

# Demo Application UI Guide (Bluetooth Applications)

Version 0.1.0

## Display Audio

Solution Team

**NEXELL**

## Release information

The following changes have been made to this document.

### Change History

Date	Change
07 Dec. 2017	First release for v0.1.0

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# Chap 1. BT APPLICATION ARCHITECTURE

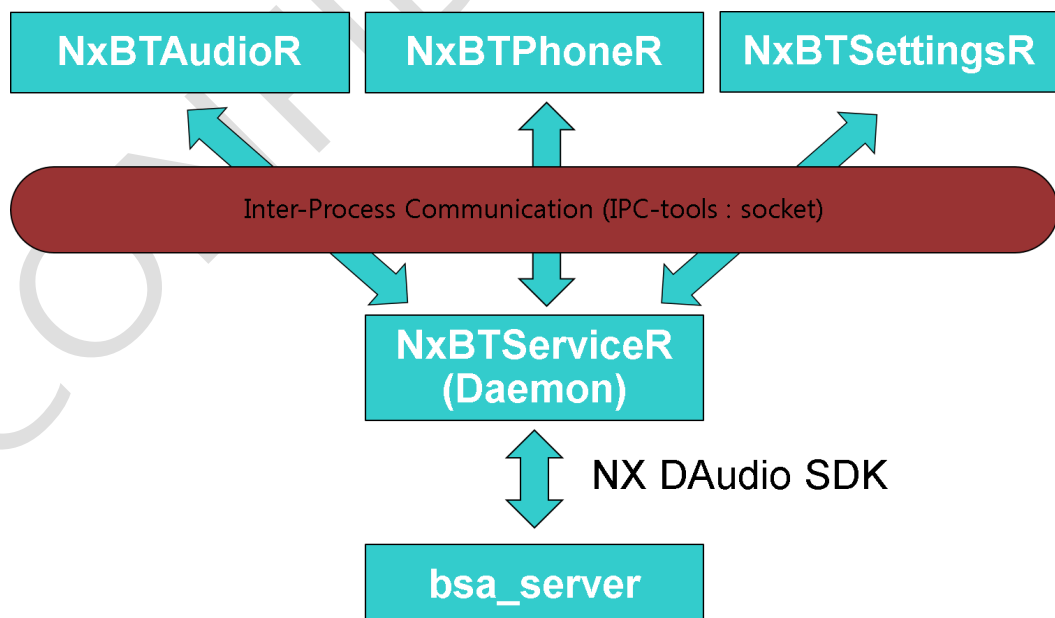
## 1.1 BT application types

It consists of four applications in total.

Applications	Description	IPC type
NxBTServiceR	Service daemon	Server
NxBTAudioR	GUI application for A2DP(BT Audio)	Client
NxBTPhoneR	GUI application for BT phone	
NxBTSettingsR	GUI application for BT settings	

## 1.2 BT application architecture / summary

Three applications operate with IPC communication with the NxBTServiceR daemon.



NxBTServiceR daemon

- An IPC server program that processes an instruction requested by an IPC client program such as NxBTAudioR and returns the result.
- When a callback function is called due to the occurrence of a BT event, the command is transmitted.
- The command consists of a string, and the command structure is as follows.
  - Request command (IPC Client → IPC Server)
    - ◆ [STX] + [SP] + [SERVICE] + [SP] + [CMD] + [ETX]
  - Request response command (IPC Server → IPC Client)
    - ◆ If there is no argument
      - [STX] + [RESULT] + [SP] + [SERVICE] + [SP] + [CMD] + [ETX]
    - ◆ If there is an argument
      - [STX]+ [RESULT]+[SP]+[SERVICE]+[SP]+[CMD]+[SP]+[ARG]+[ETX]
      - If the number of arguments is N or more, each argument is constructed using a separator.

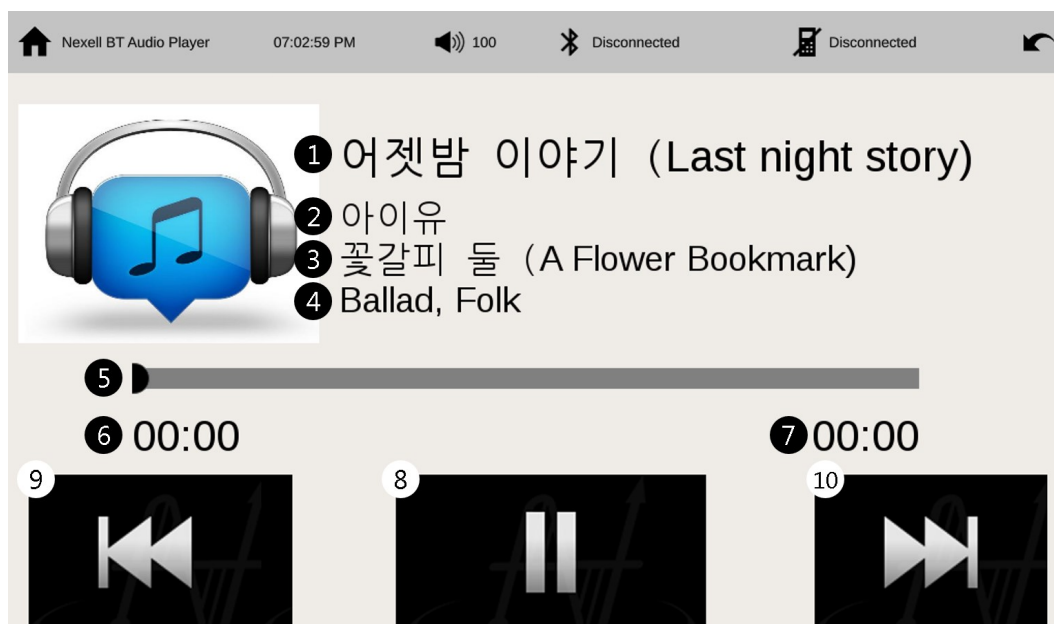
Type	Value
STX	\$
SP(SEPERATOR)	#
SERVICE	MGT / AVK / HS / PBC / MCE
CMD(COMMAND) / ARG(ARGUMENT)	It is not explained in this document.
ETX	LF

NxBTAudioR / NxBTPhoneR / NxBTSettingsR

- The IPC client program reflects the status of the command processing result received from the NxBTServiceR daemon or the command about the event in the UI.

## Chap 2. NxBTAudioR

### 2.1 User Interface



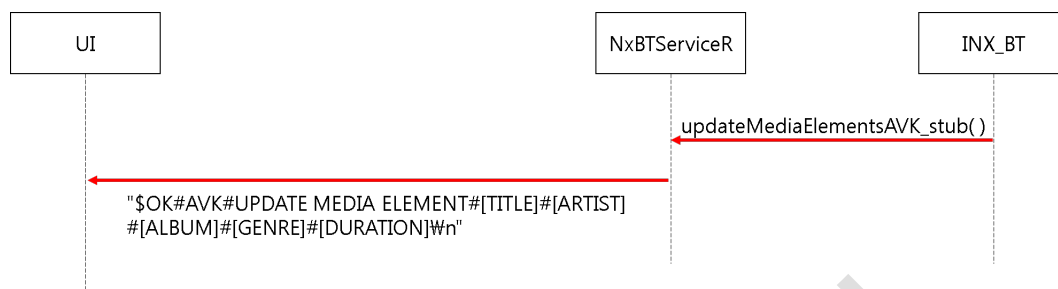
1. Music title
2. Music artist
3. Music album
4. Music genre
5. Update play position – Slider widget
6. Update play position – Label widget
7. Music duration time
8. Start / Pause music
9. Move to previous music
10. Move to next music

### 2.2 Feature description

#### 2.2.1 Update music information

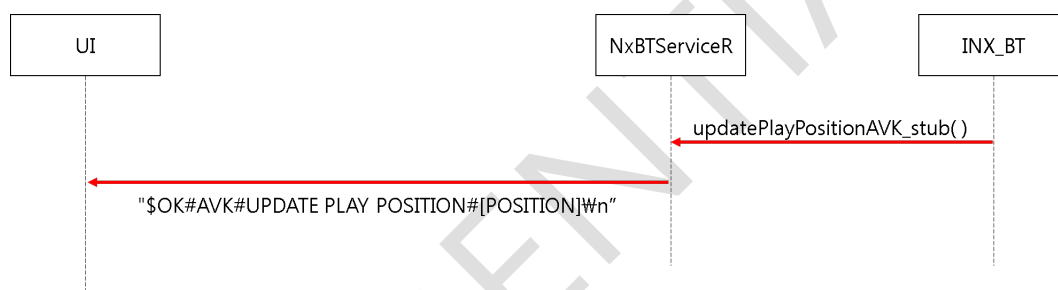
Depending on the implementation of the BT function in the BT client device, this function may not work.

The following diagram is a sequence diagram showing the process of calling the API function of Nx DAudio SDK to display the title information, the album, the genre, and the sound source information of the total playing time.



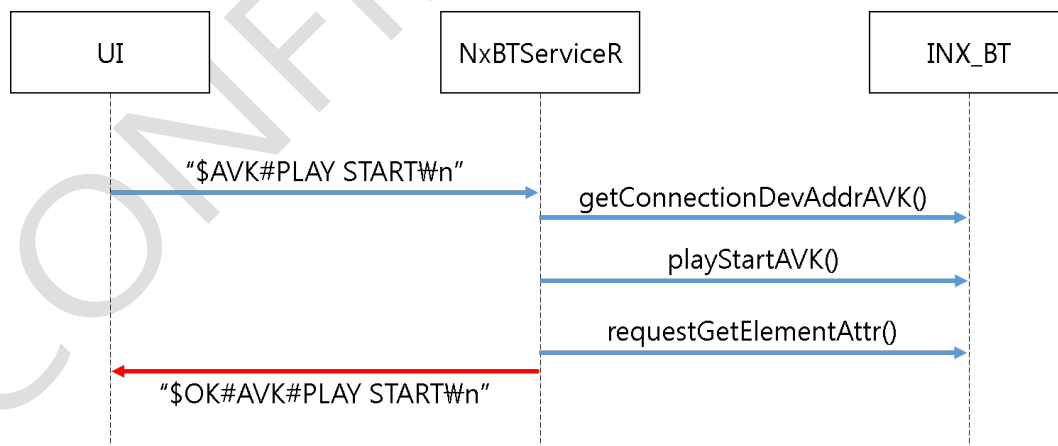
## 2.2.2 Update play position

Depending on the implementation of the BT function in the BT client device, this function may not work.



## 2.2.3 Play music

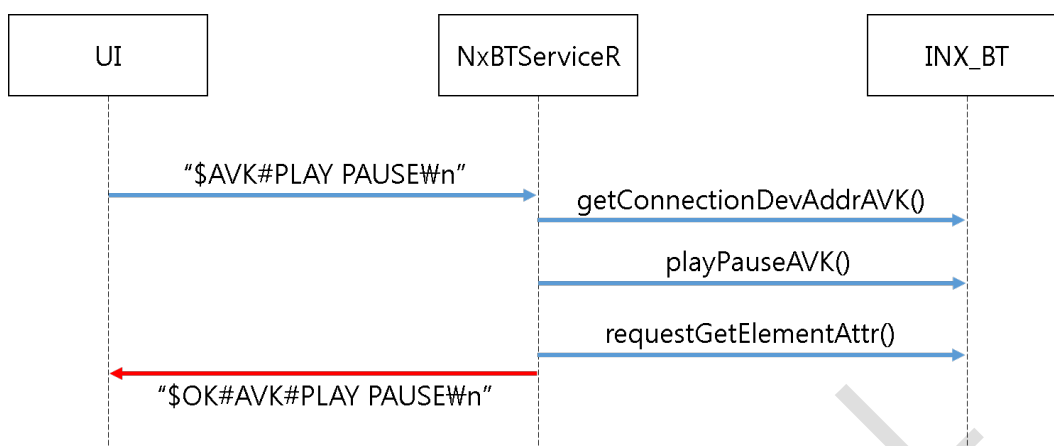
The following figure is a sequence diagram that shows the process of calling the API function of NX DAudio SDK when the music play button is clicked.



### 2.2.3.1 Pause music

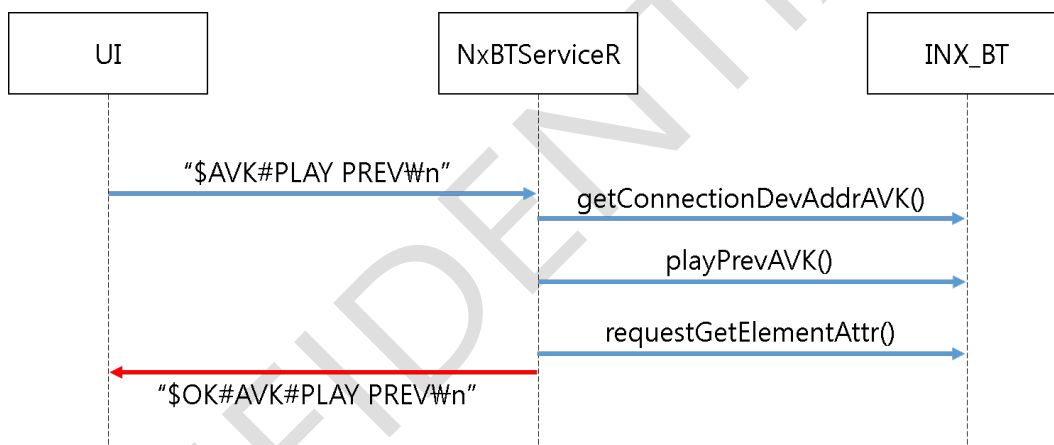
The following figure is a sequence diagram that shows the process of calling the API function of NX DAudio SDK when the music pause button is clicked.





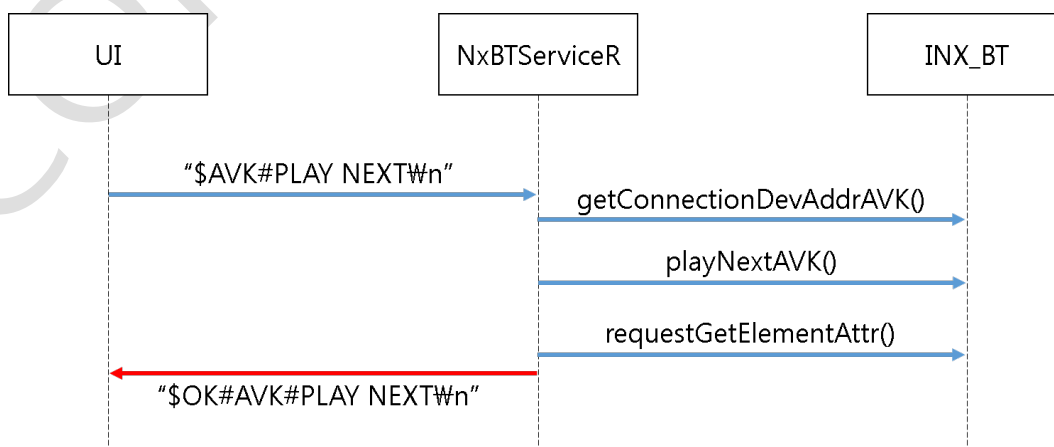
### 2.2.3.2 Move to previous music

The following figure is a sequence diagram that shows the process of calling NX DAudio SDK API function when clicking the button to move to the previous music.



### 2.2.3.3 Move to next music

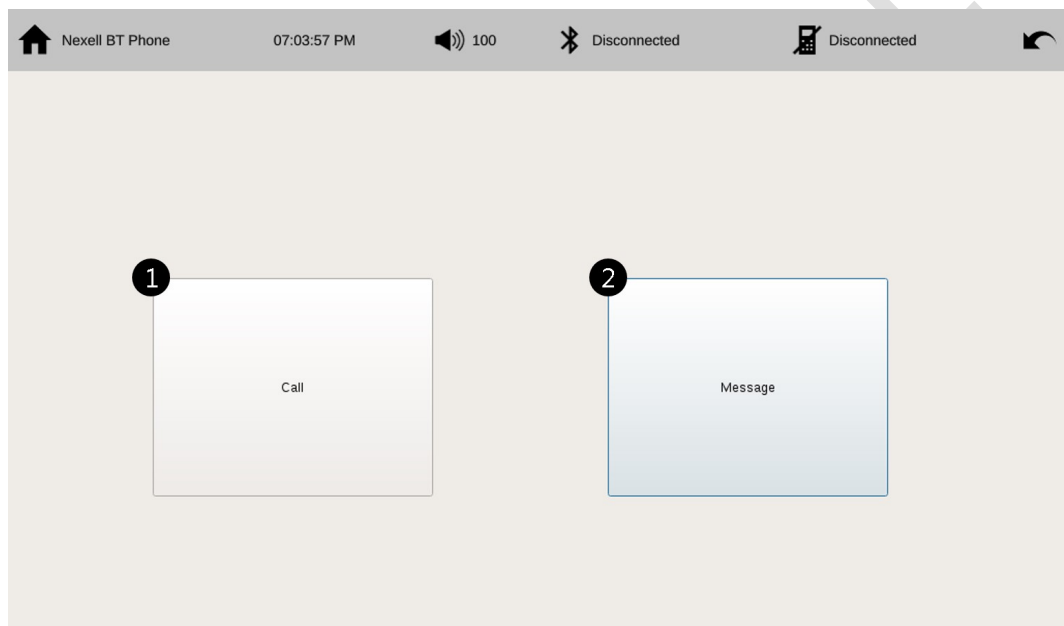
The following figure is a sequence diagram that shows the API function call process of NX DAudio SDK by clicking the button to move to the next music.



## Chap 3. NxBTPhoneR

### 3.1 User Interface

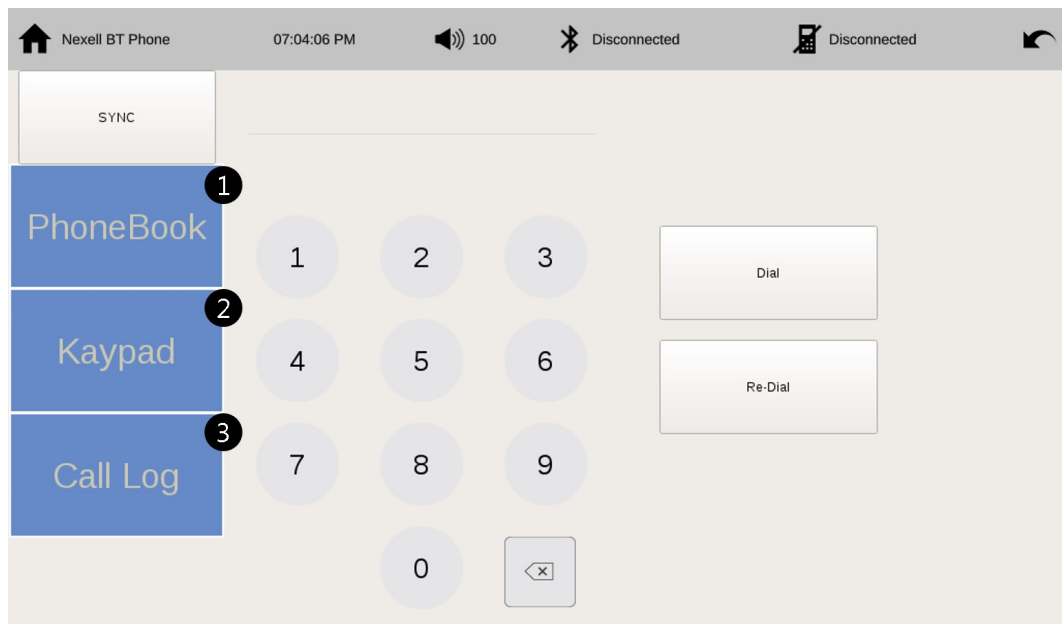
#### 3.1.1 Main menu



The main menu consists of two buttons.

1. Call menu
  - A. Tap the [Call] button to go to the call menu.
2. Message menu
  - A. Tap the [Message] button to go to the message menu.

### 3.1.2 Call menu



The call menu consists of three sub menus.

1. Phonebook menu
  - A. Tap the [PhoneBook] button to go to the phone book menu.
2. Keypad menu
  - A. Tap the [PhoneBook] button to go to the keypad book menu.
3. Call log menu
  - A. Tap the [Call Log] button to go to the call log menu.

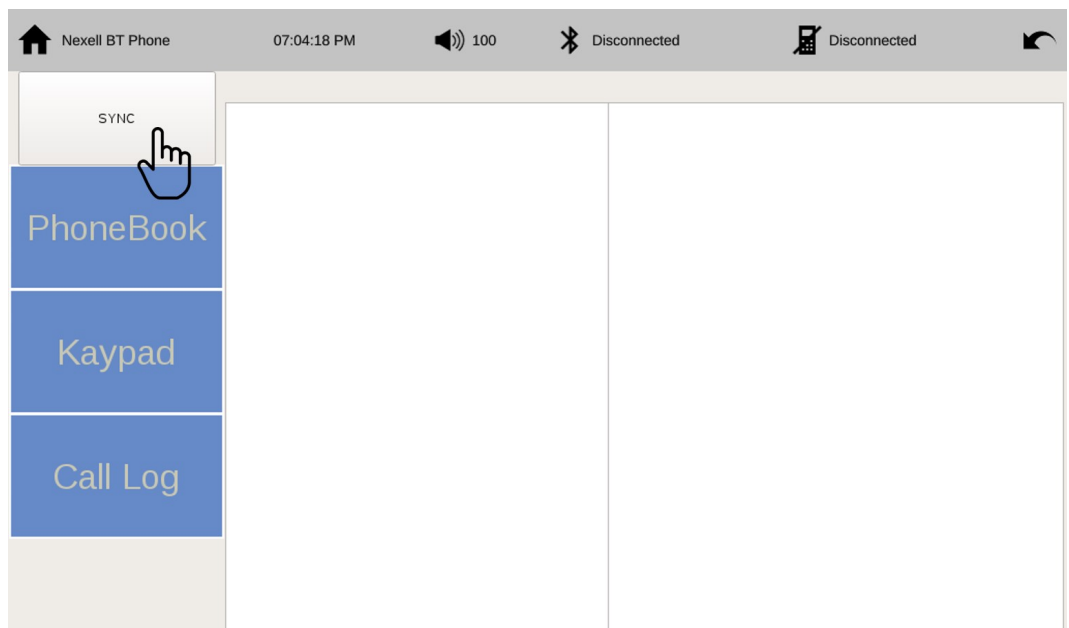
### 3.1.3 Message menu

## 3.2 Feature description

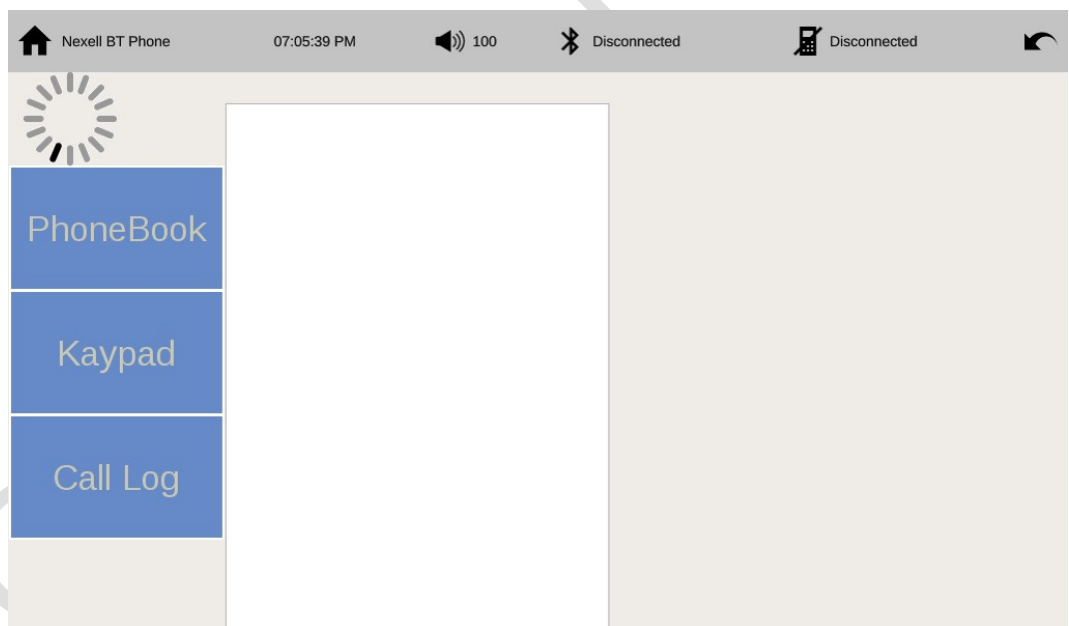
### 3.2.1 Download phone book

The following shows the UI operation when downloading the phone book.

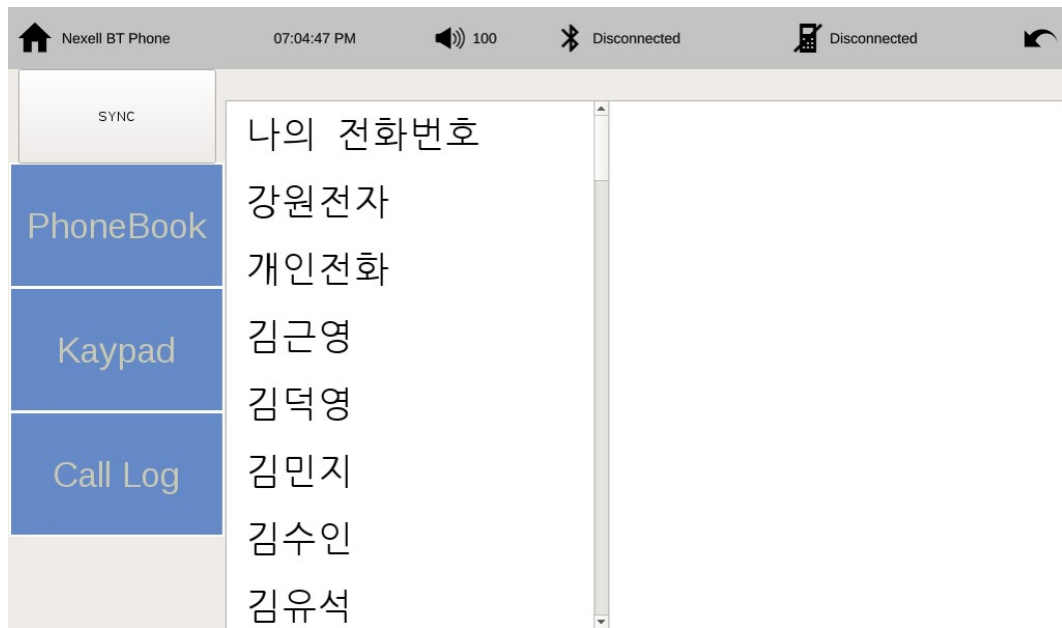
1. Go to [Call menu] → [PhoneBook] menu.
2. Tap the [Sync] button.



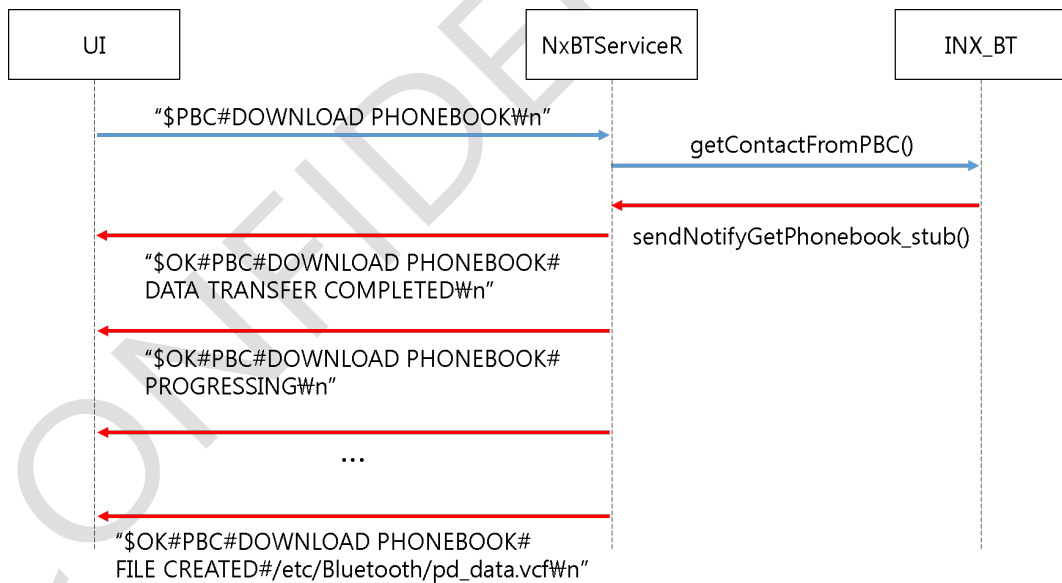
3. Phone book download is performed.



4. You can confirm that the phone book has been downloaded.



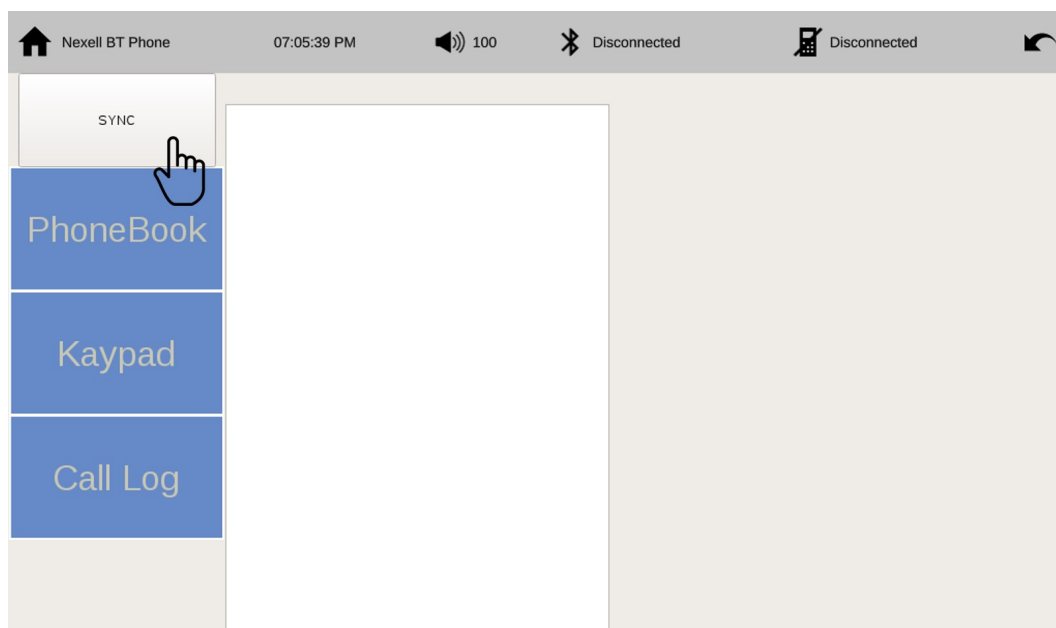
The following figure is a sequence diagram for NX DAudio SDK API call and callback function generation when tapping [Sync] button in above 2



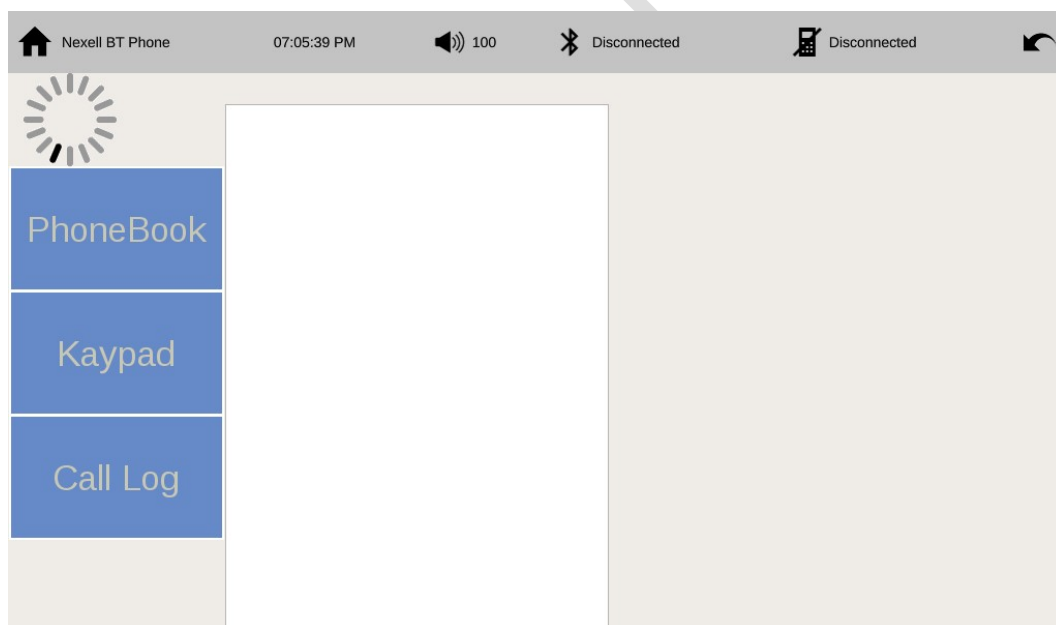
### 3.2.2 Download call log

Even in the case of downloading a recent call record, the download operation of the phone book and the UI operation are the same.

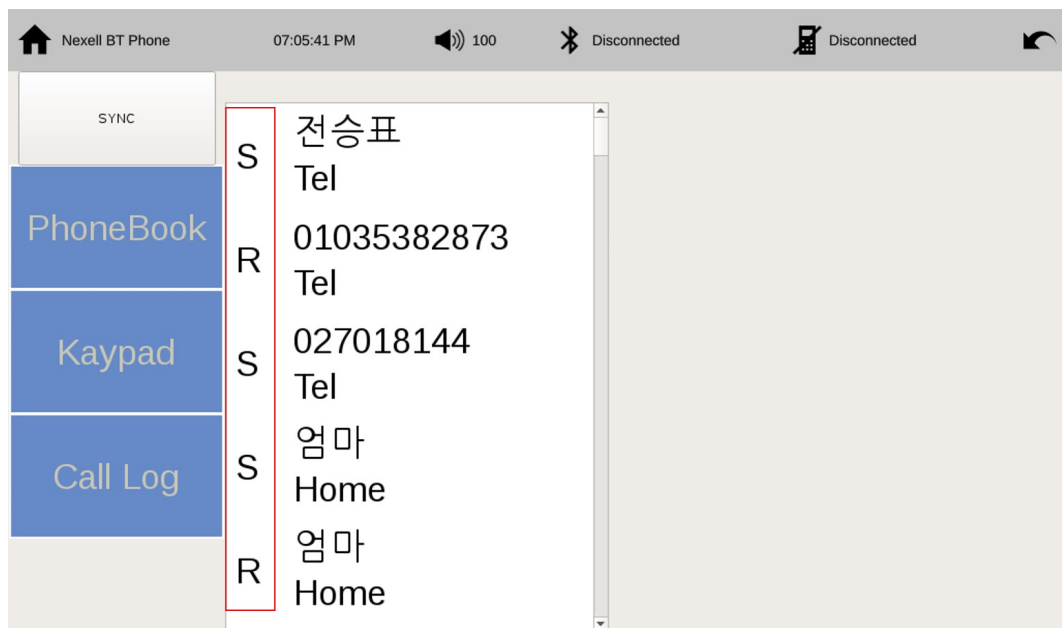
1. Go to [Call menu] → [Call Log] menu.
2. Tap the [Sync] button.



3. Call log download is performed



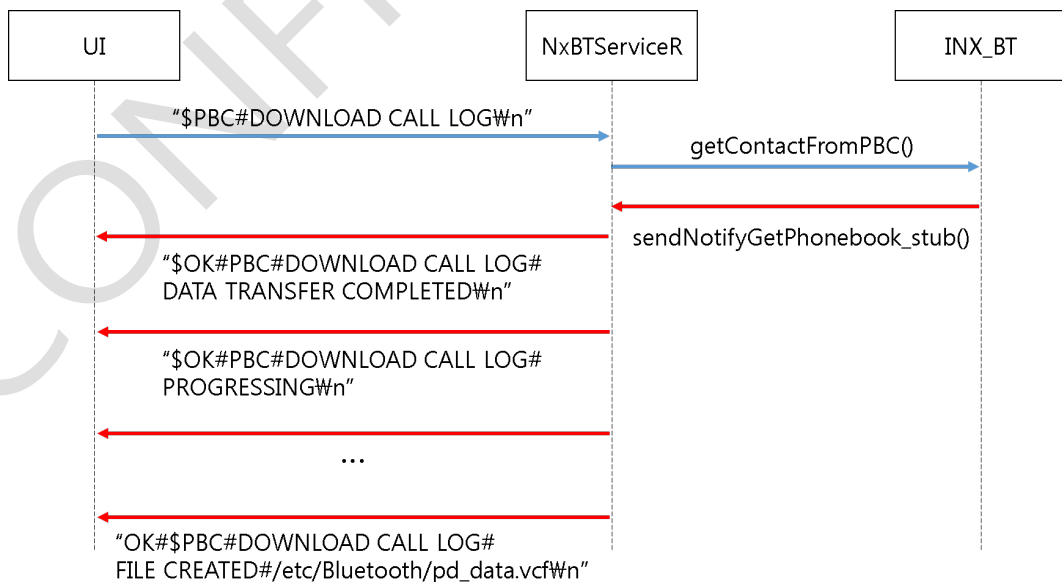
4. You can confirm that the phone book has been downloaded.



The red box indicates the call status.

Character	Description
S	Outgoing call
R	Incoming call
M	unanswered call

The following figure is a sequence diagram for the API function call process of NX DAudio SDK when tap [Sync] button in above step 2.

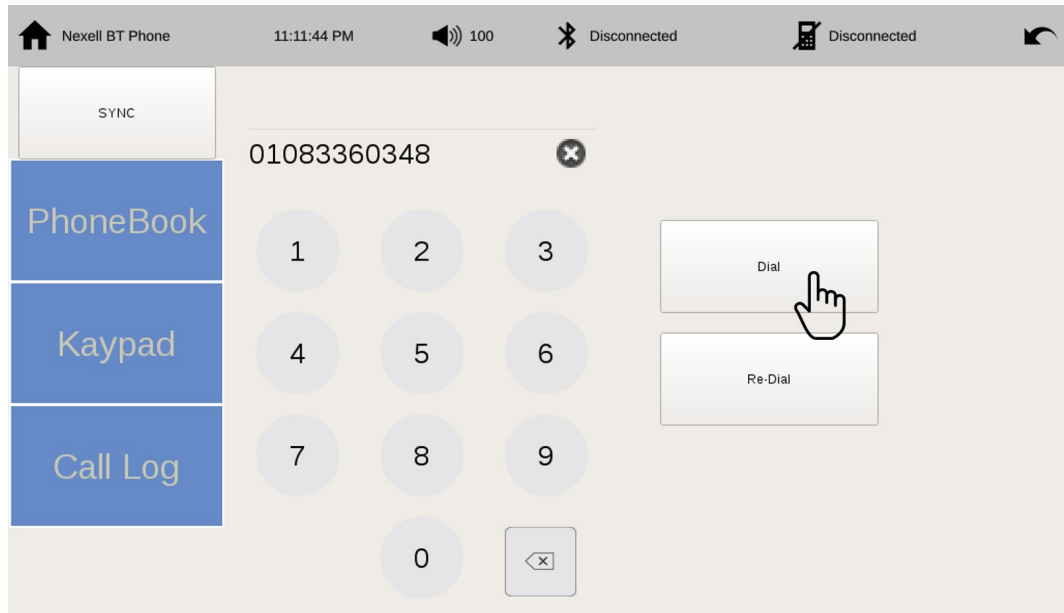


### 3.2.3 Dialing

There are four ways to make a call.

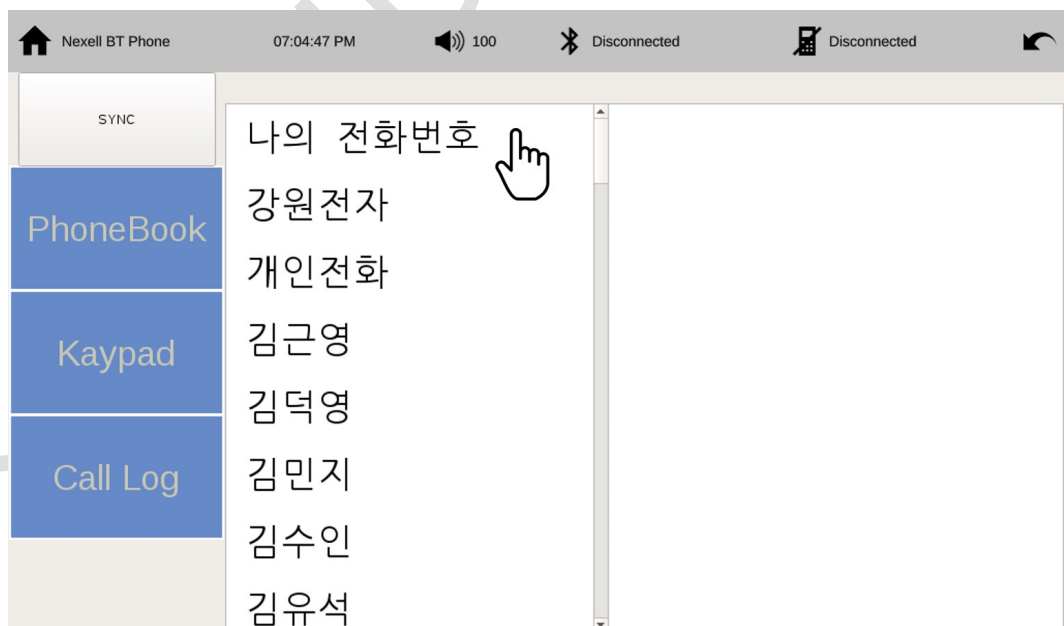
1. Using the keypad

- A. Go to [Call Menu] → [Keypad] menu.
- B. Use the keypad to enter the number you want to dial.
- C. Tap the [Dial] button to dial.



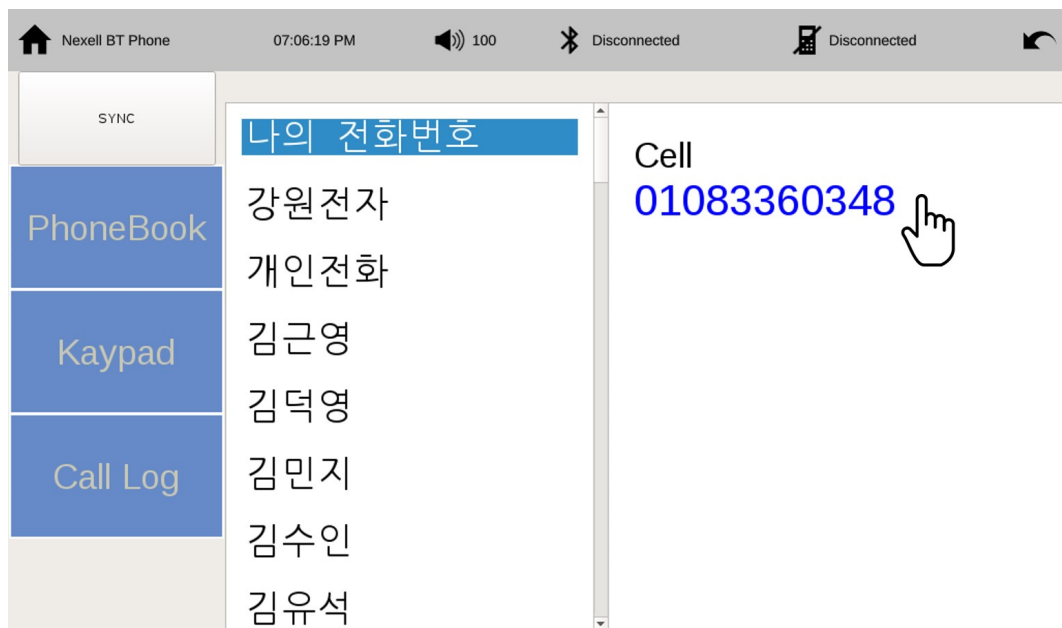
## 2. Using the phone book

- A. Tap on an entry in the phone book list to get a list of details.



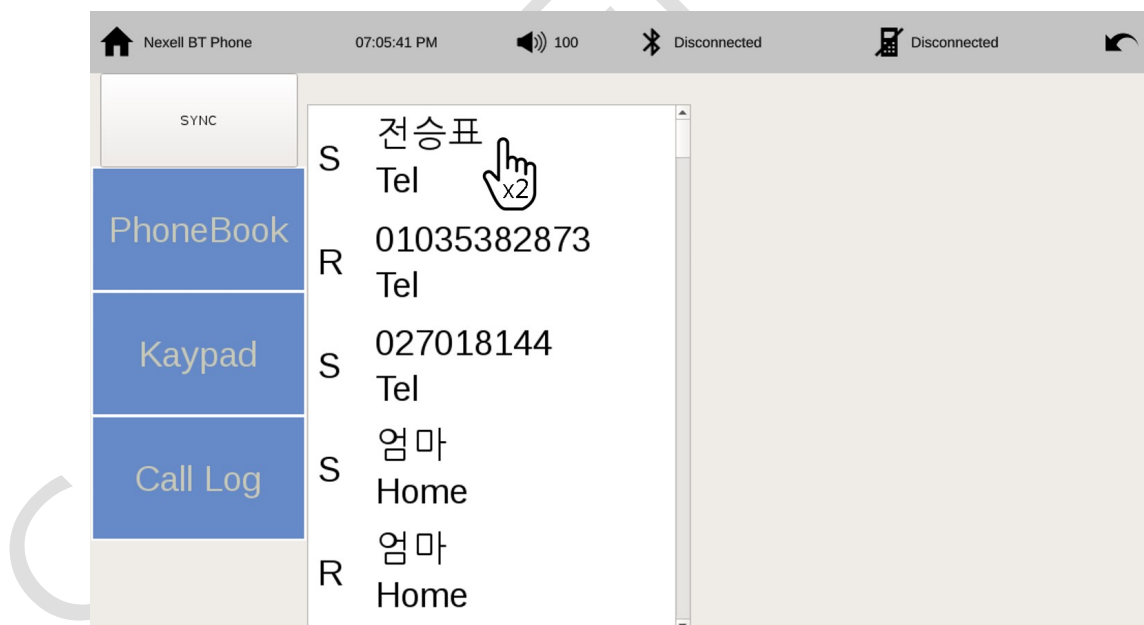
- B. In the details list, tap the number you want to dial to place a call.



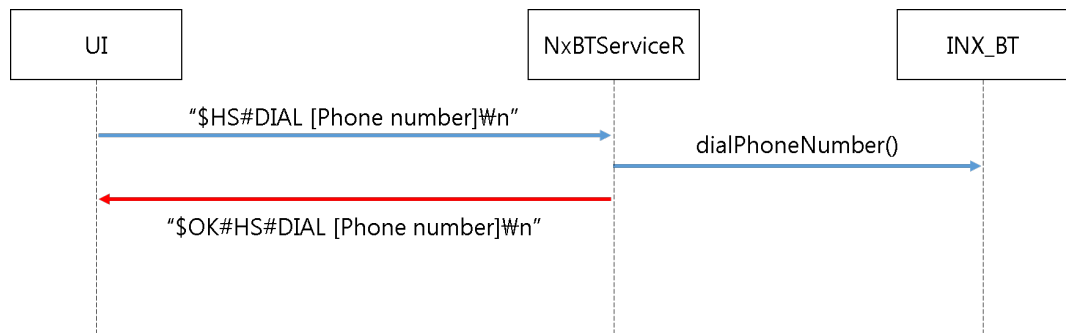


### 3. Using the call log

When you double-tap an item in the Recent Call History list, a call is made.

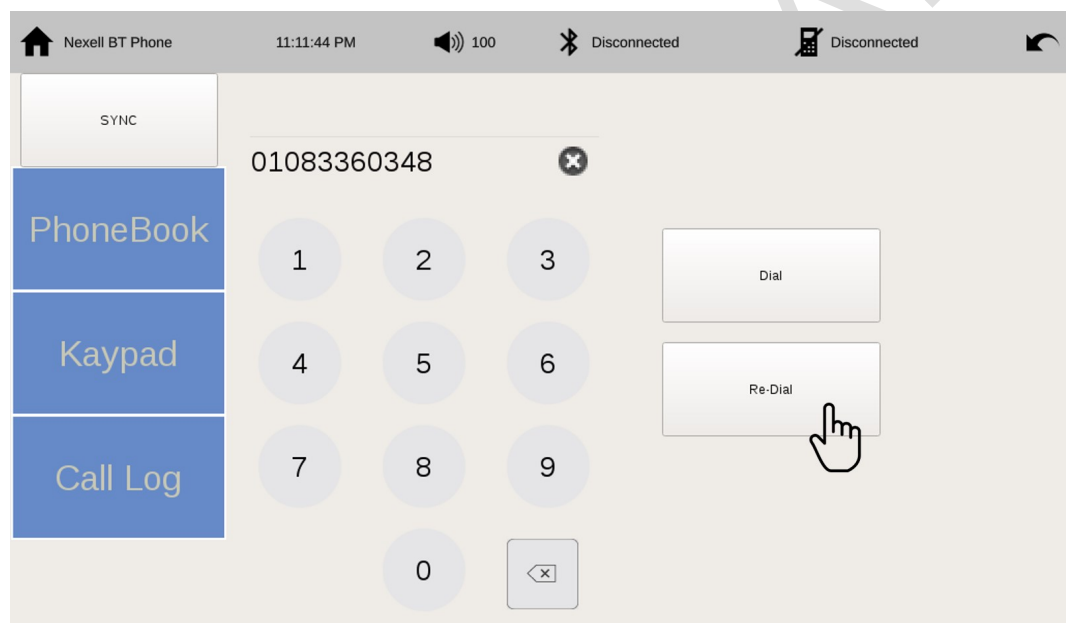


The following figure is a sequence diagram showing the process of calling API function of Nx DAudio SDK when calling from 1-3 above.

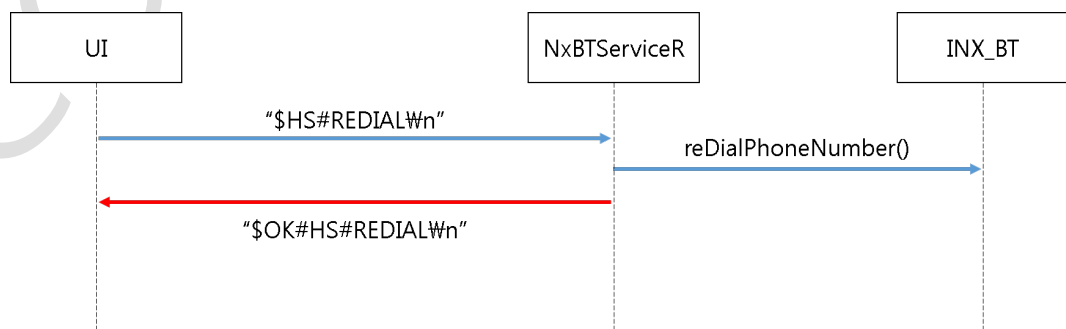


#### 4. Using the Re-Dial

- A. Go to [Call menu] → [Keypad] menu
- B. Tap the [Re-Dial] button.



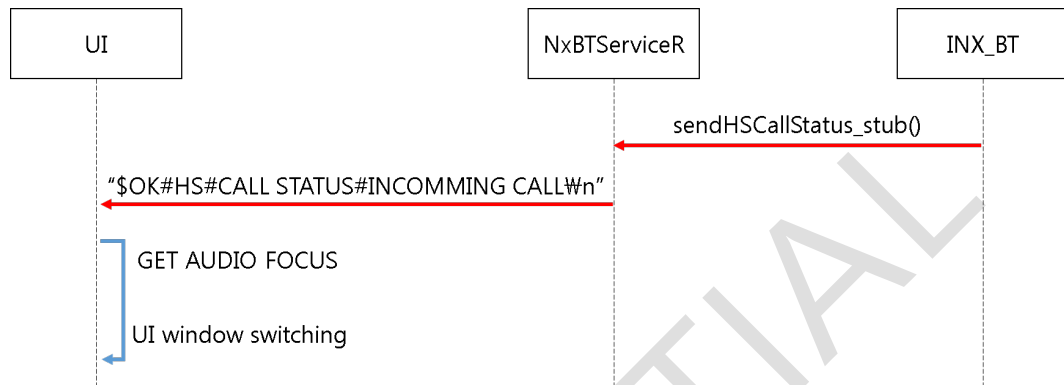
The following figure shows the sequence diagram of Nx DAudio SDK API function call when tap [Re-Dial] button in above 2.



### 3.2.4 Receiving a call

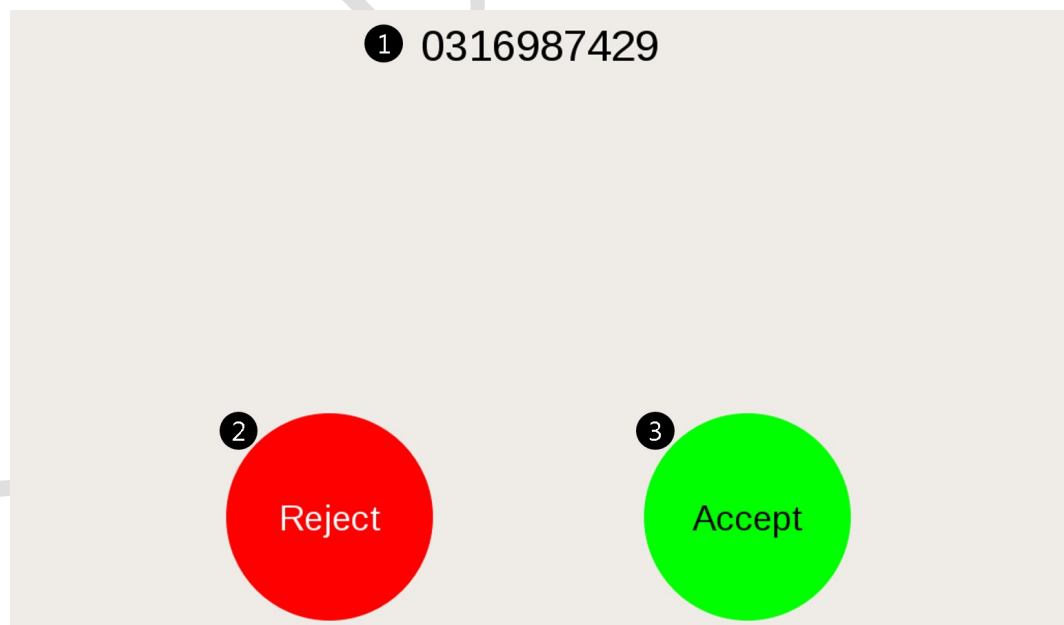
#### 3.2.4.1 Call connection request

The following figure is a sequence diagram when a call connection request event occurs.



1. Callback function for HS Call Status is called.
2. The callback function sends the command about HS Call Status to the UI.
3. If HS call status is INCOMMING CALL, request audio focus.
4. Switch to the phone connection request window.

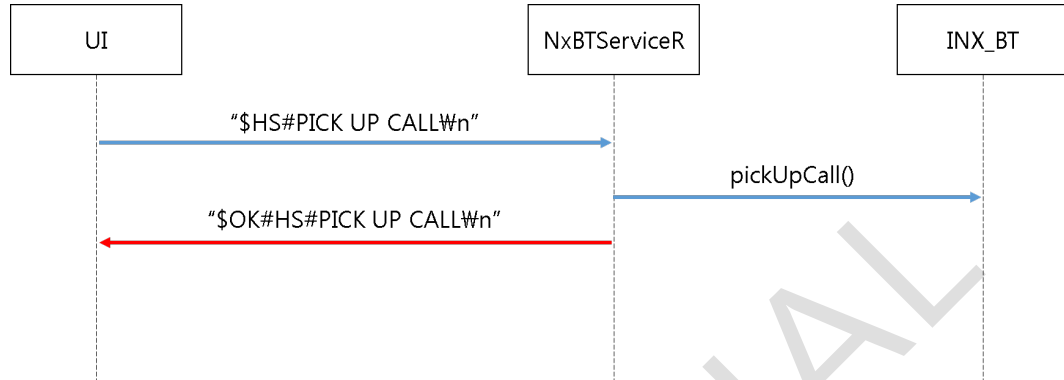
The following figure shows the User Interface of the telephone connection request window.



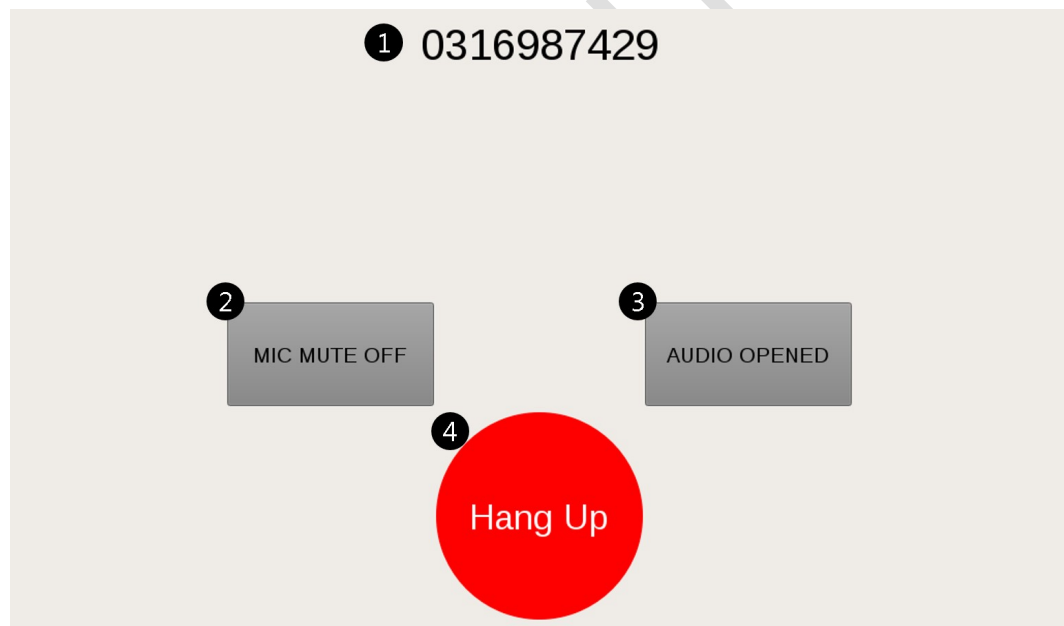
1. Display for phone number
2. Reject the call request
3. Accept the call request

### 3.2.4.2 Accept call connection request

The following figure is a sequence diagram showing the process of calling the Nx DAudio SDK API function when the [Accept] button is tapped on the telephone connection request window described above.



The following figure shows the user interface when accepting the call connection request.

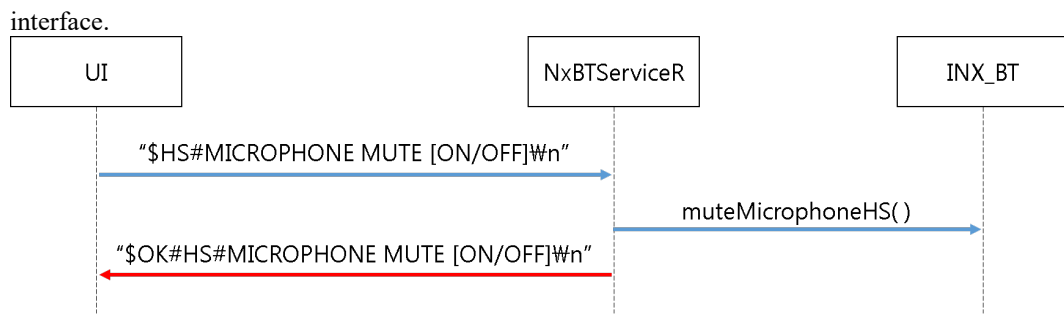


1. Display for phone number
2. Display/Settings for microphone mute status
3. Display/Settings for audio open/close status
4. Disconnect call connection

The above window is closed when the call connection ends.

#### 3.2.4.2.1 Settings for microphone mute status

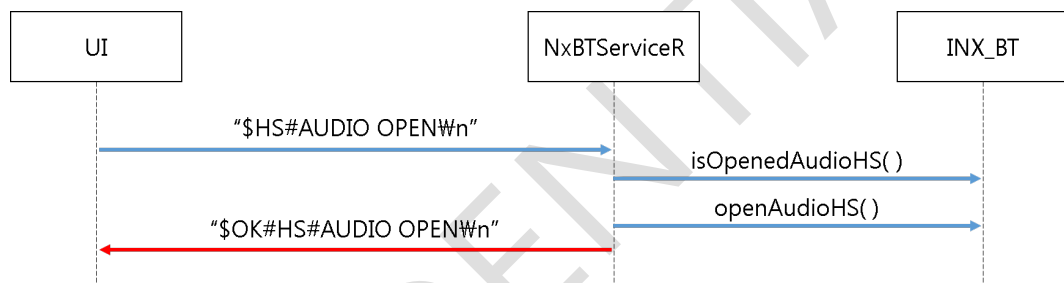
The following figure is a sequence diagram showing the process of calling API function of Nx DAudio SDK when [MIC MUTE ON / OFF] button 2 is tapped in the above user



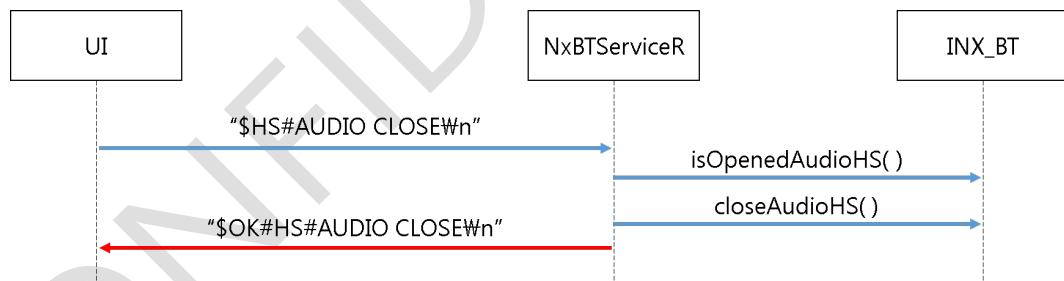
### 3.2.4.2.2 Settings for audio open/close status

The following figure is a sequence diagram showing the process of calling Nx DAudio SDK API function when tapping [AUDIO OPENED / CLOSED] button 3 in the above user interface.

When you open an audio device

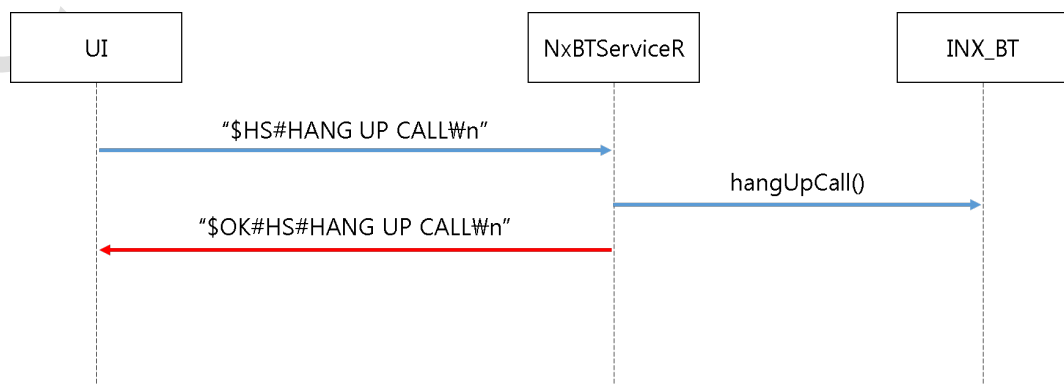


When you close an audio device



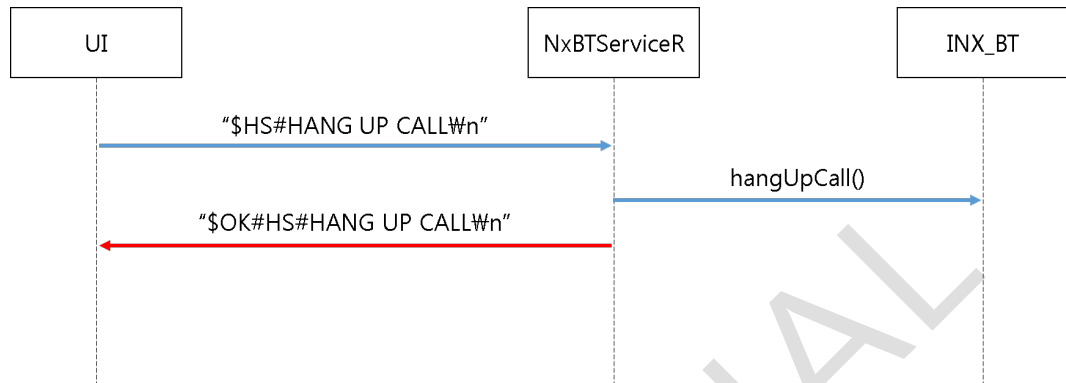
### 3.2.4.2.3 Disconnect call connection

The following figure is a sequence diagram showing the process of calling API function of Nx DAudio SDK when tapping [Hang up] button 4 in the above user interface.



### 3.2.4.3 Rejecting a call connection request

The following figure is a sequence diagram showing the process of calling API function of Nx DAudio SDK when tap [Reject] button in the above-mentioned telephone connection request window.

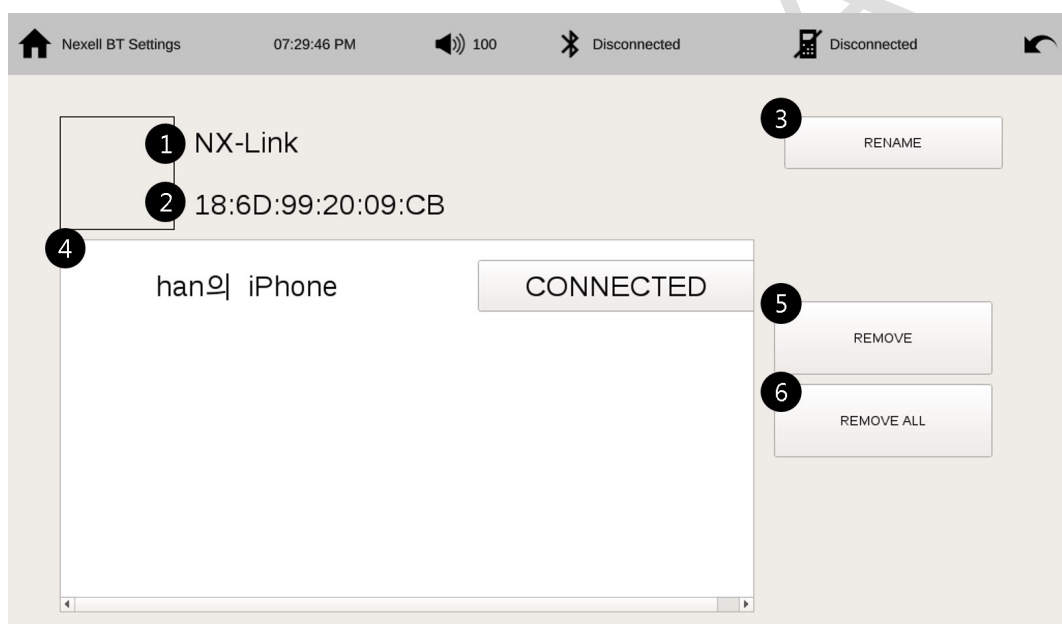


## Chap 4. NxBTSettingsR

### 4.1 User interface

#### 4.1.1 Main menu

#### 4.1.2 Connection menu

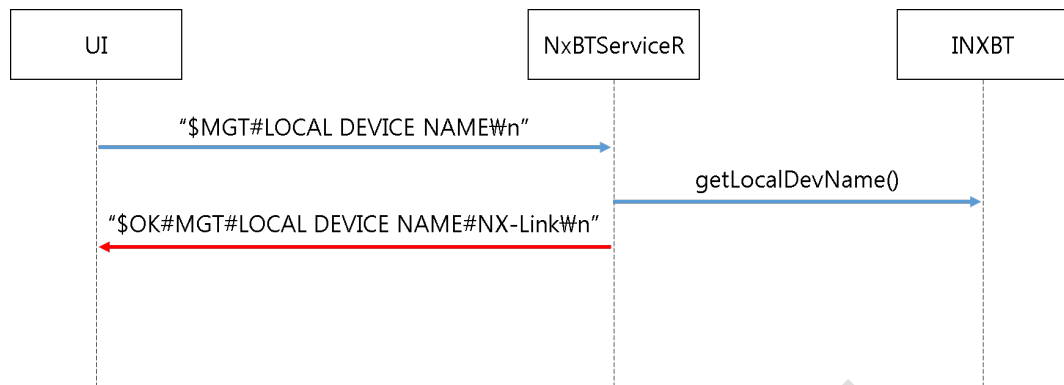


1. The BT device name of the current system
2. The BT device address of the current system
3. The button for BT device rename of the current system
4. List of paired BT devices
5. Delete selected BT device information
6. Delete all BT device information

### 4.2 Feature description

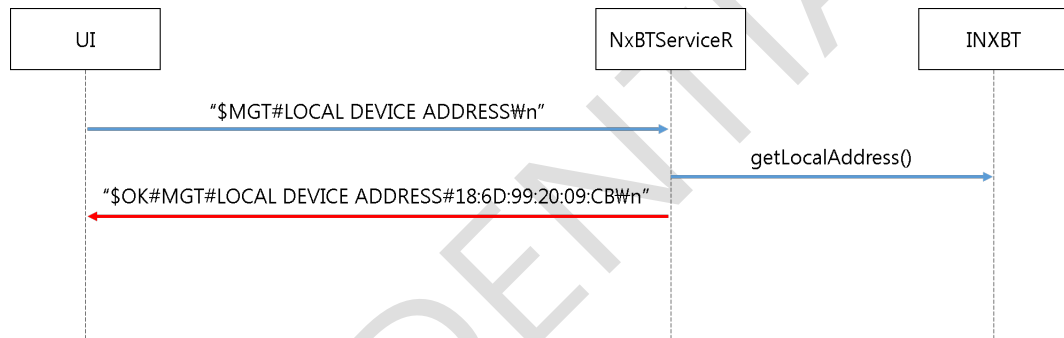
#### 4.2.1 Display the BT device name of the current system

The following figure is a sequence diagram showing the NX DAudio SDK API function call when querying the BT device name of the current system.



#### 4.2.2 Display the BT Device Address of the Current System

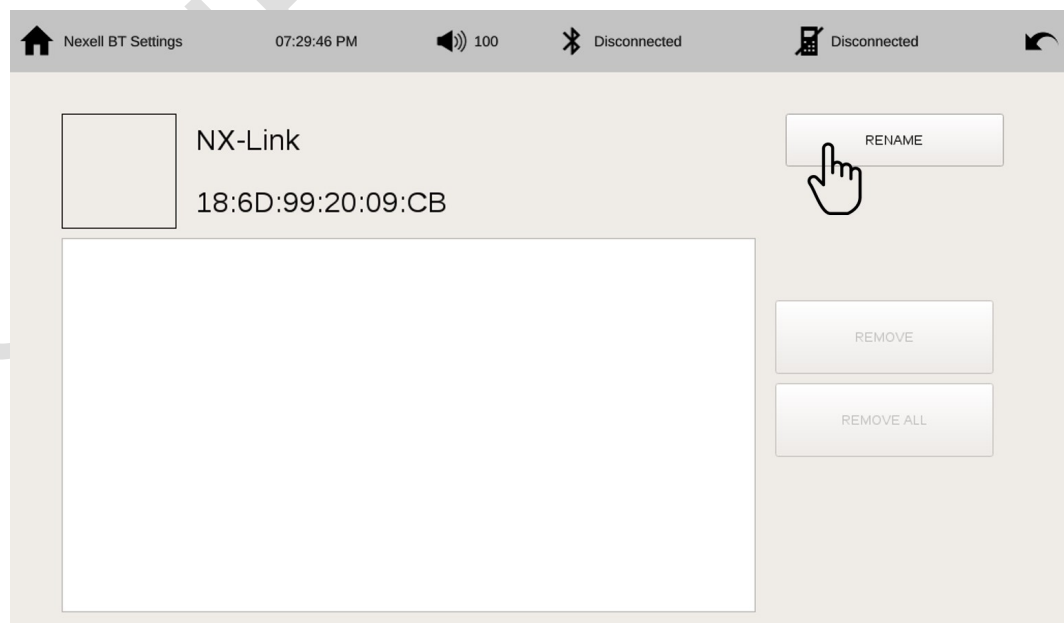
The following figure is a sequence diagram showing the NX DAudio SDK API function call when querying the BT device name of the current system.



#### 4.2.3 Change the BT device name of the current system

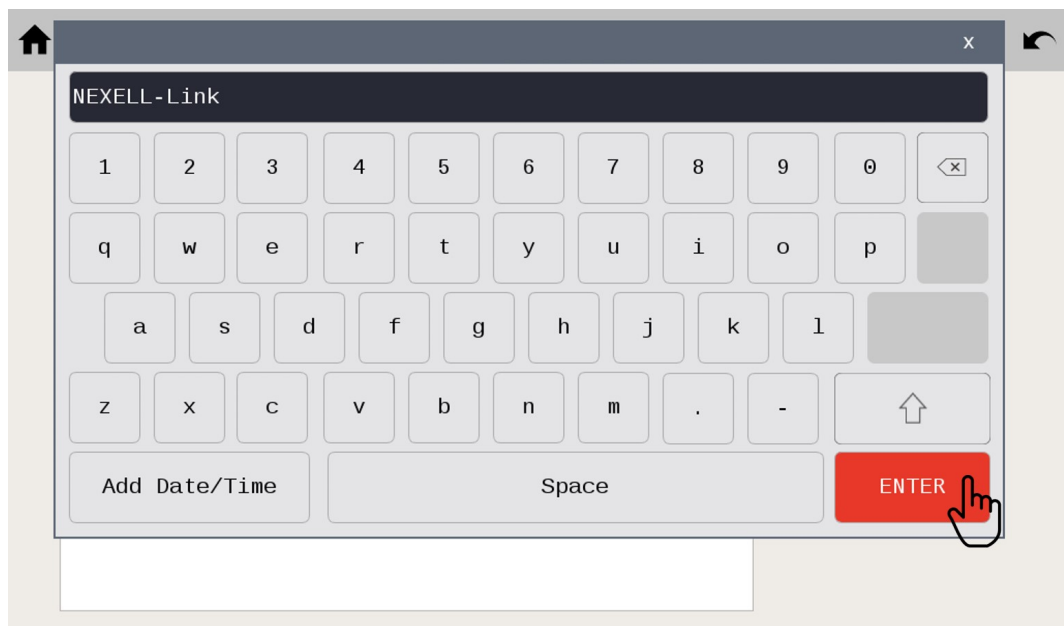
Indicates the UI behavior when changing the BT device name of the current system.

1. Go to [Main menu] – [Connection menu]

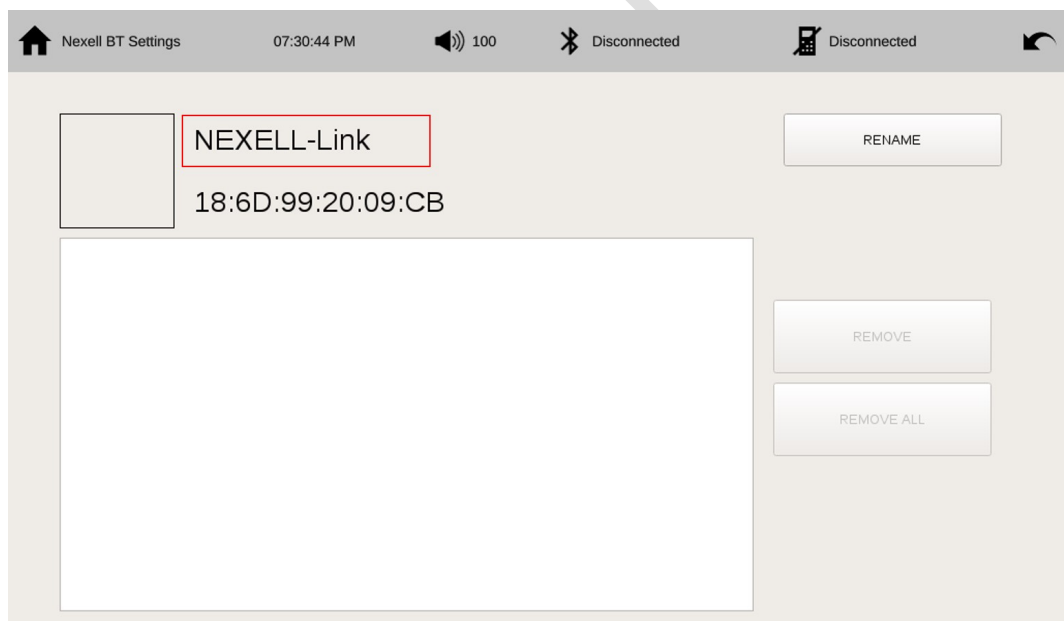


2. Tap the [RENAME] button to launch the virtual keyboard.
3. Enter the name of the BT device you want to change, and then tap the [ENTER] button.

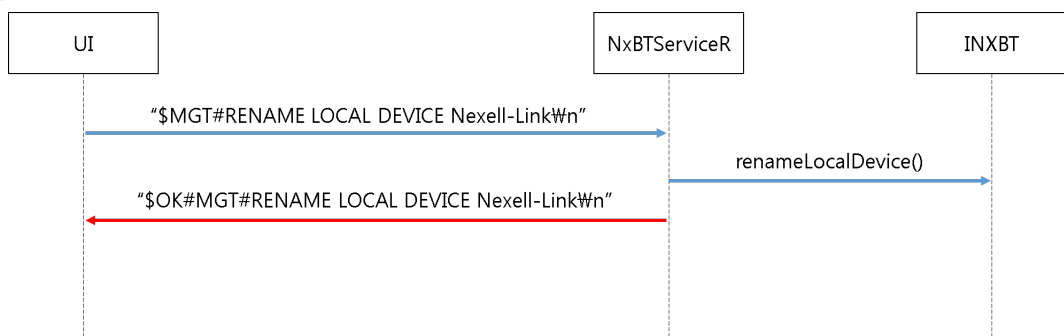




4. You can confirm that the BT device name of the current system has been changed.

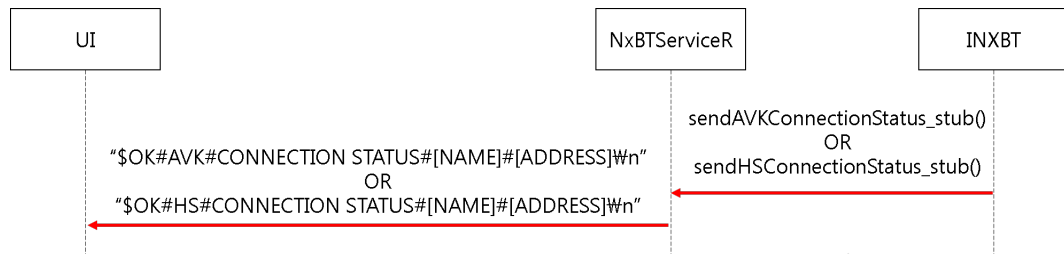


The following figure is a sequence diagram showing the process of calling the API function of NX DAudio SDK when the above step 3 is performed.

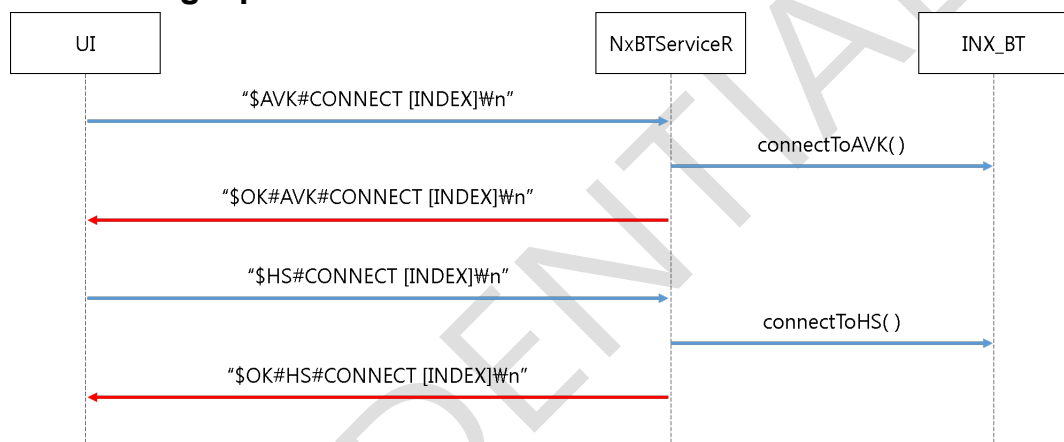


#### 4.2.4 Display for pairing BT device name and connection status

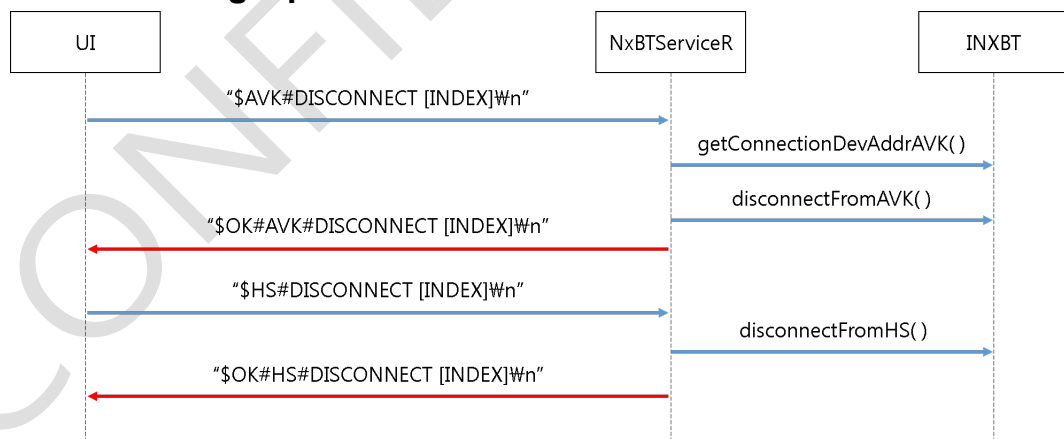
The following figure is a sequence diagram showing the API function call flow of NX DAudio SDK when the connection status of the BT device is changed.



#### 4.2.5 Connecting a paired BT device



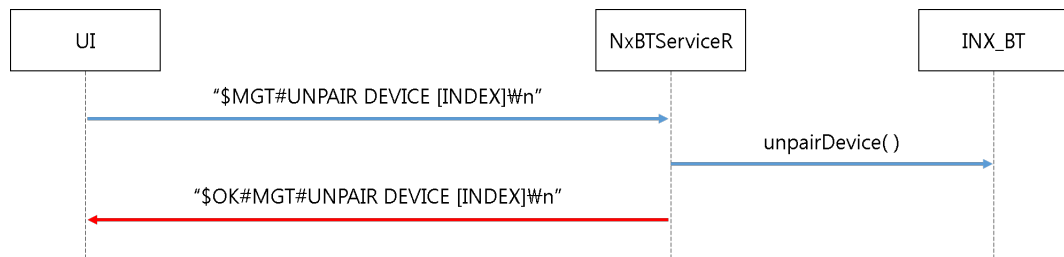
#### 4.2.6 Disconnecting a paired BT device



#### 4.2.7 Deleting selected paired BT device information

Tap the item on the paired BT device list and tap the [REMOVE] button. At this time, if the deleted device is connected, the connection is disconnected.

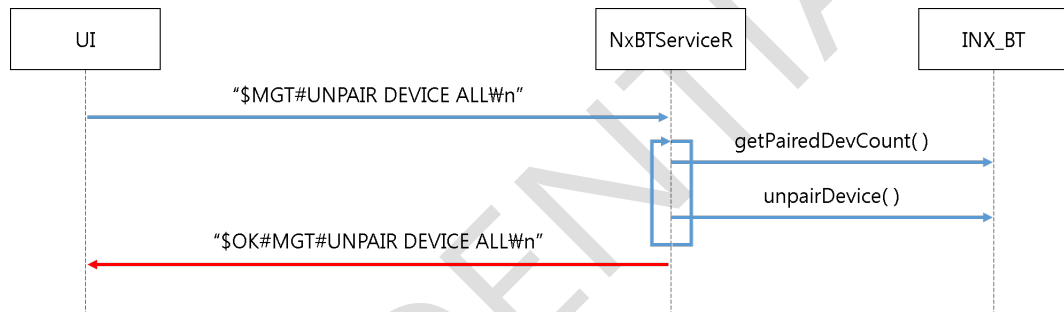
The following diagram is a sequence diagram showing the API function call flow of Nx DAudio SDK when disconnecting the selected BT device. when deleting all paired BT device information.



#### 4.2.8 Delete all paired BT device information

Tapping the [REMOVE ALL] button erases all device information. At this time, if the deleted device is connected, the connection is disconnected.

The following figure is a sequence diagram showing the API function call flow of Nx DAudio SDK when deleting all paired BT device information.

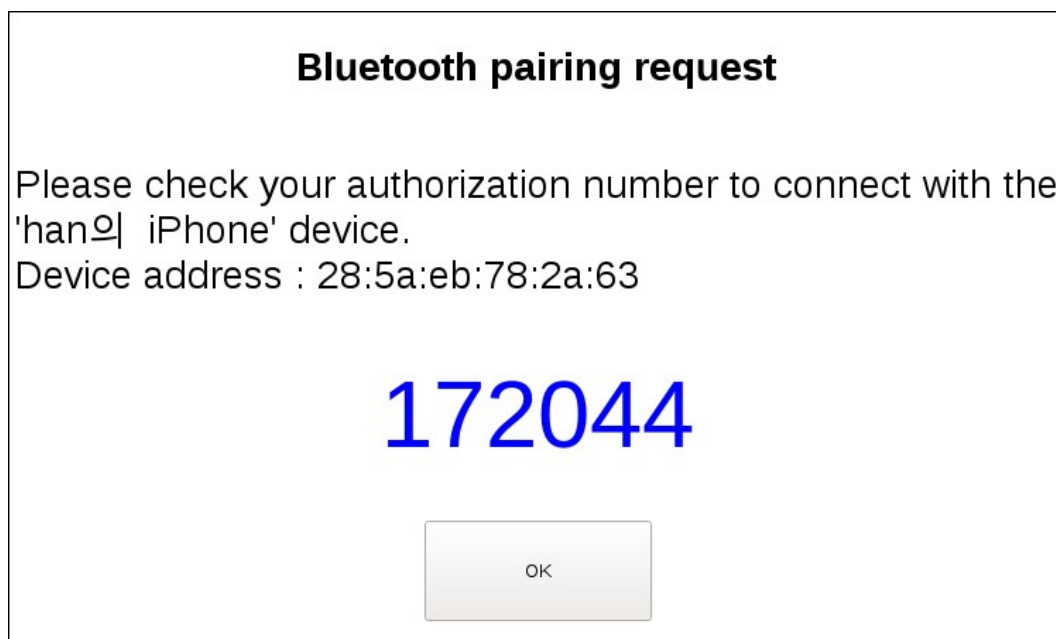


#### 4.2.9 Pairing request

When a pairing request event is received, information on the pairing request is output to a message window. The information about the pairing request consists of BT device name, address, and pairing code.

##### 4.2.9.1 Condition : Auto Pairing ON

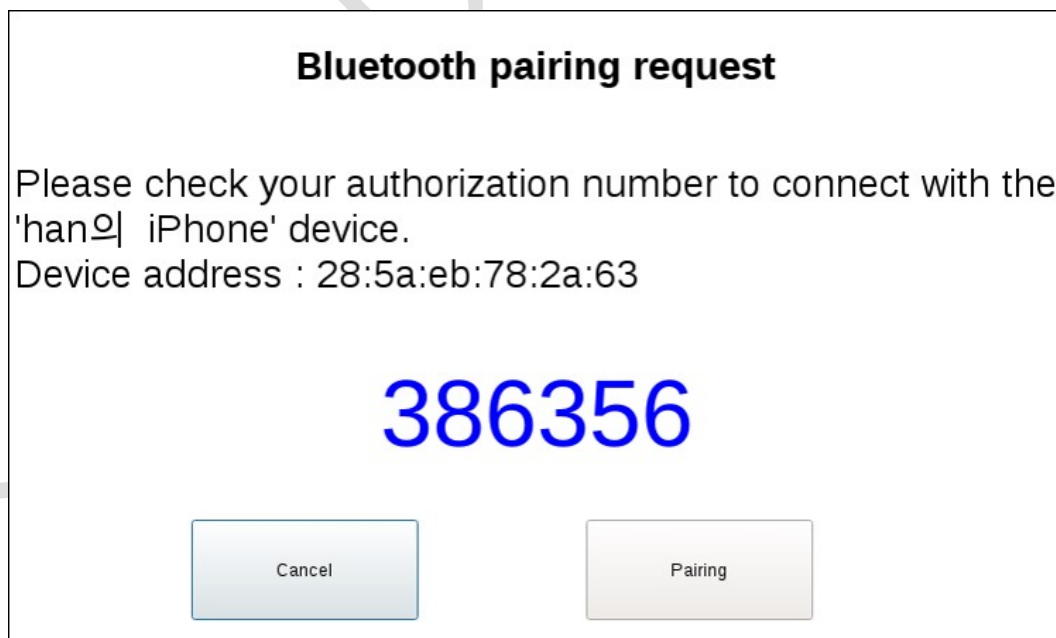
The following figure shows the message window that is displayed when a pairing request is received.



In this case, since there is no need to respond to acceptance or rejection, only buttons for closing the window are disposed. When the pairing request processing is completed and the pairing device list is changed, the corresponding message window is automatically closed.

#### 4.2.9.2 Condition : Auto Pairing OFF

The following figure shows the message window that is displayed when a pairing request is received.

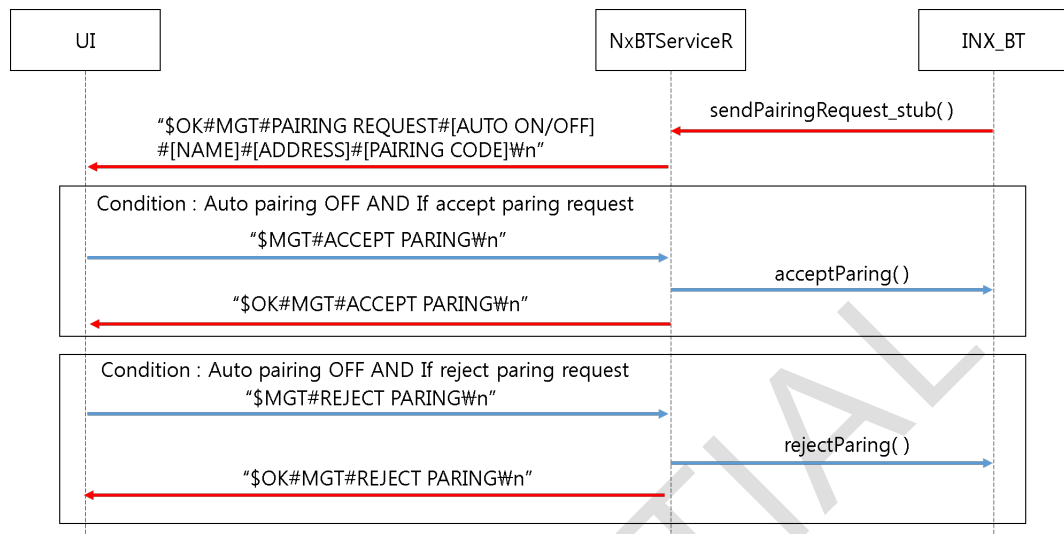


In this case, two buttons [Pairing] and [Cancel] are placed, since a response to acceptance or rejection is required.

Tap the [Pairing] button to send a command to accept the pairing request.

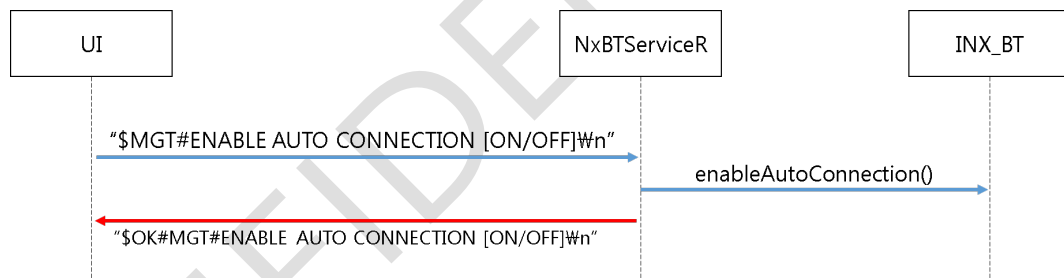
Tap the [Cancel] button to send a command to reject the pairing request.

The following figure is a sequence diagram showing the API function call flow of NX DAudio SDK when a pairing request is received.



#### 4.2.10 Settings for Auto connection ON/OFF

The following figure is a sequence diagram showing the API function call flow of Nx DAudio SDK when setting auto connection.



#### 4.2.11 Settings for Auto pairing ON/OFF

The following figure is a sequence diagram showing the API function call flow of Nx DAudio SDK when setting Auto pairing.

