



**Your specialist for environmental measurement technology –
Equipment, sensors and services for open water discharge measurement**



SOMMER Messtechnik

SOMMER MESSTECHNIK develops and markets equipment and sensors for environmental measurement technology including system solutions for data recording, transmission and evaluation. With more than 25 years of experience SOMMER is a true measurement specialist and reliable partner in hydrology, meteorology and geology for customers in both the public and private sectors as well as for research institutes and universities.

The wide **PRODUCT PORTFOLIO** includes our innovative radar technology for the non-contact determination of the discharge of rivers and streams, equipment for mobile discharge measurement, level data loggers as well as snow measurement systems for analysing snow coverage, alpine weather stations and snow scales for determining the snow water equivalent.

SERVICES: service and maintenance assignments carried out by optimally qualified engineers, tailor-made measuring services for technical offices and civil engineers and rental of equipment and sensors. Workshops and training complete the service spectrum and our commitment to customers both nationally and internationally.

In this brochure we would like to inform you about our wide range of competences in flow and discharge measurement.



SOMMER headquarters in Koblach,
Vorarlberg, Austria



RG-30

The RG-30 measures the surface flow velocity of rivers, streams and channels by use of innovative radar technology. It is installed outside the water and measures without direct contact to the same. Hence, the system requires no maintenance and works reliably even during high flow, floodings or despite of debris, driftwood or high turbidity.

Features and advantages

- ✓ Non-contact and fast measurement of surface flow velocity
- ✓ Simple mounting on bridge railings or any other superstructure across the river
- ✓ Low power consumption and simple integration into existing systems
- ✓ Recognition of flow direction
- ✓ Measuring range from ± 0.10 to ± 15 m/s (depending on the flow conditions)



Measuring principle

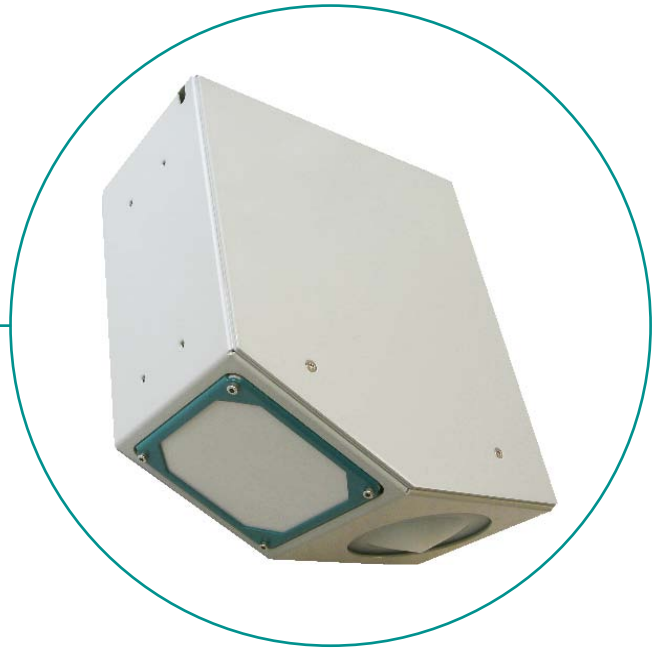
The measurement of the flow velocity is based on the principle of the Doppler frequency shift. The sensor emits a radar signal and compares its frequency with the one of the reflected signal from the water surface. The frequency is shifted proportional to the surface flow velocity. The RG-30 is applied for example in open rivers, streams or channels.

Implementation

The sensor impresses with low power consumption and its high reliability for permanent recording of the flow velocity. Setting and configuration of the RG-30 can easily and conveniently be done from the PC or laptop through the RQ-Commander software or standard terminal programs. The measurement data are supplied via common communication interfaces, e.g. RS-485, SDI-12 or Modbus, to any affiliated system for further discharge calculations. Optionally the flow velocity can also be outputted as an analogue 4 to 20 mA signal (RG-30a).

RQ-30

The RQ-30 is a sensor for discharge measurement of rivers, open channels and canals with known cross-section profile using innovative radar technology. It enables reliable, non-contact measurement without the need for structural work in the water.



Features and advantages

- ✓ Maintenance free
- ✓ No structural work is necessary in the water
- ✓ No threat to the system through flooding
- ✓ Low power consumption enables operation using solar cells
- ✓ Recognition of flow direction
- ✓ Measuring range from ± 0.10 to ± 15 m/s (depending on the flow conditions)
- ✓ Recognition of hysteresis effects
- ✓ Measures even where weed growth prevails and sensor is not affected by turbidity
- ✓ Measurement in backwater situations
- ✓ Measurement in tidal waters
- ✓ Automatic angle measurement
- ✓ Optional: analog outputs from 4 ... 20 mA

Fields of application

The RQ-30 enables discharge measurement for rivers, streams, open channels and canals for which continuous monitoring is desired. Thanks to the non-contact radar technology the measuring equipment is not susceptible to contamination, debris or driftwood in the water. Furthermore, the non-contact measurement warrants very low maintenance and fail-safe operation especially during high water or flooding.

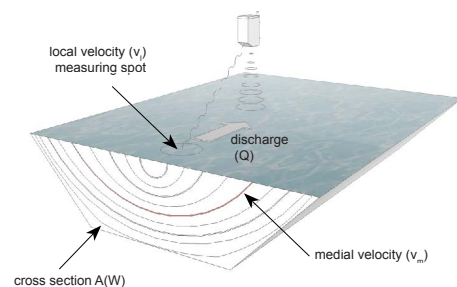


Implementation

The sensor can be simply mounted on bridges, on the roves of closed canals or channel superstructures. The bed of the water should be as stable as possible in order to warrant consistent measurement. A visible swell must be evident on the surface of the water.

Measuring principle

The non-contact radar technology determines the water surface flow velocity using the Doppler frequency shift method and furthermore the water level is established by a travel time measurement. With known cross section profile the discharge Q of the water can then be calculated.



Technical details

	Radar sensor RQ-30
Dimensions	338 mm x 333 mm x 154 mm
Total weight	5.4 kg
Protection	IP 67
Power supply	6 ... 30 V
Power consumption at 12V	standby approx. 1 mA; active operation approx. 140 mA
Operating temperature	-35 ... +60 °C
Velocity measurement range	0.10 ... 15 m/s (depending on flow conditions)
Distance to water surface	from 0.50 up to 35 m
Miscellaneous	integrated lightening protection

RP-30

The mobile measuring device RP-30 (Radar Profiler) is used to determine the velocity profile of rivers and streams. Together with cross section and water level data the discharge rate can hence be established – a highly useful measuring instrument especially during situations of high water levels or floods.



Features and advantages

- ✓ Portable mobile measuring system
- ✓ Simple mounting on cable cranes, bridge railings or tripods
- ✓ Suitable for flood conditions and high flow velocities
- ✓ No threat from debris or driftwood
- ✓ Calculation of discharge with known water level and cross section profile
- ✓ Easy operator controls and handling
- ✓ Remote data transmission via Bluetooth
- ✓ Measuring range from ± 0.10 m/s to ± 15 m/s (depending on the flow conditions)

Fields of application

The RP-30 is used in rivers, streams and open channels and calculates the exact discharge of the body of water through several sectional velocity measurements. As is the case with the RQ-30, this method of measurement is also based on innovative radar technology including all the advantages of a non-contact measuring device.

The Radar Profiler is ideally suited for selective measurement and therefore for project evaluation or control measurements. In contrast to most other measuring devices it provides reliable values even in flood situations – an extremely interesting situation from a hydrological point of view – and is, therefore, particularly used in flooding and natural hazard management.

Implementation

With the aid of an adjustable traveller for handrails the Radar Profiler can be easily moved along a bridge railing to the desired measuring points. Alternatively it can be fixed to a cable crane or tripod. The measurement is then carried out in sections across the whole width of the water. Thanks to the integrated Bluetooth transmitter the data are transferred directly to a notebook during measurement and can so be viewed in real time.



Radar Profiler with adjustable traveller for handrails

Technical details

	Radar Profiler RP-30
Dimensions	445 mm x 154 mm x 226 mm
Total weight	6.6 kg (excluding traveler for handrails)
Protection	IP 67
Battery	12 V / 4.5 Ah
Power consumption	standby 10 mA; active operation 110 mA
Operating temperature	-35 ... +60 °C
Velocity measurement range	0.10 ... 15 m/s (depending on flow conditions)
Distance to water surface	from 0.50 up to 130 m
Miscellaneous	sensor stored in flight case; AA batteries; data transmission via Bluetooth

TQ-Tracer

The TQ-Tracer is a mobile system for discharge measurement using a salt tracer (TQ-S) or fluorescent tracer (TQ-F). It can be deployed in rivers, creeks or waters for which data regarding the cross-section profile are not available. Here the tracer dilution method is applied as measuring principle.



Features and advantages

- ✓ Simple, mobile discharge measurement
- ✓ Reliable results even without knowledge and independent of the cross-section profile
- ✓ Suitable for fast-flowing, turbulent waters or where access is limited
- ✓ Environmentally friendly, harmless for water
- ✓ Discharge values immediately available
- ✓ Easy transmission of measurement data from the sensor to receiving device via Bluetooth
- ✓ Convenient receiving of data on notebook, PDA or smartphone
- ✓ Real time visualisation of measurement data
- ✓ Simultaneous measurement with up to four probes
- ✓ Device can be applied with conductivity or fluorescence probes (e.g. for fluorescein or rhodamine)
- ✓ Compact and convenient: complete equipment securely packed in two cases

Fields of application

The TQ-Tracer system is especially suitable for fast-flowing, turbulent waters with complex cross sections, for example, mountain streams, small brooks, tributaries or even fish ladders.

The measuring device is used particularly in hydrometry as well as by engineering offices, civil engineers or power plant operators, for instance for control measurements or for evaluating projects.

Implementation

The tracer dilution method can be applied for discharge measurement in all waters in which a thorough mixing of the tracer ensues. High turbulences, alternating cross sections and stones promote the mixing process and therefore, have a positive effect on the measurement.



TQ-Tracer: TQ-Tracer model with robust reinforcement for particularly turbulent waters and high flow velocities.

Technical details

	Tracer-System TQ-S	Tracer-System TQ-F
Tracer material	salt	fluorescence (fluorescein or similar)
Probe type	conductivity probe	optical fluorescence probe
Measuring principle	tracer dilution method with instantaneous feed	
Implementation	discharge quantities up to 10 m ³ /s	all discharge quantities
Operating temperature	-20 ... +60 °C	
Operationg time (with 3 x 2500 mAh batteries)	50 hrs	25 hrs
Accessories	evaluation software TQ-commander, pipette, various measuring containers, charger, USB Bluetooth adapter, etc.	



Conductivity probe type TQ-S



Fluorescence probe type TQ-F

Measuring weir with level logger

An elementary and very simple method for determining the discharge rate of relatively small streams and channels or springs is by means of a measuring weir. Through the height of the accumulated water level the discharge quantities can be ascertained relatively accurately. In doing so, the water level is measured using a level pressure probe.



Features and advantages

- ✓ Minimum structural effort, simple measuring method
- ✓ Discharge measurement with measuring weir; measurement of water level and temperature in level pipes, wells, springs and open waters
- ✓ Data retrieval on-site or data transmission
- ✓ Data storage at regular intervals or event-driven
- ✓ Recording of actual values as well as minimum, maximum und average values

Fields of application

Discharge measurement using a measuring weir and level logger is the optimal solution especially for relatively small discharge quantities (approx. < 60l/sec). Therefore, this method is often used for well or spring containment and small streams. Furthermore, level probes are used in water towers, reservoirs and lakes, water tanks and above all in monitoring groundwater.

Implementation

The so-called **THOMSON WEIR** is mostly applied. To a certain degree the weir constricts the flow of the water. From the height of this damming the current discharge can be calculated using familiar approximation formulas. Hereby the control section of the Thomson Weir consists of an isosceles triangle pointing downwards. The level of the dammed water is measured with the level data logger upstream from the weir.



Competence in Discharge Measurement

In addition to the sale of innovative measuring systems for hydrology and meteorology SOMMER Messtechnik also offers a range of **CUSTOMER SERVICES**. These include customer-specific sample and single measurements, the rental of measuring devices, system demonstrations as well as training and workshops for applied measuring devices and operating software.

Please contact us for a non-binding consultation or an individual offer under the telephone no. +43 5523 55989 or by email office@sommer.at.

Services

According to prevailing conditions we can carry out measurements with the appropriate measuring device out of the following systems.

The **SCOPE OF SERVICES** includes: assessment of the measuring site, permanent measurement or several temporary measurements, evaluation and compilation of a measuring report as well as preparation of the measurement data, (e.g. as Excel or CSV file).

The **COSTS** are individually tailored depending on the type and scope of the measuring services as well as the location of the measuring site.

- TQ-Tracer-System
- Discharge measurement with radar RQ-30
- Mobile discharge measurement with Radar Profiler RP-30
- ADCP boat measurement
- FlowTracker (as alternative to current meter)
- Determination of discharge using measuring weir and level logger

Rental Service

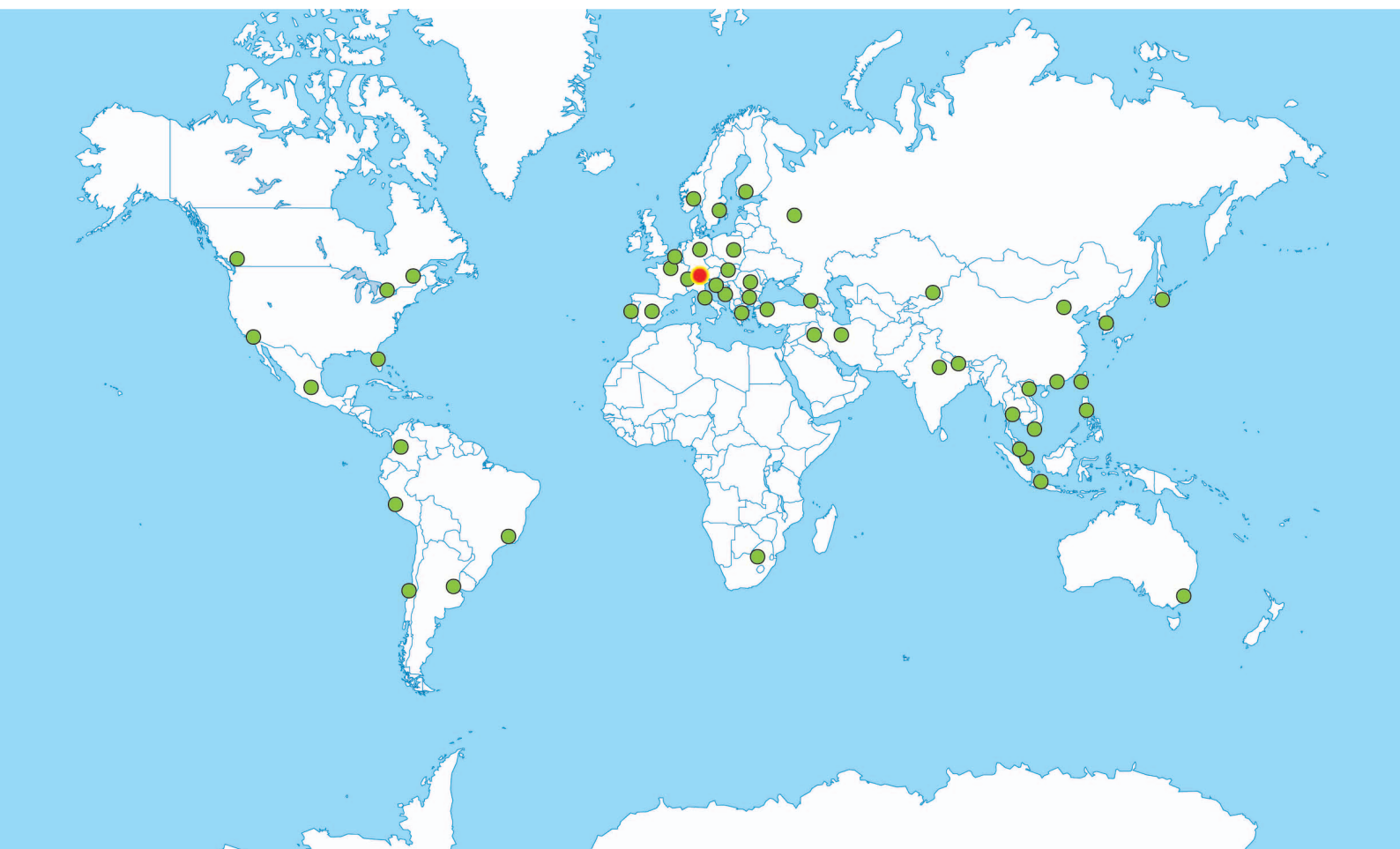
TESTING AND RENTAL: For single measurements in order to familiarize oneself with the measuring technology or perhaps for water evaluation SOMMER Messtechnik offers the possibility to rent or borrow devices and components (e.g. TQ-Tracer, RQ-30 and RP-30) on a temporary basis.

Workshops and Training

What possibilities exist for carrying out discharge measurements? What are the advantages and disadvantages and the limits of the various systems? How do I carry out measurements using the tracer dilution method? These and further hydrographic topics are highlighted in our regular workshops and training courses.

Further information as well as upcoming dates can be found on our website www.sommer.at or contact us personally and we will be pleased to provide you all details. We look forward to your contact and participation.





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