Advanced Card Systems Ltd.
Card & Reader Technologies

AIR60U
ePassport Reader

User Manual V1.04

Subject to change without prior notice

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1. Packing List

Check all contents after unpacking. Contact your supplier if any item is missing:
☐ AIR60U Reader Main Unit ×1
☐ USB Type-C Cable ×1
☐ USB DC Power Cable (for auxiliary power supply) ×1

Note: Do not discard the original packaging. Please use the original packaging when shipping the device for return or repair.

2. Safety Instructions (Must Read)

⚠ **Important Operating Rule**

The document reading sequence must not be reversed: **Read the machine-readable zone (MRZ) code first, then read the chip.**

Electronic passports implement the BAC/PACE access control protocols. Valid MRZ information is required to decrypt data on the chip. An incorrect operating sequence will cause repeated reading failures.

(1) The reader shall only be used in dry indoor environments. Do not expose it to rain or immerse it in water, and do not place it in humid or greasy environments.
(2) Do not drop, strike, or place heavy loads on the reader. The scanning window is made of tempered optical glass; do not scratch it with hard objects.
(3) Do not disassemble or modify the device yourself. Unauthorized disassembly will void the warranty.
(4) Use the original data cable supplied with the device. Do not use inferior cables or excessively long USB extension cables.
(5) If the device will not be used for an extended period, disconnect the USB cable and power supply, and store it in a dust-proof place.

3. Product Overview

The AIR60U ePassport Reader complies with the ICAO Doc 9303 international standard. It integrates OCR recognition, MRZ recognition, NFC contactless RF reading and contact IC card read/write functions.

It supports electronic passports, visas, travel documents, and NFC ID cards from all over the world that comply with the ICAO 9303 standard, allowing simultaneous optical recognition of the Machine Readable Zone (MRZ) and NFC-chip-data reading for the document.

It also supports contact ID cards meeting ICAO 9303 and ISO7816 standards. The reading rule is: first read the MRZ, then insert the card to read chip data.

Models equipped with a scanner support decoding printed and digital 1D/2D barcodes: PDF417, Aztec, QR Code, Data Matrix, etc.

AIR60U-A1 (Without Scanner)	AIR60U-A2 (With Scanner)

4. Reader Components

AIR60U is a compact desktop device. Its hardware modules are described below:

- MRZ Scanning Area: Place the document here for reading the MRZ on the document's bottom edge
- Barcode Scan Window (AIR60U-A2 only): To recognize 1D and 2D barcodes
- LED Indicators: To show document reading status in real time
- Device Ports: The back panel integrates 1 USB-C communication port, 1 DC power port, with a USB-A expansion port on the left side and a contact-type card slot on the right side
- Bottom Mounting Screw Holes: For use with a bracket to enable embedded installation

(1) MRZ Scanning Area

A 144×61mm OCR scanning platform is located under the top light shield.

Operating Instructions: Place a passport with its image side face-down or a card-type document with the MRZ face-down. Push the document toward the rear of the scanning window until it reaches the stop, then perform scanning and recognition using the software.

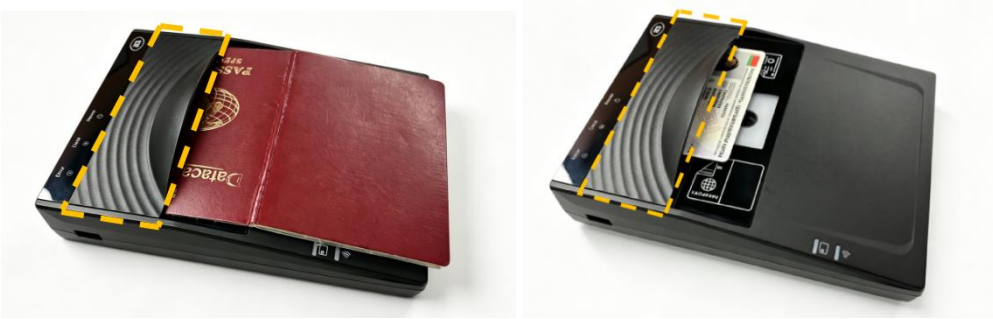

Figure 1: A passport and a card-type document placed flat for scanning

(2) Device Ports

Figure 2: Rear, side and bottom panels

① **Circular 5 V DC Power Port:** For use with the DC power cable supplied with the reader. When USB power from the computer is insufficient or peripheral devices are connected to the USB-A expansion port, use a DC power adapter rated 5 V / 1 A or higher, or connect to an unused USB port on the computer for supplementary power. If the computer provides sufficient power, no DC connection is required.

② **Standard USB-C Port:** For data communication with the computer and basic power supply

③ **USB-A Expansion Port:** For connecting external USB devices

④ **IC Card Slot:** Insert a card with the chip side face-up for contact smart card read/write

⑤ **Mounting Screw Holes:** For securing the device to a mounting bracket in an embedded installation

Port Safety Warnings

1. Use only a 5 V DC power adapter. Do not use third-party non-standard AC power supplies.
2. Do not use the power adapter if its casing is damaged.
3. Do not disassemble the device yourself. No user-serviceable parts inside; only qualified personnel may service the device.
4. Operate only in dry indoor environments. Do not power on the device in humid or wet conditions.

(3)LED Indicators

Figure 3: LED indicators on the top and side panels of the device

Indicator Name	Working Status	Description
Power LED	Steady On	Device powered normally, in standby ready state
Data LED	Steady On	Document detected in the scanning area
	Flashing	Scanning and reading the passport's MRZ code
Error LED	Steady On	Document recognition failure / device communication error / MRZ reading error
PICC LED	Steady On	Document/card detected in the reading zone
PICC LED	Flashing	Reading document data and transmitting to PC
ICC LED	Steady On	Card detected in the IC card slot (chip side face-up, correctly inserted)
ICC LED	Flashing	Reading IC card chip data and transmitting to PC

(4)Light Shield

AIR60U features a half-enclosed light shield to effectively block ambient stray light and ensure MRZ OCR recognition accuracy.

Cleaning Operation: Remove the two fixing screws on the top rear of the device, flip up the light shield, and wipe the OCR optical glass window.

Figure 4: Half-enclosed light shield and OCR MRZ scanning glass window

5. Reader Installation

This chapter describes the procedures for installing the supporting software and connecting the device to a computer.

(1) Pre-installation System Requirements

1. PC equipped with USB 2.0 or higher ports
2. Supported OS: Windows 10 / 11 (64-bit)
3. When multiple RFID-equipped devices are deployed side by side, maintain a minimum spacing of 25 cm between units to avoid RF signal interference.

(2) Software Installation

Please contact ACS to obtain the complete installation resources (software development kit).

Installation Steps:

1. Open the SDK folder and run the "ACS AIR60U ePassport Reader SDK.exe" installer

2. Click [**Install AIR60U SDK Package**], then follow the on-screen wizard to complete the main SDK installation
3. Click [**Setting Environment**] to finish system configuration
4. Click [**Install ACS QR Scanner Driver**] to complete scanner driver installation (AIR60U-A2 only)
5. Click [**Install ACS CCID PC/SC Driver**] to complete the installation of the reader driver.

(3) Cable Connection

Important Rule: The software installation must be completed before connecting the device cables.

1. USB A-C Communication Cable (USB2.0): To transmit data and supply basic power simultaneously. Plug its Type-C end into the USB-C port on the reader's rear panel and its Type-A end into a PC USB port.

Type-C End of Cable (to the Reader)	Type-A End of Cable (to the PC)

2. USB-DC Auxiliary Power Cable: A 5 V 1 A or higher DC power adapter or a spare PC USB port is required for supplementary power when the PC USB power supply is insufficient or multiple peripherals are connected to the USB-A expansion port of the reader.

The circular DC port does not need to be connected if the PC provides sufficient power.

DC-Barrel End of Cable (to Reader)	Type-A End of Cable (to Adapter/PC USB)

(4) Wiring Safety Instructions

1. Connect the reader's rear USB-C port to the PC using the USB-C cable

2. Connect an additional DC power adapter if the computer's USB power supply is insufficient, resulting in device malfunction, or when USB power from the computer is insufficient for peripherals connected to the expansion port.

- Align the DC-barrel plug and fully insert it into the rear power port
- Plug the power adapter into a mains socket

3. The reader will automatically perform self-check. Its yellow Power LED on the top will remain steadily lit once software installation and wiring are complete and the reader is ready for operation.

6. Document Scanning

(1) Reading ePassport & NFC ID Card

Figure 5: ePassport Scanning

Figure 6: NFC ID Card Scanning

ePassport Reading Procedure:

Open the passport to personal data page, place it flat face-down, and push it into the MRZ scanning area. Align the black MRZ strip at the bottom edge of the passport with the reference line, and center it with no raised edges and obstructions. Keep the document flat and stationary against the OCR glass, then perform scanning and chip reading using the software. (Figure 5)

NFC ID Card Reading Procedure:

Place the ID card with its MRZ side face-down and push it into the scanning area, align the black MRZ strip with the reference line, and center it with no obstructions. Keep the card stationary against the glass, then perform scanning and chip reading using the software. (Figure 6)

(2) Scanning QR codes

Click the "Barcode (1D/2D)" button on the software interface before scanning.

- Printed QR codes: Hold the codes in front of the scanner, about 5 cm away. Remove it after the scanner lights up and you hear a beep.
- Mobile QR Codes: Keep the phone screen on. Hold the phone with the screen face-down in front of the barcode scanner, about 5 cm away. Remove the phone after the scanner lights up and you hear a beep.

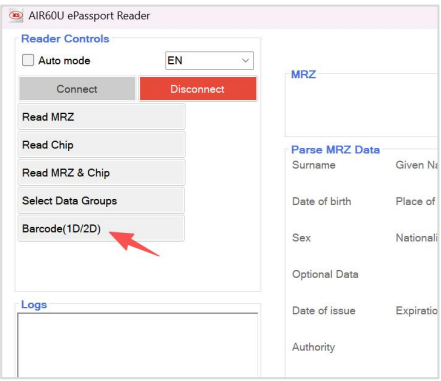

Figure 7: Scanning QR code on a smartphone screen

(3) Reading Contact IC ID Cards

(Two-step procedure; sequence must not be reversed)

Figure 8: Contact IC ID Card

Prerequisite: Only after the MRZ has been read, insert the card into the slot to read the chip data.

Figure 9: Step 1 - MRZ Scanning

Figure 10: Step 2 - Card Insertion

- Step 1: Place the card with its MRZ side face-down, and push it into the scanning area. Align the black MRZ stripe at the card's bottom edge with the reference line, center it and ensure no obstruction, then initiate MRZ scanning in the software. (Figure 9)
- Step 2: Remove the card after MRZ recognition is complete; insert it into the side-panel IC card slot with the chip side face-up, then perform IC chip reading in the software and pull it out when finished. (Figure 10)

7. Function Test

After completing software installation and cable connection, follow the steps below to verify proper operation of hardware and software:

① Confirm that the USB cable is firmly connected to the PC

② Open the application list on your computer, launch "ACS AIR60U ePassport Reader SDK" and run the "AIR60U ePassport Reader" tool.

③ Click the [**Connect**] button on the test tool to establish communication between the reader and the PC.

④ Place a document properly on the reader as instructed above

⑤ You have two operational options on the test tool's interface: Click [**Read MRZ**] and then [**Read Chip**] separately, or one-click [**Read MRZ & Chip**] to collect complete passport data. (Figure 11)

Note: Do not move the document during scanning. **For contact ID cards, MRZ reading must be completed first before inserting it into the card slot for chip reading.**

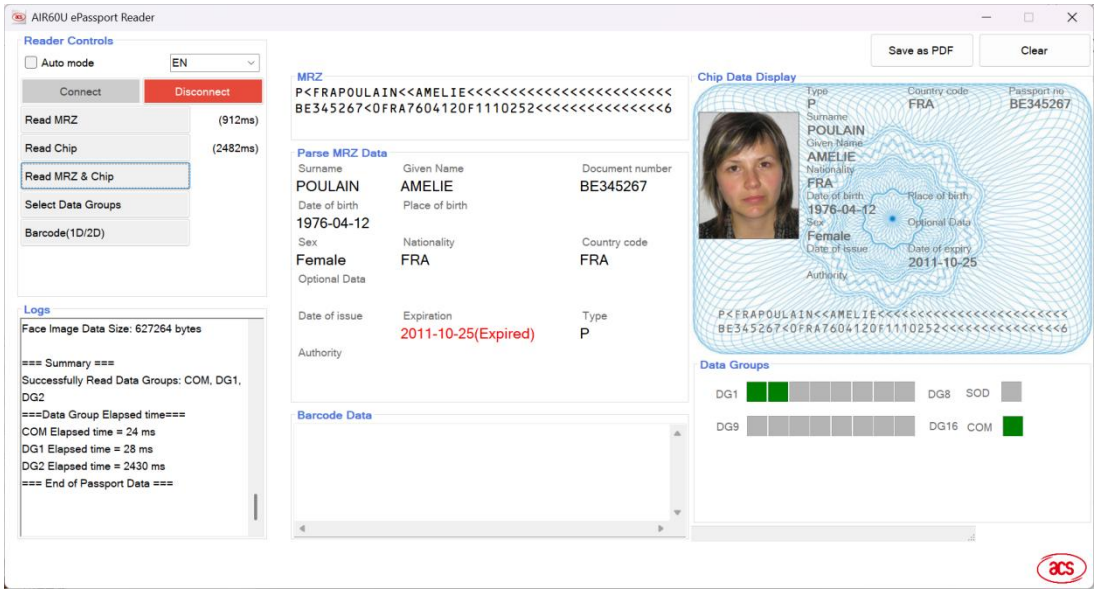

Figure 11: AIR60U Software Operation Interface

8. Equipment Maintenance

The AIR60U reader contains no user-serviceable parts. Only the optical glass scanning platform requires regular cleaning. In the event of major hardware faults, send the device to the ACS's official service center for repair.

Regular Cleaning Procedure (to ensure stable and accurate MRZ recognition) :

1. Only use a microfiber cloth. Steel wool, abrasive cleaners and organic solvents shall not be used as these will scratch the glass surface.
2. Disconnect the USB communication cable and DC power cable for complete power disconnection before cleaning.
3. Loosen the two screws on the top rear of the reader, flip up the light shield, and wipe the OCR optical glass window with a soft microfiber cloth. For stubborn stains, apply water-based screen cleaner to a slightly damp cloth and wipe gently.
4. Confirm that no watermarks, fingerprints or dust remain on the glass surface.
5. Wipe the reader's outer casing with a slightly damp microfiber cloth to remove dust.
6. Reconnect power and verify scanning/recognition function.

Forbidden Cleaning Supplies: Steel wool, abrasive cleaners, alcohol, and organic solvents (as these will corrode and scratch the optical glass).

9. Specifications

Category	Item	Parameter Value
Physical Spec	Dimension	18.7 cm (L) × 14.5 cm (W) × 5.5 cm (H)
	Weight	358g (AIR60U-A1), 372g (AIR60U-A2)
Electrical Spec	Input Voltage	DC 5V (USB Power / External DC Adapter)
	Max Power Consumption	900mA in USB-powered mode
	Power Port	Circular DC port, supporting 5V DC input
Environmental Spec	Operating Temperature	-10℃ ~ 50℃
	Storage Temperature	-20℃ ~ 50℃
	Operating Humidity	20% ~ 95% (Non-condensing)
Communication Port	Main Port	1× USB-C (USB2.0 Full Speed 12Mbps)
	Aux Power Port	DC barrel port for supplementary power via spare PC USB or 5V DC adapter
	Expansion Port	1× USB-A
	Standard Cable Length	1m
Power Adapter	AC Input	100-240V AC ±10%, 50/60Hz
	DC Output	5V, 1A

10. Troubleshooting

Fault Phenomenon	Possible Cause	Solution
All LEDs off after power-on	1. No power supply 2. Hardware damage	1. Check firm connection of the USB cable and power adapter 2. Send back to factory for repair if the fault cannot be resolved
Software prompts "Reader Not Found"	Damaged USB cable / charge-only cable without data transmission function	1. Replace the cable with the original USB cable supplied with the reader 2. Try a different USB port on the PC

Reader fails to communicate with PC software	1. Loose USB cable 2. Incomplete driver installation 3. Multiple reader programs running simultaneously	1. Re-plug the USB cable 2. Completely uninstall and reinstall the official drivers 3. Keep only one reader program active
Data LED blinks continuously during document scanning	1. No MRZ detected / document without MRZ 2. Blurry printing, non-compliant with ICAO standard 3. Document placed upside down	1. Confirm the document has a standard MRZ 2. Adjust the device to avoid strong reflective light 3. Place the document strictly following scanning instructions
Recognition software cannot launch	1. Conflicts from multiple running programs 2. Corrupted installation package 3. Other programs occupying the device port	1. Close all recognition tools and run only the test utility 2. Completely uninstall the software and drivers, then reinstall them 3. Close apps occupying the device and retest with ACS tool utility
No LED change during chip reading	Document without NFC chip / physically damaged chip	Replace with a compliant electronic document and retry
Reader is completely unresponsive	Software freeze / communication loss	1. Restart the recognition software 2. Unplug and reattach USB & DC cables 3. Power off and restart the reader and PC, then reconnect 4. Contact technical support if unresolved
Peripheral on USB-A expansion port has no power / does not work	No external 5V DC adapter connected / adapter output current below 1A	1. Connect a 5V/1A DC adapter 2. Make sure the mains outlet is powered 3. Check that the DC connector is fully inserted into the rear-panel DC port 4. Verify the adapter's output current rating

11. Customer Support

If the problem persists after completing the troubleshooting steps, contact ACS for technical support.

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