

EPIC SBC supports Intel® Celeron® dual core 847E 1.1GHz on-board CPU, DDR3, Dual HDMI/ VGA/ LVDS, Dual GbE, USB 2.0, PCIe Mini, SATA 6Gb/s and Audio

NANO-HM651

Quick Installation Guide

Version 1.0

Dec 18, 2014.

Package List

NANO-HM651-847E-R10 package includes the following items:

- 1 x NANO-HM651 Single Board Computer
- 1 x SATA with Power Cable kit (P/N: 32801-000201-100-RS)
- 1 x Audio Cable (P/N: 32000-072100-RS)
- 1 x Power Cable (P/N: 32100-087100-RS)
- 2 x RS-232 Cable (P/N: 32200-000049-RS)
- 2 x Plastic shaft for securing half-size PCIe Mini card (P/N: 43124-0010C2-01-RS)
- 1 x Enclosure Heatsink
- 1 x Mini Jumper Pack
- 1 x Utility CD
- 1 x QIG (Quick Installation Guide)



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Specifications

- CPU:
Intel® Celeron® dual core processor 847E 1.1GHz
- System Chipset: Intel® HM65
- BIOS: UEFI BIOS
- System Memory:
Two 204-pin 1333/1066MHz dual-channel DDR3 SO-DIMMs supported (system max. 16GB)
- Graphics: Intel® HD Graphics Gen 6 supports DX10.1 and OpenGL 3.0, Full MPEG-2, VC1, AVC Decode
- Display Output:
VGA integrated in the Intel® HM65 (up to 2048 x 1536 @75Hz)
Dual channel 24-bit LVDS integrated in the Intel® HM65 (up to 1920 x 1200 @60Hz)
Dual HDMI (up to 1920 x 1200 @60Hz)
- Ethernet: Dual PCIe LAN controller by Realtek RTL8111E with ASF 2.0 support
- Super I/O: Fintek F81866
- Audio:
Realtek ALC662 HD codec on board
- I/O Interface:
1 x 6-pin wafer for PS/2 KB/MS
2 x RS-232
1 x RS-422/485
2 x SATA 6Gb/s with 5V SATA power connector
2 x USB 3.0 (2 on rear)-
4 x USB 2.0 (2 on rear, 2 by pin header)
- Expansion:
1 x full-size PCIe Mini card slot with mSATA support
- Watchdog Timer:
Software programmable support 1~255 sec. System reset

- Digital I/O: 8-bit digital I/O (4-bit input / 4-bit output)
- FAN Connector:
 - 1 x 4-pin CPU Fan Connector
 - 1 x 3-pin system Fan Connector (Smart Fan)
- Power supply: 12V only, AT/ATX support
- Power Consumption:
 - 12V@3.01A (Intel® Celeron® with 1333MHz 4GB memory)
- Operation Temperature: -10°C ~ 60°C
- Operation Humidity: 5% ~ 95%, non-condensing
- Dimensions: 115mm x 165mm
- Weight GW/NW: 850g / 350g

Ordering Information

- **NANO-HM651-847E-R10:**
EPIC SBC supports Intel® Celeron® dual core 847E 1.1GHz CPU, dual HDMI/VGA/LVDS, dual GbE, USB 3.0, PCIe Mini, SATA 6Gb/s and Audio
- **32000-070301-RS:** Dual port USB cable

Jumpers setting and connectors

LABEL	FUNCTION
J_CMOS1	CMOS state setting
J_ATXCTL1	Select ATX or AT mode
J_VLVDS1	LCD Voltage Selector
J_PID1	LVDS Panel Resolution Selection
MSATA_SW	MSATA setting
USB_CON3	USB 3.0 Connector
USB_CON2	USB 2.0 Connector
USB3	Internal USB 2.0 Connectors
KB_MS1	PS/2 MOUSE & KEYBOARD Connector
DP1, DP2	DisplayPort Connector
VGA1	External 1 Port Serial Port DB-9 Connectors
LAN1, LAN2	LAN Connector
COM1~3	Internal 2 Serial Port DB-9 Connectors
AUDIO1	Extend Audio Module Connector
CN3	PCI-E Mini Card
S_ATA1~2	Serial ATA Connectors
CN1~2	Serial ATA Power Connectors
INVERTER1	LVDS Panel Voltage Supply
LVDS1	LVDS Panel Connector
SYS_FAN1	Fan Connector
FAN1	Fan Connector
DIO1	Digital I/O Connector
F_PANEL1	PWR & RST Buttons and Indicators
PWR2	Power Supply DC12V Power IN
TPM1	TPM Connector
BAT1	Battery connector

J_CMOS1 : Clear CMOS Setup	
J_CMOS1	DESCRIPTION
1-2 (default)*	Keep CMOS Setup (Normal Operation)
Short 2-3	Clear CMOS Setup

J_ATXCTL1 : Select ATX or AT Mode	
J_SPI	DESCRIPTION
1-2 (default)*	ATX mode
Short 2-3	AT mode

J_VLVDS1 : Set The Panel Voltage	
J_LVDS1	DESCRIPTION
1-2 (default)*	Set The Voltage Level Of Panel To VCC3
Short 2-3	Set The Voltage Level Of Panel To VCC

J_PID1 : LVDS Panel Resolution Selection	
J_PID1	DESCRIPTION
OFF	640 X 480 (18bit)
1-2	800 X 600 (18bit)
3-4	1024 X 768 (18bit)
1-2 & 3-4(Default)	1024 X 768 (24bit)
5-6	1280 X 800 (24bit)
1-2 & 5-6	1280 X 1024 (48bit)
3-4 & 5-6	1366 X 768 (24bit)
1-2 & 3-4 & 5-6	1440 X 900 (48bit)
7-8	1400 X 1050 (48bit)
1-2 & 7-8	1600 X 900 (48bit)
3-4 & 7-8	1680 X 1200(48bit)
1-2 & 3-4 & 7-8	1680 X 1050 (48bit)
5-6 & 7-8	1920 X 1080 (48bit)
1-2 & 5-6 & 7-8	1920 X 1200 (48bit)
3-4 & 5-6 & 7-8	2048 X 1536 (48bit)
1-2 & 3-4 & 5-6 & 7-8	LVDS Disabled

MSATA_SW : MSATA setting	
PIN NO.	DESCRIPTION
Short 1-2 (default)	Auto detect M-SATA
OFF	M-SATA Enable

USB_CON3 : External USB Connector	
PIN NO.	DESCRIPTION
1, 10	VBUS
2, 11	D1-
3, 12	D1+
4, 13	GND1
5, 14	STDA_SSRX1_N
6, 15	STDA_SSRX1_P
7, 16	GND_DRAIN
8, 17	STDA_STX1_N
9, 18	STDA_STX1_P

USB_CON2 : External USB Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	USB_VCC	2	USB_VCC
3	DATA-	4	DATA-
5	DATA+	6	DATA+
7	GND	8	GND

USB3 : Internal USB Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	USB_VCC	2	GND
3	DATA-	4	DATA+
5	DATA+	6	DATA-
7	GND	8	USB_VCC

KB_MS1: 6-pin Wafer Keyboard Connector	
PIN NO.	DESCRIPTION
1	VCC5_KBMS
2	MSDATA
3	MSCLK
4	KBDATA
5	KBCLK
6	KBGND

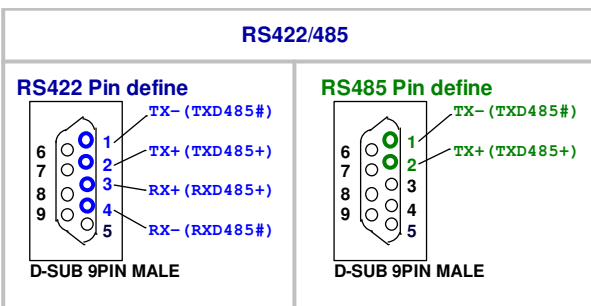
HDMI1,HDMI2 : HDMI Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	HDMI_DATA2	13	N/C
2	GND	14	N/C
3	HDMI_DATA2#	15	HDMI_SCL
4	HDMI_DATA1	16	HDMI_SDA
5	GND	17	GND
6	HDMI_DATA1#	18	+5V
7	HDMI_DATA0	19	HDMI_HPD
8	GND	20	HDMI_GND
9	HDMI_DATA0#	21	HDMI_GND
10	HDMI_CLK	22	HDMI_GND
11	GND	23	HDMI_GND
12	HDMI_CLK#		

VGA1: External Serial Port Connector		
PIN NO.	DESCRIPTION	
D1	DATA CARRIER DETECT	(DCD1)
D2	RECEIVE DATA	(RXD1)
D3	TRANSMIT DATA	(TXD1)
D4	DATA TERMINAL READY	(DTR1)
D5	GND	(GND1)
D6	DATA SET READY	(DSR1)
D7	REQUEST TO SEND	(RTS1)
D8	CLEAR TO SEND	(CTS1)
D9	RING INDICATOR	(RI1)

LAN1,LAN2 : RJ45 LAN Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LAN1_MDI0+	7	LAN1_MDI2+
2	LAN1_MDI0-	8	LAN1_MDI2-
3.	LAN1_MDI1+	9	LAN1_MDI3+
4.	LAN1_MDI1-	10	LAN1_MDI3-

COM1,2 : Internal Serial Port Connector	
PIN NO.	DESCRIPTION
1	-NDCD2
2	-NDSR2
3	NSIN2
4	-NRTS2
5	NSOUT2
6	-NCTS2
7	-NDTR2
8	-XRI2
9	GND
10	GND

COM3 : Internal Serial Port Connector	
PIN NO.	DESCRIPTION
1	RXD485#
2	RXD485+
3	TXD485-
4	TXD485#



AUDIO1 : Audio Source Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LFRONT-R	2	LLINE-R
3	GND	4	GND
5	LFRONT-L	6	LLINE-L
7	GND	8	GND
9	LMIC1-CONN-R	10	LMIC1-CONN-L

CN3: PCI-E Mini 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	CLK-	12	N/C
13	CLK+	14	N/C
15	GND	16	N/C
17	PCIRST#	18	GND
19	N/C	20	VCC3
21	GND	22	PCIRST#
23	PERN2	24	3VDual
25	PERP2	26	GND
27	GND	28	1.5V
29	GND	30	SMBCLK
31	PETN2	32	SMBDATA
33	PETP2	34	GND
35	GND	36	USB D-
37	N/C	38	USB D+
39	N/C	40	GND
41	N/C	42	N/C
43	N/C	44	N/C
45	N/C	46	N/C
47	N/C	48	1.5V
49	N/C	50	GND
51	N/C	52	VCC3

SATA1 \ SATA2 : Serial ATA 3.0 Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	5	RXN
2	TXP	6	RXP
3	TXN	7	GND
4	GND	8	N/C

CN1,CN2 : SATA Power CONNECTOR	
PIN NO.	DESCRIPTION
1	+V12S
2	GND
3	GND
4	+V5S

INVERTER1: Panel Power Supply	
PIN NO.	DESCRIPTION
1	BRIGHTNESS
2	GND
3	+V12S_LCD_BKL
4	GND
5	ENABKL

LVDS1: LVDS Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	GND
3	A_Y0	4	A_Y0#
5	A_Y1	6	A_Y1#
7	A_Y2	8	A_Y2#
9	A_CK	10	A_CK#
11	A_Y3	12	A_Y3#
13	GND	14	GND
15	B_Y0	16	B_Y0#
17	B_Y1	18	B_Y1#
19	B_Y2	20	B_Y2#
21	B_CK	22	B_CK#
23	B_Y3	24	B_Y3#
25	GND	26	GND
27	VCC/VCC3	28	VCC/VCC3
29	VCC/VCC3	30	VCC/VCC3

SYS_FAN1: System FAN CONNECTOR	
PIN NO.	DESCRIPTION
1	Rotation Signal
2	+12V
3	GND

FAN1: CPU FAN CONNECTOR	
PIN NO.	DESCRIPTION
1	GND
2	+V12S
3	Rotation Signal
4	PWM Control Signal

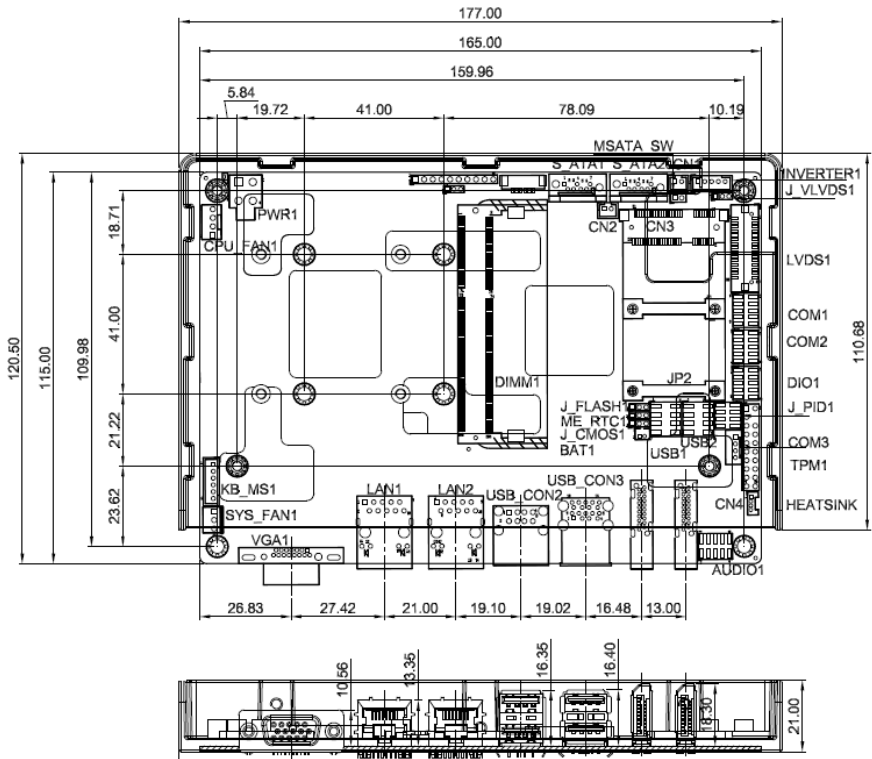
DIO1 : Digital Input / Output Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+V5S
3	DOUT3	4	DOUT2
5	DOUT1	6	DOUT0
7	DIN3	8	DIN2
9	DIN1	10	DIN0

F_PANEL1 : External Switches and Indicators panel					
Function	PIN	DESCRIPTION	Function	DESCRIPTION	PIN
	1	NC	PWR_LED	LED_PWR	6
PWR_BTN	2	GND		LED_PWR	7
	3	PWR_BTN-		GND	8
HDD_LED	4	IDE_LED_PWR	RESET	EXTRST-	9
	5	SATA_LED#		GND	10

PWR2: Power Supply DC12V Power IN			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	GND
3	+12V	4	+12V

BAT1 : Battery Connector	
PIN NO.	DESCRIPTION
1	VBATT
2	GND

Board Layout: Jumper and Connector Locations



(Unit: mm)