



W5300 IP 3D Camera over Single Pair Ethernet "ToffeCam"

Overview

19th August 2023

Jaroslav Juda

jarojuda@gmail.com

<https://github.com/jarojuda>

“ToffeCam” 3D Camera	1
Fig. 1. Block Diagram.....	1
Enclosure	2
Fig. 2. Front view.....	2
Fig. 3. Side view.....	2
PCB	3
Fig. 4. PCB top side (transformerless variant, screw terminals for SPE i power screw terminals).....	3
Fig. 5. PCB Bottom side (before assembly of ToF modules).....	4

“ToffeCam” 3D Camera

The ToffeCam device is actually an assembly of two cameras: one traditional with a 180-degree wide-angle lens and the other, seeing in three dimensions, consisting of a set of ToF matrices.

Data from cameras and sensors are collected and sent over an IP network. One of the unique features of the W5300 chip has been used: it includes both an internal physical interface and an MII interface to an external PHY. ToffeCam can switch between these interfaces as needed. The internal PHY runs on traditional four-pair UTP, the external runs on Single Pair Ethernet 10Base-T1L.

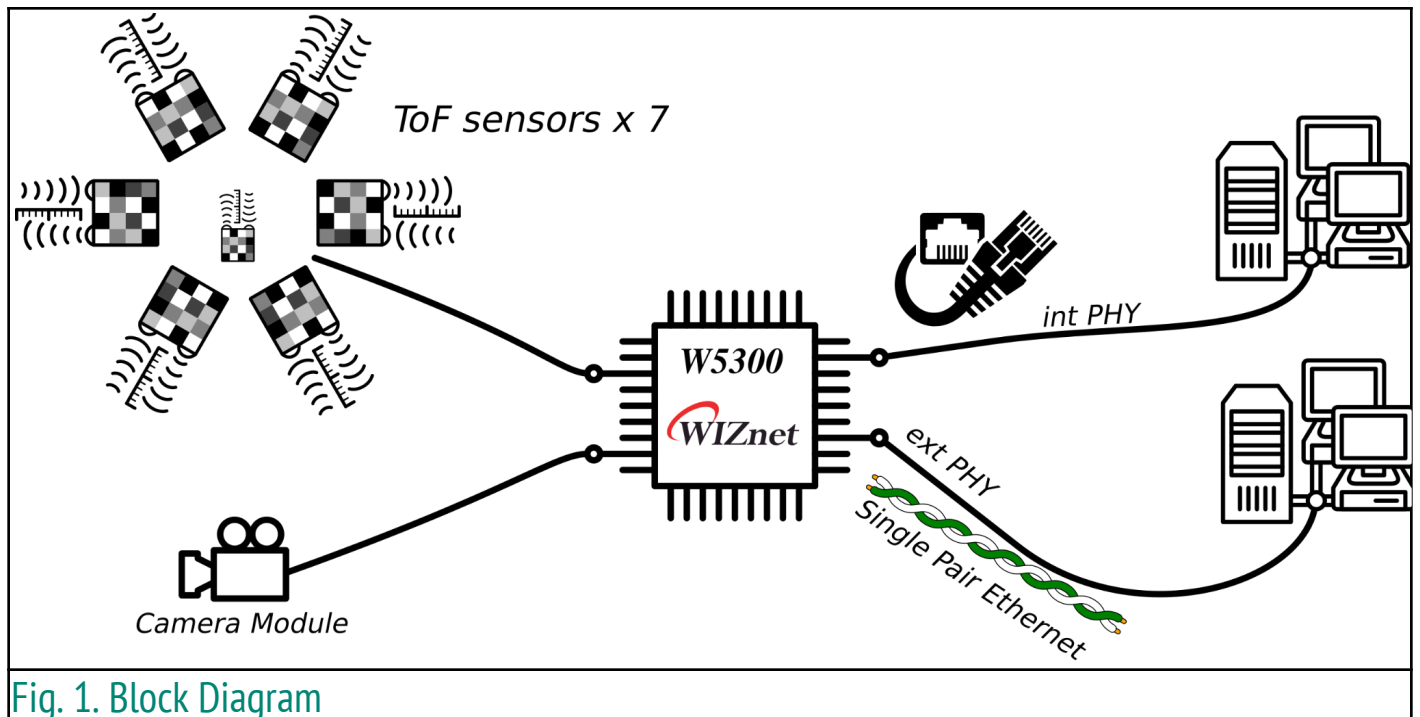


Fig. 1. Block Diagram

Enclosure

The device was mounted in a round housing designed for routers. Holes for the ToF sensors and the camera have been cut out in the top cover. Access to the sockets is on the side of the housing.

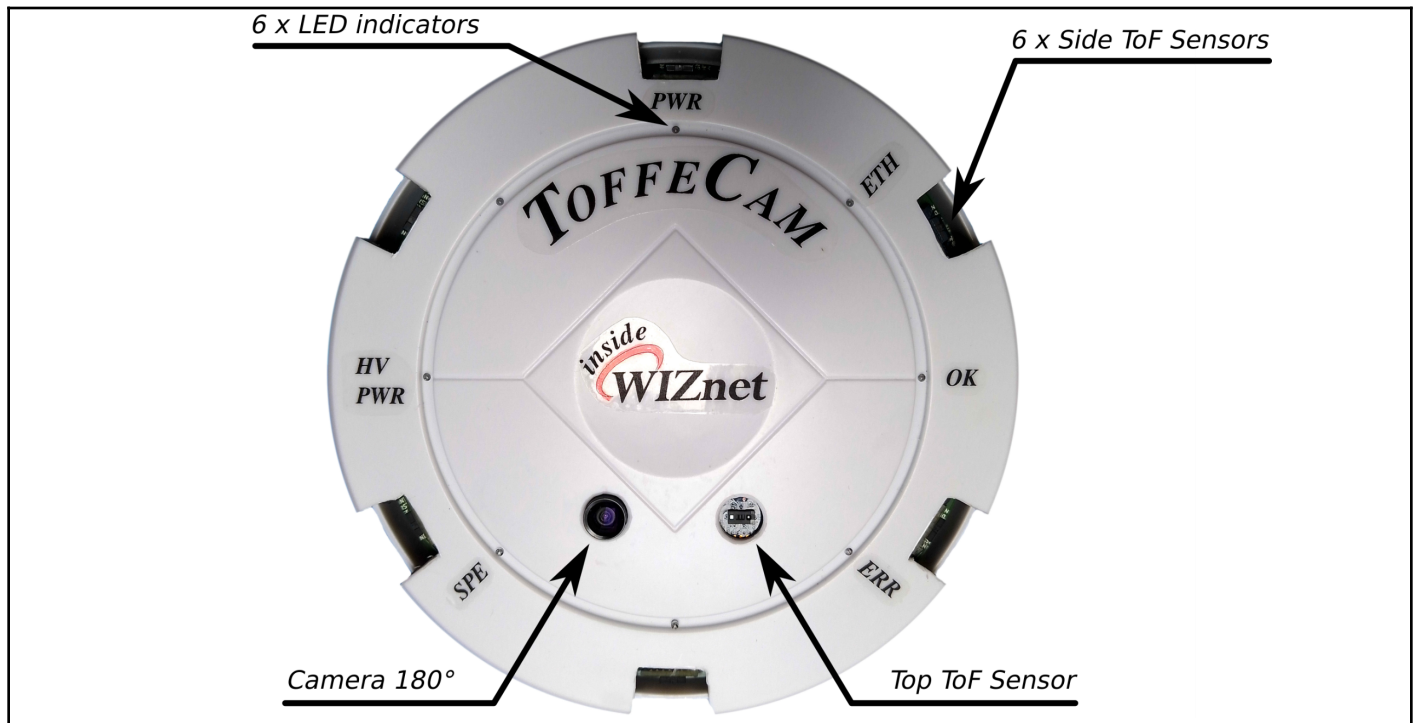


Fig. 2. Front view

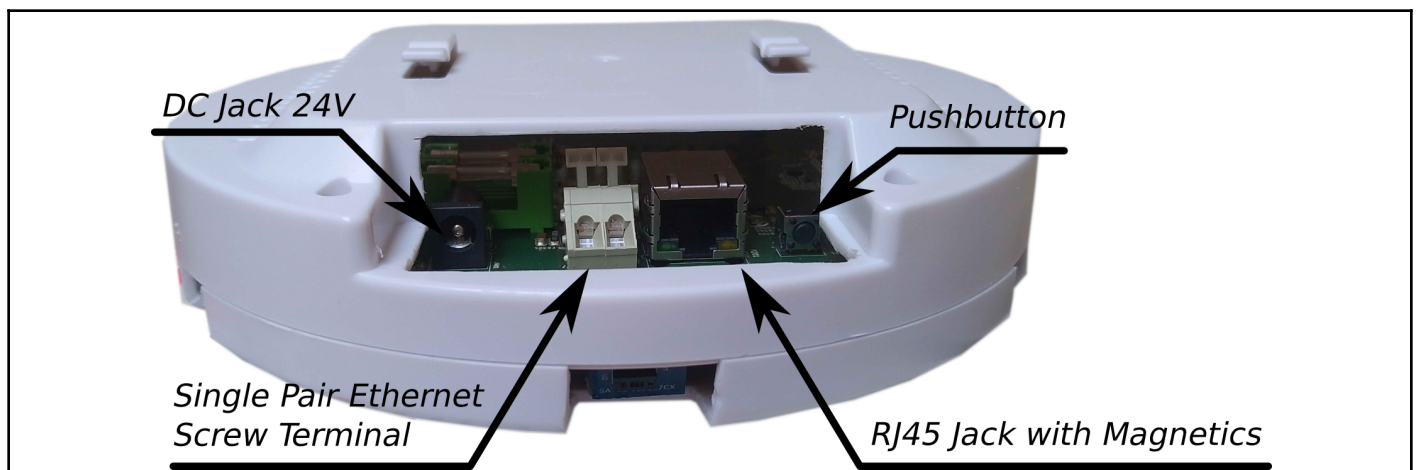


Fig. 3. Side view

PCB

ToffeCam was assembled on a 4-layer board. Double-sided mounting was used, most of the components are on the top side, ToF modules and LEDs are on the bottom side.

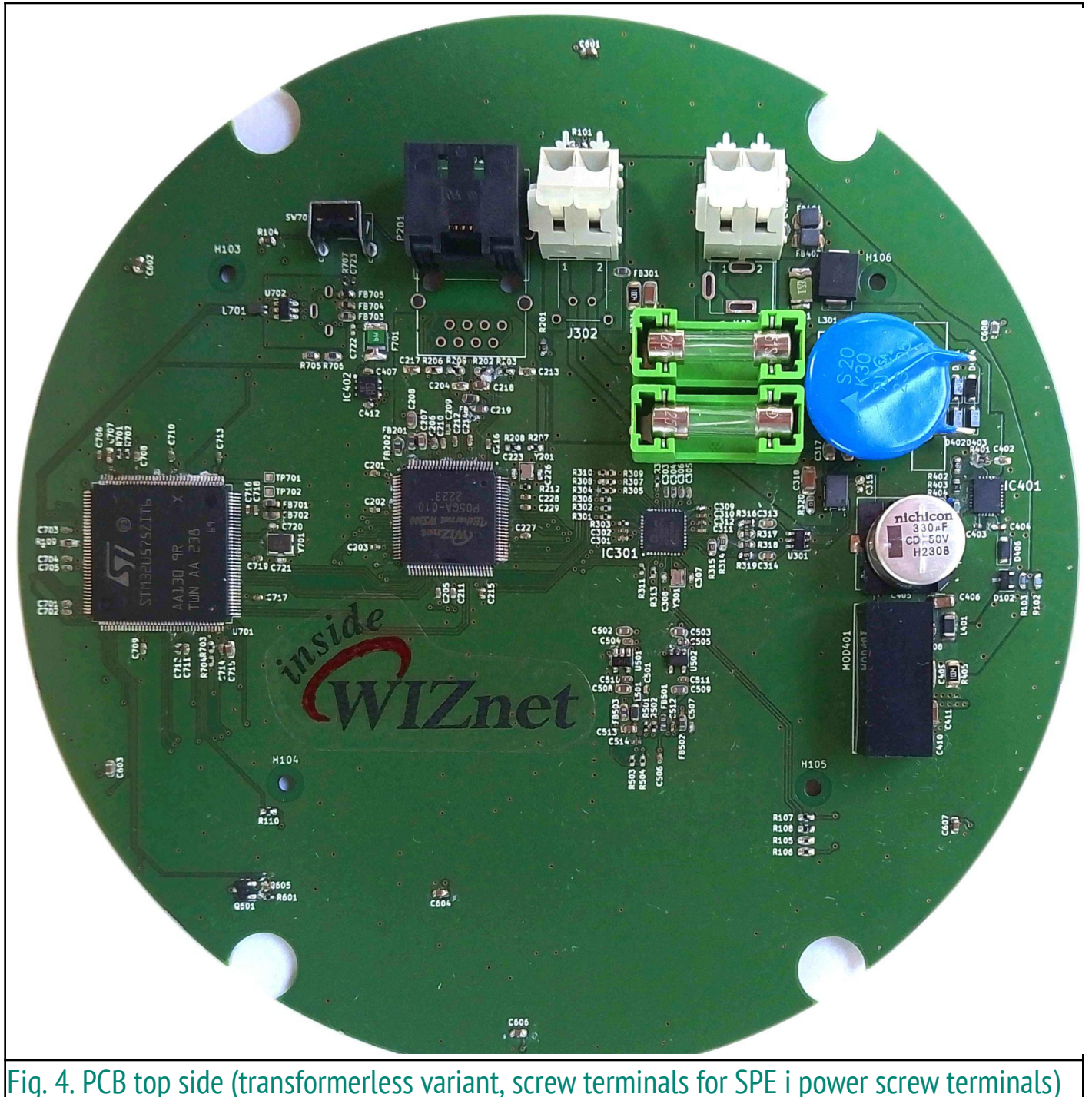


Fig. 4. PCB top side (transformerless variant, screw terminals for SPE i power screw terminals)

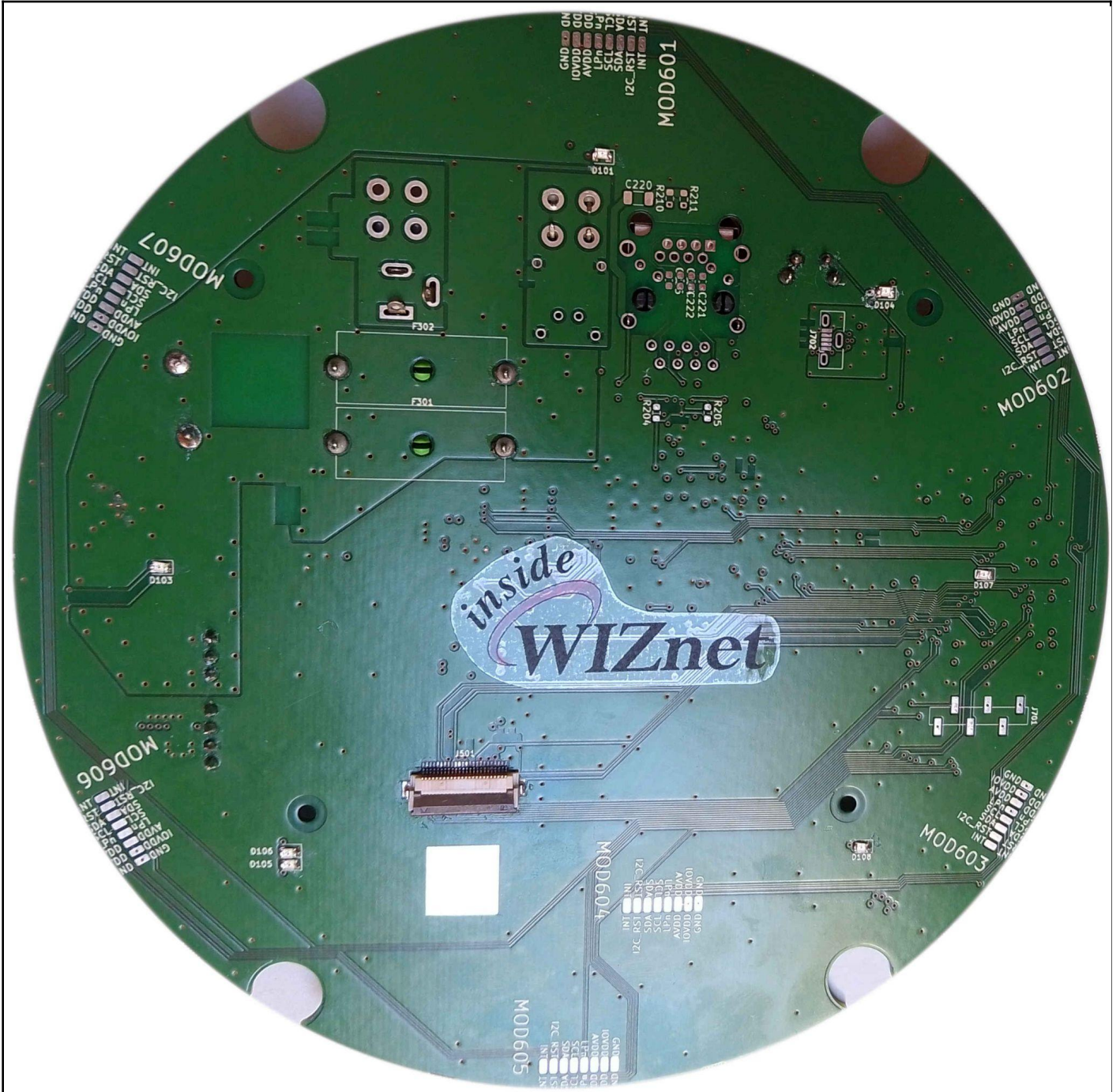


Fig. 5. PCB Bottom side (before assembly of ToF modules)