REVOLUTION PI

Updated Raspbian Stretch

The image is based on Raspbian Stretch 2018-11-13 and includes all Raspbian package updates released until mid-March 2019.

The kernel is 4.9.76-rt60 as before.

Support of the Compute Module 3+

The image works with the 4 GByte eMMC of the CM1 and CM3 as well as with the 8, 16 or 32 GByte eMMC of the CM3+.

When logging in for the first time, the root partition is expanded to the full size of the eMMC.

To be exact, the last partition in the partition table is expanded. By default, this is the root partition.

Users have the option of building their own images. For example, by creating a small root partition followed by an additional data partition, the latter could be expanded to the full size of the eMMC.

Faster flashing

The free space on the root partition is no longer contained in the image, so that it only contains about 3 GByte. This is realized by reducing the root partition to a minimum when building the image and expanding it when logging in for the first time. Compared to our previous 4 GByte images, this accelerates the flash process by about 25%, specifically to about 490 instead of 650 seconds for the CM3. With the 8 and 16 GByte variant of the CM3+, flashing is about 10 seconds faster again, with the 32 GByte variant even 20 seconds.

Expanding when logging in for the first time happens almost instantaneously. Only on the CM3+ with 32 GByte it takes slightly longer (a few seconds) because of the size of the eMMC, also on the CM1 because of the slower eMMC.

piControl

The communication with RevPi gateways was newly implemented with the purpose of increased stability. Thus, the simultaneous operation of the Con CAN module with a gateway at the RevPi Connect is now also possible.

Gateway communication takes place via SPI Ethernet chips at the PiBridge connection. The RevPi Core has two, the RevPi Connect one.

The old implementation accessed the chips directly, bypassing the Linux network stack. With the new implementation, however, the chips are integrated as regular Ethernet interfaces under Linux and piControl communicates with connected gateways via the native Linux network stack.

The Ethernet interfaces are called "pileft" and "piright" for better differentiation. If one of the interfaces is shut down and restarted with "ifconfig", piControl resiliently reacts and automatically resumes gateway communication. The interruption is logged in /var/log/kern.log.

The gateway communication cannot be disrupted even by high system load. An exception applies to the CM1 because of its slow single Core processor; here, for example, brief interruptions of gateway communication can occur if the graphical user interface is used at the same time.

If two gateways are operated on the CM1, the response time of the system also drops considerably. We recommend connecting at most one gateway to the CM1. On the CM3 and CM3+, however, two gateways can also be used without noticeable performance influence.

As before, the source code of piControl is disclosed on GitHub and has been significantly streamlined in the course of the new implementation.

Connectivity via PiBridge

Since the Ethernet chips at the PiBridge connection are now visible as regular network interfaces under Linux, it is possible to network several RevPi Cores via the PiBridge. A RevPi Connect can also be connected to the right end of such a chain.

Each device can communicate with its immediate neighbors. Communication across several devices is possible by configuring a suitable routing or bridging. Details will be explained in a separate tutorial.

Potential applications are high availability (using Pacemaker), load sharing (bonding the USB-Ethernet interface with an Ethernet interface from PiBridge) or distributed computing (clustering e.g. with Kafka, Hadoop).

Since piControl is not yet prepared for several RevPi Cores on the PiBridge, it must first be switched off by commenting it out in /etc/modules. Also, no I/O modules and gateways may be in such a RevPi Core chain at the moment.

PiCtory

PiCtory can now search for Modbus TCP devices in connected networks by scanning port 502 at the push of a button. If devices are found, PiCtory adds a virtual Modbus TCP master to its device list and enters found devices as slaves. Users only have to configure the registers to be accessed via Modbus. This "Device Scan" function can be accessed via the Tools menu.

Another new feature is the "Auto Save" function. This function can be activated in the "User Settings" and provided with a user-specific interval.

For encoders of DIO modules, user inputs are better validated. In addition, isolated bugs and browser incompatibilities have been corrected.

Third-party software

Procon Web IoT has been updated to release 6.3.7.0. This new version contains numerous bugfixes, corrections and stability improvements.

The connection to logi.RTS was developed from scratch.