Quick Start Guide
SABRE Board for Smart Devices

Based on the i.MX 6 Series

SMART APPLICATION BLUEPRINT FOR RAPID ENGINEERING (SABRE)
GET TO KNOW SABRE BOARD FOR SMART DEVICES BASED ON THE i.MX 6 SERIES

P1 – DC Power Connector
J2 – Headphone Output Jack
J4 – Microphone Input Jack
SW1 – Optional Power Button
SW3 – Manual Shutdown Switch
SW4 – Volume Up Button
SW5 – Volume Down Button
J6 – JTAG Connector
J8 – HDMI Connector
SW6 – Boot Mode Selector Switch

CON1 – SIM Card Connector
J1 – Mini PCIe Connector
J13 – Bluetooth® Connector
J7 – Ethernet Connector
J9 – DVP Camera Connector
U18 – Accelerometer
U20 – eCompass
SW2 – Board Reset Button
SW3 – Manual Shutdown Switch
SW4 – Volume Up Button
SW5 – Volume Down Button
SW6 – Boot Mode Selector Switch
J500 – SD2 AUX SDIO Socket
J502 – LVDS1 Connector
J504 – LCD Expansion Port Connector
J506 – 22-Pin SATA Connector
J505 – Micro USB Connector
J503 – LVDS0 Connector
J507 – SD3 Card Socket
J509 – Serial-To-USB Debug Port
BT500 – Lithium Coin Cell Connector
CON500 – External Speaker Connector
GET TO KNOW SABRE BOARD FOR SMART DEVICES BASED ON THE i.MX 6 SERIES

The Smart Application Blueprint for Rapid Engineering (SABRE) board for smart devices provides the development kit and software to evaluate the i.MX 6 series of applications processor. The development kit provides an out-of-box working demonstration to power-on and run an operating system from an SD card, exercising the features found on the SABRE board. Design information including documentation, hardware schematics, software board support packages (BSP) for Linux® and Android™ reference links are provided.

FEATURES

The following features are available with the SABRE board for smart devices:

- i.MX 6QuadPlus 1 GHz applications processor
- 1 GB DDR3, 533 MHz
- 8 GB eMMC NAND
- Two SD card slots
- SATA 22-pin connector
- HDMI connector
- Two LVDS connectors
- LCD expansion port connector
- Serial camera connector
- Two 3.5 mm audio ports (stereo HP and microphone)
- USB OTG connector
- Debug out via USB µAB device connector
- Gigabit Ethernet connector
- JTAG 10-pin connector
- mPCIe® connector
- Sensor package including:
  - 3-axis accelerometer
  - Digital compass
STEP-BY-STEP INSTRUCTIONS

This section describes how to use the SABRE board for smart devices and the components in the kit. This section also describes the PC requirements to develop applications using the SABRE board for smart devices.

1 Unpack the Kit

The SABRE board for smart devices is shipped with the items listed in Table 1. Ensure the items listed in Table 1 are available in the i.MX 6 series development kit. Remove the board from the antistatic bag.

Development Kit Contents

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board</td>
<td>i.MX 6 SABRE board for smart devices</td>
</tr>
<tr>
<td>USB Cable</td>
<td>USB cable (micro-B to standard-A)</td>
</tr>
<tr>
<td>Power Supply</td>
<td>5 V/5 A universal power supply</td>
</tr>
<tr>
<td>Documentation</td>
<td>Quick Start Guide (this document)</td>
</tr>
<tr>
<td>8 GB SD Card</td>
<td>Bootable operating system demonstration image</td>
</tr>
<tr>
<td>JTAG cable</td>
<td>10-conductor ribbon cable</td>
</tr>
<tr>
<td>JTAG adapter</td>
<td>20-pin adapter card</td>
</tr>
</tbody>
</table>

Table 1: SABRE Board for Smart Devices Based on i.MX 6 Series Development Kit Contents
STEP-BY-STEP INSTRUCTIONS

Download Software and Tools

Download installation software and documentation under “Jump-Start Your Design” at nxp.com/SABRESDB.

Table 2 lists the documents available on the kit website.

“Jump-Start Your Design” Contents

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
</table>
| SABRE board for smart devices documentation | • Schematics, layout and Gerber files  
• SABRE Board for Smart Devices Quick Start Guide (this document) |
| Software development tools | Android™ and Linux® BSPs |
| SABRE board for smart devices demo images | Copy of the bootable operating system demonstration image provided on the SD card |

Table 2: “Jump-Start Your Design” Contents
SETTING UP THE SYSTEM

1 Insert SD Card
Insert the supplied SD card into socket SD3.

2 Connect USB Debug Cable (Optional)
Connect the micro-B end of the supplied USB cable into debug port J509. Connect the other end of the cable to a PC acting as a host terminal. If needed, the Serial-to-USB drivers can be found at www.ftdichip.com/FTDrivers.htm.

Terminal window configuration: 115.2 kbaud, 8 data bits, 1 stop bit, no parity

3 Connect Display
Option 1: HDMI
Connect an HDMI cable to the HDMI connector J8. Connect the other end of the HDMI cable to an HDMI-capable monitor.

Linux:
Add “video=mxcfb0:dev=hdmi,1920x1080 M@60,bpp=32” into kernel command line in U-Boot.

Android:
U-Boot > setenv bootcmd booti mmc2
U-Boot > setenv bootargs
console=ttymxc0,115200 androidboot.
console=ttymxc0 consoleblank=0
vmalloc=400M init=/init video=mxcfb0:dev=hdmi,1920x1080M@60,bpp=32
video=mxcfb1:off video=mxcfb2:off
video=mxcfb3:off androidboot.
hardware=freescale cma=384M
U-Boot > saveenv
SETTING UP THE SYSTEM (CONT.)

Option 2: LVDS
Linux:
Add “video=mxcfb0:dev=ldb,bpp=32” into kernel command line in U-Boot.

Android:
U-Boot > setenv bootcmd booti mmc2
U-Boot > setenv bootargs
console=ttymxc0,115200 init=/
init video=mxcfb0:dev=ldb,bpp=32
video=mxcfb1:off video=mxcfb2:off
video=mxcfb3:off vmalloc=400M
androidboot.console=ttymxc0
consoleblank=0 androidboot.
hardware=freescale cma=384M
U-Boot > saveenv

For more details, please refer to Linux User Guide document or the Android Quick Start document.

4 Connect User Interface Devices
The touch screen can be used to interact with the user interface on the LVDS display. To interact with the user interface displayed on the monitor it may be desirable to attach a keyboard and/or a mouse. Attach a USB hub to USB jack J505 and connect the keyboard and mouse to the hub. If only one device is used, it can be plugged directly into the USB jack. A micro B male to A female adapter cable may be needed.

5 Connect Ethernet Cable (Optional)
Connect an Ethernet cable to the Ethernet jack J7.

6 Connect Power Supply
Connect the 5 V power supply cable to the 5 V DC power jack P1. When power is connected to the smart device, it will automatically begin the boot sequence.
1 Boot Process

- During the boot process, there will be operating system status information scrolling on the terminal window of the PC (if connected). The Linux penguin images will initially appear in the upper left corner of the display, one for each operating ARM® core.

- When the boot process is complete, the user interface will be displayed.

- To work from the terminal window on the host PC, press enter at the terminal window to get the command prompt.

- Linux:
  Login credentials
  User: root
  Password: <no password required, just press enter>

- Android:
  No login credentials necessary, however if running Lollipop or later, the serial input is disabled by default and only serial output is enabled by NXP.

- The uboot bootargs must be modified to include: androidboot. selinux=disabled.
DIP SWITCH CONFIGURATION

Table 3 shows the jumper configuration to boot the smart device from SD card slot SD3.

DIP Switch Configuration (SW6)

<table>
<thead>
<tr>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>D5</th>
<th>D6</th>
<th>D7</th>
<th>D8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>On</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>On</td>
<td>Off</td>
</tr>
</tbody>
</table>

Table 3: SABRE Board for Smart Devices DIP Switch Configuration (SW6)
Table 4 shows the functions of the five pushbutton switches on the board.

### Button Operations

<table>
<thead>
<tr>
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<th>Description</th>
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</table>
| **POWER SW1**      | **SABRE board POWER button**  
• Linux: Prolonged depress (> 5 sec) will force an immediate hardware shutdown.  
• Android:  
  • Momentary depress of button will place the system in standby.  
  • Long press of the button will display a software drive shutdown option menu.  
  • Prolonged depress (> 5 sec) will force an immediate hardware shutdown.  
  • If board is in the OFF state, momentary depress of button will restart (boot) the system.  
  • If board is in the STANDBY state, momentary depress of the button will bring the system out of standby (resume operations, no boot). |
| **RESET SW2**      | **SABRE board RESET button**  
Momentary depress of button will reset the system and begin a boot sequence. |
| **SHUTDOWN SW3**   | **SABRE board shutdown switch**  
• Sliding the switch to the ON position connects the 5 V power supply to the SABRE board main power system.  
• Sliding the shutdown switch immediately removes all power to the board. |
| Volume up SW4      | Volume + |
| Volume down SW5    | Volume - |

Table 4: SABRE Board for Smart Devices Button Operations
SUPPORT
Visit i.MX community at imxcommunity.org.

WARRANTY
Visit www.nxp.com/warranty for complete warranty information.

Get Started
Download installation software and documentation under “Jump Start Your Design” at nxp.com/SABRESDB.