kivic

HUD SDK

(Version 2.1.0)

kivic

Contents

1. Introduction

This document is an API specification document used for Kivic HUD and any application interworking.

The KIVIC SDK is divided into KivicCast mirroring library and a HUD library. The HUD library is used to communicate information such as phone, text, music,

"NOTIFICATION", "COMMAND" to change the settings of the HUD, and "EVENT" to transfer the status of the HUD to the app.

The Kivic SDK configuration is as follows:

Android	IOS
➢ **kivicCast library** kivicCast.jar, libKivicCastNative.so ➢ **HUD library** Kivic-network_vx.x.x.jar	➢ **kivicCast library** KivicCast.framework ➢ **HUD library** KivicNetwork.framework

Notification differences by OS.

In case of Android, Kivic SDK should be used when Notifications are generated. In iOS, except **Music and Speed,** all the notifications are handled by iOS ANCS(Apple Notification Center Service).

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NOTIFICATION

Class	
InComingCallNotificationPacket	Class to show CallerID when the phone call comes in
SocialNotificationPacket	Class to show SNS related info sms, kakao talk, whatsapp, facebook, wechat, line, skype, viber, tango, nimbuzz , kik, telegram
MusicNotificationPacket	Class to show song title
SpeedNotificationPacket	Class to show GPS speed

COMMAND

Class	
SystemTimeCommandPacket	To set time in Kivic HUD
MinBrightnessCommandPacket	To set the minimum brightness of Kivic HUD backlight
KivicCastMinBrightnessCommandPacket	To set the minimum brightness of KivicCast screen
KeyStoneCommandPacket	To set keystone correction value
KivicModeCommandPacket	To change Kivic HUD mode
FullScreenCommandPacket	To On/Off KivicCast screen
NotiTimeoutCommandPacket	To set time duration of Notification display
DisplayBrightnessCommandPacket	To On/Off the backlight of Kivic HUD
DisplaySpeedCommandPacket	To On/Off the speed display
DisplayTimeCommandPacket	To On/Off time
DisplaySpeedUintsCommandPacket	To change the unit of speed such as Km/h or Mph
DisplayNotificationCommandPacket	To display Notification
DisplayNotificationSettingCommandPacket	Individual On / Off setting of each Notification. service It should be set at initial setting after HUD connection.
DisplaySpeedWarningCommandPacket	To set speed limit
DisplaySpeedColorCommandPacket	To set the color of Speed display
DisplayThemeCommandPacket	To set the color theme
DisplaySpeedGaugeCommandPacket	To On/Off speed guage
SoftwareUpdateCommandPacket	To set firmware update mode
SoftwareUpdateCancelCommandPacket	To cancel firmware update mode
GpsSignalWeekCommandPacket	To On/Off GPS
HudDisconnectCommandPacket	To disconnect BLE connection
LayoutSizeCommandPacket	To set the size of HUD display
KeepAliveCommandPacket	To check the status of Kivic HUD
WifiSTAModeCommandPacket	To transfer of SSID and Password

EVENT

Class	
UartConnectionEventPacket	Used to check apps and connection status and initialize HUD
KivicAppStartEventPacket	To inform whether KivicCast is ready
SoftwareUpdateEventPacket	To inform HUD software Update ready
HudVersionEventPacket	To transfer HUD의| system, ble versio .
WifiSTAStatusEventPacket	To inform WiF connection status and transfer IP addresss

2. Notification

Notifications are identified by packageName, and are displayed at the bottom of HUD screen in the order of icon:title:message. Since Notification is service in one line, if there exits '₩n', it should be concatenated at the end of text.

To use Notification, you should enable the following command when connected.

DisplayNotificationCommandPacket, DisplayNotificationSettingCommandPacket

IncomingCall Example>

- Init()

```
DisplayNotificationCommandPacket displayNotification = new DisplayNotificationCommandPacket();
displayNotification.setEnable(true);
sendPacket(displayNotification);


// call enable
DisplayNotificationSettingCommandPacket callSettingCommandPacket =
                        DisplayNotificationSettingCommandPacket.getDefaultCallSettingPacket();
callSettingCommandPacket.setEnable(true);
sendPacket(callSettingCommandPacket);
```

- Received call

```
InComingCallNotificationPacket sendPacket = new InComingCallNotificationPacket();
sendPacket.setPackageName(DisplayNotificationSettingCommandPacket.DEFAULT_CALL_PACKAGE_NAME);
sendPacket.setTitle("01012341111");
sendPacket(sendPacket);
```

InComingCallNotificationPacket

Support Device: HUD 1,2 세대

The Class used when the call comes in.

Public methods	
void	setPackageName(String packageName)
void	setTitle(String title)
void	setMessage(String message)

Example>

```
InComingCallNotificationPacket sendPacket = new InComingCallNotificationPacket();
sendPacket.setPackageName(DisplayNotificationSettingCommandPacket.DEFAULT_CALL_PACKAGE_NAME);
sendPacket.setTitle("01012341111");
sendPacket(sendPacket);
```

SocialNotificationPacket

Support Device: HUD 1,2 세대

Notifications related to SNS services are supported as follows.

sms, kakao talk, whatsapp, facebook, wechat, line, skype, viber, tango, nimbuzz, kik, telegram

Public methods	
void	setPackageName(String packageName)
void	setTitle(String title)
void	setMessage(String message)

Example>

```
SocialNotificationPacket socialNotificationPacket = new SocialNotificationPacket();
socialNotificationPacket.setPackageName(DisplayNotificationSettingCommandPacket.DEFAULT_WECHAT_PACKAGE_NAME);
socialNotificationPacket.setMessage("hellow kivic");
sendPacket(socialNotificationPacket);
```

MusicNotificationPacket

Support Device: HUD 1,2 세대

Public methods	
void	setPackageName(String packageName)
void	setTitle(String title)
void	setMessage(String message)

Example>

```
MusicNotificationPacket musicNotificationPacket = new MusicNotificationPacket();
musicNotificationPacket.setPackageName(DisplayNotificationSettingCommandPacket.DEFAULT_MUSIC_PACKAGE_NAME);
musicNotificationPacket.setTitle("track");
musicNotificationPacket.setMessage("artist");
sendPacket(musicNotificationPacket);
```

SpeedNotificationPacket

Support Device: HUD 1,2 세대

Used to send Speed info to Kivic HUD.

Public methods	
void	setTitle(String title)

Example>

```
SpeedNotificationPacket sendPacket = new SpeedNotificationPacket();
sendPacket.setTitle("120");
sendPacket(sendPacket);
```

3. Command

SystemTimeCommandPacket

Support Device: HUD 1,2 세대

Set time of Kivic HUD

Since Kivic HUD does not store time in it, you should set time info right after BLE connection.

Public methods	
void	setTimeInMillis(long timeInMillis)
void	setTimeZoneId(String timeZoneId)

Example>

```
Calendar calendar = Calendar.getInstance();
SystemTimeCommandPacket systemTimeCommandPacket = new SystemTimeCommandPacket();
systemTimeCommandPacket.setTimeInMillis(calendar.getTimeInMillis());
systemTimeCommandPacket.setTimeZoneId(calendar.getTimeZone().getID());
sendPacket(systemTimeCommandPacket);
```

MinBrightnessCommandPacket

Support Device: HUD 1,2 세대

Sets the minimum brightness of Kivic HUD. Minimum brightness must be greater than 51.

If setShowSetting is (true), Kivic HUD shows the configuration screen. You must set false at initial setting.

Public methods	
void	setBrightness(int min_brightness) min_brightness: 51 ~ 255
void	setShowSetting(boolean isShowSetting) if isShowSetting i**S** true, it displays applied screen.

Example>

```
MinBrightnessCommandPacket minBrightnessCommandPacket = new MinBrightnessCommandPacket();
```

```
minBrightnessCommandPacket.setBrightness(brightness);
minBrightnessCommandPacket.setShowSetting(false);
sendPacket(minBrightnessCommandPacket);
```

KivicCastMinBrightnessCommandPacket

Support Device: HUD 1,2 세대

Set the minimum brightness of KivicCast Screen
If setShowSetting is (true), Kivic HUD shows the configuration screen. You must set false at initial setting.

Public methods	
void	setBrightness(int min_brightness) min_brightness: (-100 ~ 0)
void	setShowSetting(boolean isShowSetting) if isShowSetting i**S** true, it displays applied screen.

Example>

```
KivicCastMinBrightnessCommandPacket kivicCastMinBrightnessCommandPacket = new KivicCastMinBrightnessCommandPacket();
kivicCastMinBrightnessCommandPacket.setBrightness(brightness);
kivicCastMinBrightnessCommandPacket.setShowSetting(true);
sendPacket(kivicCastMinBrightnessCommandPacket);
```

KeyStoneCommandPacket

Support Device: HUD 1,2 세대

Keystone is software-based optical error correction. If the driver's eye level is high, the operator must turn the combiner lens 90 degrees or more to see the HUD image. In this case, the HUD image looks like an inverted trapezoid like a normal projector. Keystone correction is a function that corrects an inverse trapezoid HUD image to a rectangle.

Public methods	
void	setKeyStone(float keyStone) default: 0 keyStone: (0~ 0.1)

Example>

```
KeyStoneCommandPacket keyStoneCommandPacket = new KeyStoneCommandPacket();
keyStoneCommandPacket.setKeyStone(keyStoneValue);
sendPacket(keyStoneCommandPacket);
```

KivicModeCommandPacket

Support Device: HUD 1,2 세대

To chane Kivic HUD mode.

Constants	
int	ANDROID_MIRACAST_MODE Deprecated in the current firmware constant value: 0
int	IOS_MODE ios airplay mode constant value: 1
int	ANDROID_KIVICCAST_MODE
int	IOS_STA_MODE To use Apple Airplay mirroring as WiFi station mode constant value: 3
int	ANDROID_KIVICCAST_STA_MODE android kivicCast mode. constant value: 4
int	IOS_TBT_STA_MODE
int	ANDROID_TBT_STA_MODE
int	ANDROID_HUD_MODE android hud mode constant value: 7
int	IOS_HUD_MODE ios hud mode constant value: 8
int	ANDROID_TBT_MODE
int	IOS_TBT_MODE
int	IOS_KIVICCAST_MODE ios kivicCast mode constant value: 11
int	IOS_KIVICCAST_STA_MODE To use ios kivicCast as WiFi station mode constant value: 12

Public methods	
Void	setMode(int mode)

Example>

```
KivicModeCommandPacket kivicModeCommandPacket = new KivicModeCommandPacket();
kivicModeCommandPacket.setMode(KivicModeCommandPacket.ANDROID_HUD_MODE);
sendPacket(kivicModeCommandPacket);
```

FullScreenCommandPacket

Support Device: HUD 1,2 세대

This command works only in the mirroring state and shows the mirroring screen when it is true.

If false, Kivic HUD is turn into hud mode

Public methods	
void	setFullScreen(boolean isFullScreen) default: false

Example>
FullScreenCommandPacket fullScreenCommandPacket = new FullScreenCommandPacket();
fullScreenCommandPacket.setFullScreen(true);
sendPacket(fullScreenCommandPacket);	

NotiTimeoutCommandPacket

Support Device: HUD 1,2 세대

Sets the notification exposure time in the HUD.

Public methods	
void	setTimeout(int timeout) default: 10s
Example> NotiTimeoutCommandPacket notiTimeoutCommandPacket = new NotiTimeoutCommandPacket(); notiTimeoutCommandPacket.setTimeout(10); sendPacket(notiTimeoutCommandPacket)	

DisplayBrightnessCommandPacket

Support Device: HUD 1,2 세대

Turn On/Off backlight.

Public methods	
void	setBacklightEnabled (boolean isBacklightEnabled) default: true
Example> DisplayBrightnessCommandPacket displayBrightnessCommandPacket = new DisplayBrightnessCommandPacket(); displayBrightnessCommandPacket.setBacklightEnabled(true); sendPacket(displayBrightnessCommandPacket)	

DisplaySpeedCommandPacket

Support Device: HUD 1,2 세대

Turn On/Off Speed display

Public methods	
void	setSpeedInformationVisible (boolean isSpeedInformationVisible) default: true

Example>
DisplaySpeedCommandPacket displaySpeedCommandPacket = new DisplaySpeedCommandPacket();
displaySpeedCommandPacket.setSpeedInformationVisible(true);
sendPacket(displaySpeedCommandPacket);	

DisplayTimeCommandPacket

Support Device: HUD 1,2 세대

Turn On/Off time.
The default setting is off. After setting the time, you must set it to on to view the time on the HUD.

Public methods	
void	setSpeedInformationVisible (boolean isEnable) default: false

Example>
DisplayTimeCommandPacket displayTimeCommandPacket = new DisplayTimeCommandPacket();
displayTimeCommandPacket.setEnable(true);
sendPacket(displayTimeCommandPacket);	

DisplaySpeedUintsCommandPacket

Support Device: HUD 1,2 세대

Sets the unit of speed. The setting types are 0 (km / h) and 1 (mph).

Public methods	
void	setType(int type) type 0 : km/h, 1: mph default: 0

Example>
DisplaySpeedUintsCommandPacket displaySpeedUintsCommandPacket = new DisplaySpeedUintsCommandPacket();
displaySpeedUintsCommandPacket.setType(0);
sendPacket(displaySpeedUintsCommandPacket);	

DisplayNotificationCommandPacket

Support Device: HUD 1,2 세대

To turn off Notification on the bottom of Kivic HUD screen.

Public methods	
void	setEnable(boolean enable) default: false

Example>
DisplayNotificationCommandPacket displayNotification = new DisplayNotificationCommandPacket();
displayNotification.setEnable(true);
sendPacket(displayNotification);	

DisplayNotificationSettingCommandPacket

Support Device: HUD 1,2 세대

Used to enable Notification items or to change individual attributes.

Constants	
String	DEFAULT_CALL_PACKAGE_NAME = "com.kivic.call"
String	DEFAULT_SMS_PACKAGE_NAME = "com.kivic.sms"
String	DEFAULT_MUSIC_PACKAGE_NAME = "com.kivic.music"
String	DEFAULT_EMAIL_PACKAGE_NAME = "com.kivic.email"
String	DEFAULT_OBD2_PACKAGE_NAME = "com.kivic.obd2"
String	DEFAULT_KAKAO_TALK_PACKAGE_NAME = "com.kivic.kakaotalk"
String	DEFAULT_WHATSAPP_PACKAGE_NAME = "com.kivic.whatsapp"
String	DEFAULT_FACEBOOK_PACKAGE_NAME = "com.kivic.facebook"
String	DEFAULT_WECHAT_PACKAGE_NAME = "com.kivic.wechat"
String	DEFAULT_LINE_PACKAGE_NAME = "com.kivic.line"
String	DEFAULT_SKYPE_PACKAGE_NAME = "com.kivic.skype"
String	DEFAULT_VIBER_PACKAGE_NAME = "com.kivic.viber"
String	DEFAULT_TANGO_PACKAGE_NAME = "com.kivic.tango"
String	DEFAULT_NIMBUZZ_PACKAGE_NAME = "com.kivic.nimbuzz"
String	DEFAULT_KIK_PACKAGE_NAME = "com.kivic.kik"
String	DEFAULT_TELEGRAM_PACKAGE_NAME = "com.kivic.telegram"
String	DEFAULT_MELON_PACKAGE_NAME = "com.kivic.melon"
String	DEFAULT_NEWS_PACKAGE_NAME = "com.kivic.news"
String	DEFAULT_PODCAST_PACKAGE_NAME = "com.kivic.podcast"
String	DEFAULT_RADIO_PACKAGE_NAME = "com.kivic.radio"

Public methods	
DisplayNotificationSettingCommandPacket	getDefaultCallSettingPacket() getDefaultSmsSettingPacket() getDefaultMusicSettingPacket() getDefaultKakaotalkSettingPacket() getDefaultFacebookSettingPacket()

	getDefaultTelegramSettingPacket() getDefaultWhatsAppSettingPacket() getDefaultWechatSettingPacket() getDefaultLineSettingPacket() getDefaultSkypeMessengerSettingPacket() getDefaultViberSettingPacket() getDefaultTangoSettingPacket() getDefaultNimbuzzSettingPacket() getDefaultKikSettingPacket()
void	setEnable(boolean enable) Display On/Off on Kivic HUD screen
void	setTextColor(int textColor) To set the color of text
void	setIcon(int icon)

Example>

```
// 기본 설정
DisplayNotificationCommandPacket displayNotification = new DisplayNotificationCommandPacket();
displayNotification.setEnable(true);
sendPacket(displayNotification);

// call
DisplayNotificationSettingCommandPacket callSettingCommandPacket =
                                    DisplayNotificationSettingCommandPacket.getDefaultCallSettingPacket();
callSettingCommandPacket.setEnable(true);
sendPacket(callSettingCommandPacket);
```

DisplaySpeedWarningCommandPacket

Support Device: HUD 1,2 세대

Sets the speed of Warning Speed. The default is 100 km / h.

The speed of the HUD will be displayed in red when operating more than 100km / h.

Public methods	
void	setSpeedThreshold(int speedThreshod) default: 100km/h

Example>

```
DisplaySpeedWarningCommandPacket speedWarningSendPacket = new DisplaySpeedWarningCommandPacket();
speedWarningSendPacket.setSpeedThreshold(100);
sendPacket(speedWarningSendPacket);
```

DisplaySpeedColorCommandPacket

Support Device: HUD 1,2 세대

Sets the color of Speed. The color of the warning speed cannot be changed.

Public methods	
void	setSpeedColor(int speedColor) default: 0xffffffff (white)

Example>

```
DisplaySpeedColorCommandPacket normalSpeedColorSendPacket = new DisplaySpeedColorCommandPacket();
normalSpeedColorSendPacket.setSpeedColor(0xff00ff00);
sendPacket(normalSpeedColorSendPacket);
```

DisplayThemeCommandPacket

Support Device: HUD 1,2 세대

Set the theme of Kivic HUD

Constants	
int	HUD_THEME_AMBER
int	HUD_THEME_CYAN
int	HUD_THEME_PINK
int	HUD_THEME_GREEN

Public methods	
void	setTheme(int theme)

Example>

```
DisplayThemeCommandPacket themeSendPacket = new DisplayThemeCommandPacket();
themeSendPacket.setTheme(DisplayThemeCommandPacket.HUD_THEME_PINK);
sendPacket(themeSendPacket);
```

DisplaySpeedGaugeCommandPacket

Support Device: HUD 1,2 세대

To On/Off Speed Gauge

Public methods	
void	setSpeedInformationVisible(boolean isSpeedGauge)

Example>

```
DisplaySpeedGaugeCommandPacket displaySpeedGauge = new DisplaySpeedGaugeCommandPacket();
displaySpeedGauge.setSpeedInformationVisible(mSpeedGauge_sw.isChecked());
sendPacket(displaySpeedGauge);
```

SoftwareUpdateCommandPacket

Support Device: HUD 1,2 세대

To copy the update file to the HUD, set the HUD to update mode.

Public methods	
void	setSize(long size) Size of the file updated
void	setType(int type)

Example>

```
SoftwareUpdateCommandPacket softwareUpdateCommandPacket = new SoftwareUpdateCommandPacket();
softwareUpdateCommandPacket.setSize(mImageSize);
softwareUpdateCommandPacket.setType(SoftwareUpdateCommandPacket.UPDATE_HUD);
sendPacket(softwareUpdateCommandPacket);
```

SoftwareUpdateCancelCommandPacket

Support Device: HUD 1,2 세대

Cancel updating process

Example
SoftwareUpdateCancelCommandPacket softwareUpdateCancelCommandPacket = new SoftwareUpdateCancelCommandPacket(); sendPacket(softwareUpdateCancelCommandPacket);

GpsSignalWeekCommandPacket

Support Device: HUD 1,2 세대

Used when the speed cannot be displayed due to the surrounding environments such as underground, tunnel etc.

Public methods	
void	setGpsSignalWeek(boolean mIsWeek) true: 신호 약함.

Example>

```
    GpsSignalWeekCommandPacket sendPacket = new GpsSignalWeekCommandPacket();
    sendPacket.setGpsSignalWeek(true);
    sendPacket(sendPacket);
```

HudDisconnectCommandPacket

Support Device: HUD 1,2 세대

Used to enforce disconnection

Example
HudDisconnectCommandPacket HudDisconnectCommandPacket = new HudDisconnectCommandPacket(); sendPacket(HudDisconnectCommandPacket);

LayoutSizeCommandPacket

Support Device: HUD 1,2 세대

The display screen size of Kivic HUD can be changed by software.

The size adjustment is 20% of the maximum HUD size.

Public methods	
void	setLayoutSize(float layoutSize) Range: 0.0f ~ 0.2f

Example>
LayoutSizeCommandPacket hudScaleCommandPacket = new LayoutSizeCommandPacket();
hudScaleCommandPacket.setLayoutSize(0.1f);
hudApplication.hudNetworkManager.sendPacket(hudScaleCommandPacket);	

KeepAliveCommandPacket

Support Device: HUD 1,2 세대

Kivic HUD app should check the connection status periodically since disconnect even may be received irregular in real situations.

Example
KeepAliveCommandPacket keepAlive = new KeepAliveCommandPacket(); sendPacket(keepAlive);

WifiSTAModeCommandPacket

Support Device: HUD 1,2 세대

When Kivic HUD operates in Wi-Fi Station mode, it is used to transmit the ssid and password of the AP to be connected

.

Public methods	
void	setSsid(String ssid)
void	setPassword(String password)
void	setSecurity(int security)

Example>
WifiSTAModeCommandPacket wifiSTAModeCommandPacket = new WifiSTAModeCommandPacket();
wifiSTAModeCommandPacket.setSsid("kivic");
wifiSTAModeCommandPacket.setPassword("87654321");	

```
wifiSTAModeCommandPacket.setSecurity(2);
hudNetworkManager.sendPacket(wifiSTAModeCommandPacket);
```

4. Event

To be able to handle subsequent processing in the app, we send the state of Kivic Hud such as update, Hud Version, network to the App.

UartConnectionEventPacket

Support Device: HUD 1,2 세대

When the connection between Kivic HUD App and Kivic Hud is successful, UartConnectionEventPacket will be received. After receiving this event, start the initialization.
UartConnectionEventPacket is a periodic event sent by Kivic Hud and it is used not only for initial connection but also for checking whether it is normally connected.

Public methods	
int	getKivicMode() return the Hud Mode When booted, it returns -1
Example> Android HudControl Sample source "setupPacketReceiver()" 함수 참조	

KivicAppStartEventPacket

Support Device: HUD 1,2 세대

Since KivicCast startup takes several seconds from network initialization to KivicCast ready state, KivicAppStartEventPacket Tells you the status..
If isKivicAppStart is true, it means KivicCast is not ready yet. if false, it means KivicCast is ready

Public methods	
boolean	isKivicAppStart ()

SoftwareUpdateEventPacket

Support Device: HUD 1,2 세대

Since Software Update normally takes few seconds from the initialization of network, SoftwareUpdateEventPacket is used to notify the status. SoftwareUpdateEventPacket is to notify that Kivic HUD is ready for Software Update.
In Android, when SoftwareUpdateEventPacket is received, WiFi-Direct connection between Kivic HUD and Android based smartphone is initiated.

HudVersionEventPacket

Support Device: HUD 1,2 세대

Send firmware version number of Kivic HUD and BLE.

Public methods	
String	getHudVersion()

WifiSTAStatusEventPacket

Support Device: HUD 1,2 세대

Send connection status and infor when KivicHUD is trying to connect WiFi APs nearby.

Constants	
int	UNKNOWN = 0
int	WIFI_STA_CONNECTED = 1
int	WIFI_STA_DISCONNECTED = 2
int	WIFI_STA_REQUEST_ENABLE_HOTSPOT = 3
int	WIFI_STA_SEARCH_ADDRESS_TIMEOUT = 4
int	WIFI_STA_INVALID_NETWOWRK_INFO = 5
int	WIFI_STA_EMPTY_NETWORK_INFO = 6

Public methods	
int	getStatus()
String	getReason()
String	getAddress()