SEBA HYDROMETRIE

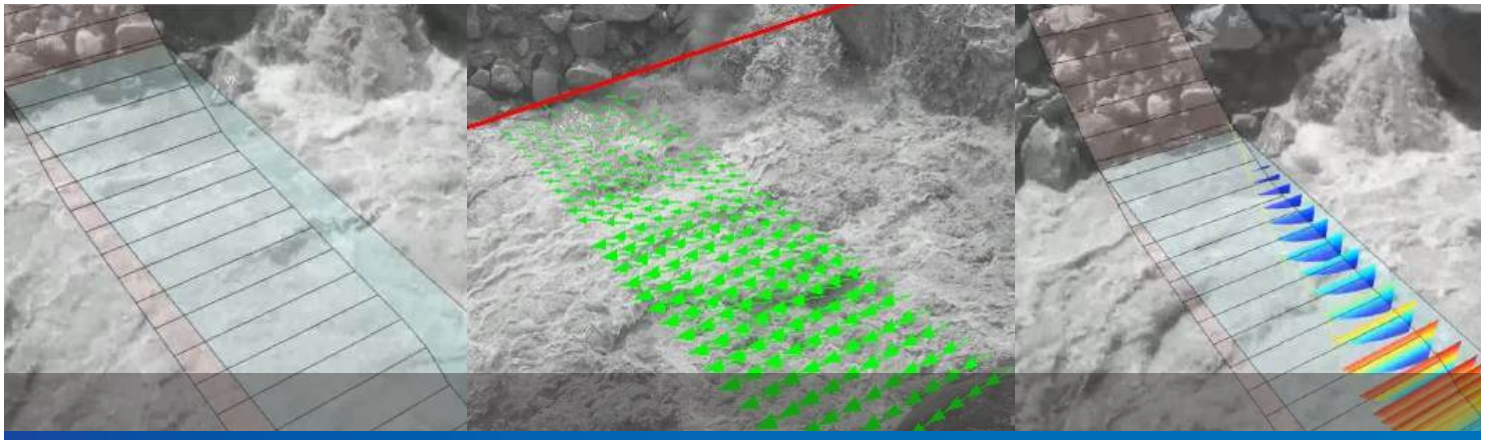
DischargeKeeper

Non-intrusive, optical flow measurement for rivers, irrigation and wastewater channels

- Camera-based measurement of water level, surface velocity and discharge
- Versatile camera mounting positions
- Non-intrusive system, reliably measuring during flood events
- Remote transmission of measurement data and proof images
- Real-time, in-situ discharge measurements and alarm
- More than a sensor: use augmented reality to add value to the data

ISO 9001:2015 QZV We are certified Quality is our standard

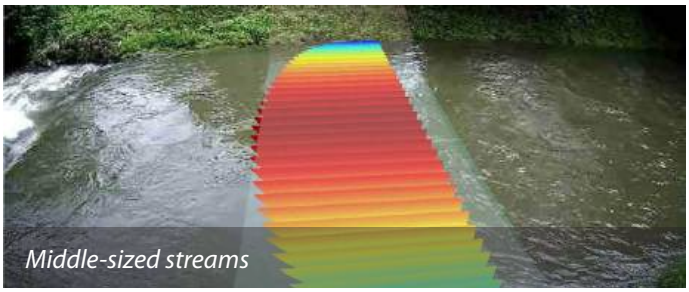
C13_DischargeKeeper_e 27.04.2021



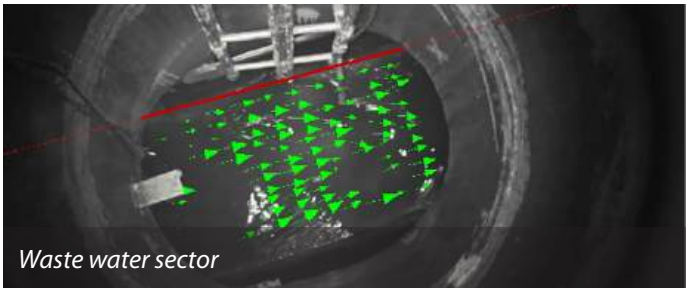
Product description and functionality

The DischargeKeeper is an innovative product for the continuous measurement and storage of water level, surface velocity and discharge in rivers, irrigation furrows and wastewater channels.

The DischargeKeeper consists of an IP-camera, an infrared beamer as well as processing and transmission units. This non-intrusive measurement system can be mounted on existing structures in a versatile way.



Middle-sized streams



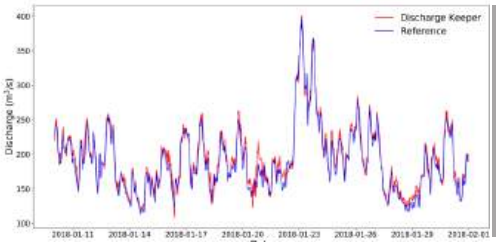
Waste water sector

optically captured | optically captured | defined | calculated

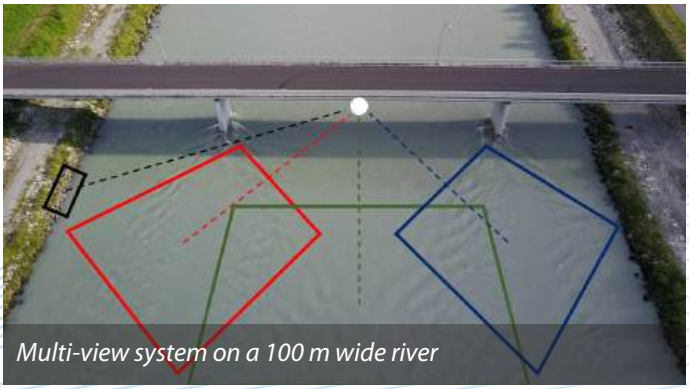
The surface velocity profile is measured optically using a patented cross correlation approach, SSIV. The water level detection is carried out simultaneously by an image processing technique. The vertical velocity profile is obtained following ISO standard EN ISO 748:2007. Integrating the velocity over the river width yields the discharge.

Wider rivers can be monitored in multi-view mode, using pan-tilt-zoom cameras for which several views are defined. The water level is measured optically in a dedicated level view and the surface velocity in dedicated velocity views. The information obtained in these different views is combined to compute the discharge.

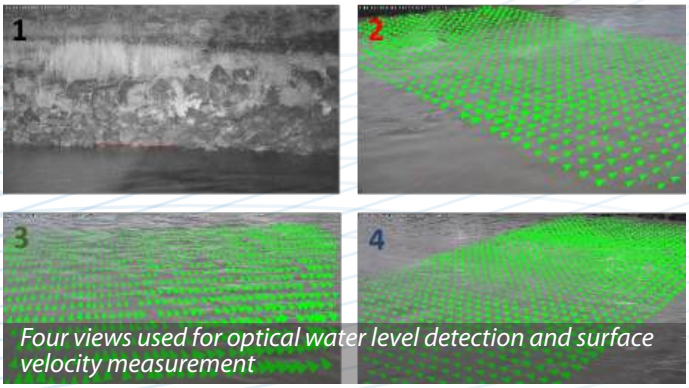
In less than a minute, the user receives the measurement results of the water level, average flow velocity and the discharge. In addition to the digitized measured values, proof images are stored on the customers FTP server and optionally, they may be uploaded to the SEBA server.



Discharge time series of DischageKeeper and of reference data



Multi-view system on a 100 m wide river

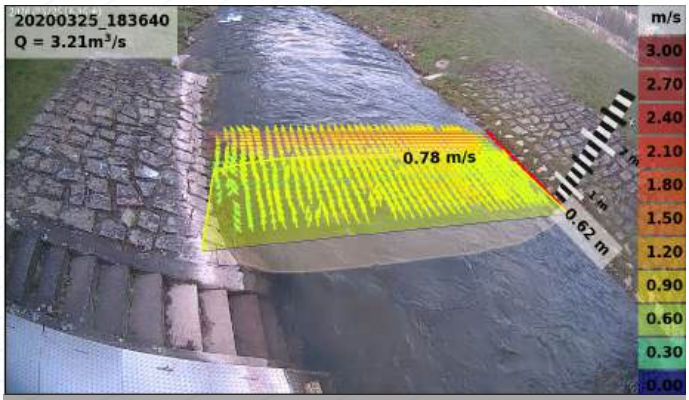


Four views used for optical water level detection and surface velocity measurement

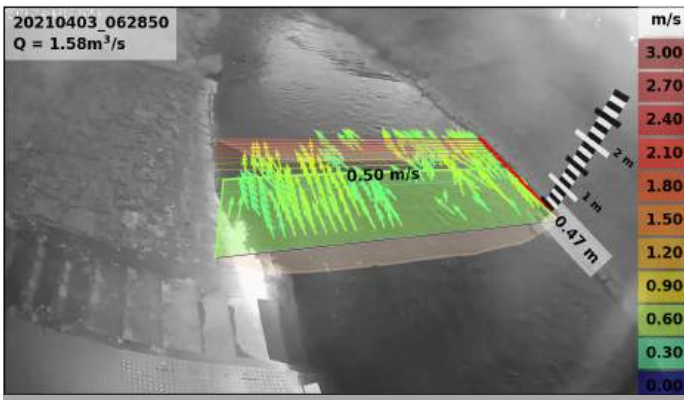
Special features and benefits

- **Simple installation:** The weatherproof IP-camera and the infrared beamer can be mounted easily on e.g. a gauge station, a mast, concrete constructions or a bridge. The process unit can be housed in a water gauge station or in a protective case. Elaborate and expensive installations in the water are no longer required.
- **No flow tracers required:** A special feature of the developed measuring system is that no flow tracers need to be added for flow velocity detection. The DischargeKeeper operates on visible moving surface structures. Nevertheless, naturally occurring floating objects on the water surface (e.g. leaves) enhance the measurement signal.
- **Representative measurement:** Unlike other non-intrusive sensor types (such as radar), the DischargeKeeper computes the volumetric flow rate with measurements of the entire surface velocity field, so that the discharge obtained is based on a robust and spatially resolved velocity measurement.
- **Non-intrusive:** The DischargeKeeper does not come into contact with the measured medium. A damage of the equipment as a result of siltation, vegetation growth etc. is excluded. Therefore the technology is practically maintenance-free.
- **On-site evaluation:** All DischargeKeeper measurement parameters (water level, surface velocity, and discharge) are collected and processed locally on site almost in real time.
- **Smart:** DischargeKeeper informs when critical system states are reached or when definable thresholds are exceeded/ fallen below.
- **Autonomy:** The DischargeKeeper may be operated with 12V batteries charged by solar power or fuel cells (on request).
- **Robust, weather insensitive, precise:** The DischargeKeeper can also be used under a wide variety of environmental, weather, and lighting conditions.
- **Redundancy:** The water level is measured optically, but existing external water level sensors can be combined with the optical system to provide redundant information.
- **More than just a sensor:** use augmented reality to visualize the measured water level and velocity field and water level on a so-called „proof-image“ and assess their accuracy in real-time. Changes of the cross-section can be detected automatically. Time-consuming service missions to the measuring site can be performed only when necessary.

Installation on a wide river



Proof image of a day measurement



Proof image of a night measurement

Technical Specifications

Non-intrusive, optical flow measuring system for processing and storing of videos, images and measured data of surface water.
Inclusive remote access to DischargeKeeper and camera (on request).
Measurement results are available in real-time on a web portal. Mounted in a robust protection housing made of plastic with lock.

Camera:	**Single view**	**Multi-view**
Width:	< 50 m	< 250 m per camera (several cameras possible)
Resolution:	3 MP full HD 1080p PoE IR	
Protection class:	IP 66	
Frame rate:	30 fps	
Night vision:	up to 50 m	
Operating system:	Linux	
Measuring range:	0.2 - 15 m/s	
Accuracy:		
Flow velocity:	< 5 % of measured value*	
Water level:	< 1 cm*	
Discharge:	< 10 % of measured value*	
	**) depending on site conditions.*	
External water level input:	4...20 mA or SHWP/RS 485 or SHWP/RS 232 or SDI-12 (on request)	
Data output:	ModBus or 4...20 mA or SHWP/RS 485 or SDI-12	
Temperature:		
Operating temperature camera:	-10 °C ...+50 °C, -40 °C... +50 °C (on request)	
Operating temperature central unit:	0 °C...+60 °C, -40 °C...+70 °C (on request)	
Storage temperature:	-20 °C... +85 °C	
Power supply:	230 V / 12 V, grid or solar power or fuel cell (on request)	
Protection housing:		
Material:	fibre reinforced plastic	
Mounting:	at wall or on mast	
Mast clamping range: *Deviating clamping ranges cause extra costs!*	round Ø 40-190 mm square 50-150 mm	
Dimensions:	400 x 600 x 200 mm	

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