

User Manual

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Important Notice: This product is CE and FCC certified. Before use, please read this manual carefully and strictly follow all safety warnings and operating instructions. This is essential for safe operation, extended product lifespan, and maintaining certification compliance.

1、Product Overview

1.1 Product Introduction

Dongguan Yuefeng Optoelectronics Co., Ltd. Industrial Tablet is a high-stability intelligent interactive terminal developed for Industry 4.0 scenarios. Featuring industrial-grade core hardware architecture and fully sealed protective design, it is specifically optimized for harsh industrial environments including temperature cycling, high humidity condensation, dust exposure, mechanical vibrations, and electromagnetic interference. The device operates stably across a wide temperature range of -30°C to 70°C (model-specific). It is widely applicable in core scenarios such as: MES system interaction in smart manufacturing production lines, WMS system scanning and traceability in warehousing logistics, heavy equipment control in ports and docks, real-time data upload for power inspection, parameter settings for medical devices (non-life support), retail chain POS cash register operations, and industrial IoT data collection. Equipped with high-definition bright display modules, precision touch systems, multi-protocol communication modules, and comprehensive industrial interfaces, the device enables core functions including industrial automation control command issuance, real-time field data collection and analysis, remote equipment monitoring, and human-machine collaborative interaction, providing hardware support for digital transformation in industrial scenarios.

II. Safety Warnings and Certification Requirements

2.1 General Safety Warnings

- This device is exclusively intended for industrial applications specified in the manual. It is strictly prohibited for use in high-risk environments such as medical life support systems, aerospace control systems, and nuclear industry control systems unless certified by our company.
- The equipment must be powered by the original manufacturer's compatible power adapter. Using non-designated power sources or modifying the power supply is strictly prohibited to prevent short circuits, fires, or permanent equipment damage.
- Do not open the device or remove any components while powered on. All repairs or upgrades must be performed by our authorized technicians. Unauthorized disassembly may void the warranty and pose electrocution risks.
- Do not place the device directly under water, in rain, or in prolonged damp conditions (unless marked IP67 or higher waterproof rating). If liquid enters the device, immediately disconnect the power and contact customer service. Do not power on the device.
- The device generates normal heat during operation. Ensure it is placed in a well-ventilated area. Do not block the cooling vents or cover the device with debris, as overheating may cause performance degradation or hardware damage.
- Do not impact or squeeze the device's screen or body. While industrial-grade touchscreens are shock-resistant, severe external forces may still cause screen cracks or internal component displacement.
- This equipment is strictly prohibited for children and non-professional operators. It contains small interface components that may pose ingestion risks if damaged, and improper operation of its industrial control functions could lead to production accidents.
- When disposing of equipment, please follow the 'Regulations on the Management of Electronic Waste Recycling and Disposal' and local industrial e-waste recycling policies. It is strictly prohibited to discard it as regular household waste. For assistance with recycling, please contact our company.

2.2 CE certification compliance requirements

This product complies with the relevant EU CE certification directives, including the Electromagnetic Compatibility Directive (2014/30/EU), the Low Voltage Directive (2014/35/EU), and the Radio Equipment Directive (RED 2014/53/EU, if wireless modules are included). To ensure ongoing compliance with CE certification requirements, the following regulations must be strictly followed during use:

- Only the original manufacturer-provided or our company's officially designated accessories (e.g., power adapters, antennas, expansion modules, etc.) may be used. Using non-designated accessories may cause electromagnetic compatibility (EMC) performance to exceed standards or pose safety risks, which violates CE certification requirements.
- When using the equipment within the EU, ensure the working environment complies with the EN 61010-1 safety standard for industrial electronic equipment. Any modifications (including hardware upgrades or software tampering) require prior certification from our company and the EU's official certification body.

- If the device is equipped with a wireless module, its operating frequency must comply with the radio management regulations of EU member states. Unauthorized adjustment of the wireless module's transmission power or operating frequency is prohibited.

2.3 FCC Warning Statements and Certification Requirements

FCC WARNING

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.

Any changes or modifications not expressly approved by the party responsible for compliance 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 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.

To maintain compliance with FCC's RF Exposure guidelines, This equipment should be installed and operated with minimum 20cm distance between the radiator and your body: Use only the supplied antenna.

FCC certification (Part 15 Class A) compliance requirements:

- This product is an FCC Part 15 Class A digital device, designed for commercial, industrial, and office environments. It is not recommended for use in sensitive areas such as residential neighborhoods, hospitals, or schools. If used in these areas and causes interference to radio communications (e.g., TV, radio, or mobile phone signals), users must bear all costs associated with troubleshooting and resolving the interference.

- To prevent electromagnetic interference, maintain a minimum 1-meter safety distance from the following devices during installation: televisions, radios, wireless routers, mobile base stations, medical electronics, and aviation communication equipment. If proximity to these devices is necessary, conduct interference tests beforehand to ensure no adverse effects.
- Any unauthorized modification, disassembly, or parameter adjustment of the device's wireless modules (including Wi-Fi, Bluetooth, 4G/5G) is strictly prohibited. This includes altering transmission power or frequency ranges using unofficial software. Such unauthorized modifications will invalidate FCC certification compliance, violate U.S. Federal Communications Commission regulations, and may result in penalties.
- If the device is equipped with a replaceable antenna, only the FCC-certified dedicated antenna (model: [specific model]) provided by our company is permitted. Using uncertified antennas may cause radio frequency radiation to exceed safety limits, posing risks to both safety and regulatory compliance.
- If your device experiences wireless communication issues, do not attempt to repair the wireless module yourself. Instead, contact our authorized service personnel and use original manufacturer parts to ensure compliance with FCC certification requirements after repair.

3. Equipment Installation and Initialization

3.1 Installation Environment Requirements

To ensure stable operation and maintain certification performance, the following environmental conditions must be met during installation. Failure to meet these conditions may cause equipment failure or reduced certification compliance.

- **Temperature control:** The operating environment temperature must be strictly maintained between -20°C and 70°C . Avoid prolonged exposure to extreme temperatures of $\geq 65^{\circ}\text{C}$ or $\leq -25^{\circ}\text{C}$, as high temperatures may degrade wireless module performance, while low temperatures may reduce battery endurance.
- **Humidity requirements:** Maintain relative humidity between 10% and 95% without condensation. In high-humidity environments (e.g., food processing workshops or aquatic product warehouses), additional dehumidification equipment must be installed, as condensation may cause interface short circuits or degrade electromagnetic shielding performance.
- **Dust Protection:** Select areas with dust concentration $\leq 10\text{mg}/\text{m}^3$. For high-dust environments like mining or cement production, our dedicated dust cover (Model: [Dust Cover Model]) must be installed to ensure it neither blocks ventilation ports nor interferes with wireless signal transmission.
- **Vibration and Shock:** The installation location must meet the following requirements: vibration frequency $\leq 500\text{Hz}$, acceleration $\leq 1\text{g}$, and impact acceleration $\leq 10\text{g}$ (within 11ms). For areas exceeding these limits (e.g., near heavy machinery or logistics conveyor belts),

industrial-grade vibration dampers (model: [damping bracket model]) must be installed.

- **Power stability:** The supply voltage must remain within $\pm 10\%$ of 12V DC at 50/60Hz. In environments with voltage fluctuations (e.g., during startup/shutdown of large workshop equipment), an industrial-grade voltage stabilizer (minimum 12V/5A output) must be installed.
- **Electromagnetic Environment:** The electromagnetic radiation intensity in the installation area must be $\leq 3\text{V/m}$ (30MHz-1GHz frequency band). Keep away from high-power motors, transformers, welding machines, and other strong electromagnetic interference sources to prevent interference with communication modules and ensure FCC certification compliance.
- **Ventilation and Heat Dissipation:** Maintain a minimum 15cm clearance around the equipment to ensure full exposure of heat dissipation vents. For embedded installations, the ventilation area of the mounting panel must be at least 1.5 times the size of the equipment's heat dissipation vents.

3.2 Installation Method

This device supports three standard installation methods: wall-mounted, embedded, and bracket-mounted. Each method requires the corresponding original factory installation kit. Non-original kits may result in unstable installation or compromised electromagnetic shielding performance. Below are detailed installation steps and precautions:

3.2.1 Wall-mounted installation (Suitable for: workshop walls, control room cabinets)

Required kit: 1 wall-mounted bracket, 4 M4 expansion screws, 1 crosshead screwdriver, 1 level

1. **Installation mark:** Mark four mounting holes on the wall with a pencil, using the device's back wall mounting holes (75mm×75mm or 100mm×100mm) as reference points. Level the mark points with a level to ensure the bracket is installed horizontally, with an error of $\leq 1^\circ$.
2. **Wall load-bearing inspection:** For concrete walls, drill holes directly. For hollow brick or gypsum board walls, install load-bearing embedded parts (with a load capacity of $\geq 5\text{kg}$) first to prevent support detachment.
3. **Mounting bracket:** Drill a 6mm hole (30mm deep) at the marked point with a hammer drill. Insert and tighten the expansion screw, then align the wall-mounted bracket with the screw and secure it. Apply a torque of 2.5N·m to ensure the bracket remains stable.
4. **Device installation:** Align the hook on the device's back with the bracket's slot, gently push it in until a 'click' sound is heard, then secure it with two M3 screws on the bracket's side. After installation, shake the device by hand to confirm it is in place. The load test should allow hanging a 1kg weight for 5 minutes without issues.

3.2.2 Embedded Installation (Applicable to: Control cabinets, control panel surfaces)

Required kit: 8 fixed pressing plates, 8 M3 screws, 1 hole-opening template, 1 wrench

1. Panel hole specifications: Apply the hole template to the mounting panel and mark the contour with a marker. The hole dimensions should be [length×width]mm (2mm larger than the equipment body, with an allowable error of $\leq \pm 0.5\text{mm}$). All edges must be polished smooth without burrs.
2. Reserve space confirmation: The back of the panel must have at least 50mm of space for installation and maintenance, ensuring device interfaces can be easily plugged and unplugged without blocking the ventilation holes. If other devices are installed inside the panel, maintain at least 10cm spacing to avoid electromagnetic interference.
3. Device embedding: Insert the device into the panel's front opening with the front surface flush (tolerance $\leq 1\text{mm}$). On the back panel, secure eight fixing clamps into the device's four-side slots, tightening them with screws at 1.5N·m torque.
4. Sealing procedure: In environments with high dust or humidity, apply the manufacturer's waterproof sealing strip (5mm wide, 2mm thick) along the gaps between the equipment and panel to ensure a protection rating of at least IP65.

3.2.3 Bracket-mounted installation (Ideal for: mobile workstations, temporary operation points)

Required kit: adjustable bracket ×1, clamp ×2, M5 screw ×4, hex wrench ×1

1. Stent fixation: Position the stent base on the edge of the workbench and secure it with clamps, ensuring a minimum spacing of 10cm between clamps. Tighten the clamps to a torque of 3N·m to prevent any wobbling of the stent.
2. Angle adjustment: Secure the device on the bracket's tray with M5 screws, then adjust the tilt angle (-15° to 90°) and rotation angle (360°). Once you find the optimal viewing angle, lock the bracket's adjustment knob.
3. Cable management: Route power cables, Ethernet cables, and other cables through the bracket's cable holes, then secure them with ties to prevent tangling or pulling that could loosen the connectors.

3.3 Initial Settings

Before first use, complete initialization settings to ensure device parameters meet your requirements. Keep the power stable during setup to prevent configuration failures due to power loss. Here are the initialization steps for Windows 10 IoT Enterprise (refer to the official SDK documentation for other systems):

1. Power on procedure: Connect the device to the DC port using the original power adapter. Once the power indicator (red) lights up, press and hold the Power button on the side of the device for 2 seconds to initiate startup. The screen will display the brand logo and a boot progress bar for approximately 30 seconds.
2. System Wizard Configuration: On first boot, you will enter the OOB (Out-of-Box) interface. Follow the prompts to complete the following configurations:
3. -Language and region: Select "Chinese (Simplified)", "China", "Chinese (American keyboard)";
4. -Network connection: Select 'Do not connect to network temporarily' (to be configured manually later, to prevent automatic updates from affecting industrial software compatibility).
5. -Account setup: Create an admin account (username: admin; password should include uppercase letters, lowercase letters, numbers, and special characters).
6. -Privacy Settings: Turn off non-essential services like Location and Diagnostic Data, and enable Device Encryption.
3. Network configuration (critical, affects communication stability):
4. -Wired Network Setup: Insert the network cable into the Gigabit Ethernet port (green indicator light stays on for stable connection, yellow flashing for data transmission). Navigate to Control Panel> Network & Sharing Center> Ethernet> Properties to configure the IP address (e.g., 192.168.1.100), subnet mask (255.255.255.0), gateway (192.168.1.1), and DNS (223.5.5.5). After clicking OK, test the gateway's ping by opening Start> Run> cmd and typing ping 192.168.1.1-t. A packet loss rate $\leq 1\%$ indicates a working connection.
5. -Wi-Fi: Tap the Wi-Fi icon in the bottom-right corner of your desktop, turn on Wi-Fi, search for the target network (e.g., "Industrial_WiFi"), enter the password (WPA2-PSK encryption recommended). Once connected, the Wi-Fi icon will turn green. Test the industrial server by running a ping command (e.g., ping 192.168.1.200) with a latency $\leq 50\text{ms}$.
4. Touch calibration (ensures operational accuracy):
5. -Capacitive Screen: Go to Control Panel> Tablet Settings> Calibration, then follow the on-screen prompts to tap the five calibration points in sequence. After completing the calibration, click Save. Test by tapping the desktop icon to verify an accuracy rate of at least 99%.
6. -Resistance Screen: Install the original factory touch driver (downloadable from the official website, model: [driver model]). After installation, restart the device and enter the driver calibration interface. Use the stylus to tap 9 calibration points, ensuring the error is $\leq \pm 1\text{mm}$.
5. Install industrial software:
6. -Copy the required software (e.g., MES client or PLC configuration software) from a USB drive or industrial server, right-click the installer, and select "Run as administrator".
7. -During installation, select the default path (C:\\Program Files\\Industrial Software) to prevent startup failure caused by installation on non-system drives.

8. After installation, create a desktop shortcut and set it to 'Start Up Automatically' by dragging the shortcut to the 'Start-All Programs-Start' folder.
6. Certification parameter check: Open 'Device Manager-Network Adapter' to verify the Wi-Fi/Bluetooth module model (e.g., Intel Wi-Fi 6 AX200) matches the FCC-certified model. Then, go to 'Control Panel-System' to check the device serial number (which should match the device label for certification traceability).

4. Basic Operation Guide

4.1 Detailed Description of Body Buttons and Interfaces

4.1.1 Body buttons (right side panel, top to bottom)

Button name	external characteristics	function declaration	Operational Notes
Power key	Circle, 8mm diameter, with a red indicator light	Shut down: Long press 2 seconds to power on. Power on: Short press 1 second to lock the screen, long press 3 seconds to open the shutdown menu, long press 10 seconds to force shutdown.	Force shutdown is only used when the device crashes. Use it no more than once a month to avoid data loss.

4.1.2 Body Interface

Interface name	interface type	function declaration	Plug-in operation specifications
DC power interface	5.5mm×2.1mm Circular hole, positive inside and negative outside	Connect the original power adapter to power the device or charge the battery	When plugging or unplugging, apply vertical force and avoid side-to-side movement to prevent needle bending. The indicator light turns orange during

			charging and green when fully charged.
USB 3.0 port	Blue Type A interface	Connect high-speed peripherals such as barcode scanners, USB drives, and external hard drives, with a transfer rate of $\leq 5\text{Gbps}$	Hot-swapping is supported. Do not pull cables forcefully during insertion or removal. Ensure the external hard drive has sufficient power supply ($\leq 500\text{mA}$) when connecting.
USB 2.0 port	Black Type A interface	Connect low-speed peripherals such as mice, keyboards, and printers with a transfer rate of $\leq 480\text{Mbps}$	Supports connection of 2 peripherals simultaneously with a total current $\leq 1\text{A}$ to prevent interface damage from overload.
RS232/RS485 interface ($\times 2$)	DB9 male connector, labeled "COM1" and "COM2"	COM1: Fixed RS232 port; COM2: Switches between RS232 and RS485 via jumper, used for connecting PLC and sensors	Disconnect the peripheral device's power supply before plugging and unplugging. Connect the pins according to the specified configuration (Pin 1 GND, Pin 2 RX, Pin 3 TX) to prevent board damage from incorrect connections.
gigabit Ethernet interface	RJ45 port with green/yellow	Connect a network cable to establish wired network	The Ethernet RJ45 connector must be securely crimped to

	indicator lights	communication with a transmission rate of $\leq 1000\text{Mbps}$	prevent poor contact. A green indicator light indicates a connected device, while a yellow flashing light signals data transmission.
HDMI joggle	HDMI 1.4A port	Connect an external monitor or projector. Supports 4K (3840×2160) @30Hz video output	When plugging or unplugging, turn off the device and any external power sources to prevent static electricity from damaging the ports. The maximum transmission distance is ≤ 5 meters. For longer distances, use an HDMI amplifier.
GPIO joggle	16-pin terminal block labeled "GPIO IN/OUT"	8 input channels (0-5V signal support), 8 output channels (maximum current 100mA), for connecting sensors and indicator lights	Before wiring, power must be disconnected. Connect wires strictly according to the pin definitions. The output terminal must not be directly connected to 220V AC power; instead, use a relay for conversion.
Headphone jack (optional)	3.5mm round hole	Connect the industrial headset for voice prompts or calls (requires a	Only supports 32Ω impedance headphones. Do not connect high-

		voice module)	power speakers to avoid damaging the audio chip.
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4.2 Core Operational Methods

4.2.1 Power On/Off and Standby Operations

- Standard startup sequence: 1) Verify power adapter connection → 2) Power indicator (red) activates → 3) Press Power button for 2 seconds → 4) Brand logo appears → 5) System desktop loads (approx. 30 seconds) → 6) Check network and peripheral status → 7) Ready to use.
- Error Handling: If the screen does not display after startup, check the power adapter output voltage. If the voltage is normal, press and hold the Power button for 10 seconds to force a shutdown, then restart the device.
- Standard shutdown procedure: 1) Close all industrial software applications. 2) Click the Start button in the lower-left corner of the desktop. 3) Select Power. 4) Click Shut Down. 5) Wait for the screen to turn off (approximately 10 seconds). 6) Wait for the power indicator to turn off. 7) Unplug the power adapter (if not in use for an extended period).
- Prohibited operation: Do not power off the industrial software directly during operation, as it may cause data corruption or system crash.
- Standby and Wake: Press and hold the Power button for 1 second while powered on to enter standby mode (screen off, data retained), reducing power consumption to $\leq 5W$. To wake up, press and hold the Power button for 1 second, and the system will return to desktop mode in about 5 seconds. For automatic standby, set it to 15 minutes (Control Panel> Power Options> Change Computer Sleep Time).

4.2.2 Touch Precision Techniques (Type-specific Guide)

4.2.2.1 Capacitive Touchscreen Operation (Mainstream Configuration)

Action	method of operation	application scenarios	Precision Operation Techniques
click	Tap the screen once with your fingertip on the target area and hold for ≤ 1 second	Open the software, click the button, and select the text	Avoid tapping with your nails or sharp objects. Use the center of your fingertip for higher accuracy.

double click	Tap the same spot twice with the same finger, with a gap of ≤ 0.5 seconds	Open files, zoom in on images, and select words	The deviation between two click positions is $\leq 2\text{mm}$, and the speed is uniform to avoid being too fast or too slow.
Long press	Press the target area with your fingertip for at least 2 seconds until the menu appears	Copy files, delete icons, and show the right-click menu	Do not move your finger while long-pressing to avoid accidentally triggering a swipe.
slither	Press the screen with your fingertips and move it smoothly in the target direction	Scroll pages, switch menus, and drag files	The contact area between your finger and the screen must be $\geq 1\text{cm}^2$ when sliding, and the movement speed should be 1-3 cm/s. Avoid moving too fast to prevent misalignment.
zoom	Press both finger pads on the screen to pinch in or out	Zoom in/out on images, reports, and maps	The initial distance between two fingers is $\geq 3\text{ cm}$. Keep symmetrical movement during zooming to avoid single finger offset.
Wear gloves when handling	Use thin cotton or conductive fiber gloves, as with bare hands	Operating in a workshop with oily and low-temperature environments	Glove thickness $\leq 2\text{mm}$. Avoid moisture. Replace gloves when damp to prevent touch failure.

4.2.2.2 Resistance Touchscreen Operation (Special Scenario Configuration)

The resistive panel requires stylus or fingernail operation, offering high precision but low sensitivity. Note the following during operation:

- Apply a light pressure (about 50g) when tapping to ensure full screen contact and prevent

unresponsive taps.

- Keep the stylus in contact with the screen while swiping to prevent track interruption.
- Clean the stylus tip regularly to prevent oil or dust from affecting its performance.

Replace the worn tip promptly (original tip model: [tip model]).

4.2.3 Industrial Peripheral Connection and Debugging (High-Frequency Use Cases)

4.2.3.1 PLC Connection (RS485 Interface, with Siemens S7-200 as an example)

1. Hardware wiring: Disconnect the device and PLC power supply → Connect the device's COM2 interface to the PLC's RS485 interface via an RS485 bus cable → Wiring connections: COM2's A pin → PLC's A pin, COM2's B pin → PLC's B pin, GND → PLC GND → Tighten terminal screws to ensure secure contact.
2. Interface configuration: Open the device's Control Panel> Device Manager> Ports (COM and LPT)> COM2> Properties> Port Settings. Set the baud rate to 9600bps, data bits to 8, stop bits to 1, and no parity bit. Click OK.
3. Software debugging: Launch the PLC configuration software (e.g., STEP 7-Micro/WIN) → select 'Communication-Configure PG/PC Interface' → choose 'COM2' with baud rate 9600bps → click 'Find CPU'. If the PLC model (e.g., S7-200 SMART) is detected, the connection is successful → test data read/write to ensure no packet loss or errors.

4.2.3.2 Barcode Scanner Connection (USB Interface, Wired)

1. Hardware connection: Plug the scanner's USB cable into the device's front USB 3.0 port. The device will automatically detect and install the driver (about 10 seconds, no manual installation required). The scanner will emit a 'beep' sound, confirming a successful connection.
2. Parameter configuration: Scan the 'Restore factory settings' barcode in the scanner manual → scan the 'USB keyboard mode' barcode → scan the 'Baud rate 9600' barcode (to match the system).
3. Function test: Open Notepad → Scan product barcode or industrial QR code → Barcode data is automatically entered into Notepad without garbled characters and is complete, indicating successful debugging → If garbled characters appear, check the barcode scanner's encoding format (set to UTF-8).

4.2.3.3 External Display Connection (HDMI Interface)

1. **Hardware connection:** First, disconnect the device and monitor from power. Then, connect the device's HDMI port to the monitor's HDMI port using an HDMI cable. Next, tighten the cable's fixing screws (if applicable). Finally, plug the monitor into the power outlet.
2. **Display settings:** After booting, right-click the desktop, select Display Settings, then Multi-monitor Settings. Choose Extended displays, set the external monitor resolution (preferably matching the device, e.g., 1920×1080), and adjust the screen position by dragging the monitor icon.
3. **Test Verification:** Drag the industrial software window to an external monitor → Play 4K video to test display quality → Ensure no lag, screen flickering, or color distortion indicates a successful connection.

4.2.4 Data Transmission and Backup (Core Industrial Requirements)

4.2.4.1 USB Peripheral Data Transfer (Local Transfer)

1. **Data Export:** Insert a blank USB drive into the USB 3.0 port → Wait for device recognition (about 5 seconds, desktop shows USB icon) → Open File Explorer → Locate the industrial software data storage directory (e.g., C:\\Industrial Data\\202511) → Select files to export (multiple files allowed, hold Ctrl and click) → Right-click to select "Copy" → Open the USB drive directory → Right-click to select "Paste" → Wait for copying to complete (for large files, check the progress bar to avoid unplugging the drive mid-process).
2. **Data Import:** Insert the USB drive containing data into the port → Open File Explorer → Locate the target file on the drive → Right-click and select Copy → Paste into the local device directory (e.g., D:\\Import Data) → After import completion, right-click the drive icon and select Pop-up → Wait for the 'Device can be safely removed' prompt before unplugging the drive.
3. **Error handling:** If the USB drive is not recognized, replace the USB port or unplug and replug it. If the system prompts 'Insufficient disk space' during copying, delete unused files on the device (ensure the system drive has at least 10GB of free space).

4.2.4.2 Industrial Network Data Transmission (Remote Transmission)

For example, using an FTP server for workshop data upload:

1. **Server configuration:** Install an FTP server (e.g., FileZilla Server) on the industrial server → Create a user account (username: industrial, password: [complex password]) → Set up a shared directory (e.g., D:\\Server Data) → Grant read/write permissions.

2. Device connection: Open the device's 'This PC' → Enter 'ftp://[server IP]:21' in the address bar (e.g., ftp://192.168.1.200:21) → Enter your username and password → Connect to the FTP server → Locate the shared directory.
3. Upload data: Locate the data file on the device → Right-click "Copy" → Right-click "Paste" in the FTP server directory → After uploading, verify the file size matches the local version and confirm no transmission errors → Close the FTP window.
4. Auto-upload settings: Create a batch script (.bat file) and write FTP upload commands. Set up the script to run automatically at 2:00 AM daily via the Task Scheduler to achieve scheduled data backup.

V. Daily Maintenance and Care

5.1 Regular Cleaning Guidelines (Categorized by Period)

5.1.1 Daily cleaning (to be completed before operation)

- Screen cleaning: Use the manufacturer's dedicated cleaning cloth (ultra-fine fiber material, model: [cleaning cloth model]) to gently wipe the screen surface, removing fingerprints and dust. For oily stains, dip the cloth in a small amount of deionized water (do not use tap water), wring it out (ensure no dripping), and gently wipe. Then dry it with a dry cloth. After cleaning, ensure the screen is free of water marks and avoid direct sunlight exposure to prevent water stains.
- Interface Inspection and Cleaning: Visually inspect for dust on common interfaces (e.g., USB, Ethernet). Use a dry nylon soft-bristled brush (5mm bristles) to gently clean the interior. Never insert metal tools into the interface to avoid pin damage.

5.1.2 Clean every week (before work on weekends)

- Body cleaning: Clean the device surface with a dry microfiber cloth, covering the front frame, back ventilation holes, and side buttons. For stubborn stains on aluminum alloy bodies, use a cloth dipped in a small amount of neutral cleaner (e.g., diluted dishwashing liquid 10 times), wring it out, and wipe. Then dry it with a clean cloth. Ensure the ventilation holes are clear. Allow 30 minutes of ventilation after cleaning.
- Heat dissipation system inspection: 1) Power off the device. 2) Gently check the side ventilation holes for visible dust accumulation. 3) If present, use a hair dryer (cold setting, 30cm distance) to blow on the holes for 30 seconds to remove internal dust. 4) Avoid using the hot setting to prevent high-temperature damage to internal components.

5.1.3 Monthly cleaning (completed during end-of-month maintenance)

- Deep cleaning procedure: 1) Power off the device. 2) Disassemble wall-mounted or embedded units (using original manufacturer tools). 3) Use a compressed air tank (pressure $\leq 0.5\text{MPa}$) to blow through the chassis gaps, interfaces, and cooling vents to remove internal dust. 4) Clean the device labels with 75% medical alcohol swabs to ensure serial numbers are clearly visible. 5) Allow 10 minutes of rest after cleaning before reinstallation.
- Touchscreen calibration: After cleaning, power on the device and go to Control Panel> Tablet Settings> Calibration. Re-calibrate the touchscreen and test click accuracy to ensure no deviation. If significant deviation is detected, check for screen residue.

5.2 Key Components Maintenance (with Special Focus)

5.2.1 Battery Maintenance (for models with built-in batteries only)

- Daily usage guidelines: Prevent battery over-discharge (recharge promptly when below 20% capacity), as this reduces lifespan. Charge to 100% but unplug within 2 hours after charging to avoid prolonged storage. Maintain operating temperature between 0°C and 45°C .

In sub-zero environments ($\leq 0^{\circ}\text{C}$), use external power sources whenever possible.

- Routine maintenance: Perform a complete charge-discharge cycle monthly (deplete battery power to automatic shutdown $\rightarrow$ connect to power source and charge to 100% $\rightarrow$ continue charging for 1 hour) to activate battery activity. Check battery status quarterly (access "Power Options-Battery Report" to generate a report showing battery capacity. If the actual capacity is below 80% of the designed capacity, contact after-sales service for replacement).
- Long-term storage: When the device is not in use for over a month, charge the battery to 50%-70% $\rightarrow$ disconnect the power supply and store it in an environment with $10^{\circ}\text{C}\sim 25^{\circ}\text{C}$ temperature and 40%-60% humidity $\rightarrow$ recharge to 50%-70% every 3 months to prevent battery depletion.

5.2.2 Wireless Module Maintenance (Wi-Fi/Bluetooth/4G/5G)

- Signal check: Check the Wi-Fi/4G network icon on your device daily to ensure the signal strength is at least 3 bars (full bars are 5 bars). If the signal is weak, check if the antenna is loose (for detachable antennas) and tighten it, or move the device away from metal objects.
- Interference Mitigation: If the network frequently disconnects, check for nearby strong electromagnetic devices (e.g., welding machines or frequency converters). Move the device at least 5 meters away from the interference source, or install an electromagnetic shielding enclosure (original manufacturer model: [shielding enclosure model]). Then test network stability to ensure packet loss rate $\leq 1\%$.
- Firmware Update: Log in to the Support Center on the official website quarterly to check

for firmware updates for the wireless module. Download the latest firmware and follow the upgrade guide (requires administrator access) to optimize communication performance. Keep the power stable during the upgrade process and avoid power outages.

5.2.3 Interface Maintenance (High-Frequency Plug-and-Play Interface)

- USB port maintenance: Inspect weekly for loose or deformed connections. When plugging/unplugging, apply vertical force to prevent lateral movement. For poor contact, clean internal pins with alcohol swabs (under power-off conditions) to remove oxidation. Never connect multiple high-power peripherals simultaneously (total current $\leq 1\text{A}$) to avoid port damage.
- RS232/RS485 Interface Maintenance: 1) Monthly inspection of terminal connections for looseness, followed by screw retightening (0.5N·m torque). 2) Use shielded cables with grounded shielding (device GND) to minimize electromagnetic interference. 3) For high communication error rates, measure interface voltages with a multimeter (RS232 TX: -3V~-15V; RX: +3V~+15V). Contact customer service if abnormalities are detected.

5.3 Environmental Adaptability Maintenance (Special Scenarios)

5.3.1 High-temperature and high-humidity environments (such as food processing workshops)

- Clean the equipment surface of condensation daily, dry with dry cloth, avoid condensation into the interface;
- Install industrial dehumidifiers to maintain ambient humidity at $\leq 80\%$ RH.
- Perform monthly inspections for mold spots inside the aircraft (disassembly required by certified technicians). If detected, clean with alcohol swabs and apply the manufacturer's recommended anti-mold agent (model: [anti-mold agent model]).

1.1 Product Introduction

Industrial tablets are high-stability smart interaction terminals specifically designed for Industry 4.0 applications. Featuring industrial-grade core hardware architecture and fully sealed protective design, they are optimized for harsh industrial environments including temperature fluctuations, high humidity condensation, dust exposure, mechanical vibrations, and electromagnetic interference. These devices are widely used in critical scenarios such as: MES system interactions in smart manufacturing lines, WMS system scanning and traceability for warehousing logistics, heavy equipment operation at ports and docks, real-time data upload for power line inspections, parameter configuration for medical devices (non-life support), and industrial IoT data collection. Equipped with high-definition display

modules, precision touch systems, multi-protocol communication modules, and industrial interfaces, they enable core functions including automated control command execution, real-time field data acquisition and analysis, remote equipment monitoring, and human-machine collaborative interaction, providing hardware support for industrial digital transformation. The product has obtained CE and FCC certifications, complying with regional electromagnetic compatibility and safety standards.

1.2 Main Functional Features

- **Robust Environmental Adaptability:** Featuring IP65+ comprehensive protection (with optional IP67 front panel), the device incorporates waterproof/dustproof interfaces and a fully metal-reinforced body to effectively resist dust ingress and short-term water exposure. Certified to IEC 60068-2-6 (vibration) and IEC 60068-2-27 (impact) standards, it performs reliably in mobile environments including production lines and logistics vehicles. Operating within -30°C to 70°C with low-temperature startup capability, it meets both cold-region outdoor and high-temperature workshop requirements.
- **High-definition and bright touch experience:** Equipped with a [7/10.1/12.1] inch industrial-grade ADS-Pro hard screen (resolution [1280×800/1920×1080]), with a brightness of up to [500/1000] cd/m² (sunlight visible version available), featuring anti-glare and anti-fingerprint coatings for clear display even under outdoor strong light; supports 10-point capacitive touch (wear thin gloves) or resistive touch (operate with water, specific models vary), touch accuracy $\leq \pm 2\text{mm}$, response time $\leq 5\text{ms}$, meeting the needs of rapid operation in industrial settings.
- **Industrial-grade performance configuration:** Powered by industrial-grade processors (e.g., Intel Celeron J4125/ARM Cortex-A72 architecture) with low power consumption and high stability, it features [4/8/16]GB DDR4 industrial-grade RAM for multi-tasking. Storage options include [64GB/128GB/256GB] eMMC 5.1 or SSD, with optional 1TB SATA hard drive and Micro SD card expansion (up to 256GB), designed to meet industrial software and massive data storage requirements.
- **Full-scenario interface coverage:** The device features a front-mounted USB 3.0 port (for quick device connection/disconnection), rear-mounted USB 2.0 ports, two RS232 ports (with one switchable to RS485), a Gigabit Ethernet port, an HDMI 1.4 port (supporting 4K output), an 8-pin GPIO port, a DC power port, and a headphone jack. Optional CAN bus interface and 4G/5G module interface are available, enabling direct connection to PLCs, sensors, barcode scanners, printers, projectors, and other industrial peripherals.
- **Multimodal Stable Communication:** Built-in dual-band Wi-Fi(2.4G+5G, supporting 802.11 a/b/g/n/ac/ax), with enhanced interference resistance in 5G frequency bands and transmission speeds up to 1.2 Gbps; Bluetooth 5.2 module, supporting long-range (100m) multi-device connections; optional industrial-grade 4G Cat.12 (download speed 600 Mbps) or 5G NSA/SA modules, supporting mainstream global frequency bands; Gigabit Ethernet supports industrial network protocols such as VLAN and QoS, ensuring low latency and no packet loss in data transmission.

- Long-lasting battery life and secure power supply: Powered by an industrial-grade lithium polymer battery [10000/15000]mAh, it supports wide-voltage charging (9V-24V) and fast charging (2-hour charge), delivering 8-12 hours of continuous operation (50% backlight brightness). The device features seamless dual-power switching between battery and external power to prevent data loss during sudden power outages. With four-layer protection against overcharge, over-discharge, overheating, and short circuits, the battery boasts a service life of 2000 charge-discharge cycles.

1.3 Product Specifications and Parameters

class	Parameter details
display screen	Screen size: [7/10.1/10.412.1/13.3/15/15.6/17/18.5/19/21.5/23.8/27/32/43/55/65] inches; Panel type: Industrial-grade ADS-Pro hard screen; Resolution: [1280×800/1024*768/1920×1080/1280*1024/2K/4K]; Brightness: [500cd/m ² (Standard Edition)/1000cd/m ² -2000cd/m ² (Sun View Edition)]; Contrast ratio: 1000:1; View angle: 178° full view; Display features: Anti-glare, anti-fingerprint, wide temperature display (-30°C to 70°C)
Touch mode	Capacitive Touch: 10-point touch, accuracy ≤±2mm, response time ≤5ms, supports operation with thin gloves. Resistive Touch (optional): single-point touch, accuracy ≤±1mm, supports operation with wet surfaces and thick gloves. Touch lifespan: ≥5 million clicks.
Core Configuration	Processors: Intel I3/I5/I7 (N97/J1900 series) or ARM Cortex-A72 (4-core, 1.8GHz). RAM: 4/8/16/32/64GB DDR4. Storage: 64GB/128GB/256GB/512GB eMMC 5.1/SSD, supports Micro SD card expansion (up to 512GB) and optional 1TB SATA hard drive.
Interface configuration	2 USB 3.0 ports, 4 USB 2.0 ports, 2 RS232 ports (RS485 switchable), 1 Gigabit Ethernet port, 1 HDMI 1.4 port, 1 GPIO (8 input/8 output) port, 1 DC power port, 1 headphone jack; optional ports: 1 CAN bus port, 14G/5G module port
communicating module	Wi-Fi: Dual-band (2.4G + 5G) with 802.11 a/b/g/n/ac/ax support, maximum transmission rate ≤1.2Gbps; Bluetooth: 5.2, transmission range ≤100m; 4G (optional): Cat.12, supports TD-LTE/FDD-LTE,

	download rate ≤600Mbps; 5G (optional): NSA/SA dual-mode, supports global mainstream frequency bands, download rate ≤ 2Gbps
Power Supply and Battery Life	Power supply: DC 12V/5A (factory adapter), supports wide voltage input (9V-36V); Battery capacity: [10000/15000]mAh lithium polymer battery; Battery life: 8-12 hours (50% backlight, continuous operation); Charging method: Fast charging (2-hour full charge), supports dual power/battery switching
protection and environment	Protection rating: IP65 (frontal IP67 optional); Vibration test: IEC 60068-2-6, 10-500Hz, 1g acceleration; Impact test: IEC 60068-2-27, 10g acceleration, 11ms duration; Operating temperature: -30°C to 70°C; Operating humidity: 10% to 95% RH (no condensation); Storage temperature: -40°C to 85°C
Body specifications	[Body Material: Aluminum alloy reinforced frame with anodized surface treatment]
Systems and software	Operating system: Windows 10 IoT Enterprise/Linux Ubuntu 20.04/Android 11 industrial edition; supported software: MES, WMS, PLC configuration software, data acquisition software and other industrial software, providing SDK development kit