CORSAIR

CUE SDK
Overview and Reference

Protocol version 16

CORSAIR

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Overview

The Corsair Utility Engine (CUE) SDK gives ability for third-party applications to control lightings on Corsair RGB devices. CUE SDK interacts with hardware through CUE so it should be running in order for SDK to work properly.

SDK features are supported in CUE version 1.10 or higher.

To use this SDK you should have basic knowledge in C and library linking.

CUE SDK functional features:

- SDK provides ability to specify/query RGB color for every LED on keyboard, mouse, mouse mat, headset, headset stand, Commander PRO, Lighting Node PRO, memory module and cooler (ie. control lighting by key id)

- SDK provides information about connected hardware: models, physical and logical layouts.

- SDK provides information about HW geometry so that clients can show visual effects that depend on geometry like wave or ripple (ie. control lighting by key position).

- SDK provides helper functions to convert alphanumeric key names (like 'A', 'Q', 'Z') into identifiers for "tutorial" kind of clients that want to highlight exact keys taking into account logical layout (ie. control lighting by key name).

- SDK provides **exclusive** and **shared** access to SDK clients.

- SDK provides layers for shared clients so they can ensure that colors set by them are shown on top of CUE colors if this is needed

- SDK provides information about G keys pressed on the keyboard or M keys pressed on the mouse

- User can forbid third-party applications to control lighting in CUE settings.

Other SDK features:

- CUE works properly with multiple clients. SDK library itself is thread safe so that clients are able to use it from multiple threads within the same process.

- SDK is fail-safe. If CUE is not present, shuts down by the user or crashes this does not cause a client crashing or hanging.

- SDK handles handshake during client initialization to agree on protocol version that CUE implements, so that CUE can decide if it supports client protocol version and client can decide which of API functions it can call.

SDK Package

The following folders are included:

- **include** contains C/C++ header files with function prototypes and enum declarations;

- **redist** contains both 32 and 64 bit .dll files;

- **lib** contains companion .lib files to access exported functions (32 and 64 bit);

- **examples** contains sample project that shows how to use SDK;

- **doc** contains SDK documentation (this document).

Requirements

This SDK can be used on the following platforms:

- **Windows 7** (32-bit and 64-bit);

- **Windows 8, 8.1** (32-bit and 64-bit);

- **Windows 10** (32-bit and 64-bit);

- **macOS 10.13**;

- **macOS 10.14**;

- **macOS 10.15**.

Supported devices

- Keyboards:

    - CGK65 RGB

    - K55 RGB

    - K60 RGB PRO

    - K63

    - K65 LUX RGB

    - K65 RGB RAPIDFIRE

    - K68

- K70 LUX
- K70 LUX RGB
- K70 RAPIDFIRE
- K70 RGB
- K70 RGB MK.2
- K70 RGB RAPIDFIRE
- K95 RGB
- K95 RGB PLATINUM
- K95 RGB PLATINUM XT
- K100 RGB
- STRAFE
- STRAFE RGB
- STRAFE RGB MK.2
- Mice:
  - GLAIVE RGB
  - HARPOON RGB
  - HARPOON RGB PRO
  - IRONCLAW RGB
  - KATAR
  - M65 ELITE RGB
  - M65 PRO RGB
  - M65 RGB
  - SABRE
  - SABRE RGB
  - SABRE RGB Laser
  - SABRE RGB Optical
  - Scimitar
  - Scimitar ELITE RGB
  - Scimitar PRO RGB

- Mouse Mat:
  - MM700
  - MM800 RGB
- Headsets:
  - VIRTUOSO RGB
  - VIRTUOSO RGB SE
  - VOID PRO USB
  - VOID PRO WIRELESS
  - VOID USB
  - VOID WIRELESS
- Headset Stand:
  - ST100 RGB
- LED Controllers:
  - Commander PRO
  - Lighting Node CORE
  - Lighting Node PRO
- Memory module:
  - DOMINATOR PLATINUM RGB
  - Vengeance RGB PRO
  - VENGEANCE RGB PRO SL
- Coolers:
  - CORSAIR ONE
  - CORSAIR ONE PRO
  - H100i Platinum
  - H100i PRO
  - H115i Platinum
  - H115i PRO
  - H150i PRO

Multiple clients using the SDK at the same time

SDK provides **exclusive** and **shared** access to SDK clients.

- **Exclusive** access - lighting controlled only by client and not by CUE or other SDK clients. There can be only one **exclusive** client at a time. If there is already an active **exclusive** client A and a new client B requests **exclusive** access to the lighting then client B becomes **exclusive** client and client A loses exclusive control (i.e. "last win" strategy).

- **Shared** access - multiple clients may control lighting at the same time, optionally choosing theirs layer priority from interval [0..255]. There can be unlimited number of **shared** clients working simultaneously. If some client requests **exclusive** access then all other **shared** clients will not be able to override colors that were set by **exclusive** client. When **exclusive** client disconnects all **shared** clients can override colors again.

- CUE itself acts like a shared client with layer priority 127, so if there is a client taking over exclusive control then CUE will not try to override colors.

The default access mode is **shared**.

Other considerations

Single-color devices

If a connected device only has LEDs of one color instead of all three (RGB) then when RGB color is set to such leds SDK chooses maximum of three (RGB) values and uses it as brightness for LED.

On/off leds

If a connected device has some LEDs that support only on/off control then if supplied brightness value is >= 128 such LED will be switched on, otherwise it will be switched off.

LEDs that are not controlled by SDK

Side LEDs on Corsair STRAFE keyboards can not be controlled by SDK. These LEDs remain controlled by CUE regardless of connected SDK clients. Some devices have a certain number of service LED indicators (for example, WinLock or Profile LEDs on keyboards) and depending on device model CUE may, optionally or unconditionally, prohibit controlling these LEDs by SDK. If, however, despite the prohibition on controlling the service LEDs, SDK tries to set a color for them, the new color settings will be ignored for these service LEDs without an error.

Memory management

SDK is responsible for freeing memory that was allocated by its functions. The memory is freed when SDK library is unloaded.

Win+L

CUE should preserve communication channels with SDK clients when user locks screen, so when user session is restored and set of connected devices is unchanged the client can continue using SDK as if session was never locked.

For all G/M keys which are in a pressed state at the time user locks screen CUE should notify client application that these keys have been released.

RDP limitations

Both CUE and SDK are designed to work on a local computer and will not work if accessed remotely through Microsoft RDP.

Access rights

In order to be able to communicate with each other, CUE and SDK client must run with identical access rights: either with regular access or "As Administrator".

Reference

CorsairSetLedsColors

```
bool CorsairSetLedsColors(int size, CorsairLedColor* ledsColors);
```

Description: set specified leds to some colors. The color is retained until changed by successive calls. This function does not take logical layout into account. This function executes synchronously, if you are concerned about delays consider using *CorsairSetLedsColorsAsync*

Note

It is not recommended to use this function with DIY-devices, coolers and memory modules (leds: CLD_C1_1, ..., CLD_C1_150, CLD_C1_151, ..., CLD_C1_300, CLD_C2_1, ..., CLD_C2_150, CLD_C2_151, ..., CLD_C2_300, CLD_C3_1, ..., CLD_C3_150, CLD_C3_151, ..., CLD_C3_300, CLLC_C1_1, ..., CLLC_C1_150 and CLDRAM_1, ..., CLDRAM_12). Consider using *CorsairSetLedsColorsBufferByDeviceIndex* and *CorsairSetLedsColorsFlushBuffer* functions instead.

Input arguments:

- *int size* - number of leds in *ledsColors* array;

- *CorsairLedColor* ledsColors* - array containing colors for each LED.

Returns: boolean value. True if successful. Use *CorsairGetLastError()* to check the reason of failure. If there is no such ledId present in currently connected hardware (missing key in physical keyboard layout, or trying to control mouse while it's disconnected) then function completes successfully and returns true.

Possible errors:

- *CE_ServerNotFound, CE_NoControl, CE_ProtocolHandshakeMissing*

- *CE_InvalidArguments* - if some of r, g, b values are beyond [0..255] interval or array contains duplicates of some led ids.

CorsairSetLedsColorsBufferByDeviceIndex

```
bool CorsairSetLedsColorsBufferByDeviceIndex(int deviceIndex,
int size, CorsairLedColor* ledsColors);
```

Description: set specified LEDs to some colors. This function set LEDs colors in the buffer which is written to the devices via *CorsairSetLedsColorsFlushBuffer* or *CorsairSetLedsColorsFlushBufferAsync*. Typical usecase is next: *CorsairSetLedsColorsFlushBuffer* or *CorsairSetLedsColorsFlushBufferAsync* is called to write LEDs colors to the device and follows after one or more calls of *CorsairSetLedsColorsBufferByDeviceIndex* to set the LEDs buffer. This function does not take logical layout into account.

Input arguments:

- *int deviceIndex* – zero-based index of device. Should be strictly less than value returned by CorsairGetDeviceCount()
- *int size* – number of leds in ledsColors array
- *CorsairLedColor* ledsColors* – array containing colors for each LED.

Returns: boolean value. True if successful. Use *CorsairGetLastError()* to check the reason of failure. If there is no such ledId present in currently connected hardware (missing key in physical keyboard layout, or trying to control mouse while it's disconnected) then functions completes successfully and returns true.

Possible errors:

- *CorsairErrorServerNotFound, CorsairErrorProtocolHandshakeMissing*
- *CorsairErrorInvalidArguments* – if some of r, g, b values are beyond [0..255] interval or array contains duplicates of some led ids.

CorsairSetLedsColorsFlushBuffer

```
bool CorsairSetLedsColorsFlushBuffer();
```

Description: writes to the devices LEDs colors buffer which is previously filled by the *CorsairSetLedsColorsBufferByDeviceIndex* function. This function executes synchronously, if you are concerned about delays consider using *CorsairSetLedsColorsFlushBufferAsync*

Input arguments: no.

Returns: boolean value. True if successful. Use *CorsairGetLastError()* to check the reason of failure. If there is no such ledId in the LEDs colors buffer present in currently connected hardware (missing key in physical keyboard layout, or trying to control mouse while it's disconnected) then functions completes successfully and returns true.

Possible errors:

- *CorsairErrorServerNotFound, CorsairErrorNoControl, CorsairErrorProtocolHandshakeMissing*

CorsairSetLedsColorsFlushBufferAsync

```
bool CorsairSetLedsColorsFlushBufferAsync(void (*callback)
(void *context, bool result, CorsairError error), void *context);
```

Description: same as *CorsairSetLedsColorsFlushBuffer* but returns control to the caller immediately.

Input arguments:

- *void (*callback)(void *context, bool result, CorsairError error)* – callback that is called by SDK when colors are set. Can be *NULL* if client is not interested in result;

  - *context* contains value that was supplied by user in *CorsairSetLedsColorsFlushBufferAsync* call;

  - *result* is true if call was successful, otherwise false;

  - *error* contains error code if call was not successful (*result==false*) **Possible errors:** *CorsairErrorServerNotFound, CorsairErrorNoControl*

- *void *context* – arbitrary context that will be returned in callback call. Can be *NULL*

Returns: boolean value. True if successful. Use *CorsairGetLastError()* to check the reason of failure. If there is no such ledId in the LEDs colors buffer present in currently connected hardware (missing key in physical keyboard layout, or trying to control mouse while it's disconnected) then functions completes successfully and returns true.

Possible errors:

- *CorsairErrorProtocolHandshakeMissing*

CorsairSetLedsColorsAsync

```
bool CorsairSetLedsColorsAsync(int size, CorsairLedColor*
ledsColors, void(*CallbackType)(void*, bool, CorsairError),
void *context);
```

Description: same as *CorsairSetLedsColors* but returns control to the caller immediately.

> ### *Note*
>
> It is not recommended to use this function with DIY-devices, coolers and memory modules (leds: CLD_C1_1, ..., CLD_C1_150, CLD_C1_151, ..., CLD_C1_300, CLD_C2_1, ..., CLD_C2_150, CLD_C2_151, ..., CLD_C2_300, CLD_C3_1, ..., CLD_C3_150, CLD_C3_151, ..., CLD_C3_300, CLLC_C1_1, ..., CLLC_C1_150 and CLDRAM_1, ..., CLDRAM_12). Consider using *CorsairSetLedsColorsBufferByDeviceIndex* and *CorsairSetLedsColorsFlushBuffer* functions instead.

Input arguments:

- *int size* – number of leds in *ledsColors* array;
- *CorsairLedColor* ledsColors* – array containing colors for each LED;
- *void (*CallbackType)(void* context, bool result, CorsairError error)* – callback that is called by SDK when colors are set. Can be *NULL* if client is not interested in result:
  - *context* contains value that was supplied by user in *CorsairSetLedsColorsAsync* call;
  - *result* is true if call was successful, otherwise false;
  - *error* contains error code if call was not successful (*result==false*); **Possible errors:** *CE_ServerNotFound, CE_NoControl*
- *void* context* – arbitrary context that will be returned in callback call. Can be *NULL*.

Returns: boolean value. True if successful. Use *CorsairGetLastError()* to check the reason of failure.

Possible errors:

- *CE_ProtocolHandshakeMissing*

- *CE_InvalidArguments* - if some of r, g, b values are beyond [0..255] interval or array contains duplicates of some led ids.

CorsairGetLedsColors

```
bool CorsairGetLedsColors(int size, CorsairLedColor* ledsColors);
```

Description: get current color for the list of requested LEDs. The color should represent the actual state of the hardware LED, which could be a combination of SDK and/or CUE input. This function works only for keyboard, mouse, mousemat, headset and headset stand devices.

Input arguments:

- *int size* - number of leds in *ledsColors* array;

- *CorsairLedColor* ledsColors* - array containing colors for each LED. Caller should only fill ledId field, and then SDK will fill R, G and B values on return;

Returns: boolean value. True if successful. Use *CorsairGetLastError()* to check the reason of failure. If there is no such ledId present in currently connected hardware (missing key in physical keyboard layout, or trying to control mouse while it's disconnected) then functions completes successfully and returns true.

Also ledsColors array will contain R, G and B values of colors on return.

Possible errors:

- *CorsairErrorServerNotFound*, *CorsairErrorProtocolHandshakeMissing*

- *CorsairErrorInvalidArguments* - if array contains duplicates of some led ids.

CorsairGetLedsColorsByDeviceIndex

```
bool CorsairGetLedsColorsByDeviceIndex(int deviceIndex,
int size, CorsairLedColor* ledsColors);
```

Description: get current color for the list of requested LEDs. The color should represent the actual state of the hardware LED, which could be a combination of SDK and/or CUE input. This function works for keyboard, mouse, mousemat, headset, headset stand, DIY-devices, memory module and cooler.

Input arguments:

- *int deviceIndex* - zero-based index of device. Should be strictly less than value returned by *CorsairGetDeviceCount()*

- *int size* - number of LEDs in *ledsColors* array;

- *CorsairLedColor* ledsColors* - array containing colors for each LED. Caller should only fill ledId field, and then SDK will fill R, G and B values on return.

Returns: boolean value. True if successful. Use *CorsairGetLastError()* to check the reason of failure. If there is no such ledId present in currently connected hardware (missing key in physical keyboard layout, or trying to control mouse while it's disconnected) then functions completes successfully and returns true. Also ledsColors array will contain R, G and B values of colors on return.

Possible errors:

- *CE_ServerNotFound, CE_ProtocolHandshakeMissing*

- *CE_InvalidArguments* - if array contains duplicates of some LED ids.

CorsairGetBoolPropertyValue

```
bool CorsairGetBoolPropertyValue(int deviceIndex,
CorsairDevicePropertyId propertyId, bool* propertyValue);
```

Description: reads boolean property value for device at provided index.

Input arguments:

- *int deviceIndex* - zero-based index of device. Should be strictly less than value returned by *CorsairGetDeviceCount()*

- *CorsairDevicePropertyId propertyId* - id of property to read from device;

- *bool* propertyValue* - pointer to memory where to store boolean property value read from device.

Returns: boolean value. True if successful. Use *CorsairGetLastError()* to check the reason of failure.

Possible errors:

- *CE_ServerNotFound, CE_ProtocolHandshakeMissing*

- *CE_IncompatibleProtocol* - if the function was called for SDK that implements protocol version 5 or earlier;

- *CE_InvalidArguments* - if deviceIndex is invalid, type of property (specified by *propertyId*) is not boolean, device does not support *CDC_PropertyLookup `capability or `propertyId* is not supported by device.

CorsairGetInt32PropertyValue

```
bool CorsairGetInt32PropertyValue(int deviceIndex,
CorsairDevicePropertyId propertyId, int* propertyValue);
```

Description: reads integer property value for device at provided index.

Input arguments:

- *int deviceIndex* - zero-based index of device. Should be strictly less than value returned by *CorsairGetDeviceCount()*

- *CorsairDevicePropertyId propertyId* - id of property to read from device;

- *int* propertyValue* - pointer to memory where to store integer property value read from device.

Returns: boolean value. True if successful. Use *CorsairGetLastError()* to check the reason of failure.

Possible errors:

- *CE_ServerNotFound*, *CE_ProtocolHandshakeMissing*

- *CE_IncompatibleProtocol* - if the function was called for SDK that implements protocol version 5 or earlier;

- *CE_InvalidArguments* - if deviceIndex is invalid, type of property (specified by *propertyId*) is not integer, device does not support *CDC_PropertyLookup* capability or *propertyId* is not supported by device.

CorsairSetLayerPriority

```
bool CorsairSetLayerPriority(int priority);
```

Description: set layer priority for this shared client. By default CUE has priority of 127 and all shared clients have priority of 128 if they don't call this function. Layers with higher priority value are shown on top of layers with lower priority.

Input arguments:

- *int priority* - priority of a layer [0..255];

Returns: boolean value. True if successful. Use *CorsairGetLastError()* to check the reason of failure. If this function is called in exclusive mode then it will return true.

Possible errors:

- *CorsairErrorServerNotFound, CorsairErrorProtocolHandshakeMissing*
- *CorsairErrorInvalidArguments* - if priority value is beyond [0..255] interval.

CorsairSubscribeForEvents

```
bool CorsairSubscribeForEvents(void(*CorsairEventHandler)
(void *context, const CorsairEvent *event), void *context);
```

Description: registers a callback that will be called by SDK when some event happened. If client is already subscribed but calls this function again SDK should use only last callback registered for sending notifications.

Input arguments:

- *void(*CorsairEventHandler)(void *context, const CorsairEvent *event)* - callback that is called by SDK when some event happened

    - *context* contains value that was supplied by user in *CorsairSubscribeForEvents* call;

    - *CorsairEvent *event* - information about event, user can distinguish between events by reading *event->id* field;

- *void* context* - arbitrary context that will be returned in callback call. Can be *NULL*

Returns: boolean value. True if successful. Use *CorsairGetLastError()* to check the reason of failure.

Possible errors:

- *CE_ServerNotFound, CE_ProtocolHandshakeMissing*
- *CE_InvalidArguments* - if callback is *NULL*

CorsairUnsubscribeFromEvents

```
bool CorsairUnsubscribeFromEvents();
```

Description: unregisters callback previously registered by *CorsairSubscribeForEvents* call.

Input arguments: no.

Returns: boolean value. True if successful. Use *CorsairGetLastError()* to check the reason of failure.

Possible errors:

■ *CE_ServerNotFound, CE_ProtocolHandshakeMissing*

CorsairGetDeviceCount

```
int CorsairGetDeviceCount();
```

Description: returns number of connected Corsair devices. For keyboards, mice, mousemats, headsets and headset stands not more than one device of each type is included in return value in case if there are multiple devices of same type connected to the system. For DIY-devices and coolers actual number of connected devices is included in return value. For memory modules actual number of connected modules is included in return value, modules are enumerated with respect to their logical position (counting from left to right, from top to bottom).

Use *CorsairGetDeviceInfo()* to get information about a certain device.

Input arguments: no.

Returns: integer value. -1 in case of error.

Possible errors:

■ *CE_ServerNotFound, CE_ProtocolHandshakeMissing*

CorsairGetDeviceInfo

```
CorsairDeviceInfo *CorsairGetDeviceInfo(int deviceIndex);
```

Description: returns information about a device based on provided index.

Input arguments:

■ *int deviceIndex* - zero-based index of device. Should be strictly less than a value returned by *CorsairGetDeviceCount()*

Returns: pointer to *CorsairDeviceInfo* structure that contains information about device or *NULL* pointer if error has occurred.

Possible errors:

■ *CE_ServerNotFound, CE_ProtocolHandshakeMissing*

■ *CE_InvalidArguments* - if *deviceIndex* is invalid.

CorsairDeviceId

```
typedef char CorsairDeviceId[CORSAIR_DEVICE_ID_MAX]
```

Description: defines a character array of length *CORSAIR_DEVICE_ID_MAX* (== *128*) to store device identifier string.

CorsairGetLedPositions

```
CorsairLedPositions *CorsairGetLedPositions();
```

Description: provides list of keyboard LEDs with their physical positions. Coordinates grids for different device models can be found in Device coordinates.

Input arguments: no.

Returns: returns pointer to *CorsairLedPositions* struct or *NULL* if error has occurred.

Possible errors:

- *CE_ServerNotFound*, *CE_ProtocolHandshakeMissing*

CorsairGetLedPositionsByDeviceIndex

```
CorsairLedPositions *CorsairGetLedPositionsByDeviceIndex(
int deviceIndex);
```

Description: provides list of keyboard, mouse, headset, mousemat, headset stand, DIY-devices, memory module and cooler LEDs by its index with their positions. Position could be either physical (only device-dependent) or logical (depend on device as well as CUE settings).

Input arguments:

- *int deviceIndex* - zero-based index of device. Should be strictly less than a value returned by *CorsairGetDeviceCount()*

Returns: returns pointer to CorsairLedPositions struct or *NULL* if error has occurred.

Possible errors:

- *CE_ServerNotFound*
- *CE_ProtocolHandshakeMissing*

- *CE_InvalidArguments* if *deviceIndex* is out of bounds or corresponds to neither keyboard, mouse, headset, mousemat, headset stand, DIY device, memory module nor cooler;

- *CE_IncompatibleProtocol* if the function was called for CUE that implements protocol version 2 or earlier.

CorsairGetLedIdForKeyName

```
CorsairLedId CorsairGetLedIdForKeyName(char keyName);
```

Description: retrieves led id for key name taking logical layout into account. So on AZERTY keyboards if user calls *CorsairGetLedIdForKeyName('A')* he gets *CLK_Q*. This id can be used in CorsairSetLedsColors function.

Input arguments:

- *char keyName* - key name. ['A'..'Z'] (26 values) are valid values.

Returns: proper *CorsairLedId* or *CLI_Invalid* if error occurred.

Possible errors:

- *CE_ServerNotFound*, *CE_ProtocolHandshakeMissing*

- *CE_InvalidArguments* - if *keyName* is invalid.

CorsairRequestControl

```
bool CorsairRequestControl(CorsairAccessMode accessMode);
```

Description: requests control using specified access mode. By default client has shared control over lighting so there is no need to call CorsairRequestControl() unless a client requires exclusive control.

Input arguments:

- *CorsairAccessMode accessMode* - requested access mode

Returns: boolean value. Returns true if SDK received requested control or false otherwise.

Possible errors:

- *CE_ProtocolHandshakeMissing*, *CE_ServerNotFound*

- *CE_InvalidArguments* - if provided *accessMode* is not supported by this version of SDK.

CorsairReleaseControl

```
bool CorsairReleaseControl(CorsairAccessMode accessMode);
```

Description: releases previously requested control for specified access mode.

Input arguments:

- *CorsairAccessMode accessMode* - access mode that is requested to be released.

Returns: boolean value. Returns true if SDK released control or false otherwise.

Possible errors:

- *CE_ProtocolHandshakeMissing,* CE_ServerNotFound

- *CE_InvalidArguments* - if provided *accessMode* is not supported by this version of SDK.

- *CE_IncompatibleProtocol* - if the function was called for SDK that implements protocol version 1 or earlier.

CorsairPerformProtocolHandshake

```
CorsairProtocolDetails CorsairPerformProtocolHandshake();
```

Description: checks file and protocol version of CUE to understand which of SDK functions can be used with this version of CUE.

Input arguments: no.

Returns: *CorsairProtocolDetails* struct.

Possible errors:

- *CE_ServerNotFound*

CorsairRegisterKeypressCallback

```
bool CorsairRegisterKeypressCallback(void (*CallbackType)
(void *context, CorsairKeyId keyId, bool pressed),
void *context);
```

Description: registers a callback that will be called by SDK when some of G or M keys are pressed or released.

> ***Note***
>
> It is not recommended to use this function. Consider using *CorsairSubscribeForEvents* and *CorsairUnsubscribeFromEvents* instead.

Input arguments:

- *void (*CallbackType)(void* context, CorsairKeyId keyId, bool pressed)* – callback that is called by SDK when key is pressed or released;

  - *context* contains value that was supplied by user in *CorsairRegisterKeypressCallback* call;

  - *CorsairKeyId keyId* – the id of the key that was pressed or released;

  - *bool pressed* – true if the key was pressed and false if it was released;

- *void* context* – arbitrary context that will be returned in callback call. Can be *NULL*

Returns: boolean value. True if successful. Use *CorsairGetLastError()* to check the reason of failure.

Possible errors:

- *CorsairErrorServerNotFound, CorsairErrorProtocolHandshakeMissing*

- *CorsairErrorInvalidArguments* – if callback is *NULL*

CorsairLedId

```
enum CorsairLedId
```

Description: contains shared list of all leds on all devices (keyboard, mouse, mouse mat, headset, headset stand, DIY, memory module, cooler) and all models/physical layouts.

Item samples:

- *CLK_F1, CLK_Esc, CLK_Q, CLK_1, CLK_UpArrow, CLK_G1, ...* – for keyboard leds;

- *CLKLP_Zone1, ..., CLKLP_Zone19, CLKLP_Zone20, ..., CLKLP_Zone50* – for keyboard light pipe leds;

- *CLM_1, CLM_2, ..., CLM_20* – for mouse leds;

- *CLH_LeftLogo, CLH_RightLogo* - for headset leds;
- *CLMM_1, CLMM_2, …, CLMM_15* - for mousemat leds;
- *CLHSS_Zone1, CLHSS_Zone2, …, CLHSS_Zone9* - for headset stand leds;
- *CLD_C1_1, …, CLD_C1_150, CLD_C1_151, …, CLD_C1_300* - for first channel of the DIY-devices;
- *CLD_C2_1, …, CLD_C2_150, CLD_C2_151, …, CLD_C2_300* - for second channel of the DIY-devices;
- *CLI_Oem1, …, CLI_Oem250* - reserved range for custom leds;
- *CLDRAM_1, …, CLDRAM_12* - for memory module leds;
- *CLD_C3_1, …, CLD_C3_150, CLD_C3_151, …, CLD_C3_300* - for third channel of the DIY-devices;
- *CLLC_C1_1, …, CLLC_C1_150* - for first channel of the liquid coolers;
- *CLMB_Zone1, …, CLMB_Zone100* - for motherboard leds;
- *CLGPU_Zone1, …, CLGPU_Zone50* - for graphics card leds;
- *CLI_Invalid* - dummy value.

CorsairKeyId

```
enum CorsairKeyId
```

Description: contains shared list of G and M keys (not all available keys!).

Items samples:

- *CorsairKeyKb_G1, …, CorsairKeyKb_G18* - for keyboard/touchbar G keys;
- *CorsairKeyMouse_M1, …, CorsairKeyMouse_M12* - for mouse M keys;
- *CorsairKey_Invalid* - dummy value.

CorsairGetLastError

```
CorsairError CorsairGetLastError();
```

Description: returns last error that occurred in this thread while using any of Corsair* functions.

Input arguments: no.

Returns: *CorsairError* value.

Possible errors: no.

CorsairEventId

```
enum CorsairEventId
```

Description: contains list of event identifiers.

Items:

- *CEI_Invalid* - dummy value;
- *CEI_DeviceConnectionStatusChangedEvent, CEI_KeyEvent* - valid values.

CorsairDeviceType

```
enum CorsairDeviceType
```

Description: contains list of available device types.

Items:

- *CDT_Keyboard* - for keyboards;
- *CDT_Mouse* - for mice;
- *CDT_Headset* - for headsets;
- *CDT_Mousemat* - for mouse mat;
- *CDT_HeadsetStand* - for headset stand;
- *CDT_CommanderPro* - for Commander PRO DIY-devices;
- *CDT_LightingNodePro* - for Lighting Node PRO DIY-devices;
- *CDT_MemoryModule* - for memory modules;
- *CDT_Motherboard* - for motherboards;
- *CDT_GraphicsCard* - for graphics cards;
- *CDT_Cooler* - for coolers;
- *CDT_Touchbar* - for touchbars.

CorsairPhysicalLayout

```
enum CorsairPhysicalLayout
```

Description: contains list of available physical layouts for keyboards.

Items:

- *CPL_US*, *CPL_UK*, *CPL_JP*, *CPL_KR*, *CPL_BR* – valid values for keyboard;
- *CPL_Zones1*, *CPL_Zones2*, ..., *CPL_Zones20* – valid values for mouse, number represents configurable mouse LEDs;
- *CPL_Invalid* – dummy value.

CorsairLogicalLayout

```
enum CorsairLogicalLayout
```

Description: contains list of available logical layouts for keyboards.

Items:

- *CLL_US_Int*, *CLL_NA*, *CLL_EU*, *CLL_UK*, *CLL_BE*, *CLL_BR*, *CLL_CH*, *CLL_CN*, *CLL_DE*, *CLL_ES*, *CLL_FR*, *CLL_IT*, *CLL_ND*, *CLL_RU*, *CLL_JP*, *CLL_KR*, *CLL_TW*, *CLL_MEX* – valid values;
- *CLL_Invalid* – dummy value.

CorsairDeviceCaps

```
enum CorsairDeviceCaps
```

Description: contains list of device capabilities. Current version of SDK only supports lighting and property lookup, but future versions may also support other capabilities.

Items:

- *CDC_None == 0* – for devices that do not support any SDK functions;
- *CDC_Lighting == 1* – for devices that has controlled lighting;
- *CDC_PropertyLookup == 2* – for devices that provide current state through set of properties. These properties could be read with *CorsairGetBoolPropertyValue* and *CorsairGetInt32PropertyValue* functions.

CorsairDevicePropertyType

```
enum CorsairDevicePropertyType
```

Description: contains list of properties types.

Items:

- *CDPT_Boolean = 0x1000*
- *CDPT_Int32 = 0x2000*

CorsairDevicePropertyId

```
enum CorsairDevicePropertyId
```

Description: contains list of properties identifiers which can be read from device that supports *CDC_PropertyLookup* capability. Each identifier characterized by two values – id and data type. Data type is represented by high nibble and equals 1 for boolean or 2 for integer property values. E.g. *CDPI_Headset_MicEnabled & 0xF000 == CDPT_Boolean, CDPI_Headset_EqualizerPreset & 0xF000 == CDPT_Int32*.

Items:

- *CDPI_Headset_MicEnabled = 0x1000* - indicates Mic state (On or Off);
- *CDPI_Headset_SurroundSoundEnabled = 0x1001*
- *CDPI_Headset_SidetoneEnabled = 0x1002*
- *CDPI_Headset_EqualizerPreset = 0x2000* - the number of active equalizer preset (integer, 1 - 5).

CorsairAccessMode

```
enum CorsairAccessMode
```

Description: contains list of available SDK access modes.

Items:

- *CAM_ExclusiveLightingControl*

CorsairError

```
enum CorsairError
```

Description: contains shared list of all errors that could happen during calling of Corsair* functions.

Items:

- *CE_Success* - If previously called function was completed successfully;

- *CE_ServerNotFound* - if CUE is not running or was shut down or third-party control is disabled in CUE settings (runtime error);

- *CE_NoControl* - if some other client has or took over exclusive control (runtime error);

- *CE_ProtocolHandshakeMissing* - if developer did not perform protocol handshake (developer error);

- *CE_IncompatibleProtocol* - if developer is calling the function that is not supported by the server (either protocol has been broken by server or client or the function is new and server is too old. Check *CorsairProtocolDetails* for details), (developer error);

- *CE_InvalidArguments* - if developer supplied invalid arguments to the function (for specifics look at function descriptions), (developer error).

CorsairLedColor

```
struct CorsairLedColor
```

Description: contains information about led and its color.

Fields:

- *CorsairLedId ledId* - identifier of LED to set;

- *int r* - red brightness [0..255];

- *int g* - green brightness [0..255];

- *int b* - blue brightness [0..255].

CorsairChannelDeviceType

```
enum CorsairChannelDeviceType
```

Description: contains list of the LED-devices which can be connected to the DIY-device or cooler.

Items:

- *CCDT_HD_Fan, CCDT_SP_Fan, CCDT_LL_Fan, CCDT_ML_Fan, CCDT_Strip, CCDT_DAP, CCDT_Pump, CCDT_QL_Fan, CCDT_WaterBlock, CCDT_8LedSeriesFan* – valid values;

- *CCDT_Invalid* – dummy value;

- *CCDT_SPPRO_Fan* – obsolete value.

CorsairDeviceInfo

```
struct CorsairDeviceInfo
```

Description: contains information about device.

Fields:

- *CorsairDeviceType type* – enum describing device type;

- *const char *model* – null-terminated device model (like "K95RGB");

- *CorsairPhysicalLayout physicalLayout* – enum describing physical layout of the keyboard or mouse. If device is neither keyboard nor mouse then value is *CPL_Invalid*

- *CorsairLogicalLayout logicalLayout* – enum describing logical layout of the keyboard as set in CUE settings. If device is not keyboard then value is *CLL_Invalid*

- *int capsMask* – mask that describes device capabilities, formed as logical "or" of *CorsairDeviceCaps* enum values;

- *int ledsCount* – number of controllable LEDs on the device;

- *CorsairChannelsInfo channels* – structure that describes channels of the DIY-devices and coolers;

- *CorsairDeviceId deviceId* – null-terminated string that contains unique device identifier that uniquely identifies device at least within session.

CorsairChannelsInfo

struct **CorsairChannelsInfo**

Description: contains information about channels of the DIY-devices or cooler.

Fields:

- *int channelsCount* - number of channels controlled by the device;

- *CorsairChannelInfo* channels* - array containing information about each separate channel of the device. Index of the channel in the array is same as index of the channel on the device.

CorsairChannelInfo

struct **CorsairChannelInfo**

Description: contains information about separate channel of the DIY-device or cooler.

Fields:

- *int totalLedsCount* - total number of LEDs connected to the channel;

- *int devicesCount* - number of LED-devices (fans, strips, etc.) connected to the channel which is controlled by the device;

- *CorsairChannelDeviceInfo* devices* - array containing information about each separate LED-device connected to the channel controlled by the device. Index of the LED-device in array is same as the index of the LED-device connected to the device.

CorsairChannelDeviceInfo

struct **CorsairChannelDeviceInfo**

Description: contains information about separate LED-device connected to the channel controlled by the DIY-device or cooler.

Fields:

- *CorsairChannelDeviceType type* -type of the LED-device;

- *int deviceLedCount* - number of LEDs controlled by LED-device.

CorsairLedPositions

> struct **CorsairLedPositions**

Description: contains number of leds and array with their positions.

Fields:

- *int numberOfLeds* - integer value. Number of elements in the following array;
- *CorsairLedPosition* pLedPosition* - array of led positions.

CorsairLedPosition

> struct **CorsairLedPosition**

Description: contains led id and position of led rectangle. Most of the keys are rectangular. In case if key is not rectangular (like Enter in ISO/UK layout) it returns the smallest rectangle that fully contains the key.

Fields:

- *CorsairLedId ledId* - identifier of led;
- *double top*, *double left*, *double height*, *double width* - for keyboards, mice, mousemats, headset stands and memory modules values are in mm, for DIY-devices, headsets and coolers values are in logical units.

CorsairEvent

> struct **CorsairEvent**

Description: contains information about event id and event data.

Fields:

- *CorsairEventId id* - event identifier.

Anonymous union with fields:

- *const CorsairDeviceConnectionStatusChangedEvent *deviceConnectionStatusChangedEvent*- when id == *CEI_DeviceConnectionStatusChangedEvent* contains valid pointer to structure with information about connected or disconnected device;

- *const CorsairKeyEvent *keyEvent* – when id == *CEI_KeyEvent* contains valid pointer to structure with information about pressed or released G or M button and device where this event happened.

CorsairDeviceConnectionStatusChangedEvent

struct **CorsairDeviceConnectionStatusChangedEvent**

Description: contains information about some device that is connected or disconnected. When user receives this event, it makes sense to reenumerate device list, because device indices may become invalid at this moment.

Fields:

- *CorsairDeviceId deviceId* – null-terminated string that contains unique device identifier;

- *bool isConnected* – true if connected, false if disconnected.

CorsairKeyEvent

struct **CorsairKeyEvent**

Description: contains information about device where G or M key was pressed/released and the key itself.

Fields:

- *CorsairDeviceId deviceId* – null-terminated string that contains unique device identifier;

- *CorsairKeyId keyId* – G or M key that was pressed/released;

- *bool isPressed* – true if pressed, false if released.

CorsairProtocolDetails

struct **CorsairProtocolDetails**

Description: contains information about SDK and CUE versions

Fields:

- *const char *sdkVersion* - null-terminated string containing version of SDK (like "1.0.0.1"). Always contains valid value even if there was no CUE found;

- *const char *serverVersion* - null-terminated string containing version of CUE (like "1.0.0.1") or *NULL* if CUE was not found;

- *int sdkProtocolVersion* - integer number that specifies version of protocol that is implemented by current SDK. Numbering starts from 1. Always contains valid value even if there was no CUE found;

- *int serverProtocolVersion* - integer number that specifies version of protocol that is implemented by CUE. Numbering starts from 1. If CUE was not found then this value will be 0;

- *bool breakingChanges* - boolean value that specifies if there were breaking changes between version of protocol implemented by server and client.

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Device coordinates

LED coordinates returned by *CorsairGetLedPositions* and *CorsairGetLedPositionsByDeviceIndex* functions are available on pictures below.
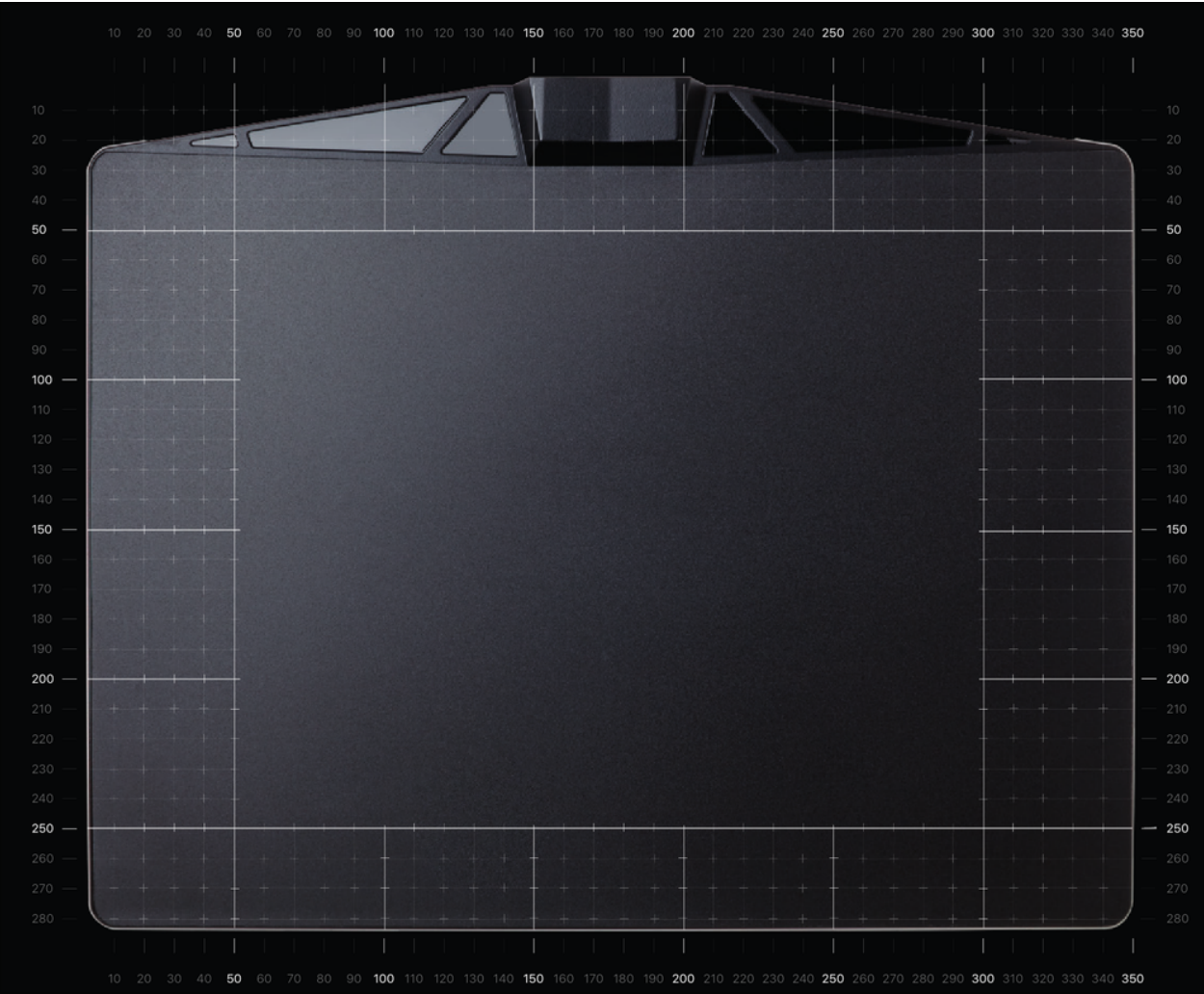
K95 RGB

K95 RGB PLATINUM

K68

K63

MM800 RGB

Examples of how to use SDK

There are usage **examples** in examples folder:

- **color_pulse** plays pulse effect on all available LEDs on connected devices using *CorsairGetDeviceCount, CorsairGetLedPositionsByDeviceIndex, CorsairSetLedsColorsAsync* functions;

- **color_pulse_by_device_index** plays pulse effect on all available LEDs on connected devices using *CorsairGetDeviceCount, CorsairGetLedPositionsByDeviceIndex, CorsairSetLedsColorsBufferByDeviceIndex, CorsairSetLedsColorsFlushBufferAsync* functions;

- **progress** shows how to implement basic progress bar with all keyboard LEDs on different layers using *CorsairGetLedPositions, CorsairSetLedsColors, CorsairSetLayerPriority* functions;

- **text_highlight** gets word from user input and one by one highlights keys that correspond to every char of that word. This example describes sample usage of *CorsairRequestControl, CorsairGetLedIdForKeyName, CorsairSetLedsColors* functions;

- **properties_example** demonstrates how to use *CorsairGetBoolPropertyValue* and *CorsairGetInt32PropertyValue* to get properties of headset and headset stand.

- **events_example** - shows how to register callback (pointer to function) that will be called by SDK when some event happened (some Corsair device is connected or disconnected, some of G or M keys are pressed or released) using *CorsairSubscribeForEvents* function, how to unregister callback using *CorsairUnsubscribeFromEvents* function and how to distinguish between events by event id.

End User License Agreement

On-Line End User License Agreement

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