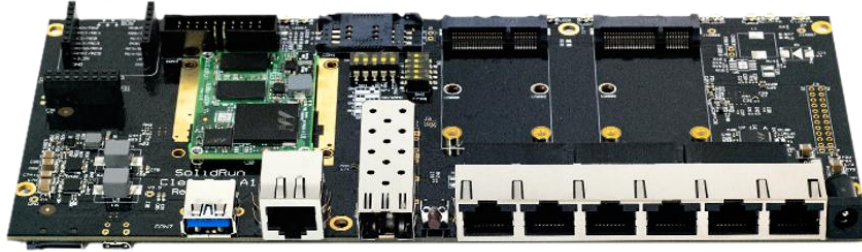


ClearFog | **SolidRun Evaluation Board**



Users' Manual

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REVISIONS AND NOTES

Revision	Date	Notes
1.0	10 January 2017	First Release

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1. OVERVIEW

1.1 General Information

The SolidRun Clearfog PRO is a high performance Evaluation Platform featuring **SolidRun's MicroSoM (A38x-uSoM)**. It provides a base for building various applications and fits well with a wide range of various target markets requiring high performance processing power, connectivity and storage interfaces. The SolidRun Clearfog PRO has compact dimensions and a low power consumption, utilizing an ARM Cortex A9 Single/Dual CPU.

SolidRun Clearfog PRO Evaluation Board components are listed here:

- SolidRun Clearfog PRO Carrier Board
- A38x – uSOM for the SolidRun Clearfog PRO
- Power adapter
- Heat sink
- Enclosure (optional)
- Micro SD card (optional)
- Officially released distributions
 - Open WRT
 - Yocto

Please contact SolidRun support for further information: support@solid-run.com.

1.2 Summary of Features

Listed here are the available features of the product:

- **Marvell ARMADA 38x series SoC Single/Dual ARM® Cortex™-A9 Core at 1.6 GHz**
- 1 GB DDR3 RAM
- 4 MB NOR Flash [storage memory / boot]
- MicroSD based storage (Can be replaced with an on-board eMMC)
- M.2 slot supporting 2242 SSD modules
- Two slots supporting either Mini PCIe or mSATA SSD modules
- One SIM Card holder for Mini PCIe cellular modem
- 10/100/1000 Mbps Ethernet WAN port
- SFP frame
- Six switched 10/100/1000 Mbps Ethernet LAN ports
- One USB 3.0
- Telephony/Audio header supporting PSTN and analog audio modules
- MicroBus Header supporting serial interfaces such as SPI , UART, etc.
- Serial communication over MicroUSB for development purposes
- JTAG Interface for low level development and debug
- Power over Ethernet (PoE) Header (optional module)
- RTC Backup battery
- 9-32V power supply

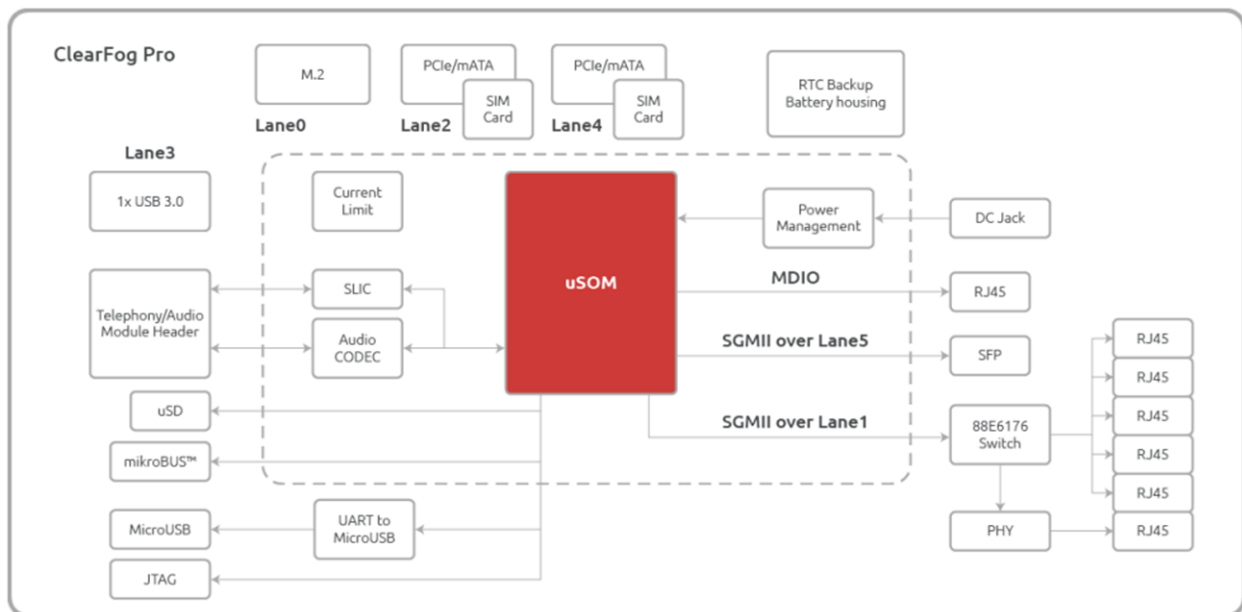
Other elements on the board are:

- Push button connected to a GPIO.

- LEDs:
 - One power indicator
 - One pair of LEDs for each RJ45
 - Link / Activity indicator
 - 1000 vs. 10/100 indicator
- MicroUSB to UART – Please see <http://wiki.solid-run.com/doku.php?id=products:imx6:microsom:usbuart>

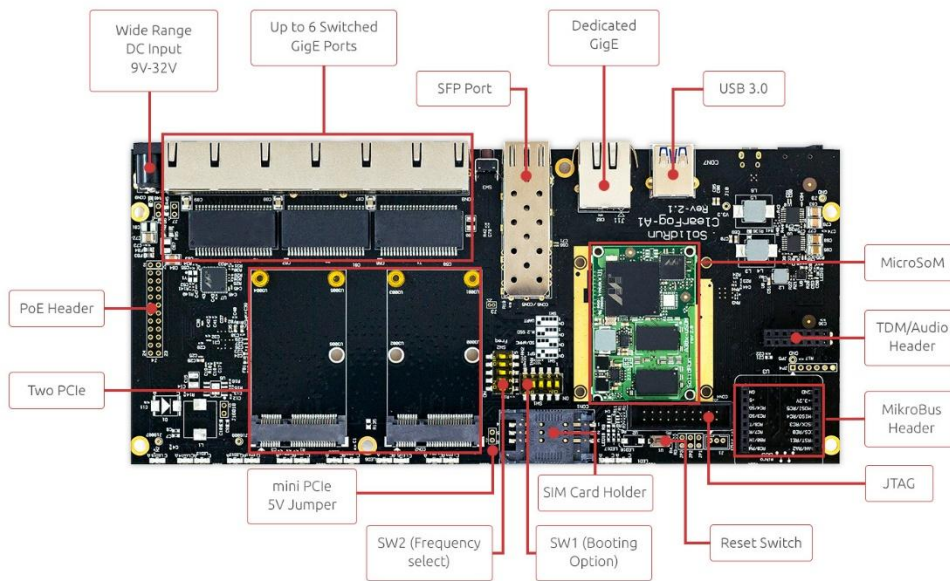
1.3 Block Diagram

SolidRun Clearfog PRO Evaluation Board block diagram is shown here. It displays all relevant interfaces of it. For further details please visit www.solid-run.com and wiki.solid-run.com:

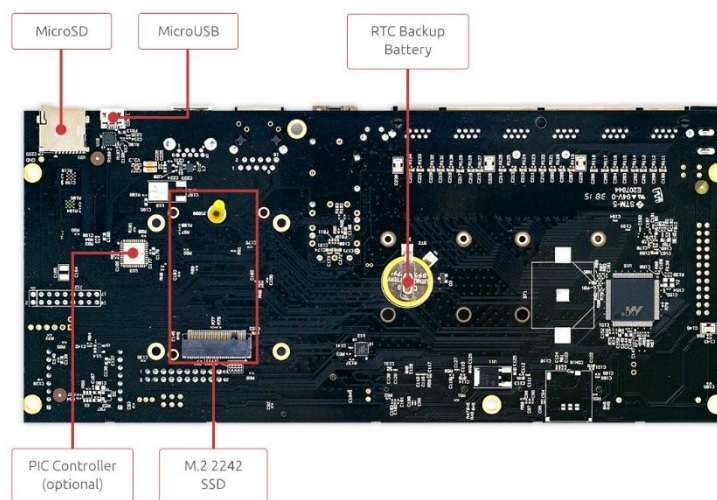


2. MAIN HARDWARE COMPONENTS

This chapter shows the main hardware components and interfaces of the SolidRun Clearfog PRO Evaluation Board, including the A38x-uSoM MicroSoM.



Top view of SolidRun Clearfog PRO Evaluation Board.



Bottom view of SolidRun Clearfog PRO Evaluation Board.

3. CONNECTOR LAYOUT

SolidRun Clearfog PRO Evaluation Board has standard interfaces. The non-standard interfaces are listed here:

1. MicroBus Header
2. TDM Telephony Audio Header
3. Power over Ethernet (PoE) expansion header

Please refer to the previous chapter for their specific location on the board.

The schematics by components can be found in our wiki pages, please look for the file under the product documentation tab.

4. INSTALLATION AND SWITCHING ON

This chapter explains how the SolidRun Clearfog PRO Evaluation Board is packaged and how to prepare it for usage and how to power it on in its default stage. This relates also to the block diagram in chapter 2.

5.1 Unpacking your SolidRun Clearfog PRO

The package contains:

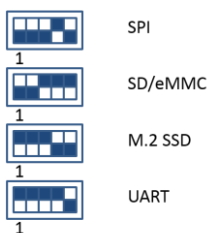
- Clearfog Pro Board
- MicroSoM A388
- Heat Sink
- Power adapter, 110V/220V (optional)
- SD card, 8GB (optional) / eMMC
- Aluminum Enclosure (optional)
- **Users' Manual**

5.2 Power

A suitable external power supply is to be connected to the DC jack, which has the dimensions 5.5 x 2.1 mm. The power supply needs to be in the range of 9-32VDC. Recommended voltage is 12VDC

5.3 SD card with operating system and boot select

You will need to download an operating system to an SD card in order to operate the system. You can download officially released distributions at www.solid-run.com. In addition there are also several community released distributions available for usage. Once downloaded and flashed to the SD card needs to be inserted into its slot on the Clearfog PRO Evaluation Board. Before you start using the board, we recommend to make sure to start the system from SD card by defining the booting media. In order to determine the booting media, please set the S1 switch according to second option (SD/eMMC) as in the following graphic:



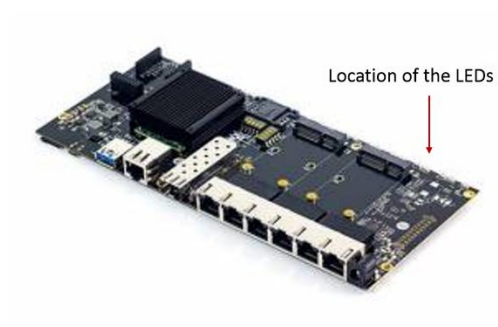
For additional insights on operating system, please visit our home page, choose Support → Learning Center → getting started → downloads.

5.4 Micro USB connectivity (UART to micro-USB)

The Clearfog PRO Evaluation Board can boot also connected to an external terminal on a serial port as a console by using a micro-USB cable and making a serial connection. This configuration is typically used by developers for debugging purposes (e.g. kernel or drivers). Such serial console connection is of USB-to-UART type. The connection speed is to be set to 115200 bps. Further information is displayed on our wiki page with tags #usbuart and #serial and #console.

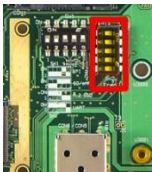
5.5 LEDs

There are port related LEDs on the Clearfog Pro Evaluation Board. These are indicating for example power on, connection and port activity. For further details, please refer to our wiki.solid-run.com pages.



5.6 Clock options

For frequency configuration a dip switch is used. The default setting is the off-position for all 5 switches as in the picture here:



Please refer to wiki.solid-run.com for various settings for different frequencies.

5.7 SIM card holder

It is possible to utilize a Cellular connection by inserting a SIM card into the SIM card holder. Please observe that a GSM modem needs to be installed utilizing the mini PCIe connection.

5.8 Additional Components

The components listed here are also needed for starting to use the Evaluation Board:

- SD card with installed OS (officially released distribution)
- Suitable Power Adapter

5. OPERATIONAL DATA

The following tables provides details on operational values:

6.1 Operating Voltage

Item	Minimum	Maximum	Unit
Mains/ Power Supply	9.00	32.00	V

6.2 Environmental Data

Item	Minimum	Maximum
Ambient Temperature Range (Commercial)*	0°C	+70°C
Ambient Temperature Range (Industrial)*	-40°C	+85°C**
Humidity (non-condensing)	N/A	75%

Note: Any environmental data ranges are based solely on the carrier board components. The customer needs to consider its specific thermal and mechanical design for a final product, including but not limited to housing, depending also on specific operational and environmental conditions.

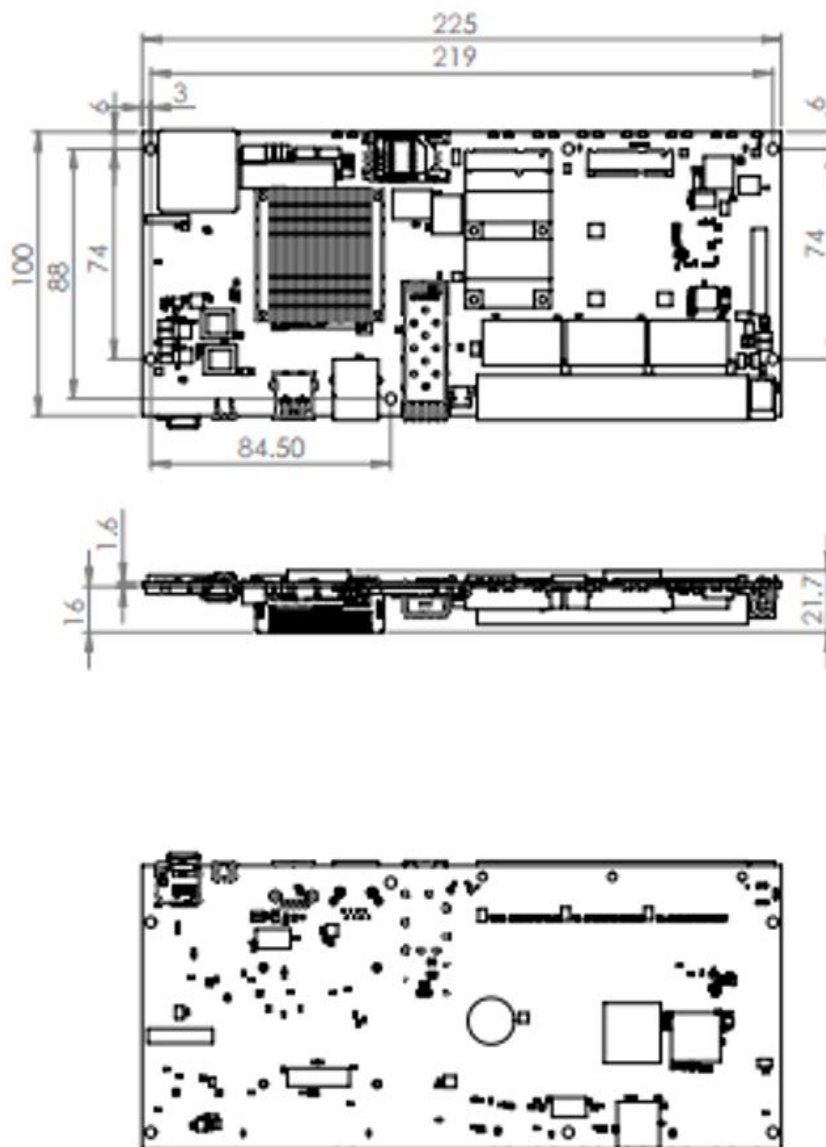
*Armada 38x SoC has a maximum die temperature of 115°C regardless of ambient temperature and temperature ratings.

**Safety Note: Please observe that the used RTC has a maximum temperature range of +70°C. In order to utilize the full range of the industrial temperature range, another RTC has to be used.

6. MECHANICAL DRAWINGS AND DIMENSIONS

For product design purposes, this chapter provides the SolidRun Clearfog PRO Evaluation board's dimensions and component positions on the board on both sides.

A-Board Base Top, Side and Bottom View [225x100 mm]



CAD files are available for download at www.solid-run.com

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Compliant with:

- ROHS Standard

8. WARRANTY TERMS AND CONDITIONS

SolidRun guarantees its hardware products against defects in workmanship and material for a period of one (1) year from the date of shipment. **Under warranty, the customer's sole remedy and SolidRun's sole liability shall be, at SolidRun's sole discretion, to either repair or replace the defective hardware product at no charge.**

This warranty is void if the hardware product has been altered or damaged by an accident, misuse or abuse.

About additional information on warranty and related topics like RMA, please visit www.solid-run.com.

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9. CONTACT INFORMATION AND RESOURCES

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