Stationary discharge measurement at the river Große Roeder in Saxony

STAATLICHE BETRIEBS-GESELLSCHAFT FÜR UMWELT UND LANDWIRTSCHAFT | Freistaat SACHSEN

Hybrid system OTT Sonicflow & OTT SLD

Online-measurement with travel time differential method and horizontal Doppler

Background

The river Große Roeder is a tributary of the river Schwarze Elster. It has a length of 105 km, rises northeastern from Dresden and is flowing into the river Schwarze Elster near the town Elsterwerda. At the measuring station „Kleinraschuetz“ the Große Röder is a typical man-induced lowland river.

Due to the seasonally strong weed growth and low flow during low water periods the relation level/flow was rather distorted and had to be corrected by putting in additional manpower for manual measurements. Therefore it was decided to modernize the station completely and to install a stationary discharge measuring system

Flooded dike at Kleinraschuetz during the flood in 2010

This measure was ordered by the BfUL (Staatliche Betriebsgesellschaft für Umwelt und Landwirtschaft) who is also the operator of the Saxonian water measurement network.

Construction works at Kleinraschuetz begin

Measuring task

- Online measurement of velocity of flow and subsequent calculation of discharge per velocity – index method in water levels from 29 cm to 310 cm
- Storage and management of all data for the Saxonian authority for environment, agriculture and geology (LfULG)
- Remote data transfer and remote maintenance of the measuring systems

Monitoring Solution

- **OTT** SonicFlow (one-level cross path)
- **OTT** SLD 2.0 MHz Side-Looking-Doppler-Sensor for measurement of local velocity of flow (index velocity)
- **OTT** SE 200 water level sensor
- Stationmanager **OTT** LogoSens2 for monitoring and storing measured data, for discharge calculation and for controlling the remote data transfer

OTT SLD at the bottom of the stair (Foto:Hydrotec Berlin)

Die Sensoren der OTT Sonicflow Kreuzpfadanlage befinden sich kurz über der gepflasterten Gewässersohle (Foto: Hydrotec Berlin)

The measurement profile was designed as double-trapeze and paved with armour stone. Two independently installed empty conduits DN 50 are crossing the water body. They are protected by a galvanized steel tube at the river bed (mainly during the pavement works). For easier access to the cables a cable duct has been installed.

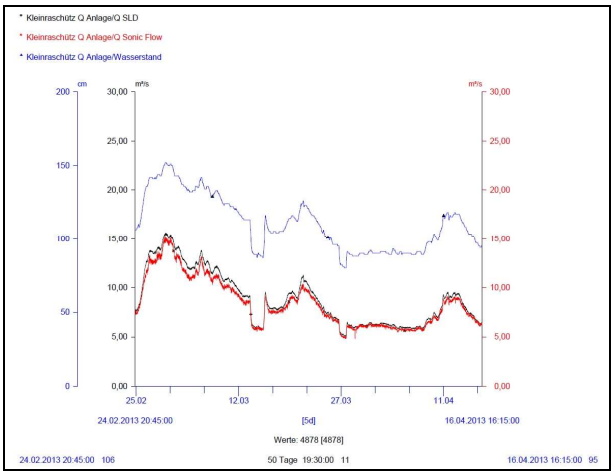
Advantages

- Online – monitoring of total discharge
- Measurement of flow velocity in the first level with run-time differential method allows measurement at extremely low water levels (NNW 29 cm) to identify seasonal weed growth
- Measurement of flow velocity in the 2nd level with current ultrasonic Doppler technology, starting from a water level of approx. 85 cm (MW 67 cm)
- Data retrieval and remote system maintenance via public telephone network.

Summary

- For the installation OTT partnered with an external service company (HydroTec Berlin GmbH). The implementation was done in a professional manner and in high quality.
- Questions regarding engineering and design of the measurement system have been greatly supported by the OTT HydroService team.
- Now and in the future, the measuring station at Kleinraschuetz delivers reliable data, for both low and medium levels of discharge (run-time system), and also for high levels of discharge with increased concentration of suspended materials (Doppler-system).

The station at Kleinraschuetz after the installation of the Hybrid system



Measuring results of the Hybrid system (Hydras3)

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