Compulab Airtop

Owner's Manual

Revision 1.0

16-March-2016

For the latest version of this document please visit Airtop wiki page:

http://fit-pc.com/download/airtop/documents/airtop-owners-manual.pdf

Table of Contents

Introduction

Package contents

1. Airtop computer
2. Power supply: input 115-230VAC 50/60Hz, 250W output 19VDC 13.15A
3. AC Cord (North American)
4. HDMI to DVI adapter
5. WiFi 2.4GHz/5GHz band 2 antennas
6. Mini-serial to DB9-male adapter cable
7. M3 screw for HDD x16
8. Airtop decorative vane

Note: For more information about Airtop package content please consult www.airtop-pc.com → Specifications

To use Airtop you will need:

- Display with DisplayPort or HDMI/DVI input + DVI/HDMI cable adapter if needed
- USB keyboard and mouse
- For Barebone models – compatible RAM modules and storage devices with installed operating system

Note: Local resellers may supply Airtop with other AC cord types.

Quick Start Guide

Several Airtop models are sold "Barebone" – without RAM and storage. To install RAM and storage please consult "Installation and Service" below.

Connecting Airtop

- Turn off the display and connect it to Airtop DisplayPort or HDMI connector (use the HDMI to DVI adapter if needed)
- Connect the USB keyboard and mouse to USB2.0 connectors
- Plug the Ethernet cable into the Ethernet connector
- Mount WiFi antennas on the SMA connector by turning it clockwise repeatedly until the antenna holds firm
- Insert the DC plug into Airtop main DC-in jack
- Plug the speakers into the line-out jack
- Connect the power supply to the AC cord and plug the cord into AC outlet

⚠️ WARNING: Operating Airtop in horizontal position will reduce its cooling efficiency.

Booting Windows 7

Upon first power-up, you will be guided through the Windows Welcome procedure which is self-explanatory. The Windows 7 serial number is printed on the Windows 7 label.

Booting Linux

Linux loads automatically on power up. Upon boot you will be guided through the Linux Mint first-boot setup procedure.

Installing an operating system

To install Windows please visit: http://fit-pc.com/wiki/index.php/Installing_Windows_7_on_Airtop
Drivers can be found at: http://fit-pc.com/wiki/index.php/Airtop_Software

To install Linux please visit: http://fit-pc.com/wiki/index.php/Airtop:_Installing_Linux_Mint_17
Drivers can be found at: http://www.fit-pc.com/wiki/index.php/Airtop_Software

Hardware specifications

Model

Name	Airtop
Current HW Revision	1.1
Long Term Availability	2022

Processor

Type	Intel 5th Gen Xeon E3-1285L v4 Intel 5th Gen Core i7-5775C Intel 4th Gen Core i5-4690S
Socket	FCLGA1150
Cores	64-bit quad core Intel Hyper-Threading Technology
Clock speed	3.4 GHz (turbo boost up to 3.8 GHz) 3.3 GHz (turbo boost up to 3.7 GHz) 3.2 GHz (turbo boost up to 3.9 GHz)
TDP	65W
Chipset	Intel C226 Chipset (Lynx Point)

Memory

Supported	2x DIMM 240-pin DDR3 SDRAM memory slots Up to 32GB (2x 16GB) ECC/Non-ECC DDR3-1866 (refer to specific model specs)

Storage

Supported	All SATA3.0 ports (up to 6 Gbps) 4x 2.5" HDD/SSD in disks cartridge 1x M.2 2280 M-key slot 1x mSATA slot
RAID	Intel Rapid Storage Technology RAID 0/1/5/10 support

Integrated Graphics

GPU	Intel Iris Pro Graphics 6300 / 6200 Up to 7x displays supported (refer to specific model specs)
Display I/F 1	DisplayPort 1.2 up to 3840 x 2160 @ 60 Hz
Display I/F 2	HDMI 1.4a up to 4096 x 2304 @ 24 Hz
Display I/F 3	HDMI 1.4a up to 4096 x 2304 @ 24 Hz

Discrete Graphics

GPU	NVIDIA GeForce GTX 950 Graphics Card (refer to specific model) NVIDIA Quadro M4000 Graphics Card (refer to specific model)
Display I/F 1	DisplayPort 1.2 up to 4096×2160 @ 60 Hz
Display I/F 2	DisplayPort 1.2 up to 4096×2160 @ 60 Hz
Display I/F 3	DisplayPort 1.2 up to 4096×2160 @ 60 Hz
Display I/F 4	HDMI 2.0 / DisplayPort 1.2 up to 4096×2160 @ 60 Hz (refer to specific model)

Audio

Codec	Realtek ALC886 HD audio codec
Audio Output	Digital 5.1-ch TOSLINK output Analog 2-ch stereo output 3.5mm jack
Audio Input	Analog microphone input 3.5mm jack

Networking

LAN	2x GbE LAN ports (by option additional 4x GbE) LAN1: Intel I218 GbE PHY (MAC integrated into the chipset) (RJ-45) LAN2: Intel I210 GbE controller (RJ-45) LAN3-6: Intel 82574 GbE Controller (RJ-45) (in server models only)

Wireless

WLAN	WLAN 802.11ac (2.4/5GHz dual band Intel 7260HMW)
Bluetooth	Bluetooth 4.0
Cellular	2x micro SIM slot (6 pins)

Connectivity

USB3	4x USB 3.0 (back)
USB2	2x USB 2.0 (back) 4x USB 2.0 (front)
Serial	3x Serial communication ports COM0: Full RS232 via mini serial connector COM1: 2-wire RS232 via mini serial connector COM3: 2-wire RS232 via mini serial connector

Expansion

PCI Express	1x 16 PCIe 3.0 (up to 8 Gbps) Graphics Card, Full-height
Mini PCIe 1	Intel 7260HMW WLAN/BT module
Mini PCIe 2	Full-size slot available
FACE Module	4x USB2.0

Advanced Technologies

vPRO/AMT	Yes (N/A in Broadwell desktop processors SKUs)
CPU Virtualization	Yes
AES	Yes
Special Functionality	Auto-On, Wake-on-LAN, Wake-on-Timer, PXE Boot, Watchdog I^3M – Integrated Interactive Information Monitor

BIOS

Vendor	Phoenix
Features	BIOS Legacy mode UEFI 2.3.1 Secure Boot

Operating System

Supported	Windows 7/8/10; Windows Server 2012 R2 Linux Mint

Operating Conditions

Input Voltage	Unregulated 15 – 20VDC input Dual power input for redundancy
Power Consumption	10W – 200W
Operating Temperature	Standard: 0°C to 45°C Extended: -20°C to 70°C Industrial: -40°C to 70°C
Relative Humidity	5% to 95% (non-condensing)
MTTF	> 100,000 hours

Enclosure

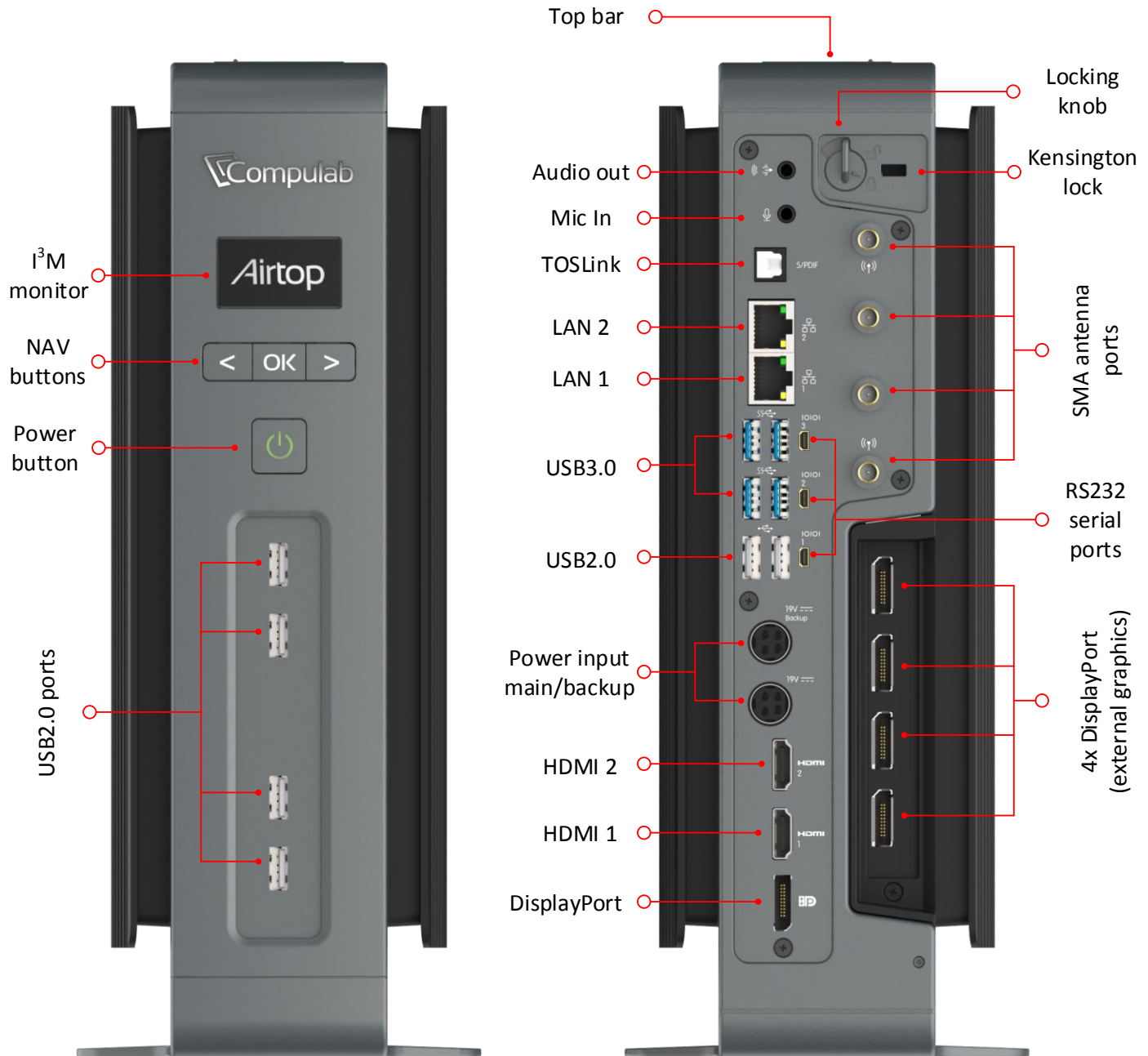|	
Material	All Aluminum
Cooling	Passive Zero-Fans Natural Airflow (NAF) cooling
Dimensions	10 cm (W) x 30 cm (H) x 25.5 cm (D) 4" (W) x 12" (H) x 10" (D)
Weight	5 kg – 5.8 kg

Airtop features

Airtop I/O

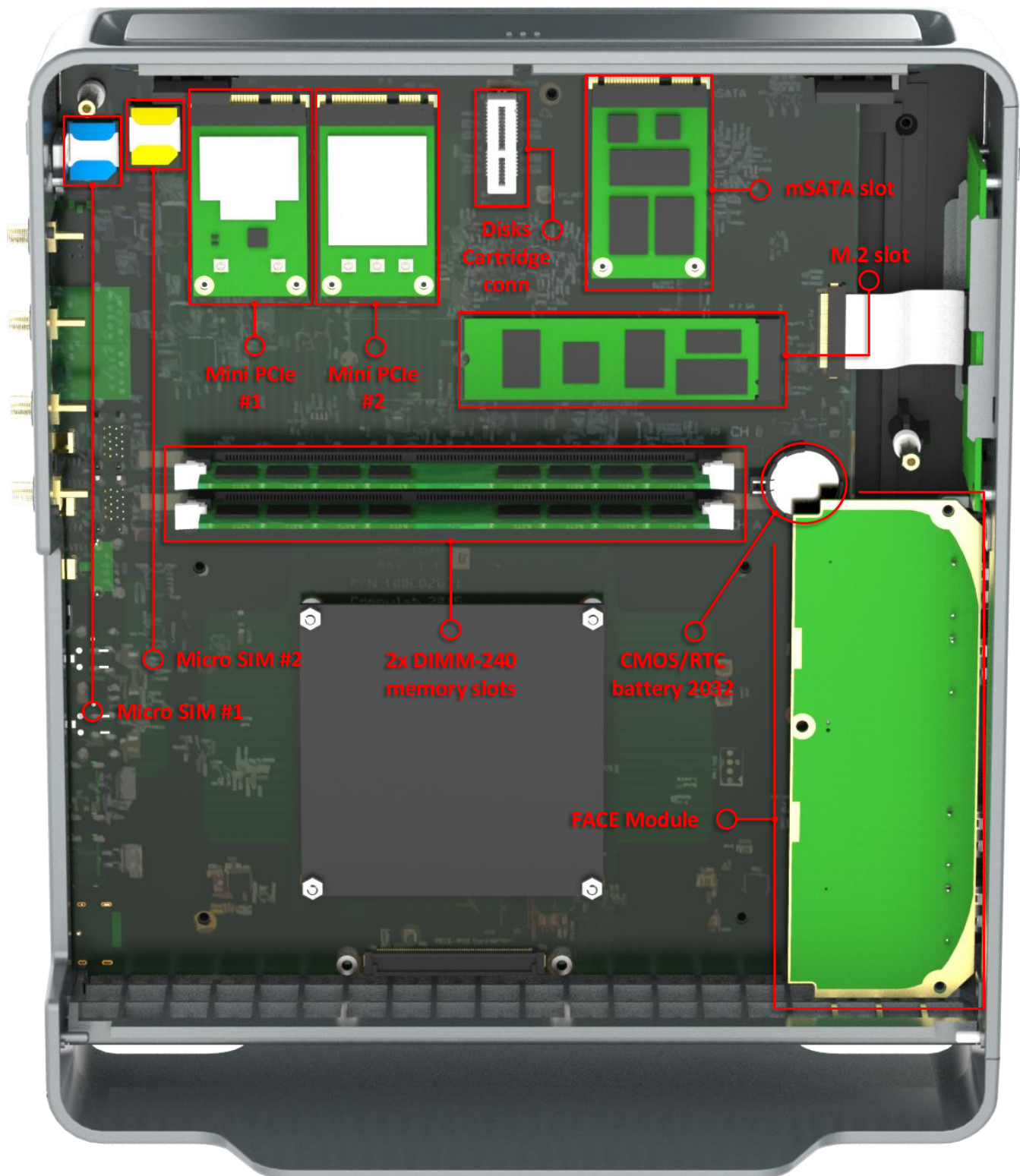*Figure 1 - Airtop I/O ports*

Airtop Motherboard

Figure 2 - Airtop motherboard features

CPU

Airtop is designed to be used with LGA1150 Intel processors.
Among them Xeon E3-1285L v4, Core i7-5775C and others.

Figure 3 - Intel LGA1150 socketed CPU

RAM

Airtop motherboard features two DIMM slots 240-pin suitable for DDR3 SDRAM memory modules. Airtop supports up to 32 GB in 2x 16 GB configuration. Intel Core CPUs memory controller can operate up to 1600 MT/s, while Intel Server CPUs can operate up to 1866 MT/s.

Both, ECC and Non-ECC RAM is supported, specific CPU/RAM compatibility is shown in Airtop model specification.

Storage

Airtop has 6 independent SATA3.0 ports, which allow users to install up to 6 storage devices inside Airtop. Four 2.5'' HDD/SSD drives arranged and mounted in a special disks cartridge for convenient installation and maintenance. Two additional SATA locations are onboard M.2 2280 and mSATA slots for SSD devices in corresponding form factors.

Disks Cartridge

Disk cartridge is a unique storage compartment that allows to store up to four 2.5'' form factor HDD (hard drives) or SSD (solid state drives). It is designed to support up to 15mm drives.

Users can install into the disks cartridge up to two 15mm height drives (while the two others can be 7mm or 9.5mm height), or up to four 7mm and 9.5mm height drives in any arrangement.
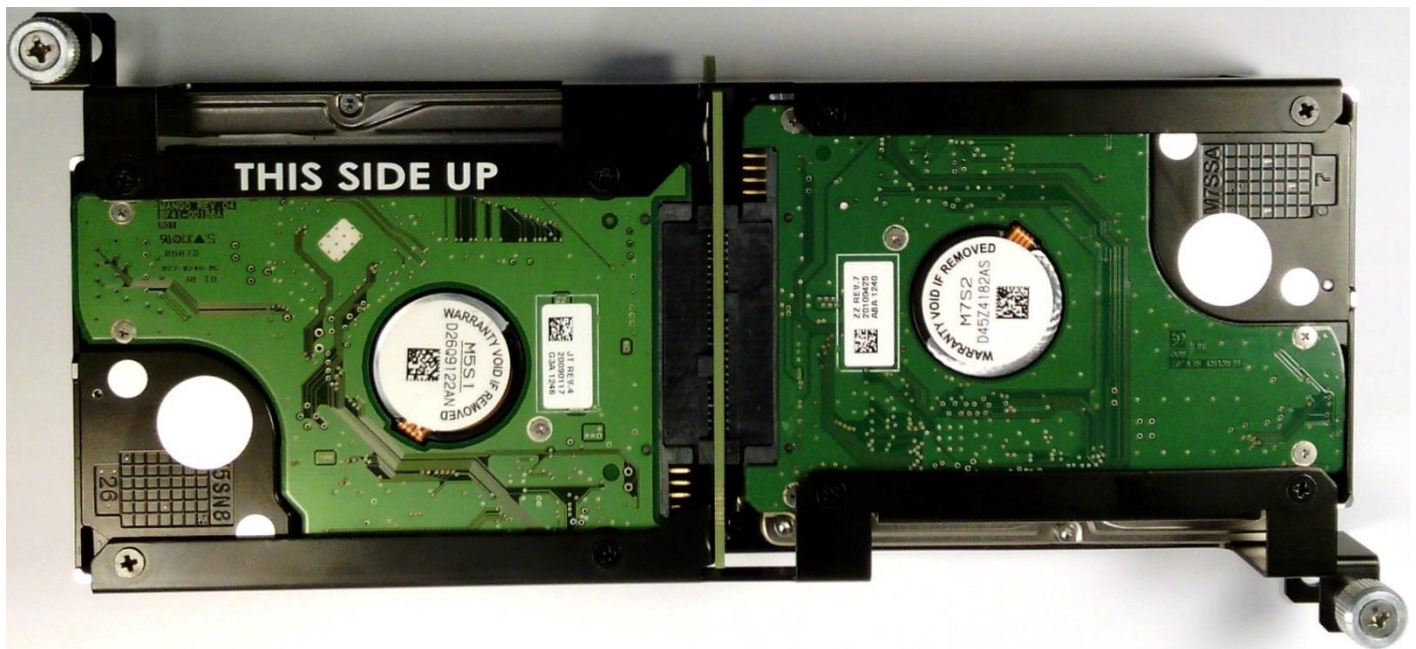
For YouTube video please visit:

https://www.youtube.com/watch?v=p7ANwEd14Wk

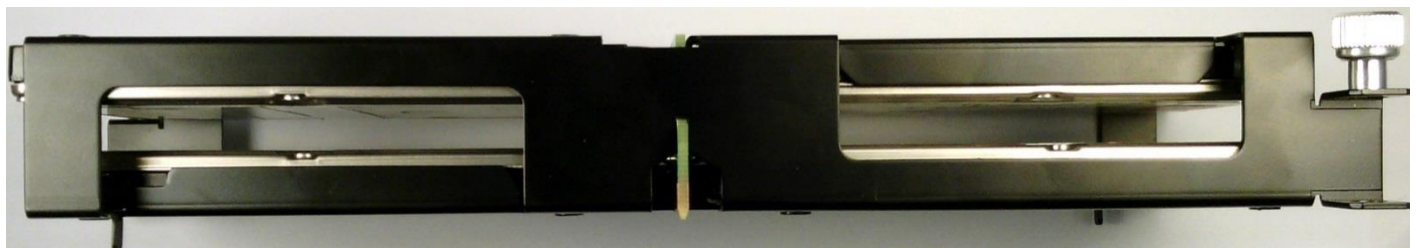*Figure 4 - Disks cartridge top view*

Figure 5 - Disks cartridge side view

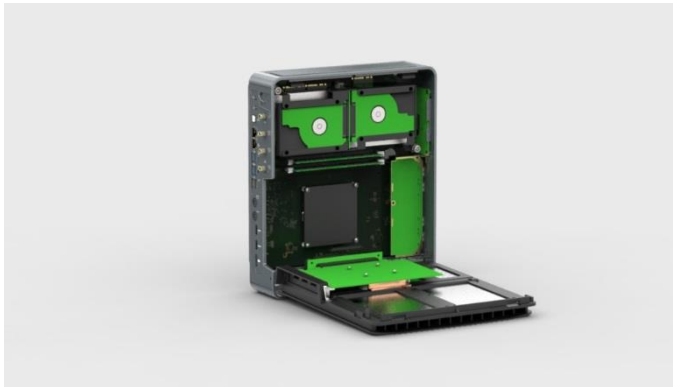The following images show disks cartridge removal and storage drive replacement in 4 simple steps:

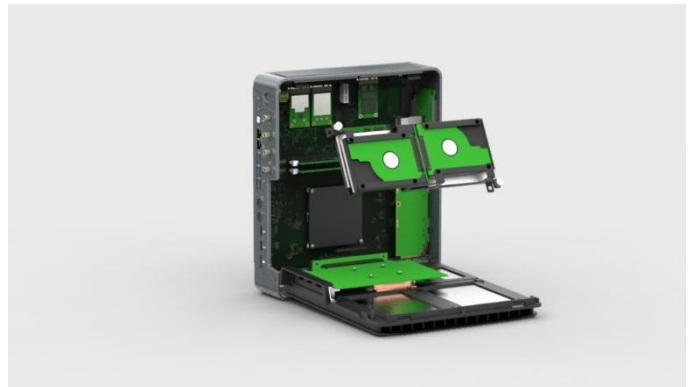*Figure 6 – Press top-bar to open left lid*

Figure 7 – Unscrew disks-cartridge's two thumb screws
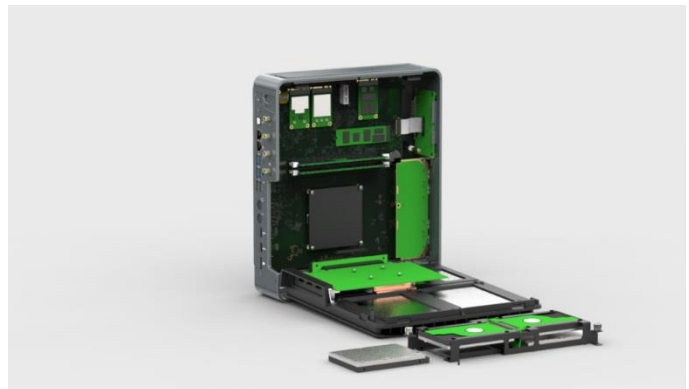

Figure 8 – Pull out the disk cartridge

Figure 9 – Install disks and assemble in reverse order

RAID

The Intel® Rapid Storage Technology (Intel RST®) supports RAID levels 0/1/5/10.

For more information please refer to Airtop wiki: http://fit-pc.com/wiki/index.php/RAID_on_Airtop

mSATA

Airtop features single mSATA slot suitable for connecting standard mSATA SSD modules.

M.2

Airtop features single M.2 slot suitable for M.2 2280 SATA only modules.

Display

Airtop can drive up to 7 independent 4K displays. Based on the model in use, it features integrated graphics and external discrete graphics card.

Integrated Graphics

Intel 5th generation of Core and Xeon processors integrates Intel® Iris™ Pro Graphics 6x00 with three digital display interfaces (DDI), all with Audio support:

- 1x DisplayPort 1.2
- 2x HDMI port 1.4a

To connect Airtop to a DVI display, use the included HDMI to DVI-D adapter. Use a DVI cable to connect the adapter to the display.

External Graphics

Several Airtop models come with external discrete graphics cards. Both support up to four independent digital display outputs with Audio support.

NVIDIA GeForce GTX 950 Graphics Card:

- 3x DisplayPort 1.2
- HDMI 2.0

NVIDIA Quadro M4000 Graphics Card:

- 4x DisplayPort 1.2

Audio

Airtop back panel offers 2 standard 3.5mm jacks for analog audio, and one TOSLink output for digital audio.

- Stereo analog audio output using standard 3.5mm plug
- 5.1-channels digital audio output using TOSLINK cable
- Stereo microphone input using standard 3.5mm plug

Connectivity

USB

Airtop models feature 4x USB 3.0 ports (5 Gbps) and 6x USB 2.0 ports, when all USB3.0 ports and two of USB2.0 ports are located on the back panel. Four additional combined USB2.0 ports are located on Airtop front when ordered with FM4U.

Each USB pair is capable of supplying up to 2.5A.

Serial

Airtop features three RS232 serial ports via mini-serial connectors:

- 1x Full signal set
- 2x Tx/Rx signals only

One mini-serial to DB9 adapter to connect to standard serial devices is included. Additional adapters can be ordered from Compulab.

Networking

LAN

Airtop features two 10/100/1000BaseT Ethernet ports using standard RJ45 connectors. Use a standard Ethernet cables to connect. Four additional GbE LAN ports can be installed using FM-LANE4U4 FACE Module.

Wireless Communications

WLAN & Bluetooth

Standard Airtop models ship with WLAN/Bluetooth module - Intel 7260HMW which supports 802.11ac WLAN and BT4.0. Two antennas are included and should be screwed into the SMA connectors on the back panel.

Cellular

Airtop provides the option for cellular communication. Dedicated 3rd party communication modem card can be installed in one of two mini PCI express onboard slots, while the USIM card is connected to onboard respective micro SIM slots. Mini PCIe #1 and #2 corresponds to micro SIM slot #1 and #2 respectively as shown in Figure 2.

I^{3}M – Integrated Interactive Information Monitor

The integrated interactive information monitor (I^{3}M) is a GUI system integrated in the front panel of Airtop. I^{3}M has the following major components:

1. An OLED display
2. Navigation keys
3. Programmable micro-controller
4. Interfaces to power and temperature sensors on the motherboard
5. Serial interfaces for communication with BIOS and operating system

The user can navigate through menus between multiple screens of the I^{3}M that display system information, temperatures, power consumption and notifications.
I^{3}M firmware can be upgraded.

Options

By navigating I^{3}M screen the following basic information can be displayed:

- Power consumption
- Temperature (CPU/GPU)
- Airtop Part Number (PN)
- Airtop Serial Number (SN)
- MAC addresses of the LAN ports
- Additional parameters can be added by programming new I^{3}M firmware

Expansion

PCI Express

Airtop allows installing a full-height single slot PCI Express card 2x/4x/8x/16x up to PCIe gen 3.0 (8 Gbps). The most common use case is an installation of discrete external graphics card. Airtop-G model features NVIDIA GeForce GTX 950 graphics card, and Airtop-W/S have NVIDIA Quadro M4000 graphics card installed.

Alternatively other PCI Express cards can be installed, such as Ethernet NIC, professional audio card, Fire-wire or Thunderbolt extenders, etc.

Notes:
1. Compulab ships some Airtop models with the graphics cards selected and adapted to Airtop. Users cannot install another graphics card.
2. For installing another PCIe card please consult Compulab technical support: support@fit-pc.com

Mini PCI Express

Airtop motherboard has two full-size mini-PCI express slots. One of the slots is normally used for WLAN/BT module. Half-size modules can be installed with half-to-full size adapter bracket available from Compulab.

Note: When removing the WLAN module make sure to isolate the tips of antenna-cables to avoid short-circuits to the motherboard.

FACE Module

FACE Modules are extension boards that integrate seamlessly into Airtop to provide custom functionality and I/O extension. FACE Module is connected to the PC motherboard with a board-to-board mezzanine connector featuring standard PC interfaces such as PCI Express, USB and serial interfaces.

Compulab offers a catalog of ready-made FACE Modules with various functions. The FACE Module interface is fully documented and supported to allow 3rd parties to design their own FACE Modules.

For more information please visit http://fit-pc.com/wiki/index.php/Fit-PC_Product_Line:FACE_Modules

Kensington Security Lock

Airtop Kensington lock can be found on the upper side of its rear panel.

Make sure to set the locking knob to locked state before using Kensington lock. This will prevent opening the case.

Figure 10 - Kensington lock and locking knob

Figure 11 - Airtop in locked position

Operating Conditions and Environmental Characteristics

Power Input

Airtop is powered from unregulated DC voltage in the range between 15V – 20V, with nominal value of 19V.
19V @ 13.15A power supply is included.

For redundancy purposes Airtop incorporates two power inputs. Airtop can be powered from single power supply, or from both power inputs simultaneously.

Backup power input
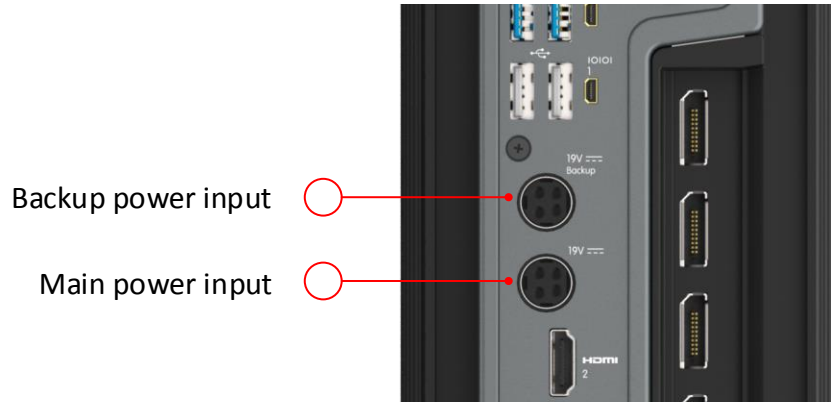
Main power input

Figure 12 - Power inputs

Environmental Characteristics

Airtop is operational under relative non-condensing humidity in the range 5% to 95%, and available in three operating temperature grades, with ambient temperatures as follows:

- Standard: 0°C to 45°C
- Extended: -20°C to 70°C
- Industrial: -40°C to 70°C

Notes:
1. Please consider the temperature ratings of storage devices and extension cards if you intend to operate Airtop at extreme conditions.
2. You may consult Compulab technical support: support@fit-pc.com

Installation and Service

Maintenance

Airtop requires no maintenance. You should not take Airtop apart other than opening the clamshell door and installing. Taking Airtop apart will void its warranty.

For your convenience Airtop video available: https://www.youtube.com/watch?v=p7ANwEd14Wk

Access Airtop Motherboard

In order to access Airtop mother board follow the steps below:

1. Shut down the computer and disconnect PSU
2. Move locking knob on the rear panel to open position
3. Press the top-bar
4. Open the clamshell door

Figure 13 – Move locking knob to open position

Figure 14 – Press the top-bar

Figure 15 - Airtop from inside

Servicing Airtop

Safety instructions

Use the following safety guidelines to help protect your computer from potential damage and to help to ensure your personal safety. Unless otherwise noted, each procedure included in this document assumes that the following conditions exist:

- You have read the safety information that shipped with your computer.
- A component can be replaced or, if purchased separately, installed by performing the removal procedure in reverse order.

⚠️ WARNING: Disconnect all power sources before opening the computer cover or panels. After you finish working inside the computer, replace all covers, panels, and screws before connecting to the power source.

⚠️ WARNING: Before working inside your computer, read the safety information that shipped with your computer.

⚠️ CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Compulab is not covered by your warranty. Read and follow the safety instructions that came with the product.

⚠️ CAUTION: To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface, such as a connector on the back of the computer.

⚠️ CAUTION: Handle components and cards with care. Do not touch the components or contacts on a card. Hold a card by its edges or by its metal mounting bracket. Hold a component such as a processor by its edges, not by its pins.

⚠️ CAUTION: When you disconnect a cable, pull on its connector or on its pull-tab, not on the cable itself. Some cables have connectors with locking tabs; if you are disconnecting this type of cable, press in on the locking tabs before you disconnect the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before you connect a cable, ensure that both connectors are correctly oriented and aligned.

Before servicing Airtop

To avoid damaging Airtop, perform the following steps before you begin working inside the computer.

1. Ensure that you follow the Safety instructions.
2. Ensure that your work surface is flat and clean to prevent the computer cover from being scratched.
3. Turn off your computer, see Turning off Airtop.

⚠️ CAUTION: To disconnect a network cable, first unplug the cable from your computer and then unplug the cable from the network device.

4. Disconnect all the network cables from the computer. Disconnect your computer and all attached devices from the electrical outlets.
5. Press and hold the power button while the computer is unplugged to ground the system board.
6. Open Airtop's Clamshell door.

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⚠ CAUTION: Before touching anything inside your computer, ground yourself by touching an unpainted metal surface of the computer. While you work, periodically touch an unpainted metal surface to dissipate static electricity, which could harm internal components.

Turning off Airtop

Ensure that the computer and all attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your operating system, press and hold the power button for about 6 seconds to turn them off.

⚠ CAUTION: To avoid losing data, save and close all open files and exit all open programs before you turn off your computer.

After servicing Airtop

After you complete service operation, ensure that you connected all external devices, cards, and cables before turning on Airtop.

1. Close Airtop's Clamshell door.
2. Make sure Airtop is oriented vertically in order to ensure cooling efficiency.

⚠ WARNING: Operating Airtop in horizontal position will reduce its cooling efficiency.

3. Connect any network and other cables to your computer.

⚠ CAUTION: To connect a network cable, first plug the cable into the network device and then plug it into the computer.

4. Connect your computer and all attached devices to their electrical outlets.
5. Turn on your computer.

BIOS

For BIOS documentation see http://fit-pc.com/wiki/index.php/Airtop_BIOS_Guide

Entering BIOS Setup Utility

Turn off Airtop.
Turn on while holding down the F2 key.

Warranty and RMA

Warranty

- Compulab guarantees products against defects in workmanship and material for a period of 60 months (12 months for Airtop-DIY model) from the date of shipment.
- Warranty on the storage device is 24 months only
- Warranty on the replaceable battery is 24 months only
- Your sole remedy and Compulab's sole liability shall be for Compulab, at its sole discretion, to either repair or replace the defective product at no charge.
- This warranty is void if the product has been altered or damaged by accident, misuse or abuse.

RMA

Keep the original package for shipping in case of hardware failure.
In case of HW failure of an **Airtop** under warranty, please contact the seller of that **Airtop**.
Please provide the following required information:

- Serial number
- Name of purchaser
- Address
- Problem description

If Airtop was purchased directly from Compulab, please email rma@fit-pc.com.

Regulatory Information

Airtop
Manufacturer: Compulab Ltd.

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.

Statement

Changes or modifications to this equipment not expressly approved by the party responsible for compliance (Compulab Ltd.) could void the user's authority to operate the equipment.

Statement
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.

WEEE
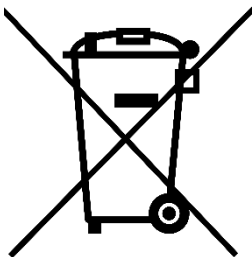
You must dispose this electrical item separately from general household waste when it reaches the end of its useful life. Take your PC to your local waste collection point or center. This applies to all countries of the European Union, and to other European countries with a separate waste collection system.