Baumer
Passion for Sensors

Application Note

Baumer GAPI SDK for Raspberry Pi® 3 with Raspbian OS

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Description
This document explains how to install the ARM®-based single board computer Raspberry Pi® 3 Model B for the usage of Baumer Industrial Cameras.

Products
Raspberry Pi® 3 Model B
Baumer GAPI SDK Linux® - Raspbian
Baumer GigE Industrial Cameras

Preparation
Prior to installation of the Baumer GAPI SDK on the Raspberry Pi® 3, install the operating system (OS) "Raspbian". This requires a Micro-SD-HC Card and a PC to download and flash the OS on the memory card. For further information see chapter 2 – Getting started.

Contents

1 Technical Background

The Raspberry Pi® is a single board computer with an ARM®-based central processing unit (CPU).Here, the board Raspberry Pi® 3 Model B is used. It's a quad-core CPU is based on the ARM® Cortex® A53 architecture and it further integrates a graphics processing unit (GPU). The Raspberry Pi® 3 supports maximum data rates of up to 100 Mbit/s. It therefore is necessary to reduce the data rates of the – applied camera. For more information see chapter 2.3.

2 Getting Started

2.1 Installing a new OS on Raspberry Pi®

First download the image file from the following link:
https://www.raspberrypi.org/downloads/raspbian/

Then, follow the guide on the webpage to install the new OS:
https://www.raspberrypi.org/documentation/installation/installing-images/README.md

Or use the quick start guide:
https://www.raspberrypi.org/help/quick-start-guide/

After the Raspbian OS has been installed you can start the board by connecting it to the power supply which comes via the micro USB connector. The first boot of the board starts a configuration menu. There you can resize the partition of your SD card to use all available space. We recommend doing this. In this menu you can also change the password and decide if the Raspberry Pi® should boot into the graphical desktop environment. The configuration menu can always be started by the following command:

```
# sudo raspi-config
```

Note: Please refer to the Installation Guide for Linux on how to connect a camera, aquire images and build an application.

2.2 Installing Baumer GAPI SDK

To install the Baumer GAPI SDK download the Raspbian software package from the Baumer website (www.baumer.com). You can download the software package directly to the Raspberry Pi® by connecting it to the internet. Then install the software by using the Linux® terminal. Branch to the directory where the downloaded file is stored (e.g. /home/user/Downloads).
The file is called "baumer-gapi-sdk-linux-vxxxxx-Raspbian-Jessie-raspberry-pi3.deb". [1]
Start the installation by executing the following command:

```
# sudo dpkg -i  baumer-gapi-sdk-linux-vxxxxx-Raspbian-Jessie-raspberry-pi3.deb [1]
```

[1] xxxxx is a version number

2.3 CPU Usage and Power Consumption

Frame Rate	Data Rate	Power Consumption	CPU Usage
5 fps	95 Mbit/s	2.9 W	19 %
10 fps	191 Mbit/s*	3.8 W	8 %

Table 2: CPU Usage and Power Consumption

Table 2 shows the CPU Usage and Power Consumption of the Raspberry Pi® 3 (Model B) while constantly getting pictures from a Baumer GigE industrial camera. For that the Baumer SDK example 001 (image acquisition by polling) with an increased amount of requested images was used.

Note: This was measured with optimized network configuration.

*) To get a higher data rate at the Raspberry Pi® 3 a USB3.0 to Gigabit-Ethernet adapter was used. With such an adapter it is also possible to use a higher packet size.

3 Support

In the case of any questions or for troubleshooting please contact our support team.

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4 Legal Notes

Baumer Group

The Baumer Group is one of the worldwide leading manufacturers of sensors, encoders, measuring instruments and components for automated image-processing. Baumer combines innovative technologies and customer-oriented service into intelligent solutions for factory and process automation and offers an unrivalled wide technology and product portfolio. With around 2,600 employees and 38 subsidiaries in 19 countries, the family-owned group of companies is always close to the customer. Baumer provides clients in most diverse industries with vital benefits and measurable added value by worldwide consistent high quality standards and outstanding innovative potential. Learn more at www.baumer.com on the internet.

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