Android MetaScan SDK API

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Revision History

Revision	Author	Date	Description
0.1	Iris	2024/1/25	1. Initial version

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Introduction

This document is to let users understand how to use the SDK provided by ISC for development. It introduces the entire APP process, including connection, scanning..., and provides how to call API for development. Corresponding with source code will make it easier to get started. If you want to know more about BLE callback, please refer to **ISC NIRScan Bluetooth Communications Data Sheet V1.4.pdf.**

Specification

The TIVA versions and functions supported by this SDK are as follows:

Standard Wavelength (900nm~1700nm)

TIVA	Function						
	Quick Scan	Select Config	Set Conig	Reset Config	Activation	Device Status	Lock/Unlock Button
<v2.1.0.67	X	X	X	X	X	X	X
v2.1.0.67~v2.3.2	V	X	X	X	X	V	X
v2.4.2	V	V	V	V	V	V	X
≧v2.4.3	V	V	V	V	V	V	V

Extend Wavelength (1350nm~2150nm)

TIVA	Function						
	Quick Scan	Select Config	Set Conig	Reset Config	Activation	Device Status	Lock/Unlock Button
<v3.3.0	V	V	V	V	V	V	X
≧v3.3.0	V	V	V	V	V	V	V

Extend Plus Wavelength (1600nm~2400nm)

TIVA	Function						
	Quick Scan	Select Config	Set Conig	Reset Config	Activation	Device Status	Lock/Unlock Button
≧v5.0.1	V	V	V	V	V	V	V

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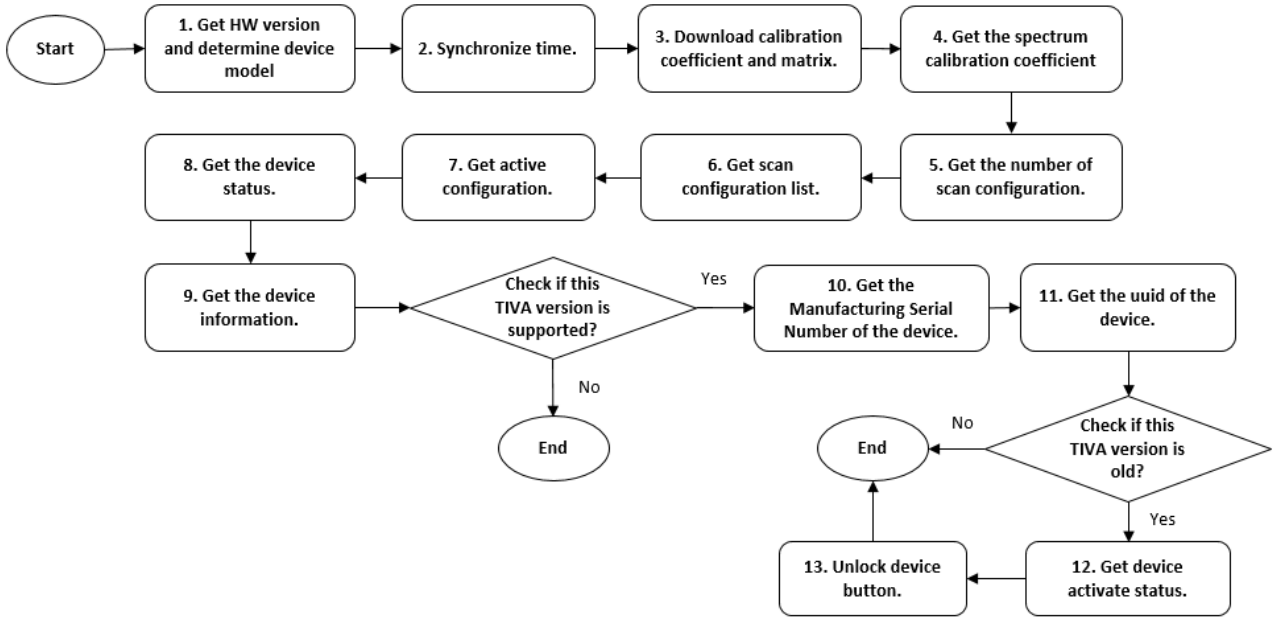
Connected to the Device

MainSelectConfigViewActivity.java



1. When the device is connected, it will first call the **ISCMetaScanSDK.getHardwareRev()** to request to get HW and TIVA version. Register **GetHWVerReceiver** to get HW and TIVA version. Determine whether the device belongs to standard wavelength, extended wavelength or extended plus wavelength according to TIVA version.

API	Process	Receiver	Receiver Description
ISCMetaScanSDK.getHardwareRev() (UUID: 0x00002A27-0000-1000-8000-00805F9B34FB 0x00002A26-0000-1000-8000-00805F9B34FB)	Request to get the device HW and TIVA version.	GetHWVerReceiver	Get the device HW and TIVA version.

2. Call the **ISCMetaScanSDK.SetCurrentTime()** to synchronize the time. Register SetTimeCompleteReceiver to complete to synchronize the time.

API	Process	Receiver	Receiver Description
ISCMetaScanSDK.SetCurrentTime() (UUID: 0x4348410C-444C-5020-4E49-52204E616E6F)	Synchronize the time.	SetTimeCompleteReceiver	Complete to synchronize the time.

3. Call the **ISCMetaScanSDK.requestRefCalCoefficients()** to download calibration coefficient and calibration matrix. Register **RefCoefficientDataProgressReceiver** to see the progress of download calibration coefficient. Register **CalMatrixDataProgressReceiver** to see the progress of download calibration matrix. Register **RefDataReadyReceiver** to get the calibration coefficient and matrix.

API	Process	Receiver	Receiver Description
ISCMetaScanSDK.requestRefCalCoefficients() (UUID: 0x4348410F-444C-5020-4E49-52204E616E6F 0x43484111-444C-5020-4E49-52204E616E6F)	Download calibration coefficient->Download calibration matrix	RefCoefficientDataProgressReceiver (UUID: 0x43484110-444C-5020-4E49-52204E616E6F)	Download calibration coefficient
		CalMatrixDataProgressReceiver (UUID: 0x43484112-444C-5020-4E49-52204E616E6F)	Download calibration matrix
		RefDataReadyReceiver	Get the calibration coefficient and matrix

4. Call the **ISCMetaScanSDK.GetSpectrumCoef()** to request to get the spectrum calibration coefficient. Register **SpectrumCalCoefficientsReadyReceiver** to get the spectrum calibration coefficient.

API	Process	Receiver	Receiver Description
ISCMetaScanSDK.GetSpectrumCoef() (UUID: 0x4348410D-444C-5020-4E49-52204E616E6F)	Request to get the spectrum calibration coefficient	SpectrumCalCoefficientsReadyReceiver (UUID: 0x4348410E-444C-5020-4E49-52204E616E6F)	Get the spectrum calibration coefficient

5. Call the **ISCMetaScanSDK.GetNumberOfScanConfig()** to request to get the number of scan configuration. Register **ScanConfSizeReceiver** to get the number of scan configuration.

API	Process	Receiver	Receiver Description
ISCMetaScanSDK.GetNumberOfScanConfig() (UUID: 0x43484113-444C-5020-4E49-52204E616E6F)	Get number of scan configuration.	ScanConfSizeReceiver	Get the number of scan configuration

6. Call the **ISCMetaScanSDK.requestStoredConfigurationList()** to request to get scan configuration data from the device. Register **ScanConfReceiver** to get the scan configuration.

API	Process	Receiver	Receiver Description
ISCMetaScanSDK.requestStoredConfigurationList() (UUID: 0x43484114-444C-5020-4E49-52204E616E6F)	Get scan configuration data	ScanConfReceiver (UUID: 0x43484115-444C-5020-4E49-52204E616E6F)	Get the scan configuration

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7. Call the **ISCMetaScanSDK.GetActiveConfig()** to request to get active configuration from the device. Register **GetDefaultScanConfReceiver** to get the index of active configuration.

API	Process	Receiver	Receiver Description
ISCMetaScanSDK.GetActiveConfig() (UUID: 0x43484118-444C-5020-4E49-52204E616E6F)	Request to get active configuration	GetDefaultScanConfReceiver (UUID: 0x43484118-444C-5020-4E49-52204E616E6F)	Get the index of active configuration

8. Call the **ISCMetaScanSDK.GetDeviceStatus()** to request to get the status of the device including battery capacity, system temperature, humidity, total lamp time, the byte of the device status and the byte of the error status. Register **GetDeviceStatusReceiver** to get the device status.

API	Process	Receiver	Receiver Description
ISCMetaScanSDK.GetDeviceStatus() (UUID: 0x00002A19-0000-1000-8000-00805F9B34FB 0x43484101-444C-5020-4E49-52204E616E6F 0x43484102-444C-5020-4E49-52204E616E6F 0x43484109-444C-5020-4E49-52204E616E6F 0x43484103-444C-5020-4E49-52204E616E6F 0x43484104-444C-5020-4E49-52204E616E6F)	Request to get the status of the device	GetDeviceStatusReceiver	Get the device status

9. Call the **ISCMetaScanSDK.GetDeviceInfo()** to request to get the device information including the device of model name, serial number. Register **DeviceInfoReceiver** to get the device information. Need to know which functions the device supports through **ISCMetaScanSDK.GetSupportFunction()**.

API	Process	Receiver	Receiver Description
ISCMetaScanSDK.GetDeviceInfo() (UUID: 0x00002A29-0000-1000-8000-00805F9B34FB 0x00002A24-0000-1000-8000-00805F9B34FB 0x00002A25-0000-1000-8000-00805F9B34FB)	Request to get the device information	DeviceInfoReceiver	Get the device information
ISCMetaScanSDK.GetSupportFunction()	Get the supported device function.	X	X

If supported TIVA version for this APP, continue with the following steps.

10. Call the **ISCMetaScanSDK.GetMFGNumber()** to request to get the Manufacturing Serial Number of the device. Register **ReturnMFGNumReceiver** to get the Manufacturing Serial Number.

API	Process	Receiver	Receiver Description
ISCMetaScanSDK.GetMFGNumber() (UUID: 0x4348410B-444C-5020-4E49-52204E616E6F)	Request to get the Manufacturing Serial Number	ReturnMFGNumReceiver (UUID: 0x4348410B-444C-5020-4E49-52204E616E6F)	Get the Manufacturing Serial Number

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11. Call the **ISCMetaScanSDK.GetUUID()** to request to get the uuid from the device. Register **GetUUIDReceiver** to get the uuid.

API	Process	Receiver	Receiver Description
ISCMetaScanSDK.GetUUID() (UUID: 0x00002A23-0000-1000-8000-00805F9B34FB)	Request to get the uuid	GetUUIDReceiver	Get the uuid

If TIVA version is not old, continue with the following steps.

12. Call the **ISCMetaScanSDK.ReadActivateState()** to request to get whether the device is activate. Register **ReturnReadActivateStatusReceiver** to get whether the device is activated.

API	Process	Receiver	Receiver Description
ISCMetaScanSDK.ReadActivateState() (UUID: 0x43484130-444C-5020-4E49-52204E616E6F)	Request to get whether the device is activate	RetrunReadActivateStatusReceiver	Get whether the device is activated

13. Call the **SetDeviceButtonStatus(false)** to unlock device physical button.

API	Process	Receiver	Receiver Description
SetDeviceButtonStatus(true)	Lock device button.	X	X
SetDeviceButtonStatus(false)	Unlock device button.	X	X
ISCNIRScanSDK.ControlPhysicalButton(ISCNIRScanSDK.PhysicalButton.Lock) (UUID: 0x4348410B-444C-5020-4E49-52204E616E6F)	Lock device button.	X	X
ISCNIRScanSDK.ControlPhysicalButton(ISCNIRScanSDK.PhysicalButton.Unlock) (UUID: 0x4348410B-444C-5020-4E49-52204E616E6F)	Unlock device button.	X	X

Warm Up

WarmUpViewActivity.java

This APP supports the warm-up function. The default is to turn on the warm-up detection. The warm-up method is to turn on the light bulb. You can choose 1, 3 or 5 minutes. After warming up, if the device does not scan or turn on the light bulb for more than 30 minutes, it needs to be warmed up again. The time will be recorded every time the light is turned on. You can check whether the device needs to be warmed up through **ShouldWarmUp()**.

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API	Process	Receiver	Receiver Description
ISCMetaScanSDK.ControlLamp(ISCMetaScanSDK.LampState.ON) (UUID: 0x43484144-444C-5020-4E49-52204E616E6F)	Turn on the lamp	SetLampStateCompleteReceiver	Know the set is completed
ISCMetaScanSDK.ControlLamp(ISCMetaScanSDK.LampState.OFF) (UUID: 0x43484144-444C-5020-4E49-52204E616E6F)	Turn off the lamp	SetLampStateCompleteReceiver	Know the set is completed
ISCMetaScanSDK.ControlLamp(ISCMetaScanSDK.LampState.AUTO) (UUID: 0x43484144-444C-5020-4E49-52204E616E6F)	Set lamp to auto	SetLampStateCompleteReceiver	Know the set is completed

Quick Scan

MainSelectConfigViewActivity.java

Direct to Scan View with device default config. Use **SetDefaultConfig()** to set config to the device. This function will first find the index of default config from scan config list()**(listScanConfig.Configs)**. Then write the config to the device through **ISCMetaScanSDK.SetDefaultConfig(index)**.

API	Process	Receiver	Receiver Description
ISCMetaScanSDK.SetDefaultConfig(index) (UUID: 0x43484118-444C-5020-4E49-52204E616E6F)	Set the active scan configuration	SetDefaultConfigCompleteReceiver	Know the set is completed

Select Config

SelectConfigViewActivity.java

Select config from scan config list and then scan. After selecting and pressing confirm, Call **CommonAPI.ChangeScanConfigToByte(CurrentScanConfig)** to convert config into byte array**(EXTRA_DATA)**. Then set the device's config through **ISCMetaScanSDK.ScanConfig (EXTRA_DATA,ISCMetaScanSDK.ScanConfig.SET)**. Register **WriteScanConfigStatusReceiver** to check whether write scan config is successful. Then read the current config of the device to compare whether it is the same as the selected config. Call **ISCMetaScanSDK.ReadCurrentScanConfig()** to get the current scan config of the device. Register **ReturnCurrentScanConfigurationDataReceiver** to get current scan config. Use **CommonAPI.Compareconfig(intent.getByteArrayExtra(ISCMetaScanSDK.EXTRA_CURRENT_CONFIG_DATA), CurrentScanConfig)** to compare the device and the selected scan config.

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API	Process	Receiver	Receiver Description
CommonAPI.ChangeScanConfigToByte(Current ScanConfig)	Convert scan Config to byte array. Return value is EXTRA_DATA	X	X
ISCMetaScanSDK.ScanConfig (EXTRA_DATA,ISCMetaScanSDK.ScanConfig.SET) (UUID: 0x43484142-444C-5020-4E49-52204E616E6F)	Set the configuration to the device	WriteScanConfigStatusReceiver (UUID: 0x43484143-444C-5020-4E49-52204E616E6F)	Verify whether the scan configuration was set successfully
ISCMetaScanSDK.ReadCurrentScanConfig() (UUID: 0x43484140-444C-5020-4E49-52204E616E6F)	Get the current device configuration	ReturnCurrentScanConfigurationDataReceiver (UUID: 0x43484141-444C-5020-4E49-52204E616E6F)	Get the byte array of current configuration of the device
CommonAPI.Compareconfig(intent.getByteArrayExtra(ISCMetaScanSDK.EXTRA_CURRENT_CONFIG_DATA), CurrentScanConfig)	Compare the device and the selected scan config.	X	X

Set Config

QuicksetViewActivity.java

Set the scan configuration to the device. **(Note: This only set the configuration to the device memory and generating the scan patterns accordingly.)** Call **SetScanConfig()** to set the user set's scan config to the current config. Call **CommonAPI.ChangeScanConfigToByte(CurrentScanConfig)** to convert config into byte array**(EXTRA_DATA)**. Then set the current config through **ISCMetaScanSDK.ScanConfig (EXTRA_DATA,ISCMetaScanSDK.ScanConfig.SET)**. Register **WriteScanConfigStatusReceiver** to check whether write scan config is successful. Then read the current config of the device to compare whether it is the same as the set config. Call **ISCMetaScanSDK.ReadCurrentScanConfig()** to get the current scan config of the device. Register **ReturnCurrentScanConfigurationDataReceiver** to get current scan config. Use **CommonAPI.Compareconfig(intent.getByteArrayExtra(ISCMetaScanSDK.EXTRA_CURRENT_CONFIG_DATA), CurrentScanConfig)** to compare the device and the set scan config.

API	Process	Receiver	Receiver Description
SetScanConfig()	Set the user set's scan config to the current config.	X	X
CommonAPI.ChangeScanConfigToByte(Current ScanConfig)	Convert scan Config to byte array. Return value is EXTRA_DATA	X	X
ISCMetaScanSDK.ScanConfig (EXTRA_DATA,ISCMetaScanSDK.ScanConfig.SET) (UUID: 0x43484142-444C-5020-4E49-52204E616E6F)	Set the configuration to the device	WriteScanConfigStatusReceiver (UUID: 0x43484143-444C-5020-4E49-52204E616E6F)	Verify whether the scan configuration was set successfully
ISCMetaScanSDK.ReadCurrentScanConfig() (UUID: 0x43484140-444C-5020-4E49-52204E616E6F)	Get the current device configuration	ReturnCurrentScanConfigurationDataReceiver (UUID: 0x43484141-444C-5020-4E49-52204E616E6F)	Get the byte array of current configuration of the device
CommonAPI.Compareconfig(intent.getByteArrayExtra(ISCMetaScanSDK.EXTRA_CURRENT_CONFIG_DATA), CurrentScanConfig)	Compare the device and the selected scan config.	X	X

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Reset Config

MainSelectConfigViewActivity.java

The device can accommodate 20 scan configs. You can clear it through reset config, which will leave two default configs. (Column 1 and Hadamard 1) After resetting, it will automatically disconnect and jump back to the home page. Call **ISCMetaScanSDK.ResetConfig()** to reset scan config list. Register **ResetConfigCompleteReceiver** to know reset config is completed.

API	Process	Receiver	Receiver Description
ISCMetaScanSDK.ResetConfig() (UUID: 43484148-444C-5020-4E49-52204E616E6F)	Reset scan config	ResetConfigCompleteReceiver	Know reset config is completed

Perform Scan – New Reference

ScanViewActivity.java

Reference setting select **new** to perform new reference scan. Call **ISCMetaScanSDK.StartScan()** to scan spectrum. Register **ScanDataReadyReceiver** to get scan data. New reference data will be saved **NewReferenceIntensity.**

API	Process	Receiver	Receiver Description
ISCMetaScanSDK.StartScan() (UUID: 0x4348411D-444C-5020-4E49-52204E616E6F 0x43484127-444C-5020-4E49-52204E616E6F)	Trigger the scan event	ScanDataReadyReceiver (UUID: 0x43484128-444C-5020-4E49-52204E616E6F)	Get the scan result

Perform Scan – Use Previous Reference to Scan

ScanViewActivity.java

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Reference setting select **previous** to perform scan. Call **ISCMetaScanSDK.StartScan()** to scan spectrum. Register **ScanDataReadyReceiver** to get scan data. Use **NewReferenceIntensity** to calculate absorbance and reflectance.

API	Process	Receiver	Receiver Description
ISCMetaScanSDK.StartScan() (UUID: 0x4348411D-444C-5020-4E49-52204E616E6F 0x43484127-444C-5020-4E49-52204E616E6F)	Trigger the scan event	ScanDataReadyReceiver (UUID: 0x43484128-444C-5020-4E49-52204E616E6F)	Get the scan result

Perform Scan – Use Built-in Reference to Scan

ScanViewActivity.java

Reference setting select **built-in** to perform scan. Call **ISCMetaScanSDK.StartScan()** to scan spectrum. Register **ScanDataReadyReceiver** to get scan data. Use **Scan_Spectrum_Data.getIntensity()** to calculate absorbance and reflectance.

API	Process	Receiver	Receiver Description
ISCMetaScanSDK.StartScan() (UUID: 0x4348411D-444C-5020-4E49-52204E616E6F 0x43484127-444C-5020-4E49-52204E616E6F)	Trigger the scan event	ScanDataReadyReceiver (UUID: 0x43484128-444C-5020-4E49-52204E616E6F)	Get the scan result

Perform Scan – Device Setting

ScanViewActivity.java

Device settings can set lamp mode, lamp-stable time, and PGA. Call **LampAuto()**, **LampOn()**, or **LampOff()** to switch lamp mode. Register **SetLampStateCompleteReceiver** to know the set is completed. Call **ISCMetaScanSDK.SetLampStableTime(lampstabletime)** to set lamp-stable time. Register

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SetLampDelayTimeCompleteReceiver to know the set is completed. Call **SetPGAToDevice()** to set PGA. Register **SetPGACompleteReceiver** to know the set is completed.

API	Process	Receiver	Receiver Description
ISCMetaScanSDK.ControlLamp(ISCMetaScanSDK.LampState.ON) (UUID: 0x43484144-444C-5020-4E49-52204E616E6F)	Turn on the lamp	SetLampStateCompleteReceiver	Know the set is completed
ISCMetaScanSDK.ControlLamp(ISCMetaScanSDK.LampState.OFF) (UUID: 0x43484144-444C-5020-4E49-52204E616E6F)	Turn off the lamp	SetLampStateCompleteReceiver	Know the set is completed
ISCMetaScanSDK.ControlLamp(ISCMetaScanSDK.LampState.AUTO) (UUID: 0x43484144-444C-5020-4E49-52204E616E6F)	Set lamp to auto	SetLampStateCompleteReceiver	Know the set is completed
ISCMetaScanSDK.SetLampStableTime(lampstabletime) (UUID: 0x43484145-444C-5020-4E49-52204E616E6F)	Set lamp-stable time	SetLampDelayTimeCompleteReceiver	Know the set is completed
ISCMetaScanSDK.SetPGA(pga) (UUID: 0x43484146-444C-5020-4E49-52204E616E6F)	Set scan PGA	SetPGACompleteReceiver	Know the set is completed

Status Bar

DeviceStatusViewActivity.java

Get device detail. Call **ISCMetaScanSDK.GetDeviceStatus()** to request to get device detail. Register **GetDeviceStatusReceiver** to get device detail.

API	Process	Receiver	Receiver Description
ISCMetaScanSDK.GetDeviceStatus() (UUID: 0x00002A19-0000-1000-8000-00805F9B34FB 0x43484101-444C-5020-4E49-52204E616E6F 0x43484102-444C-5020-4E49-52204E616E6F 0x43484109-444C-5020-4E49-52204E616E6F 0x43484103-444C-5020-4E49-52204E616E6F 0x43484104-444C-5020-4E49-52204E616E6F)	Request to get the status of the device	GetDeviceStatusReceiver	Get the device status

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