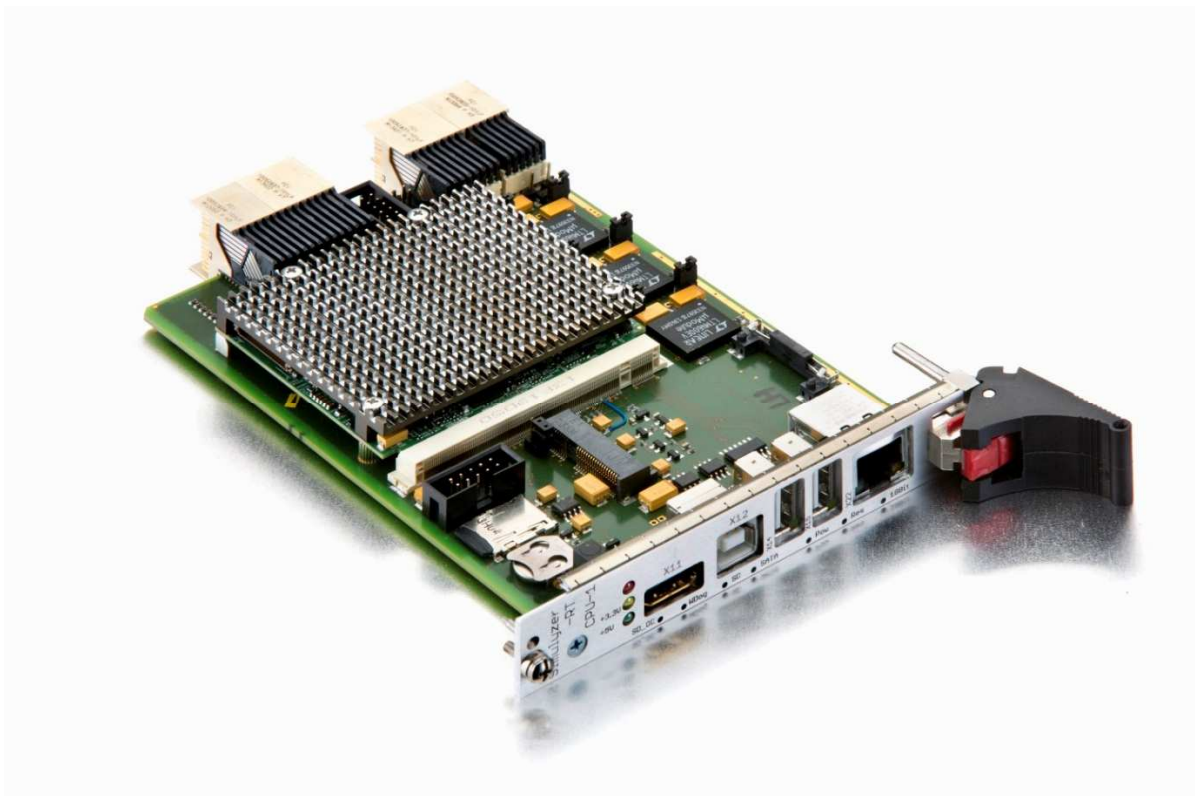


Simulyzer-RT CPU-1 Card



Hardware version	1.1_a
Documentation version:	1.0 1.1 Jan 2016 Added chapter 1. start up 1.2 April 2016 Note HF sealing spring
Created:	April 2015
Order no:	1.1001

Safety instructions

To avoid damages to persons and devices the following safety instructions have to be noticed!

- Only qualified personnel are allowed to handle this device!
- Before any handling within the device the current supply has to be switched off!
- During operation the device have to be positioned, that enough air condition is supplied and no small parts can get into the ventilation slots.
- In case of any trouble the system has to be switched de-energized!
- The declared environmental conditions and max. voltage ranges have to be observed!
- To warranty the device remove all dust and dirt in periodically intervals.
- Make sure that the ventilation slots are unobstructed!

Intended use:

**The Simulyzer-RT CPU-1 is engineered for use as a CPU within a Simulyzer-RT system.
Each Simulyzer-RT-System has to have this CPU card mandatory.
Peripheral devices are allowed to use in any user defined application.**

- The device is only permitted to use for the intended use.
Any other use results the deletion of the guarantee!

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1. Start up

The CPU-1 card is delivered without applied battery, which means with a separate packed battery.

To start up the CPU-1 card an IP-address have to be set.

If date and time for access dates of files or log entries is necessary, it is **mandatory** that the battery is applied and date and time is set!

1.1 Setting of an IP address

The CPU-1 has a preinstalled fixed IP address of 192.168.4.64.

For establishing first communication you have the selection of

- Using the Console-connection via SesKion "Console-USB cable".
- Supply your host PC with a network interface of IP address 192.168.4.xx, connect it with network cable to the CPU-1 card and try a ssh connection.

If connection is done one-time you may change IP address settings by editing the file `/etc/network/interfaces` (by using vi). For changing to another fixed IP address, simply change the `address` field below the `iface eth0` line.

Example:

```
iface eth0 inet static
    address 192.168.0.97
    netmask 255.255.255.0
    gateway 192.168.0.1
```

For establishing automatic interface configuration with DHCP protocol, replace static with dhcp.

Example:

```
iface eth0 inet dhcp
#    address 192.168.0.97
#    netmask 255.255.255.0
#    gateway 192.168.0.1
```

After you have saved your changes,

- reboot by typing `reboot`,
- a shell with root privileges or
- simply Power Off and ON to activate your new settings

1.2 Apply the battery

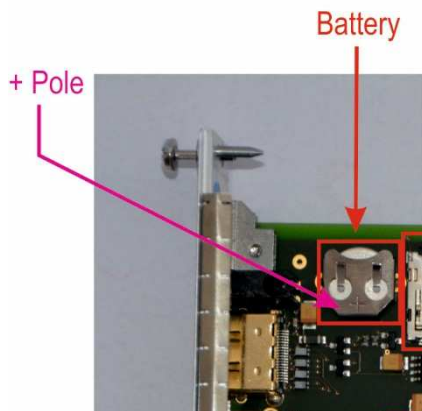
Remove the packaging of the battery.

Put the battery sideways into the battery-equipment until the battery is locked noticeably.

Please notice the polarity of the battery!



Separately packed lithium battery (manufacturer can varied)



1.3 Settings of time and date

Linux system time is taken from a battery buffered hardware clock during boot time. Therefore the system time is always be valid. In some special cases the buffering of the hardware clock fails. This cases can be caused by low battery capacity or removed battery. If this happens the system time and date reverts to Jan. 1. 2000 00:00 and have to be set manually to the actual time and date.

Example:

```
root@localhost:~# date
Sat Jan 1 00:00:38 UTC 2000
root@localhost:~#
```

Failed hardware clock time; since power-on and boot process, 38 seconds have elapsed.

1.3.1 Setting the actual time to the linux system clock (software clock):

```
root@localhost:~# date 110610242014.30
Thu Nov 6 10:24:30 UTC 2014
root@localhost:~#
```

The string **110610242014.30** for the date and time to be set includes:

- **11** The month, in this case November
- **06** The day of the month
- **10** The hour
- **24** The minute
- **2014** The year
- **30** The seconds

1.3.2 Synchronization of the hardware clock from the Linux system time:

```
root@localhost:~# hwclock -w
root@localhost:~#
```

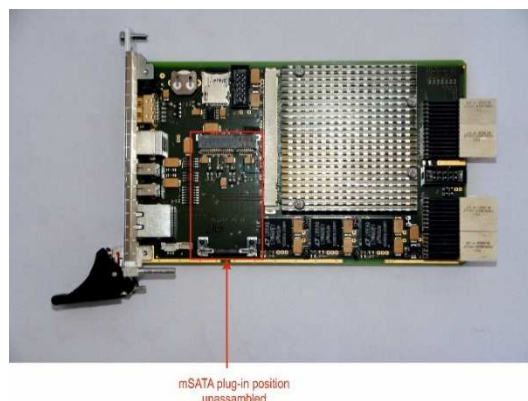
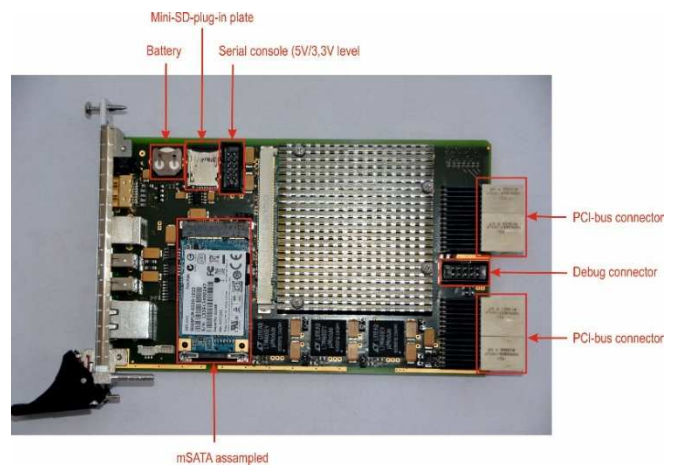
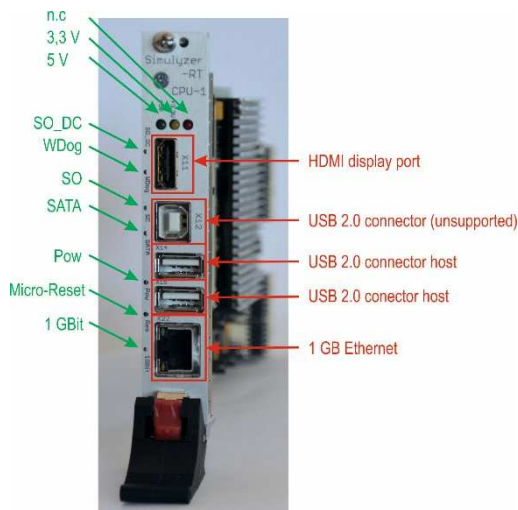
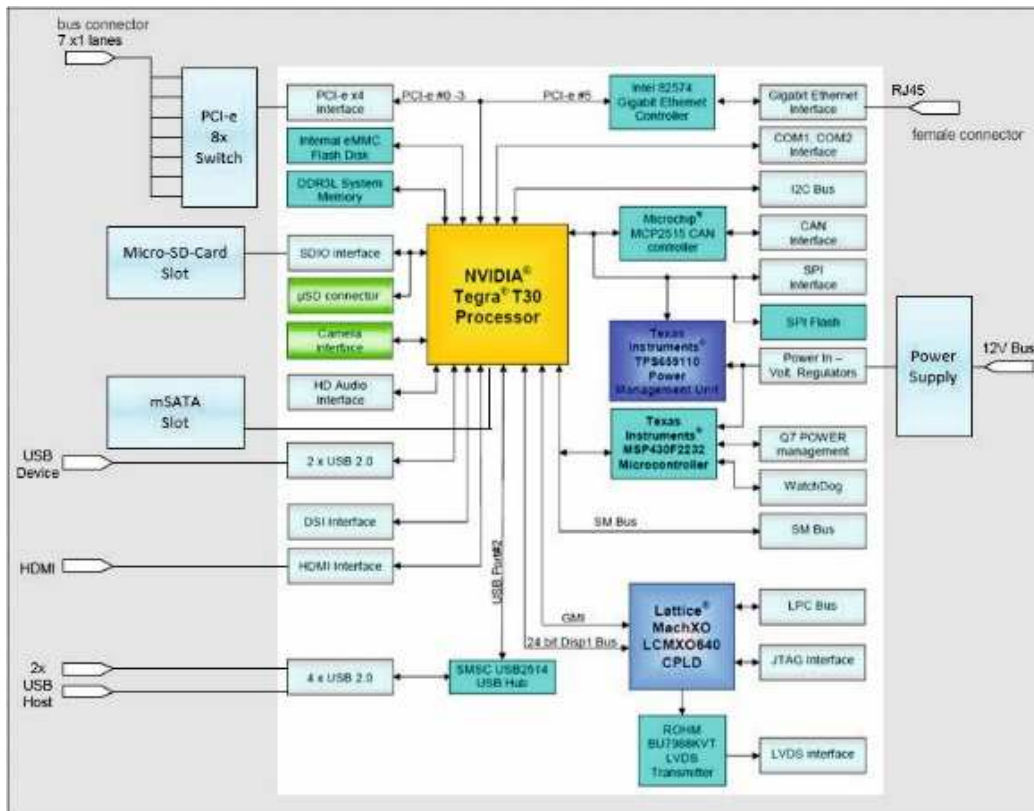
Now time and date are valid and run again from battery power during CPU-1 card is powered off.

2. Technical data

- NVIDIA® Tegra® T30 w/ Quad ARM® CORTEX -A9;
MPCore™ CPU, 1.3 GHz per core
- Dimensions: Euroformat, 4 U
- Current consumption: 12V / 0.7A
- Environmental temperature: 0°C ... 40°C (32° F ... 104°F)
- Rel. Humidity: Max. 85% not condensed
- Weight: 0,25 kg

Test conditions: Environmental temperature 20°C to 26°C (68°F to 78,8°F)						
Num	Evaluation	Symbol	typ.	min.	max.	Note
1	Permitted voltage range	U_{supp}	12V	11.4V	12.6V	
2	Current consumption	I_{supp}	680mA	-	750mA	Without USB devices, mSATA Modul and Micro-SD

3. Block diagram



4. Connectors/Interfaces

- Connectors to bus: 7xPCIe Lanes to peripheral cards, SATA-II Interface
 Current consumption: I2C parallel to all cards (synchronization)
 Connectors front:
- 1GB-Ethernet,
 - USB Device,
 - USB Host,
 - HDMI Disp.Port,
 - LEDs,
 - Micro-Reset

5. Storage

- Working space: 2GB DDR3L RAM
 Bulk storage:
- Micro-SD-Card
For automatical detection a PowerOn hast to be done after plug-in!
 - mSATA Gen 1 plug-in (e.g. for SSD)
The plug-in is mounted after PowerOn!
 - 4GB FLASH (Q-seven-Modul)
 - 2 x USB-Interface -
are detected during operation!

6. Operating system

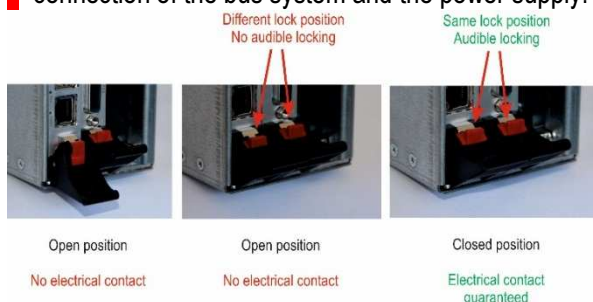
Linux Kernel 3.0.8 (alternative Android)

A detailed description of the LINUX commands are given at the documentation sheet „Simulyzer-RT Linux Commands”

- **Boot procedure:**
 U-Boot v2011.03-SVN1024 (The Universal Boot Loader)
 Linux boots from the FLASH file system or USB stick at the USB host connector.
- **Debugging**
 Debug console (UART) with 115kBaud, 1 start, 8 date, 1 stop bit
- **Realtime clock**
 Realtime clock with battery buffering.

7. Handling card/chassis

Pay attention that the ejection lever of the plug-in card is arrested correctly. Only the correct position guarantees a justly connection of the bus system and the power supply!



Note

The forcible insertion of the card with displaced HF-sealing spring will damage them. As a result of that HF energy emission will be increased!

Only with intact HF-sealing spring we guarantee that the whole system confirms to the EMC guidelines.

HF-sealing spring