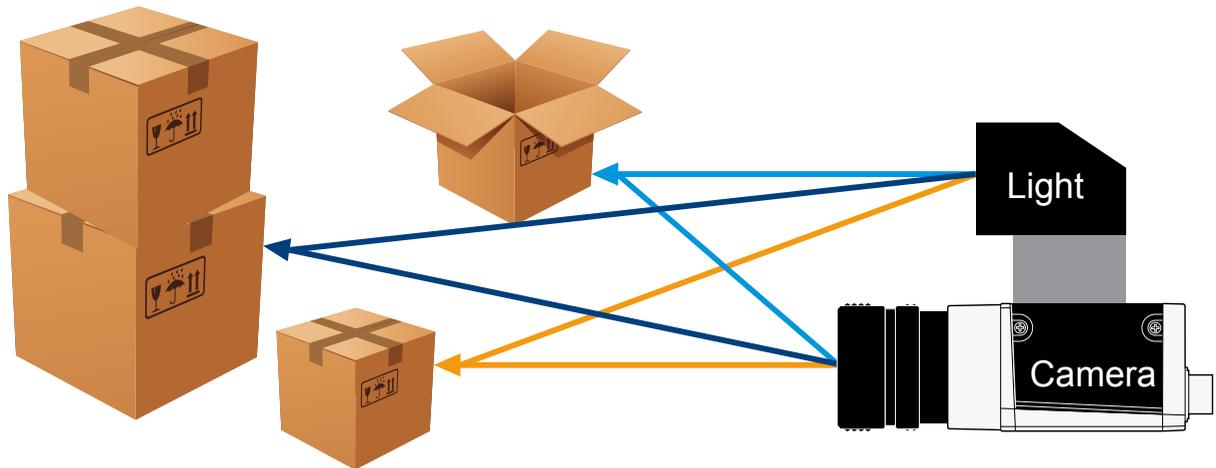


Basler Lab

TIME-OF-FLIGHT CAMERAS



- Pulsed time-of-flight camera with 2D image capability
- High resolution: VGA to over 1 MP
- Variability: Color and mono camera versions
- Ease of use: GigE interface – GigE Vision and GenICam compliant
- Easy-to-use pylon Camera Software Suite
- Completeness: Light source and optic included

OVERVIEW

Time-of-Flight Cameras For 3D Shape and Volume Measurement

Basler is developing a pulsed time-of-flight (ToF) camera with standard machine vision interface and functionality that will make 3D shape and volume measurement applications quick and easy.

Basler's ToF camera is equipped with a pulse-emitting high-power IR light source for range measurement.

The measurement principle is based on the time the light needs to travel from the light source to the object and back to the camera. The further the distance, the longer the time. Both light source and image acquisition are synchronized in such a way that the distances can be extracted and calculated from the image data.

This measurement principle can also be found in the animal world. There, dolphins use sonar to navigate. Our camera works the same way, but it uses light, not sound.

Powered by unique cutting-edge ToF Panasonic CCD sensor technology, this system achieves best-in-class 2D resolution while maintaining a high level of depth accuracy. With the rich lineup of color and mono versions planned, our users can choose from multiple options to find the best option for their needs.

The combination of 2D and depth image in one shot from one camera makes 3D imaging easy without sacrificing the 2D image potential. This also makes the camera setup and integration process elementary for system manufacturers while reducing total system costs.

Over a broad working range of 50 cm - 5 m, Basler's ToF camera can achieve a high depth accuracy of +/-1 cm. Higher levels of depth accuracy should be possible in closed environments.

Simple depth displacement analysis can speed up XY triangulation. Finally, with its integrated NIR light source, our camera is impervious to ambient light and can even see in the dark!

Your benefits include:

- Being independent of ambient light, the Basler ToF camera can even see in the dark
- 2D image with per-pixel depth information (2D + 3D)
- Easy to integrate and use
- Total system cost reduction
- Industry standard interface
- Flexible product for broad variety of applications
- 3D modeling possible
- Automatic exposure control and scene-specific pre-sets
- NIR LED's used
- Optimized for indoor applications



Sample "Gesture Control" Image Taken by ToF Camera

TYPICAL APPLICATIONS

A Basler ToF camera can be used in a wide variety of applications within a working range of between 0.5 to 5 m where accuracy in the cm range is sufficient. Examples include:

Logistics Automation

Basler ToF cameras can be used for shipment packaging assistance, e.g. box filling, box or pallet stacking, volume scanning, or labelling / OCR. It can also be used for shelf robot assistance or for luggage and box routing.



Robotics

Robotics is another field that offers a wide range of application possibilities for the Basler ToF camera. In bin picking machines, for instance, the ToF camera can:

- Find objects
- Detect damaged objects
- Pick objects
- Detect stacking failures
- Mount objects



Driver Assistance Cameras

In vehicles, camera-based driver assistance systems can be used to increase safety and efficiency. Typically they are located behind the windshield, to monitor the environment. Here, the camera can either help to avoid accidents, through warning signals, a live display for the driver, or emergency stop. It can also be used to assist in maneuvering, via the live display providing critical information to the driver, such as distance information for properly picking and placing pallets.

Autonomous Vehicles

For autonomous vehicles, the ToF camera can be a valuable tool for navigation, utilising the depth information for obstacle avoidance, and the 2D data for standard image processing.



Specifications

Basler ToF	ToF-6m	ToF-6c	ToF-13m	ToF-13c
first model				
Camera				
Sensor	Panasonic MN34902BL	Panasonic MN34903TL	Panasonic MN34922BL	Panasonic MN34923TL
Colour Image Resolution	640 × 480	640 × 480	1280 × 1024	1280 × 1024
Type	NIR	RGB	NIR	RGB
Depth Image XY- Resolution	640 x 480	320 x 240	1280 x 1024	640 x 512
Frame Rate	30 fps	25 fps	20 fps	15 fps
Accuracy	Target Working Range: 0.5 to 5m, Accuracy: +/- 1cm			
Video Interface	Gigabit Ethernet, GigE Vision and GenICam compliant			
Lens	FOV: 48 × 38° or 84 × 68°			
Software	Basler pylon Camera Software Suite, Windows and Linux			
Exposure Control	Programmable or Auto Mode			
Shutter Synchronization	External Trigger, Free-Run, Application Software			
Digital I/O	Yes			
Operating Temperature	0°C – 50°C			
Weight	0.5 kg			
Power	24VDC, 25W, Hirose Circular Connector			
Conformity	CE, RoHS, GenICam, GigE Vision, IP30, FCC, EN60825-1 Class 1 Eye Safe (planned)			

Specifications are subject to change without prior notice.



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