

## General Description

The epc660 Evaluation Kit is a fully assembled and tested camera system designed for the evaluation of the epc660 Time of Flight (TOF) imager. The basis of this kit is the DME 660 distance measurement camera which provides all necessary hardware to operate the epc660 imager chip, including both the camera lens and illumination. The system is fully controllable by an intuitive GUI on a PC or Mac computer.

The DME 660 distance measurement camera is a standalone 3D TOF distance measurement camera with a resolution of 320 x 240 pixel (QVGA). This camera system is built from a combination of three independent parts: An epc660 sensor board with a 108° FOV lens, an LED illumination board, and a BeagleBone Black as a host controller board. The host controller board provides a powerful and flexible development environment for the design engineer.

The very wide field of view (FOV) of 108° is a perfect basis for an application evaluation. The normal operating range of the included LED illumination board is up to 10m, depending upon the selected integration (exposure) time and the object reflectivity. 39 full frame TOF images per second in full resolution allow for very fast imaging applications. The extreme high sensitivity of the imager chip epc660 also allows for very short exposure time.



## Features

- Complete development system for applications using epc660 Time of Flight (TOF) imager
- FOV 108°, operating range up to 10m
- Open-source controller environment with integrated BeagleBone Black controller board
- Computer (PC/Mac) connectivity with USB or RJ45 Ethernet
- User software (PC/Mac) with visualization and logging features
- Firmware based on open-source tools

## Kit contents

- DME 660 distance measurement camera engine
- GUI software for PC and Mac
- Documented SDK based on open-source SW and HW
- Power adapter and USB cable
- Flexible tripod for easy setup



## Block Diagram

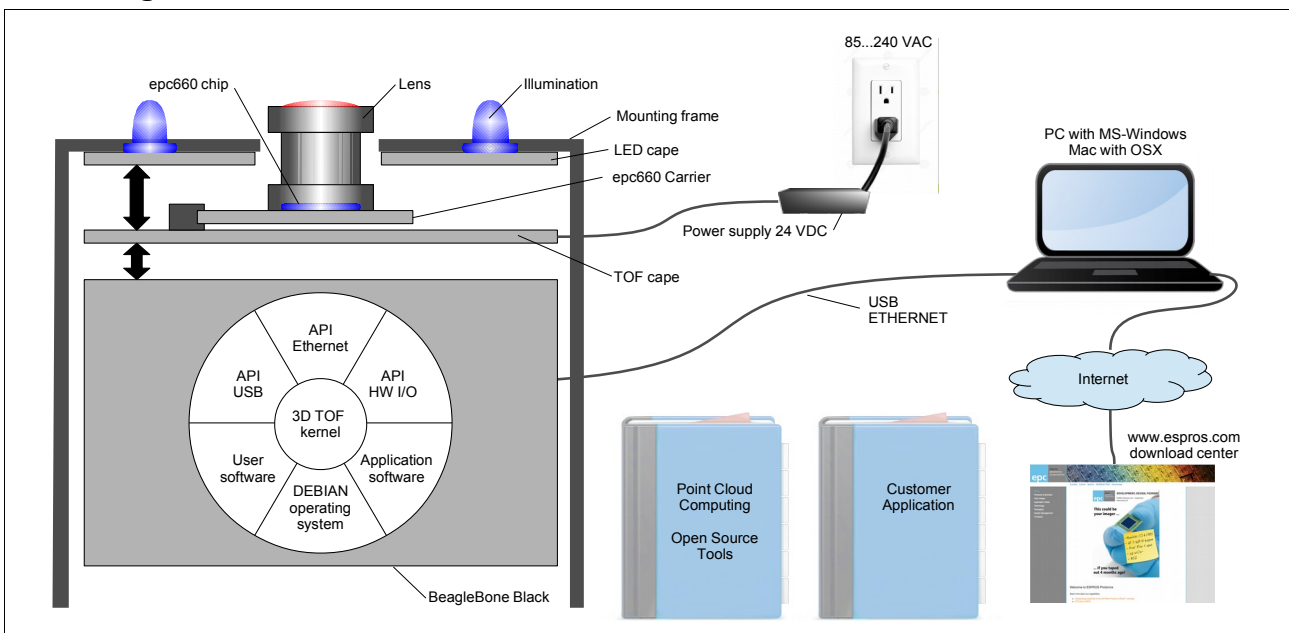


Figure 1: Functional block diagram of the epc660 Evaluation Kit

# Main Features

## General

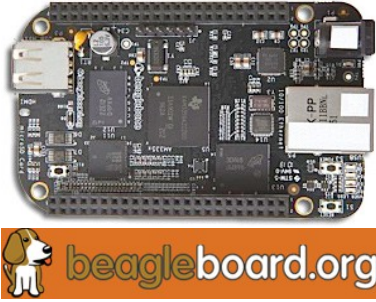
- 3D TOF camera, 320 x 240 pixel-field, backside illuminated
- Field of view (FOV) approx. 108°
- Standard lens holder

## Integrated LED illumination board with 8 LEDs

- Operating range 0 ... 10m (depending on object reflectivity and exposure time)
- LED feedback for drift compensation

## Host controller

- BeagleBone Black



- Processor: AM335x 1GHz ARM® Cortex-A8
- 512MB DDR3 RAM, 4GB 8-bit eMMC on-board flash storage
- 3D graphics accelerator, NEON floating-point accelerator, 2x PRU 32-bit micro controllers
- USB client for power & communications, USB host, Ethernet
- Open-source tools

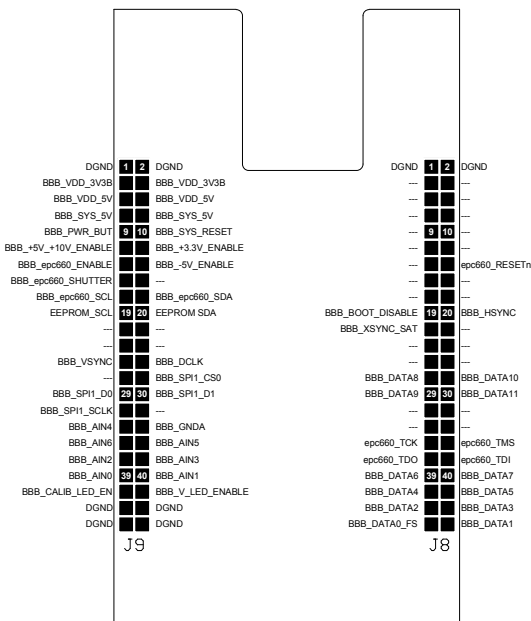
## Power supply (included)

- Input: 100 – 240 VAC
- Output: 24V / 2.5A

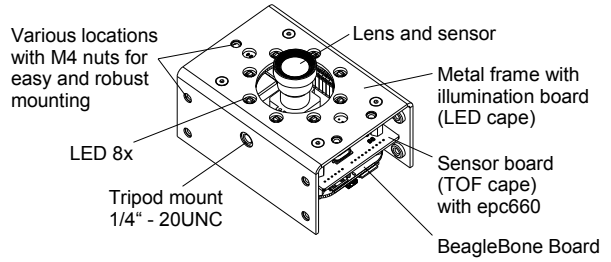
## Dimensions of the camera module DME 660

- 90 x 70 x 50 mm (L x W x H)

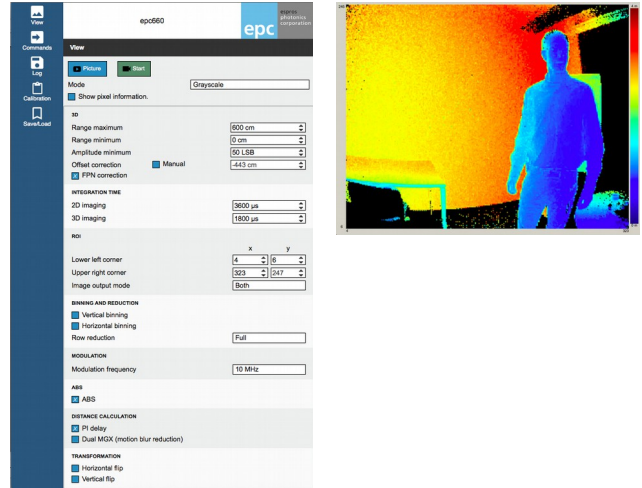
## TOF Cape Pinout



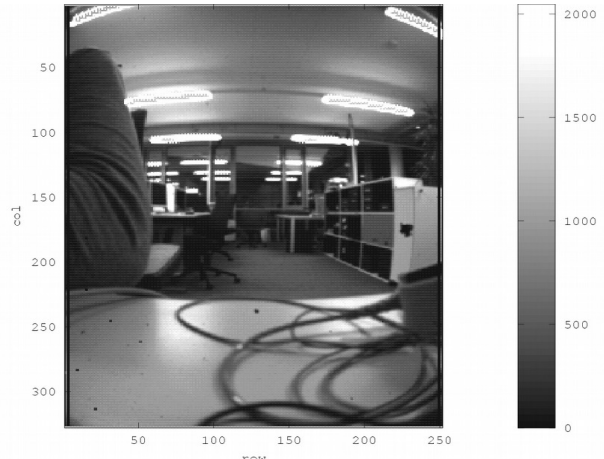
# DME 660 Hardware



# Operating Software



GUI software to operate the epc660 chip in various modes like 3D TOF color coded and point cloud, grayscale image, DCS. Exposure time settings, etc.



Grayscale image taken with epc660 Evalkit

## Ordering Information

Part no.	Part name	List price CHF/pc	Comments
P100 280	<b>epc660 Evaluation Kit, Version EU &amp; US Power plug EU Europlug (CEE7/16) and US adapter (NEMA 1-15, 2pole)</b> including the distance measurement engine DME 660, power supply, cables, tripod, software downloadable GUI, license for future purchase and use of the epc660 chip and DME 600 distance measurement engine	4,950.00	<ul style="list-style-type: none"> <li>• Comes in a toolbox (picture above is a representation and is subject to change).</li> <li>• Includes DME Cover Plate Set for Face ID.</li> <li>• Includes the book "3D TOF - A guideline to 3D-TOF sensors that work".</li> </ul>
P100 518	<b>DME 660-108°/10m</b> distance measurement engine including camera board, camera lens, illumination board, BeagleBone Black board, SD memory card, metal mounting frame, fully assembled and tested	1,386.00	<ul style="list-style-type: none"> <li>• Requires a prior purchase of one epc660 Evaluation kit for license.</li> <li>• Volume pricing on request.</li> <li>• Customized configurations on request.</li> </ul>

## IMPORTANT NOTICE

Information furnished by ESPROS Photonics AG (epc) is believed to be accurate and reliable. However, no responsibility is assumed for its use. ESPROS Photonics AG and its subsidiaries (epc) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is the latest and is complete. All products are sold subject to epc's terms and conditions of sale supplied at the time of order acknowledgment. epc warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with epc's standard warranty. Testing and other quality control techniques are used to the extent epc deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed. epc assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using epc components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards. epc does not warrant or represent that any license, either express or implied, is granted under any epc patent right, copyright, mask work right, or other epc intellectual property right relating to any combination, machine, or process in which epc products or services are used. Information published by epc regarding third-party products or services does not constitute a license from epc to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from epc under the patents or other intellectual property of epc. Resale of epc products or services with statements different from or beyond the parameters stated by epc for that product or service voids all express and any implied warranties for the associated epc product or service. epc is not responsible or liable for any such statements. epc products are not authorized for use in safety-critical applications (such as life support) where a failure of the epc product would reasonably be expected to cause severe personal injury or death, unless officers of the parties have executed an agreement specifically governing such use. Buyers represent that they have all necessary expertise in the safety and regulatory ramifications of their applications, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of epc products in such safety-critical applications, notwithstanding any applications-related information or support that may be provided by epc. Further, Buyers must fully indemnify epc and its representatives against any damages arising out of the use of epc products in such safety-critical applications. epc products are neither designed nor intended for use in military/aerospace applications or environments unless the epc products are specifically designated by epc as military-grade or "enhanced plastic." Only products designated by epc as military-grade meet military specifications. Buyers acknowledge and agree that any such use of epc products which epc has not designated as military-grade is solely at the Buyer's risk, and that they are solely responsible for compliance with all legal and regulatory requirements in connection with such use. epc products are neither designed nor intended for use in automotive applications or environments unless the specific epc products are designated by epc as compliant with ISO/TS 16949 requirements. Buyers acknowledge and agree that, if they use any non-designated products in automotive applications, epc will not be responsible for any failure to meet such requirements.