

revoox Test Description

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Purpose

This document describes the function and methodology used by individual tests of the automated xixLab revoox system for Android devices. It is permitted for external communication.

Terminology

- ATS
 - o Automated test system such as the robotized xixLab revoox system

- UUT
 - o Unit Under Test: a product tested

- Test sequence
 - o A test sequence is the order of steps for carrying out a test as described above.

- Test recipe
 - o A test recipe is a defined order of individual tests, carried out successively.
 - o Recipes are product specific, often also product-firmware specific.
 - o Recipes define the individual tests to be executed along with test parameters and test limits.
 - o Recipes can consider customer requirements.
 - o Recipes can be tailored to be most efficient for different use-cases, examples are incoming inspection, quality assurance in aftermarket service, customer-specific screening tests, pre-commercial product sample tests, software integration testing and more.

- Test
 - o A test is a defined functionality, verifying a specific product feature or functionality. A test might:
 - Read digital information from the UUT for comparison with defined numerical test limits, with defined textual information or with an information format declaration. Example: read IMEI

- serial number and check whether it is valid, invalid / corrupted or programmed to default.
- Measure physical parameters and compare with defined numerical limits. Example: measure audio level output under defined conditions and compare with lower limit / upper limit in mV.
 - Execute a functional interaction with the UUT in order to stimulate a behavior which is monitored and compared with expected result. Example: move stylus across touchscreen following a defined pattern, checking whether all expected areas have been contacted.
- Most tests are product specific, test parameters allow executing tests with the correct functionality for individual products

Functional Tests

The document refers to test object names internally used by the software. These object names are self-descriptive.

accelerometerTest

- Turn UUT into default position. Read accelerometer data. Turn UUT around by 90°. Read accelerometer data again.
- Compare G force readings.

approximeterTest

- UUT approximeter sensor positioned in defined start position relative to test component (“long distance”). Read approximeter status. Move UUT towards test component to defined end position (“short distance”). Read approximeter status. Check whether approximeter gets triggered.

audioEarSpeakerVolume

- The UUT plays a sound over the earspeaker/earpiece/receiver and the system own microphone record this sound. revoox measure the volume of the recorded sound.

audioEarSpeakerTHD

- Like the audioEarspeakerVolume but this test analyzes the quality of the recorded sound compared with the source audio file.

audioEnvironmentVolume

- Used as pre-test for audio measurements. Measuring the noise level immediately prior to starting audio tests aims to ensure that measurements are only started under acceptable conditions, ensuring test results are valid.

audioMicSensitivity

- Replay audio media file under controlled conditions using revoox equipment speaker. Record replayed audio signal using UUT microphone. Automatically analyze recorded signal for audio level applying Fourier-methodologies and resulting microphone sensitivity

audioMicTHD

- Replay audio media file under controlled conditions using revoox equipment speaker. Record replayed audio signal using UUT microphone. Automatically analyze recorded signal for audio distortion applying Fourier-methodologies and calculate distortion caused by UUT microphone

audioMicSweep

- Play with the system speaker a sound over a bandwidth of frequencies. The UUT recorded all the time and this file will be analyzed. This test detects if signal level on each measured frequency is too low.

audioSpeakerVolume

- revoox test app replays audio media file under controlled conditions using UUT speaker. Record replayed audio signal using revoox system microphone. Automatically analyze recorded signal for audio level applying Fourier-methodologies.

audioSpeakerTHD

- Replay audio media file under controlled conditions using revoox equipment speaker. Record replayed audio signal using UUT microphone. Automatically analyze recorded signal for audio distortion applying Fourier-methodologies and calculate distortion caused by UUT microphone

audioSpeakerSweep

- The same as the audioMicSweep, but this time the UUT plays the sound and the revoox microphone record the tone.

backlightTest

- Take pictures of device displays illuminated with different brightness levels and analyze difference.

barometer

- Take measurement of air pressure.

blacklistTestWithSystemApps

- Read all apps installed on UUT, including system apps, compare app names and versions with customer-defined blacklist file stored on system

blacklistTestNoSystemApps

- Read all customer-installed apps installed on UUT, compare app names and versions with customer-defined blacklist file stored on system

bluetoothQuickTest

- Scan Bluetooth environment for known BT ID.

bulletinTest

- NOTE: the bulletin test is not targeting use cases for automated test systems but can technically be executed as part of test recipes.
- revoox prompts operator to confirm actions have been taken on a customer-owned bulletin (e.g. service repair bulletin). The system allows linking to the bulletin document for opening it from within the revoox UI. This allows to force process compliance on operation floors. The bulletin test has no test functionality by itself.

chargeStatusTest

- Read the UUT battery charge status as reported by the UUT operating system

dialTest

- revoox dials a configurable phone number, trying to establish MOC call.

dialTHD

- Configurable number called, if the call is established, a single tone is played, recorded by the UUT and analyzed.

displayAOI

- Test allows display analysis on dead-/hot-pixel or white bubbles.

displayTopbarAOI

- Test analyses for burn ins on the top of the screen.

displayColor

- Test inspects the chrominance of the display color.

displayBurnAOI

- Test analyses for burn ins of icons or text on the whole display.

flashLightTest

- Check flash light functionality while taking a photo with device camera.

gyroscope

- Reads the gyroscope sensor measurements while turning the device.

lightSensorTest

- Set chamber internal light to predefined intensity. Read light sensor value. Repeat test under different light intensity conditions as defined.

magnetic

- revoox start the magnetic sensor measurement and read the uncalibrated values.

mainCameraTest

- Set defined light conditions in chamber and take photo of camera test pattern with UUT main camera. Automatically analyze picture content: RGB colors / brightness, and sharpness.

masterReset

- System calls the operating system master reset and verifies execution.

nfc

- revoox touches UUT with NFC tag, reads the information of the tag and compare it with limits.

notificationLed

- Turn the notification LED on in configurable color, take a photo and analyze.

powerUpTime

- reads the time since the UUT was booted.

readIMEINumber

- Read the IMEI or MEID serial number from UUT. The IMEI number format is validated for length / format, checksum and default number.

readFirmwareVersion

- Read the firmware version string from UUT

readModelNumber

- Read the model number from UUT

readWlanMacAddress

- Read the unit's WLAN MAC address

rootTest

- Check for symptoms of the UUT being rooted or device jailbreak.

readInternalFreeMemory

- Read free internal memory on board UUT and compare with limits.

readExternalFreeMemory

- Read free external memory on board UUT and compare with limits.

readInternalMemoryLowStatus

- Read the internal memory status as reported by the UUT operating system.

readBatteryHealth

- Read the battery health status as reported by the UUT operating system

readBatteryLevel

- For Android only: Read the battery charging level as reported by the UUT operating system

readBatteryTemperature

- For Android only: Read the UUT battery temperature as reported by the UUT operating system.

readBatteryTechnology

- For Android only: Read the battery technology as reported by the UUT operating system

readBatteryVoltageLevel

- For Android only: Read the UUT battery voltage level as reported by the UUT operating system

secondCameraTest

- Same as mainCameraTest, but with UUT front camera.

samsungSelftestLed

- Check for LED to work in all colors supported by product using Samsung preloaded test app.

samsungSelftestDimming

- Check display brightness dimming to using Samsung preloaded test app.

samsungSelfTestLightSensor

- revoox starts the pre-loaded Samsung test app on board the UUT and runs the “Sensor” test. Set chamber internal light to 2 defined intensities. Read Samsung test app log file, parse light sensor readings / results.

semiAutomaticTestHRMSensor

- NOTE: semi-automated test using external USB-connector at revoox system. Test carried out as part of the complete test recipe, can be executed simultaneously to running automatic test recipe within revoox system with another phone (“dual-up”).
- Connect unit to external port for starting “external” recipe. Test app prompts operator to measure heart rate with HowTo-information. Test app measures heart rate.

signalStrengthTest

- Read current signal strength from the UUT.

simCardStatusTest

- Read SIM card reader status from UUT operating system.

touchscreenTest

- Test app activates pattern on display, moves passive stylus across display. app reports IDs of touched areas.

vibratorTest

- System activates vibrator and reads accelerometer.

volDownButtonTest

- Check button function during step-by-step movement of test mechanics and report trigger point.

volUpButtonTest

- Check button function during step-by-step movement of test mechanics and report trigger point.

backButtonTest

- Check button function during step-by-step movement of test mechanics and report trigger point.

homeButtonTest

- Check button function during step-by-step movement of test mechanics and report trigger point.

menuButtonTest

- Check button function during step-by-step movement of test mechanics and report trigger point.

powerButtonTest

- Check button function during step-by-step movement of test mechanics and report trigger point.

wlanTest

- Activate WLAN test token with known SSID. Activate UUT WLAN and start scan. Parse scan result for known ID.