Baumer
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Application Note

Baumer GAPI SDK for ODROID-XU4 with Linux® Ubuntu®

AN201521/0.6/2018-03-09

Description
This document explains how to install the ARM®-based single board computer ODROID-XU4 for the usage of Baumer Industrial Cameras.

Products
Hardkernel ODROID-XU4
Baumer GAPI SDK Linux® - Ubuntu®
Baumer GigE Industrial Cameras

Preparation
Prior to installation of the Baumer GAPI SDK on ODROID-XU4, the operating system (OS) Linux® Ubuntu® 16.04 must be installed on the platform. For further information see chapter 2 – getting started.

Contents

1 Technical Background

The ODROID-XU4 is a single-board computer with an ARM®-based central processing unit (CPU). It's an octa-core CPU based on the ARM® big.LITTLE technology. It includes four ARM® Cortex® A15 cores and four ARM® Cortex® A7 cores. It also integrates a graphics processing unit (GPU) based on the ARM® Mali technology. The ODROID-XU4 supports Gigabit Ethernet and USB3.0. For the GigE interface data rates of up to 880 Mbit/s are specified by Hardkernel.

2 Getting Started

2.1 Installing a new OS on ODROID-XU4

Installing a new OS on the ODROID-XU4 requires a host PC (we recommend using Ubuntu® 16.04). It is necessary to install the OS version Linux® Ubuntu® 16.04 (20161125) on the ODROID-XU4.

First download the *Ubuntu® 16.04 Image* from the following link:
http://odroid.com/dokuwiki/doku.php?id=en:xu3_release_Linux® Ubuntu®

There is an issue downloading the file with Windows®. Therefore we recommend downloading the image file with a Linux® PC.

To install the OS on the ODROID-XU4 follow the guide on the Hardkernel website:
http://odroid.com/dokuwiki/doku.php?id=en:odroid_flashing_tools

Note: It is possible to use a SD card or an eMMC which can be ordered from the Hardkernel website. We tested the installation with a SD card type Micro-SD-HC Class 10 with a size of 16GB.

After the image has been installed, we recommend starting the application "ODROID Utility" which can be found on the desktop. From this application you can resize your file system. This allows the usage of the complete space of the used SD card.

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 ODROID-XU4 software package from the Baumer website (www.baumer.com). You can download the software package directly to the ODROID-XU4 by connecting it to the internet. Then install the software package by using the Linux® terminal. Change to the directory where the downloaded file is stored (e.g. Downloads).
The file is called "baumer-gapi-sdk-Linux-vxxxxx-Ubuntu-16.04-ODROID-XU4.deb" (xxxxx is a version number). Start the installation by executing the following command:

```
# sudo dpkg -i baumer-gapi-sdk-Linux-vxxxx-Ubuntu-16.04-ODROID-XU4.deb
```

2.3 CPU Usage and Power Consumption

Frame Rate	Data Rate	Power Consumption	CPU Usage
5 fps	100 Mbit/s	5.5 W	3 %
40 fps	782 Mbit/s*	8.2 W	21 %

Table 1: CPU Usage and Power Consumption

Table 1 shows the CPU usage and power consumption of the ODROID-XU4 during constantly getting pictures from a Baumer GigE industrial camera. For that the Baumer SDK example 001 (image capturing by polling) with an increased amount of requested images was used.

Note: Measurements progressed with optimized network configuration. The used camera model was VLG-23M.

*) 782 Mbit/s is the top data rate with what the ODROID-XU4 received error-free images. Therefor the data rate of the camera was reduced by setting a Streaming Channel Packet Delay of 20000 ticks.

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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