

# Project DVTI Camera

A digital camera with GPS time inserter built by IOTA members

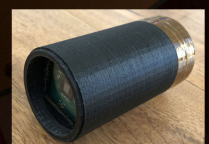
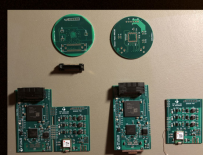
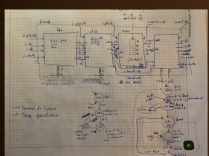
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## Milestones of the Project



### 1. Proof-of-Concept:

- No own image sensor (ASI 120MM)
- No GPS-module
- Small FPGA board with a Xilinx Virtex II FPGA, insertion of a static text into the two highest bits of the ASI 120MM.

### 2. Prototype ASI with additional board:

- No own image sensor (ASI 120MM)
- GPS-module Maestro A2200-A: SIRFStarIV, GPS, no Buffering, external antenna
- Xilinx Spartan 7 FPGA

### 3. Prototype Camera V1:

- rectangular shape
- Sensor AR0130CSSM, QE ca. 80%, resolution 1280x960, max. 45 fps
- GPS-module Maestro A5100-A: SIRFStarV, GPS + GLONASS, Supercap-Backup up to 4h, external antenna
- USB3-Interface (micro-b)
- Xilinx Spartan 7 FPGA

### 4. Prototype Camera V2:

- round shape (2" diameter)
- Sensor AR0130CSSM, with option to use alternative sensors (used as plugin-modules).
- Next step: IMX174
- GPS-module uBlox CAM-M8C: GPS, GLONASS, Galileo, BeiDou (max. 3 at the same time), no backup, internal + external antenna
- USB3-Interface (rugged USB-C)
- Xilinx Artix 7 FPGA

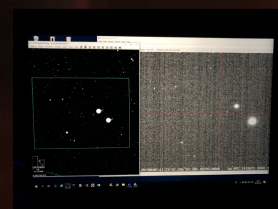
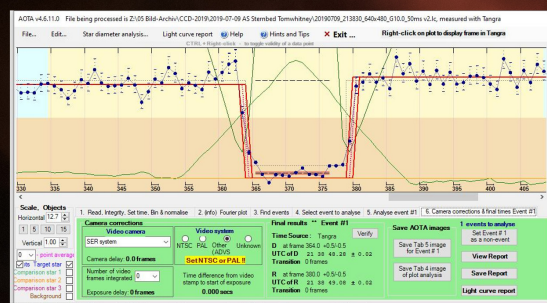
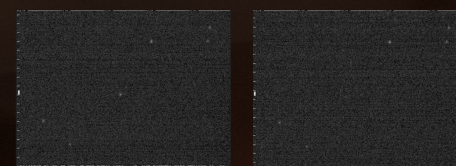
### 5. Prototype Camera V3 (planned):

- Sensors AR0130CSSM (?), IMX174, IMX428 (?), multiple sensors as plugin-modules
- GPS-Module uBlox CAM-M8C: GPS, GLONASS, Galileo, BeiDou (max. 3 at the same time), internal + external antenna
- USB3-Interface (rugged USB-C or typ B7)
- Xilinx Artix 7 FPGA
- Onboard RAM Buffer for 1 frame

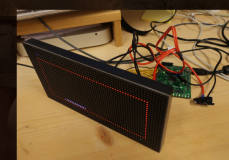
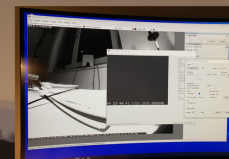
## In Operation



```
20170218-16:35:43.034-43.034 07732+0000 1280x960 1x1 5fps 15.0 00000 +1
Processing: 1947 Frames (0 dropped) in 004:22 at 25.5 fps (currently at 25.4 fps) (Memory: 3 of 201 frame buffers in use.)
20170218-16:36:47.746-46.527 08115+0000 11x11 7.3572576 0000 000000 00g 02g 02g 24g 24g 24g 24g 24g
Processing: 1708 Frames (0 dropped) in 004:45 at 25.9 fps (currently at 25.8 fps) (Memory: 3 of 201 frame buffers in use.)
```



## Testings



## Project overview

The goal of the DVTI project is to develop a digital video camera targeted mainly at observing star occultations, with the following attributes:

- precise GPS timestamp from internal GPS receiver module with no delay (integration of the timestamp within the camera into the digital data stream)
- highly sensitive monochrome image sensor
- continuous improvement of hard- and software through feedback from the community
- price as low as possible

The development team consists of Andreas Schweizer and Stefan Meister. To reach the goal of a low price, we plan to initiate a **Kickstarter campaign later in 2019** so that components can be manufactured and bought at reasonable prices. In addition, as we develop the camera in our spare time, the time for R&D won't add to the camera price.

The project website including a wiki, discussion board, "To Do" list for new features, news, firmware updates etc. is available at

<https://groups.io/g/d-vti-cam/>

