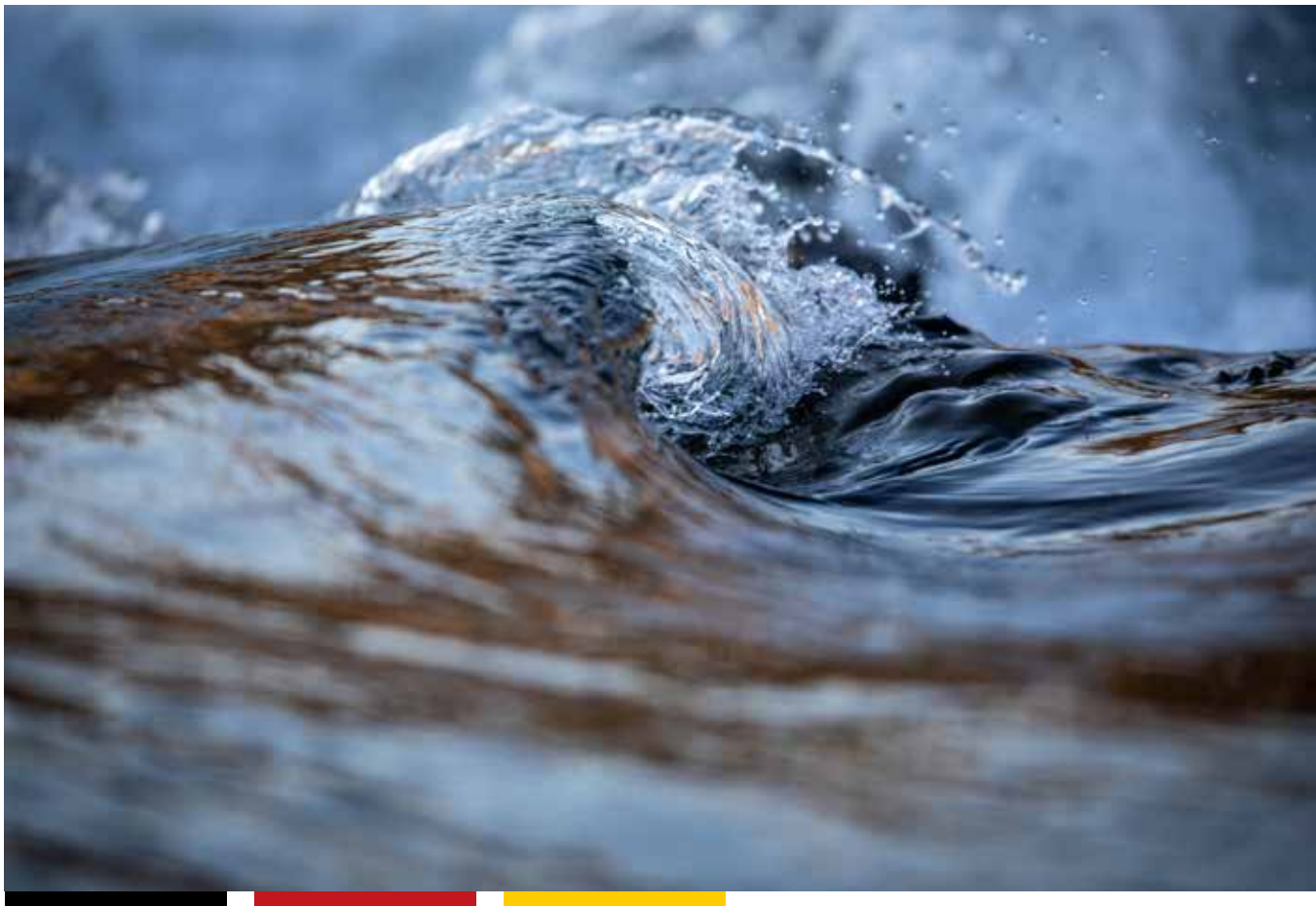




IOT SOLUTIONS – DIGITAL NETWORKING FOCUSING ON WATER LEVELS



MADE IN GERMANY

Smart communication and optimised processes in level measurement.
Preparedness for heavy rain, flooding and high water.

THE PERFECT BLEND OF CLASSIC MEASUREMENT TECHNOLOGY AND THE DIGITAL WORLD

The IoT solutions from ACS Control-System open up a multitude of new possibilities for monitoring and measurement in a wide range of application areas. Measurement data visualisation, device management and much more besides – at any time and anywhere in the world!

SIMPLE DATA MANAGEMENT

The ACS Web Portal allows users to centrally manage all their measurement points. When it is used in conjunction with the self-sufficient Data Logger DLF4 or HLF4, obtaining the most accurate measured values even from the most remote locations is an absolute breeze.

The data is automatically transferred to the ACS Web Portal with the highest security standards for precisely this purpose. A sophisticated alert management system with various escalation levels and modern alerting methods by means of the ACS Alert app, text message or email also enables early response to changes in local status conditions.

EASY HANDLING

Proprietary apps complement the portfolio and offer additional options for commissioning and monitoring:

- **The ACS SmartConnect app** is used for mobile configuration of devices on site
- **The ACS Alert app** enables reliable alerting and gives an overview of the measurement points' status on a smartphone or tablet



WE MAKE
THE UNPREDICTABLE
PREDICTABLE.



SELF-SUFFICIENT DATA LOGGER

DATA LOGGER DLF4

The Data Logger DLF4 acts as a sensor gateway with measured value recording and remote data transmission of:

- Fill level • Flow • Pressure • Level • Temperature
- Precipitation • Air pressure • Solar radiation

Digital or analogue sensors are connected to the five multifunction inputs. The recorded measurement data is automatically transferred to the ACS Web Portal and can be analysed and processed from absolutely anywhere.

AREAS OF USE:

- Water level measurement
- Monitoring of rainwater overflow basins
- Flow measurements at channels
- Temperature monitoring in ripening cellars
- Fill level monitoring in silos
- Landfill monitoring

and much more besides...



ADVANTAGES

- + Data logger with remote data transmission
- + Five sensor inputs
- + Bluetooth®
- + Redundancy measurement function
- + Service lives of up to ten years
- + Sturdy, robust aluminium housing for mounting on a wall or in the field
- + Various energy supply options
- + Memory for 500,000 measured values
- + Suitable for all mobile phone standards and providers

DATA LOGGER PIPE LEVEL MEASUREMENT HYDROLOG® HLF4

The Hydrolog® HLF4 is used for recording measured values and remote data transmission of:

- Level
- Temperature
- Ultrasound
- Or similar sensor technology

Automatic Data transmission to the ACS Web Portal, using the strongest mobile phone provider on site.

Our innovative alert management system makes it possible to detect dangers caused by flooding or low water in time. The Hydrolog HLF4 was specifically developed for measuring in narrow pipes.



AREAS OF USE:

- Groundwater monitoring
- Surface water measurement
- Rainwater overflow basin logging
- Landfill monitoring



ADVANTAGES

- + Data logger with remote data transmission
- + Five sensor inputs
- + Bluetooth®
- + Configurable using the app
- + Battery operated (rechargeable)
- + Suitable for all mobile phone standards and providers

ULTRASONIC FILL LEVEL TRANSMITTER SONICONT® USP4

Ultrasonic sensor for non-contact fill level measurement in liquids and bulk solids:

- Fill level

The device is an electronic ultrasonic fill level transmitter for continuous measuring, monitoring and controlling fill levels in liquids, pastes or coarse-grained bulk solids. Due to its high level of accuracy and digital alignment using Bluetooth® 5.0 LE, the device can be adapted to an extremely wide range of applications.

AREAS OF USE:

- Redundancy measurement in level pipes
- Non-contact measurement of fill level and volume
- Flow measurement at open channels and measuring weirs
- Water and wastewater sector
- Process industry
- Environmental technology
- Storage tanks, storage bunkers, silos

and much more besides...



ADVANTAGES

- + Easy to operate using the app
- + Measuring ranges of up to 8 m
- + M12 connector or suspension cable version
- + High protection class (IP65 / IP67 or IP68)
- + 4 to 20 mA electronics with two-wire technology
- + High level of accuracy ($\leq 0.2\%$)
- + Bluetooth® 5.0 LE operating interface
- + Integrated overvoltage protection
- + Temperature compensation and interference echo suppression



HYDROSTATIC LEVEL PROBE HYDROCONT® HP4

Level probe for hydrostatic fill level measurement with a capacitive ceramic measuring cell:

• Level probe • Temperature

Due to the capacitive ceramic measuring cell, the immersion probe offers maximum accuracy and long-term stability. The slim design, measuring 22 mm in diameter, enables use even in small sounding pipes. Due to the possibility of combining different materials for sensors, cables and seals, the measuring system can be designed to handle a multitude of even aggressive filling media.

AREAS OF USE:

- Level measurement in connection with data logger
- Continuous fill level measurement in reservoirs, clarifying tanks, deep wells and boreholes
- Different materials for sensors, cables and seals selectable, enabling use in an extremely wide variety of media
- Fill level measurement in containers that can be flooded from the outside



ADVANTAGES

- + Slim design
- + Overvoltage protection integrated in the probe
- + Very sturdy special cable with wire rope and air compensation capillary
- + Maximum accuracy due to capacitive ceramic measuring cell
- + With built-in temperature measurement



THE ACS WEB PORTAL

THE PERFECT SOLUTION FOR YOUR MEASUREMENT DATA

Functional, flexible, networked and clear. ACS Control-Systems data management system automatically saves your measured values and presents the data in clear tables and charts. Alert management can be activated using the ACS Web Portal, enabling users to inform various people by email, text message or the ACS Alert app.

ADVANTAGES

- + Your data is stored on infrastructures with C5 certification (high level of protection against cyber attacks)
- + Encrypted data transmission according to the most stringent security standards
- + Measurement data at any time and worldwide
- + Central device management
- + Alerting using the ACS Alert app, text message or email
- + Reporting
- + Monitoring and visualisation
- + Data export
- + **MORE SERVICE**
All-inclusive service package, complete cost control, simple operating system, free telephone support, installation, commissioning, maintenance contract







ACS CONTROL-SYSTEM AND VERBUND – EXPERT PARTNERS SINCE 2009

The water of the River Inn covers around 517 km from its source in the Swiss Alps to its estuary in the Danube near Passau. The River Inn is the primary energy source for VERBUND hydropower plants in Bavaria. Its water provides tremendous amounts of clean electricity from renewable hydropower, safely supplying millions of people with vital energy.

At the same time, our partner VERBUND is well aware of its responsibility towards both humanity and the environment. In the Bavarian course, the River Inns drainage basin covers about 8,000 km². The reservoir area between Rosenheim and Feldkirchen has many nature reserves and biotopes. This is exactly where ACS Control-System provided active assistance. The ACS flood prevention and heavy rain protection system detects at an early stage when the water levels of the River Inn change and issues warnings of impending natural disasters in good time.

But ACS Control-System isn't just an expert partner in crisis situations. Our measurement points impress since they are highly reliable in operation and deliver a very high data quality. We help our customers to run their plants efficiently and save costs. Automatic transfer of data to the ACS Web Portal saves substantial human resources too.



In ACS Control-System, we have a partner who offers us a complete package, ranging from planning the measurement points to installation and maintenance. This has also significantly improved the quality of our measurement data.





AS THE LEADING OPERATOR
OF HYDROPOWER PLANTS
IN BAVARIA, WE RELY ON ACS.

Verbund

HYDROPOWER

LEVEL MEASUREMENT 4.0

As an innovative and powerful company for measurement technology and control systems, ACS Control-System is an expert partner. We combine classic level measurement with the digital world.

ACS Control-System has been cooperating successfully with E.ON, since 1995, which became part of the UNIPER Group in 2016.



UNIPER SE

Germany is our home market and the base from which we manage our global activities. Our operations range from electricity production and energy trading, to energy storage, energy distribution and technology services.



ISAR HYDROPOWER PLANT GROUP

The Isar Hydropower Plant Group comprises run-of-the-river power plants on the Isar, Rißbach, Kesselbach, Loisach and Amper rivers, as well as the Walchensee/Kochelsee storage power plant. The power plant group's expansion capacity is 366 MW, and its average annual output is around 1,600 GWh.



LECH HYDROPOWER PLANT GROUP

The Lech Hydropower Plant Group comprises 22 run-of-the-river power plants on the Lech and Lochbach rivers, as well as the Roßhaupten storage power plant on Lake Forgggen. The power plant groups expansion capacity is 260 MW, and its average annual output is around 1,100 GWh.



ACS Control-System – a reliable partner for all measuring tasks for decades.



An aerial photograph of a wide river flowing through a lush green forest. In the foreground, a concrete dam with a small white building on top spans the river. The river continues into the distance, flanked by dense trees. In the far background, a city skyline is visible under a blue sky with scattered white clouds.

WE ARE THE
LINK BETWEEN
HUMANS, NATURE AND
INDUSTRY

POWER

12 / 13

ROB MEASUREMENT

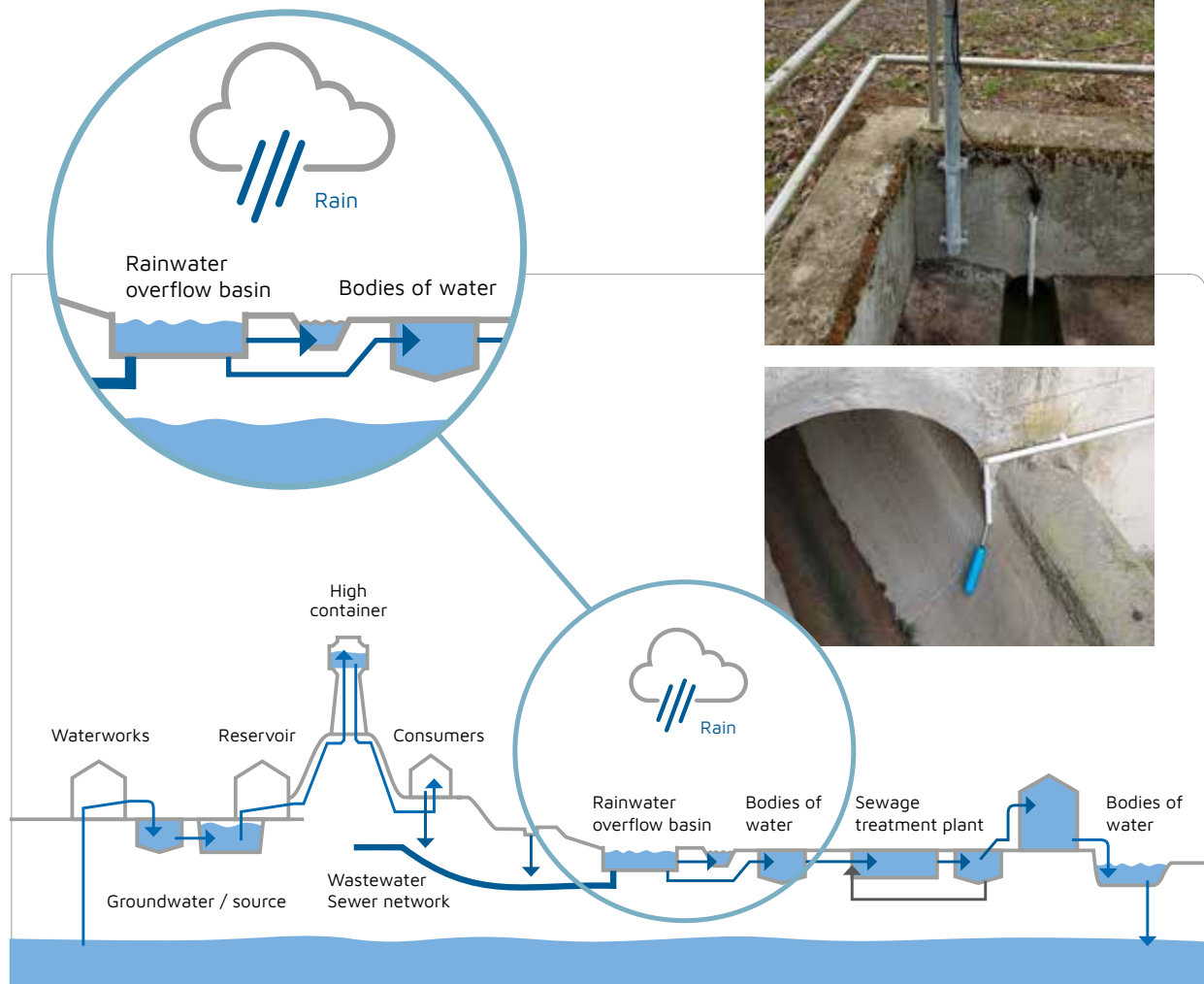
IN ACCORDANCE WITH SECTION 5 OF THE GERMAN SELF-MONITORING ORDINANCE

The European Water Framework Directive, adopted in the year 2000, gave rise to various measures designed to improve the ecological and chemical conditions of surface waters.

Here, quite a few measures are aimed directly at the ecologically sensitive junctions of the sewer network and wastewater treatment plants with open water systems. This particularly applies to rainwater overflow and catchment basins.

Flow-through basins keep the precipitation in the basin during heavy rainfall events, since the clarifying tanks can only absorb a certain amount of wastewater. If the volume in the flow-through basin is full, a partial quantity may be returned to the bodies of water (i.e. the pressure on the basin is relieved). Prior to this, solids / sludge, etc., must be deposited. In catchment basins, the sedimentation effect is omitted, since here outflow into the bodies of water is only intended when the basin is full, without any inflow to sewage treatment plants.

In the German Federal Water Act, a reduction in pollutant loads according to the state of the art in wastewater discharges is required. These requirements are uniformly set out throughout Germany in the German Waste Water Ordinance. For the treatment and discharge of precipitation water, the requirements are regulated at state level.



MONITORING AND LOGGING

INSTRUMENTS FOR ROB LOGGING

WITH POWER SUPPLY

HYDROCONT® M AND DPA

- + Reliable, robust measurement
- + Many versions and process connections
- + Paperless, digital process indicators
- + Ideal for documentation and verification vis-à-vis authorities by means of data storage function
- + USB



WITHOUT POWER SUPPLY

HYDROCONT® HP4 AND DLF4/HLF4

- + Measuring ranges from 100 mbar to 10 bar
- + Robust, ceramic, flush diaphragm
- + Highly accurate, dry capacitive sensor
- + Maximum accuracy of up to $\leq 0.05\%$
- + Integrated temperature sensor offering long-term stability
- + Temperature range from -20°C to $+70^{\circ}\text{C}$
- + RS485 Modbus® RTU electronics
- + Integrated overvoltage protection



ACS FLOOD PREVENTION AND HEAVY RAINFALL PROTECTION

IDENTIFYING NATURAL DISASTERS AT AN EARLY STAGE

Sudden, localised heavy rainfall can cause immense damage to residential and infrastructure buildings and, in the worst-case scenario, can cause a tremendous amount of harm to people too. So it is important to issue early warnings in risk areas to protect against these forces of nature.

With the ACS early warning system, measurement already begins with the amount of precipitation at neuralgic points, before the rainwater reaches the nearest surface water.

Additionally, conventional level sensors are installed at critical road culverts and bridges. If culverts are blocked or overloaded by bedload and floating debris, the backwater that occurs is detected by our system and reported without delay. In combination with a precipitation sensor, the various measured variables and information enable correlations to be identified and warnings to be sent at an early stage. This faster response option means alerts can be issued before widespread flooding of housing and infrastructure occurs.

Our Hydrolog HLF4 and DLF4 systems are self-sufficient in operation, meaning they can also be used at any critical point where a measurement task is required.

With our experience, we support the federal states, districts and municipalities in setting up an early warning system so they can issue warnings to the population at an early stage.



Partially blocked flood spillway



Stream underpass in a densely built-up area

ADVANTAGES

- + Self-sufficient measurement point with battery lives of up to ten years
- + Various complete systems assembled ready for operation → Calculable costs
- + State-of-the-art modules for data transmission from 2G to LTE-M
- + Simple user management
- + Simple commissioning
- + Measured values can be accessed at any time over the internet
- + Reliable alerting of events such as flooding or heavy precipitation by means of the ACS Alert app, text message or email



MONITORING YOUR RISK AREAS HAS NEVER BEEN SO EASY!

**We deliver a complete package
that is specifically adapted to your needs.**

- + We take over conceptual design, commissioning and maintenance
- + Complete cost control
- + Connection for any kind of sensors
- + All data simple and clear in the ACS Web Portal
- + Connected at all times and worldwide
- + Alerting with suitable ACS Alert app, text message or email
- + Easy device configuration using the ACS SmartConnect app

PRECIPITATION AND LEVEL MEASUREMENT

NR4M

Precipitation sensor according to Joss-Tognini

The all-metal Tipping Bucket precipitation sensor of the NR4M family meets the highest measurement requirements. In combination with the DLF4, local precipitation amounts can be precisely recorded and warnings sent in the event of heavy rain.



PRECIPITATION SENSOR NR4M

For continuous recording of precipitation, used in meteorological applications worldwide.

High-quality materials and workmanship guarantee a long service life. Its functionality is precisely geared to the needs of classic meteorology and hydrology, not to mention industrial meteorology. It is an extremely economical investment for life!

SELF-SUFFICIENT REMOTE DATA TRANSMISSION WITHOUT POWER AND LAN CONNECTION

- + Mobile phone connection
- + Ultra low power
- + Various energy supply options
(Rechargeable) battery, PV module, external DC supply
- + Battery lives of up to ten years
- + Robust aluminium housing for mounting on a wall / in the field
- + Memory for 500,000 measured values

Other physical sensors:

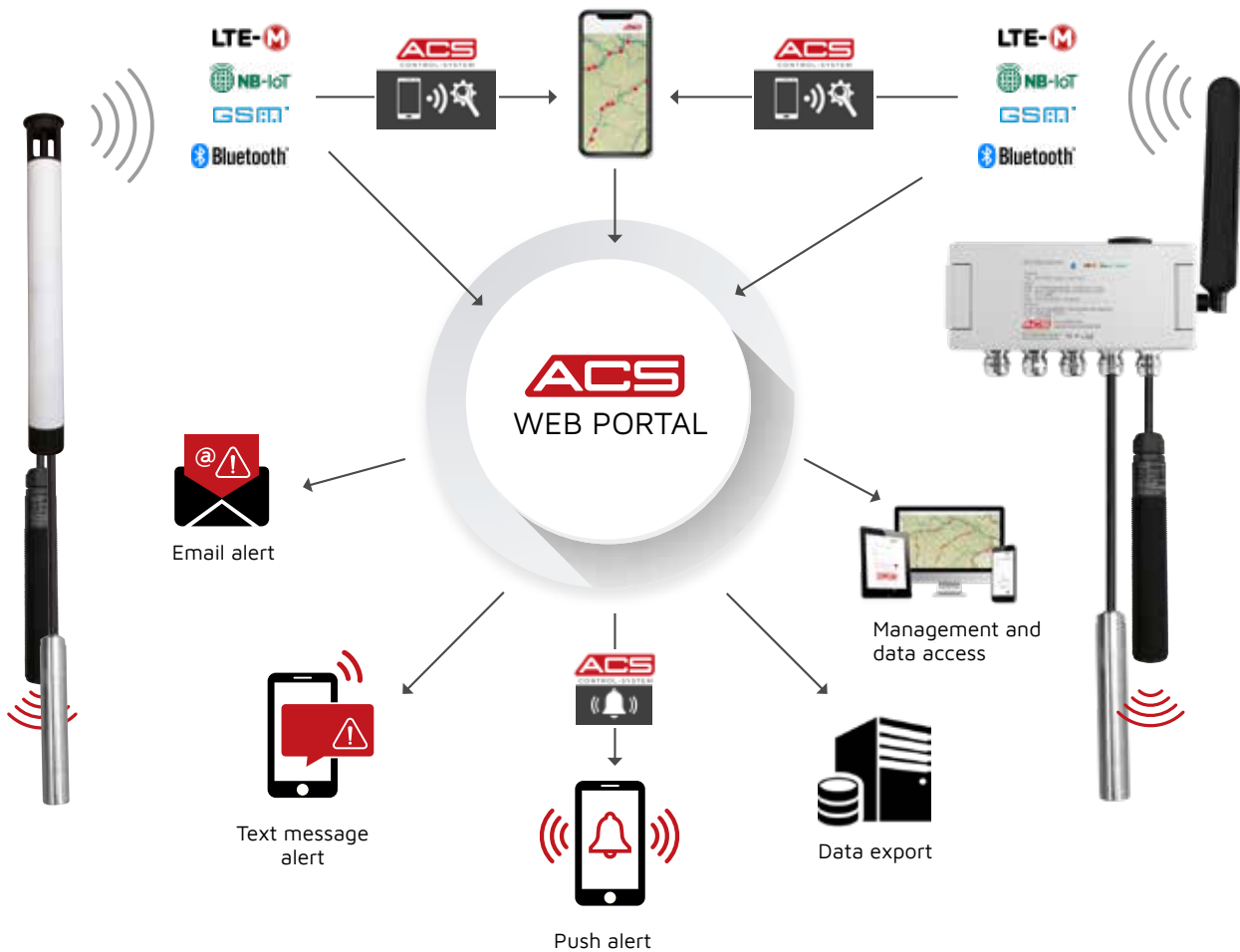
wind direction, dew point, wind speed, air pressure, air temperature, global radiation, relative humidity



Precipitation sensor with logger



Data logger configuration



DATA TRANSFER

- + SIM cards are already integrated in the devices
- + Automatic connection using the strongest local network
- + Data protection concept according to the latest guidelines
- + Automatic update of the measurement points on site using the ACS Web Portal
- + Operation of the local devices with a free app for Android, iOS and Windows via Bluetooth®
- + No special readout devices and interface cables necessary

DATA MANAGEMENT

- + Easy access to all measurement data at any time
- + No need to install software
- + Quick overview of the status of all the measurement points
- + Parameters for the devices can be set using the ACS Web Portal
- + Alerting in the case of failure of a measurement point or implausible measured values
- + Measured values displayed in charts
- + Automatic data export to the WISKI water management information system
- + Display of the measurement points on Google Earth with exact GPS positions
- + Preventive maintenance possible



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