
IOT-500

5" Risc-based Panel PC

User's Manual

Version 1.0



2016.03



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Revision History

Version	Release Time	Description
1.0	2016.03	Initial release

Copyright

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Under no circumstances will the manufacturer be liable for any direct, indirect, special, incidental, or consequential damages arising from the use or inability to use the product or documentation, even if advised of the possibility of such damages.

About This Manual

This user's manual provides the general information and installation instructions for the product. The manual is meant for the experienced users and integrators with hardware knowledge of personal computers. If you are not sure about any description in this manual, consult your vendor before further handling.

We recommend that you keep one copy of this manual for the quick reference for any necessary maintenance in the future. Thank you for choosing ARBOR products.

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Declaration of Conformity

CE

The CE symbol on your product indicates that it is in compliance with the directives of the Union European (EU). A Certificate of Compliance is available by contacting Technical Support.

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This kind of cable is available from ARBOR. Please contact your local supplier for ordering information.

FCC Class B

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 guarantee of this device could void the user's authority to operate the equipment.

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.

RoHS

ARBOR Technology Corp. certifies that all components in its products are in compliance and conform to the European Union's Restriction of Use of Hazardous Substances in Electrical and Electronic Equipment (RoHS) Directive 2002/95/EC.

The above mentioned directive was published on 2/13/2003. The main purpose of the directive is to prohibit the use of lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB), and polybrominated diphenyl ethers (PBDE) in electrical and electronic products. Member states of the EU are to enforce by 7/1/2006.

ARBOR Technology Corp. hereby states that the listed products do not contain unintentional additions of lead, mercury, hex chrome, PBB or PBDB that exceed a maximum concentration value of 0.1% by weight or for cadmium exceed 0.01% by weight, per homogenous material. Homogenous material is defined as a substance or mixture of substances with uniform composition (such as solders, resins, plating, etc.). Lead-free solder is used for all terminations (Sn(96-96.5%), Ag(3.0-3.5%) and Cu(0.5%)).

SVHC / REACH

To minimize the environmental impact and take more responsibility to the earth we live, ARBOR hereby confirms all products comply with the restriction of SVHC (Substances of Very High Concern) in (EC) 1907/2006 (REACH --Registration, Evaluation, Authorization, and Restriction of Chemicals) regulated by the European Union.

All substances listed in SVHC < 0.1 % by weight (1000 ppm)

Safety Symbols



This symbol of “CAUTION” indicates that there is a danger of injury to the user or a risk of damage to the product, should warning notices be disregarded.



This symbol indicates electrical warning.

Important Safety Instructions

Read these safety instructions carefully:

1. Read all cautions and warnings on the equipment.
2. Place this equipment on a reliable surface when installing. Dropping it or letting it fall may cause damage
3. Make sure the correct voltage is connected to the equipment.
4. For pluggable equipment, the socket outlet should be near the equipment and should be easily accessible.
5. Keep this equipment away from humidity.
6. Disconnect this equipment from the A/C outlet before cleaning it. Use a moist cloth. Do not use liquid or sprayed detergent for cleaning.
7. To fully disengage the power to the unit, please disconnect the power from the AC outlet.
8. Do not scratch or rub the screen with a hard object.
9. Never use any of the solvents, such as Thinner Spray-type cleaner, Wax, Benzene, Abrasive cleaner, Acid or Alkaline solvent, on the display. Harsh chemicals may cause damage to the cabinet and the touch sensor.
10. Remove dirt with a lightly moistened cloth and a mild solvent detergent. Then wipe the cabinet with a soft dry cloth.
11. The openings on the enclosure are for air convection and protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
12. Position the power cord so that people cannot step on it. Do not place anything over the power cord.

13. If the equipment will not be used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
14. Never pour any liquid into openings. This may cause fire or electrical shock.
15. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
16. If one of the following situations arises, get the equipment checked by service personnel:
 - a. The power cord or plug is damaged.
 - b. Liquid has penetrated into the equipment.
 - c. The equipment has been exposed to moisture.
 - d. The equipment does not work well, or you cannot get it to work according to the user's manual.
 - e. The equipment has been dropped or damaged.
 - f. The equipment has obvious signs of breakage.
17. The sound pressure level at the operator's position, according to IEC 704-1:1982, is no more than 70dB(A).
18. Keep this User's Manual for later reference.
19. DO NOT LEAVE THIS EQUIPMENT IN AN UNCONTROLLED ENVIRONMENT WHERE THE STORAGE TEMPERATURE IS BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). THIS MAY DAMAGE THE EQUIPMENT.



Do not use the power adapter that isn't made for the equipment. Supplying the equipment with inappropriate voltage may cause harm to or burn the equipment.



To prevent possible hearing damage, do not listen at high volume levels for long periods

General Cleaning Tips

You may need the following precautions before you begin to clean the device. When you clean any single part or component for the device, please thoroughly read and understand the details below.

1. We strongly recommended that you should shut down the system before you start to clean any single components.
2. When you need to clean the device, please rub it with a piece of dry cloth.
3. Be cautious of the tiny removable components when you use a vacuum cleaner to absorb the dirt on the floor.
4. Never drop the components inside the device or get circuit board damp or wet.
5. Be cautious of all kinds of cleaning solvents or chemicals when you use it for the sake of cleaning. Some individuals may be allergic to the ingredients.
6. Try not to put any food, drink or cigarette around the device.

Cleaning Tools

Although many companies have created products to help improve the process of cleaning your devices and peripherals, users can also use household items to clean their devices and peripherals. Below is a listing of items you may need or want to use while cleaning your devices or peripherals. Keep in mind that some components in your device may only be able to be cleaned using a product designed for cleaning that component, if this is the case it will be mentioned in the cleaning.

- **Cloth:** A piece of cloth is the best tool to use when rubbing up a component. Although paper towels or tissues can be used on most hardware as well, we still recommend you to rub it with a piece of cloth.
- **Water or rubbing alcohol:** You may moisten a piece of cloth a bit with some water or rubbing alcohol and rub it on the device. Unknown solvents may be harmful to the plastics parts.
- **Vacuum cleaner:** Absorb the dust, dirt, hair, cigarette particles, and other particles out of the device can be one of the best cleaning methods. Over time, these items can restrict the airflow in a device and cause circuitry to corrode.
- **Cotton swabs:** Cotton swabs moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas in your keyboard, mouse, and other locations.
- **Foam swabs:** Whenever possible, it is better to use lint-free swabs such as foam swabs.

Recommended Cleaning Procedures

1. Close all application programs
2. Close operating software
3. Turn off the equipment
4. Remove all peripherals
5. Disconnect the power cable
6. Proceed to clean.

Disposing of the Equipment

- **Within the European Union**



EU-wide legislation, as implemented in each Member State, requires that waste electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste.

This includes monitors and electrical accessories, such as signal cables or power cords. When you need to dispose of your display products, please follow the guidance of your local authority, or ask the shop where you purchased the product, or if applicable, follow any agreements made between yourself. The mark on electrical and electronic products only applies to the current European Union Member States.

- **Outside the European Union**

If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority so as to comply with the correct disposal method.

Additional Information & Technical Support

To get the latest information about the product or technical support you need, please visit our website at:

<http://www.arbor-technology.com>

Warranty

This product is warranted to be in good working order during the warranty period. Should this product fail to be in good working order at any time during this period, we will, at our option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster.

Vendor assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, or inability to use this product. Vendor will not be liable for any claim made by any other related party.

Vendors disclaim all other warranties, either expressed or implied, including but not limited to implied warranties of merchantability and fitness for a particular purpose, with respect to the hardware, the accompanying product's manual(s) and written materials, and any accompanying hardware. This limited warranty gives you specific legal rights.

Return authorization must be obtained from the vendor before returned merchandise will be accepted. Authorization can be obtained by calling or faxing the vendor and requesting a Return Merchandise Authorization (RMA) number. Returned goods should always be accompanied by a clear problem description.

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Chapter 1

Introduction

1.1 Product Highlights

- Android 5.1 operating system
- Dual-core ARM Cortex-A7 1.0GHz
- Front bezel IP65 water and dust resistance
- Flat and ultra-thin front bezel with 5" TFT LCD
- Built-in CAN 2.0b/ OBD-II
- Support 10/100 Mbps Ethernet
- Built-in WWAN, WLAN, GPS and Bluetooth
- 12~24V Wide-range voltage DC-input support



1.2 Package Contents

Upon opening the package, carefully inspect the contents. If any of the items is missing or appears damaged, contact your local dealer or distributor. The package should contain the following items:



IOT-500 5" Risc-Based Panel PC



2-pin DC Terminal Block, Plug, Green

Antenna

Wi-Fi/Bluetooth Antenna



User Manual

Optional Accessories



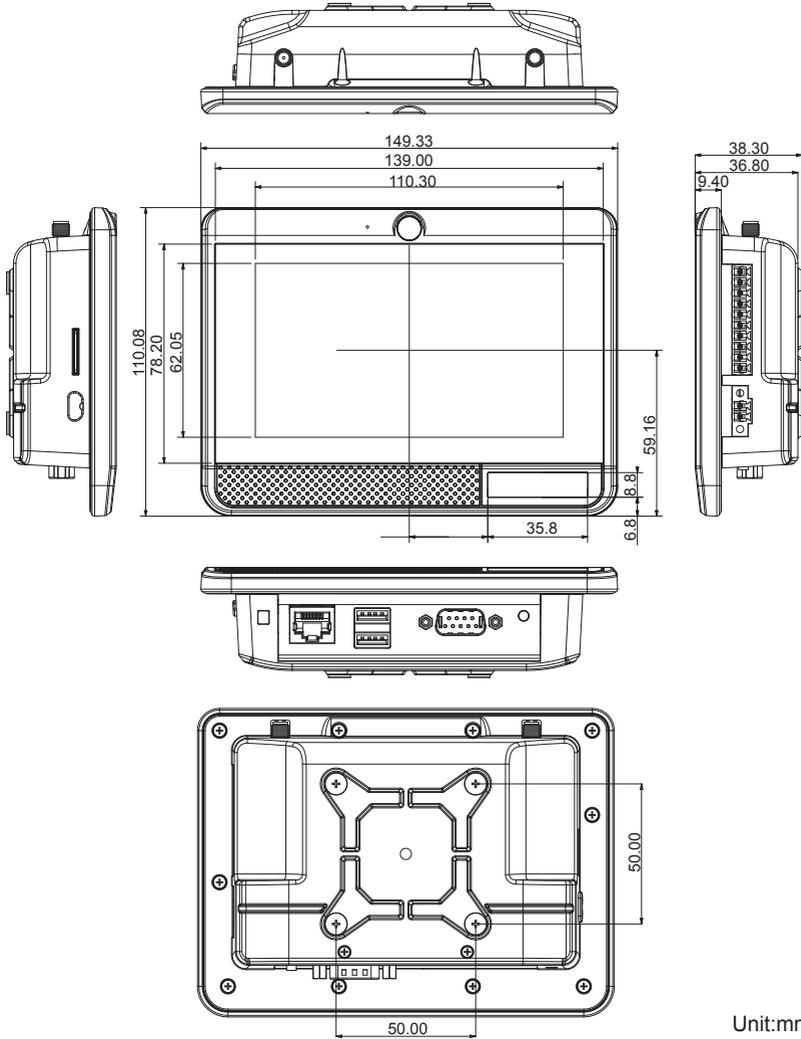
12V/2A AC/DC Power Adapter w/ 2-pin power terminal

1.3 Parts of the Device



1	2.0 megapixel camera	9	10/100 Mbps RJ-45 LAN port
2	Microphone	10	2 x USB 2.0 ports
3	5-point projected capacitive touch screen	11	DB-9 RS-232/422/485 port
4	Integrated 0.8W speaker	12	Power/Reset button <ul style="list-style-type: none"> • Press and hold to power on/off the device. • Press to suspend or resume the device.
5	4x 3.3V DIO, 1 x CAN 2.0b / OBD-II	13	Wi-Fi / Bluetooth antenna *Remove the protective cap to attach the antenna.
6	2-pin DC terminal, 12V~24V auto-detection	14	3G antenna *Remove the protective cap to attach the antenna.
7	SIM card slot	15	VESA 50 mounting holes (M3 size)
8	Reserved for S/W test or upgrade		

1.4 Dimensions



1.5 Specifications

System	
CPU	Dual-core ARM Cortex-A7 1.0GHz
OS	Android™ v5.1
Memory	512MB LPDDR2
Flash	4GB eMMC
Peripherals and Devices	
Front Camera	2.0 megapixel camera
Sensor	Magnetometer (M-Sensor)
Audio	1 x built-in speaker (0.8W) 1 x built-in microphone
Wireless	
WLAN	Integrated IEEE 802.11 a/b/g/n/ac
Bluetooth	Bluetooth 4.1 (BLE, HS compliant)
WWAN	2G GSM/GPRS/EDGE (Band 850 / 900 / 1800 / 1900) 3G WCDMA/HSPA+ (Band 1,2,5,8)
GPS	GPS/GLONASS/Beidou
I/O Interface	
CAN	CAN 2.0b / OBD-II
USB Port	2 x USB 2.0 High Speed
LAN	1 x 10/100 Mbps
RS-232	1 x RS-232/422/485 (DB-9 male), software configurable
DIO	4 x 3.3V GPIO
SIM Slot	1 x mini-SIM (2FF) slot
DC-in	2-pin terminal block
Button	1 x Power button (reset function button)
LCD Display	
Size/Type	5" TFT LCD
Resolution	960(W) x 540(H)
Brightness	350 cd/m ²
Touch Screen	
Type	5-point projected capacitive touch (PCT)

Power Input	
DC Input	2-pin terminal block 12V~24V Auto-Detection
Mechanical & Environmental	
Ingress Protection	Front bezel IP65
Operating Temp.	-10°C ~ 50°C (14°F ~ 122°F)
Storage Temp.	-20°C ~ 60°C (-4°F ~ 140°F)
Operating Humidity	5% ~ 90% RH
Dimensions (W x H x D)	149.3 x 110 x 36.8 mm (5.88" x 4.33" x 1.45")
Weight	Under 350g (0.77 lb)
Installation	
VESA Mount	50mm x 50mm



Chapter 2



Installation

2.1 SIM Card Installation

To install a SIM card to the device, locate the SIM card slot on the side and insert the card following the direction as shown below. Push the SIM card into the card slot until it locks into place.



To remove the SIM card, just push the SIM card in to eject it from its slot.

The device requires a 12~24V DC power supply. A 2-pin terminal block receptacle is located on the side of the device for DC power connection.

2.2 Power Connection

2.2.1 Using the DC Terminal Block Connector

The IOT-500 comes with one 2-pin DC terminal block connector to connect power to DC power connector on the device. To use the block connector:



1. Use a wire-stripping tool to strip both of the wires from the DC-input power source. Expose the wire to the appropriate length for the DC power connector.
2. Insert the wires into the DC power connector terminals and use a screwdriver to tighten the two captive screws on the connector.

Make sure to match the pinouts as described in [2.4.1 PWPIN](#) on page [10](#).

3. Connect the DC terminal block connector to the power connector on the IOT-500.

4. Enable DC power by plugging in the DC power supply cord to a power source, or by enabling power at the designated circuit.
5. After power connection, toggle the power switch to **ON** to turn on the device.

2.2.2 Using the Power Adapter (Optional)

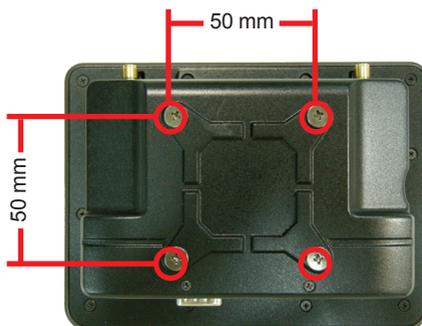
If your IOT-800 comes with the optional AC-DC power adapter, just connect the 2-pin terminal block plug of the power adapter to the 2-pin terminal block receptacle on the device. Then connect the adapter to a power source.



After power connection, press the power button to turn on the device.

2.3 Mounting the Device

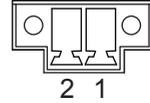
The device is VESA 50-compliant and can be mounted on a VESA 50-compliant mounting kit using M3 screws.



2.4 Connector Pintouts

2.4.1 PWPIN

Description: Power Input Connector
Connector Type: 2-pin Terminal Block

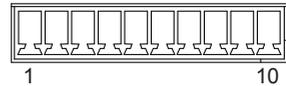


Pin	Description
1	Power_GND
2	+12V-

2.4.2 GPIO and CAN Bus

Description: Digital General Purpose Signal Input/Output and CAN

Connector Type: 4x 3.3V Digital GPIO connector and 1 x CAN 2.0b Bus



Pin	Description	Pin	Description
1	IO_GND	6	GPIO_4
2	GPIO_1	7	IO_GND
3	GPIO_2	8	CANL
4	IO_GND	9	CANH
5	GPIO_3	10	IO_GND

Note: The pin assignments of other connectors conform to the industry standard.



Chapter 3

Using the Device

3.1 Power On/Off the Device

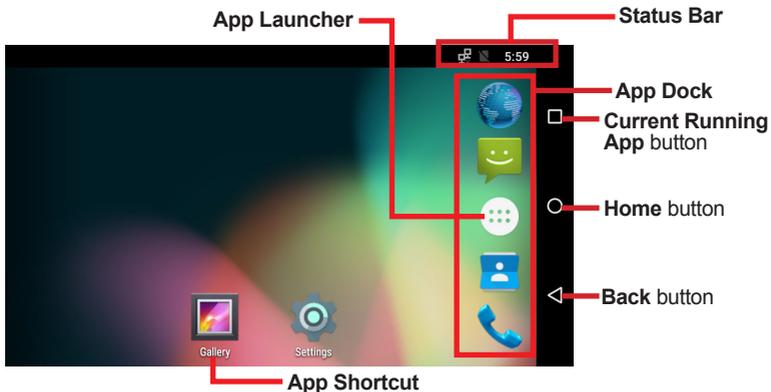
Once the device is connected to a power supply, it will be turned on automatically. Then the device will enter the Android system directly.

To power off the device, press and hold the **Power** button on the bottom of the device. When prompted, tab **OK** to shut down the device.

3.2 Home Screen

The **Home** screen provides you with an instant access to device status, notifications, application shortcuts, folders and widgets. Simply tap an item and you can launch the associated application. You can also add desired items to the **Home** screen, extend the **Home** screen or personalize the wallpaper to tailor it to your personal needs.

When you power on the device for the first time, a typical **Home** screen looks like the example below.



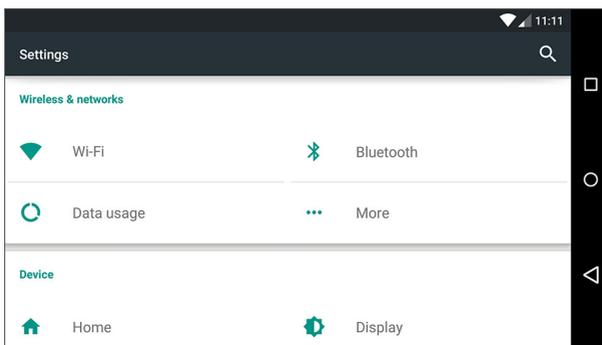
The table below describes the elements on a typical **Home** screen:

Element	Descriptions
Home Screen	<ul style="list-style-type: none">• Tap an item on this screen to launch that item.• To delete an icon or widget, tap and hold that item until the Remove bar appears on the top of the screen. Then move the icon to the Remove bar.• Tap and hold any empty spot on this screen to customize your home screen.

Notification Area	<p>The Notification Area is visible across the Home screens. The icons on the left side inform you of new messages, events, alarms, and activities in progress, while the icons on the right side shows the time, signal strength, and other information.</p> <p>Applications you install on your device may show their own icons in this area.</p> <p>You can access the notification panel to see more information by swiping down the Notification Area.</p>
Widget	The miniature of an application that functions directly on the Home screen.
App Launcher	Tap it to open the " App Launcher " where all applications installed on the device can be viewed and launched.
Bottom Dock	The dock is visible across the home screens. It shows the most commonly used App icons for quick access. You can change the icons as needed.
Back Button	Tap to go to the previous screen.
Home Button	Tap to return to Home scree.
Current Running App Button	Tap to view show your current running Apps and touch an App to open it. To remove an App from the list, swipe it left or right.

3.3 Configurations

To configure the settings of Ethernet, Wi-Fi, Bluetooth or other features, tap the **Setting** icon on the Home screen to open the **Settings** page and change relevant settings for your device if necessary.



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