

# **MOVEIRO BT-200**

## Technical Information for

## Application Developer

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## 1. Scope

### 1.1 Purpose

This documentation describes technical information to support application development for Epson see-through mobile viewer BT-200.

### 1.2 Major System Specification

Category	Description
Model	MOVERIO BT-200
Main Processor	OMAP4460 (dual core ARM Cortex A9)
System Clock	Max 1.2GHz (Automatic adjustment based on system load and temperature)
Number of Pixel on LCD	960x540 (QHD) / 16:9 / refresh rate 60Hz
Virtual Screen Size	80" (at virtual distance of 5m)
Color	24bit full color (16770K color)
3D Display	Supported (side by side format)
Track Pad	Single touch, multi touch (up to 2 touch)
Buttons on Controller	Home, Back, Menu, Volume, and Function
Audio	Stereo / Dolby Mobile
Wi-Fi	IEEE 802.11b/g/n, Wi-Fi Direct Support
Bluetooth	A2DP, HSP, HID, OPP, SPP
Sensors	Gyro / Accelerometer / Compass
GPS	Built-in on the controller unit
Camera	Built-in on the head set unit (Resolution VGA)
Main Storage (RAM)	1GB
Internal Memory (emmc)	8GB (Reserved 2GB for system)
External Memory	MicroSD / MicroSDHC (Max. 32GB)
System Software	Android 4.0.4 / Linux 3.0.21

### 1.3 Basic Information for Application Development

Category	Description
CPU/ABI	ARMv7 armeabi
Android API Level	15
Screen Density	mdpi (160dpi)
UI Type	Tablet UI
Orientation	Landscape Only (No rotation by sensor)
USB Vendor ID	0x04B8

### 1.4 Difference from Smartphone

- HOME/MENU/BACK Keys are hardware buttons
- No touch screen feature on the display itself (only Touch pad on the controller is supported)
- Touch pad uses relative position method similar to PC pointing method
- Only Wi-Fi is supported (3G, LTE and other are not supported)
- No Google certification

Therefore, the following services that need Google certification are not supported:

- Google Play
- Google positioning information service
- Other services that require Google Certification

## **2. Supported Functions**

MOVERIO BT-200 supports the following BT-200 specific functions/settings.

- Full screen display function
- 3D contents display function
- Switching sensor (from headset to controller, and vice versa)
- Camera control parameters

Other than the above BT-200 specific functions, basic functions, such as controlling sensors, are accessed through Android standard methods/API. Following section describes the above functions.

## **2.1 Full screen display**

BT-200 uses Android 4.0 Tablet UI. With this UI, Application is typically not allowed to use full screen. However, application can use full screen with the following setting.

### **■In Application**

Implement the following lines in each Activity onCreate().

```
Window win = getWindow();
 WindowManager.LayoutParams winParams = win.getAttributes();
 winParams.flags |= WindowManager.LayoutParams.FLAG_FULLSCREEN;
 win.setAttributes(winParams);
```

If application has multiple activities, implement above procedure in each Activity.

### **■Add import definition**

```
import android.view.Window;
import android.view.WindowManager;
```

To use the import function, the file must be in the SDK. Using the Google standard SDK, the following modification is used to avoid build errors.

### **■Modify definition value to immediate value (for Standard SDK)**

```
※Definition: FLAG_FULLSCREEN = 0x80000000;
winParams.flags |= WindowManager.LayoutParams.FLAG_FULLSCREEN;
winParams.flags |= 0x80000000;
```



**Full screen is disabled**  
**Status bar**



**Full screen is enabled**  
**No Status bar**

## 2.2 Camera control function

The camera resolution is VGA. The resolution is not high when compared with other cameras on smartphones.

This is because BT-200 doesn't need to display image from its camera on its screen. Use the camera for marker recognition or normal image capture with the following settings:

### ■ For marker recognition

Use `setSceneMode(SCENE_MODE_BARCODE)` to Camera class to read markers. It is best optimized to recognize markers like barcode.

### ■ For Normal image capturing

Use `setSceneMode(SCENE_MODE_AUTO)` to Camera class.

Function	API	Value
White Balance	<code>setWhiteBalance(x)</code>	WHITE_BALANCE_AUTO WHITE_BALANCE_FLUORESCENT WHITE_BALANCE_INCANDESCENT WHITE_BALANCE_DAYLIGHT WHITE_BALANCE_CLOUDY_DAYLIGHT
Frame rate limit	<code>setPreviewFpsRange(x,30000)</code>	4000, 8000, 10000, 15000, 30000 ( 4 / 8 / 10 / 15 / 30 fps )
Exposure Setting	<code>setExposureCompensation(x)</code>	-3 ~ +3
Edge enhancement	<code>set("sharpness",x)</code>	0 ~ 7
Digital Zooming	<code>setZoom(x)</code>	0 ~ 10 (0=x1, 10=x4 )

■ Example images with settings



SCENE\_MODE\_AUTO



SCENE\_MODE\_BARCODE



Sharpness +7

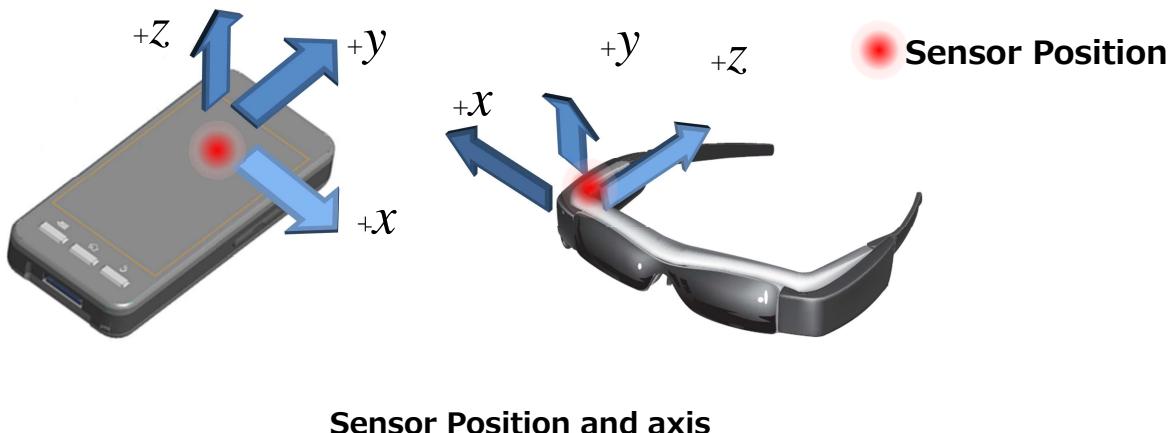


White Balance Daylight

## 2.3 Sensor switching function

BT-200 has 9 axis sensor set (Accelerometer, Gyro, Compass) on both the controller and headset. Application program can choose which sensor set to use. (There is no UI for the end user to switch.)

Each sensor axis is set as follows



Default setting is to use sensors on the controller. Application can switch the setting with the following interface.

### ■ Switching from Application

Switching in Java layer can be done through API (ChangeSensor.java is provided separately).

#### ■ Class

ChangeSensor

#### ■ Interface

```
int chgSensorType(int type);
```

```
int getSensorType();
```

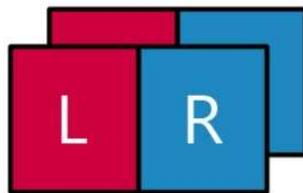
#### ■ Parameter

type: Sensor type

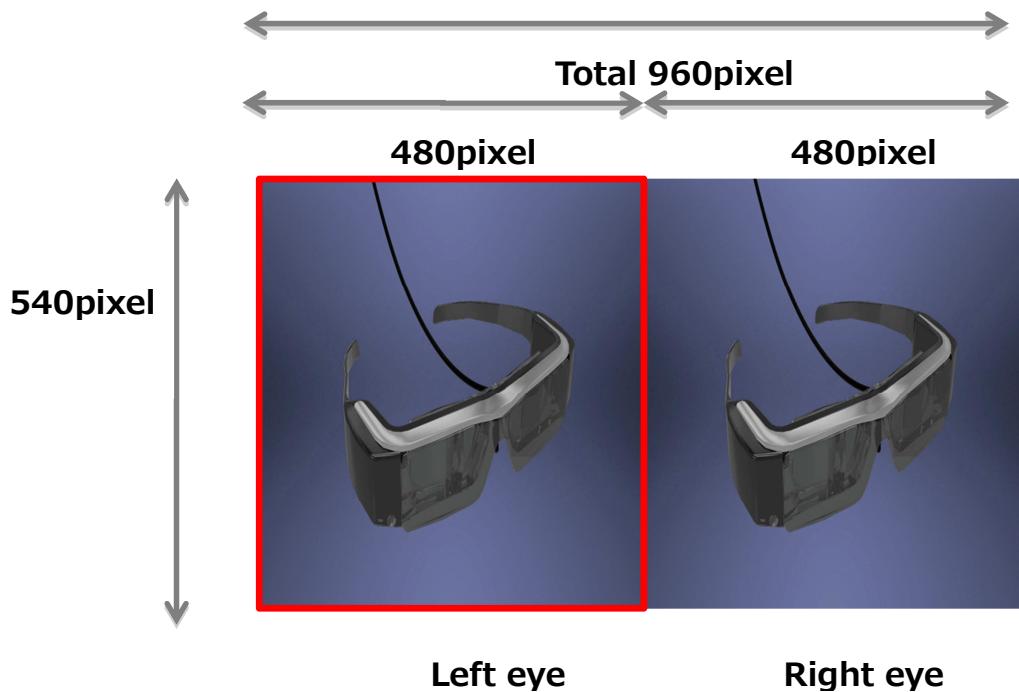
## 2.4 3D contents display function

BT-200 can display side-by-side 3D format contents on screen.

Side-by-side format is the format that contains left and right eye images in one frame.



To make side-by-side 3D contents, the original two 960 x 540 images must be compressed and combined into one single 960 x 540 QHD frame (each image is thus reduced to 480 x 540).



To display the side-by-side images on the left and right screen separately, use the following interface.

### ■How to Use

using provided library

### ■Interface

Toast display

```
int set2d3d(int dimension)
```

### ■Parameter

dimension : 2D/3D status

DIMENSION\_2D / DIMENSION\_3D



## 2.5 Setting Brightness

Application can change the display brightness level on the BT-200. The darker the backlight setting the display image will be more transparent and will have more of a see-through effect.

### ■How to Use

using provided library

### ■Interface

```
int setBacklight(int backlight)  
int getBacklight()
```

### ■Parameter

backlight or return value: Brightness level 0 (dark) – 20 (bright)

### **3. Revision History**

<b>Rev</b>	<b>Contents</b>	<b>Date</b>
A	1 <sup>st</sup> release	2014.03.03
B	2 <sup>nd</sup> release	2014.03.20
C	3 <sup>rd</sup> release	2014.05.13