

Motherboard API Test Guide

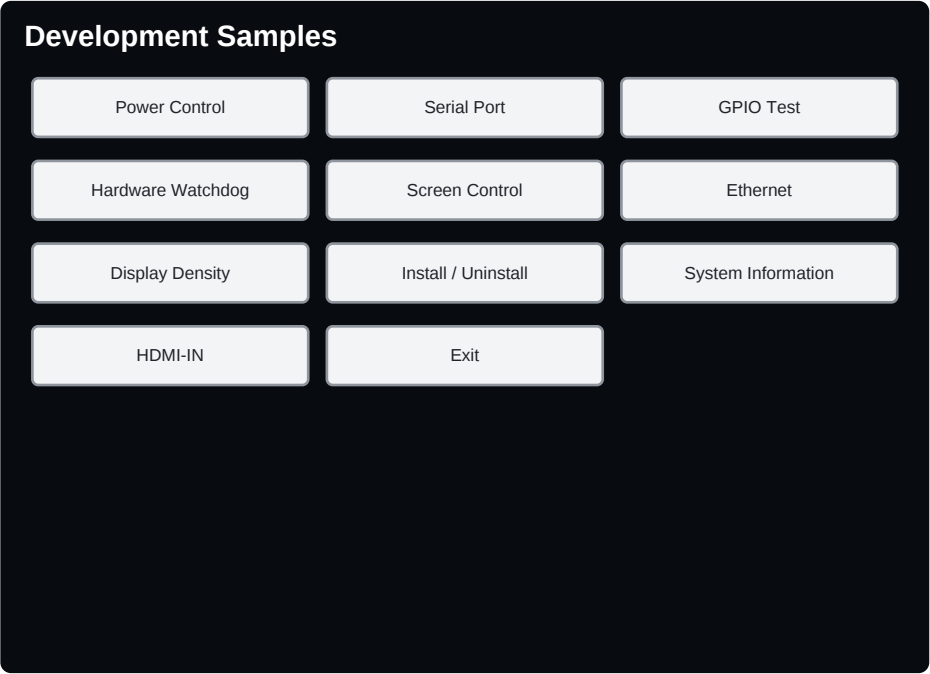
Abstract: This document is intended for users performing low-level testing and development with the company's motherboards.

1. Installing the Test Software

Install sdkdemo.apk directly. After installation, tap Development Samples to begin testing.

Some interfaces described in older releases require system root privileges. With API version V1.2.0.20211022 or later, all interfaces can be used without root. Contact technical support for Android system upgrades or root access on earlier releases.

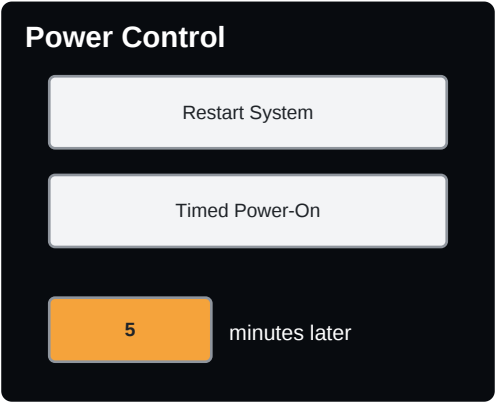
The test application's main screen is shown below.



2. Power-On / Power-Off Test

System restart performs a hardware reboot operation.

Timed power-on shuts the unit down and powers it on again after the specified number of minutes. While shut down, the hardware remains in cold-standby state; only the external 12 V supply and the 5 V standby supply remain active.



3. Serial-Port Test

Available serial ports differ by motherboard model. Observe the electrical-level configuration for each port. Program device COMn is /dev/ttySn; for example, COM3 maps to /dev/ttyS3.

Board	COM0	COM1	COM2	COM3	COM4	Notes
P1	J35	J34	J37	J34	X	COM2 disabled; COM1/COM3 default to RS-232; COM0 supports RS-232
M1	J18	J19	J17	J20	X	COM2 disabled; COM1/COM3 default to TTL; COM0 supports TTL
M2	X	X	J16	X	X	COM2 is TTL only and cannot be used together with the TF card
M3	X	J8	J11	J7	J24	COM2 disabled; COM1/COM3 default to RS-232; COM4 supports TTL
FP8	J19	J19	J19	J19	X	COM2 disabled; COM1/COM3 default to TTL; COM0 supports TTL
EP8	J8	J19	J18	J24	X	COM2 disabled; COM1/COM3 default to RS-232; COM0 supports TTL

Select the correct hardware serial device, baud rate, and Open. Send transmits a test string containing the current date/time and alphabet. Printable characters sent from another device are echoed in the corresponding receive pane. For testing, connect a port to a PC terminal, cross-connect ports on two boards, or cross-connect two ports on one board and open the matching devices in the left and right panes.

Serial Port Test

COM0115200OpenClose

COM0115200OpenClose

Send

Send

4. GPIO Test

Enter the GPIO number matching the motherboard model and signal connection, then tap Open to enable the signal. Select input or output, and read or set the I/O state (high = 1, low = 0).

All I/O signals use 3.3 V TTL levels. If a peripheral requires 5 V or another voltage, use an appropriate level converter.

GPIO Test

GPIO:

226

Open

Direction:

Input

Output

Level:

0

1

Read

Write

GPIO Signals Available on DP6

Connector	Function	GPIO Name	GPIO No.
J9.8	K6	GPIO3_D2	282
J9.9	K7	GPIO3_C6	278
J9.10	K8	GPIO3_C4	276
J15.1	L1	GPIO3_D0	280
J15.7	L6	GPIO0_C1	177
J15.3	L3	GPIO3_D1	281
J15.5	L4	GPIO0_C0	176
J15.6	L5	GPIO0_C5	181

GPIO Signals Available on FP8 (system version 20161209 or later)

Connector	Function	GPIO Name	GPIO No.
J31.3	K1	GPIO0_C0	176
J31.4	K2	GPIO0_C1	177
J31.5	K3	GPIO0_C2	178
J31.6	K4	GPIO0_C3	179

Connector	Function	GPIO Name	GPIO No.
J31.7	K5	GPIO0_C4	180

GPIO Signals Available on P1/P1X and EP8

Connector	Function	GPIO Name	GPIO No.
J31.3	K1	GPIO0_C0	176
J31.4	K2	GPIO0_C1	177
J31.5	K3	GPIO0_C2	178
J31.6	K4	GPIO0_C3	179
J31.7	K5	GPIO0_C4	180
J31.8	K6	GPIO0_C5	181
J31.9	K7	GPIO0_C6	182
J31.10	K8	GPIO0_C7	183
J21.1	L1	GPIO0_B4	172
J21.3	L2	GPIO0_B6	174
J21.5	L3	GPIO0_B7	175
J21.6	L4	GPIO1_A6	198
J21.7	L5	GPIO1_A7	199
J21.8	L6	GPIO1_B7	207

RJ11 Cash-Drawer GPIO Definitions for P0 and P1

Connector	Function	GPIO Name	GPIO No.
P-2	CTL1	GPIO1_A7	199
P-3	FB	GPIO1_B7	207
P-5	CTL2	GPIO1_A6	198

GPIO signals available on the M1 motherboard (system version 20161209 or later) continue on the next page.

GPIO Signals Available on M1

Connector	Function	GPIO Name	GPIO No.
J22.6	K1	GPIO0_C0	176
J22.5	K2	GPIO0_C1	177
J22.4	K3	GPIO0_C2	178
J22.3	K4	GPIO0_C3	179
J22.2	K5	GPIO0_C4	180

GPIO Signals Available on M2

The board provides internal pull-ups by default. The signals shown in red in the source document are available by default.

Connector	Function	GPIO Name	GPIO No.
J4.2	K5	GPIO3_C2	114
J4.3	K4	GPIO3_C1	113
J4.4	K3	GPIO3_B6	110
J4.5	K2	GPIO3_B2	106
J4.6	K1	GPIO3_D4	124
J17.2	TX	GPIO1_C1	49
J17.3	RX	GPIO1_C0	48
J17.4	CLK	GPIO1_B6	46
J17.5	CS	GPIO1_B7	47

GPIO Signals Available on M3

Internal pull-ups are provided. On Android 6.1 and later, subtract 8 from the listed system number (for example, K5 on Android 7.1 is 251).

Connector	Function	GPIO Name	GPIO No.
J16.2	K5	GPIO8_A3	259
J16.3	K4	GPIO8_A2	258
J16.4	K3	GPIO8_A1	257
J16.5	K2	GPIO8_A0	256
J16.6	K1	GPIO7_A2	226
J10.2	TX	GPIO8_B1	265
J10.3	RX	GPIO8_B0	264

Connector	Function	GPIO Name	GPIO No.
J10.4	CLK	GPIO8_A6	262
J10.5	CS	GPIO8_A7	263

RK3368-Based P2/K2 Boards - K6 to K8

Function	GPIO Name	GPIO No.
K6	GPIO2_D2	90
K7	GPIO2_D3	91
K8	GPIO3_A6	102

RK3288-Based P3X/K3 Boards - K6 to K8

On Android 6.1 and later, subtract 8 from the listed system number.

Function	GPIO Name	GPIO No.
K6	GPIO7_B4	236
K7	GPIO7_B5	237
K8	GPIO7_B6	238

RK3399-Based K4 Boards - K1 to K8

Function	GPIO Name	GPIO No.
K1	GPIO1_B2	42
K2	GPIO2_A3	67
K3	GPIO4_D3	155
K4	GPIO2_A4	68
K5	GPIO4_D4	156
K6	GPIO2_A5	69
K7	GPIO1_C5	53
K8	GPIO2_A6	70

5. Hardware Watchdog Test

The hardware watchdog protects normal software operation and can restart the entire unit automatically when the software or operating system fails. This interface is useful for unattended equipment.

Enable Watchdog activates the hardware watchdog. Feed Every 3 Seconds services it every three seconds. If feeding is stopped, the hardware restarts automatically after approximately 10-20 seconds, depending on the board. Disable Watchdog prevents a restart even when periodic feeding stops.

Hardware Watchdog

Enable Watchdog

Feed Every 3 Seconds

Stop Feeding

Disable Watchdog

6. Screen Control

Turns the screen video-output signal and backlight on or off. An I/O can be used as a trigger: each detected low-level pulse toggles the screen. In the example, I/O 176 is K1 on an M1 board. The demo checks the signal every 200 ms; when a low level is detected, it toggles the screen and waits two seconds before resuming detection.

Screen Control

Turn Screen On

Turn Screen Off

176IO trigger

7. Ethernet

Ethernet can be enabled or disabled. Once enabled, it can use DHCP or a static IP configuration. These settings and states correspond directly to Android system settings.

Ethernet

Ethernet MAC: 0C:DE:DB:F0:C7:EC

☒ Obtain address automatically (DHCP)

☐ Use the following address

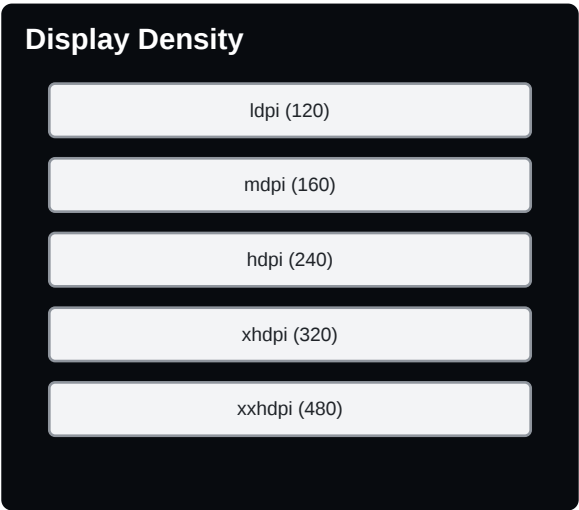
IP address:	192.168.1.104
Subnet mask:	255.255.255.0
Gateway:	192.168.1.1
DNS server:	192.168.1.1

Confirm

Cancel

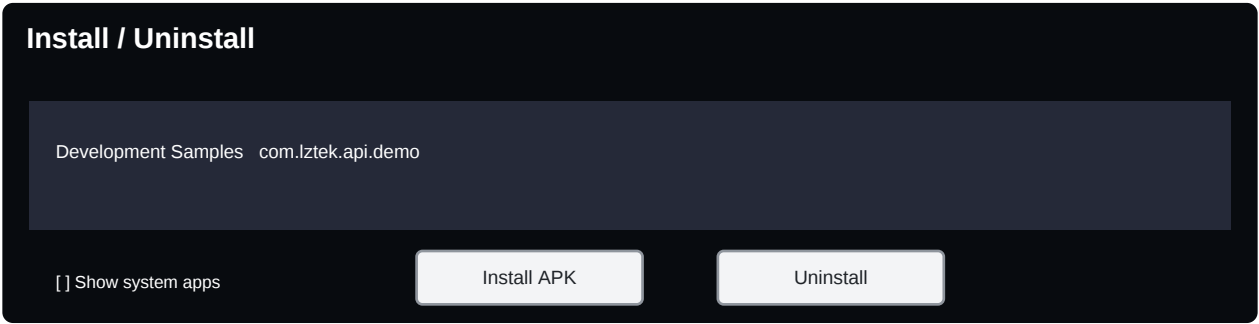
8. Display Density

Typical display-density values are 160 or 240 DPI. Excessively high density settings can cause Android System UI errors; use this function carefully.



9. Uninstall / Install

Select an APK from storage for silent installation, or select an installed application for silent uninstallation. System applications cannot be uninstalled from this screen.



10. HDMI-IN

After an HDMI-IN module is connected to an M2 or M3 motherboard, the application can read the basic HDMI input-signal state and resolution. Signal state 0 means no signal and 1 means signal present. Resolution 1 means 1080p, 2 means 720p, and 0 means unknown.



With SDK 1.1.0 or later and Android system version 20170818 or later, hdmoplayer.apk provides automatic HDMI-IN playback. It detects the input signal, starts full-screen playback when a signal appears, and exits automatically when the signal is lost. Tap anywhere on the screen to reveal the centered configuration icon at the bottom and configure automatic detection and playback.

11. System Information

Displays the system version, kernel version, API version, memory size, and hardware addresses. Wi-Fi must be enabled before its MAC address can be obtained.

System Information

System version:	5.0.8-211207-OEM
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Kernel version:	4.4.126
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API version:	1.2.0.20211022
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Available RAM:	1.91 GB
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Ethernet MAC:	36:A4:3B:33:01:37
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WLAN MAC:	02:00:00:00:00:00
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End of the Motherboard API Test Guide.