT_errcode MBRT_CreateDisplay (int w, int h)

Initialize SDL and creates the video display (SDL screen)

Parameters:

- w* width of the display (resolution)
- h* height of the display (resolution)

Returns:

An error code (NO_ERR if successful)

6.3.2 MBRT_errcode MBRT_CreateVideoAcq (int *device*)

Filled the video acquisition structure with the parameters of the given device and initialize it.

Parameters:

device the video device (usually 0)

Returns:

an error code (NO_ERR if successful)

6.3.3 MBRT_errcode MBRT_DestroyDisplay (void)

Destroy the video display (SDL screen) and quit SDL

Returns:

An error code (NO_ERR if successful)

6.3.4 MBRT_errcode MBRT_DestroyVideoAcq (void)

Close the acquisition device and reset the structure

Returns:

NO_ERR if successful

6.3.5 MBRT_errcode MBRT_GetAcqSize (int * *acq_w*, int * *acq_h*)

Returns the acquisition device resolution.

Parameters:

acq_w the width (output)

acq_h the height (output)

Returns:

NO_ERR if successful

6.3.6 MBRT_errcode MBRT_GetImageFromAcq (MB_Image * *dest*)

Obtains an image from the acquisition device

Parameters:

dest the mamba image filled by the device

Returns:

NO_ERR if successful

6.3.7 MBRT_errcode MBRT_PaletteDisplay (Uint8 * *palette*)

Change the palette associated with the display

Parameters:

palette an array containing the complete palette definition (256*3 integers)

Returns:

An error code (NO_ERR if successful)

6.3.8 MBRT_errcode MBRT_PollDisplay (MBRT_eventcode * *event_code*)

Handles event that have occurred in the display

Parameters:

event_code an integer representing a specific event (output)

Returns:

An error code (NO_ERR if successful)

6.3.9 MBRT_errcode MBRT_StartAcq ()

Starts the acquisition device capture process

Returns:

NO_ERR if successful

6.3.10 MBRT_errcode MBRT_StopAcq ()

Stops the acquisition device capture process

Returns:

NO_ERR if successful

6.3.11 MBRT_errcode MBRT_UpdateDisplay (MB_Image * *src*, double *wfps*, double * *ofps*)

Update the display with the content of a given mamba image structure

Parameters:

src the image displayed

wfps input the desired framerate

ofps output the framerate

Returns:

An error code (NO_ERR if successful)

7 mambaRTApi_loc.h File Reference

```
#include <qedit.h>
#include "mambaRTApi.h"
#include <SDL.h>
```

Data Structures

- struct **MBRT_VideoAcq**

Variables

- **MBRT_VideoAcq * MBRT_acqDevice**
- **SDL_Surface * MBRT_screen**
- **SDL_Color color_palette [256]**
- **SDL_Color standard_palette [256]**
- **Uint32 isPalettized**

7.1 Detailed Description

Date:

03-27-2009

This file contains the various definitions, global variables macro, struct and functions that are shared between components of the library but are not meant to be exported to the outside world.

7.2 Variable Documentation

7.2.1 **SDL_Color color_palette[256]**

Color palette associated to the screen

7.2.2 **Uint32 isPalettized**

indicates if the display use the color palette

7.2.3 **MBRT_VideoAcq* MBRT_acqDevice**

Structure holding the acquisition device information

7.2.4 **SDL_Surface* MBRT_screen**

pointer to the SDL surface (display screen)

7.2.5 **SDL_Color standard_palette[256]**

Standard greyscale palette associated to the screen

8 MBRT_Display.cpp File Reference

```
#include "mambaRTApi_loc.h"
```

Defines

- #define **MBRT_TITLE** "Mamba RealTime"
- #define **FRAME_COLOR** 0xffffffff
- #define **FPS_VALUE_COLOR** 0xffffffff
- #define **FPS_THICKNESS** 3
- #define **FPS_MEAN_SIZE** 20
- #define **HISTO_BLACKENING** 60
- #define **HISTO_COLOR** 0xffffffff

Functions

- **MBRT_errcode** **MBRT_CreateDisplay** (int *w*, int *h*)
- **MBRT_errcode** **MBRT_DestroyDisplay** ()
- **MBRT_errcode** **MBRT_UpdateDisplay** (**MB_Image** *src, double wfps, double *ofps)
- **MBRT_errcode** **MBRT_PaletteDisplay** (**Uint8** *palette)
- **MBRT_errcode** **MBRT_PollDisplay** (**MBRT_eventcode** *event_code)

Variables

- **SDL_Surface** * **MBRT_screen** = NULL
- **Uint32** **MBRT_sz_x** = 0
- **Uint32** **MBRT_sz_y** = 0
- **SDL_Color** **color_palette** [256]
- **SDL_Color** **standard_palette** [256]
- **Uint32** **isPalettized**
- **Uint32** **last_call**
- **Uint32** **isFpsDisplayed**
- double **old_fps** [FPS_MEAN_SIZE]
- int **index_fps**
- **Uint32** **histo** [256]
- **Uint32** **isHistoDisplayed**

8.1 Detailed Description

Author:

Nicolas Beucher

Date:

03-29-2009

8.2 Function Documentation

8.2.1 **MBRT_errcode** **MBRT_CreateDisplay** (int *w*, int *h*)

Initialize SDL and creates the video display (SDL screen)

Parameters:

- w* width of the display (resolution)
- h* height of the display (resolution)

Returns:

An error code (NO_ERR if successful)

8.2.2 MBRT_errcode MBRT_DestroyDisplay (void)

Destroy the video display (SDL screen) and quit SDL

Returns:

An error code (NO_ERR if successful)

8.2.3 MBRT_errcode MBRT_PaletteDisplay (Uint8 * *palette*)

Change the palette associated with the display

Parameters:

palette an array containing the complete palette definition (256*3 integers)

Returns:

An error code (NO_ERR if successful)

8.2.4 MBRT_errcode MBRT_PollDisplay (MBRT_eventcode * *event_code*)

Handles event that have occurred in the display

Parameters:

event_code an integer representing a specific event (output)

Returns:

An error code (NO_ERR if successful)

8.2.5 MBRT_errcode MBRT_UpdateDisplay (MB_Image * *src*, double *wfps*, double * *ofps*)

Update the display with the content of a given mamba image structure

Parameters:

src the image displayed

wfps input the desired framerate

ofps output the framerate

Returns:

An error code (NO_ERR if successful)

8.3 Variable Documentation

8.3.1 SDL_Color color_palette[256]

Color palette associated to the screen

8.3.2 Uint32 isPalettized

indicates if the display use the color palette

8.3.3 SDL_Surface* MBRT_screen = NULL

pointer to the SDL surface (display screen)

8.3.4 SDL_Color standard_palette[256]

Standard greyscale palette associated to the screen

9 MBRT_ error.cpp File Reference

```
#include "MBRT_error.h"
```

Functions

- char * MBRT_ StrErr (MBRT_ errcode error_ nb)

Variables

- char * err_ str []

9.1 Detailed Description

Author:

Nicolas Beucher

Date:

3-28-2009

9.2 Function Documentation

9.2.1 char* MBRT_ StrErr (MBRT_ errcode *error_ nb*)

Returns an explanation of the error code

9.3 Variable Documentation

9.3.1 char* err_ str[]

Initial value:

```
{
    "No error",
    "Acquisition device error",
    "Initialize display error (SDL)",
    "Locking screen for updating failure",
    "Unsupported palette format",
    "Incompatible depth for realtime acquisition/display"
}
```

Error value interpretation

10 MBRT_error.h File Reference

Enumerations

- enum MBRT_errcode {
 NO_ERR, ERR_VID, ERR_INIT_DISPLAY, ERR_LOCK_DISPLAY,
 ERR_PAL_VID, ERR_DEPTH }

Functions

- char * MBRT_StrErr (MBRT_errcode error_nb)

10.1 Detailed Description

Date:

3-28-2009

This file contains the complete list of error code returned by the API functions.

10.2 Enumeration Type Documentation

10.2.1 enum MBRT_errcode

Type definition for error code

Enumerator:

NO_ERR Value returned by function when no error was encountered.

ERR_VID Video acquisition module error

ERR_INIT_DISPLAY Init SDL display error

ERR_LOCK_DISPLAY Locking screen for updating failure

ERR_PAL_VID Unsupported palette format

ERR_DEPTH The depth of the mamba image given in argument is incompatible

10.3 Function Documentation

10.3.1 char* MBRT_StrErr (MBRT_errcode error_nb)

Returns an explanation of the error code

11 MBRT_VideoAcq.cpp File Reference

```
#include "mambaRTApi_loc.h"
```

Defines

- #define RETURN_ON_ERR(hr, err_type)

Functions

- MBRT_errcode MBRT_CreateVideoAcq (int device)
- MBRT_errcode MBRT_StopAcq ()
- MBRT_errcode MBRT_StartAcq ()
- MBRT_errcode MBRT_GetImageFromAcq (MB_Image *dest)
- MBRT_errcode MBRT_DestroyVideoAcq ()
- MBRT_errcode MBRT_GetAcqSize (int *acq_w, int *acq_h)

Variables

- MBRT_VideoAcq * MBRT_acqDevice = NULL

11.1 Detailed Description

Author:

Nicolas Beucher

Date:

03-27-2009

11.2 Define Documentation

11.2.1 #define RETURN_ON_ERR(hr, err_type)

Value:

```
if (FAILED(hr)) { \
    STOP_AND_CLEANUP(); \
    return err_type; \
} \
```

11.3 Function Documentation

11.3.1 MBRT_errcode MBRT_CreateVideoAcq (int device)

Filled the video acquisition structure with the parameters of the given device and initialize it.

Parameters:

device the video device (usually 0)

Returns:

an error code (NO_ERR if successful)

11.3.2 MBRT_errcode MBRT_DestroyVideoAcq (void)

Close the acquisition device and reset the structure

Returns:

NO_ERR if successful

11.3.3 MBRT_errcode MBRT_GetAcqSize (int * *acq_w*, int * *acq_h*)

Returns the acquisition device resolution.

Parameters:

acq_w the width (output)

acq_h the height (output)

Returns:

NO_ERR if successful

11.3.4 MBRT_errcode MBRT_GetImageFromAcq (MB_Image * *dest*)

Obtains an image from the acquisition device

Parameters:

dest the mamba image filled by the device

Returns:

NO_ERR if successful

11.3.5 MBRT_errcode MBRT_StartAcq ()

Starts the acquisition device capture process

Returns:

NO_ERR if successful

11.3.6 MBRT_errcode MBRT_StopAcq ()

Stops the acquisition device capture process

Returns:

NO_ERR if successful

11.4 Variable Documentation**11.4.1 MBRT_VideoAcq* MBRT_acqDevice = NULL**

Structure holding the acquisition device information