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Smart Panel Industrial Tablet

Installation and User Manual

Models: Smart Panel Q7 / Smart Panel Q10

Version: V1.0

August 2026

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1. Product Overview

The Smart Panel Industrial Tablet is designed for use with the Arduino UNO Q. It is an industrial control terminal that integrates display, touch, and rich industrial interfaces. The product adopts a dual-architecture design with a Qualcomm Dragonwing QRB2210 processor and an STM32U585 microcontroller, combining a complete Linux system with real-time control capabilities. It is suitable for industrial control, IoT gateways, human-machine interfaces, and many other applications.

This product is available in two models: Smart Panel Q7 (with a 7-inch display) and Smart Panel Q10 (with a 10.1-inch display). The Arduino UNO Q board is installed by the customer and is not included as standard by the manufacturer.

Figure 1-1 Smart Panel Industrial Tablet

1.1 Core Board Parameters

Item	Parameter
Microprocessor (MPU)	Qualcomm Dragonwing QRB2210, Quad-core Arm Cortex-A53 @ 2.0GHz, integrated Adreno GPU and dual ISP
Microcontroller (MCU)	STM32U585, Arm Cortex-M33, up to 160MHz, 2MB Flash, 786KB SRAM
Operating System	MPU runs Debian Linux; MCU runs Arduino Core on Zephyr RTOS
Memory (RAM)	2GB or 4GB LPDDR4X
Storage	16GB or 32GB eMMC
Wireless	Wi-Fi 5 (2.4/5GHz) and Bluetooth 5.1, onboard antenna
Power Supply	DC 12V/3A power adapter
Display Output	MIPI DSI, Q7: 7-inch 1024x600; Q10: 10.1-inch 1280x800, capacitive touch
I/O Expansion	CAN, RS485, RS232, GPIO industrial interfaces

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1.2 Peripheral Interfaces

The Smart Panel provides the following external interfaces:

- DC Power x 1
- USB Type-C x 1 (Type-C cable pre-installed on the mainboard, for connecting the Arduino UNO Q board)
- USB Host x 1
- RJ45 Ethernet port x 1 (10/100Mbps)
- CAN / RS485 / RS232 / GPIO terminal block x 1 (16-Pin)
- Push-type power switch x 1
- System status LED x 1

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2. Package Contents

After opening the package, please verify that the following items are included:

No.	Item	Qty	Remarks
1	Smart Panel Industrial Tablet	1	Includes touch display, carrier board; Type-C cable pre-installed
2	Type-C data cable	1	For connecting to a computer for configuration/ADB debugging
3	Power adapter	1	12V/3A, with interchangeable EU/US/UK plugs
4	DIN rail brackets	2	For DIN rail installation
5	16-Pin terminal block	1	For CAN/RS485/RS232/GPIO wiring
6	M3 pan-head screws	3	For securing the Arduino UNO Q board
7	M3 countersunk screws	4	For installing DIN rail brackets
8	M4 pan-head screws	4	For VESA/wall mounting
9	Jumper cap	1	For entering flash mode during firmware flashing
10	Installation and User Manual	1	This document

[NOTE] The Arduino UNO Q must be prepared by the customer and is not included as standard. Please ensure you have an Arduino UNO Q before starting installation.

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3. Hardware Installation

3.1 Pre-installation Preparation

Prepare the following items before installation:

- Smart Panel Industrial Tablet x 1
- Arduino UNO Q x 1 (customer-provided)
- Type-C data cable x 1
- Power adapter (12V/3A) x 1
- M3 pan-head screws x 3
- M3 countersunk screws x 4 (if installing DIN rail brackets)
- M4 pan-head screws x 4 (if wall/VESA mounting)
- DIN rail brackets x 2 (if DIN rail mounting)
- Jumper cap x 1 (if flashing firmware)

Figure 3-1 Arduino UNO Q Development Board (customer-provided)

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3.2 Installing the Arduino UNO Q

Step 1: Lift the rear cover latch lever upward to open the rear cover.

Figure 3-2 Rear Cover Latch Lever (lift upward to open)

Step 2: Remove the 3 M3 pan-head screws and set them aside. Check that the Type-C cable on the main PCB is properly connected.

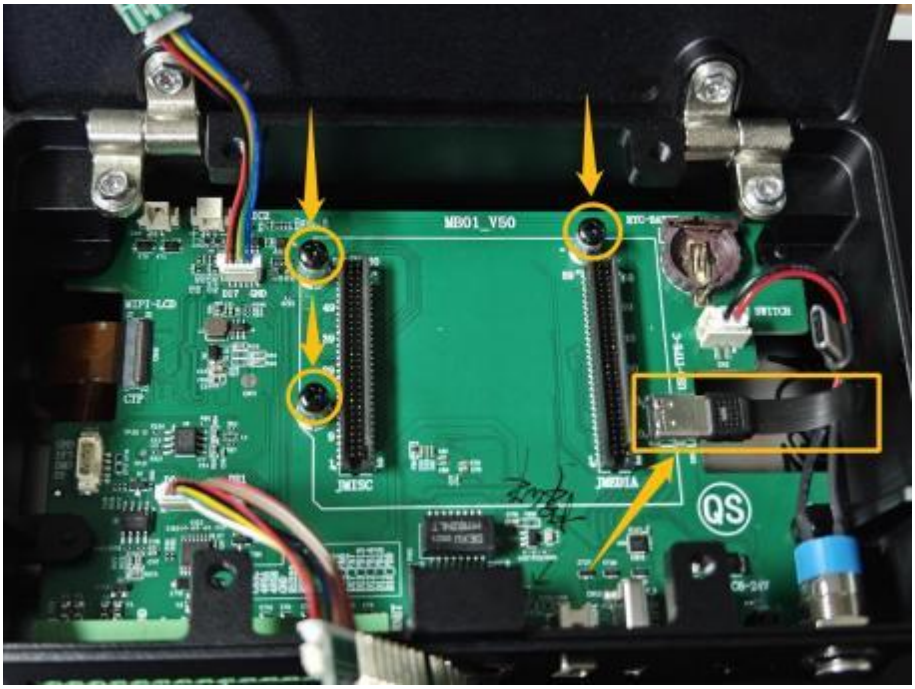

Figure 3-3 Removing Screws and Checking the Type-C Cable

[NOTE] ESD Protection: Before installing the Arduino UNO Q, please touch a grounded metal object to discharge static electricity, or wear an anti-static wrist strap. Avoid touching the chip pins and gold fingers directly with your hands to prevent electrostatic damage to the Arduino UNO Q.

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Step 3: Install the Arduino UNO Q. Ensure the Type-C connector on the UNO Q faces the same direction as the Type-C connector on the main PCB. Align the 3 mounting holes on the UNO Q with the 3 standoff holes on the main PCB, then press down gently until fully seated.

[NOTE] Make sure the pin headers are fully aligned. Avoid inserting at an angle, which could bend or damage the pins.

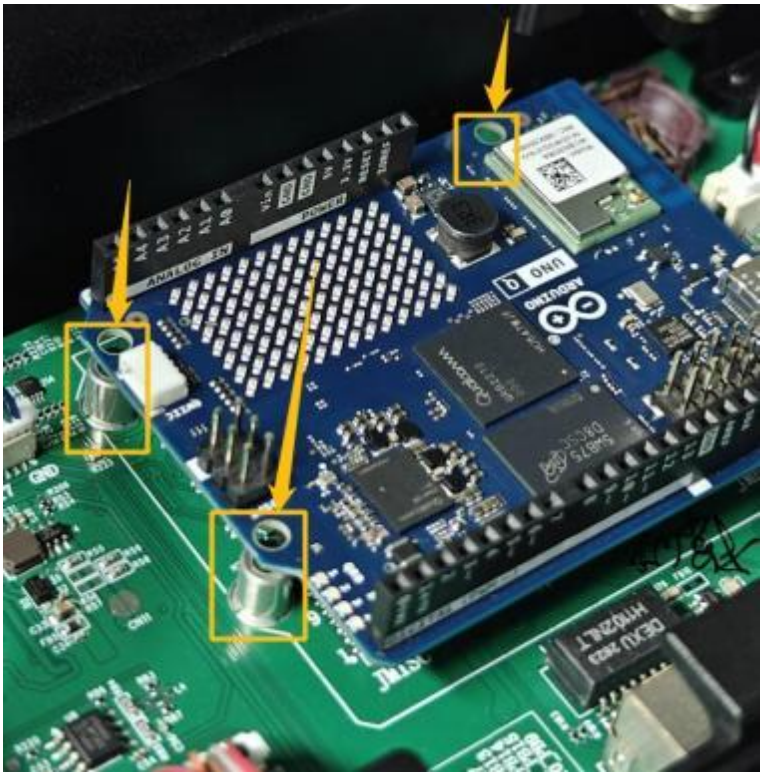

Figure 3-4 Installing the UNO Q (align mounting holes)

Step 4: Secure the UNO Q with the 3* M3 pan-head screws removed in Step 2. Connect the Type-C cable to the UNO Q's Type-C port. Insert the two small PCB adapter boards into the corresponding pin headers on the UNO Q board.

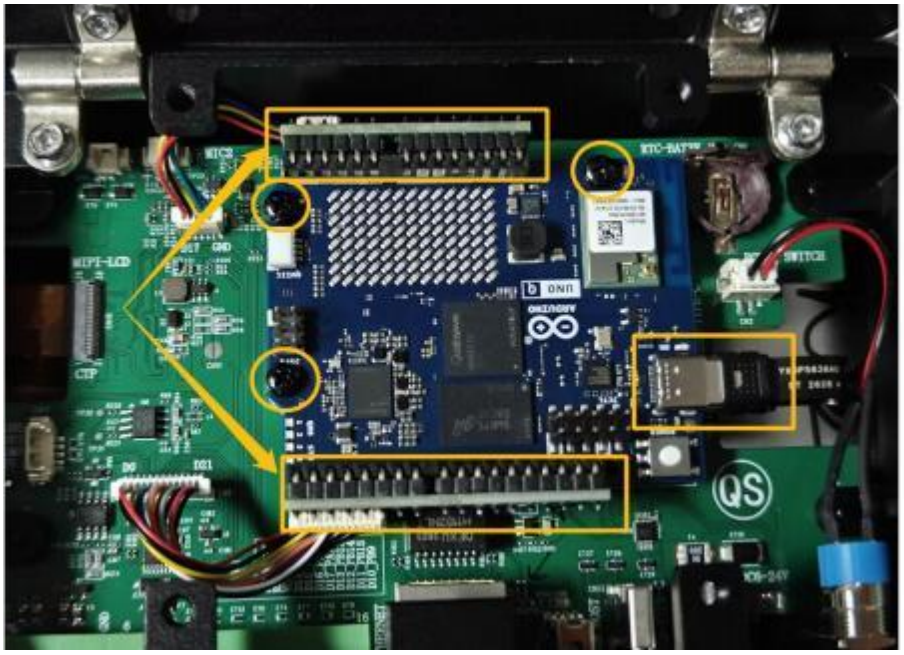

Figure 3-5 Securing the UNO Q and Connecting Cables

Step 5: Reinstall the rear cover. Press the rear cover downward until the spring latch clicks into place, indicating the cover is securely closed.

[NOTE] The rear cover uses a spring latch design and does not require screws. To open, lift the latch lever upward; to close, simply press the cover down until it clicks.

[DISCLAIMER] The Arduino UNO Q is installed by the customer. The manufacturer shall not be liable for free warranty repair of damage to the Arduino UNO Q or main unit caused by improper installation (including but not limited to reversed pin headers, electrostatic damage, excessive force, incorrect wiring, etc.). Please follow the steps in this manual strictly. Contact the manufacturer's technical support if you have any questions.

Step 6: Assemble the power adapter plug. Select the appropriate plug for your region (EU/US/UK). Align the plug with the adapter socket, push down first, then rotate clockwise to lock. To remove, press and hold the release button on the adapter, then rotate counterclockwise.

Figure 3-6 Power Adapter Plug Assembly (push down + rotate clockwise)

Figure 3-7 Power Adapter Plug Removal (press button + rotate counterclockwise)

3.3 Powering On

Step 7: First plug the DC connector of the power adapter into the Smart Panel's DC Power port, then connect to mains power.

Step 8: Press the power switch on the side. The status LED lights up and the device begins powering on.

[NOTE] This is a push-type switch. Press down to turn ON (latched), press again to release and turn OFF.

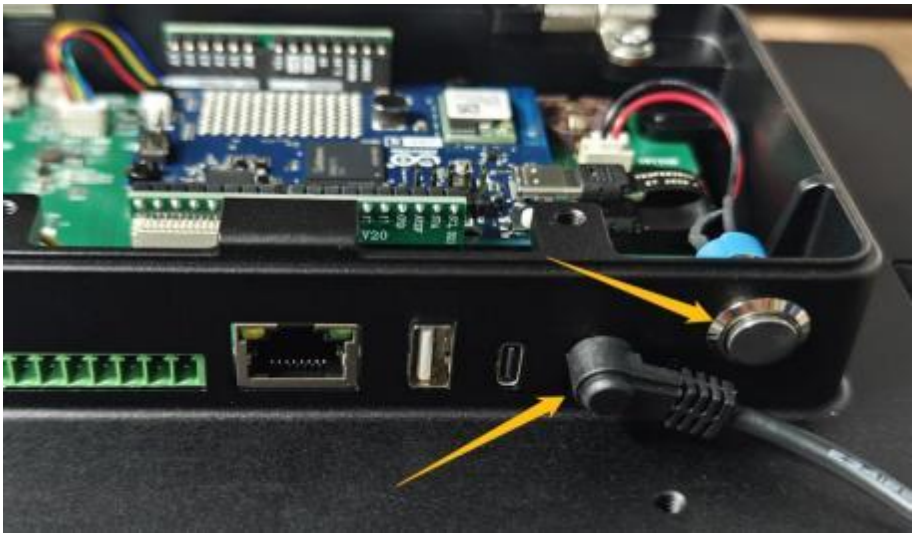

Figure 3-8 Connecting DC Power and Pressing the Power Switch

Step 9: After powering on, the LEDs on the UNO Q and mainboard light up, indicating the device is powered normally.

Figure 3-9 Internal Status After Powering On

[NOTE] Important: After hardware installation, the device only receives power. At this point, the display driver has not been configured, so the screen will not show any content. You must complete the core system firmware flashing, display driver package installation, and display configuration as described in Chapter 5 before the screen will display normally. Please complete the software configuration before using the device.

3.4 16-Pin Terminal Block Installation

The 16-Pin terminal block is used for connecting CAN, RS485, RS232, and GPIO signals. To install, align the terminal with the interface slot and push in gently until the latch locks. To remove, use a flat object to push the terminal out. See Chapter 4 for pin definitions.

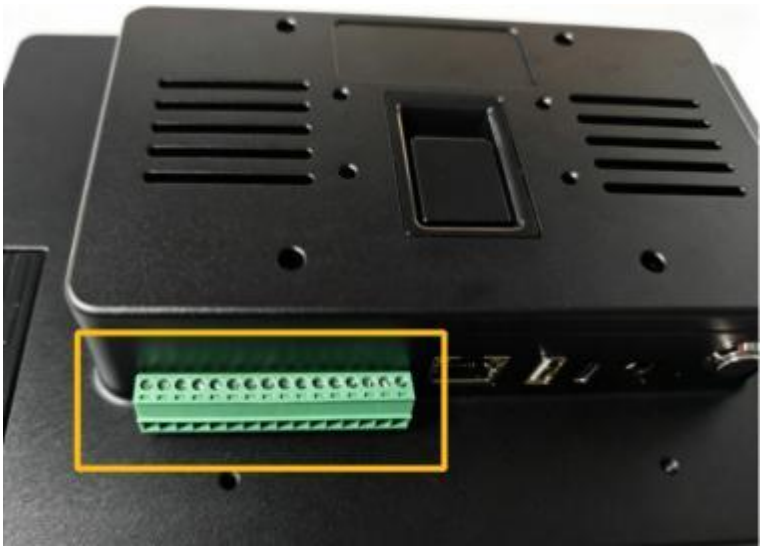

Figure 3-10 16-Pin Terminal Installation

Figure 3-11 16-Pin Terminal Removal

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3. Peripheral Interface Description

The Smart Panel's external interface layout, from left to right: 16-Pin terminal (CAN/RS485/RS232/GPIO), RJ45 Ethernet, USB Host, USB Type-C, DC Power, Status LED, Power Switch.

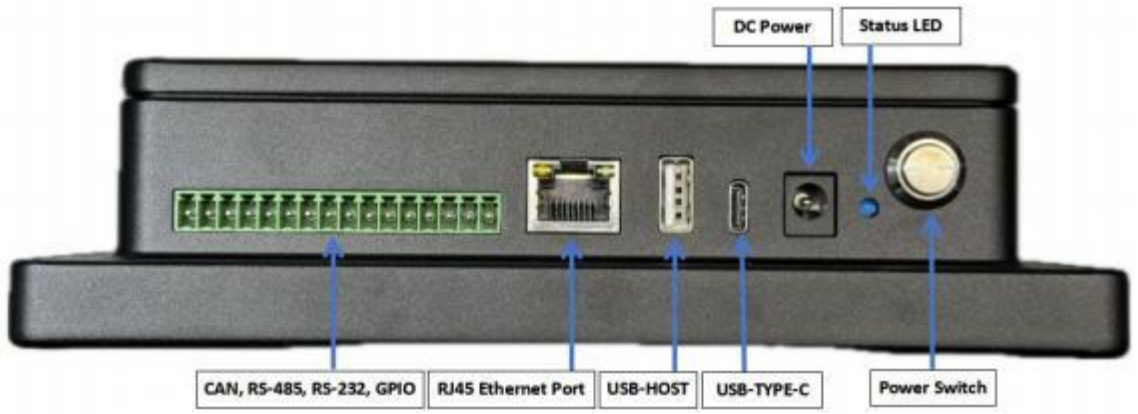

Figure 4-0 Smart Panel Peripheral Interface Layout

4.1 DC Power Interface

Item	Description
Connector Type	DC power jack
Input Voltage	DC 12V (recommended), supports DC 6~24V
Standard Adapter	12V / 3A
Polarity	Center positive, outer negative

4.2 USB Type-C Interface

Item	Description
Connector Type	USB Type-C
Function	Data transfer, ADB debugging, computer connection for configuration
Standard	USB 2.0

[NOTE] When flashing firmware or installing drivers, connect the computer through this interface. Always connect power first, then the USB cable.

4.3 USB Host Interface

Item	Description

Connector Type	USB Type-A
Function	Connect USB flash drives, mouse, keyboard, etc.
Standard	USB 2.0
Output Current	5V / max 500mA

4.4 RJ45 Ethernet Interface

Item	Description
Connector Type	RJ45
Speed	10/100Mbps auto-negotiation
Function	Wired network connection

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4.5 CAN / RS485 / RS232 / GPIO Terminal Block (16-Pin)

The 16-Pin pluggable terminal block integrates CAN, RS485, RS232, and GPIO/SPI signals. The terminal pins are numbered 1 through 16 from left to right (pin 1 on the far left, pin 16 on the far right). Pin definitions are as follows:

Pin	Signal	Description
1	CAN_H	CAN bus high
2	CAN_L	CAN bus low
3	RS485_A1	RS485 A
4	RS485_B1	RS485 B
5	GND	Ground
6	GND	Ground
7	RS232_TXD1	RS232 transmit
8	RS232_RXD1	RS232 receive
9	VDD_5V	5V power output
10	D14 / PA4 / MCU_DAC0	GPIO14 / DAC0 output
11	D15 / PA5 / MCU_DAC1	GPIO15 / DAC1 output
12	D16 / PA6 / OPAMP2_INPUT+	GPIO16 / Op-Amp 2 non-inverting input
13	D17 / PA7 / OPAMP2_INPUT-	GPIO17 / Op-Amp 2 inverting input
14	D13 / PB13 / SPI2_CLK	GPIO13 / SPI2 clock
15	D12 / PB14 / SPI2_MISO	GPIO12 / SPI2 master-in slave-out
16	D11 / PB15 / SPI2_MOSI	GPIO11 / SPI2 master-out slave-in

[NOTE] For RS485 wiring, ensure A/B are not reversed and that devices share a common ground. Physical terminal layout: pin 1 (CAN_H) on the far left, pin 16 (D11/SPI2_MOSI) on the far right.

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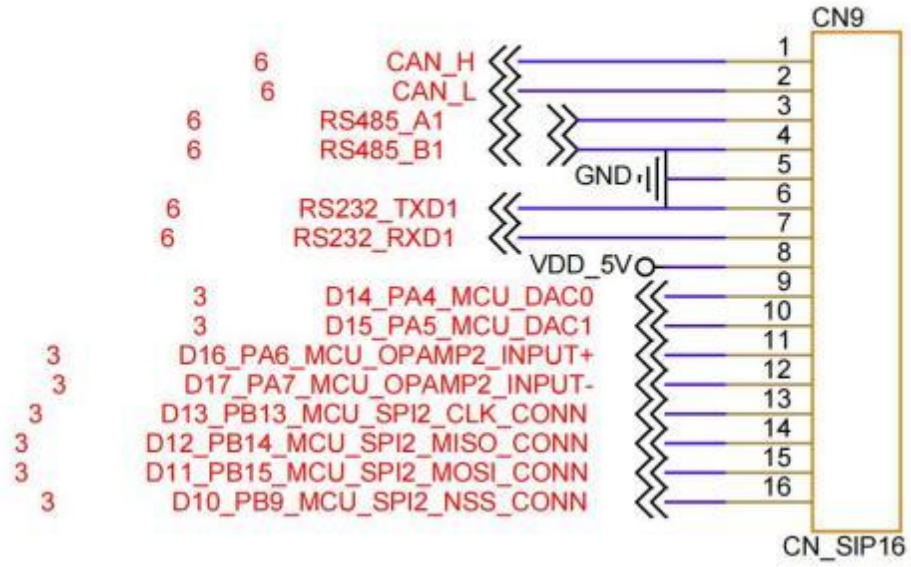

Figure 4-1 16-Pin Terminal Block Schematic

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4.6 Push-Type Power Switch

Push-type power switch. Press down to turn ON (latched), press again to release and turn OFF. After connecting power, press the switch to turn on the device; press again to release and power off.

4.7 System Status LED

The status LED is a power indicator only, showing whether the device is powered. It does not have a blinking function.

Status	Description
On (steady)	Device is powered and turned on
Off	Device is not powered or turned off

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5. Software and Firmware Configuration

5.1 Preparation

Before starting configuration, download the required firmware packages from the following Google Drive link:

https://customer:JLpjxS3W@downloads.codico.com/misc/customer/ArduinoUnoQ_Smart_Panel_OMG7XAL1W2F241KZS93I06H0TBJ4CF4S

The download link contains the following two firmware packages:

[NOTE] Software versions are updated periodically. Please check the download link for the latest firmware. The version numbers mentioned in this manual (e.g., v7.0.0, v1.0.1) are for reference only; always use the latest version available at the download link.

No.	Package Name	Purpose
1	Core system firmware (ArduinoUNO-Q_System- v7.0.0)	Upgrade Linux kernel to version 7.0.0
2	Display and peripheral driver package: ArduinoUNO-Q_Panel-DisplayConfig- v1.0.1_202606.zip	Install display driver and peripheral configuration

[NOTE] Extract both zip files into separate folders. It is recommended that the extraction paths do not contain Chinese characters or spaces.

5.2 Checking the Linux Kernel Version

Before installing drivers, verify the current kernel version on the device. Only Linux uno-q 7.0.0 can install drivers directly; other versions require flashing the core system firmware first.

Step 5.1: First connect the 12V/3A power adapter to the Smart Panel's DC Power port, then immediately connect the device to the computer using a Type-C cable.

[NOTE] Always connect power first, then the USB cable to the computer. Do not reverse this order!

Step 5.2: Open Windows Device Manager and confirm the device is connected in ADB mode.

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Figure 5-1 Device Manager - ADB Mode

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Step 5.3: Press Win + R to open the Run dialog, type cmd, and click OK to open a command prompt.

Step 5.4: In the CMD window, enter the following command and press Enter to enter the device's ADB Shell:

```
adb shell
```

The window shows the arduino@uno-q:~$ prompt, indicating a successful connection.

Figure 5-2 ADB Shell Connected Successfully

Step 5.5: Enter the following command and press Enter to check the current kernel version:

```
uname -a
```

Figure 5-3 Kernel Version Query Result (Linux uno-q 7.0.0)

Version :

- If it shows Linux uno-q 7.0.0 -> No re-flashing needed. Skip to Section 5.4 to install the display and peripheral driver package.
- If it shows Linux uno-q 6.16.7 or another version -> You must first flash the core system firmware as described in Section 5.3 to upgrade to version 7.0.0.

5.3 Flashing the Core System Firmware (if needed)

If the kernel version is not 7.0.0, follow these steps to flash the core system firmware.

Step 5.6: Power off the device, open the rear cover, and install the jumper cap on the Arduino UNO Q to enter flash mode.

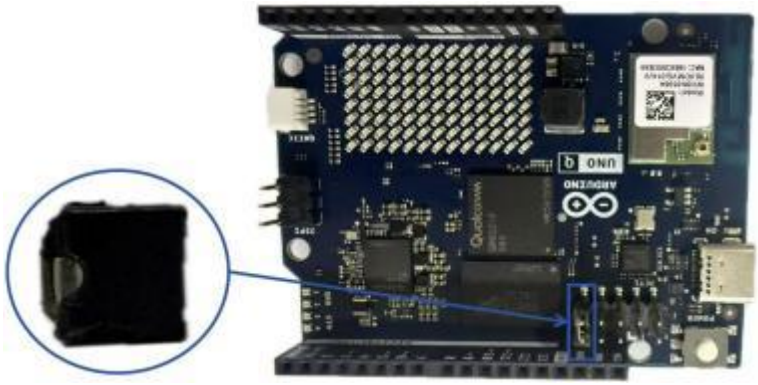

Figure 5-4 Flash Mode Jumper Cap Location

Step 5.7: First connect the 12V/3A power, then immediately connect the USB cable to the computer.

Step 5.8: Open Device Manager and confirm the device is in flash mode.

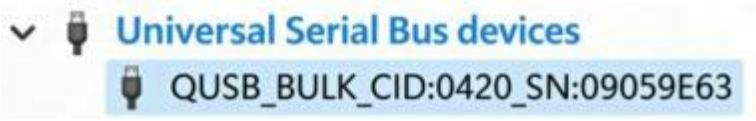

Figure 5-5 Device Manager - Flash Mode

Step 5.9: Open the core system firmware folder and double-click Click Run.bat. During flashing, type yes to confirm. Wait for flashing to complete, then disconnect power and the USB cable.

[NOTE] Do not power off or disconnect the USB cable during flashing, as this may brick the device. After flashing, remove the jumper cap and reinstall the rear cover before proceeding.

5.4 Installing the Display and Peripheral Driver Package

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After confirming the kernel version is 7.0.0, follow these steps to install the display and peripheral driver package (ArduinoUNO-Q_Panel-DisplayConfig-v1.0.1_202606.zip).

Step 5.10: First connect the 12V/3A power, then immediately connect the USB cable to the computer. Wait about 10 seconds, then open Device Manager to confirm the device is connected in ADB mode.

Step 5.11: Open the display and peripheral driver package folder and double-click Click Run.bat.

Step 5.12: A command line window appears, showing the arduino@uno-q:~$ prompt, indicating the device is connected.

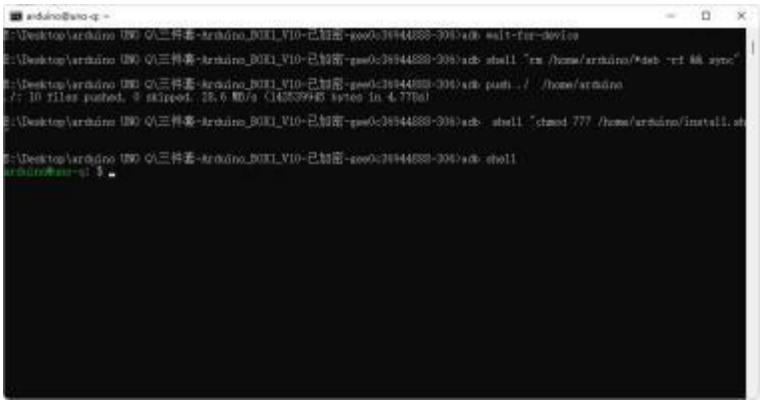

Figure 5-6 Driver Package Command Line Window

Step 5.13: In the command line window, enter the following command and press Enter to navigate to the driver directory:

```
cd
```

Step 5.14: Enter the following command and press Enter to grant execute permission and run the installer:

```
chmod 777 install.sh && ./install.sh
```

Step 5.15: During installation, you will be prompted to set a password (recommended: arduino for easy memory). Enter the password and press Enter, then enter it again to confirm.

[NOTE] No characters will appear on screen while typing the password. This is normal - simply type the password and press Enter.

Step 5.16: After the password is set, the installer will run automatically. When complete, press any key to close the window.

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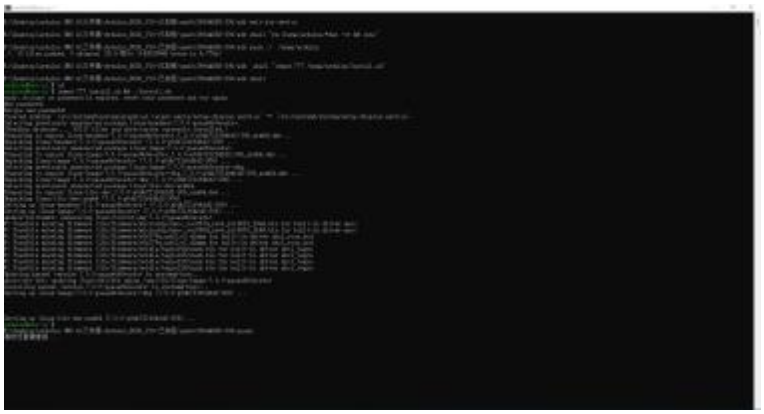

Figure 5-7 Driver Installation Complete

5.5 Configuring the Display Driver

After installing the driver package, enter the corresponding configuration command based on your device model. The display parameters for the two models are:

Model	Screen Size	Resolution	Brightness	Touch
Smart Panel Q7	7-inch	1024 x 600	300 cd/m2	Capacitive
Smart Panel Q10	10.1-inch	1280 x 800	300 cd/m2	Capacitive

Step 5.17: First connect the 12V/3A power, then immediately connect the USB cable to the computer. Wait about 10 seconds and confirm the device is in ADB mode.

Step 5.18: Repeat steps 5.3 to 5.4 from Section 5.2: Win + R -> type cmd -> enter adb shell in the CMD window, and confirm the arduino@uno-q:~$ prompt appears.

Step 5.19: Based on your device model, enter the corresponding configuration command in ADB Shell and press Enter:

(1) Smart Panel Q7 (7-inch, 1024x600):

```
sudo arduino-linux-config carrier enable media-carrier camera0=type1-2lanes
camera1=type1-2lanes display=8-dsi-touch-a

sudo reboot
```

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(2) Smart Panel Q10 (10.1-inch, 1280x800):

```
sudo arduino-linux-config carrier enable media-carrier camera0=type1-2lanes
camera1=type1-2lanes display=10-dsi-touch-a
```

Step 5.20: After entering the configuration command, press Enter. The system will prompt for a password. Enter the password set in step 5.15 (default: arduino) and press Enter.

Step 5.21: After password verification, the system will automatically complete the display configuration. When done, enter the following command to reboot the device:

```
sudo reboot
```

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6. Installation Scenarios

The Smart Panel Industrial Tablet supports the following 4 installation methods:

6.1 Scenario 1: Custom Mounting Holes

Use M4 pan-head screws to secure the Smart Panel to a customer panel based on the customer's mounting hole layout. The standard mounting hole dimensions differ between the two models:

- Smart Panel Q7: 100mm x 110mm
- Smart Panel Q10: 100mm x 135mm

Mounting hole positions can also be customized as needed.

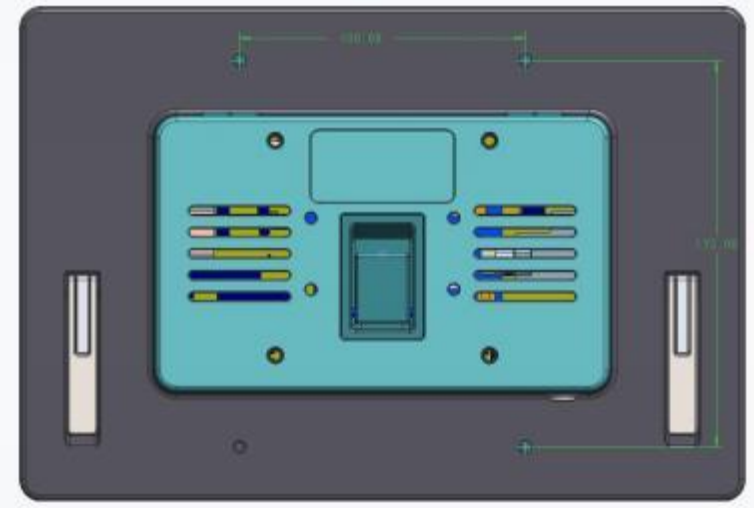

Figure 6-1 Q10 Mounting Hole Dimensions (100mm x 135mm)

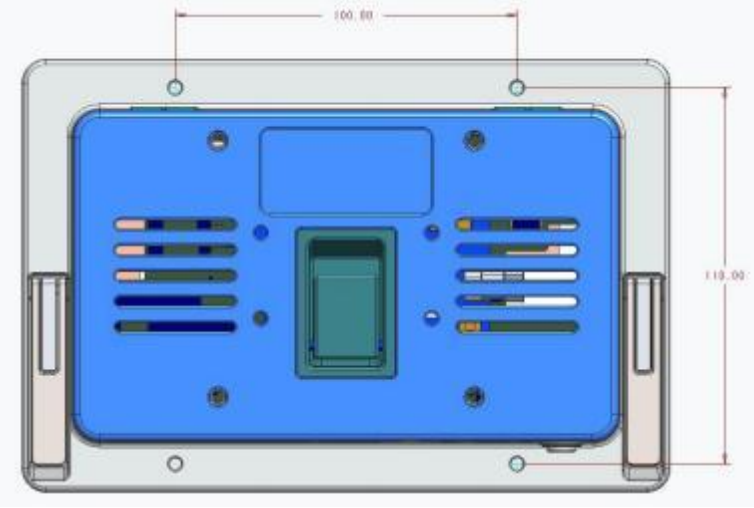

Figure 6-2 Q7 Mounting Hole Dimensions (100mm x 110mm)

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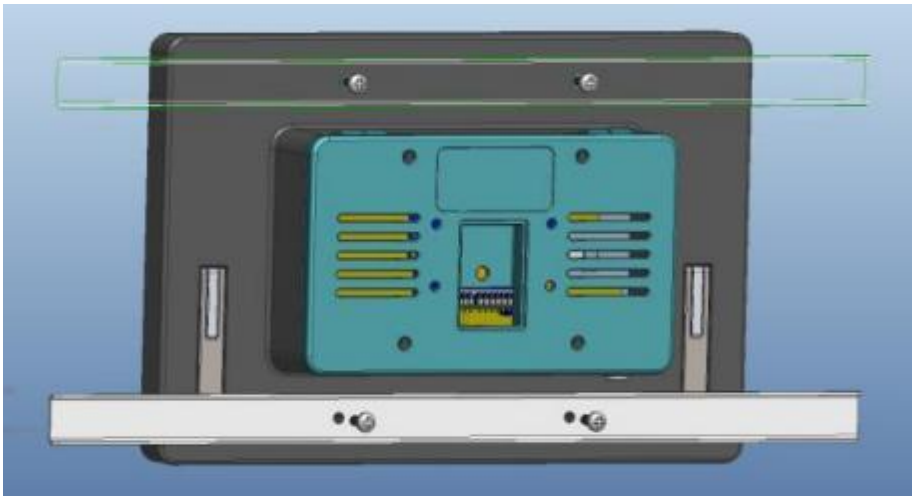

Figure 6-3 Custom Mounting 3D Illustration

6.2 Scenario 2: VESA Standard Mounting

Supports 75mm x 75mm standard VESA holes. Secure with M4 pan-head screws. Compatible with standard VESA wall mounts and monitor arms.

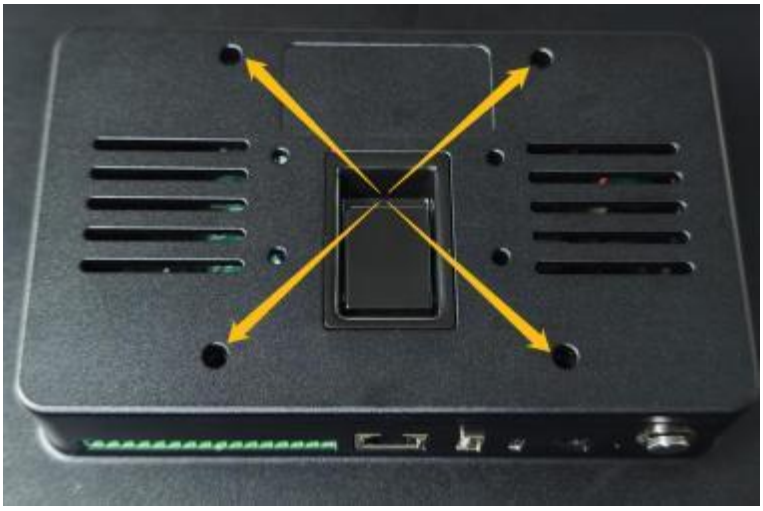

Figure 6-4 VESA 75x75 Standard Holes

6.3 Scenario 3: Stand Mounting

Use with a desktop stand to adjust viewing angle and height. Suitable for desktop workstations, test stations, etc.

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Figure 6-5 Stand Mounting

6.4 Scenario 4: DIN Rail Mounting

Use the 2 included DIN rail brackets to mount the Smart Panel on a standard DIN rail, suitable for installation in industrial control cabinets. First secure the 2 brackets to the back of the device with M3 countersunk screws (one on each side), then clip the brackets onto the DIN rail.

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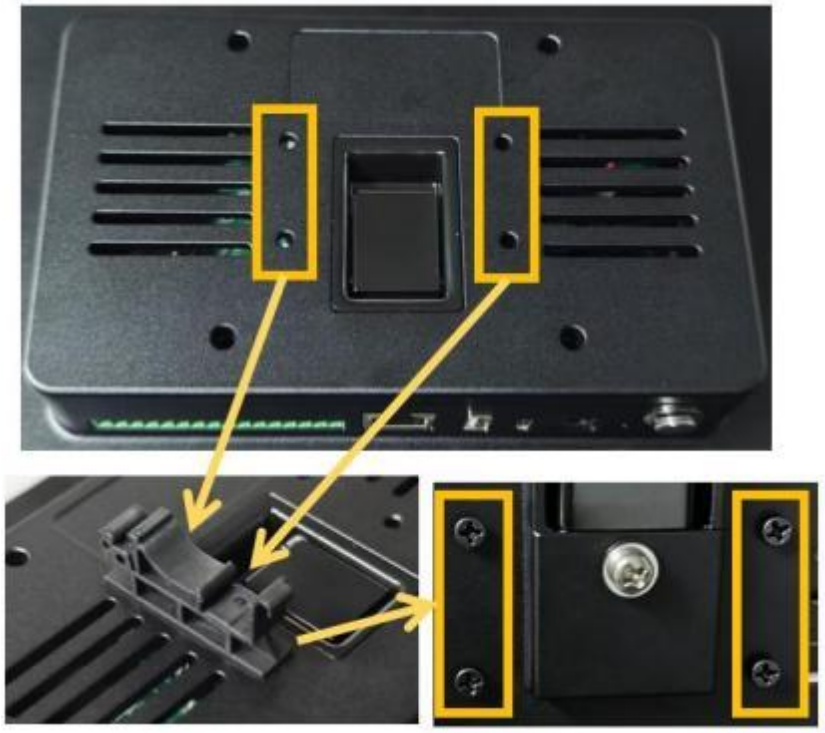

Figure 6-6 DIN Rail Bracket Installation and Latch (secured with M3 countersunk screws)

Figure 6-7 DIN Rail Mounting - Completed

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7. Precautions

7.1 Display Configuration Takes Effect After Reboot

After entering the display configuration command, reboot the device with the following command for the configuration to take effect:

```
sudo reboot
```

7.2 Display Information

The Smart Panel's display and touchscreen are installed and calibrated at the factory. Customers cannot and should not attempt to remove the screen. If the screen exhibits abnormalities, please contact the manufacturer's after-sales service. Do not disassemble the device or screen assembly yourself.

7.3 Power Connection Order

Every time you power on the device or connect it to a computer for configuration, you must connect the power adapter first, then connect the USB/Type-C data cable to the computer. Do not reverse this order, as it may cause the device to not be recognized or firmware flashing to fail.

7.4 Transportation and Storage

- Storage environment: Anti-static, moisture-proof, pressure-proof
- Input voltage: DC 6~24V (12V recommended)
- Operating temperature: -20C to 55C
- Relative humidity: 5% to 95% (non-condensing)

7.5 Other Precautions

- Ensure pin headers are aligned when installing the UNO Q board to avoid damage from angled insertion
- Verify wire order when wiring the 16-Pin terminal to avoid short circuits
- Do not block ventilation holes during operation; maintain adequate airflow
- Non-professional personnel should not disassemble the rear cover or screen assembly

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8. Troubleshooting

Q1: The Click Run.bat window closes immediately when flashing core firmware?

A: 1. Confirm the firmware package is complete and not blocked by antivirus software;

2. Right-click and run as administrator;

3. Confirm the jumper cap is properly installed and the device is in flash mode.

Q2: Permission denied when installing the driver package?

A: Confirm the install.sh file has been granted execute permission with chmod 777. If the problem persists, check that the driver package was fully extracted and that the extraction path contains no Chinese characters or spaces.

Q3: I forgot my password?

A: Re-run the install.sh script in the display and peripheral driver package (ArduinoUNO-Q_Panel-DisplayConfig-v1.0.1_202606.zip) to reset the password during installation.

Q4: Device will not boot after flashing firmware?

A: Check that the jumper cap has been removed; confirm power was not interrupted during flashing; if the device still does not boot, re-enter flash mode and flash the core firmware again.

Q5: The screen does not turn on?

A: 1. Confirm the configuration command matches your device model (Q7 uses display=8, Q10 uses display=10);

2. Reboot with sudo reboot;

3. Confirm the Arduino UNO Q is properly installed and the Type-C cable is connected;

4. If the problem persists, contact after-sales support.

Note: After hardware installation, the screen will not display until the software configuration in Chapter 5 is completed.

Q6: Computer cannot recognize the device (ADB device not appearing)?

A: 1. Confirm the power connection order is correct (power first, then USB);

2. Try a different USB cable or computer USB port;

3. Check Device Manager for unknown devices and try updating drivers;

4. Wait for the device to fully boot (about 10-15 seconds) before connecting.

Q7: CAN/RS485/RS232 communication is abnormal?

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A: 1. Confirm the 16-Pin terminal wiring is correct (A/B, TX/RX not reversed);

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2. Confirm communication parameters (baud rate, data bits, parity) match;

3. Confirm devices share a common ground to avoid ground potential differences.

Q8: Status LED does not light up after powering on?

A: 1. Confirm the power adapter is 12V/3A and the plug is properly assembled;

2. Confirm the DC power connector is fully inserted and mains power is normal;

3. Press the power switch and confirm it is functioning;

4. If there is still no response, test with a different power adapter.

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9. Technical Specifications

9.1 Electrical Parameters

Item	Parameter
Product Model	Smart Panel Q7 / Smart Panel Q10
Core Board	Arduino UNO Q (QRB2210 + STM32U585), customer-installed
Supply Voltage	DC 6V ~ 24V (12V recommended)
Standard Power	12V / 3A power adapter
USB Type-C	1 port (USB 2.0, for configuration/ADB)
USB Host	1 port (USB 2.0 Type-A)
Ethernet	1 RJ45 (10/100Mbps auto-negotiation)
CAN	1 channel (terminal block)
RS485	1 channel
RS232	1 channel
GPIO	6 channels (16-Pin terminal block)
Display (Q7)	7-inch, 1024x600, capacitive touch, 300 cd/m2 brightness
Display (Q10)	10.1-inch, 1280x800, capacitive touch, 300 cd/m2 brightness
Power Switch	Push-type
Status Indicator	1 LED indicator

9.2 Environmental Parameters

Item	Parameter
Operating Temperature	-20C to 55C
Storage Temperature	-30C to 80C
Relative Humidity	5% to 95% (non-condensing)
Mounting Methods	Custom holes / VESA 75x75 / Stand / DIN rail

9.3 Mechanical Dimensions

The external dimensions and mounting hole positions for the two models are as follows:

Item	Smart Panel Q7	Smart Panel Q10
Dimensions (W x H)	189.6mm x 126.5mm	253.8mm x 172.6mm
Thickness	50.2mm (with bracket) / 15mm (body)	55.2mm (with bracket) / 20mm (body)

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Custom Mounting Holes	100mm x 110mm	100mm x 135mm
VESA Standard Holes	75mm x 75mm	75mm x 75mm

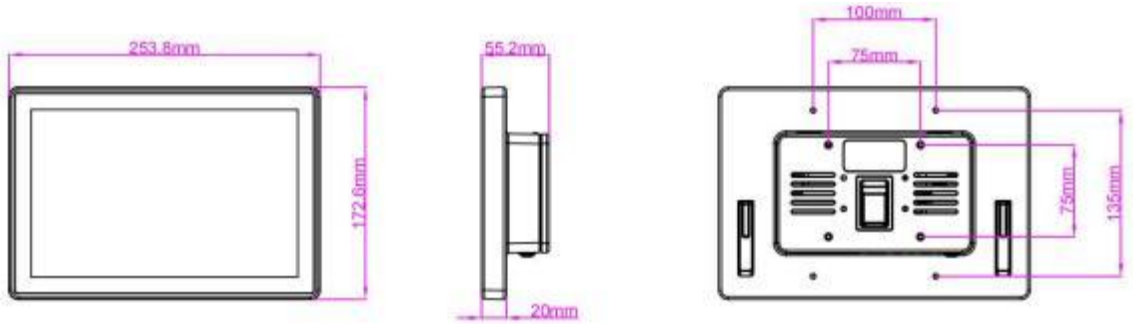

Figure 9-1 Smart Panel Q10 Mechanical Dimensions

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Figure 9-2 Smart Panel Q7 Mechanical Dimensions

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