IDTECH®

Value through Innovation

AP6800® User Manual

80817501-001 Rev A

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Warranty Disclaimer
The services and hardware are provided "as is" and "as-available" and the use of the services and hardware are at its own risk. ID TECH does not make, and hereby disclaims, any and all other express or implied warranties, including, but not limited to, warranties of merchantability, fitness for a particular purpose, title, and any warranties arising from a course of dealing, usage, or trade practice. ID TECH does not warrant that the services or hardware will be uninterrupted, error-free, or completely secure.

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FCC warning statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The user manual for an intentional or unintentional radiator shall caution the user that changes, or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: The grantee is not responsible for any changes or modifications not expressly approved by the party responsible for compliance. Such modifications could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with FCC RF radiation exposure limits set forth for an uncontrolled environment.
The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This device should be installed to provide a separation distance of at least 20cm from a person.

Cautions and Warnings

	**Caution:** Use standard USB 5V power source for USB operation. Use approved power source for RS-232 operation. Device contains a lithium battery. Approved temperature range for storage: -40°C to +80°C. Disposal: Contact your local recycling center.
	**Warning:** Avoid close proximity to radio transmitters, which may reduce the capabilities of the reader.

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Revision History

Date	Rev	Changes	By
06/28/2024	A	Initial release.	CB

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1. Overview

The AP6800 is designed to be an advanced, 3-in-1 unattended payment device, featuring a PCI PTS 6.2 certification and developed on the Android platform to use the Android 13 operating system. It supports magstripe, chip card (EMV), and NFC (contactless) payments, with a high-luminosity, outdoor-level 5.0-inch touchscreen display capable of supporting PIN-on-glass transactions and can also display video advertisements when it is not being used for menu displays or customer interactions.

The AP6800 accepts a wide range of payment methods, including digital wallet technologies such as Apple Pay, Android Pay, and Samsung Pay, as well as loyalty technologies like Apple VAS and Google Smart Tap. It is suitable for various payment solutions, including EV Charging, Parking, Vending, POS Kiosks, and Quick Service Restaurants.

1.1. Integration Location

The AP6800 is the next generation vending payment peripheral in the popular ID TECH Vending line of unattended contactless payment hardware. This device is intended to be deployed on unattended kiosks, parking systems, and vending machines that support a variety of different payment methods, digital advertising, and guidance using visual payment prompts.

1.2. Integration Options

ID TECH provides a feature-rich Android SDK to aid rapid development of external (non-device-resident) payment applications that talk to the AP6800. In addition, AP6800 is designed to host payment applications directly on the device, enhancing flexibility and responsiveness to diverse payment needs. This can be achieved easily with ID TECH's Android SDK, which is a development kit that enables customers to create their own payment applications for use on the device. The Android SDK and its client API are documented in the *Android SDK Guide for AP6800* and *Android Client ZSDK API Reference*, respectively. These documents, plus other useful utilities, demos, and downloads for the AP6800, be sure to check the AP6800 product page on the ID TECH Knowledge Base (no registration required).

1.3. Encryption

The AP6800 supports industry-standard Triple DES or AES encryption technology, with DUKPT-based key management (per ANSI X.9-24). Encryption can be configured to occur with a PIN variant key, or Data variant, as desired. ID TECH operates a certified Key Injection Facility, capable of injecting your unit(s) with any required keys. Remote Key Injection (RKI) is also available. Consult your ID TECH representative to learn about all available options involving key injection.

As a PCI-validated SRED device, the AP6800 conducts periodic self-checks and incorporates tamper detection features which, if triggered, cause automatic zeroization of sensitive data and keys. Because of its SRED features, the AP6800 is fully capable of being incorporated into a P2PE certified solution.

2. Features

- Hardware:
  - Android module based on NXP I.MX8M Quad, supporting dual display
  - Memory: 4GB LPDDR4, 16GB eMMC Flash
  - Barcode Camera: 2 Megapixel camera for barcode scanning
  - Front Facing Camera: 5 Megapixel camera with auto focus & proximity sensor
  - Internal Speaker
  - LCD: 5.0" TFT display of min. resolution 800 (height) x 480 (width) with Capacitive Touch Panel
  - USB Type C Connector: Support dual power roleConnectivity interface: RS-232, Dual USB 3.0 via USB-C, Ethernet 10/100M[1], Dual Band Wi-Fi, Bluetooth, and optional LTE 4G[2]
- Latest Secured Android OS
- Android OS & Firmware Update (Local & Remote)
- PIN on Glass, Fixed & Random PINPad
- Manual PAN Entry
- 1D Barcode / 2D QR Code
- SIM Card (optional for LTE models)
- SAM Card
- Up to 32 GB SD Card
- Power Management
- Audio with Internal Speaker
- Video Playback on Single & Dual Displays
- Customer Applications Hosted on Device
- Graphic User Interface
- MSR/ICC/Camera LEDs & NFC Virtual LEDs
- International Language Support for Payment Transaction
- Remote Device Management
- Encryption: TDES 112, AES 128, Salted Hash, TransArmor, Retail MAC Support
- DKI
- PKI RKI (Gen 4)
- USDK Demo
- Android zSDK
- ID TECH PAE V2 (on device)
- RDM with zSDK

[1] Note: the AP6800 must be power-cycled to switch between 10M and 100M.

[2] Note: Only AP6800-0318, AP6800-0338, and AP6800-0368 support LTE.

2.1. Agency Approvals and Compliances[3]

- EMV CT L1
- EMV CT L2 (Common Kernel)
- EMV CTLS L1
- PCI PTS v6.2
- CTLS L2 Payment Kernels:
  - Amex
  - Discover
  - Interac
  - JCB
  - MasterCard
  - UPI
  - Visa
- US Common Debit AID
- Felica
- MIC/TELEC (Japan)
- PCI 6.X
- FCC (Part 15, Class-B)
- JATE (Japan)
- ISED (previously known as IC)
- CE
- UL
- MasterCard TQM
- RoHS3
- REACH
- Apple VAS
- Google Pay Smart Tap 2.1
- ISO 14443A/B and ISO 18092
- USB 3.0
- AT&T TRENDI[4]
- CB
- PTCRB[5]
- VCCI

[3] Full certification ready by beta release.

[4] Note: Only applicable to AP6800-0318.

[5] Note: Only applicable to AP6800-0318.

3. Specifications

Hardware	
CPU	Android module based on NXP I.MX8M Quad, supporting dual display
Memory	4GB LPDDR4, 16GB eMMC Flash
Front Facing Camera	5 Megapixel camera with auto focus & proximity sensor
Barcode Camera	2 Megapixel camera for barcode & QR code scanning
SAMs	4 SAMs (3 SAMs with LTE radio option*)
SD card slot	1 slot
Audio	Audio with Internal Speaker & Audio Line Out through multi-port USB C port
Interface	Dual USB, RS-232, Ethernet, Dual Band Wi-Fi, Bluetooth, LTE 4G CAT4 (Optional*)
Power Supply	9V/3A
Power Consumption	13.5W (without 2nd display)
Physical	
External Dimensions	150 mm x 100 mm x 30 mm
Envelopment Dimensions	150 mm x 100 mm x 55 mm (w/ fan)
Screen	
Dimensions (in pixels)	800 (height) x 480 (width)
Luminance/Brightness	Up to 800 NITs
Touch Interface Type	Capacitive
Environmental	
Operating Temperature	-30° C to 50° C (-22° F to 122° F), max change of 10° C per hour
Storage Temperature	-30° C to 70° C (-22° F to 158° F)
Operating Humidity	Up to 95% non-condensing
Storage Humidity	10% to 90% non-condensing, duration three months
IK Rating	IK 08
IP Rating	IP 65
ESD	±8kV contact, ±12KV air discharge
Durability	
Product Life	Five years (in typical environment)
Product Battery Life	Five years (in typical environment)
MSR Swipe Durability	1,000,000 times
ICC Connector Reliability	500,000 times

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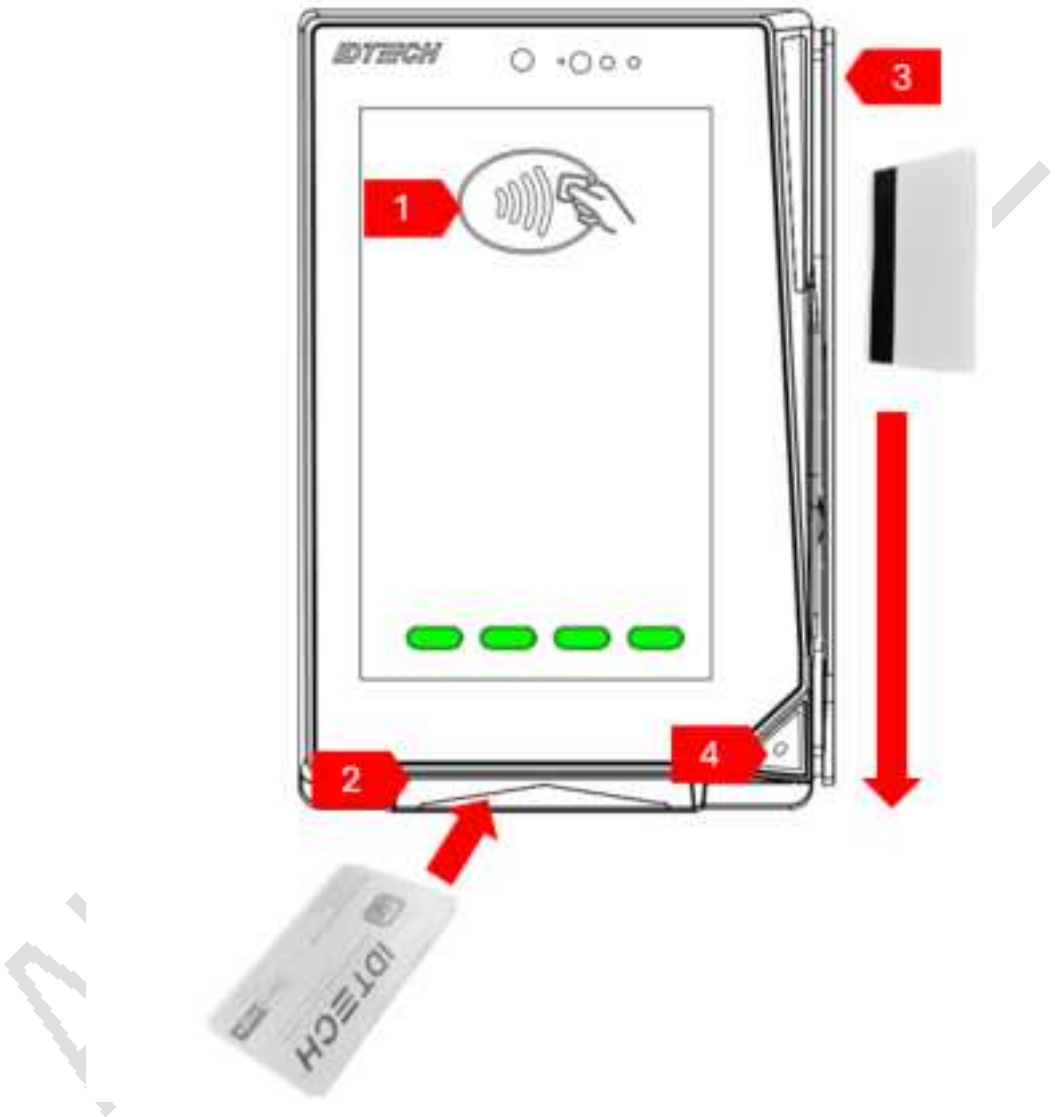
4. Hardware

The section below describes AP6800 hardware functionality.

4.1. AP6800 Card Interfaces

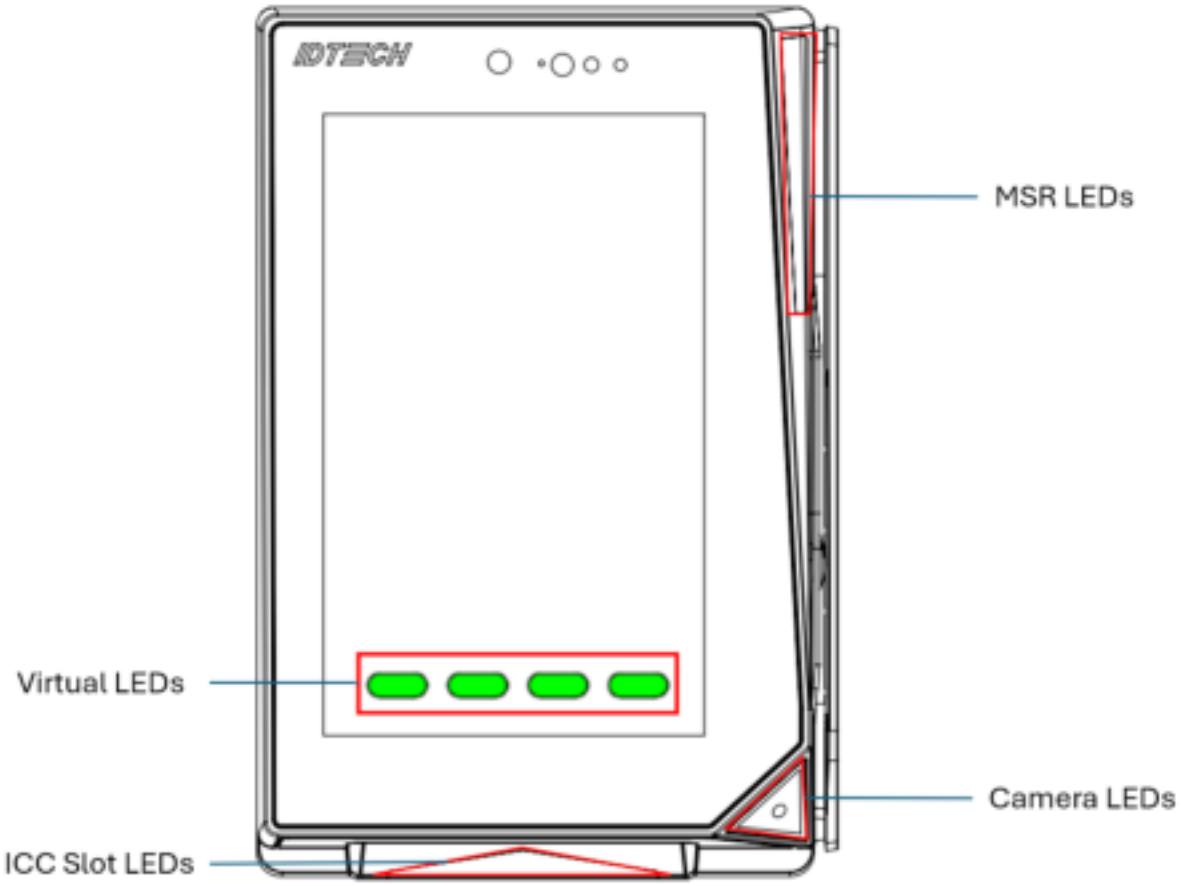
AP6800 readers have the following card interface points, shown below.



Interface	Note
1. Contactless antenna	
2. ICC slot	Smart chip must face upward for ICC transactions.
3. MSR slot	MagStripe must face left for MSR swipes.
4. QR Code camera	Rotate image 45 degrees facing the camera.

4.1. LEDs and LCD Status Indicators

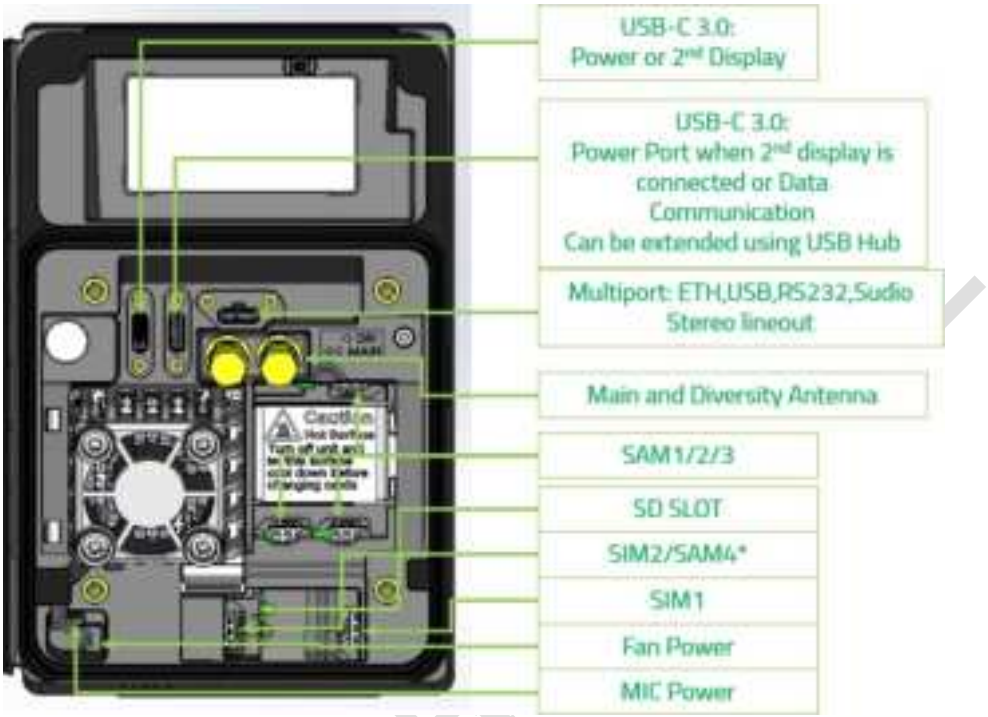
The AP6800 uses LEDs and the main LCD display to denote its status during transactions and in case of errors. Contactless LED lights appear on the digital display.



LED and Behavior	Status Indicated
First left virtual LED blink green regularly	AP6800 in standby awaiting transaction
First left virtual LED is solid green	Contactless transaction started
All four virtual LEDs blink green	Contactless transaction complete
ICC slot green LED is on	ICC transaction started
ICC slot red LED is on	Device error(s)
MSR LEDs on	MSR transaction started
Camera LEDs on	Camera is on and ready for capture

4.2. Communication Hardware

The AP6800 can communicate with a host via serial (RS-232), Wi-Fi, Bluetooth, Dual USB, Ethernet, or LTE 4G connections. The diagram below illustrates the layout of various ports.

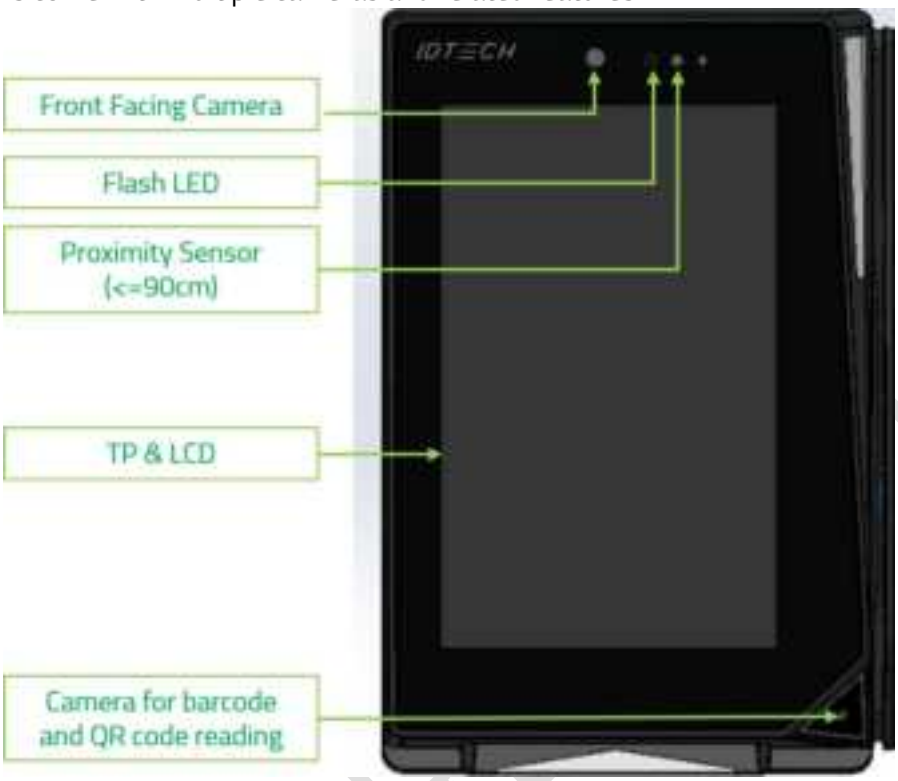


* Only AP6800-0318, AP6800-0338, and AP6800-0368 support SIM1.

** Only AP6800-0318, AP6800-0338, and AP6800-0368 support SIM2. AP6800-0308 readers use it as SAM4.

4.3. Cameras

AP6800 readers come with multiple cameras and related features.



- **Front Facing Camera:** Five-megapixel camera with autofocus.
- **Flash LED:** Flash for front facing camera.
- **Proximity Sensor:** Detects adult-size objects at a distance of 30cm to 100cm.
- **TP & LCD:** Five-inch 800x400 touchscreen display.
- **Code-Scanning Camera:** Two-megapixel camera for scanning payment barcodes and QR codes.

5. Parts List

The section below describes additional parts ID TECH offers for the AP6800.

5.1. Cables

The AP6800 can use a USB -C cable or a multi-port cable to connect to the host. In addition to RS-232 and Ethernet, the multi-port connector (USB C) also contains the signals of USB Type A (host) and Audio Line Out.

No.	Cable Type	Part Number	
1	USB-C Cable (Required to use an adapter for power supply)	80178218-001	
2	Multi-Port Cable (Required to use an adapter for power supply)	80187220-001	
3	Adapter (45W PD Adaptor, USB-C)	AC0005R-29	

5.2. Antennas

Note that LTE models of the AP6800 require an external antenna for LTE communication.

Variant	LTE (Using External Antenna)	Wi-Fi/Bluetooth Only (No LTE)
Product Model #	AP6800-0318 (North America) AP6800-0338 (EMEA)	AP6800-0308
Picture (Rear View)		
Notes	External antennas (P/N: ANT009R) must be attached for LTE to work. There are two antennas: Main and Diversity.	No additional antenna required for Wi-Fi or Bluetooth.

5.3. AP6800 LTE Regions

To connect to internet through LTE, the customer needs to prepare a SIM card with a data plan. AP6800 readers support different LTE bands in different regions; when purchasing AP6800 readers, please select the model according to the target deployment location.

Model #	**AP6800-0318**	**AP6800-0338**	**AP6800-0368**[6]
Region	North America	EMEA	Japan
IoT Modem Type	Cat 4	Cat 4	Cat 4
Feature	Data-Only	Data-Only	Data-Only
Dual SIM Support*	Yes	Yes	Yes
LTE Certification	AT&T TRENDI / PTCRB	GCF (Not Listing)	Module Certified by KDDI, NTT, SoftBank
Regulatory Certification	FCC / IC	CE / UKCA	JATE/ TELEC
External Antenna Required	Main & Diversity	Main & Diversity	Main & Diversity

[6] Forthcoming.

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6. Installation

The sections below describe AP6800 installation.

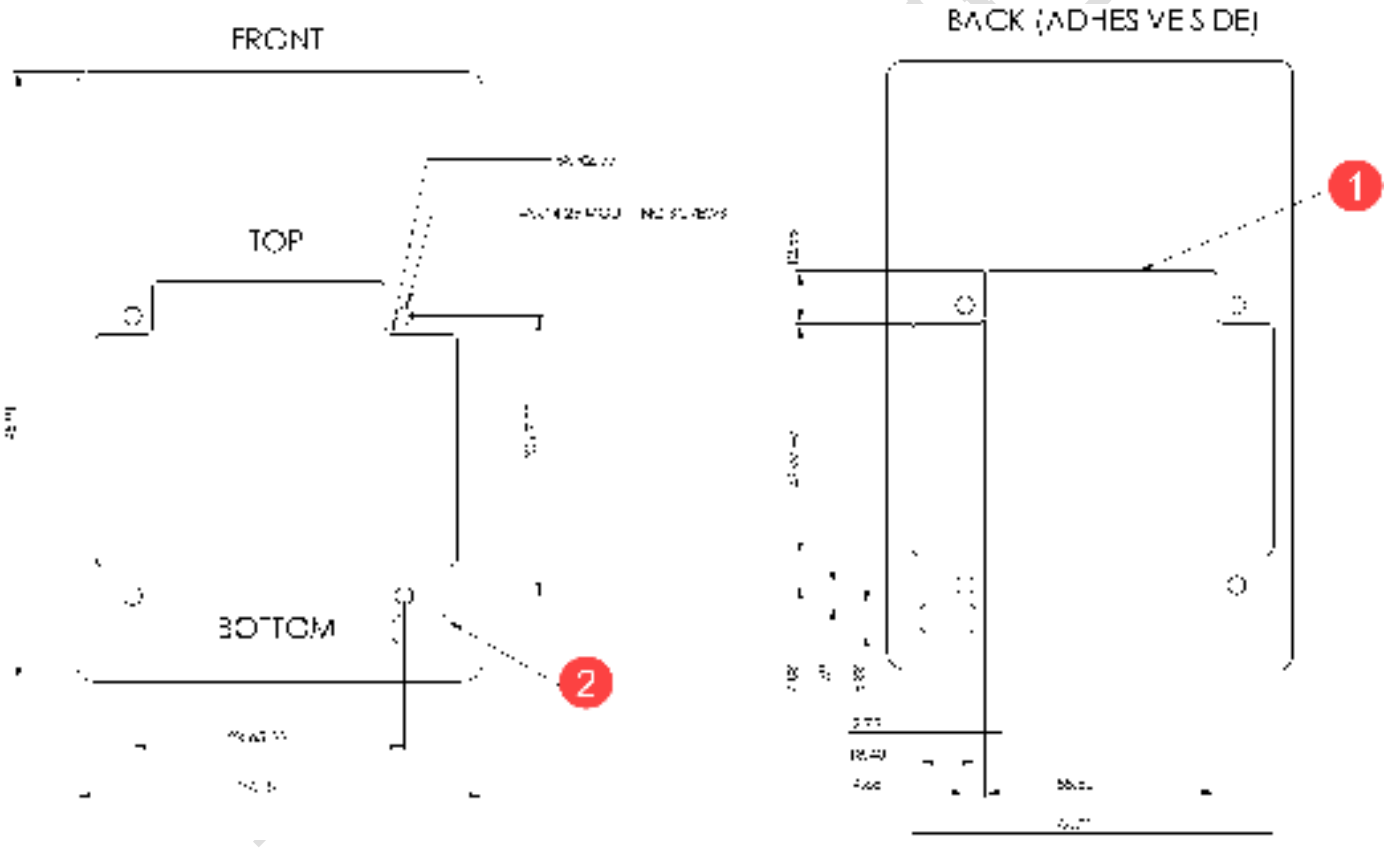
6.1. Parts List for Development

Verify that you have the following hardware for the installation of the AP6800:

- USB-C cable or multi-port cable
- 45W PD Power supply

6.2. AP6800 Mounting Guidelines and Installation

Mount the unit according to the drawings shown, with #8-32 studs spaced 65mm apart horizontally and 67mm vertically. The pitch of the nuts is the same as those used for Vendi, VP6300, and VP6800 readers. Use a torque wrench to tighten the screws to 8kg-cm.



1. Cut-out for the product. Tolerance is ±0.3 milimeters.
2. Optional hole for the microphone.

7. AP6800 Configuration Settings

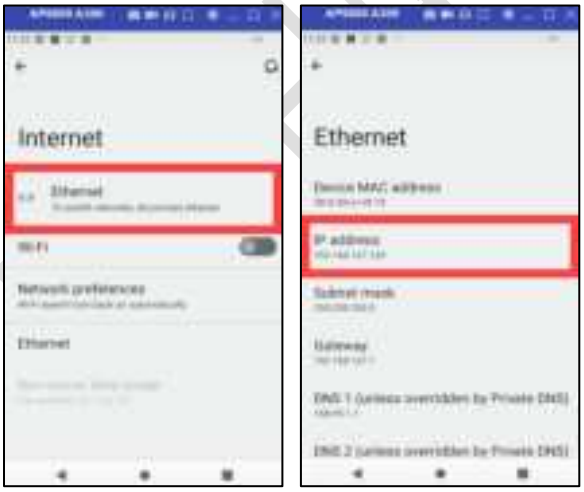
The section below describes configuration settings for the AP6800. When powered on, the AP6800 boots automatically. For development purposes, integrators can use a USB-C or a multi-port cable for RS-232 and Ethernet connections with a 45W PD adapter.

7.1. Connecting to Ethernet

Follow the steps below to connect to ethernet.

1. Connect the ethernet cable to the AP6800.
2. Go to **Settings** > **Network & internet** > **Internet**.

3. Check the IP address field. If there is an IP address in the field, the reader has successfully connected to the ethernet.



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7.1.1. Ethernet Configuration

1. Open the **Ethernet configuration** menu.

2. Select the desired connection type.

3. To manually set the IP address, select **Static IP**, enter the network information, and select **SAVE**:

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7.2. Connecting to Wi-Fi

Follow the steps below to connect to Wi-Fi.

1. In the AP6800's menu, select **Settings** > **Network & internet > Internet**.

2. Turn on **Wi-Fi** to search for available networks.

3. Enter the Wi-Fi password and select **CONNECT**.

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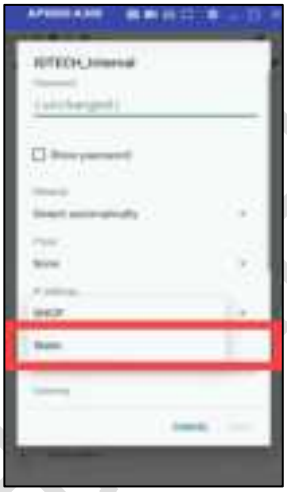
4. The main **Internet** menu displays successful connections.

5. To manually set the IP configuration, select the **Edit** icon, then select **Static**.



6. Enter the network configuration then select **SAVE**.

7.3. Connecting to Bluetooth

Follow the steps below to connect to Bluetooth.

1. In the AP6800's menu, select the **Settings** app, then go to **Connected devices** > **Pair new device**.

2. Select the target Bluetooth device (a Galaxy S22 in the example below).

3. Select **PAIR**.

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4. When the device is successfully paired, it appears under **Saved devices** on the **Connected devices** screen.

7.4. Connecting to LTE

AP6800 supports 2 SIM slots; for the steps below, assume the desired SIM card is in slot 2.

1. Go to **Settings** > **Network & internet > Internet** to check the internet connection type.

2. Check to see the reader's current internet connection.

3. Select **SIMs slot**, then select the desired SIM slot to switch to the correct LTE card (in this case, **SIM 2**).

4. After selecting the desired SIM slot, reboot the reader for the new settings to take effect.

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8. Security Guide

The AP6800 is an unattended device. Contact your ID TECH representative or send an e-mail to support@idtechproducts.com if you have any questions involving the product's daily use. We recommend you conduct daily checks of the device as follows:

- Check the tamper evidence physical seals, to make sure they are intact.
- Power on the device, check the beeper, and the display message, making sure there is no tamper indication (see earlier chart for beeper interpretation). Also read the firmware version, making sure the firmware version is correct.
- Check the touchpad, to make sure there is no physical overlay on the touchpad.
- Check the appearance of device, to make sure there isn't any hole on the device or suspicious object around the ICC card slot.
- Check the MSR (magnetic stripe) slot, to make sure there is no alteration of the device.

9. Decommissioning PCI-Certified Devices

All PCI devices require proper decommissioning prior to device disposal in order to ensure the protection of all sensitive financial card data. For instructions on decommissioning your device, see Decommissioning of PCI-Certified Devices on the ID TECH Knowledge Base.

10. Troubleshooting

Consult the ID TECH Knowledge Base for troubleshooting assistance.

10.1. Device State and UI

State	Beep	LCD	Indicating
De-activated	Beep every 5 seconds	"DEACTIVATED"	Device is in "Manufactory mode;" no security functions enabled.
Activated	No Beeper	"ACTIVATED"	Manufactory data and certificate loaded into device, but no working keys.
Common	No Beeper	"NO KEY INJECTED"	Device activated but not ready for sensitive functions. The reason should be due to missing required keys.
Ready	No Beeper	"WELCOME"	Device ready for sensitive functions, like transaction, Get PIN, GET account, etc.
Tamper	Alarm Tone	"TAMPERED"	Device was tampered by physical, temperature, or voltage attack. All sensitive information is erased or unrecoverable. Device blocks all sensitive functions. There is no way to recover except to return to manufacturer.

10.2. Tamper and Failed Self-Check Indicators

The AP6800 displays the following indicators when it has been tampered or has any of the other following internal issues, such as an expired certificate, missing key, or similar fault discovered during a self-check.

Note that the Tampered screen also displays configuration information used to diagnose the cause of the issue, similar to the image below on the right:

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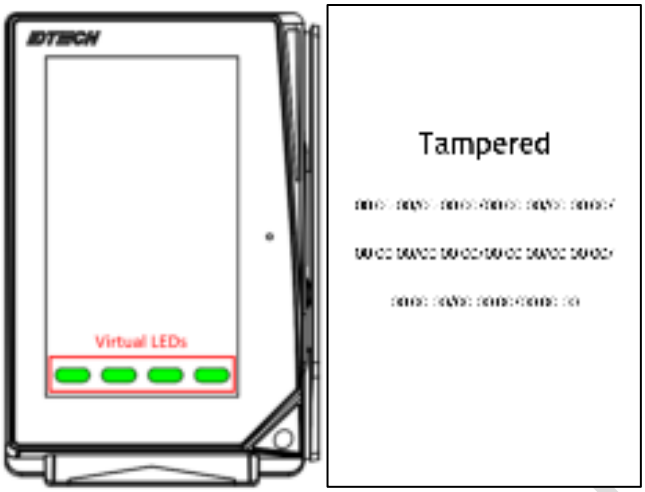

Indicator	Tampered Status	Other Issue Status
Virtual LEDs	All Virtual LEDs off	All Virtual LEDs off
LCD Display Message	TAMPERED	See below
Speaker	Alarm tone	See below

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10.2.1. Other Status Messages

The AP6800's LCD can display the following messages for both regular status and in the event of a failed self-check:

State	Speaker	LCD	Indicating
Tamper triggered	Alarm Tone	"TAMPERED"	Device was tampered by physical, temperature, or voltage attack. All sensitive information is erased or unrecoverable. The reader blocks all sensitive functions. There is no way to recover the reader except to return it to ID TECH.
Certification check fail	No sound	"Cert Fail"	Certificate tree self-check has failed (example of failure: expiration of certification).
Firmware integrity check fail	No sound	"MSRFail"	MSR failure, usually caused by the abnormal state of the MSR module.
	No sound	"FW/BL Fail"	Firmware self-check has failed
Abnormal Key Status	No sound	"Keys Fail"	Encryption key self-check has failed.
	No sound	"NO KEY INJECTED"	The reader is activated but not ready for sensitive functions. The reason is most likely due to missing required keys.
Deactivated	Beep every 5 seconds	"DEACTIVATED"	The reader is in "Manufactory mode;" no security functions are enabled.
Activated	No sound	"ACTIVATED"	Manufactory data and certificate are loaded into the reader, but no working keys.
Ready	No sound	"WELCOME"	The reader is ready for sensitive functions like transactions, Get PIN ,GET account, and similar commands.
Restrict	No sound	"RESTRICTED"	Device is suspended due to reach the retry limitation (3 times in succession) of bad signature verification, may recover after 15 mins. Once recovered, a good signature verification may reset the retry limitation, but a bad signature verification may suspend another 15 mins.

If your AP6800 is tampered, contact ID TECH support for assistance.

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11. 24-Hour Device Reboot

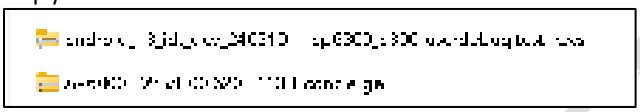
Per PCI Requirements, this device reboots every 24 hours. Please contact your device integrator if you need to check the reboot time for your unit.

12. Updating AP6800 Firmware

The following section provides instructions for updating AP6800 firmware.

12.1. Updating from a Micro SD Card

Before you begin the update, make sure you have the following:

- Micro SD card, at least 2GB capacity.
- The ICC262R firmware file. Contact ID TECH support; the file will have a name in this format: **AP6800_FW_v1.00.620.2413.T.concierge.zip**.
- The ICC388R firmware file. Contact ID TECH support; the file will have a name in this format: **android_13_idt_dev_240510-1-ap6800_a300-userdebug test-keys.zip**.
    - Copy the two files to the Micro SD card's root directory:
    - 
- Insert the Micro SD card into the AP6800's Micro SD card slot:

12.2. Updating the K81 Processor

Follow the steps below to update the K81 processor.

1. In the AP6800's menu, select the **Neo Manager** app.

2. The Neo Manager app displays two directories; select the **second** directory, which is the Micro SD card ID (each Micro SD card may have its own number). If the app doesn't show the directory, select the refresh button to reload the files.

3. Select the **K81 firmware file** and select the **UPDATE** button:

4. The screen displays the K81 firmware update progress:

5. When the firmware update completes, the log displays "The firmware updating process is done," and shows the FW version. Select OK to return to the main screen to complete the ICC262R firmware update.

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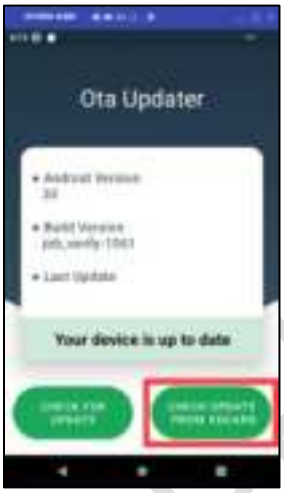
12.3. Updating the A300 Processor

Follow the steps below to update the A300 processor.

1. In the AP6800's menu, select the **Ota Manager** app.

2. Select **CHECK UPDATE FROM SDCARD**.



3. The app displays the available Android image .ZIP files.

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4. Select the desired update file, then select **Confirm** and **Update**.

5. The app displays the update progress. When the update reaches 88%, select the reboot button to restart the reader.

6. After the device reboots, enter the Ota Updater app again to verify the update:

To check both processors' firmware versions, go to **Settings** > **About device** > **Model**.

13. For More Information

- To learn more about the AP6800 and other ID TECH products, visit the ID TECH Knowledge Base.
- Visit us online at http://idtechproducts.com.
- Find more Tech Support resources at the ID TECH Tech Support home page.

14. Appendix A: Supported Micro SD Cards

The AP6800 supports a limited number of Micro SD cards; the following cards have been tested and verified for the device:

- Kingston/SDCS/16GB
- Kingston/SDCS/32GB
- SanDisk/micro SDHC UHS-I card/16G
- SanDisk/micro SDHC UHS-I card/32G