

Mini-ITX SBC supports LGA 1151 Intel® Core™ i7/i5/i3, Pentium® or Celeron® Processor, HDMI2.0/VGA, SATA, Dual Intel®GbE, USB3.0, PCIE mini, HD audio and RoHS

KINO-AQ170

Quick Installation Guide

Version 1.0

May 06, 2016.

Package List

KINO-AQ170 package includes the following items:

- 1 x KINO-AQ170 single board computer
- 1 x I/O shielding
- 2 x SATA cable
- 1 x One Key Recovery CD
- 1 x QIG
- 1 x Utility CD



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Specifications

- CPU:
LGA 1151 socket supports 6th generation Intel® Core™ i7/i5/i3 Pentium® and Celeron® processor
- BIOS: AMI UEFI BIOS
- System Chipset: Intel® Q170
- Memory:
Two 260-pin 2133 MHz dual-channel DDR4 SDRAM SO-DIMM supported (system max. 64 GB)
- Graphics:
Intel® HD Graphics Gen 9 support for DX11/12, OCL 2.x, OGL 4.3/4.4, ES 2.0 Decode/Encode for HEVC, VP8, VP9 2, VDENC
- Display Output:
Triple independent displays
1 x HDMI 2.0 by MCDP2800-BB DP to HDMI converter (up to 4096x2160@60Hz)
1 x HDMI/DP (up to 4096x2304@60Hz)
1 x VGA by CH7517 DP to VGA converter (up to 1920x1200)
1 x iDP interface for HDMI, LVDS, VGA, DVI, DP (up to 2560x1600@60Hz)
- Ethernet:
LAN1: Intel® I219LM with (Intel® AMT 11.0 support)
LAN2: Intel® I211 PCIe controller with NCSI support
- External I/O Interfaces:
2 x USB 2.0
4 x USB 3.0
- Internal I/O Interfaces:
4 x RS-232 (2x5 pin, P=2.0)
2 x RS-232/422/485 (2x5 pin, P=2.0)
4 x SATA 6Gb/s with 5V SATA power (RAID 0/1/5/10 support)
4 x USB 2.0 (2x4 pin, P=2.0)

- Audio:
 - Realtek ALC662 HD Audio codec
 - 2 x Audio jacks (line-out, mic-in) on rear IO
 - 1 x Front audio (2x5-pin)
- Front Panel:
 - 1 x Front panel connector (1x10 pin, power LED, HDD LED, speaker, power button, reset button)
- LAN LED: 2 x LAN LED (1x2 pin)
- SMBus: 1 x SMBus (1x4 pin)
- I²C: 1 x I²C (1x4 pin)
- Digital I/O: 1 x 8-bit digital I/O (2x5 pin)
- Expansion :
 - 1 x Full-size PCIe Mini slot (support mSATA)
 - 1 x PCIe x8 slot
- Chassis Intrusion: 1 x Chassis intrusion (1x2 pin)
- Watchdog Timer:
 - Software programmable supports 1~255 sec. system reset
- Power supply: AT/ATX power
- Fan Connector:
 - 1 x CPU smart fan (1x4 pin)
 - 1 x System smart fan (1x4 pin)
- Power Consumption:
 - 3.3V@1.62A, 5V@3.54A, 12V@8.17A, 5VSB@3.6A
 - (Intel® Core™ i7 6700K 4.0GHz CPU with 16 GB (two 8 GB) 2133 MHz DDR4 memory)
- Operating Temperature: -20°C ~ 60°C
- Operation Humidity: 5% ~ 95%, non-condensing
- Dimensions: 170mm x 170mm
- Weight(GW/ NW): 900g/ 450g

Ordering Information

- **KINO-AQ170-R10:**
Mini-ITX SBC supports LGA 1151 Intel® Core™ i7/i5/i3, Pentium® or Celeron® Processor, HDMI2.0/VGA, SATA, Dual Intel® GbE, USB3.0, PCIE mini, HD audio and RoHS
- **32000-070301-RS:** Dual USB cable
- **32200-000049-RS:** RS-232 cable, 200mm
- **32205-003800-300-RS:** RS-422/485 cable, 200mm
- **CF1156A-RS-R11:**
High-performance LGA1155/1156 cooler kit, 1U chassis compatible, 73W
- **CF-1156C-RS:**
LGA1155/1156 kit, 1U chassis compatible, 45W
- **CF-1156D-RS:**
LGA1155/1156 kit, 1U chassis compatible, 65W
- **CF-1156E-R11:**
High-performance LGA1155/1156 cooler kit, 95W
- **DP-DP-R10:**
DisplayPort to DP converter board (for IEI connector)
- **DP-DVI-R10:**
DisplayPort to DVI-D converter board (for IEI connector)
- **DP-HDMI-R10:**
DisplayPort to HDMI converter board (for IEI connector)
- **DP-LVDS-R10:**
DisplayPort to 24-bit dual-channel LVDS converter board (for IEI connector)
- **DP-VGA-R10:**
DisplayPort to VGA converter board (for IEI connector)

Jumpers setting and connectors

LABEL	FUNCTION
J_CMOS1	Clear CMOS
SW_BIOS1_2	Switch BIOS1 or BIOS2 (option function)
Flexibility I/O	Flexibility for PCIE_2 Slot & PCIE_3 slot (option function)
J_ATX_AT1	AT/ATX Power Mode Setting
USB SW1 Power USB SW2 Power	USB Power Setting
J_FLASH1	Flash Descriptor Security Override
F_PANEL1	PWR & RST Buttons and indicators
VIDEO1	VGA 15-pin Female Connector (Not Support Hot Plug)
J1	Display Port/HDMI COMBO Connector
HDMI1	HDMI Connector (support HDMI2.0)
DP1	iDP Connector
LAN1_USB1	RJ45 LAN and USB 3.0 Connector
LAN2_USB2	RJ45 LAN and USB 3.0 Connector
K/M_USB1	Keyboard & Mouse And USB2.0 Connector
KB_MS1	6Pin-header Keyboard & Mouse Connector
USB1, USB2	Internal Pin-header 4 USB2.0 Connectors
COM1, COM2, COM3, COM4	Internal Serial Port Connectors
COM5,6	Internal Serial Port RS232/RS422/RS485 Connector
AUDIO_CV1	HD Audio Connector
FRONT_PANEL1	Front Panel Audio Connector
SATA1, SATA2 SATA3, SATA4	Serial ATA 3.0 Connectors
MPCIE1	Mini PCI-E Card Connector
CPU_FAN1	CPU Fan Connector
SYS_FAN1 SYS_FAN2	System Fan Connectors
DIO1	Digital I/O Connector
ATX1	24Pin ATX Power Source Connector

CPU12V1	+12V Power Source Connector
SMB1	SMBUS Connector
I2C1	I2C Connector (to EC)
LED_LAN1	LAN1 LINK LED Connector
LED_LAN2	LAN2 LINK LED Connector
CHASSIS1	Chassis Status Connector

J_CMOS1: Clear CMOS Switch	
PIN NO.	DESCRIPTION
Open	Normal Operation (Default)
Push	Clear CMOS Setup

J_ATX_AT1 : AT/ATX Power Mode Setting	
PIN NO.	DESCRIPTION
Short 1 - 2	ATX Mode (default)
Short 2 - 3	AT Mode

USB SW1, USB SW2: USB power setting	
* USB SW1 set K/M_USB1 and LAN1_USB1 & LAN2_USB2 connector's USB port VCC power source.	
* USB SW2 set USB1 and USB2 connector's USB port VCC power source.	
PCIE x16	DESCRIPTION
+5V DUAL (default)	+5V DUAL
+5V	+5V

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.

Chipset

Auto Power Button Status	[Disabled(ATX)]	
Restore AC Power Loss	[Last State]	-----
> PCI Express Configuration		
> PCI Azalia Configuration		
Power Saving Function(ERP)	[Disabled]	
PCIEX16 Power	[1 x16 PCIE]	
USB SW1	[+5V DUAL]	
USB SW2	[+5V DUAL]	

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J_FLASH1: Flash descriptor security override	
PIN NO.	DESCRIPTION
Short 1 - 2	Disabled (default)
Short 2 - 3	Enabled

J_HDMI_DP : HDMI/DP display Mode Setting	
PIN NO.	DESCRIPTION
Short 1 - 2	HDMI
Short 2 - 3	DP(Default)

F_PANEL1: Front panel connector					
	PIN	DESCRIPTION	PIN	DESCRIPTION	
	1	NC	6	PWRLED	PWR LED
PWR BTN	2	PWRBTW#	7	PWRLED	
	3	GND	8	GND	
HDD LED	4	+V5S	9	RESET+	RESET
	5	HDD_LED-	10	GND	

VIDEO1: 15-pin Female Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
V1	RED	V2	GREEN
V3	BLUE	V4	NC
V5	GND	V6	Hot plug detect
V7	GND	V8	GND
V9	VCC	V10	GND
V11	NC	V12	DDCDA
V13	HSYNC	V14	VSYSN
V15	DDCCLK		

J1 : Display Port /HDMI COMBO Connector		
PIN NO.	HDMI	Display Port
1	TMDS DATA2+	L0P
2	GND	GND
3	TMDS DATA2-	L0N
4	TMDS DATA1+	L1P
5	GND	GND
6	TMDS DATA1-	L1N
7	TMDS DATA0+	L2P
8	GND	GND
9	TMDS DATA0-	L2N
10	TMDS CLK+	L3P
11	GND	GND
12	TMDS CLK+	L3N
13	CEC	GND
14	NC	GND
15	SCL	AUXP
16	SDA	GND
17	GND	AUXN
18	HDMI PWR	HPD
19	HPD	PWR RTN
20	NC	DP PWR
21	HDMI/DP Det	HDMI/DP Det

HDMI1 : HDMI Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	HDMI_DATA2	13	N/C
2	GND	14	N/C
3	HDMI_DATA2#	15	HDMI_SCL
4	HDMI_DATA1	16	HDMI_SDA
5	GND	17	GND
6	HDMI_DATA1#	18	+5V
7	HDMI_DATA0	19	HDMI_HPD
8	GND	20	HDMI_GND
9	HDMI_DATA0#	21	HDMI_GND
10	HDMI_CLK	22	HDMI_GND
11	GND	23	HDMI_GND
12	HDMI_CLK#		

DP1 : Internal Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	11	AUXP
2	LANE1N	12	AUXN
3	LANE1P	13	GND
4	GND	14	LANE2P
5	LANE3N	15	LANE2N
6	LANE3P	16	GND
7	GND	17	LANE0P
8	AUX_CTRL_DET_D	18	LANE0N
9	GND	19	+3.3V
10	HPD		

USB1: External USB3.0 Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	10	VCC
2	USB_DATA-	11	USB_DATA-
3	USB_DATA+	12	USB_DATA+
4	GND	13	GND
5	USB3_RX-	14	USB3_RX-
6	USB3_RX+	15	USB3_RX+
7	GND	16	GND
8	USB3_TX-	17	USB3_TX-
9	USB3_TX+	18	USB3_TX+

LAN1: RJ45 LAN connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
20	LAN1_MDI0P	24	LAN1_MDI2P
21	LAN1_MDI0N	25	LAN1_MDI2N
22	LAN1_MDI1P	26	LAN1_MDI3P
23	LAN1_MDI1N	27	LAN1_MDI3N

USB2: External USB3.0 Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	10	VCC
2	USB_DATA-	11	USB_DATA-
3	USB_DATA+	12	USB_DATA+
4	GND	13	GND
5	USB3_RX-	14	USB3_RX-
6	USB3_RX+	15	USB3_RX+
7	GND	16	GND
8	USB3_TX-	17	USB3_TX-
9	USB3_TX+	18	USB3_TX+

LAN2: RJ45 LAN connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
20	LAN1_MDI0P	24	LAN1_MDI2P
21	LAN1_MDI0N	25	LAN1_MDI2N
22	LAN1_MDI1P	26	LAN1_MDI3P
23	LAN1_MDI1N	27	LAN1_MDI3N

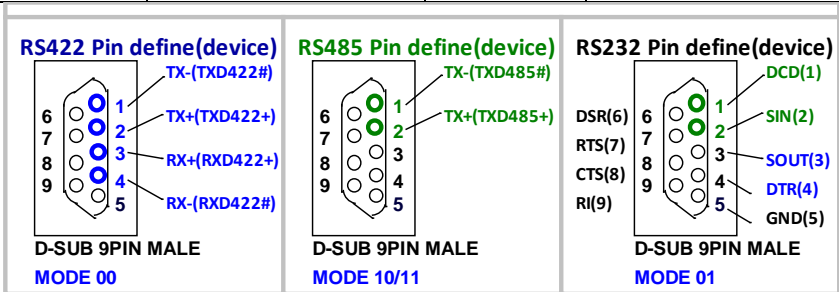
K/M_USB1: Keyboard & Mouse and USB 2.0 connectors			
USB1: External USB 2.0 connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	5	VCC
2	USB_DATA-	6	USB_DATA-
3	USB_DATA+	7	USB_DATA+
4	GND	8	GND
KB_MS1: Keyboard / Mouse connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
9	GND	10	KEYBOARD DATA
11	MOUSE DATA	12	VCC
13	KEYBOARD CLOCK	14	MOUSE CLOCK

KB_MS1: Keyboard and mouse connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	MSDATA
3	MSCLK	4	KBDATA
5	KBCLK	6	GND

USB1 ~ 2 : Internal USB Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	GND
3	USB_DATA-	4	USB_DATA+
5	USB_DATA+	6	USB_DATA-
7	GND	8	VCC

COM1~4 : internal Serial Port Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	2	DSR
3	RXD	4	RST
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	GND

COM5, COM6: Internal Serial Port RS232/RS422/RS485 Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	2	DSR
3	RXD	4	RST
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	GND



AUDIO_CV1: Audio Line-In/Out MIC Connector	
PIN NO.	DESCRIPTION
Line_Out (Green)	Connect this port to headphone or speaker
Microphone (Pink)	Connect this port to microphone

FRONT-PANEL1: Audio Source Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LMIC2-L	2	AUD_GND
3	LMIC2-R	4	PRESENCE#
5	LLINE2-R	6	MIC2-JD
7	FRONT-IO	8	NC
9	LLINE2-L	10	LINE2-JD

SPDIF1: SPDIF Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	2	NC
3	SPDIFOUT	4	GND
5	SPDIFIN		

SATA1~4: Serial ATA 3.0 Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	5	SATA_RX-
2	SATA_TX+	6	SATA RX+
3	SATA_TX-	7	GND
4	GND	8	N/C

M_PCIE1: Mini PCI-E / M-SATA Card Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	PCIE_WAKE#	2	VCC3
3	N/C	4	GND
5	N/C	6	1.5V
7	N/C	8	N/C
9	GND	10	N/C
11	PCIE_CLK#	12	N/C
13	PCIE_CLK	14	N/C
15	GND	16	N/C
17	N/C	18	GND
19	N/C	20	N/C
21	GND	22	PCIRST#
23	PCIE_RXN	24	VCC3
25	PCIE_RXP	26	GND
27	GND	28	1.5V
29	GND	30	SMBCLK
31	PCIE_TXN	32	SMBDATA
33	PCIE_TXP	34	GND
35	GND	36	USB D-
37	GND	38	USB D+
39	VCC3	40	GND
41	VCC3	42	N/C
43	GND	44	N/C
45	N/C	46	N/C
47	N/C	48	1.5V
49	N/C	50	GND
51	M-SATA Detect	52	VCC3

CPU_FAN1: CPU FAN Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+12V
3	FANIO	4	PWM

SYS_FAN1 ~ 2: System Fan Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	FANIO	2	+12V (PWM)
3	GND		

DIO1: Digital Input / Output Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	VCC
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

ATX1: ATX Power Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS_ON
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	Power good	20	-5V
9	5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND

CPU12V1: +12V Power Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	GND
3	+12V	4	+12V

SMB1: SMBus Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	SMB_DATA
3	SMB_CLK	4	+5V

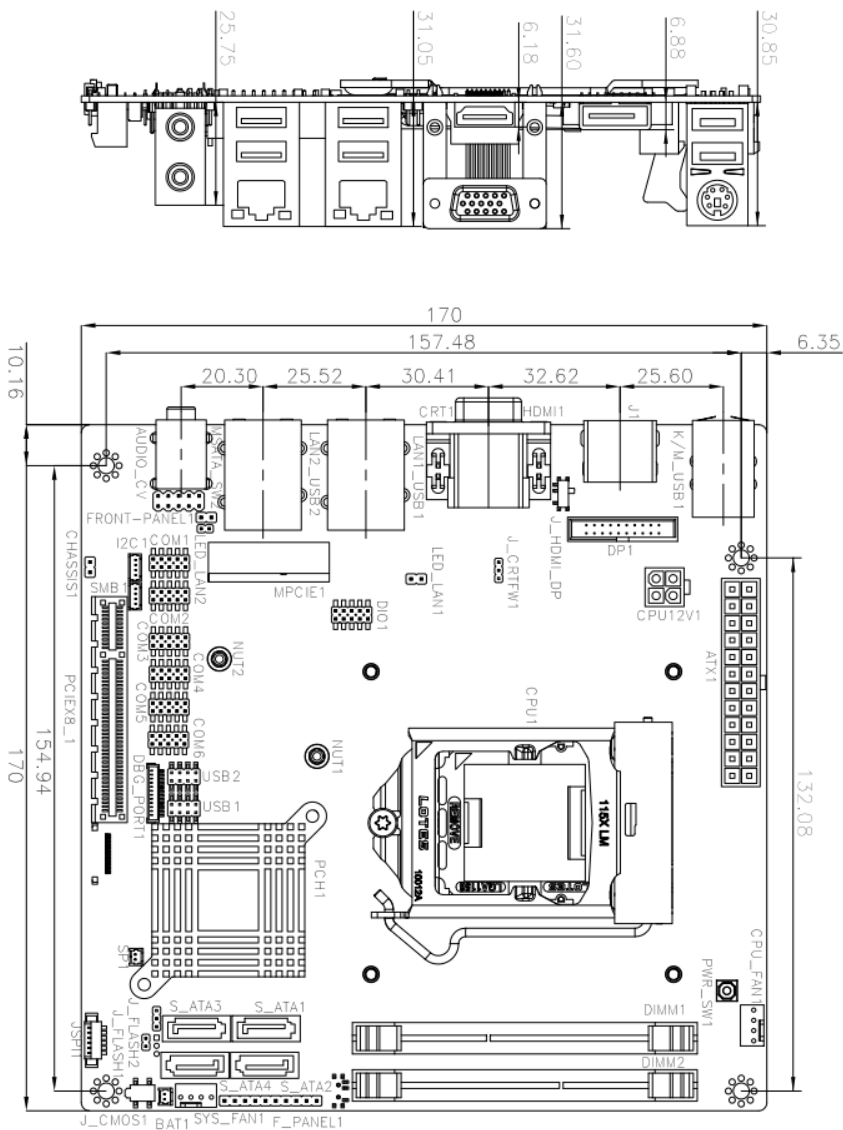
I2C1: I2C Connector (to EC)			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	PCH_GP38
3	PCH_GP39	4	+5V

LED_LAN1: LAN Link LED Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	2	LAN1_LED_LNK#_ACT

LED_LAN2: LAN Link LED Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	2	LAN2_LED_LNK#_ACT

CHASSIS1: Chassis Status Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3VSB	2	CHASSIS OPEN

Board Layout: Jumper and Connector Locations



(Unit: mm)