



GaugeKeeper - Optical Water Level Measurement



Visible & Verifiable

Camera based water level recording

Key Features:

- Patented system
- Redundant data
- Real-time measurement
- Alarm & alert procedure (definable)
- Visual verification of data
- Direct human interpretation
- Historical data can be downloaded (value + image)
- No more expensive trips to remote measuring sites
- TCP/IP connectivity



Wir sind zertifiziert

ISO 9001:2008

Zertifikat Nr. 01150509

Qualität ist unser Standard

Gauge Keeper



Many hydrologists have been waiting for a technology to see, measure and verify their water level data with just one system. And to alert them when something goes wrong. Using an image sensor for measuring water level is a new approach. The SEBA GaugeKeeper was developed in order to collect **redundant** water level data from remote sites – using image processing and data transmission.

It has never been easier to **verify data from the past** – simply select and have a look at the picture taken at the same moment that the water level was measured and compare. It's that easy.

Components

(1) Camera + (2) Processor Unit + Logger + Data Transmission



The surveillance camera is ruggedized, equipped with special illumination for nighttime measurement and uses an integrated powerful processor to automatically convert data to measurement values. The frequency is configurable and the images are saved to a local SD-card for preservation of **evidence**. Images and time-lapse movies may also be downloaded. The water level is measured and converted inside the processor unit then sent to the logger. All data are stored inside the UnilogCom data logger. Those data can be downloaded via remote access. There are several ways to transfer the files to your server or the SEBA Hydrocenter (e.g. GSM/GPRS, satellite, landline, radio



transmission, DSL, ethernet). Files (values and images) can alternatively be pushed to an FTP-Server.

The data logger allows connection of **additional sensors** (e.g. water level by radar, pressure transducer etc.) for redundant water level data. With the comfortable data management software DEMASdb, the system can be called several times per day in individually programmable time slots. Independently, alarm limits can be defined (i.e. waterlevel, battery capacity). SMS **alarms** can be sent to up to 8 different mobile phone numbers as well as to a facsimile.

What makes it new and special?

Different from other types of sensors, the Gauge-Keeper can provide the surrounding information around the sensor as well as the water level so that the measured **data can be confirmed**. It also has an advantage that it is pretty much unaffected by weather.

Since conventional methods can measure only the water level, there is no way to confirm if the provided data is correct or not. Up until now it has also been impossible to **monitor the surrounding situation** of the river. Our system solves this problem by providing more accurate measurement of data than the conventional sensors do. Compared to conventional

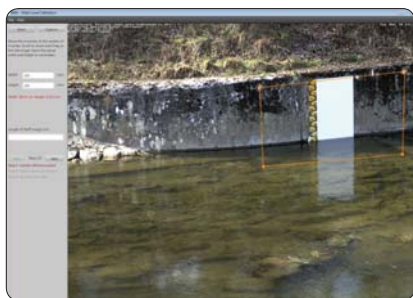
approaches, this system does not just rely on wireless communication, it also saves the data on an SD-card. **Evidence** is captured and stored at site additionally to the transferred data which gives the system even more redundancy.

No more doubt about why your data drifted: you can now **visually verify** every data point as if you were there – comfortably from your office 24/7. Your field maintenance will be dramatically reduced and the reliability and quality of your data will increase considerably.

Visible, verifiable values

- **Patented** system
- Water level is stored together with the timestamp
- Possibility to connect a second camera (camera 1 is used for measurement and the 2nd camera monitors the scene from a different angle)
- A distance of up to 100 m between camera 1 and ROI is possible
- Low energy consumption which allows battery or solar powered solutions
- In case of very bad sight (e.g. heavy fog) we recommend using an additional pressure sensor for water level detection to make sure there is no loss of water level registration data.
- Optionally, the system can be extended – provided that local power supply is available (DSL or ethernet connection).
- A clever **alarm management** is available.
- Alerted users can visit a specific website to review the hydrographs, images and time-lapse movies in greater detail to determine whether action is required.

Calibration



Prior to using the system for the first time, the GaugeKeeper needs to be **calibrated** to the site's specific conditions.

That is done via **GUI** by holding a calibration template facing towards the camera. An initial value is entered into the system.

The software then calibrates the system and defines an individual measuring scale. As a final step, the Region of Interest (**ROI**) is defined .

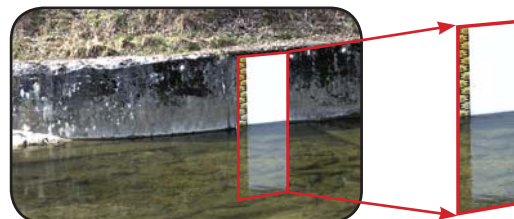
Edge line detection



Search region
Staff Gauge



Water level detection



Region of interest (ROI)

(ROI)

Technical Data

GaugeKeeper General:

- measuring range: water-level variations of up to 10 m
- power consumption: 60 µA (power down mode)
~ 75 mA (Modem transmitting/peak current)



Camera

Recording:	Day & Night
Max. Image Size :	4096 x 1536 (6,2 MEGA) with 2 modules
Image Sensor:	5MP sensor technology: more than 2,5-times detailed than Full-HD
In/Outdoor:	Weatherproof (IP66)
Sensor Modules:	L12 - L160, horizontal picture angle 180° to 13° (35 mm)
Max. Frame Rate:	30 B/s (MEGA)
Interface:	Ethernet 10/100 Mbit
Zoom:	Stepless to 8x zoom
Min. Intensity of Light:	Colour: 0,25 lux (t=1/60s) • 0,013 lux (t=1/1s) B/W: 0,05 lux (t=1/60s) • 0,0025 lux (t=1/1s)
Operating Temperature:	-30 ... +60 °C
Dimensions:	165x170x80 mm (LxWxD)

Special Illumination

Illumination:	Infrared, sensor-controlled
Angle:	15°
Energy consumption:	6 mA/h per measurement
Dimensions:	190x125x100 mm (LxWxD)

Data Logger type GaugeKeeper

Power Supply:	External 4.5...20 V
Flash Controller:	M16C 16 bit with integrated watchdog
Memory:	Serial Flash with 4 MB (approx. 280.000 measured values)
A/D Converter;	32 bit
Inputs:	RS485 sensor interfaces (SHWP) SDI12 sensor interface input (option) up/down counter input phase counter, impulse (rain) 2 contact inputs (control, protocol) 2 analogue bi-/unipolar for standard signals, extendable up to max. 32 analogue inputs (optional with external module)
Keyboard:	with 3 function keys
Display:	3 lines each 16 characters, 3,65 mm
Interfaces:	RS232 RS485 micro SD (up to 32 GB) USB highspeed (up to 2) ethernet TCP/IP functionality
Operating Temperature:	-30...70 °C
Dimensions:	157x126x60 mm (LxWxH)
Modem (integrated)	Frequency: 850/900/1800/1900MHz (EGSM, Quadband)
	SIM-card: 1.8V/3V

The right is reserved to change technical specifications without prior notice. The data is valid for the date of printing.



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