NIVUS - Products and Services

NIVUS - Instrumentation for Water Industry

The NIVUS group is a German-based leading developer, manufacturer and supplier of measurement instruments for the water industry. Since 1967 the company has been pointing the way ahead by setting new standards and by continuously developing high quality products and solutions.
The company head office is located in Eppingen/Germany. With 7 international subsidiaries and more than 40 distributing partners worldwide NIVUS is a real global player.

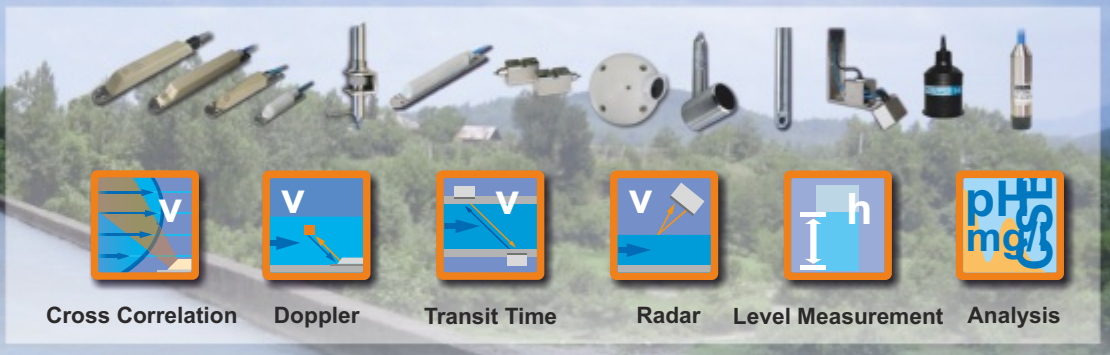
Cutting edge technology and quality while offering optimum consultancy
In simple terms: it is our mission to provide the perfect measurement solution for your application. One of the key aspects for ideal measurement solutions is to offer optimum consultancy right from the start, while focussing on your specific measuring task as well as special application requirements. Our team has many years - or even decades - of experience and know-how and regularly participates in internal and external seminars and training courses.

Our motivation to offer the best measurement systems in terms of handling, reliability, variety and accuracy to our customers drives us to constantly improve our existing solutions. Our entire team strives to offer you the perfect measurement and the best service: from the first contact to on-time shipping, from initial consultancy to maintenance on a regular basis – we put the focus on you and your needs!

Product Range

The suitable solution for each application. Tried and tested measurement systems to perfectly fit your needs. Measurement systems which measure right what they should, reliably and accurately - even under difficult conditions. This is our claim!

Sensor technology

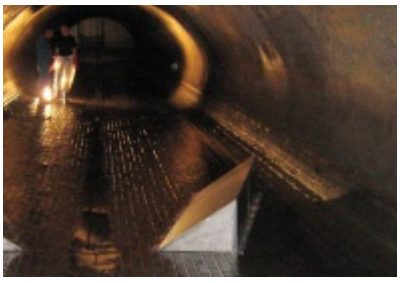


Transmitter

Intelligent transmission of measurement data

Software solutions

Fields of Activities



Channel Networks Monitoring

Portable and permanent measurement systems for continuous measurement of flow and level in channel network systems.

Wastewater Treatment Plants

Portable and permanent measurement systems for continuous measurement of flow and level in all areas of wastewater treatment plants.

Measurement Campaigns

We supply all services from one source: from device rentals to complete planning, implementation and data evaluation.
Used for master plan studies and for the calibration of hydraulic Models.

Flowing Waters Rivers & Channels

Flow measurements in flowing waters for flood protection, calibration and validation of hydrologic calculation models, dimensioning and operation of facilities in water industry.

Industry & Hydropower

Flow measurements of inlets and outlets conducting cooling water, circulation systems and turbine intakes of power plants and industry; penstock monitoring and turbine efficiency monitoring.

Water Supply & Water Distribution

Measurement of level and pressure in deep wells and conveyor systems as well as flow measurements at elevated tanks, water purification plants and water treatment plants.

Products and Services

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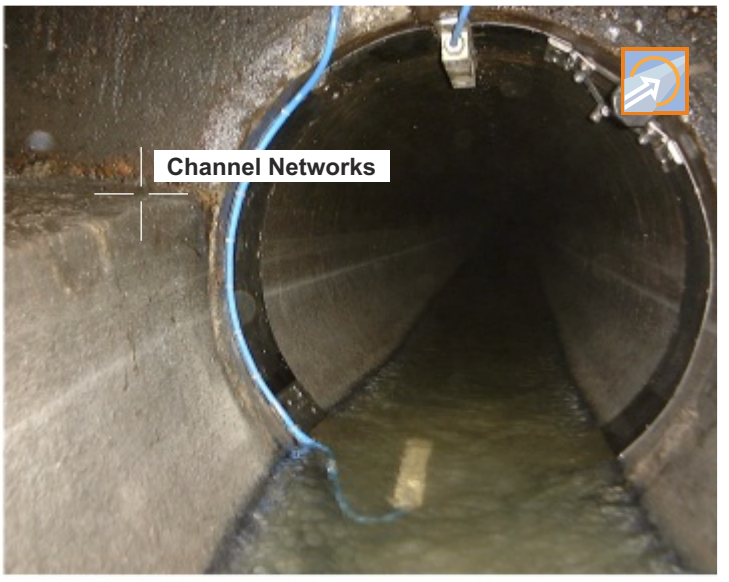
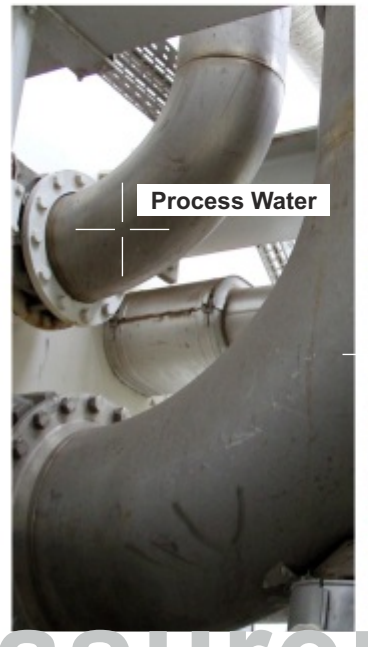
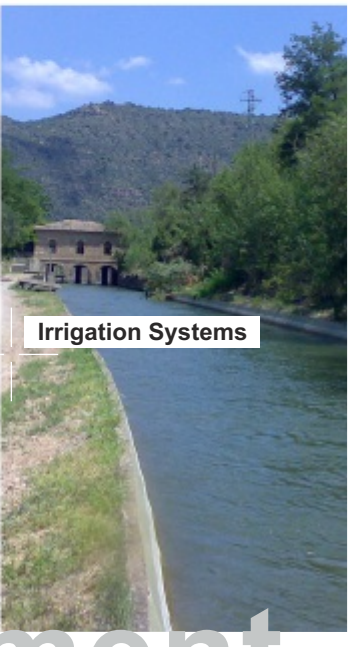






FLOW Measurement

The perfect solution for each application

Regarding flow measurement in water and wastewater NIVUS distinguish between two basic methods:

Flow Velocity Measuring Methods

NIVUS provides portable and permanent metering systems for continuous flow measurement using ultrasonic flow and radar velocity measurement. For any liquid from clean water to wastewater and for a variety of flumes such as part filled and full pipes, channels and surface waters we supply appropriate measurement systems. Our innovative units stand for highest accuracy and measurement reliability combined with easy installation and straightforward operation.

The Hydraulic Method (Q-h Relation)

For classic flow measurement methods on Venturi flumes, weirs, dam shutter and similar applications, NIVUS provides appropriate metering and evaluation instruments.

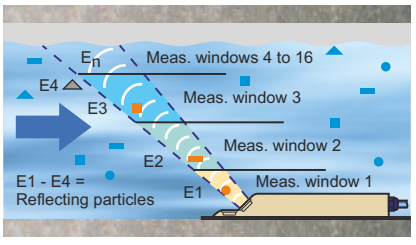
Flow Velocity Measurement Methods

$$Q = \bar{v} \cdot A$$

The flow velocity measurement method is an indirect method for flow investigation in part filled and full pipes, channels and surface waters.
The average **flow velocity ($\bar{v}$)** is measured within the fluid using flow velocity sensors based on ultrasonic or radar measurement technology. The wetted **cross-sectional area (A)** depends on the section profile as well as on the flow level **(h)**.

Wastewater

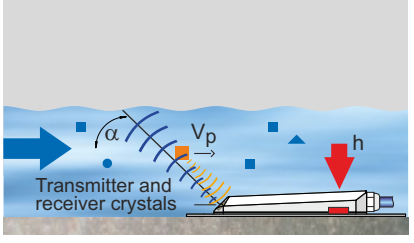
Cross Correlation Method



- **The measurement method for universal use in slight to heavily polluted water**
- **Very high accuracy**
- **Measures the real flow velocity profile**

Reflectors within the water (particles, minerals or gas bubbles) are scanned by an ultrasonic impulse and subsequently are saved as echo patterns.
A second scan follows a few milliseconds later. Correlating both signals allows us to calculate the flow velocity.
Repeating this procedure in varying flow levels enables determination of the real flow velocity profile.

Doppler Method



- **For measurement in slight to heavily polluted water**
- **Latest intelligent fourth-generation Doppler technology**

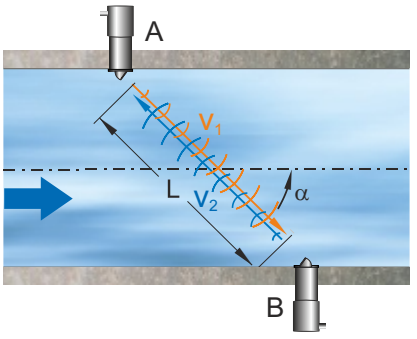
The Doppler method uses a continuous ultrasonic signal with a defined frequency and a known angle to be sent into the water. The moving particles generate a frequency shift which is proportional to the flow velocity of particles.
These values are used for statistical averaging. The Doppler method cannot be used to perform distance-related flow velocity measurements.

Hydraulic Methods

$$Q = k \cdot f(h)$$

Water

Transit Time Method

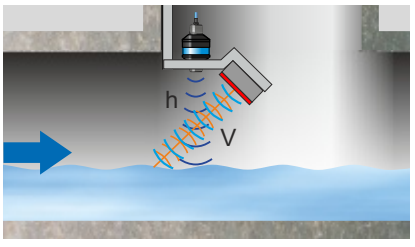


- **For clean to slightly polluted water**
- **Meets IEC 60041/ISO 12242/ EN ISO 6414 requirements**
- **Very high measurement accuracy**

The transit time method is based on detecting the transit time of ultrasonic signals between two sensors.
Here the signal transit time towards the flow direction is shorter than against the flow direction. The difference between both transit times is proportional to the average flow velocity along the measurement path.
The average velocity within the section is calculated by the transmitter.

Wastewater and Water

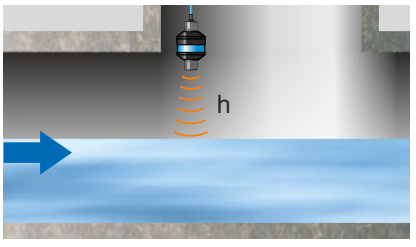
Radar Method



- **Non-contact measurement**
- **For all liquid media**
- **Installation without interrupting processes**

The radar flow meter detects the flow velocity on the water surface.
The surface velocity can be detected by reflections of the radar signals on surface waves. The evaluation of the signals are done by the Doppler method. With an additional level measurement and the known channel geometry the flow can be measured accurately.

Ultrasound, Hydrostatics



- **Non-contact measurement**
- **Easy installation**
- **For clean and wastewater**

Hydraulic flow measurement detects flow with level measurement in combination with hydraulic structures like weirs or Venturi or with two parallel level measurements. The calculation is based on the known geometries and special hydraulic knowledge in combination with special norms (i. e. DIN 19559 Part 2 for Venturi or DWA A111 for weirs).

Flow Velocity Measurement Methods

Sensors

NIVUS provides appropriate sensors for each application. Optimised mounting accessories enable easy sensor installation.

- Drift-free sensors with absolutely stable zero point
- Easy installation thanks to perfectly matched mounting accessories
- Installation under process conditions possible
- The selection of sensor variations ensures the best possible solution for each application
- Error-proof connection over long distances thanks to digital signal transmission

Sensors for flow velocity measurement

Wastewater

Channel shape

Sensor types

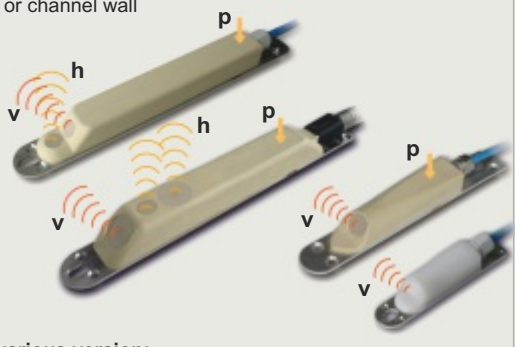
Pipe sensor cross correlation

for installation in pipes using nozzle and cutting ring screw joint

various versions:
- v-measurement only
- combined v- and h-measurement

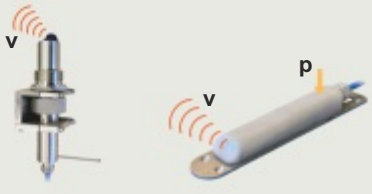
Wedge sensor cross correlation

for installation on channel bottom or channel wall



various version:
- v-measurement only
- combined v- and h-measurement (ultrasonic)
- combined v- and h-measurement (pressure)
- combined v- and 2x h-measurement (ultrasonic and pressure)

Pipe sensor Doppler Wedge sensor Doppler



various versions:
- v-measurement only
- combined v- and h-measurement

Clamp-on sensor Doppler

for installation on full filled pipes

- v-measurement

Air-ultrasonic sensor	Compact Ultrasonic Level Meter	Ultrasonic sensors	Pressure probes
			
For installation on channel crown. For connection to NivuFlow, OCM and PCM transmitters	Ultrasonic Level Meter with integrated evaluation electronics	For direct connection to NivuMaster transmitters	Hydrostatic Pressure Probes for direct connection via 4-20 mA

Comprehensive description and overview of sensors can be found in chapter Level Measurement.

Water

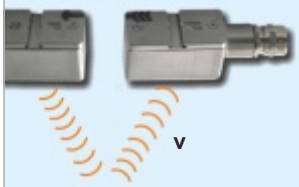
Pipe sensor/Wedge sensor

for installation in pipes and channels

- v-measurement

Clamp-on sensor

for installation on full pipes



- v-measurement

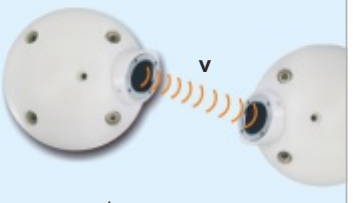
Rod sensor

for installation on channel wall

- v-measurement

Hemispherical sensor

for installation on channel wall



- v-measurement

Wastewater and Water

ORF Radar

for installation above the channel

- v-measurement
- additional h-measurement necessary

To Transmitter

Flow Velocity Measurement Methods

Transmitters

	Wastewater			
	NivuFlow 750	**NFP**	**PCM Pro**	**PCM 4**
				
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System	**Cross Correlation Method**		**Cross Correlation Method**	
Installation Mode	**permanent**	**permanent**	**portable**	**portable**
Real flow velocity profile measuring	+	+	+	+
Inputs				
0/4 - 20 mA with 12 Bit resolution for external level and external setpoints	7	-	-	-
4 - 20 mA for external level (2-wire)	1	-	1	2
Redundant level measurement	+	-	+	+
Digital inputs	7	1	1	1
Max. number of v-sensors	3(9)	1	1	1
Sedimentation measuring	+	-	+	+
Outputs				
Relays	5	2	1	1
Analog outputs	4	3	-	1
Data storage				
	+	-	+	+
Communication				
Modbus-TCP/RTU, optional GPRS	+	-	-	-
Areas of use				
	The top unit for universal use in wastewater	For full pipes - the cost-effective alternative to EMF	The top unit for portable measure-ments in hazar-dous (Ex) areas	For demanding portable measurements in non-Ex areas

				Water			Wastewater and Water		
	OCM F		PCM F	NivuChannel		NivuFlow 600	OFR Radar		
									
	Page 21		Page 24	Page 25		Page 26	Page 28		
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	+		+	+	+	–	+		
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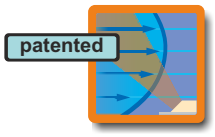
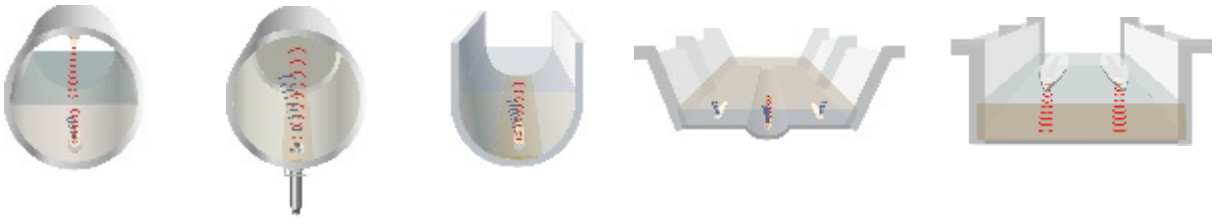
	–		–	+	+	–	+		
	Doppler Method			Transit Time Method			Radar Method		
	permanent		portable	permanent		permanent	permanent		
	-		+	-		-	-		
	2		-	4		2	4		
	1		2	1		1	1		
	-		+	-		-	(+)		
	4		1	4		2	4		
	1		1	8 paths		4 paths	3		
	-		+	-		-	-		
	5		1	5		2	5		
	3		1	4		2	4		
	-		+	+		+	+		
	-		-	+		+	+		
	Standard unit for use in wastewater		For portable measurements in slight to heavily polluted water	High accurate measurements in part filled pipes and channels		Accurate measurements in full pipes Clamp-On available	Non-contact measurement in part filled channels		



The unique NIVUS cross correlation flow meters feature a patented profiling technology for accurate flow measurements, providing outstanding flow measurement performance.

Permanent Measurement Systems



NivuFlow 750

Flow metering at the highest technical level. Universal use in wastewater for part filled pipes and channels

NivuFlow 750 is the successor to the well-known OCM Pro CF. New numeric discharge models saved in the transmitter's internal memory allow more accurate and reliable determination of flow rates even under difficult measurement conditions.
The compact dimensions of the new transmitter allow to install the unit on DIN rails and in switching cabinets even under confined conditions.

- Very high measurement accuracy
- Suitable even for very difficult applications
- Real-time measurement of real flow velocity profiles
- Intuitive, modern operating concept for quick and easy initial start-up
- No calibration required
- Extensive diagnostic functions for reliable initial start-up and quick maintenance

Ex-Separation Interface iXT

Suitable for shapes	Full and part filled channel shapes such as pipe, egg, rectangular, U-profile, trapezoid channels, detection of large flow volumes, free profiles etc.

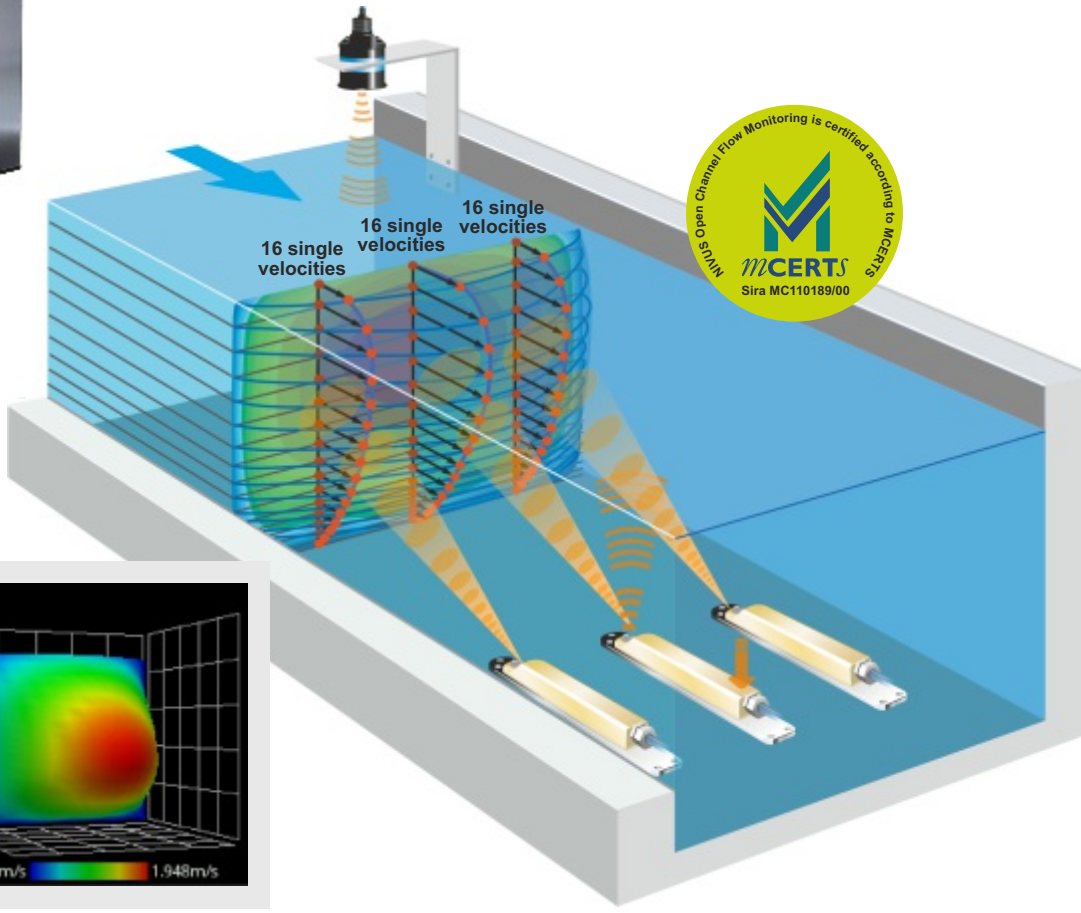
Typical applications	Channel network systems, inlets and outlets of wastewater treatment plants, billing purposes, discharge control, surface water and stormwater monitoring, CSO and SSO and many more

Flow measurement with cross correlation wedge sensor within a pipe

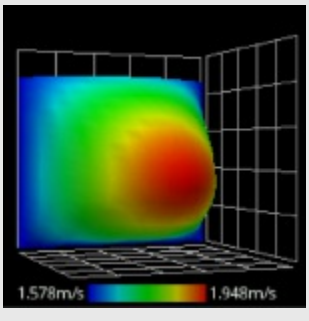
- Precise detection of flow at varying levels
- Detection of local velocities spread across the complete level
- Redundant flow measurement

The new developed NIVUS-COSP technology combines the high accurate velocity measurement with a hydraulic model, turning the available velocity measurement into a grid measurement according to VDI/VDE. Using an OCM Pro CF plus 3 sensors results in a measurement grid with 48 single spatially allocated velocities providing high accurate flow measurement.

- Visualisation of real flow conditions
- Continuous grid measurement
- Automatic error compensation

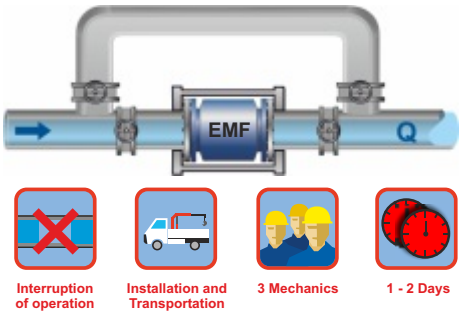


The alternative to EMF. Installation without the need to remove the EMF.

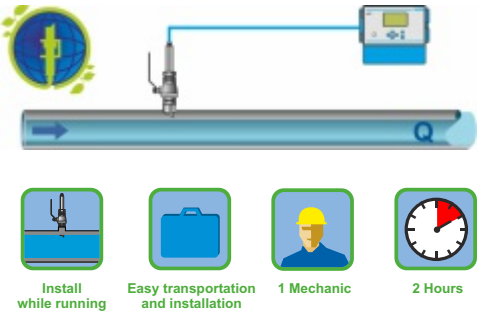


Flow profile indication on the display

Installation MID



Installation Ultrasonic Flow measurement NFP



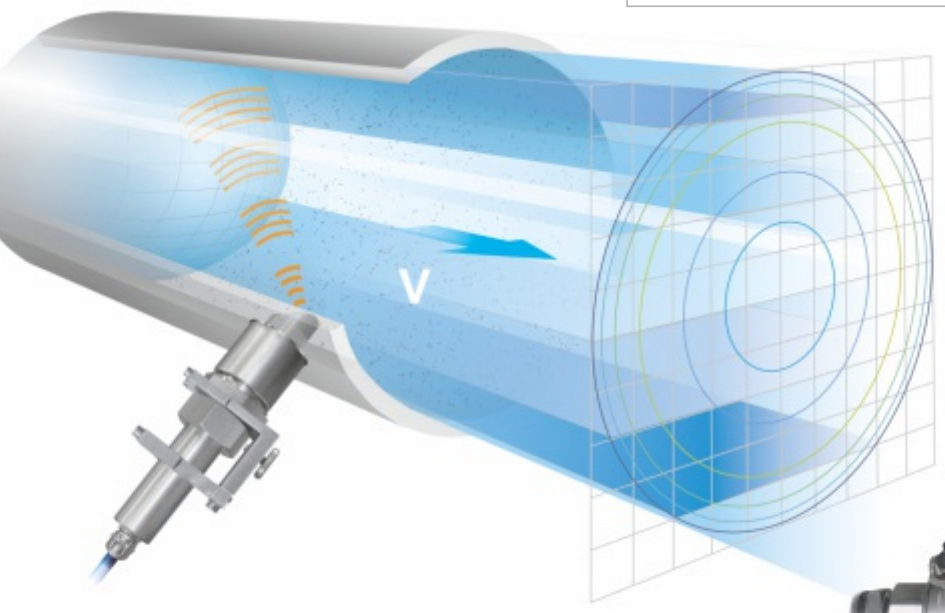
NFP (NIVUS Full Pipe)

Flow measurement in full pipes - the cost-effective alternative to EMF

- One Sensor for all diameters
- Upgrading during operation
- Installation without the need to empty the pipeline
- Easy installation and straightforward commissioning
- Low space requirements, can be installed almost anywhere
- Measurement in oily, greasy and muddy fluids

Suitable for shapes	Full pipes up to 800 mm diameter, greater diameters see NivuFlow 750

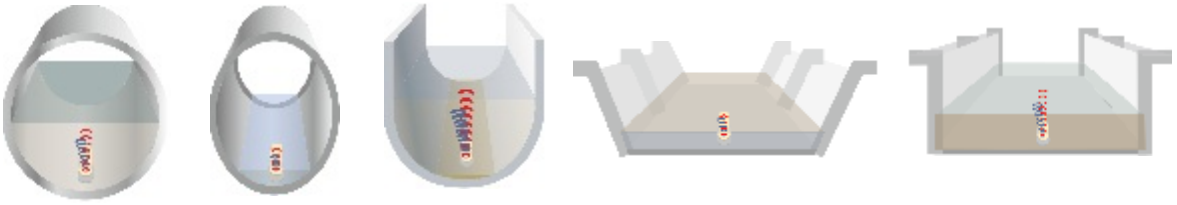
Typical applications	Pump stations for stormwater, dirty water and combined wastewater, wastewater treatment plants, pressure pipelines, drainage lines, return sludge lines, recirculation lines and many more



All you need: nozzle, ball valve and sensor as alternative to EMF. Installation without the need to interrupt the process flow - save time and costs



Portable Measurement Systems



PCM Pro

Portable, Ex-protected flow measurement using high accurate ultrasonic cross correlation, measurement of real flow velocity profiles

- No velocity calibration required due to measurement of real flow velocity profiles
- Easy-to-read graphic back-lit display
- Easy operation e.g. thanks to commissioning assistant function
- Long battery life thanks to discharge-dependent measuring cycles
- Data transmission via GPRS modem and Bluetooth
- Grid measurement on board (according to DIN EN ISO 748)

Suitable for shapes	Full and part filled shapes such as pipe, egg, rectangular, U, trapezoid, free profiles and many more

Typical applications	Use in Ex areas, calibration basis of hydraulic calculation models, determination of extent of sewer channel restoration, location of extraneous water loads, throttle verification

PCM 4

Portable flow measurement using high accurate ultrasonic cross correlation, measurement of the real flow velocity profile

- No velocity calibration required thanks to measuring the real flow velocity profile
- User-oriented operation conception
- Back-lit graphic display for easy reading
- Easy operation through dialog mode, e.g. start-up assistant
- Long battery life through discharge-dependent measuring cycles
- Mains power connection possible
- Data transmission via GPRS modem and Bluetooth
- Versatile connection options for peripheral devices
- Grid measurement on board (according to DIN EN ISO 748)

Suitable for shapes	Part filled and full shapes such as pipe, egg, rectangular, U, trapezoid, 2r egg, free profiles and many more

Typical applications	Use in non-Ex areas, calibration basis of hydraulic calculation models, determination of extent of sewer channel restoration, location of extra-neous water loads, throttle verification

Extensions for PCM Pro and PCM 4

NPP (NIVUS PipeProfiler)

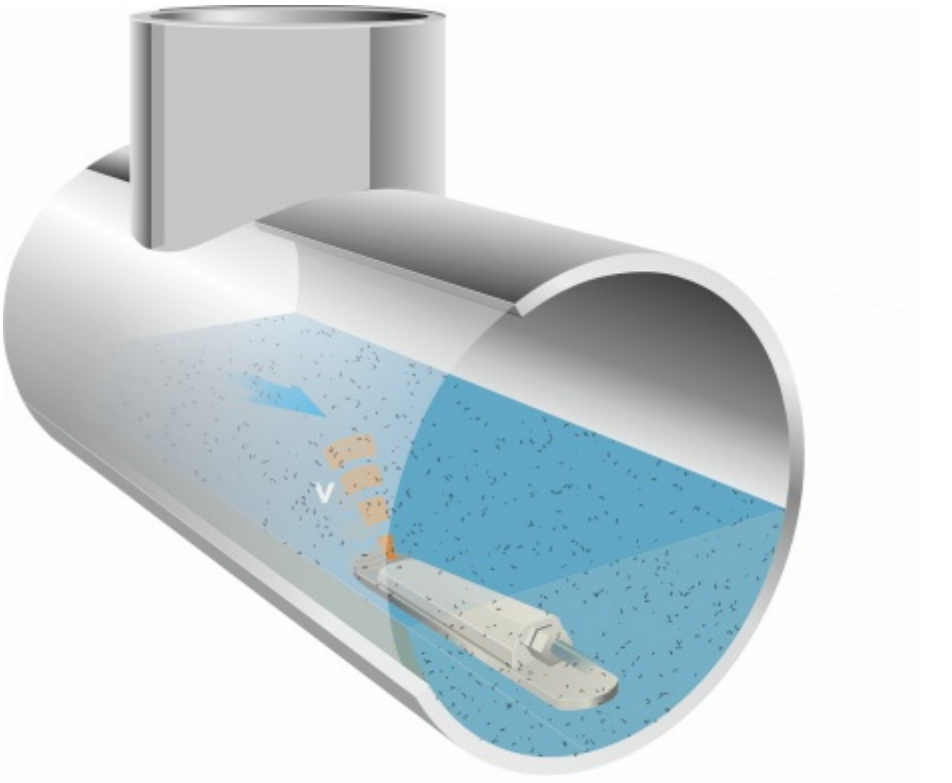
Portable pipe measuring section for PCM Pro and PCM 4

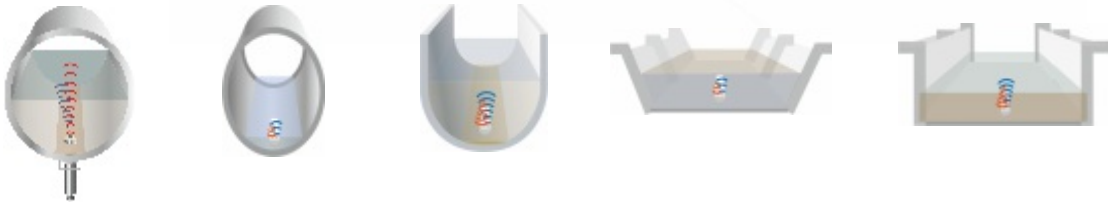
- Flexible use in various pipe diameters
- For very low flow volumes
- Measures under full-filled conditions utilising ideal flow profiles
- Sediment detection thanks to combination with level measurement integrated in flow velocity sensor

Suitable for shapes	Pipelines with diameters between DN 150 and 600 mm

Typical applications	Measurement of low flow volumes, im-provement of difficult discharge conditions

Permanent Measurement Systems





OCM F

Cost-effective flow metering for use in wastewater

- Cost-effective installation due to low mounting efforts
- Easy and straightforward commissioning, no programming skills required
- Data easily readable even under poor ambient conditions thanks to large back-lit display
- Integrated controller for discharge control

Suitable for shapes	Part filled pipe, egg, rectangular, U-, trapezoid and free profiles

Typical applications	Measurements and discharge control in pump stations, stormwater treatment facilities and wastewater treatment plants

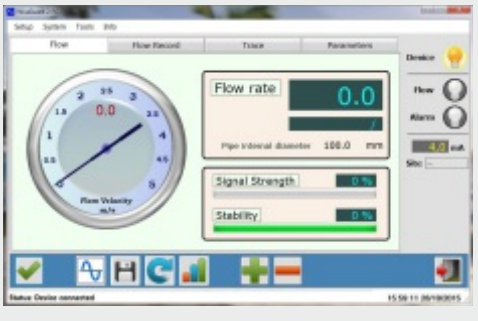
Clamp-On

NivuGuard 2

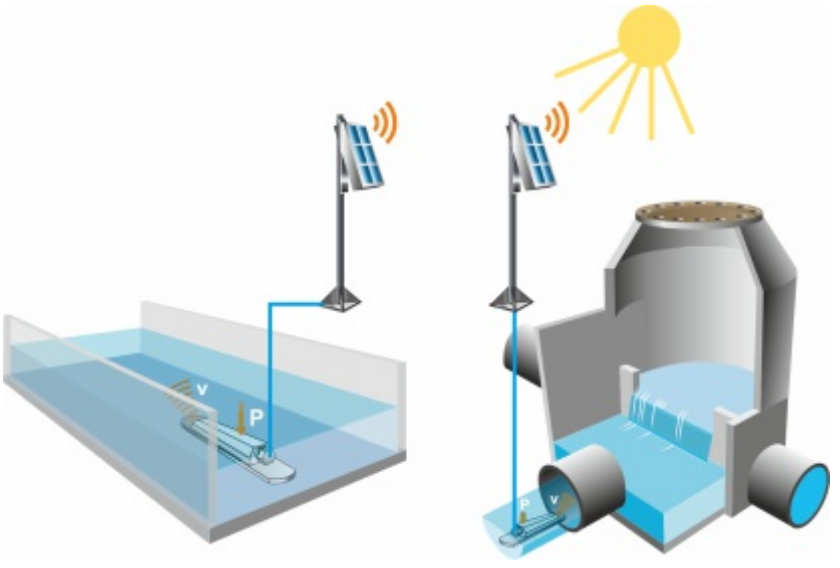
Non-contact flow monitoring for full pipelines

- Non-contact measurement
- No transmitter necessary
- Unaffected by pressure and temperature
- Easy retrofitting without the need for pipe works and operational interruptions
- Very robust enclosure

Suitable for shapes	full filled pipes, DN 50 up to DN 350
Typical applications	Dry run protection and flow monitoring on pump lines, sludge lines, wastewater pipelines



Solar Powered Measurement



NivuLog SunFlow

Self sufficient measurement for part filled channels at remote locations

- Very low costs for commissioning and operation
- Extremely robust IP68 enclosure, compact construction
- Solar panel protected by armoured glass
- Built-in rechargeable buffer battery and recharge control
- Direct connection of sensors using encapsulated terminal compartment

Suitable for shapes	Part filled pipe, egg, rectangular, U-, trapezoid and free profiles

Typical applications	Flow measurement in storm water tanks, channel networks, irrigation channels, mine drainage water cleaning units, course of streams, etc.

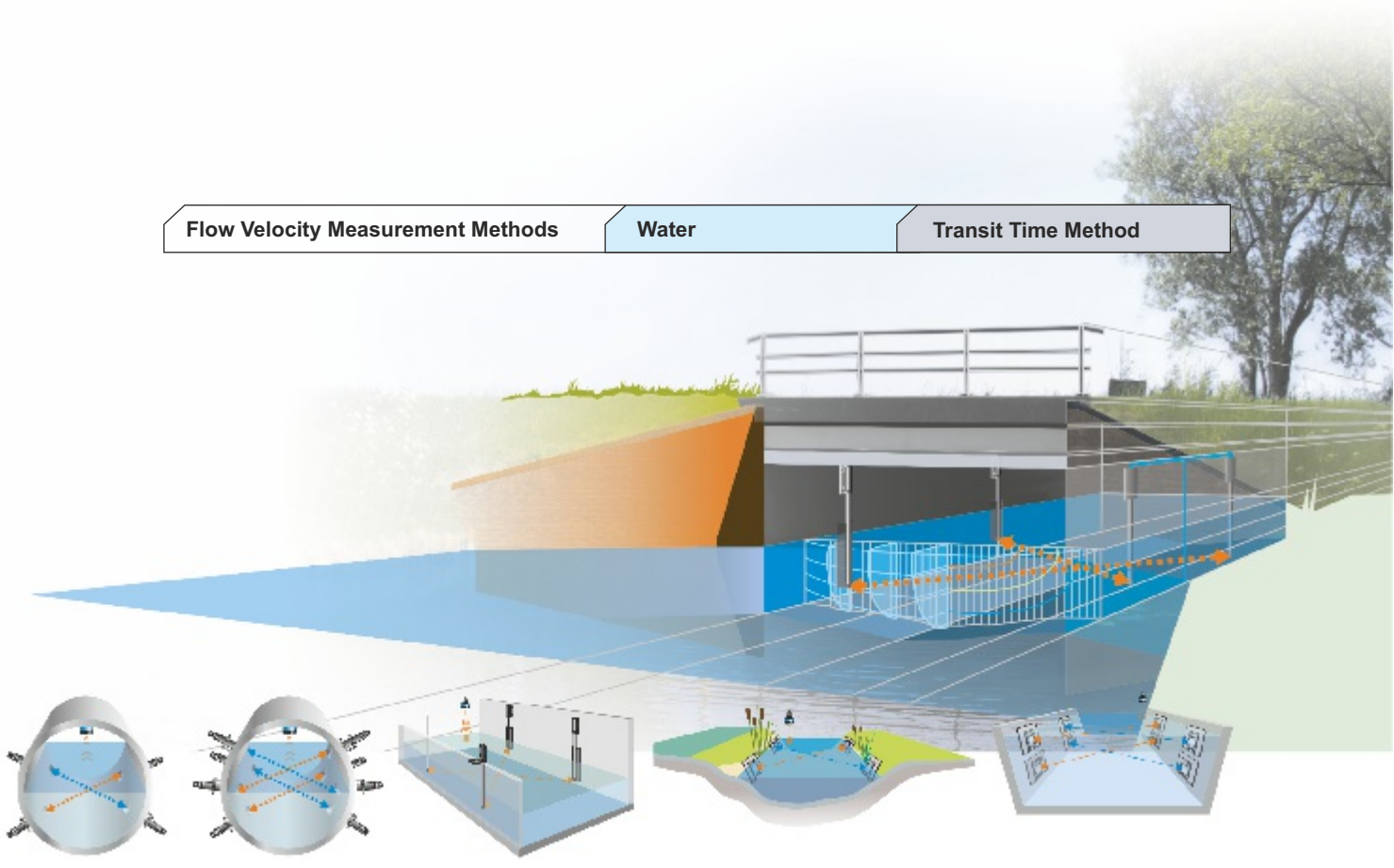
Portable Measurement Systems

PCM F

Cost-effective flow metering for universal use

- Cost-effective installation due to low mounting efforts
- Easy and straightforward commissioning, no programming skills required
- Data easily readable even under poor ambient conditions thanks to large back-lit display
- Integrated controller for discharge control

Suitable for shapes	Part filled and full shapes such as pipe, egg, rectangular, U, trapezoid, 2r egg, free profiles and many more
Typical applications	Measurements and discharge control in pump stations, stormwater treatment facilities and wastewater treatment plants



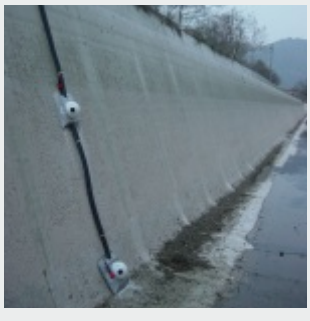
NivuChannel

High accurate flow measurement for clean to slightly polluted water in pipes, channels and surface water

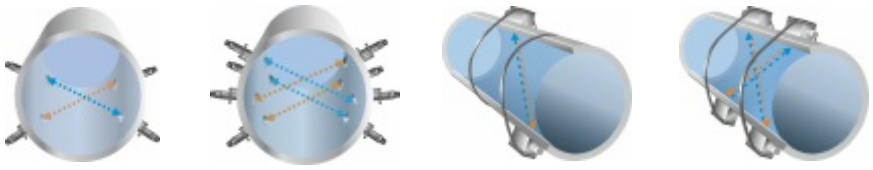
- Various sensor types allow to perfectly adjust the system
- Straightforward installation
- Easy operation through menus in dialog mode
- Accurate measurement due to use of up to 8 measurement paths
- Measurement according to IEC 60041 (ASME PTC 18)
- High sensibility through signal correlation

Suitable for shapes	Full and part filled pipes, rectangular channels, natural streaming water and many more

Typical applications	Measurement in surface water such as rivers, channels, irrigation systems, drainage systems as well as cooling water, process water, hydropower plants, penstock monitoring, turbine efficiency monitoring and many more



new



NivuFlow 600

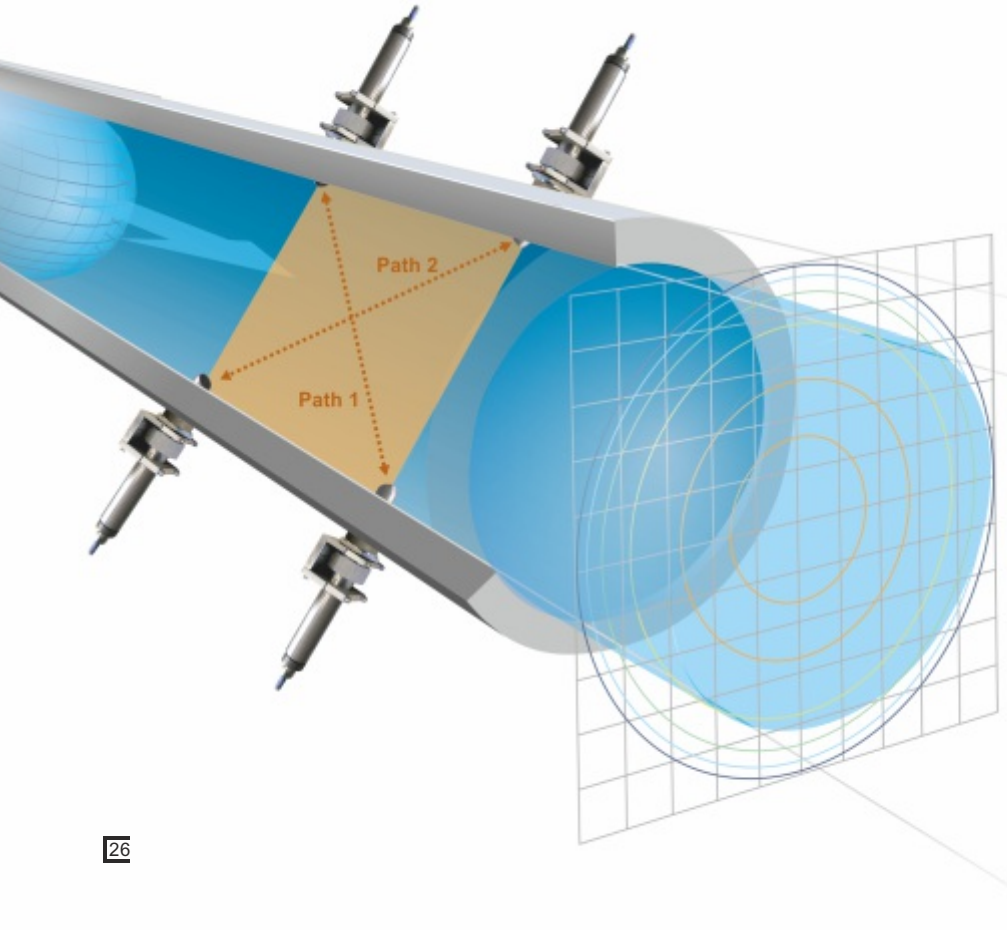
Flow measurement for clean to slightly polluted water in full pipes

- High stability due to 4 measurement paths
- Reliable commissioning due to software-supported sensor alignment
- Easy operation thanks to menu-based dialog mode
- Uncomplicated integration into existing control systems via universal interfaces

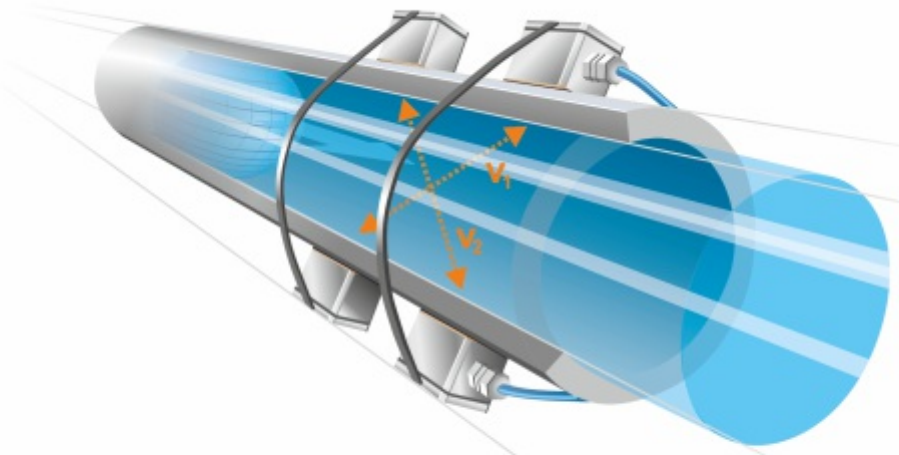
Suitable for shapes	Full pipes and rectangular channels with diameters between 100 and 10.000 mm

Typical applications	Process water in pipes, cooling water and circulation systems, hydropower plants, penstock monitoring, turbine efficiency monitoring

NivuFlow 600 - Inserted Method



NivuFlow 600 - Clamp-On Method



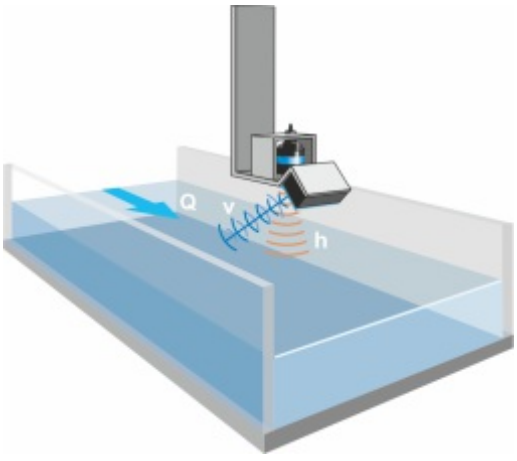
Clamp-on multi path flow measurement for clean to slightly polluted fluids in full pipes

- Contactless and pressure independent
- High measurement stability and accuracy due to connection of multiple measurement paths
- Easy startup and installation procedure thanks to software-based sensor alignment and clamp-on system
- Uncomplicated integration into existing control systems through universal interfaces
- Suitable even for aggressive fluids

Suitable for shapes	Full pipes from DN 50 up to DN 6000

Typical applications	Process water in pipes, cooling water, circulation systems, hydropower plants, water supply, production and treatment of drinking water, slide valve monitoring, turbine efficiency monitoring

new



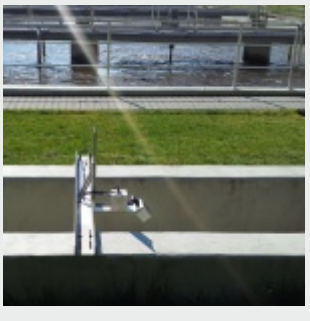
OFR Radar

Contactless flow measurement for part filled channels in clean and wastewater

- Non-contact flow velocity measurement
- Installation without interrupting processes
- Determination of surface velocity
- Low maintenance
- Easy installation and operation
- For use in aggressive/abrasive media

Suitable for shapes	Part filled channel shapes such as pipe, egg, rectangular, U-profile, trapezoid channels and free profiles etc.

Typical applications	surface water, cooling water, process water, alpine rivers and creeks, wwtp intake and discharge



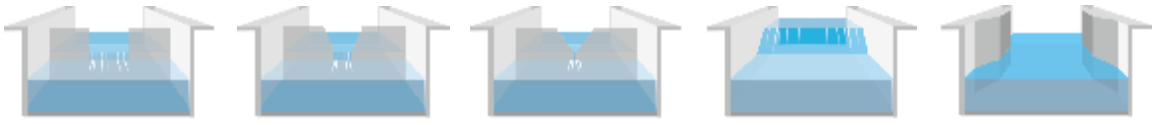
The Hydraulic Method



The hydraulic method is used to calculate flow **Q** from level **h** considering a **Q - h relation**.

$$Q = k \cdot f(h)$$

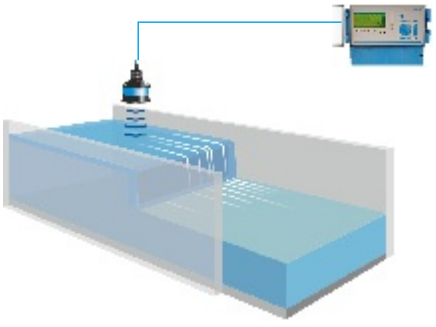
Defined **Q - h relations** can be found at hydraulic constructions such as weirs, Venturi flumes etc.



Measurements on weirs

Different kinds of weirs (e.g. overflow weirs, triangular weirs and similar) are in use depending on the flow volumes.
The overflow height is a measure for the flow.

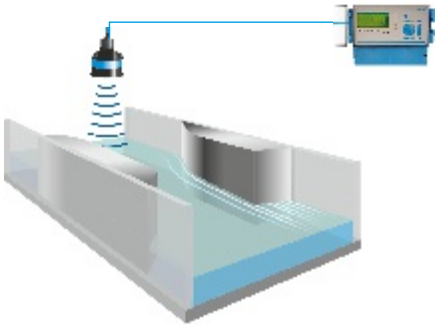
Transmitter with integrated flow calculator



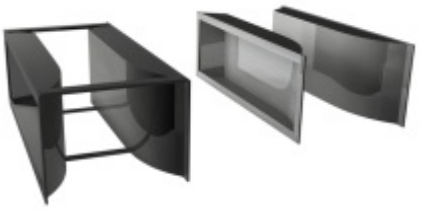
Measurements on Venturi flumes

Venturi measurements are flow measurements in particularly shaped flow channels, where a contraction creates a change of the flow velocity from streaming to shooting.
Impoundage height and flow correlate exponentially with each other: this allows to calculate flow from the flow level measurement.

Transmitter with integrated flow calculator



Venturi Flumes



The dimensions are adjusted to the channel width and to the maximum expected flow volume. The Venturi flume is calculated according to DIN 19559 Part 2.

- Available as single half shells or as complete unit in many sizes
- High-quality workmanship, made of stainless steel

HydraulicCalculator Plus

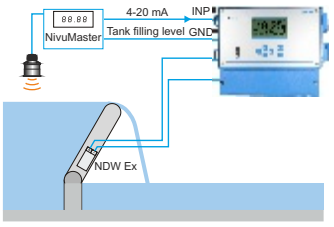
Flow measurement instrument for calculation of overflow volumes on sills, weirs and special constructions tending to backwater formation or with tangential streaming according to ATV A111.

- Large graphic display 128 x 64 pixel
- Easy operation in dialog mode
- Implemented calculation according to ATV A111
- Direct connection of 2- and 3-wire sensors possible

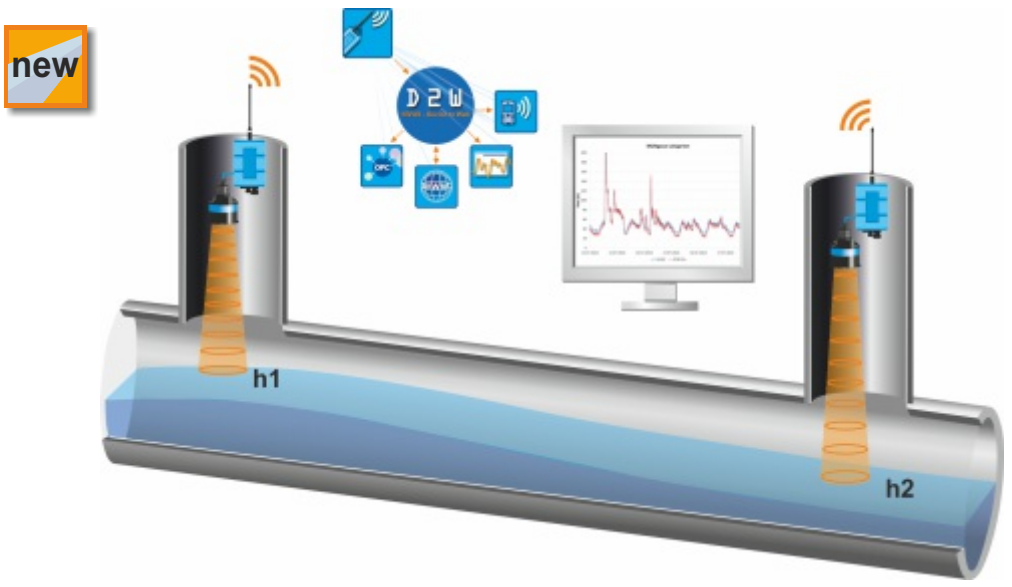
NDW

The inclinometer utilises a capacitive measurement method for inclination measurement (angle measurement) on dam shutters.

- Ex approval (optional)
- Wear-free and maintenance-free
- Robust and corrosion-resistant
- Submersible (IP 68)



Measurement with backwater limit correction



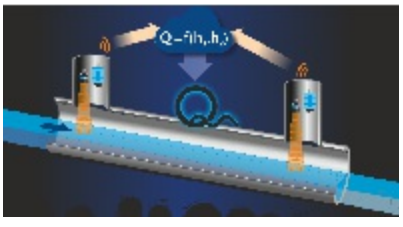
NivuSmart Q

Contactless flow metering using two parallel flow measurements

- Contactless measurement
- Low maintenance
- Accurate method (calibration using cross correlation; <2% deviation)
- Independent from mains power
- Detection of backwater and free discharge

NivuSmart Q is a new measurement method for flow rate detection using two parallel level readings. The levels are measured in a known distance, e.g. by measuring in two consecutive shafts within a sewer system.
The NIVUS exclusive metering system is putting geometrical conditions (such as slope, diameter and width of a channel etc.) and latest hydraulic flow models in relation to each other.

You can find the NivuSmart Q info video on www.nivus.com



Suitable for shapes	Part filled channel shapes such as pipe, egg, rectangular, U-profile, trapezoid channels and free profiles etc.

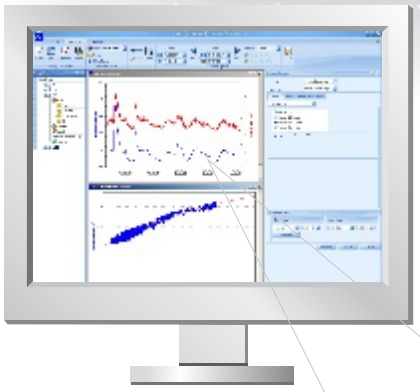
Typical applications	Measurement sites featuring difficult maintenance conditions. If it is not possible to install the measurement system in the channel, such as in glass fibre reinforced pipelines If there is no mains power or communication infrastructure available

NIVUS offers NivuSmart Q as a complete package. We provide site assessment, installation of the measurement system, commissioning as well as monitoring from one single source. You can therefore be sure that all required conditions are in place.

Software Solutions

NivuSoft

Precisely adjusted functions for processing of measurement data

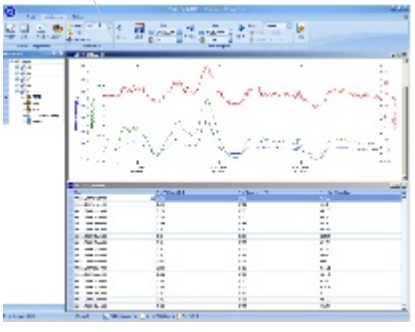


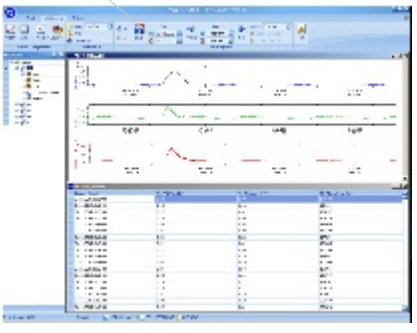
- Visualisation of measurement data
- Project administration
- Data evaluation
- Calculating functions
- Statistics evaluation
- Reporting
- Expansion options

NivuSoft is a software with precisely adjusted functions for processing of measurement data in the water industry.
NivuSoft provides a variety of options for the visualisation and evaluation of measurement data up to reporting functions. It is possible to e.g. indicate multiple hydrographs from different measurement places in one common graph.
This allows to quickly monitor the discharge behaviour within the channel network and is an effective tool to verify plausibility.

Modifications, zoom settings or special views in synchronised graphs, tables or statistics are indicated in all components simultaneously.
NivuSoft provides all common calculating functions required to analyse measurement data as known from hydraulics and fluid mechanics. Flow calculation suitable for all shapes according to DWA and calculation of overflow volumes complete the range of functions. NivuSoft provides versatile options from the documentation of measurement places through indication of readings as tables and graphs to special reports such as evaluation of extraneous water.

The software operates local and communicates with the “D2W - Device to Web“ online data portal in order to directly receive and to further process saved readings. Appealing design, clear control elements as well as drag&drop functions ensure intuitive operation.

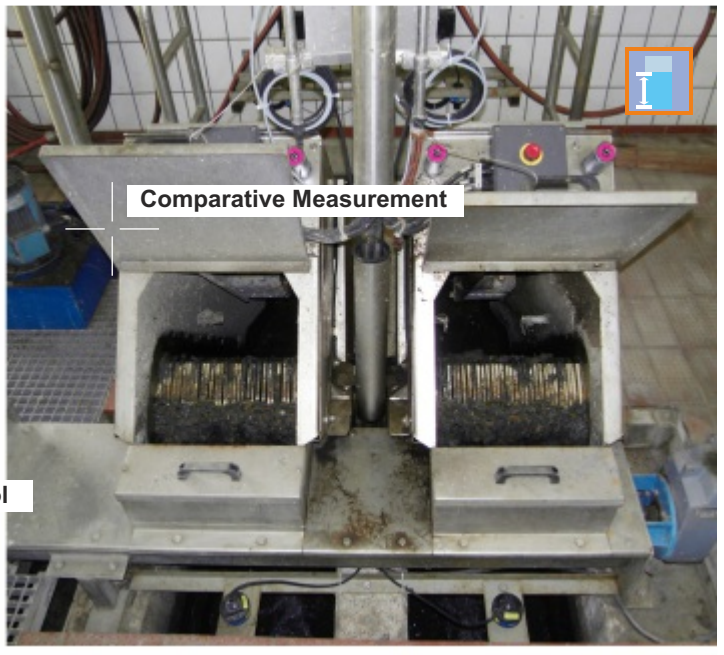




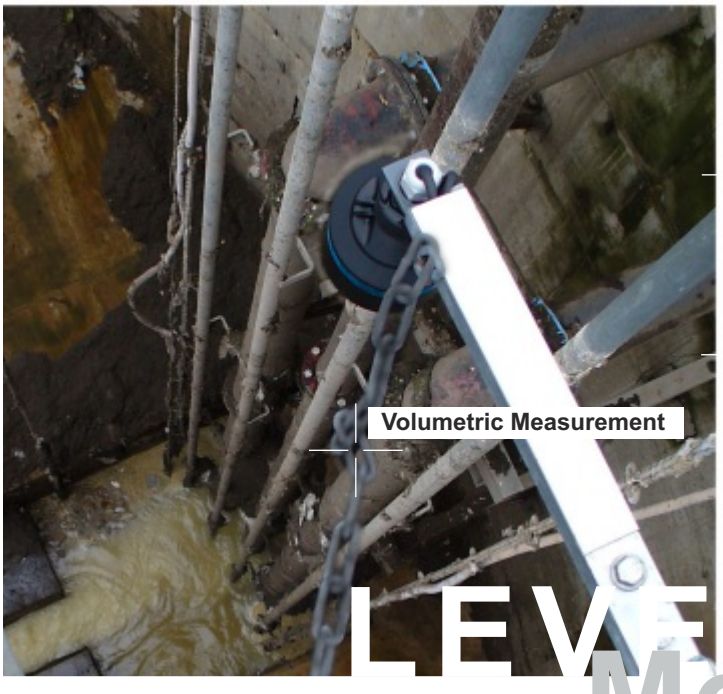
Volume Measurement

Measurement On Stormwater Tanks With Overflow

Pump Control



Comparative Measurement



Volumetric Measurement

Limit Level Measurement

Distance Measurement

Level Measurement

LEVEL Measurement

High-accurate and universal measurement solutions

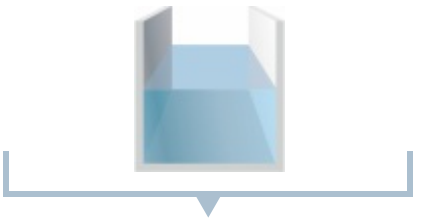
Continuous Measurement

NIVUS provides ultrasonic measurement systems for non-contacting measurement of level, distance, empty space or volume. The units are suitable for many measurement and control functions (e.g. on pumps). The ultrasonic measurement may not be suitable for liquids tending to foam formation. In addition, therefore, we offer hydrostatic measurement systems.

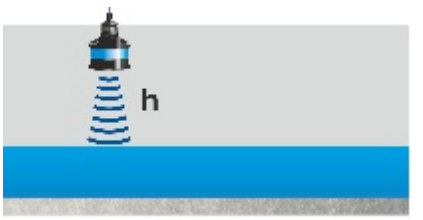
Continuous Measurement

Measurement in:

Liquids



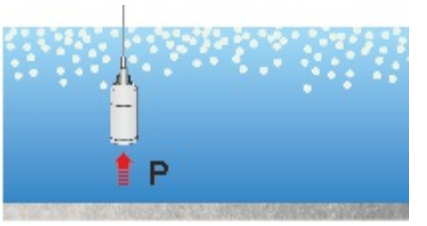
Ultrasonic Measurement Principle



The sensor continuously transmits ultrasonic impulses which are reflected from the surface of the liquid. The reflected waves are detected by the sensor again. Level, distance or volume are calculated depending on the sound transit time.

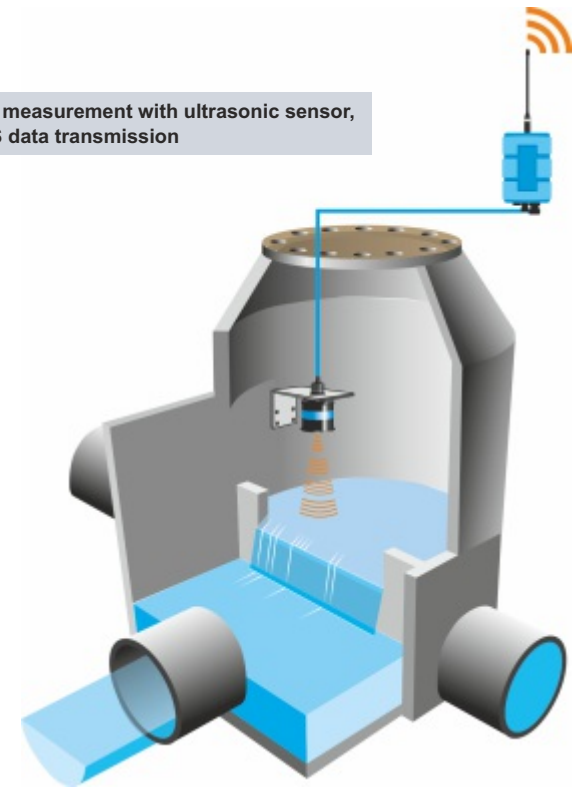
Liquids, also with foam formation

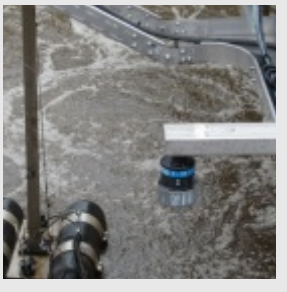
Hydrostatic Measurement Principle

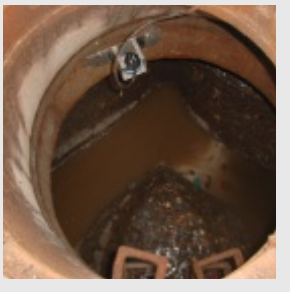


Pressure sensors convert the mechanic parameter “pressure” into a direct proportional electric signal. The built-in amplifier converts the electric sensor signal into an easy-to-handle standard signal of 4...20 mA.

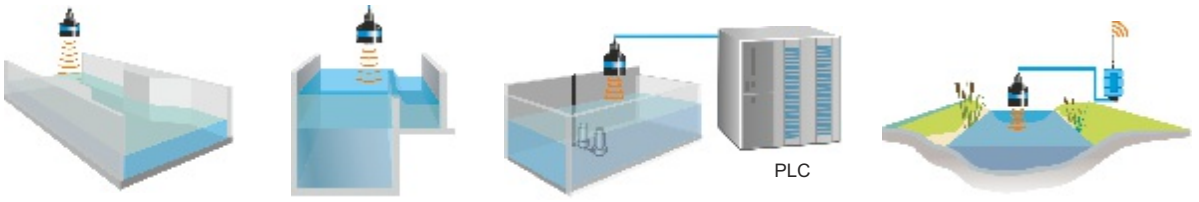
Level measurement with ultrasonic sensor, GPRS data transmission







Compact Ultrasonic Level Meter



i-Series

Install sensor, connect, done

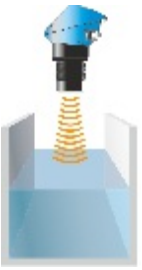
Ultrasonic sensor with integrated transmitter. Designed for use under poor ambient conditions such as moisture, aggressive vapours and dust.
Easy installation, no additional efforts and space necessary since there is no transmitter required.

- Sensor as independent, comfortable level measurement
- Alarm output in case of flooding possible
- Pre-programmed measurement range steps of 3, 6, 10 and 15 m
- Ideally suitable for battery operation through quick measurement times
- Resistant to humidity, aggressive environments and heavy temperature fluctuations
- IP68 protection
- Can be directly connected to PLC
- Saves time and space, no transmitter installation needed
- DATEM - digital echo processing with automatic false echo avoidance
- Ex-approval according to ATEX for Zone 1; optional for Zone 0
- Easy wiring directly to terminal unit in Ex-areas (no Zener barrier required)

Typical Applications	Measurement of distance, level and volume under poor and less accessible conditions, e.g. in pump stations, special constructions, sewerage channels and water purification.

Type	i-3	i-6	i-10	i-15
				
Range	0,125 to 3 m	0,3 to 6 m	0,3 to 10 m	0,5 to 15 m
Resolution	2 mm, measurement uncertainty: 0,25 % of current measurement range			
Temperature	-40 to +80°C			
Sonic angle	<10°			
Ex approval	II 2 GD Ex m IIC T4, II 1 GD Ex ia IIC T4			
Cable length	5 m, 10 m, 20 m, 30 m, 50 m and 100 m; special lengths on request			
Outputs	4 - 20 mA (3,8 - 22 mA, 2-wire), HART® (for programming via NIVUS software)			
	Front thread for i-3, i-6 and i-10, flood protection head for all types without front thread			

Compact Ultrasonic Level Meter



NivuCompact

Loop powered transmitter with electronic evaluation for non-contacting measurement of distance, level, empty space or volume

- Combi unit including sensor and transmitter
- Measuring ranges from 0.2 to 10 m
- Digital echo processing and linearisation
- Ideal for battery operation due to very quick startup and measuring times
- View echo profiles on PC
- Unit programming on site without opening the enclosure
- Integrated temperature compensation
- ATEX approval for Ex zone 1

Typical applications	Level measurement suitable for direct connection to PCM and NivuFlow transmitters or as independent measurement

Sensors: P-Series

The ultrasonic sensors with integrated temperature compensation for connection to NivuMaster series transmitters provide many possibilities for measurement of liquids and bulk solids.

- Flexible installation: maximum cable length 1000 m
- Very low in maintenance due to non-contacting measurement
- Versatile through measurement ranges from 0.07 m to 40 m
- Submersible thanks to IP 68 protection
- Versions with PVDF enclosure for use in aggressive liquids
- Safe operation through Ex approvals Zone 0, 1 and 2 according to ATEX

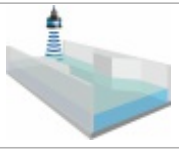
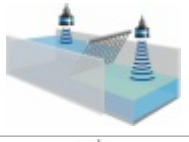
Type	P-M3 P-03	P-06	P-10	P-15	P-25	P-40
						
Range	0.07 to 2.4 m 0.125 to 3 m	0.3 to 6 m	0.3 to 10 m	0.5 to 15 m	0.6 to 25 m	1.2 to 40 m
Resolution	0,5 mm	2 mm				
Protection	IP68					
Temperature	-30°C to 95°C (Ex -15°C to 75°C)	-40°C to 95°C (if used in Ex zone -40°C to 75°C)				
Sonic angle	12°	12°	10°	9°	10°	7°
Ex approval	II 2GD Ex m II T6 (II 1GD Ex ia IIC T6 also available, only in connection with intrinsically safe transmitter (ia))					
Cable length	5 m, 10 m, 20 m, 30 m, 50 m and 100 m; special lengths on request					

Transmitters: NivuMaster-Series

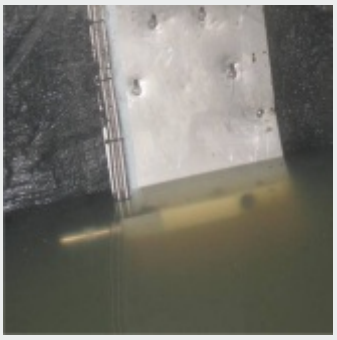
Use the NivuMaster series units to measure and to control levels, but also for pump control or for measuring flow in open channels and to calculate overflow volumes in stormwater overflow tanks.

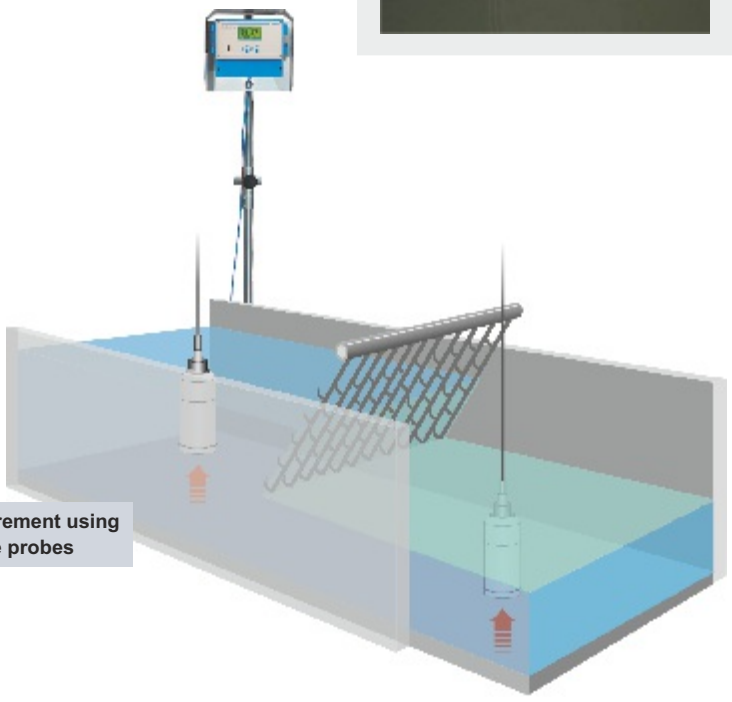
- Universal use for almost all liquids and bulk solids, measurement of level, distance, volume, difference and flow
- High measurement reliability through integrated agitator avoidance
- Easy echo analysis and setting of parameters via PC
- Up to 6 relays and galvanically isolated mA outputs
- Easy operation in dialog mode using back-lit graphic display
- Integrated emergency power switchover

Table Of NivuMaster Series Transmitters

	NivuMaster L-2	NivuMaster 3 Relays
		
Level measurement/ distance measurement 	✚ ✚	✚ ✚
Volumetric measurement/ empty space measurement 	✚ ✚	✚ ✚
Pump control/ slide valve control 	–	✚
Volume measurement 	–	✚ ✚
Comparative measurement 	–	–
Measurement on stormwater overflow tanks 	–	✚ ✚
Operation		
Display	optional	+
Keys	optional	+
Inputs		
Sensors / optional 4-20 mA / digital	1 / - / -	1 / - / -
Outputs		
Relays / mA output	2 / 1	3 / 1
RS232 interface	1	1
Construction		
Wall mount IP 65 / DIN rail mounting	+ / -	+ / +
19” version (rack mount)	-	+
Panel mount	-	+
Ex approval according to ATEX	Zone 0, 1 and 2	Zone 0, 1 and 2
	Compact standard model with 2 relays for level and volume measurement.	For measurement of distance, level and volumes as well as for pump control and extended control tasks.

NivuMaster 5 Relays	NivuMaster LD-5:2	NivuMaster LF-5:2	NivuMaster Plus
			
✚ ✚	✚ ✚	✚	✚ ✚
✚ ✚	✚ ✚	✚	✚
✚ ✚	✚	✚	✚ ✚
✚ ✚	✚	✚ ✚	✚
✚	✚ ✚	–	✚ ✚
✚ ✚	✚	✚ ✚	✚
+	+	+	+
+	+	+	+
2 / optional 4-20 mA / -	2 / - / -	1 / - / -	2 / optional 4-20 mA / 7 x digital
5 / 1	5 / 2	5 / 2	6 / 1
1	1	1	1
+ / +	+ / +	+ / +	- / -
+	+	+	-
+	+	+	+
Zone 0, 1 and 2	Zone 0, 1 and 2	Zone 0, 1 and 2	Zone 0, 1 and 2
Extended NivuMaster 3 Relays model including additional control options.	Model for connection of 2 sensors; particularly for comparative measurements on screening plants. For measurement and output of difference and level.	Particularly for use in storm-water treatment plants. For independent measurement and output of liquid level and dis-charge volume using one single sensor.	Model specialised for pump management. For comfortable control of up to 5 pumps and error message output.





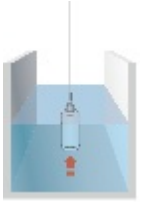
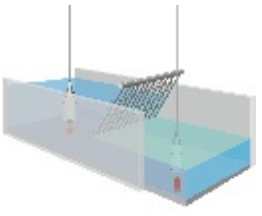
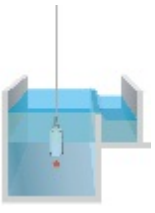
Comparative measurement using hydrostatic pressure probes

NIVUS provide individual solutions for various applications in the field of pressure measurement and hydrostatic level measurement.
Hydrostatic measurements are always to prefer as long as there are problems due to foam formation on the surface of the liquids to measure.
NIVUS hydrostatic measurement technology can be used universally, is robust and provides a high degree of operational reliability. Installation is easy thanks to wire probes and 2-wire loop powered technology.

Continuous Measurement | hydrostatic, Pressure

Pressure Probes For All Applications

You can find appropriate pressure probes to connect to NivuCont Plus, NivuCont S transmitters or other evaluation devices with 4-20 mA inputs for each measurement application.

Level Measurement	Volumetric Measurement	Comparative Measurement	Measurements On Stormwater Overflow Tanks
			

Submersible/Suspended Probes

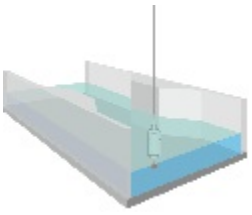
for clean to heavily polluted liquids

	NivuBar Plus II	NivuBar H II	NivuBar G II
			
Diaphragm	Ceramics	Ceramics	Ceramics
Measurement principle	capacitive	capacitive	capacitive
Ex Approval	Zone 0 standard	Zone 0 optional	Zone 0 standard
Measurement range	1, 2, 4, 6, 10 m water column/ other on request	0 - 20 m water column adjustable/ other on request	1, 2, 4 m water column/ other on request
Fastening	suspended on cable	suspended on cable	mounting 1“ thread
Applications	• Level monitoring in open tanks, flumes and basins • Wastewater treatment plants, water processing, pump stations, stormwater holding tanks, water supply		

- High operational safety through integrated overvoltage protection
- Low installation efforts due to 2-wire loop powered technology
- Reliable operation in Ex areas thanks to Zone 0 protection
- Sensor bodies available in various materials such as PVC, Teflon or Hastelloy: resistive against aggressive liquids such as acids or bases
- Suspended probes available with only 17 mm diameter for measurements in wells or depth measurements

Pump Control

Volume Measurement



Pressure Measurement

Pressure Measurement

Screw-In Probes

for clean to slightly polluted liquids

AquaBar	AquaBar BS
	
Stainless steel	Stainless steel
piezoresistive	piezoresistive
-	-
2, 4, 6, 10 m water column/ other on request	2, 4, 6, 10 m water column/ other on request
suspended on cable	suspended on cable
• Environmental technology: water supply, wastewater treatment plants • Level monitoring in open tanks, flumes and basins	• Depth measurement in wells • Groundwater level measurement

for clean to heavily polluted liquids and gases

HydroBar G II

Ceramics
capacitive
Zone 0 optional
1, 2, 4, 6, 10 m water column/ other on request
screw-in using 1,5“ thread
• Level measurement in closed tanks and pipe systems • Environmental technology: water supply, wastewater treatment plants

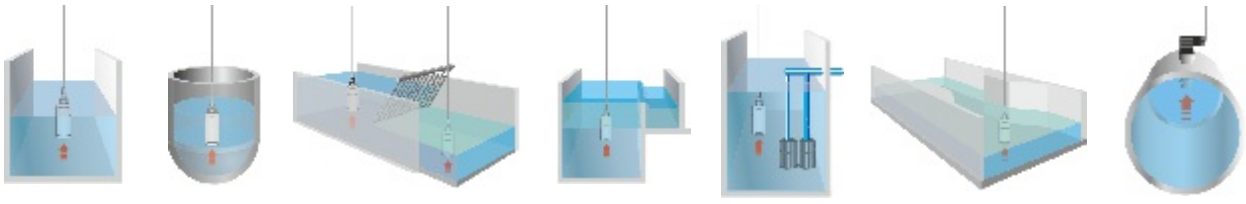
for clean to slightly polluted liquids and gases

UniBar E

Stainless steel
piezoresistive
Zone 0 optional
1, 2, 4, 6, 10 m water column/ other on request
screw-in using 1/2“ thread
• Level measurement in closed tanks and pipe systems • Water supply

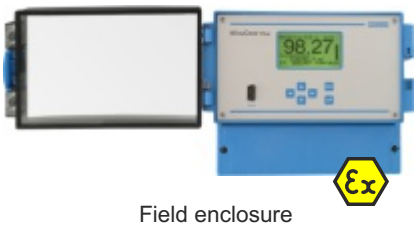
To Transmitter

Transmitters



NivuCont Plus

Multifunctional process transmitter for complex measurement and control tasks in connection with hydrostatic 2-wire pressure probes



Field enclosure

19” version (rack and panel mount)

- Universal use thanks to versatile control and calculation operations
- Parameter backup via PC possible
- Low installation efforts due to 2-wire technology
- Flexible through various enclosure versions (19" version, rack and panel mount; field enclosure)
- Easy and comfortable start-up without the need for programming skills through multilingual menu operation
- Very good readability even under poor conditions thanks to large back lit graphic display
- Complex control tasks feasible using extended pump management

Typical Applications	Level measurement for stormwater overflow tanks, wastewater treatment plants, pump sumps, water supply pump management, tank cleaning control, comparative measurements on rakes, overflow volume measurements, trend detector, volume calculation, linearisation

NivuCont S

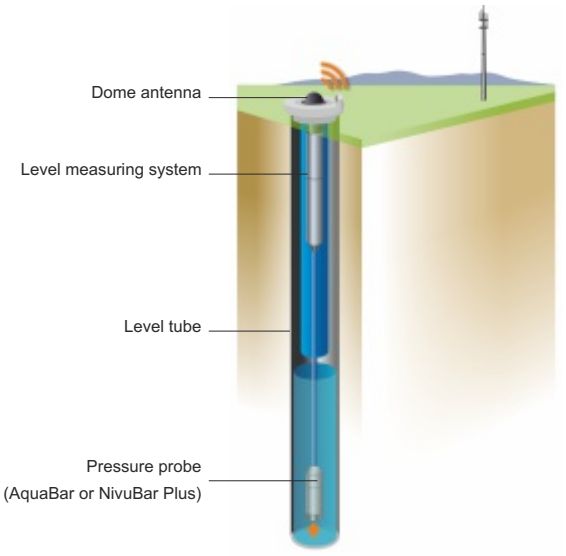
Process transmitter for simple measurement and control tasks in connection with hydrostatic 2- wire pressure probes

DIN rail mounting

- Variable use through DIN rail mounting or panel mount
- Easy operation, clear LED display

Typical Applications	Level measurement for stormwater overflow tanks, wastewater treatment plants, pump sump, water supply pump switchover, small waterworks or pump stations

Self-Sufficient Level Measurement Systems



Level Data Collector

Level measurement system with submersible pressure probe for data transmission via GPRS to D2W Internet portal D2W

- Extremely robust stainless steel enclosure, protection IP68
- Data transmission via GPRS interface possible
- Extra long lifetime through MicroPower® technology
- Terminal clamps for 2-wire systems such as pressure probes or compact echo sounder. This allows to connect any sensor without problems

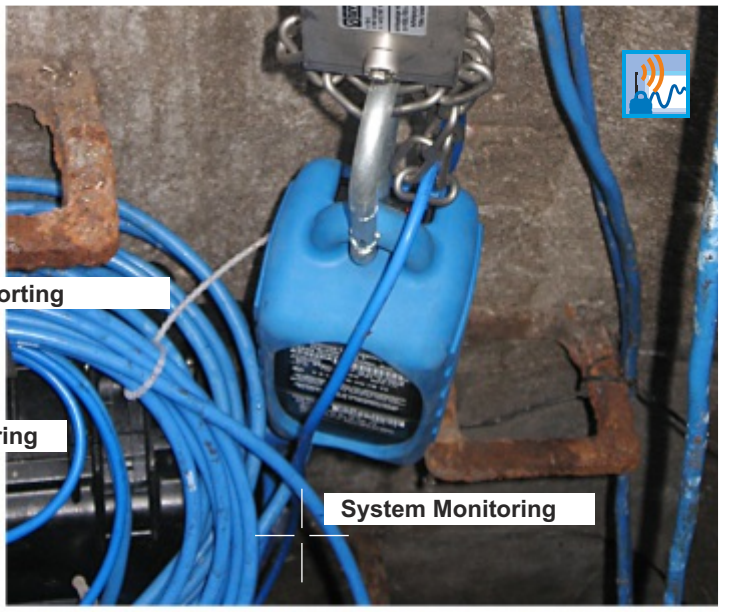
Typical Applications	Level measurement

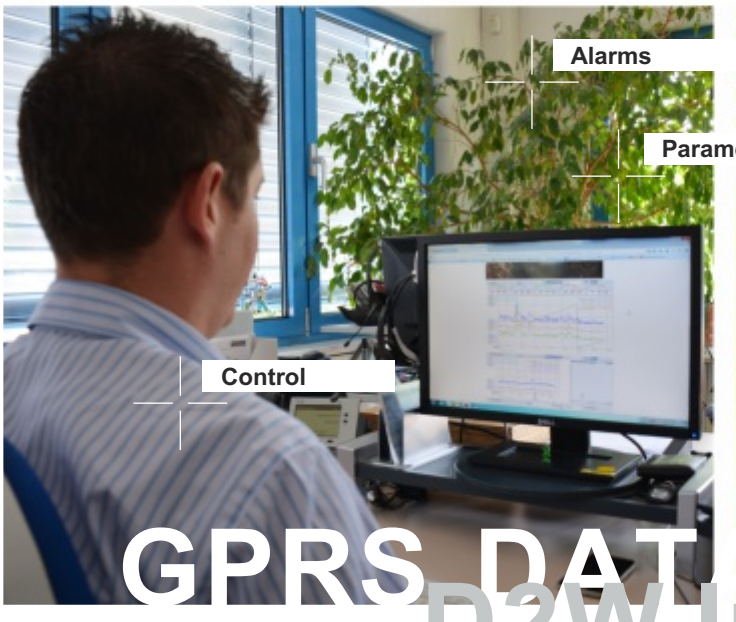
NivuLevel 150

Self-sufficient data logger for level measurement with pressure probe

- Self-sufficient level measurement system
- Internal data memory for approx. 1.000.000 readings
- For use in ATEX zone 1
- Event control
- Acquisition of level and temperature readings

Typical Applications	Level measurement in channels, tanks, stormwater basins and hydraulic structures without mains power supply.





Reporting

Limit Value Monitoring

System Monitoring

Alarms

Parameter Setting

Control

GPRS DATA LOGGER
D2W Internet Portal

GPRS Data Logger

The NIVUS GPRS data loggers enable stand-alone operation of measurement places e.g. for level and tank monitoring, level measurement and limit level monitoring independent from mains power. Recorded data are transmitted to the D2W Internet portal using GPRS.
Excellent energy efficiency, reliable and stable transmission of readings and the sturdy construction of the data loggers allow to establish an almost maintenance-free and cost-efficient measurement data network.

D2W Internet Portal - Device to Web

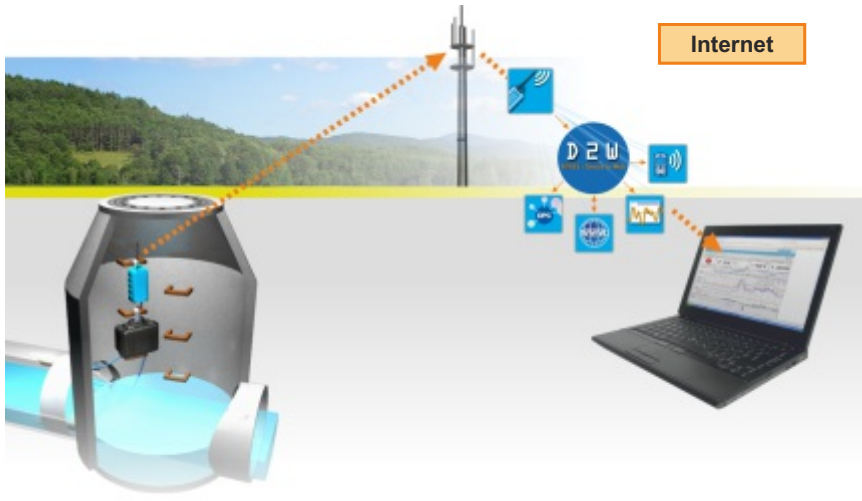
The "D2W - Device to Web" Internet portal is a comprehensive data management system saving the measurement data transmitted from the data logger via GPRS. Moreover there is a variety of options available for the direct analysis of measurement data, for system monitoring, forwarding of data and alarm functions .

GPRS Data Logger

- GPRS Wireless
- MicroPower Battery
- Online Data Recording
- Digital Input/Output
- Analog Input/Output
- Alarms
- Flow
- Level
- Precipitation

Low-Power data logger with GPRS transmission to D2W Internet portal

- Unlimited access to your measurement data via Internet
- Extremely long battery life of up to 5 years
- For use in Ex zone 1
- Comprehensive possibilities such as remote parameter setting, alarm functions, monitoring and calculation of limit values via D2W - Device to Web Internet portal
- Stable and cost-efficient data transmission



	NivuLog Easy NivuLog Easy Sun	NivuLog 2 Ex	NivuLog 4	NivuLog PCM	NivuLog PCM Ex	NivuLog Nano AMR
						
Inputs	4 x analog / digital can be combined as required	2 x analog / digital can be combined as required	4 x analog / digital can be combined as required	Connection to PCM Pro (Ex) and PCM 4 (non Ex)		4 x meter
Outputs	1 x digital	-	-	-		-
Memory	177 days*	1349 days*	781 days*	571 days*		118 days*
Power supply	Standard or rechargeable battery pack	Standard or recharge-able battery pack	Standard or recharge-able battery pack	Standard or recharge-able battery pack		Standard battery
Transmission interval	Wake up / online mode, event-driven; cyclic from 10 min. free configurable	Cyclic from 10 min. free configurable event-driven	Cyclic from 10 min. free configurable event-driven	Cyclic from 10 min. free configurable event-driven		Cyclic from 10 min. free configurable
Protection rating	Easy: IP 66 / Easy Sun: IP 68	IP 67	IP 67	IP 67		IP 68

*10 Min. Measuring interval

NivuLog Easy

Compact GPRS data logger with 4 inputs

- Extremely long battery life of up to 5 years
- Compact construction with integrated battery compartment
- Measurement channels can be configured via Internet portal
- Switchable sensor supply voltage
- Free adjustable measurement and transmission cycles
- Built-in measurement value memory
- Real-time synchronised via server
- Automatic transfer of previous settings at instrument exchange
- Very low costs for commissioning and operation

Typical applications	Level monitoring, level measurement in stormwater tanks, rain gauge, silo system monitoring

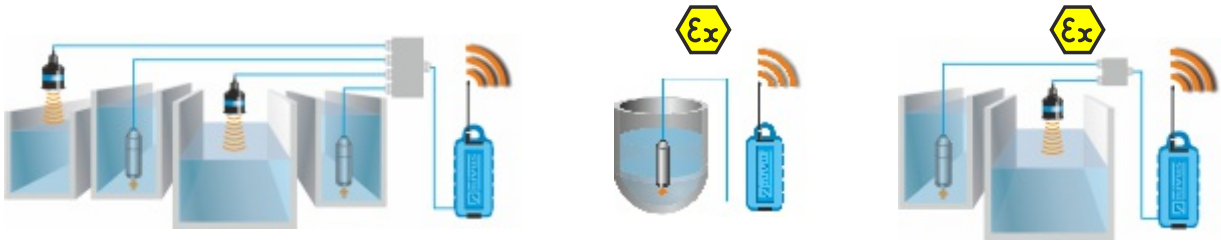
NivuLog Easy Sun

GPRS data logger NivuLog in solar panel enclosure

- Extremely robust IP68 enclosure, compact construction
- Solar panel protected by armoured glass
- Built-in rechargeable buffer battery and recharge control
- Direct connection of sensors using encapsulated terminal compartment
- Very low costs for commissioning and operation

Typical applications	Level monitoring, level measurement in stormwater tanks, rain gauge, silo system monitoring

GPRS Data Logger



NivuLog 4
NivuLog 2 Ex

GPRS data logger with 4 inputs
GPRS data logger with 2 inputs for Ex areas

- Use in Ex zone 1 (NivuLog 2 Ex only)
- Extremely long battery life
- Robust IP67 enclosure with protective cover
- Measurement channels can be configured via Internet portal
- Free adjustable measurement and transmission cycles
- Real-time synchronised via server
- Automatic transfer of previous settings at instrument exchange

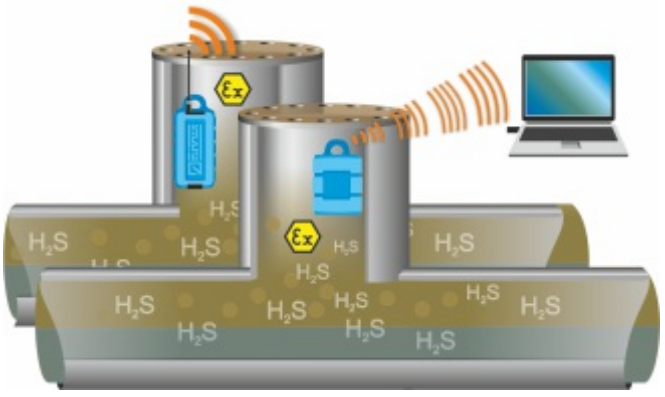
Typical applications	Measurement in Ex areas (NivuLog 2 Ex only), level monitoring, level measurement in stormwater tanks, limit level monitoring, volume calculation

NivuLog PCM
NivuLog PCM Ex

GPRS data logger for direct connection to PCM Pro (Ex) or PCM 4 (non Ex)

- NivuLog PCM Ex for use in Ex zone 1
- Extremely long battery life
- Robust IP67 enclosure with protective cover
- Measurement channels can be configured via Internet portal
- Free adjustable measurement and transmission cycles
- Real-time synchronised via server
- Automatic transfer of previous settings at instrument exchange

Typical applications	Connection to PCM, Measurement in Ex areas (just NivuLog PCM Ex), flow monitoring, limit value alarms, PCM battery monitoring, optimisation of maintenance cycles



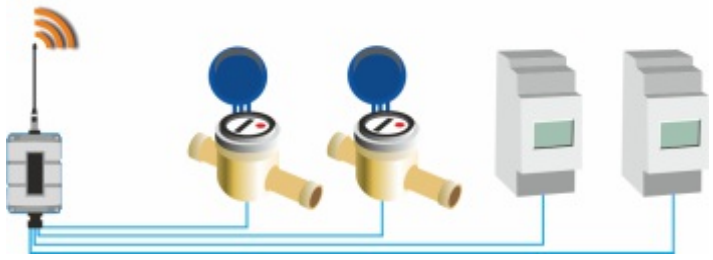
NivuLog H2S
NivuLog H2S MINI

Portable measurement instrument for detection of H2S concentration in channel networks

- Data transmission via GSM or short-range radio
- Measurement data management via D2W Internet portal
- Internal measurement data storage
- Adjustable logging cycle
- Battery life up to 5 years through MicroPower® technology
- Robust, rubber-coated IP66 enclosure with high chemical resistance
- ATEX certified

Typical Applications	Wastewater treatment plants, industries, public water and sewage systems

GPRS Data Logger



NivuLog Nano AMR

Smart data logger for remote meter readout via GPRS

- Parallel data handling of up to 4 meter
- Reliable data connection
- Compact construction with internal battery compartment
- Extremely long battery life of up to 5 years
- Unlimited access to your measurement data via Internet

Typical applications	Remote readout of water, gas and energy meters

NivuLog Prepaid Data Tariffs

Your benefits:

- **Data packet for 5 years**
- **No contract commitment**
- **Automatic login with the most powerful GSM network (international)**
  - Highest possible level of reachability and data availability
  - Automatic network switchover if the currently used network should fail
  - Independent of provider even during change of location
- **Full cost control**[1]
  - Alarm in case of exceeding the preset data volume
  - Clear information on the remaining credits
- **Free**[2] **telephone support for measurements, transmission and evaluation from one source**
  - One contact person for all aspects, uncomplicated, comprehensive and quick advice

[1] by change of settings and or extreme high event modes / SMS messages may occure a higher demand of data transmission which will be accounted for
[2] you only pay the usual costs of your telephone provider

D2W - Device to Web

Internet data portal for efficient administration of measurement data, measurement places and unit management

Test D2W : www.nivus.com

- Access to measurement data via world-wide-web
- The most important system parameters at one sight
- Graph or table views
- Alarm functions
- No need to install additional software
- Low hardware requirements
- Easy user administration
- Easy to integrate into higher systems (XML, CSV, ...)

The D2W - Device to Web software receives readings and system data transmitted via GPRS from the NIVUS device family and saves the data on secure NIVUS data servers. System backups and redundant systems guarantee virtually 100 % data availability. The “D2W - Device to Web“ data portal can be easily accessed via Internet without the need to install additional software. In password-protected areas there are many options available for the direct visualisation of measurement data, function tests and data forwarding through alarm functions via SMS or e-mail.

Permanent data access allows to directly react in case of malfunctions, to avoid damage in the event of errors or to monitor the function of special constructions.
Expenses can be reduced significantly by minimizing measurement periods, avoiding unnecessary travel costs and maintenance costs such as road-safety, emergency tripod and sewer aeration.

- Free selectable views
- Zoom function
- Automatic reporting
- Adjustable units
- Computing of measurement series

SERVICES

Services

Urban Drainage Monitoring / Channel Network Monitoring

Data collection in drainage systems

Reliable measurement data is the best way to ensure economic planning, the best possible management and efficient water pollution control. From selecting the measurement points to evaluation of data - we offer complete services all from one source.

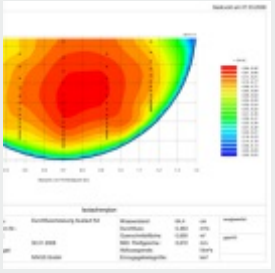
You may select from various options from instrument rental to complete planning, implementation and data evaluation carried out by our staff.
Being integrated into NIVUS GmbH as innovative manufacturer, there is always a pool of the latest state-of-the-art devices at your disposal. Close collaboration with the research department as well as with the software and device development divisions allows to constantly improve measuring solutions. For this reason it is possible to meet even extremely complex requirements and to realise project-specific solutions.

Measurement data on flow, level and precipitation are indispensable input parameters to calibrate hydrodynamic channel network models. Covering a wide area we carefully and reliably collect basic data for you to ensure that your sewerage master plan can be maintained sustainably.

As part of measurement campaigns we collect for you

- **Precipitation discharges and combined water discharges**
- **Dry weather discharges (dirty water and extraneous water)**
- **Quality parameters in wastewater systems and water using online spectrometers (e.g. CSB, AFS, NO_3)**
- **Discharges of flowing water**
- **Infiltration water, leakage water**

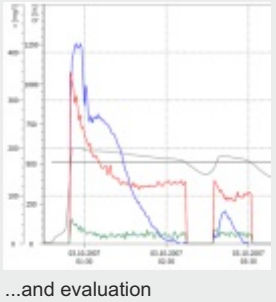
Quality in every step



Planning and advice

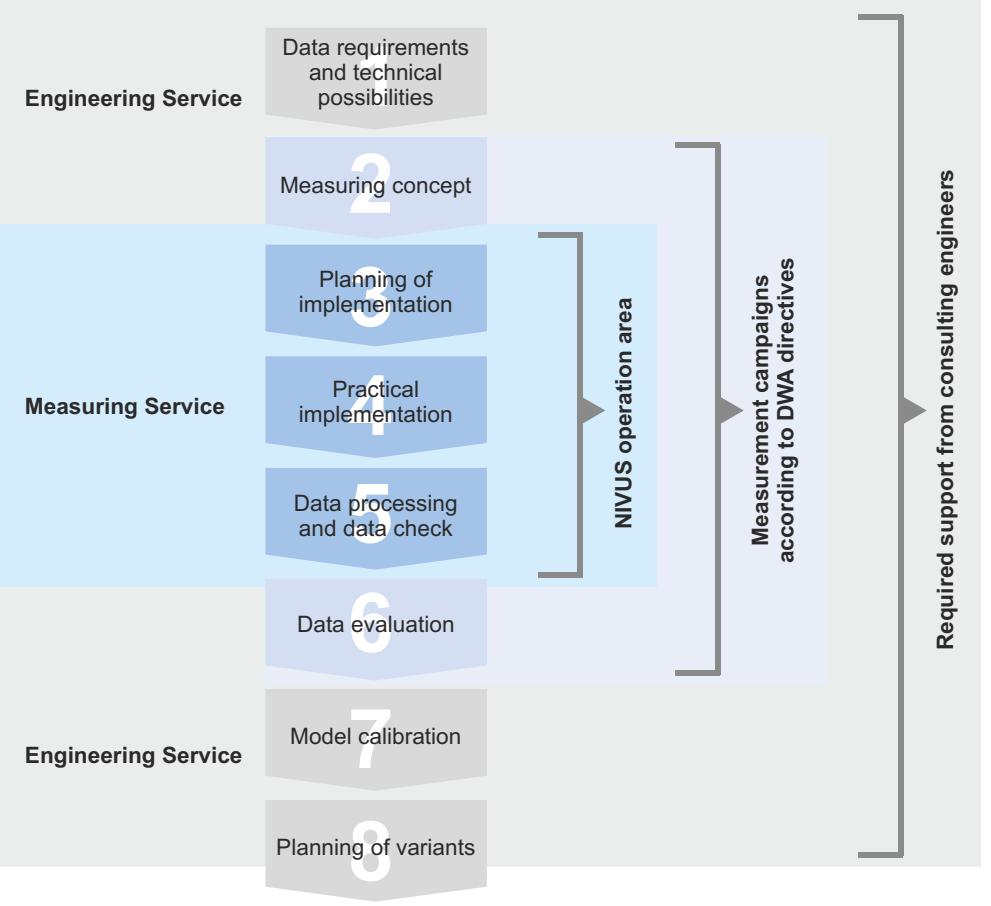
Implementation

Data check...



...and evaluation

Based on your request we will gladly prepare a non-binding offer considering your objectives and requirements. You can rent high-quality instruments from us if you wish to collect data yourselves, our urban drainage monitoring department will give you any support on questions regarding measurement systems and measurement points.
A team of engineers and technicians from water industry and electrical engineering is at your disposal for comprehensive advice.



NIVUS - reliable performance worldwide

Almost all european capitals are convinced by the well-engineered NIVUS products as well as the many years of experience in everyday operation. Please find extracts of our reference list below.

Norway

Canada

London, England

Ireland

Great Britain

Netherlands

Belgium

France

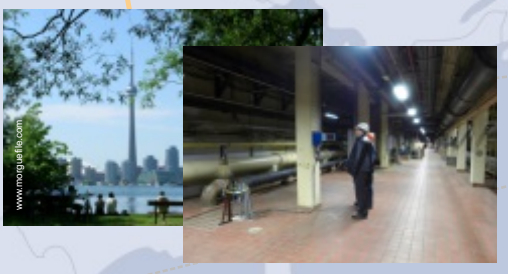
Switzerland

Austria

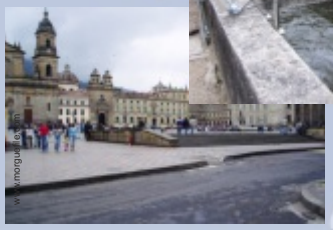
Italy

Spain

Toronto, Canada



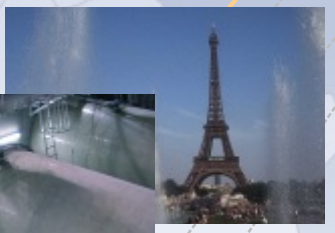
Mexico



Bogota, Colombia

Colombia

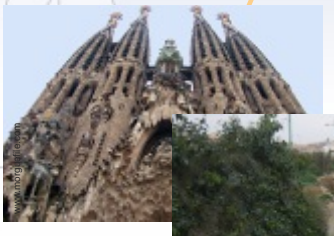
Paris, France



Brazil

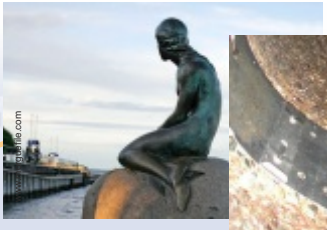
Barcelona, Spain

Chile



Argentina

Copenhagen, Denmark



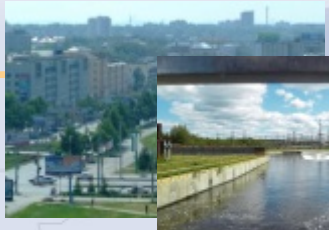
Finland

Estonia

Poland

Russia

Perm, Rusia



ech Republic

Slovenia

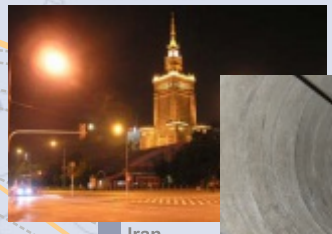
Hungary

Romania

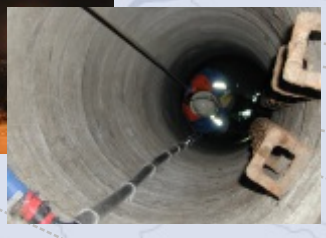
oatia

Turkey

Greece



Warsaw, Poland



South Korea

Japan

China

Shanghai, China

Iran

Kuwait

Bahrain

Dubai

Qatar

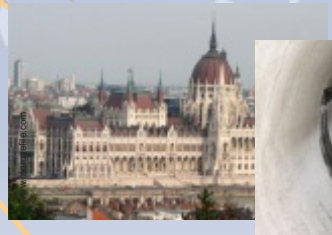
UAE

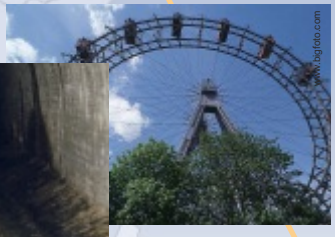
Saudi Arabia

Oman

India

Budapest, Hungary





Vienna, Austria

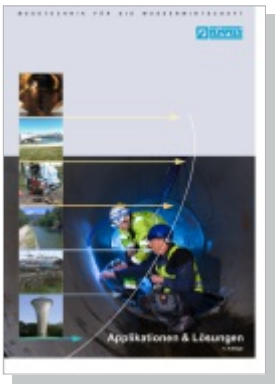
Namibia

Al Aweer, Dubai

Port Elizabeth, South Africa

South Africa

Mecca, Saudi Arabia



The NIVUS **"Applications and Solutions"-brochure** shows the versatile fields of application of the NIVUS measurement products.
At **www.nivus.com** you can download the brochure or request a printed copy.

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You want to know further details? Request our product brochures or check www.nivus.com. Find a small selection of our literature here.


Best of Flow


NivuFlow 750


NFP


Portable


OCM F

NivuGuard 2

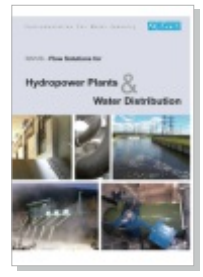

Nivu Channel


NivuFlow 600


Mini Sensor Family

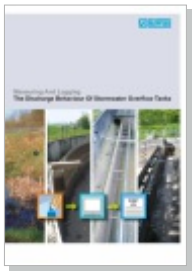

OFR Surface Radar

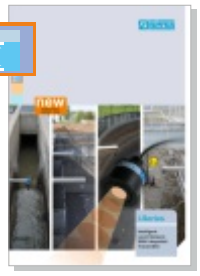

NivuSmart Q



Hydropower


Stormwater Treatment Facilities


Stormwater Overflow Tanks



i-Series


NivuCompact


NivuMaster

Level Data Collector


NivuLevel 150


GPRS Logger

Quality

and more

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Specifications subject to change. 02/2016 - 1.500 D