

Seaberry Pi

USER'S MANUAL

Revision: A.01

Release date: November 21, 2021

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Chapter 1. Introduction

1-1 FEATURES

The Seaberry Pi is a full-featured Raspberry Pi CM4 (Compute Module 4) carrier board in a standard Mini-ITX form factor that exposes the PCIe bus to a variety of different connector types, which include:

- Standard Mini-ITX form factor board, 170 mm x 170 mm
- Connector for standard Raspberry CM4 module (Regular or Lite)
- One 16-lane size vertical PCIe connector with x1 lane implementation (standard Mini-ITX location)
- One 1-lane PCIe side port connector (to allow to plug standard x1 PCIe add-on card on a left side)
- Four (4) PCIe Mini slots implementing x1 PCIe lane, USB 2.0, and I²C interfaces
- Four (4) PCIe M.2 Key E slots implementing two x1 PCIe lanes with LED indicators, USB 2.0 interfaces
- One PCIe M.2 Key M slot to allow M.2 2280 NVME SSD implementing x1 PCIe lane
- PCIe link LED indicators
- Connector for Raspberry HAT with standard pinout
- Two 12 V power input connectors - one internal, one external, which are mutually inclusive to support power failover
- One 10/100/100Mbit network RJ-45 also capable of PoE 802.3bt power handling (100W)
- Two HDMI output ports
- Two USB 2.0 ports
- One RJ-45 implementing CISCO style RS232 serial console
- 40-pin classic Raspberry Pi HAT header
- Programming control identical to the CM4 I/O board, which include:
 - One MicroSD card slot to program the CM4 Lite
 - One Micro USB port to program the CM4 (not Lite) eMMC
 - 2x7 header for jumper-selected settings/controls
- One MIPI CSI-2 camera interface (15-pin, 1mm pitch cable)
- One MIPI DSI display interface (15-pin, 1mm pitch cable)
- Real-Time clock with external battery interface
- One standard PWM fan connector
- One standard SATA power header
- One PoE 4-pin header identical to CM4 I/O board and Raspberry Pi 4

Chapter 2. Connectors

2.1 Main Power Input

Warning! Use only regulated high quality DC power source. 12Vdc routed directly to PCI x1, x16 slots and a fan connector without overvoltage protection!



Connector J21 is standard 5.5mm with 2.5mm center contact is main power input. It is rated to 10A which is enough to populate all PCI slots with cards meeting PCI power specification. Part number is CUI PJ-082BH. Connect compatible center positive power supply.

2.2 Auxilary Power Input



Widely used in industrial applications 2-pin connector J17 (part number Wurth 64900221122) is used as auxiliary power input.

Pin No	Signal
1	Gnd
2	+12Vdc

2.3 Ethernet



Ethernet connector J25 is IEEE 802.3bt compatible. If powered by PoE sourcing equipment, this voltage is available at header J42.

2.4 PoE Power Input



A PoE HAT is required to use power Seaberry from a PSE (Power Source Equipment). Connect HAT to connector J42 (part number Wurth 61300421121).

Pin No	Signal
1	Pair2
2	Pair3
3	Pair1
4	Pair4

2.5 HDMI Output



Standard size HDMI connectors J6 and J7 for display devices.

2.7 Micro SD Card



Push-pull socket J20 accepts micro-SD card. Use it with CM4Lite modules.

2.7 Micro USB Connector



Connector J19 is populated to enable the CM4 to be updated via rpiboot.

2.8 Serial Console



J26 adds serial console connection to CM4. It's type (RJ45), physical interface (RS232) and pinout allow usage of USB-RJ45 or DB9-RJ45 serial cables.

Pin No	Signal
1	No connect
2	No connect
3	Transmit
4	GND
5	No connect
6	Receive
7	No connect
8	No connect

2.9 USB 2.0 Connectors



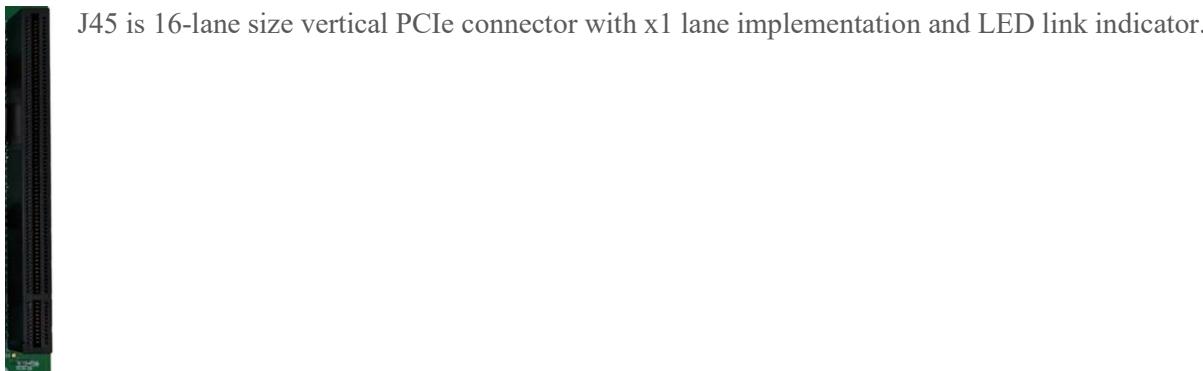
Connect keyboard, mouse, or other devices compatible with USB 2.0 specification to connectors J8 and J9. VBUS is limited to 500mA.

2.10 CM4 Module Connectors



Two 100-pin connectors J1-1 and J1-2 accept CM4 module. Four M2.5mm standoffs are populated allowing attachment of a heatsink.

2.11 PCIe Gen2 x16 Connector



2.12 PCIe Gen2 x1 Connector



J40 is a x1 lane PCIe side port connector and LED link indicator.

2.13 NVMe socket



J27 is PCIe x1 lane Key M slot with LED indicator. It accepts NVMe SSD in 2280 form-factor.

2.14 MINI PCIE SOCKETS



Connectors J2, J3, J4, J5 are full size mini-PCIe slots with x1 lane and LED link indicator.

2.15 PCIE M.2 SOCKETS



J13, J14, J15, J16 are M.2 Key slots. Each provides two x1 PCIe links and LED link indicator.

2.16 CAMERA INTERFACE



15-pin, 1mm pitch FPC connector J23 provides MIPI camera interface. Its pinout follows Raspberry Pi conventions.

Pin No	Signal
1	GND
2	CAM_DN0
3	CAM_DP0
4	GND
5	CAM_DN1
6	CAM_DP1
7	GND
8	CAM_CLKN
9	CAM_CLKP
10	GND
11	CAM_GPIO0
12	CAM_GPIO1
13	SCL0
14	SDA0
15	3.3V

2.17 DISPLAY INTERFACE



15-pin, 1mm pitch FPC connector J22 is a CSI-2 display interface. Its pinout follows Raspberry Pi convention.

Pin No	Signal
1	GND
2	DSI_DN1
3	DSI_DP1
4	GND
5	DSI_CLKN
6	DSI_CLKP
7	GND
8	DSI_DN0
9	DSI_DP0
10	GND
11	SCL0
12	SDA0
13	GND
14	3.3V
15	3.3V

2.18 POWER OUTPUT



External power connector J25 (part number Wurth 61900411121) comes handy to provide power to PCIe cards that require an external power source.

Pin No	Signal
1	5.0V
2	GND
3	GND
4	12.0V

2.19 JUMPERS



Pinout of J46 is identical to Raspberry Pi IO Board.

Pin No	Function
1-2	nRPIBOOT If fitted forces USB booting
3-4	EEPROM nWP If fitted write protects the EEPROM on the CM4
5	AIN0 MXL7704 analog input
6	AIN1 MXL7704 analog input
7	Analog GND
8	SYNC IN
9	SYNC OUT
10	GND

11	TV OUT
12	GND
13-14	Connect a push button to wake up the CM4 from low power mode. It can't be used to shut down the CM4

2.20 FAN CONNECTOR



J48 (Molex 0470531000) allows connecting standard 12V fans with PWM control and tacho feedback. Terminate a fan with Molex 0470541000 or similar housing.

Pin No	Signal
1	GND
2	12.0V
3	Tacho In
4	PWM out

2.21 RASPBERRY PI HAT CONNECTOR



Dual row connector J18 matches a standard Raspberry Pi 40-pin header. Four mounting holes are also provided.

2.22 REAL-TIME CLOCK BATTERY INTERFACE



Seaberry board incorporates an RTC. If battery backup is required, connect it at J41. It is provisioned for a latch connector Molex 0530470210, but to accommodate variety of backup batteries available is not populated. Observe polarity according to the table below.

Pin No	Signal
1	+3V
2	GND

2.23 POE INTERFACE



The PoE signals from Ethernet connector are brought to the header J42 (Wurth 61300421121). Connect PoE HAT observing polarity:

Pin No	Signal
1	Pair2
2	Pair3
3	Pair2
4	Pair4

Chapter 3. Circuit Diagram

