HUD App Development Guide

kivic

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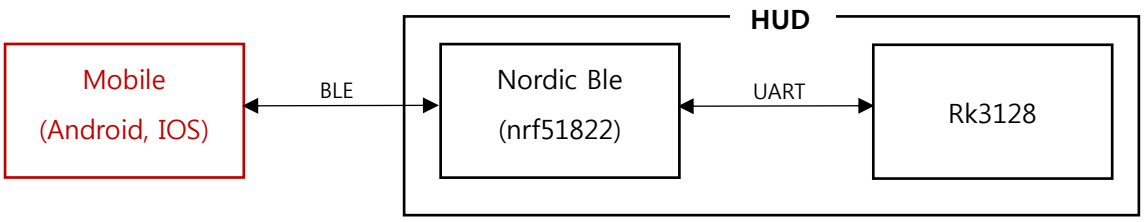
1. Introduction

In Kivic HUD, Nordic nrf51822 BLE IC is connected to RK3128 thru UART. Notification and HUD control packets such as keystone, brightness, speed, etc. are transferred from Androids and iPhones via BLE(Bluetooth Low Energy) wirelessly



1.1 Main Function

- Notification
- Command
- Event
- KivicCast Mirroring
- initialize

1.2 Componet

1.2.1 You can download hud application sources from the following link.
Source repository: https://github.com/KivicHud/HudControl

1.2.2 You can download library files for KivicCast (screen mirroring) from the following links.
Android Path: KivicAndroidFramework/libs/kivic-network.jar , kivicCast.jar, libKivicCastNative.so
IOS Path: KivicIOSFramework/KivicNetwork.framework, KivicCast.framework

2. HUD App Function

2.1 Notification

- It is used to transmit information such as call, sms, music, speed, social etc. from your smartphones to Kivic HUD. All information except speed is displayed at the bottom of the HUD screen. Notifications are defined in the protocol, pls refer to the HUD_SDK_Developer_Guide document for more information.

  The difference between Android and iOS

  Unlike Android, in iOS cases, all the notifications except music and speed are handled by iOS's ANCS(Apple Notification Control Service).

- After the successful BLE connection, the following data are transferred from your smartphone to Kivic HUD.
  - Time, Time display
  - Brightness Enable, Brightness AutoMode, Brightness DayTime, Brightness NightTime
  - Speed Units, Speed color, warning Speed
  - Keystone, HUD Scale
  - Full Screen Mode
  - Notification exposure time, Notification Enable
  - Notification (Call, sms, music, kakao, facebook, whatapp, wechat, line, skype, viber, tango, nimbuzz, kik telegram)
  - kivic mode
  - Gps Signal Week

2.2 Command

- All the functions that control Kivic HUD except Notification are carried out thru Command. The details are described in the HUD_SDK_Developer_Guide document.

2.3 Event

- On the contrary to Command, Event is the protocol for sending informations such as firmware version number and status of Kivic HUD to your smartphones.

2.4 KivicCast Mirroring

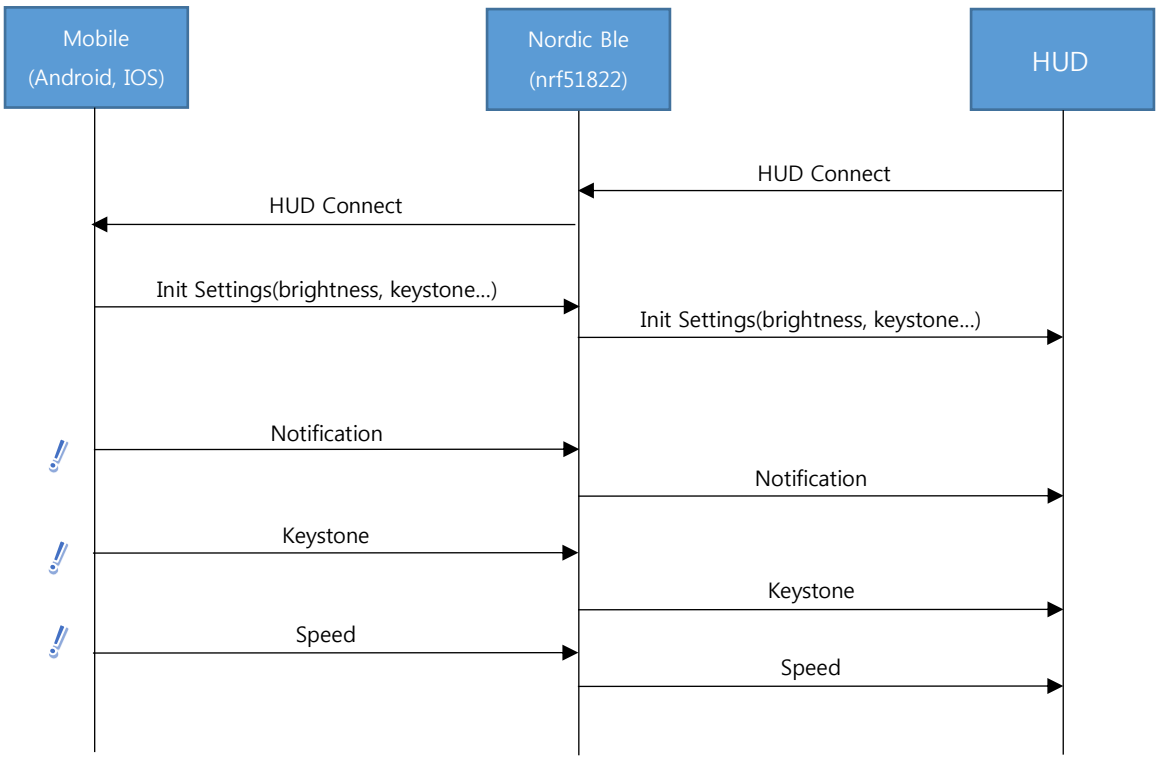
Unlike iOS's Apple Airplay Mirroring and Android's Miracast, KivicCast only cast screen of your Android and iPhones. Thanks to the separation of video and audio while screen casting, you can enjoy Bluetooth audio thru car headunit. To make KivicCast work, there should be WiFi connection between your Android or iPhone and Kivic HUD. You may refer to HudControl Sample Source, and HUD_SDK_Developer_Guide for more details..

2.5 initialize

- Kivic HUD does not store any setting values. Therefore, you should send the following setting values from your smartphones to Kivic HUD right after BLE connection.
  - Time, Time display
  - Brightness Enable, Min Brightness, Min KivicCast Brightness
  - Speed Units, Speed color, warning Speed
  - Keystone, HUD Scale
  - Full Screen Mode
  - Notification exposure time, Notification Enable
  - Notification setting enable(Call, sms, music, kakao, facebook, whatapp, wechat, line, skype, viber, tango, nimbuzz, kiktelegram)
  - kivic mode
  - Gps Signal Week

3. HUD flow

3.1 Working flow

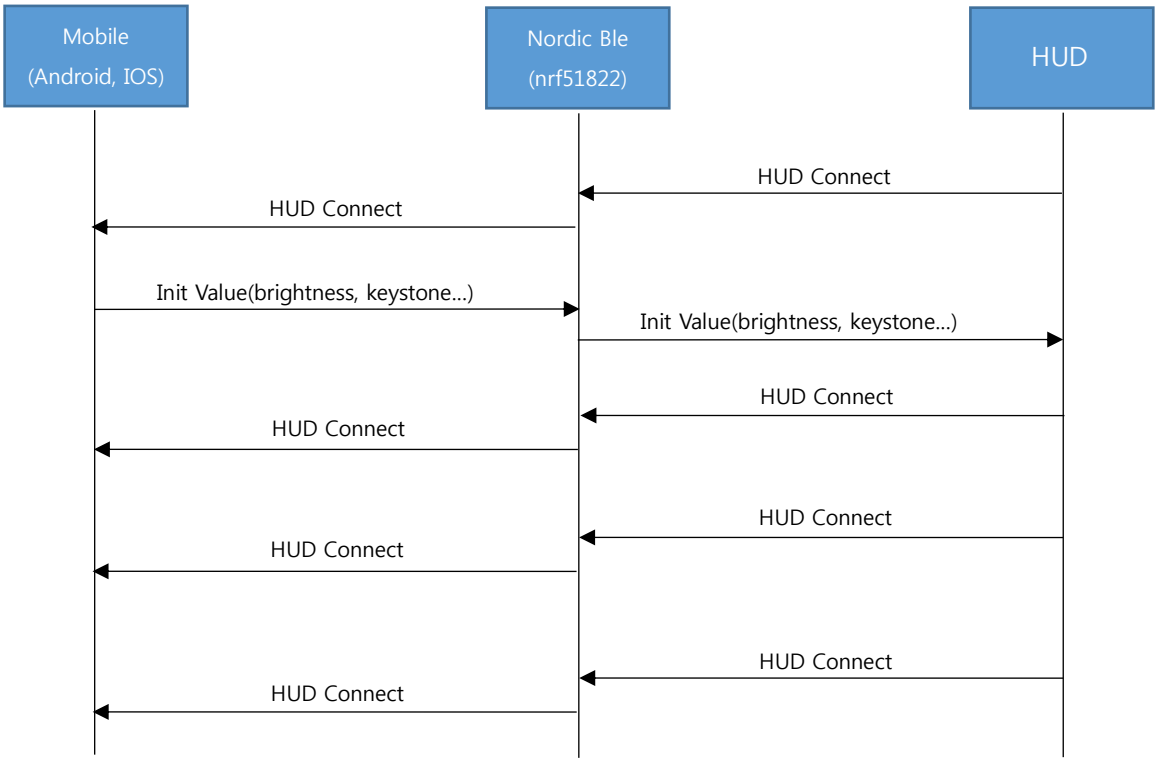


3.1.1 Kivic HUD app is on hold until it receive Connect(0x01, 0x01) Event from Kivic HUD.

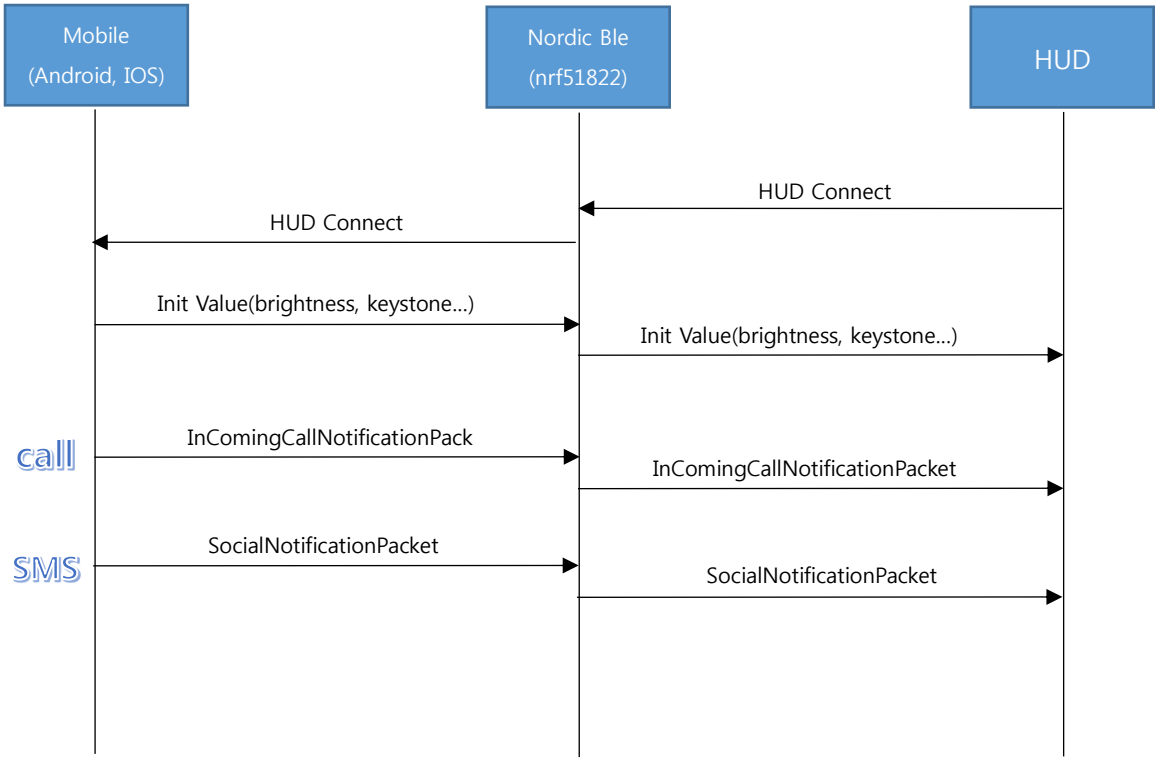
3.1.2 When HUD Connect Event is received, Kivic HUD App starts to transmit the initial setting values.

3.2 HUD Check Alive

In Kivic HUD App, HUD needs to be notified periodically because it does not know the status of Power OFF, BLE disconnection, etc. Kivic HUD sends HUD Connect Event every 5 seconds. If HUD Connect Event is not received within 10 seconds, it is regarded as Disconnect.



3.3 CALL, SMS



5. Protocol

5.1 protocol

The protocol between your smartphone and Kivic HUD is as follows.

Start Tx	Main Command	Parameter 1	Parameter 2	Value Type	End Tx

- Start Tx : message starts

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- Main Command
  - Notification (0x01): Used to transmit infos from your smartphone to Kivic HUD
  - Command (0x02): Used to control Kivic HUD actions from your smartphone
  - Event (0x03): Used to transmit Kivic HUD status infos to your msartphone
- Parameter 1: Function details of main command
- Parameter 2: feature details of Parameter 1
- End Tx: message Ends

START TX	MAIN COMMAND	PARAMETER 1	PARAMETER 2	VALUE TYPE	END TX
0x02	NOTIFICATION (0x01)	INCOMING CALL (0x01)	N/A (0x00)	String	0x03
		SOCIAL (0x04)	N/A (0x00)	String	
		MUSIC (0x0c)	N/A (0x00)	String	
		SPEED (0x0e)	N/A (0x00)	String	
	CMD : 0x02	TIME (0x01)	N/A (0x00)	String	
		BRIGHTNESS (0x02)	MIN (0x04)	Object	
			KIVICCAST MIN (0x06)	Object	
		KEYSTONE (0x03)	N/A (0x00)	Float	
		UART_CONNECT_CHECK (0x06)	N/A (0x00)	N/A	
		KIVIC_MODE (0x07)	N/A (0x00)	Integer	
		FULL_SCREEN (0x08)	ACTIVATION (0x01)	Boolean	
		DISPLAY (0x09)	NOTI_TIMEOUT (0x01)	Integer	
			BRIGHT (0X02)	Boolean	
			SPEED (0x03)	Boolean	
			TIME (0x04)	Boolean	
			SPEED UNIT (0x05)	Integer	
			NOTI INIT SETTING (0x06)	N/A	
			NOTI VISIBLITY (0x07)	Boolean	
			NOTI UI SETTING (0x08)	Object	
			SPEED WARNING (0x09)	Integer	
			SPEED COLOR (0x0a)	Integer	
			THEME (0x0b)	Integer	
			SPEED GAUGE (0x0c)	Boolean	

			NAVIGATION THEME (0x0d)	Integer	
		SOFTUPDATE (0x0a)	CONNECT (0x01)	N/A	
			CANCEL (0x02)	N/A	
		GPS (0x0b)	SIGNAL WEEK (0x01)	Boolean	
		HUD DISCONNECT (0x0c)	N/A (0x00)	N/A	
		LAYOUT SIZE(0x0e)	N/A (0x00)	Float	
		KEEP ALIVE(0x0f)	N/A (0x00)	N/A	
		WIFI_STA_MODE(0x10)	N/A (0x00)	String, String	
		OBDII (0x13)	CONNECT (0x01)	Boolean	
		HOTSPOT BASEBAND (0x15)	N/A (0x00)	Object	
	EVENT (0x03)	UART (0x01)	CONNECT (0x01)	Integer	
		KIVIC_APP (0x03)	KIVIC START (0X01)	Boolean	
			CONNECT (0x02)	Boolean	
		SOFTUPDATE (0x04)	CONNECT (0x01)	String	
		HUD VERSION (0x05)	N/A (0x00)	String	
		WIFI STA_STATUS (0x06)	N/A (0x00)	Integer, String, String	