




WATER CLIMATE FUTURE

Instrumentation & Digital Services

NIVUS-IoT-Solutions
IFAT 2024



nivus 
sensors

nivus 
campus

nivus 
monitoring

nivus 
connect

nivus
sphere
measure. analyse. optimise

nivus 
services

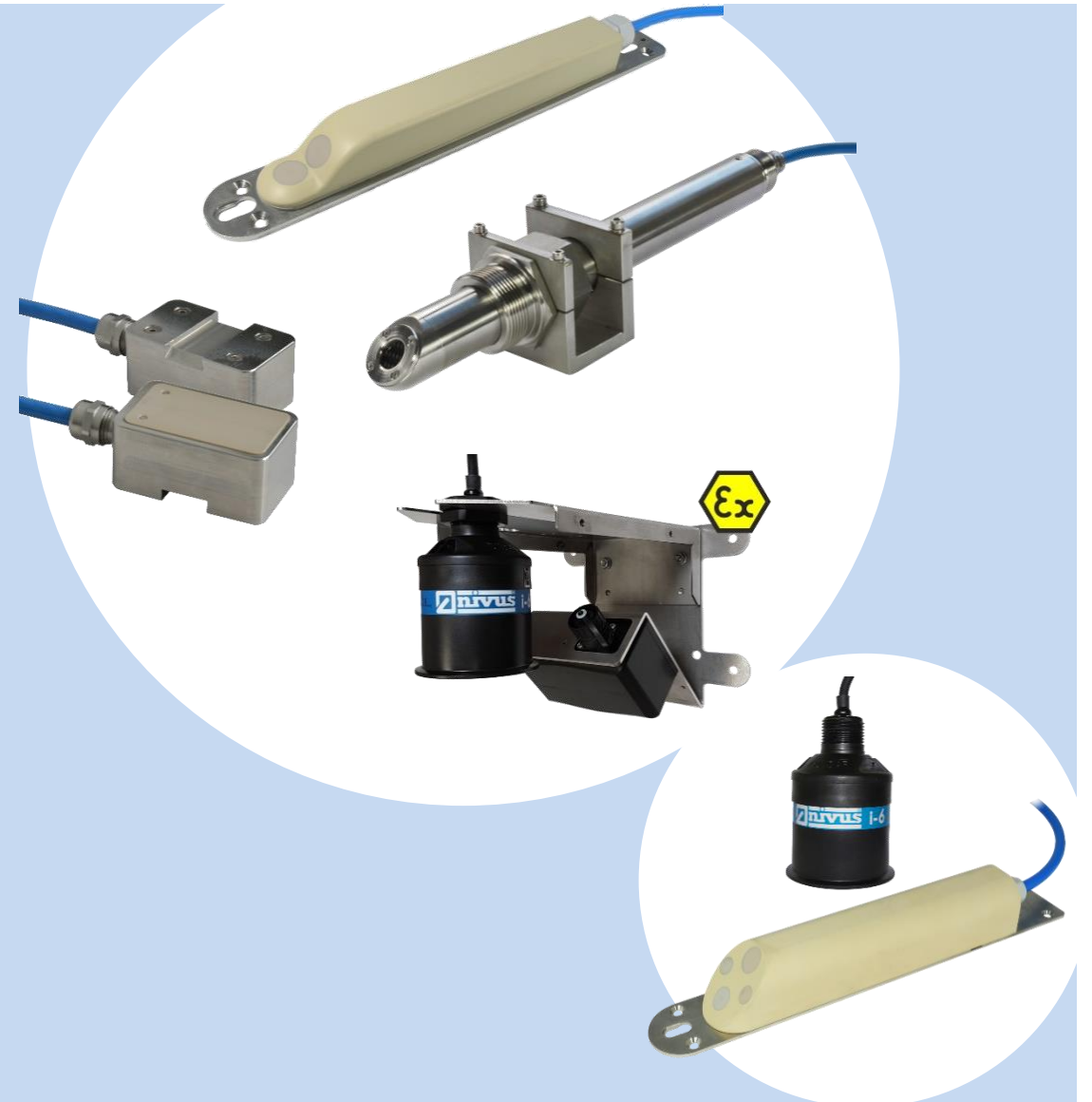
nivus 
data portal

nivus 
data analysis

IFAT 

- **Zuverlässige, praxiserprobte und hochgenaue Messsysteme**
- **Genau auf die individuelle Applikations-anforderungen zugeschnitten**

- **Durchfluss**
- **Füllstand**
- **Wasserqualität & Analyse**



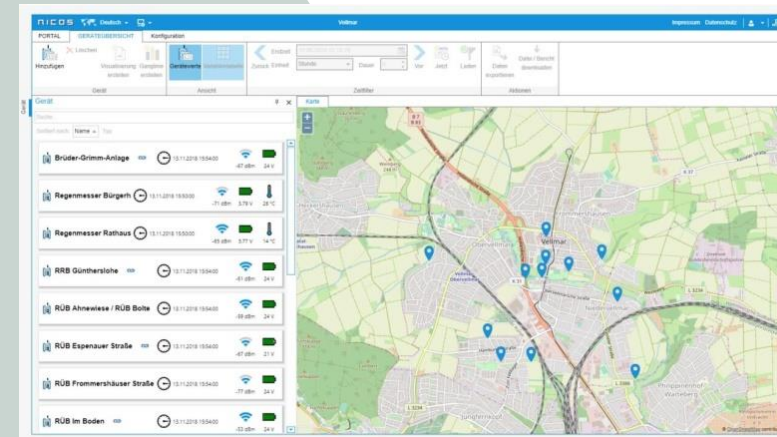
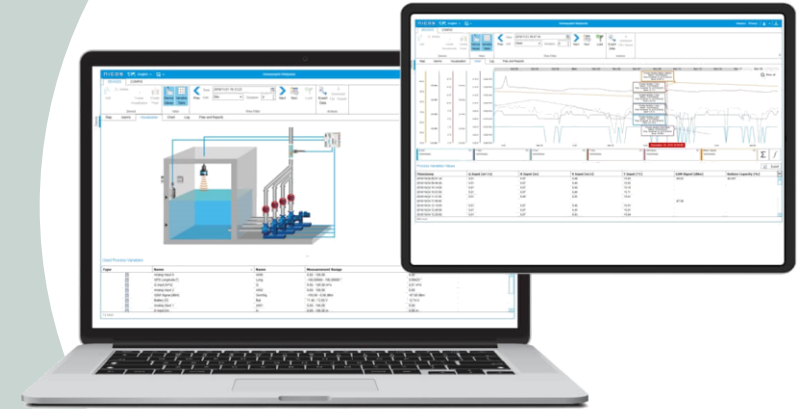
- Durchgängiges System
- Aktuelle IT-Security Standards
- Modernste
Berechnungsmethoden

- Messumformer
- Mobilfunk-Datenlogger
- IoT Gateways

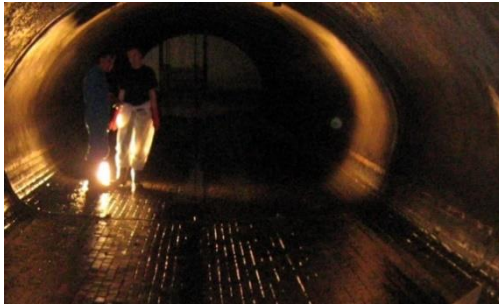


- **Visualisierung**
- **Protokollierung**
- **Cloud oder On-Premises**

- **Messdatenportal**
- **Leitsystem**
- **Systeme zur Datenanbindung**



Tätigkeitsfelder



Abwasserkanalnetze



Fließgewässer | Talsperren |
Bewässerung



Wasserversorgung und
-verteilung



Kläranlagen



Stadthydrologische
Messungen Kampagnen



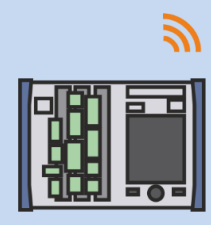
Industrie |
Meerwasserentsalzung

Produktportfolio

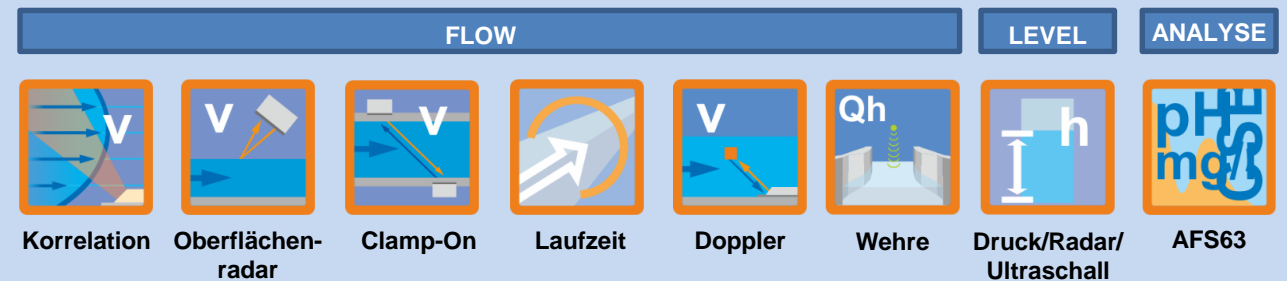
Datenportale / Leitsysteme



Messumformer/
IoT Systeme



Sensorik



Leistungsportfolio

**Service &
Datenanalyse**



**Messtechnik &
digitale Lösungen**

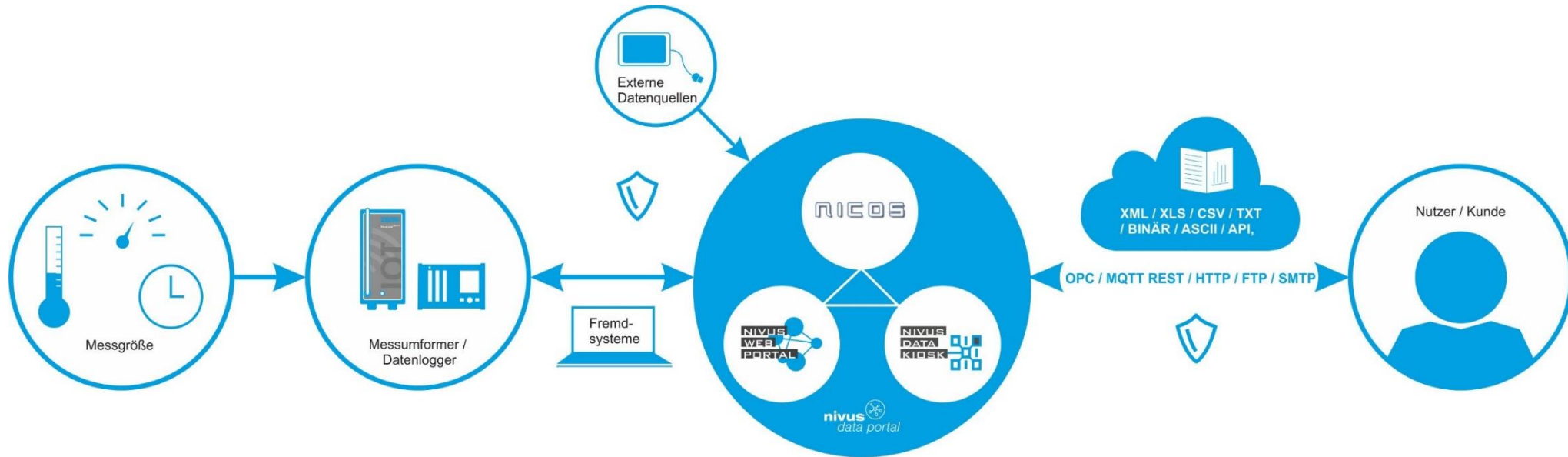


**Beratung &
planerische
Unterstützung**



NIVUS - IoT Lösungen

Kommunikationskonzept



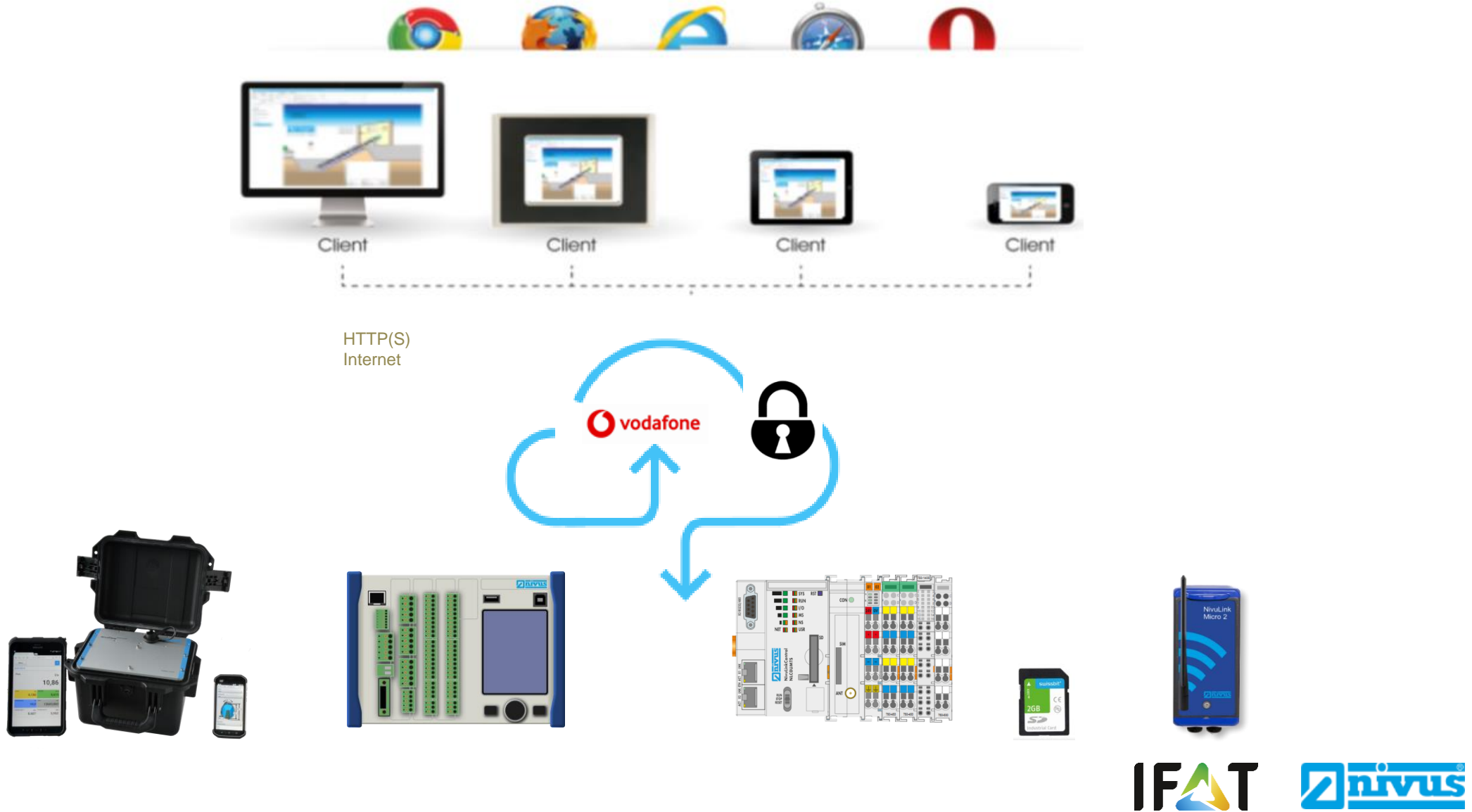
NIVUS - IoT Lösungen

Datenübertragung

- Zuverlässige und sichere Übertragung Ihrer Messdaten
- Netzgebundene und autarke Systeme
- Felderprobte Systeme mit lokalen Datenspeichern
- Einstellbare Übertragungszyklen



NIVUS - IoT Lösungen



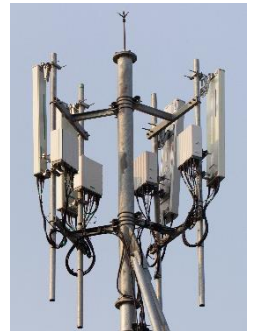
NIVUS sichere IoT-Connectivity

NIVUS IoT Connectivity: Deutlich **mehr** als reine Übertragung von Daten !!!

Intelligente sichere Vernetzung von NIVUS IoT Geräten mit der Cloud.

Sie ist die Basis für ein breites Spektrum von neuen Services, welche flexibel auf Anforderungen und Bedürfnisse unserer Kunden angepasst werden kann.

- Kurze Laufzeit: ab 12 Monate Mindestlaufzeit je Connectivity mit automatischer Verlängerung
- Keine Aktivierungsgebühr je Connectivity
- Keine Verwaltungsgebühren
- Keine monatlichen Kosten bis zur ersten Nutzung
- Kein Roaming, immer das Best Netz, Zugriff auf alle Netze
- Keine Kostenexplosion
- End zu End Nutzungsüberwachung
- Erhöhte Geräteeffizienz
- Reduzierung kostenintensiver Vor-Ort-Inbetriebnahmen und Wartung der Kommunikation
- Prädikative Wartung durch die Connectivity
- NIVUS Diagnosedienst als erste Anlaufstelle für Support bei Problemen
- Höchste Sicherheit, IT Security sorgt für Cybersicherheit im Standard DWA,DVGW und BSI

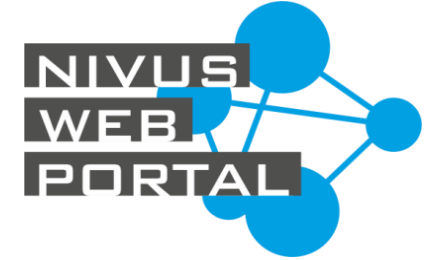




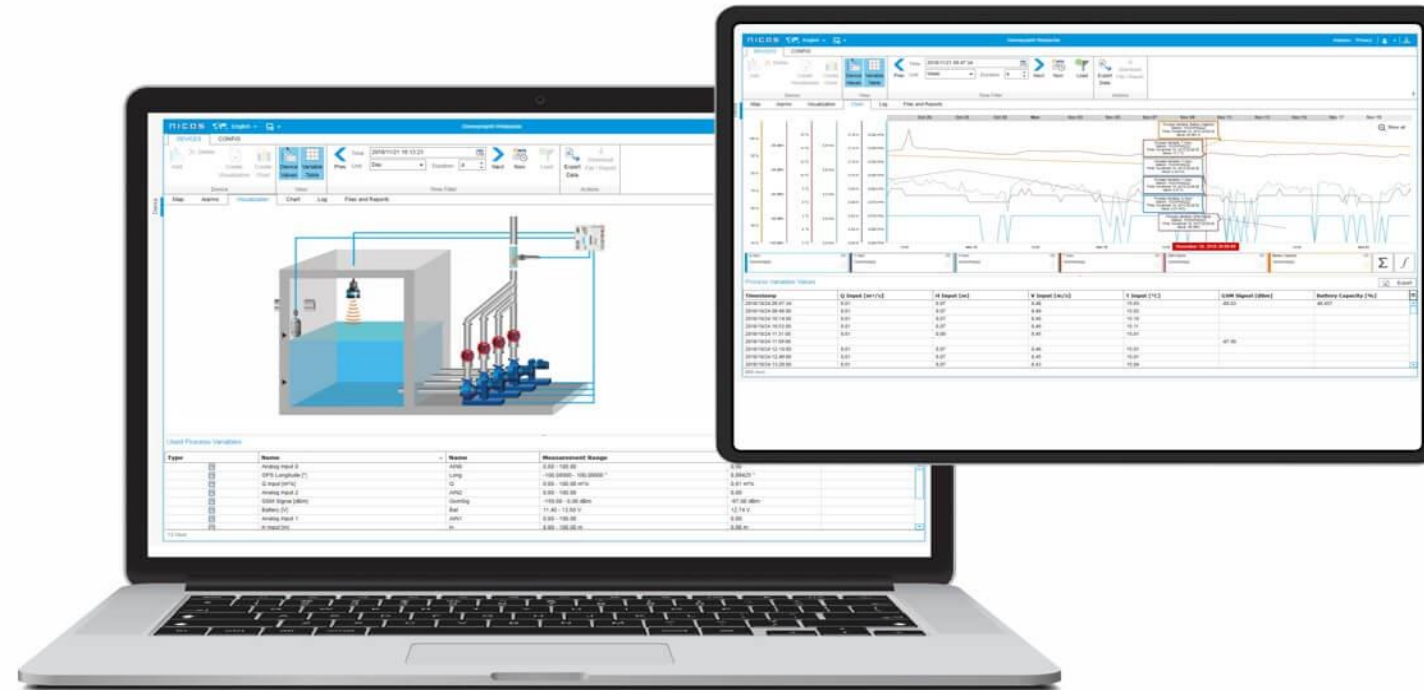
Datenmanagement

NIVUS - IoT Lösungen

NIVUS - Webportal

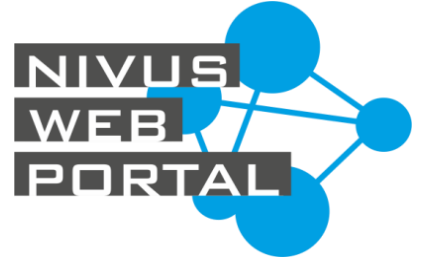


- Zugang zu Messdaten jederzeit und ortsunabhängig
- Relevante Parameter auf einen Blick
- Individuelle Alarmer
- Automatische Erstellung individueller Berichte
- www.nivuswebportal.com



NIVUS - IoT Lösungen

NIVUS – Webportal Module



Geräte/Karten

- Geräteinformationen
- Schneller Überblick



Alarmer

- Via E-Mail
- Inkl. Logging



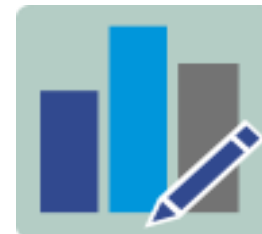
Visualisierung

- Prozessbilder
- Schneller Überblick



Berichte

- Automatische Erstellung
- Individuelle Vorlagen



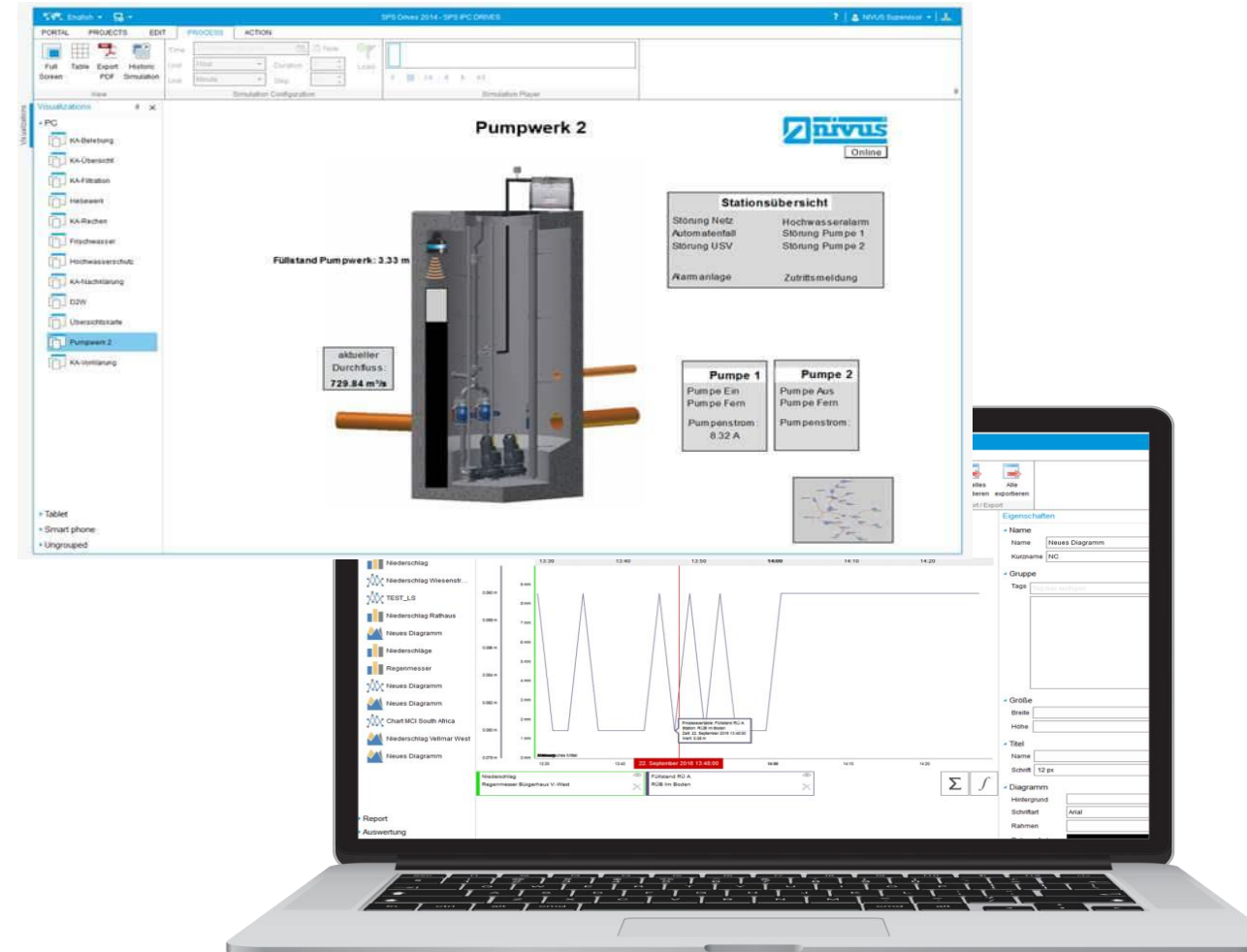
Ganglinien

- Chart-Darstellung
- Hochauflösend

NIVUS - IoT Lösungen

Datenbereitstellung

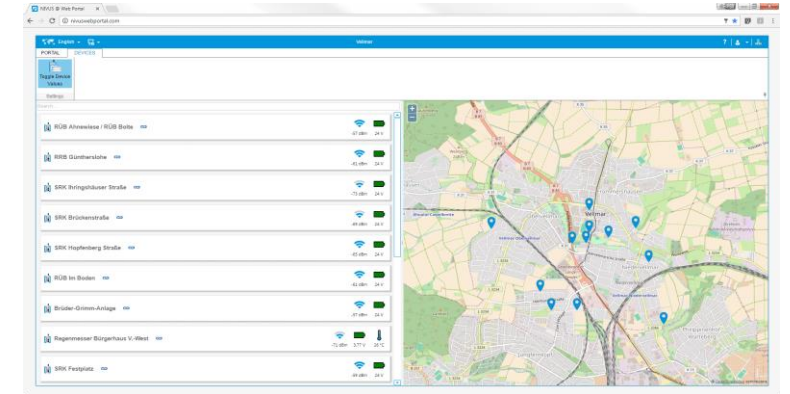
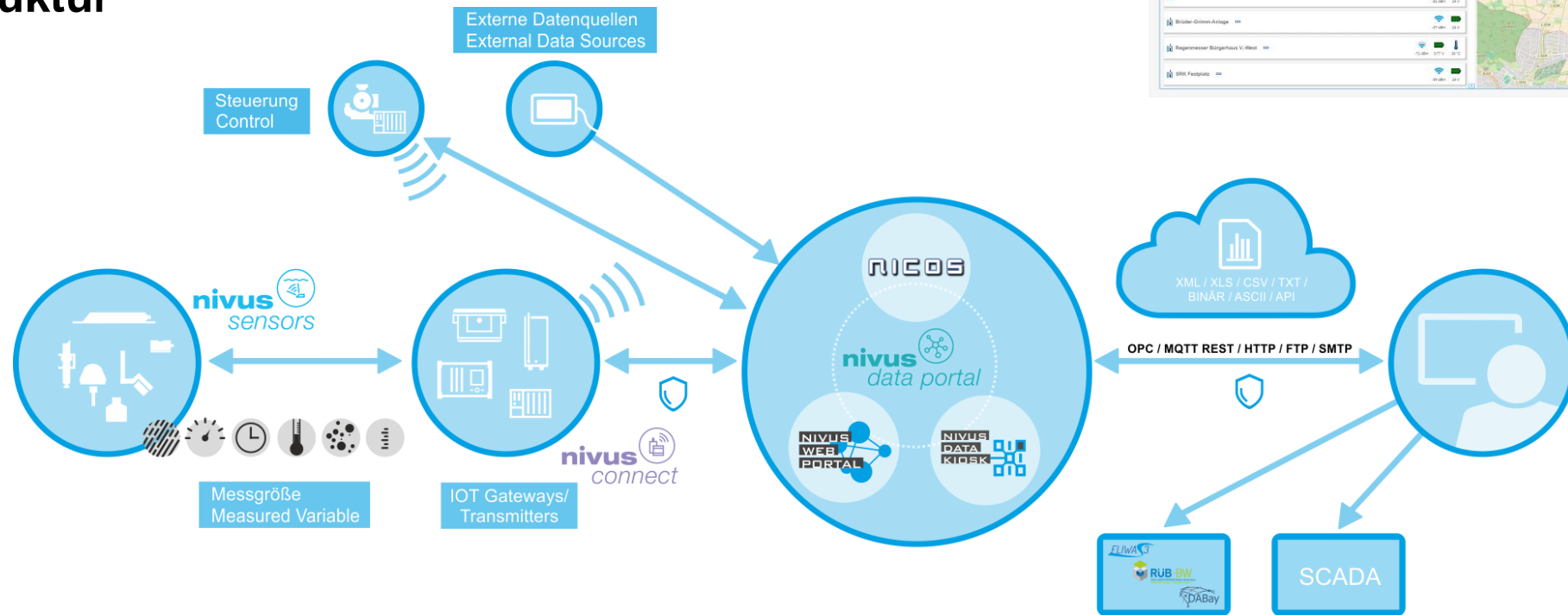
- Transparente Prozesse
- Visualisierung
- Modulbauweise
- Frei konfigurierbare Protokolle
- Anbindung an Drittsysteme



NIVUS - IoT Lösungen

Durchgehendes Kommunikationskonzept

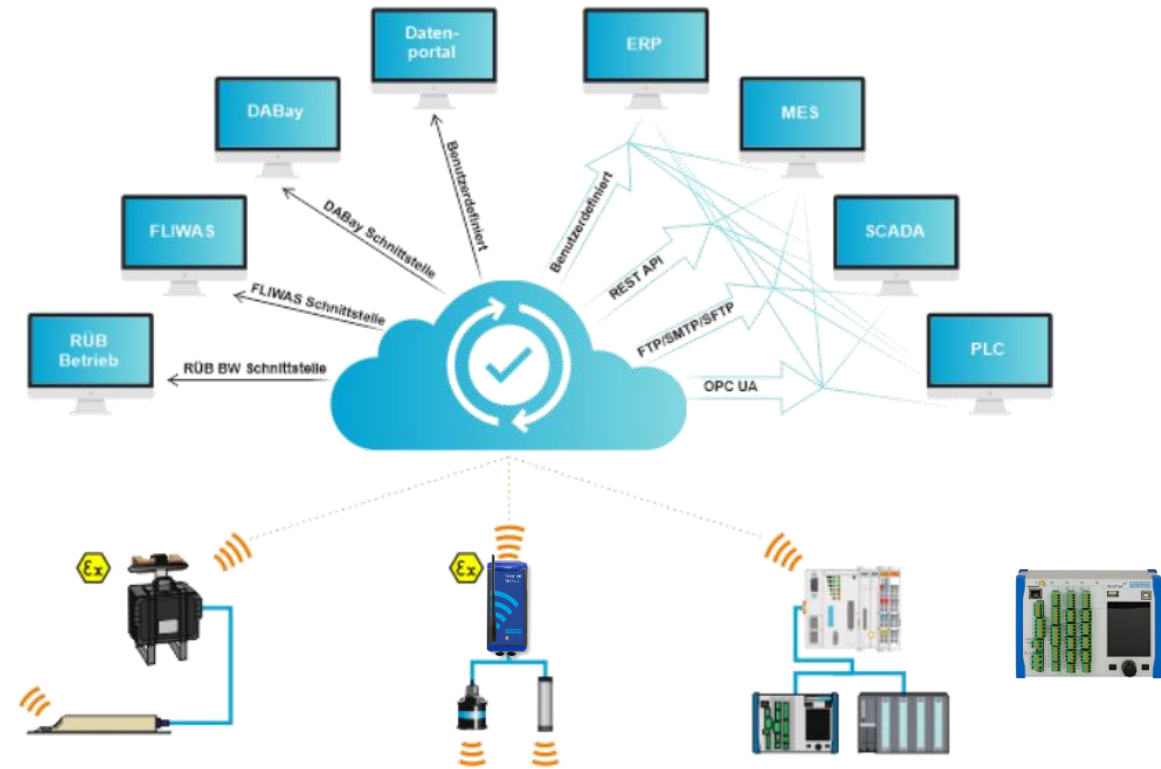
- Offenes Konzept
- Inklusive Infrastruktur



NIVUS - IoT Lösungen

Data Kiosk

- Integration von übergeordneten Leitsystemen
- Anbindung weiterer Datenquellen (z.B. GIS)
- Vernetzung mit Fremd- und Drittsystemen
- Vielfältige Schnittstellen zur Anbindung von
 - Steuerungen
 - Prozessleitsystemen
 - MES Systemen...
- Datenweiterleitung an behördliche Systeme
 - Dabay
 - FLIWAS
 - RÜB BW...



NIVUS - IoT Lösungen

Webportal – NICOS

- NIVUS Webportal
- NICOS Cloud
- NICOS
- NIVUS DataKiosk

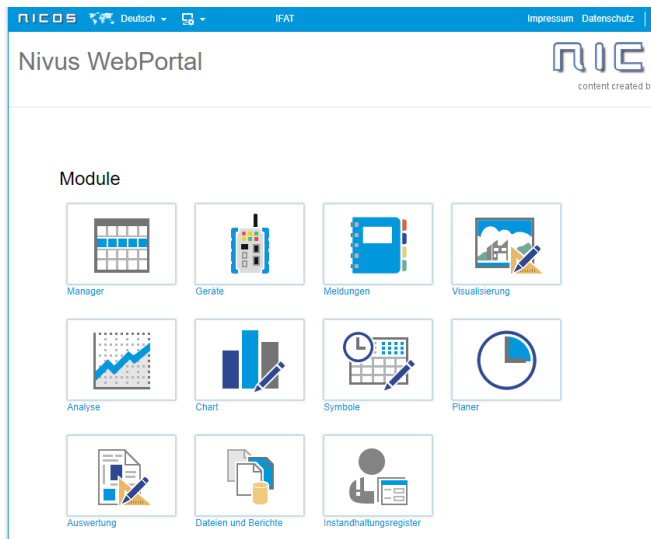


NIVUS - IoT Lösungen

Webportal - WebScada - NICOS

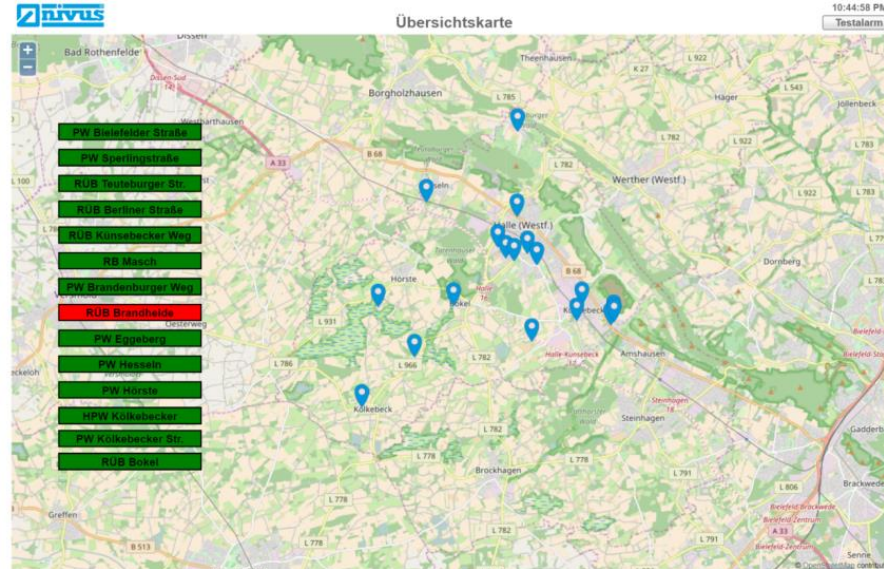
Skalierbare Lösung von der Visualisierung bis zur Prozesssteuerung

1. Webportal



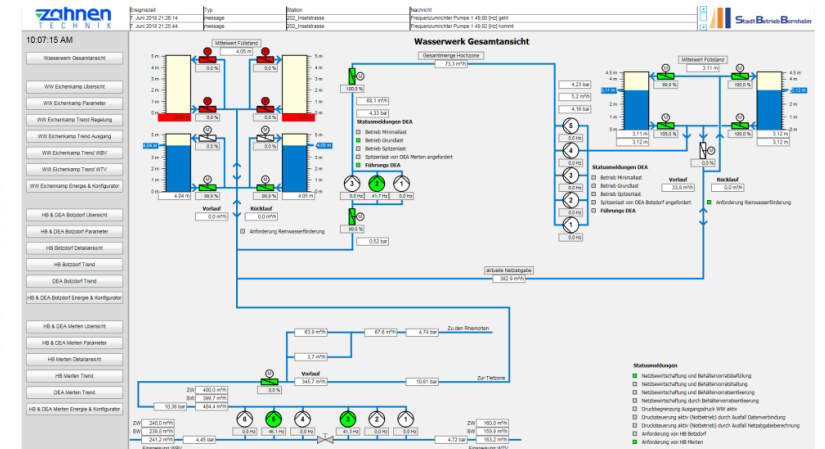
2. WebScada

- Webportal
- Steuerungsfunktion



3. NICOS

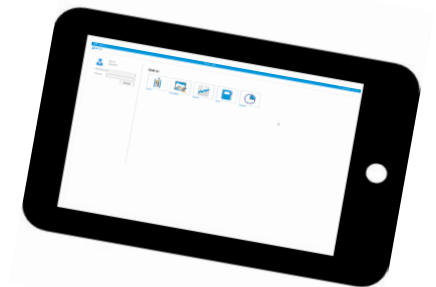
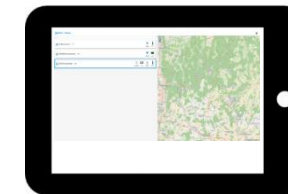
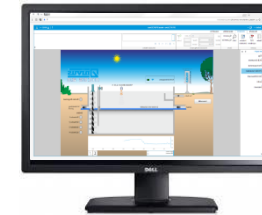
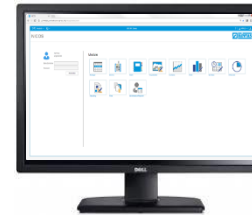
- Webportal
- WebScada
- Umfangreiches Leitsystem!



NIVUS - IoT Lösungen

NICOS Bedienoberfläche / Clients

- Browseranwendung ohne Installation auf Client
- HTML 5
- Desktop PC mit mehreren Monitoren
- Mobile Version Tablet
- Smartphone Version



NIVUS - IoT Lösungen

WebPortal - NICOS

The screenshot displays the NIVUS WebPortal interface. At the top, there is a blue navigation bar with the text "NICOS", a language dropdown set to "Deutsch", a user icon, and the text "IFAT". On the right side of the bar are links for "Impressum", "Datenschutz", and a user profile icon labeled "IFAT". Below the navigation bar, the page title "Nivus WebPortal" is on the left, and the "NICOS" logo with the tagline "content created by NIVUS" is on the right. The main content area is titled "Module" and contains a grid of 12 icons, each representing a different module. The modules are arranged in three rows and four columns (with the last cell empty).

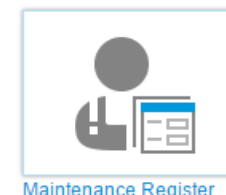
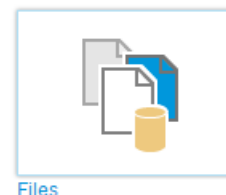
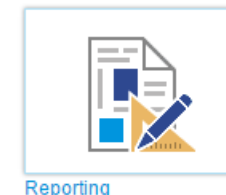
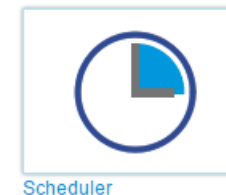
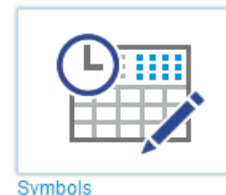
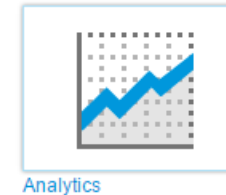
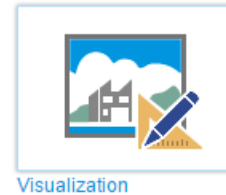
Module Name	Icon Description
Manager	Calendar icon
Geräte	Mobile device icon
Meldungen	Folder icon
Visualisierung	House and chart icon
Analyse	Line graph icon
Chart	Bar chart icon
Symbole	Calendar with clock icon
Planner	Pie chart icon
Auswertung	Document with chart icon
Dateien und Berichte	Files and report icon
Instandhaltungsregister	Person and document icon

NIVUS - IoT Lösungen

NICOS Aufbau - Module

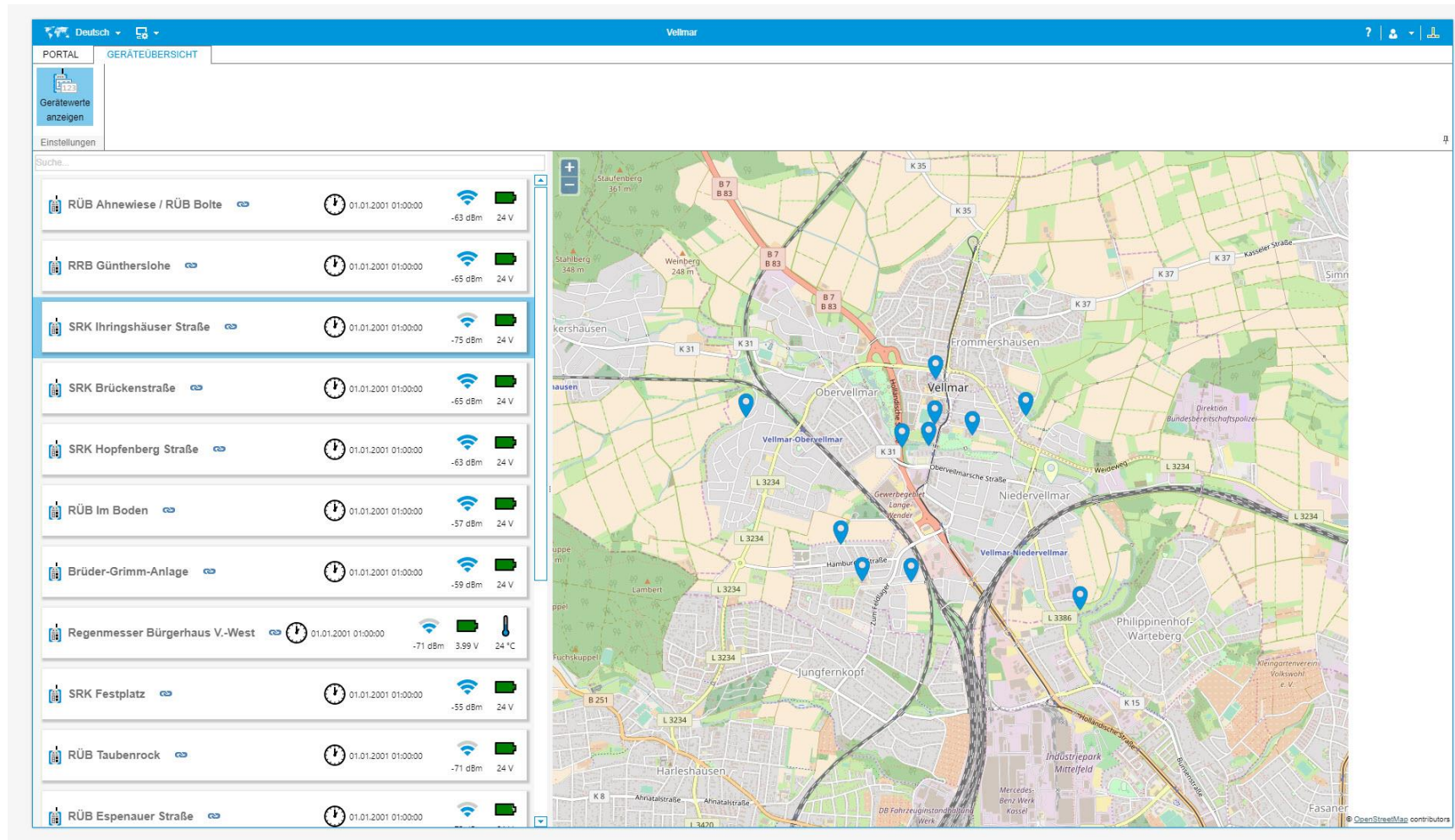
- **Engineering Tool - NICOS Studio**
- **NICOS Web-Frontend (webbasiert)**
 - Manager
 - Chart
 - Analytics
 - Alarm
 - Symbols
 - Scheduler
 - Reporting
 - Files
 - Maintenance Register

Module



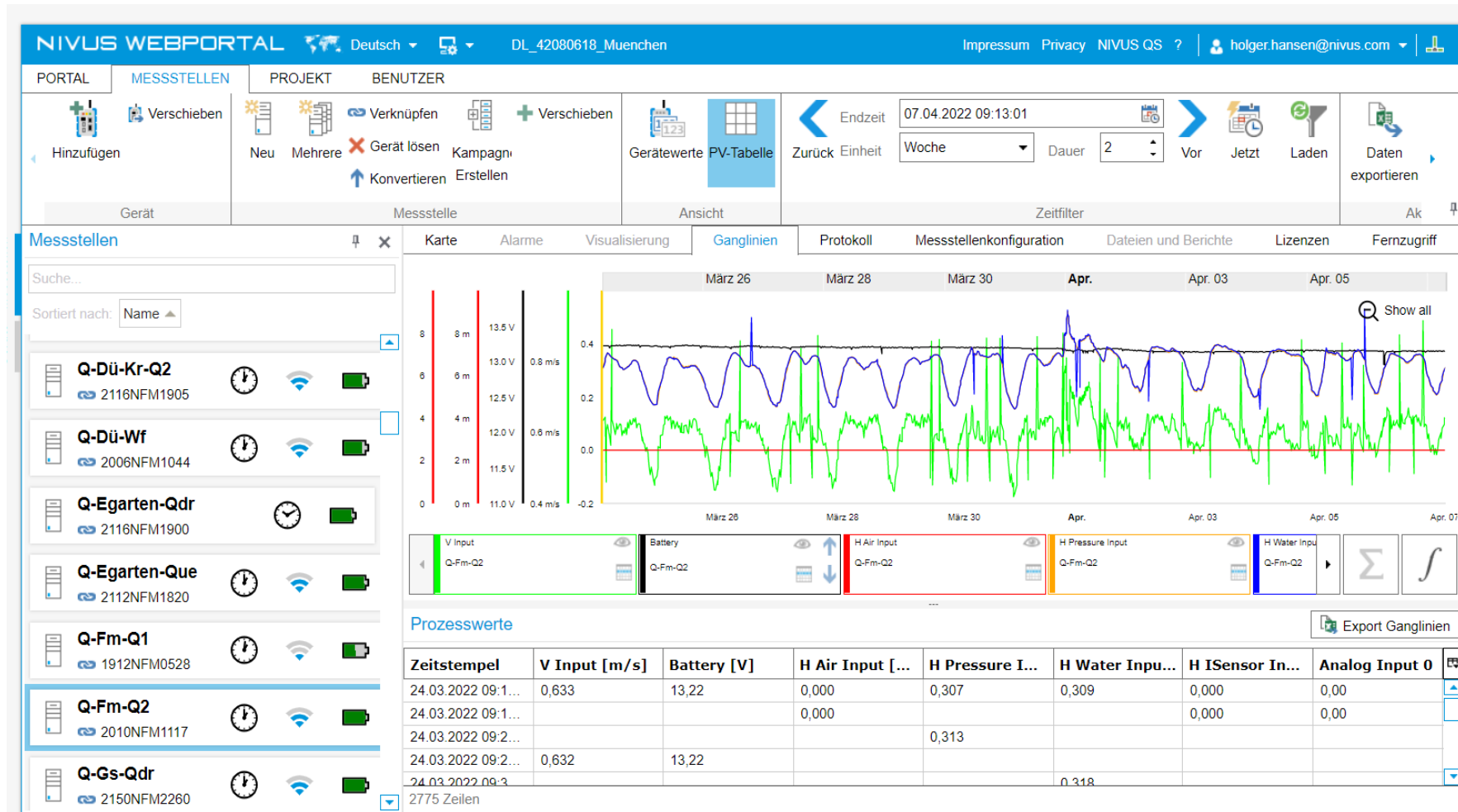
NIVUS - IoT Lösungen

Visualisierung



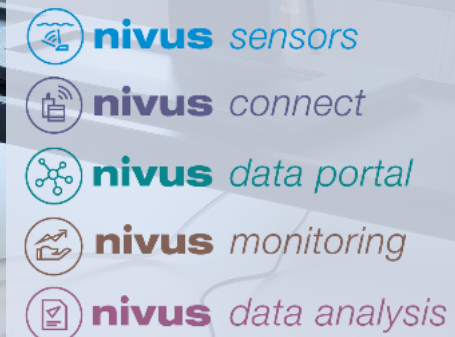
NIVUS - IoT Lösungen

Visualisierung



Datenauswertung und verordnungskonforme Protokollierung

- **Monatliche Plausibilitätsprüfung**
- **Alarmierung bei Ereignissen - unnötige Belastungen für die Umwelt werden vermieden**
- **Kontinuierliche, qualifizierte und normgerechte Protokollierung**



Digitalisierung für Stadtbetrieb

Stadtbetrieb Bornheim AöR setzt auf
standardisiertes System von NIVUS



- Nordrhein-Westfalen
- Regierungsbezirk Köln
- Fläche: 82,69 km²
- 49.739 Einwohner
- 600 Einwohner je km²

Ausgangssituation und Aufgabe

- **Vernetzung von Unterstationen muss modernisiert werden**
- **Zukunftssichere Auslegung**
- **Trinkwasserversorgung und Abwasserbetrieb in einem Leitsystem**
- **KRITIS konforme IT-Sicherheit**
- **Einheitliches und bedienerfreundliches System**

Zentrales Leitsystem



- Leitsystem NICOS
- Gleiches System für Betriebsführung und Bereitschaftsplanung
- Hochverfügbar
- Klare Visualisierung und einfache Parametrierung
- Zentrale Überwachung und Protokollierung der Bauwerke

Vielseitige Fernwirktechnik



- NivuLink Control als IoT-Gateway
- Netzwerk- und Feldbus-Schnittstellen
- Sensoren und Aktoren über Module
- Individuelle Programmierung von Steuer- und Rechenaufgaben
- DSL oder Mobilfunkanbindung
- Anbindung von 42 Unterstationen

KRITIS-sicher und zukunftsfähig

A man in a dark blue shirt is working in a server room. He is standing in front of several server racks, looking at the equipment. The racks are filled with servers and cables. The man is smiling slightly. The background is a white wall.

- IoT-Kommunikation über MQTT
- Integrierte IPsec-Verschlüsselung
- Ferndiagnosen durch Aufschalten möglich
- Hohe Verfügbarkeit
- Gesicherter Fernzugriff für Bedienung, Wartung und Statusabfrage
- Einbindung in bestehendes IT-Sicherheitskonzept



WATER CLIMATE FUTURE

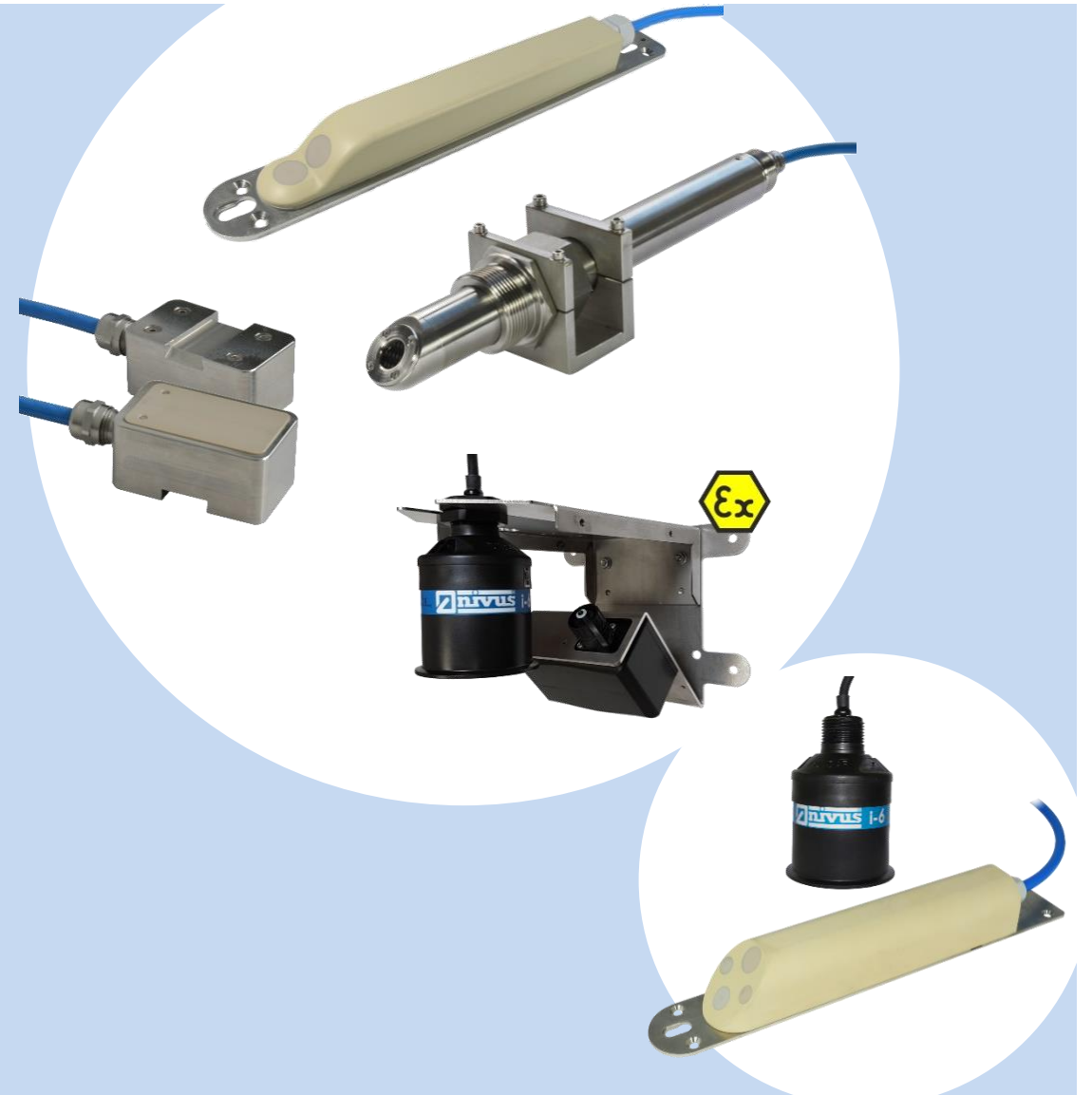
Instrumentation & Digital Services

NIVUS-IoT-Solutions
IFAT 2024



- **Reliable, field-proven and highly accurate measurement systems**
- **Precisely tailored to individual application requirements**

- **Flow**
- **Level**
- **Water Quality & Analytics**

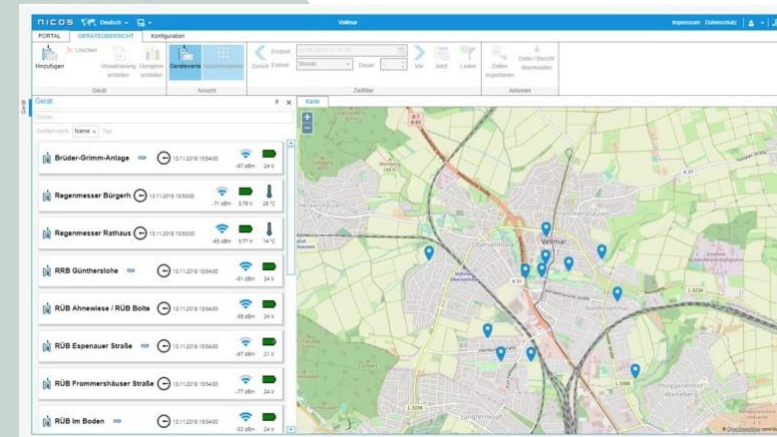
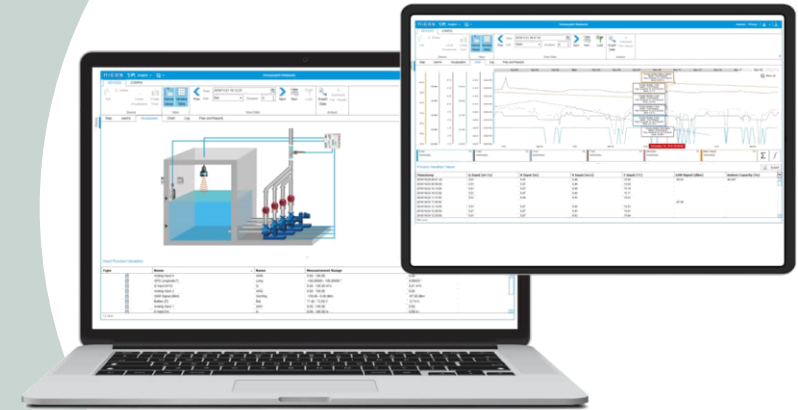


- **Consistent System**
- **Current IT Security Standards**
- **State-of-the-art calculation methods**

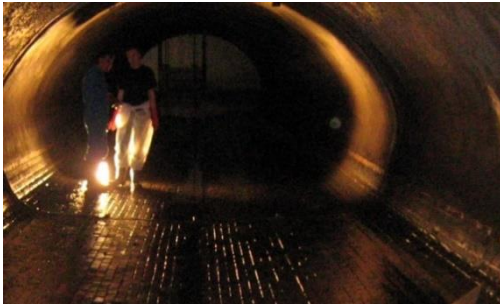
- **Transmitters**
- **Mobile Communications Data Loggers**
- **IoT Gateways**



- **Visualisation**
 - **Logging**
 - **Cloud or On-Premises**
-
- **Measurement Data Portal**
 - **Control System**
 - **Data Connection Systems**



Fields of activity



Sewer channel systems



**Flowing waters |
River dams | Irrigation**



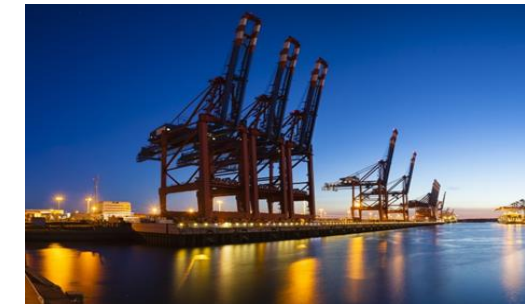
**Water supply and
distribution**



WWTPs



**Urban drainage monitoring
campaigns**



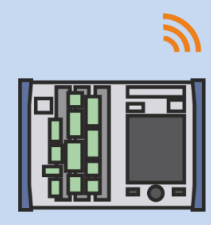
**Industry |
Seawater desalination**

Product Portfolio

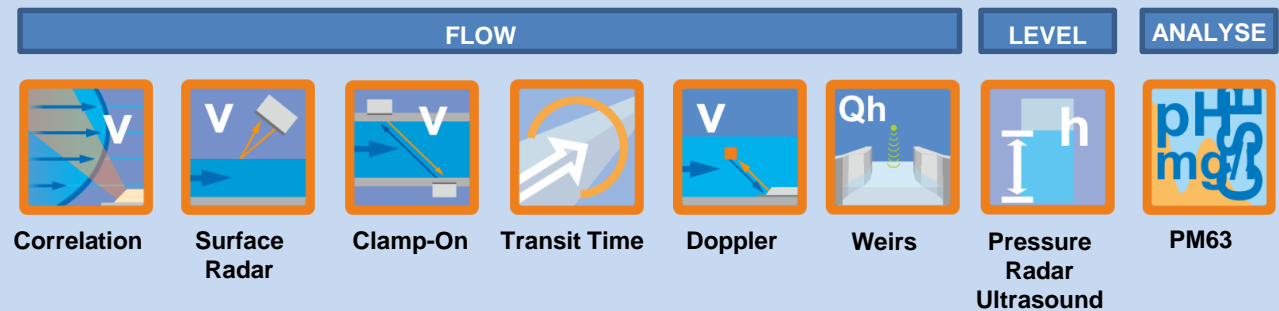
Dataportal / Scada



Transmitters/
IoT Systems



Sensor Systems



Service Portfolio

**Service &
Data Analytics**



**Measurement Systems &
digital Solutions**

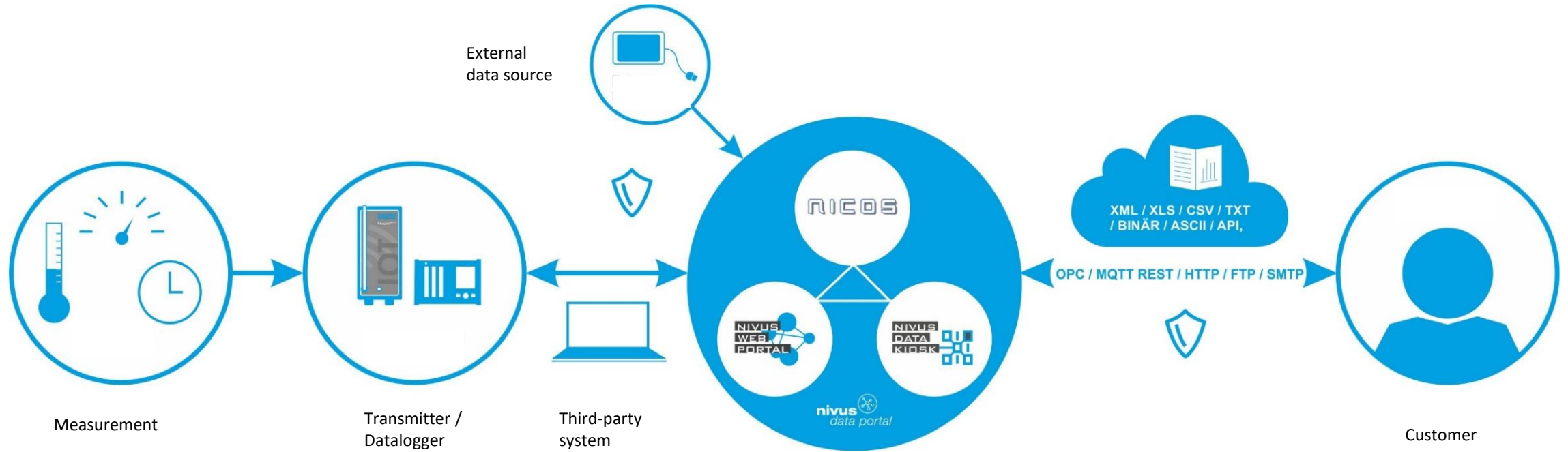


**Advice &
planning Support**



NIVUS - IoT Solutions

Communication concept



NIVUS - IoT Solutions

Data Transmission

- Reliable and secure transmission of your measurement data
- Mains-powered and self-sufficient systems
- Field-tested systems with local data storage
- Adjustable transmission cycles



NIVUS - IoT Solutions



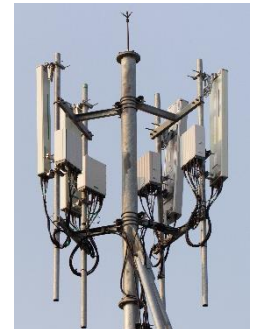
NIVUS secure IoT-Connectivity

NIVUS IoT Connectivity: much more than just transmitting data !!!!

Intelligent secure networking of NIVUS IoT devices with the cloud.

It is the basis for a wide range of new services, which can be flexibly adapted to the requirements and needs of our customers.

- Short term: from 12 months minimum term per connectivity
- No activation fee per connectivity
- No administration fees
- No monthly costs until first use
- No roaming always the best network, access to all networks
- Full cost control
- End to end usage monitoring
- Increased device efficiency
- Reduction of costly on-site commissioning and maintenance of communications
- Predictive maintenance through connectivity
- NIVUS diagnostic service as first point of contact for support in case of problems
- Highest security, IT security ensures cyber security in accordance with DWA,DVGW and BSI standards

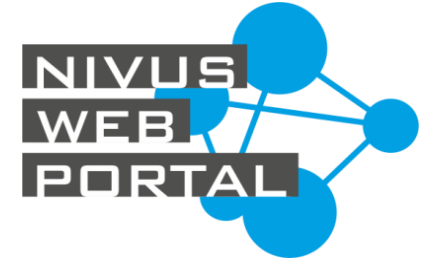




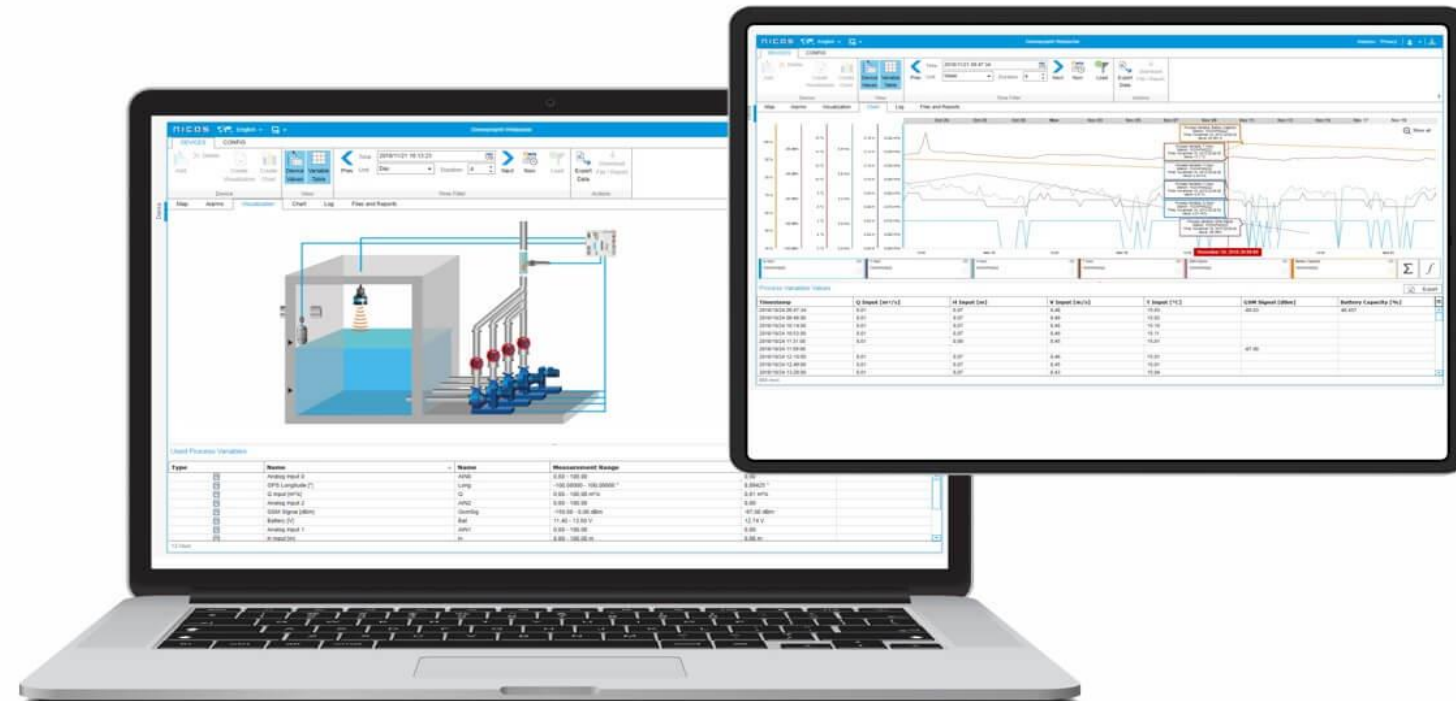
Data Management

NIVUS - IoT Solutions

NIVUS - Webportal

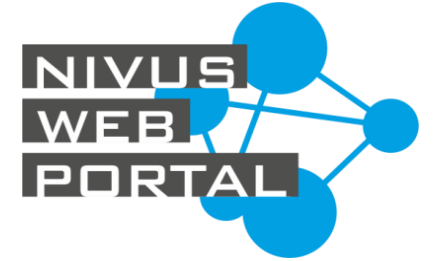


- Access to your measurement data, anytime and from anywhere
- Relevant parameters at a glance
- Individual alarms
- Automatic creation of individual reports
- www.nivuswebportal.com



NIVUS - IoT Solutions

NIVUS - Webportal



Devices/Maps

- Device Information
- Quick Overview



Alarms

- Via E-Mail
- Incl. Logging



Visualisation

- Process Images
- Quick Overview



Reports

- Automatic Creation
- Individual Templates



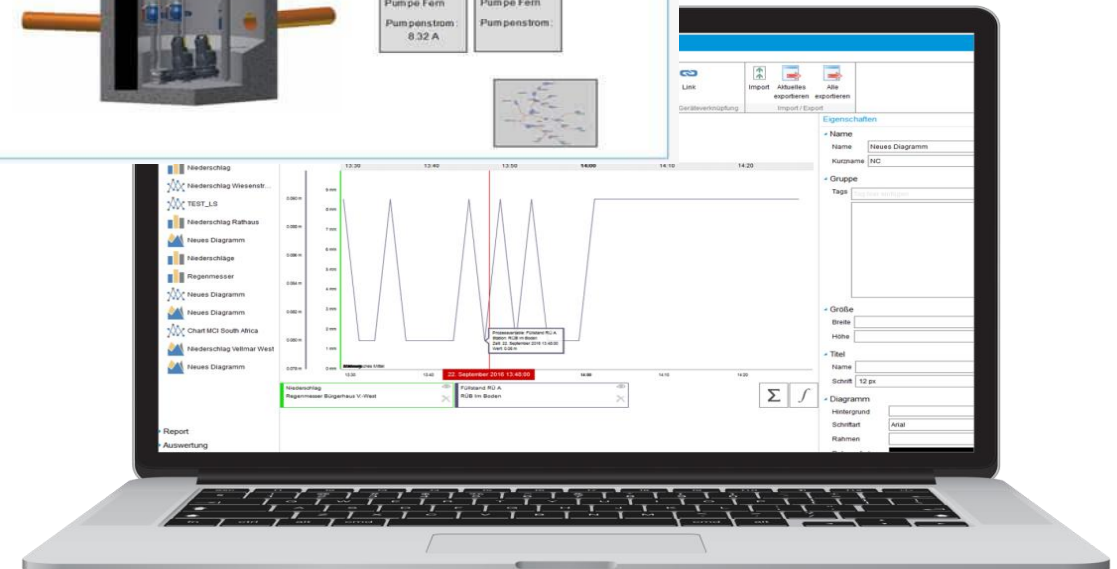
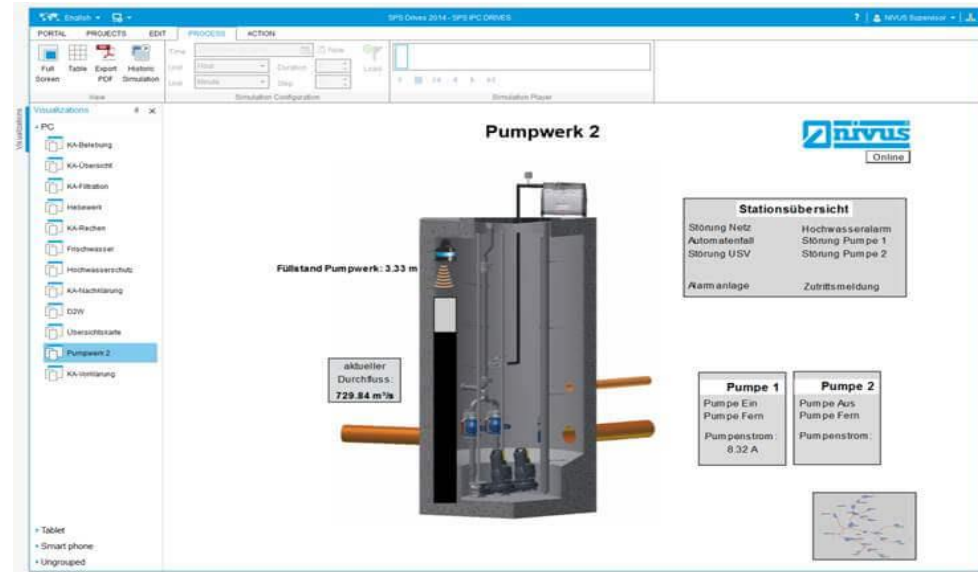
Hydrographs

- Representation as Charts
- High Resolution

NIVUS - IoT Solutions

Provision Of Data

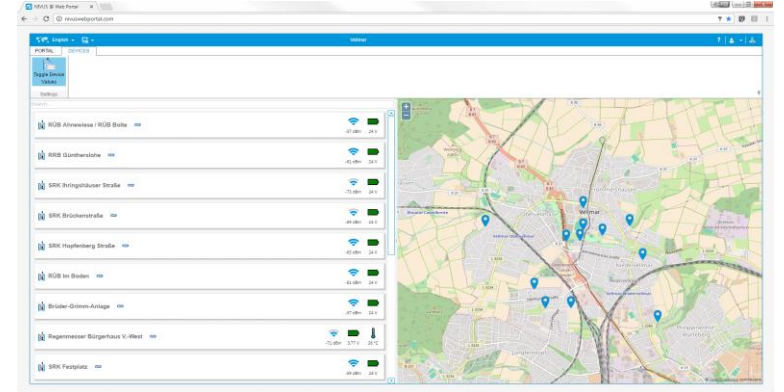
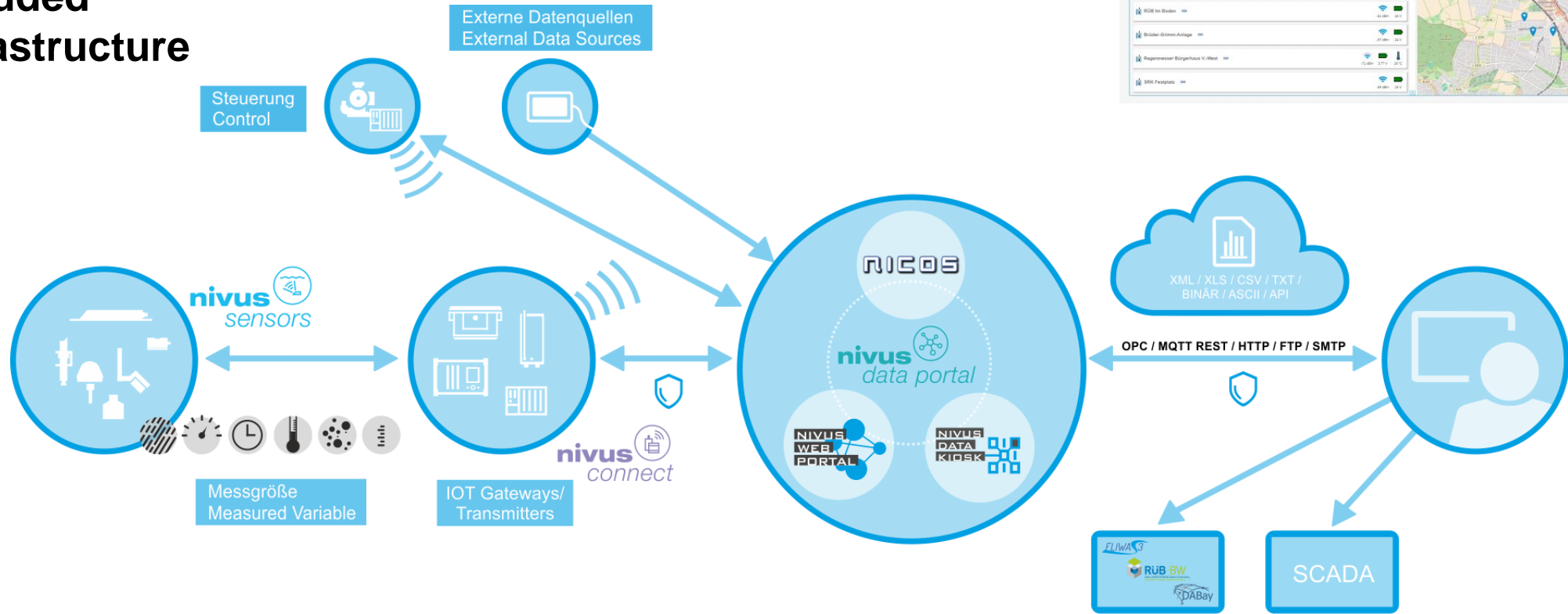
- Transparent processes
- Visualisation
- Modular design
- Freely configurable protocols
- Connection to third party systems



NIVUS - IoT Solutions

Consistent Communications Concept

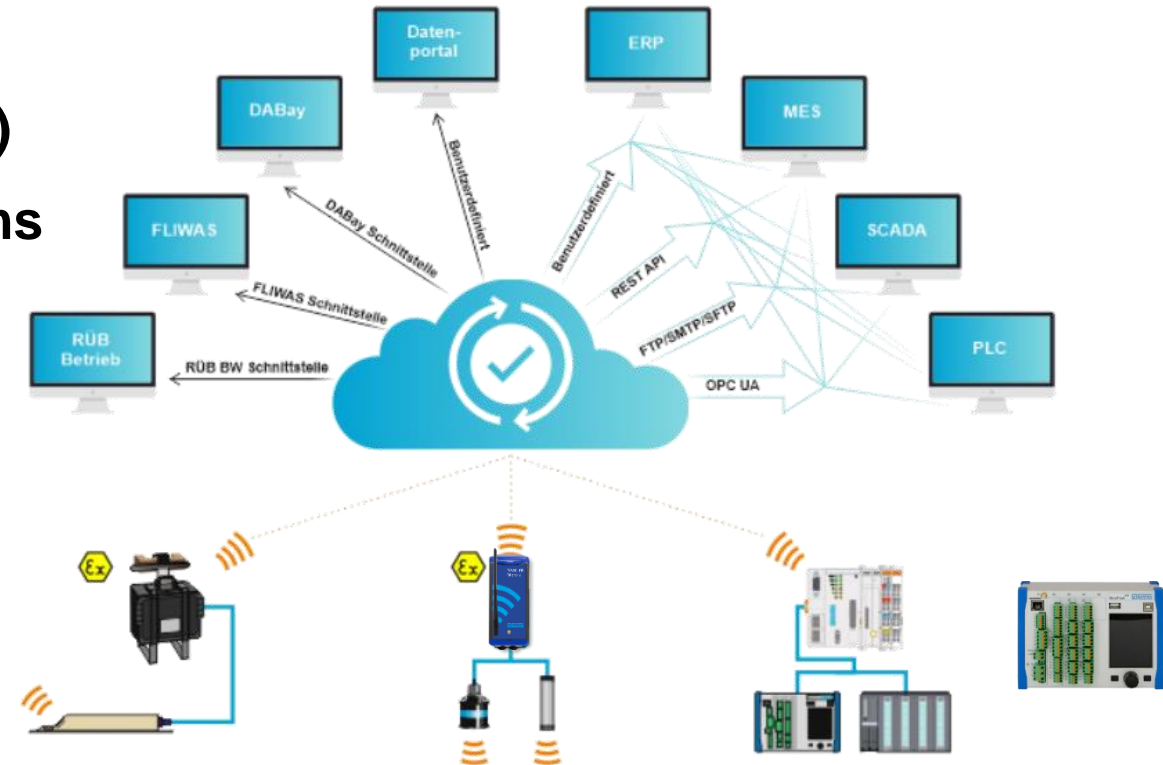
- Open system
- Included infrastructure



NIVUS - IoT Solutions

Data Kiosk

- Integration of primary control Systems
- Connection of additional data sources (e.g. GIS)
- Networking with external and third-party systems
- Wide range of interfaces for connecting
 - PLC
 - SCADA
 - MES systems...
- Data forwarding to authority systems



NIVUS - IoT Solutions

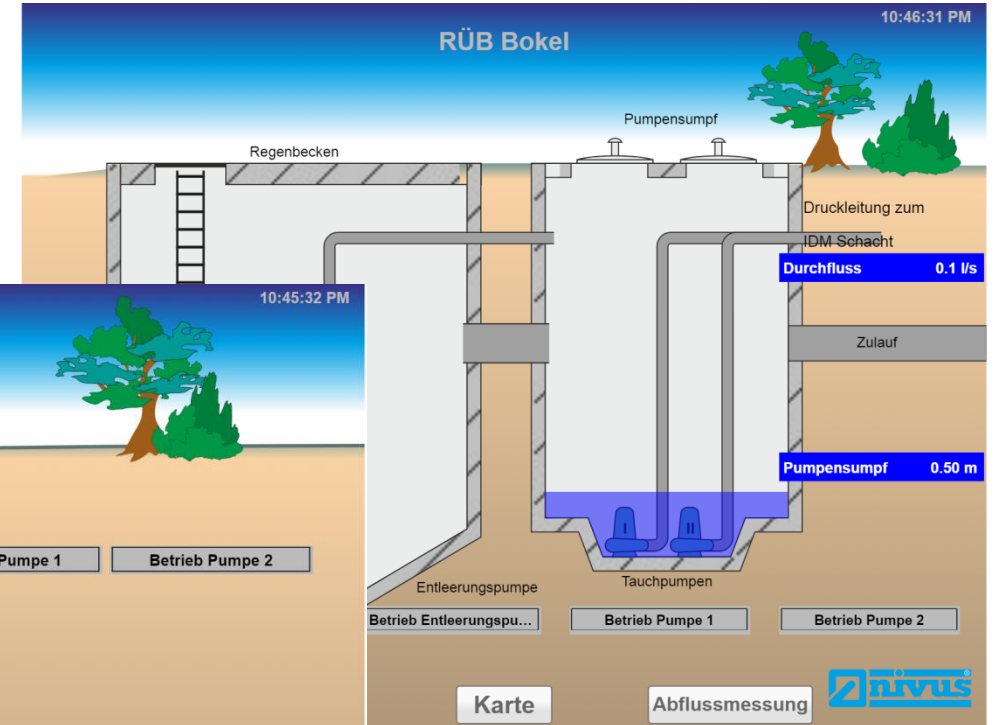
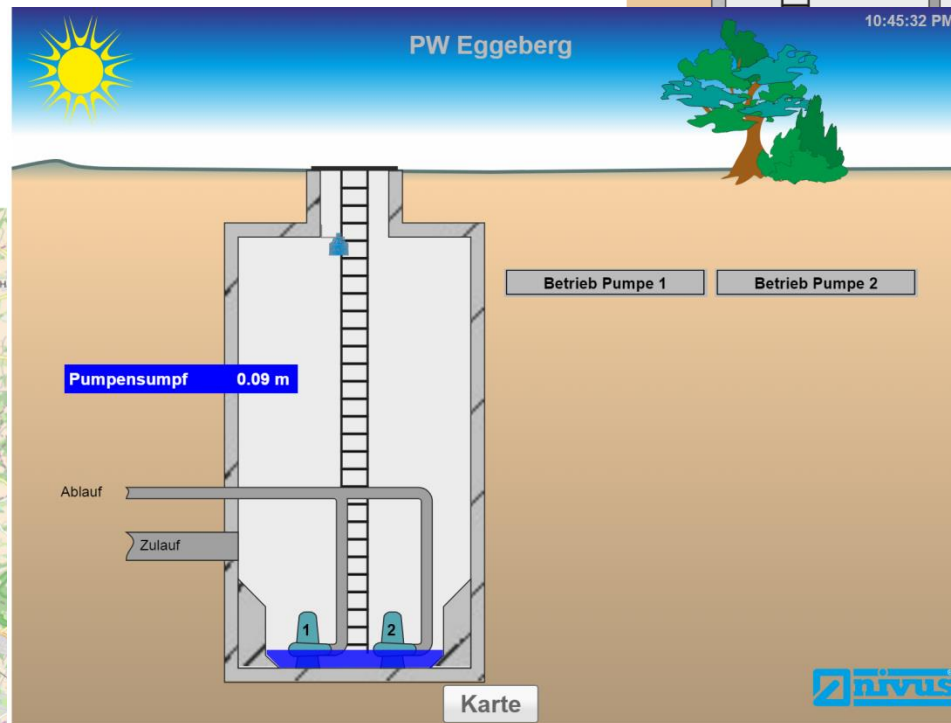
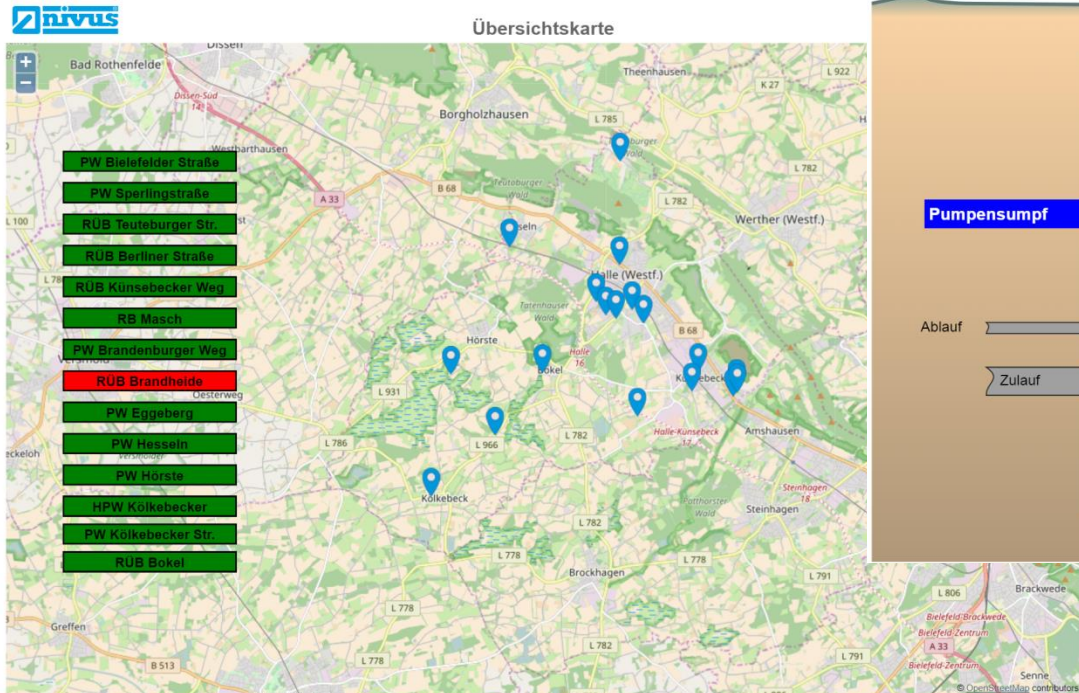
Webportal – NICOS

- NIVUS Webportal
- NICOS Cloud
- NICOS
- NIVUS DataKiosk



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Webportal – NICOS Visualization

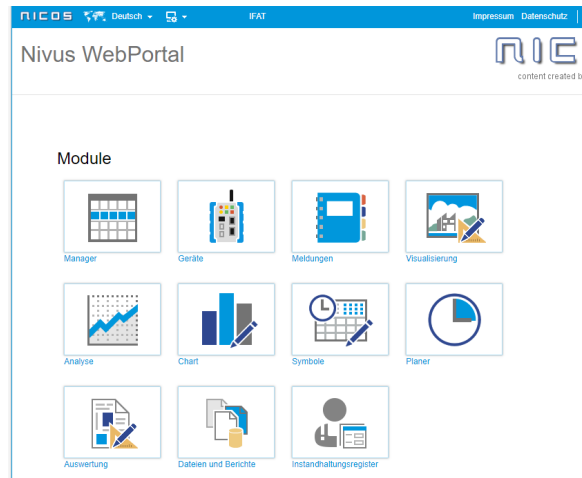


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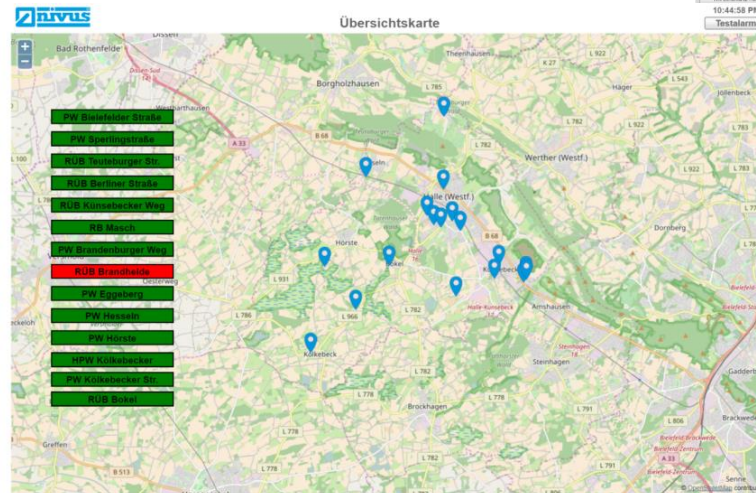
Webportal - WebScada - NICOS

Scalable solution from visualization to process control

1. Webportal

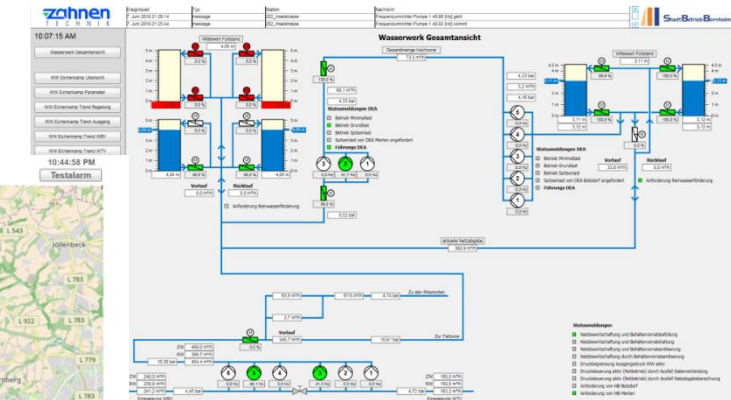


2. WebScada
- Webportal
- Control function



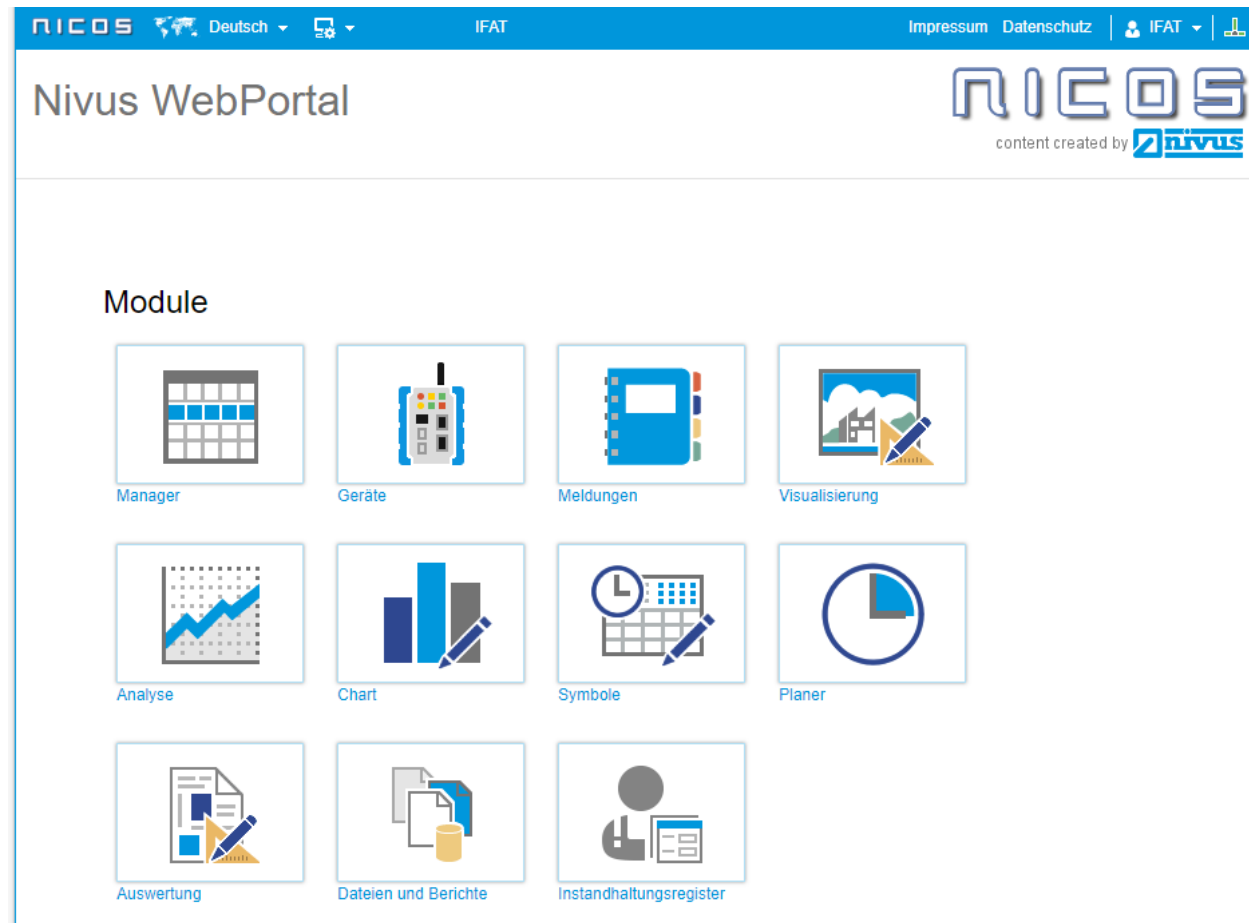
3. NICOS

- Webportal
- WebScada
- Extensive control system!



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Webportal – NICOS

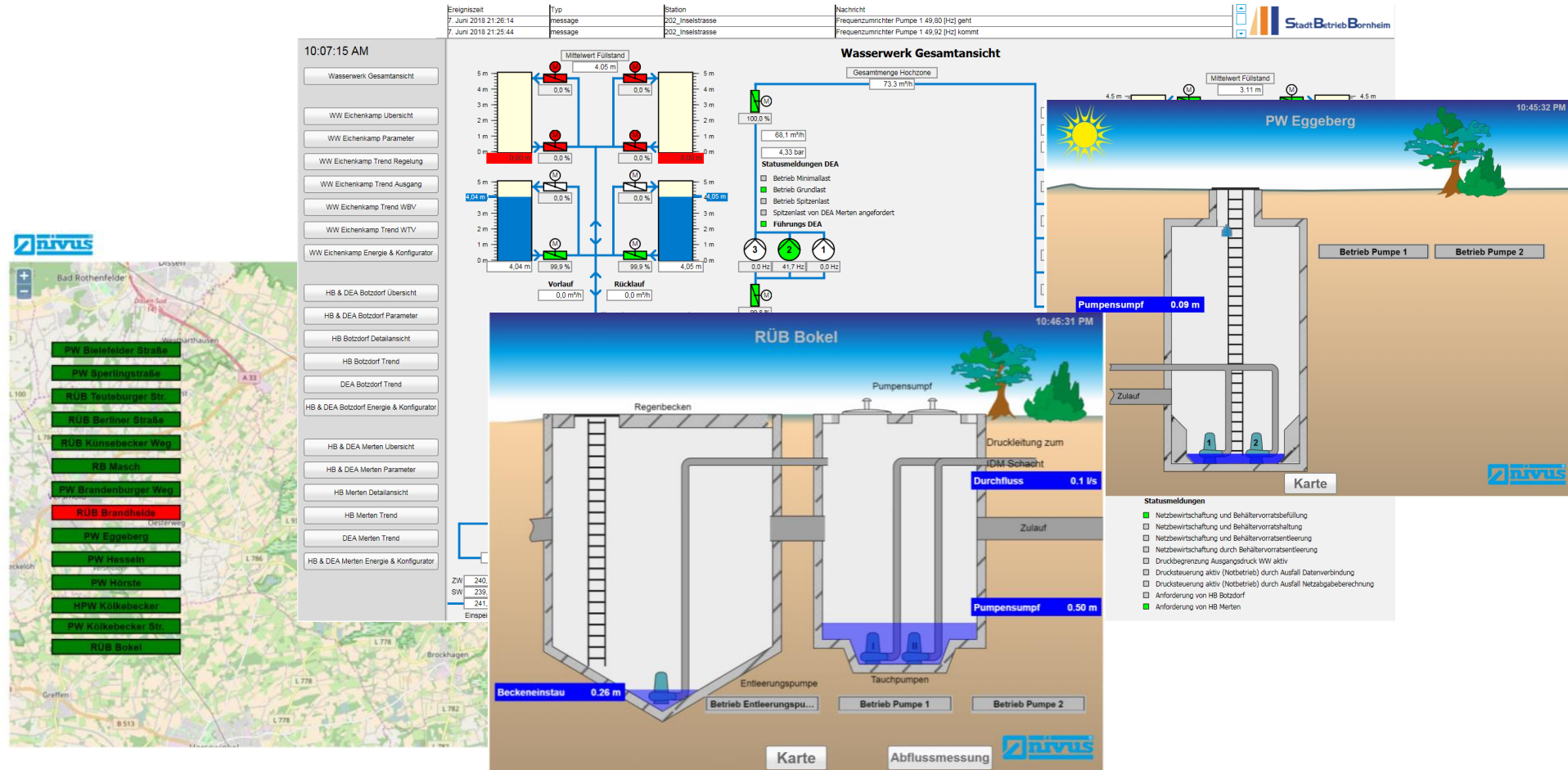


The screenshot displays the NIVUS WebPortal interface. At the top, there is a blue navigation bar with the text "NICOS", a language dropdown set to "Deutsch", a device icon, and the user name "IFAT". On the right side of the bar are links for "Impressum", "Datenschutz", and a user profile icon. Below the navigation bar, the page title "Nivus WebPortal" is on the left, and the "NICOS" logo with the tagline "content created by NIVUS" is on the right. The main content area is titled "Module" and contains a grid of 12 icons, each representing a different functional module.

Module Name	Icon Description
Manager	Calendar icon
Geräte	Mobile device icon
Meldungen	Folder icon
Visualisierung	House and chart icon
Analyse	Line graph icon
Chart	Bar chart icon
Symbole	Calendar with clock icon
Planer	Circle with square icon
Auswertung	Document with chart icon
Dateien und Berichte	Files and folder icon
Instandhaltungsregister	Person and document icon

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Visualization



NIVUS - IoT Solutions

NICOS Structure - Modules

- Engineering Tool - NICOS Studio
- NICOS Web-Frontend (webbasiert)
 - Manager
 - Chart
 - Analytics
 - Alarm
 - Symbols
 - Scheduler
 - Reporting
 - Files
 - Maintenance Register

Module



Manager



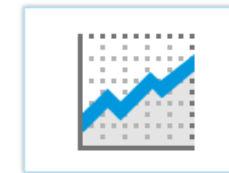
Device



Alarm



Visualization



Analytics



Chart



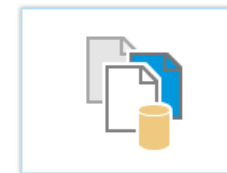
Symbols



Scheduler



Reporting



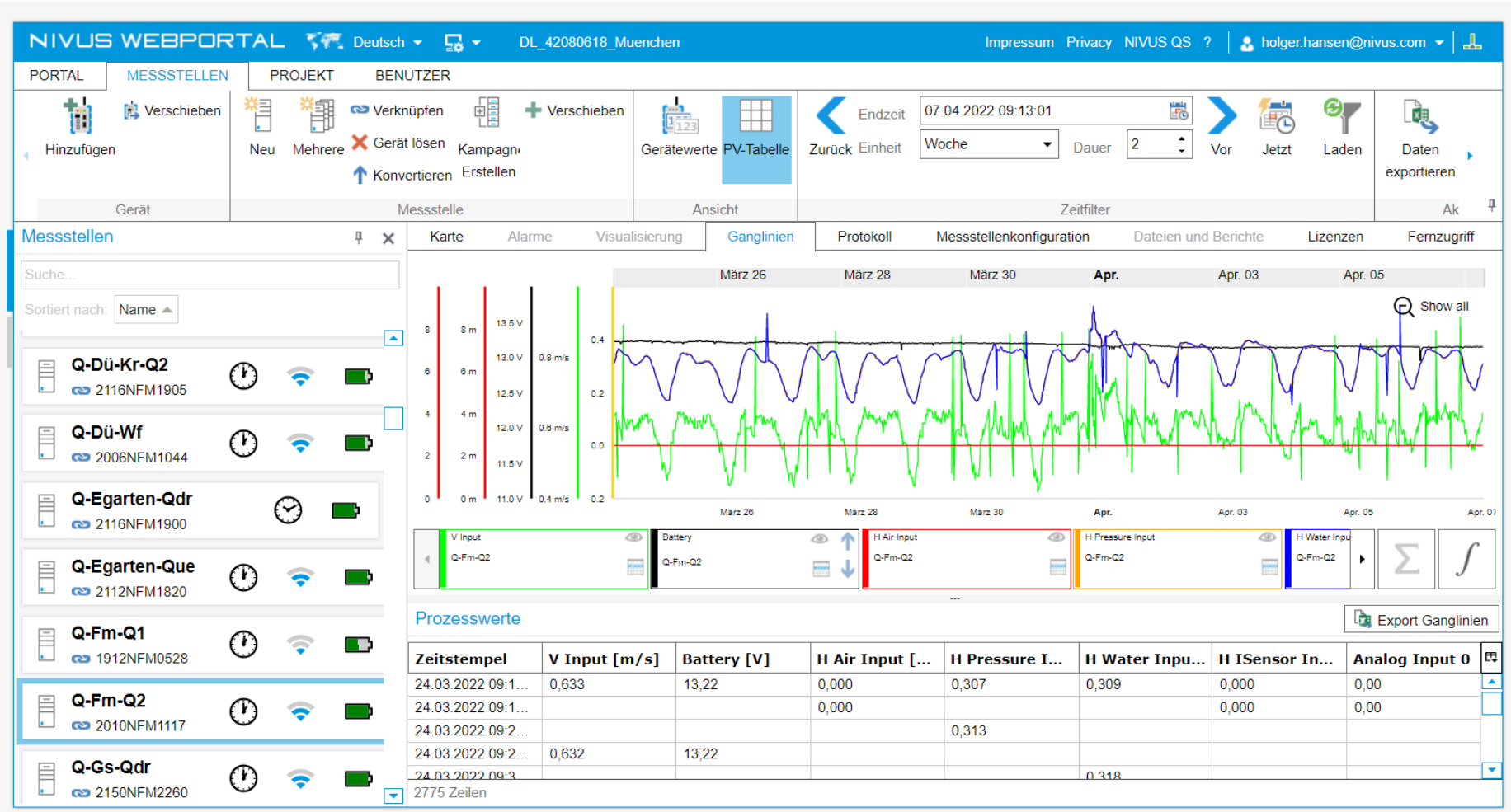
Files



Maintenance Register

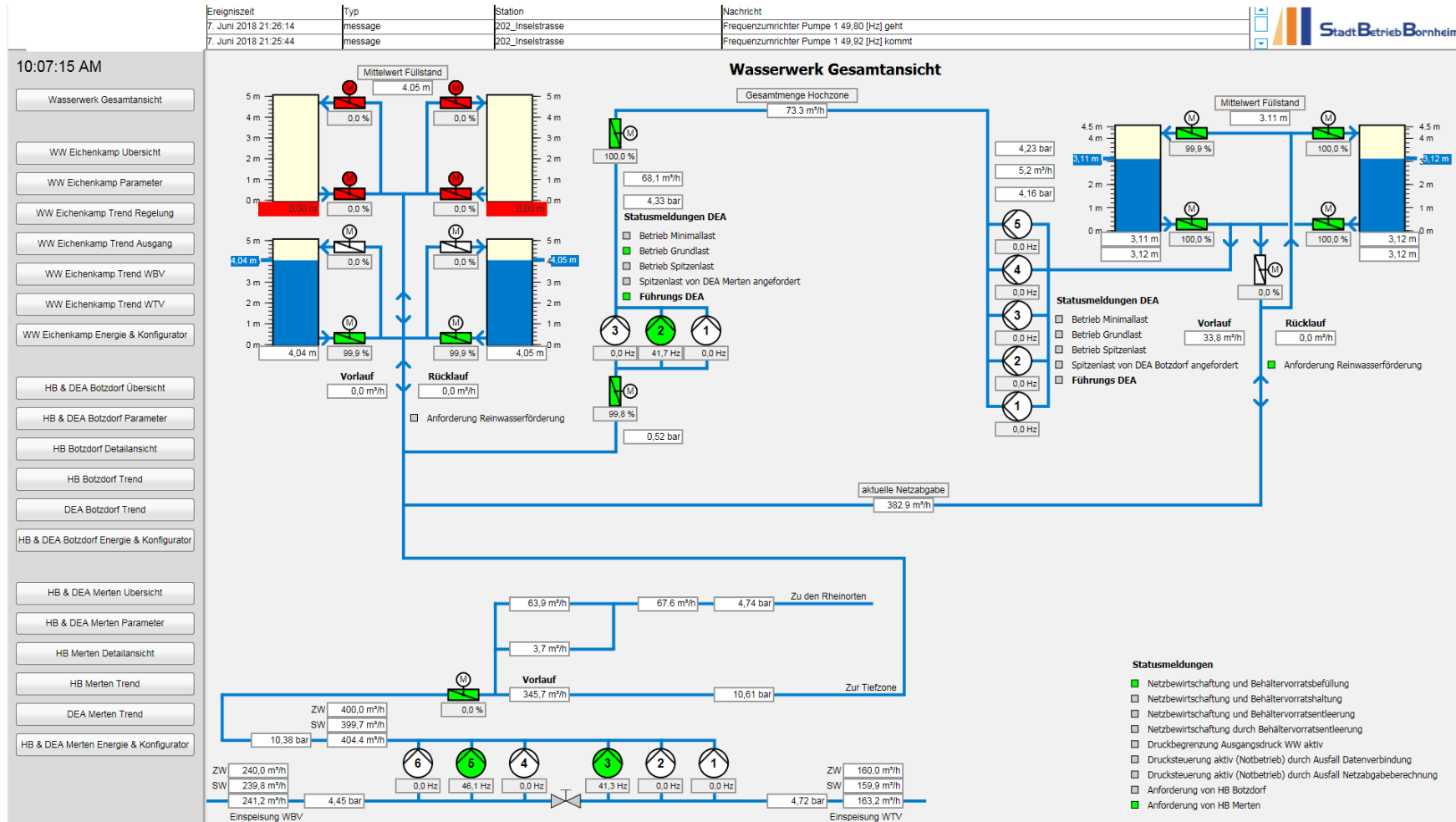
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Webportal – Visualization



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Visualization

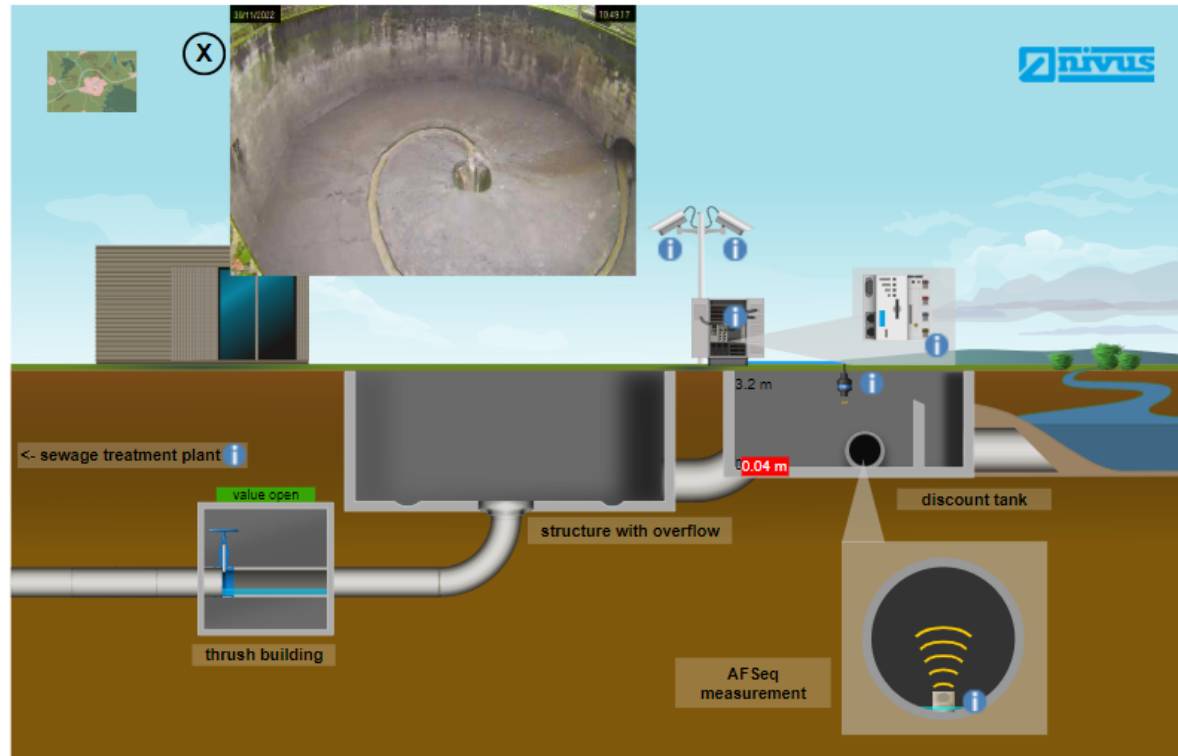


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NICOS- Demo – Stormwater overflow basin

Status

- Communication
- Measurement flow-dividing
- Flow measurement
- Actuator
- Automatic
- Power outage



Station record

Filling level

0.04 m

Particle concentration

0 mg/l

Particle < 63 µm

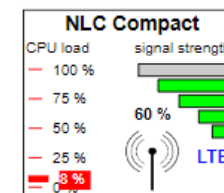
0 mg/l

Quality

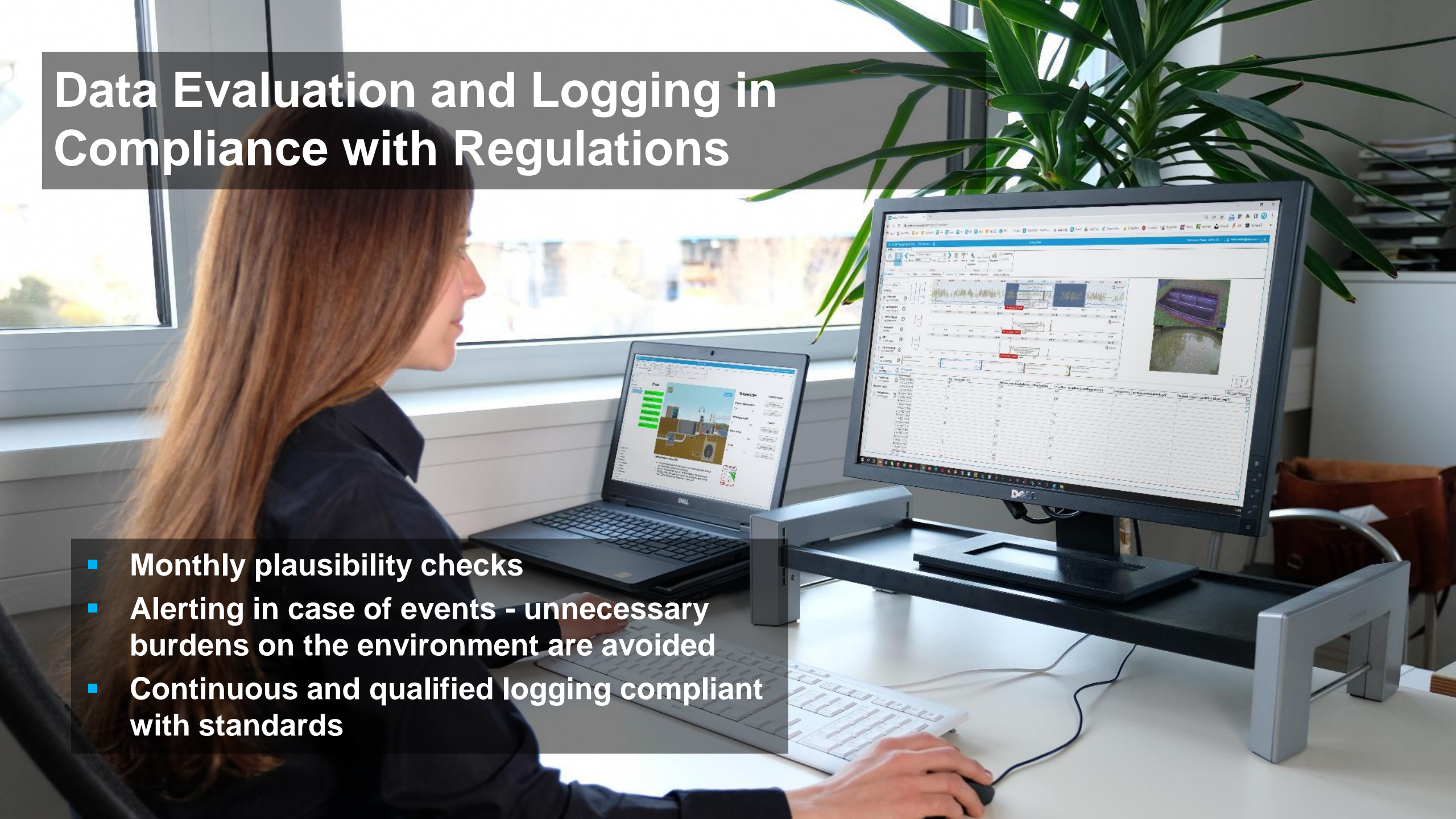
50 %

Application description stormwater overflow basin

- Water flows through the outlet structure to the relief basin
- When the throttle is open, the water is conveyed to the sewage treatment plant
- The throttle position determines the flow rate to the sewage treatment plant
- If the maximum filling level is exceeded, the water is discharged



Data Evaluation and Logging in Compliance with Regulations

A woman with long brown hair is sitting at a desk in a bright office, looking at a laptop. To her right is a large monitor on a stand displaying a complex data analysis software interface with various charts and tables. A large green plant is visible in the background. The scene is well-lit by natural light from a window.

- Monthly plausibility checks
- Alerting in case of events - unnecessary burdens on the environment are avoided
- Continuous and qualified logging compliant with standards

Digitisation for Municipality

“Bornheim Municipal Works AöR” rely on standardised system by NIVUS



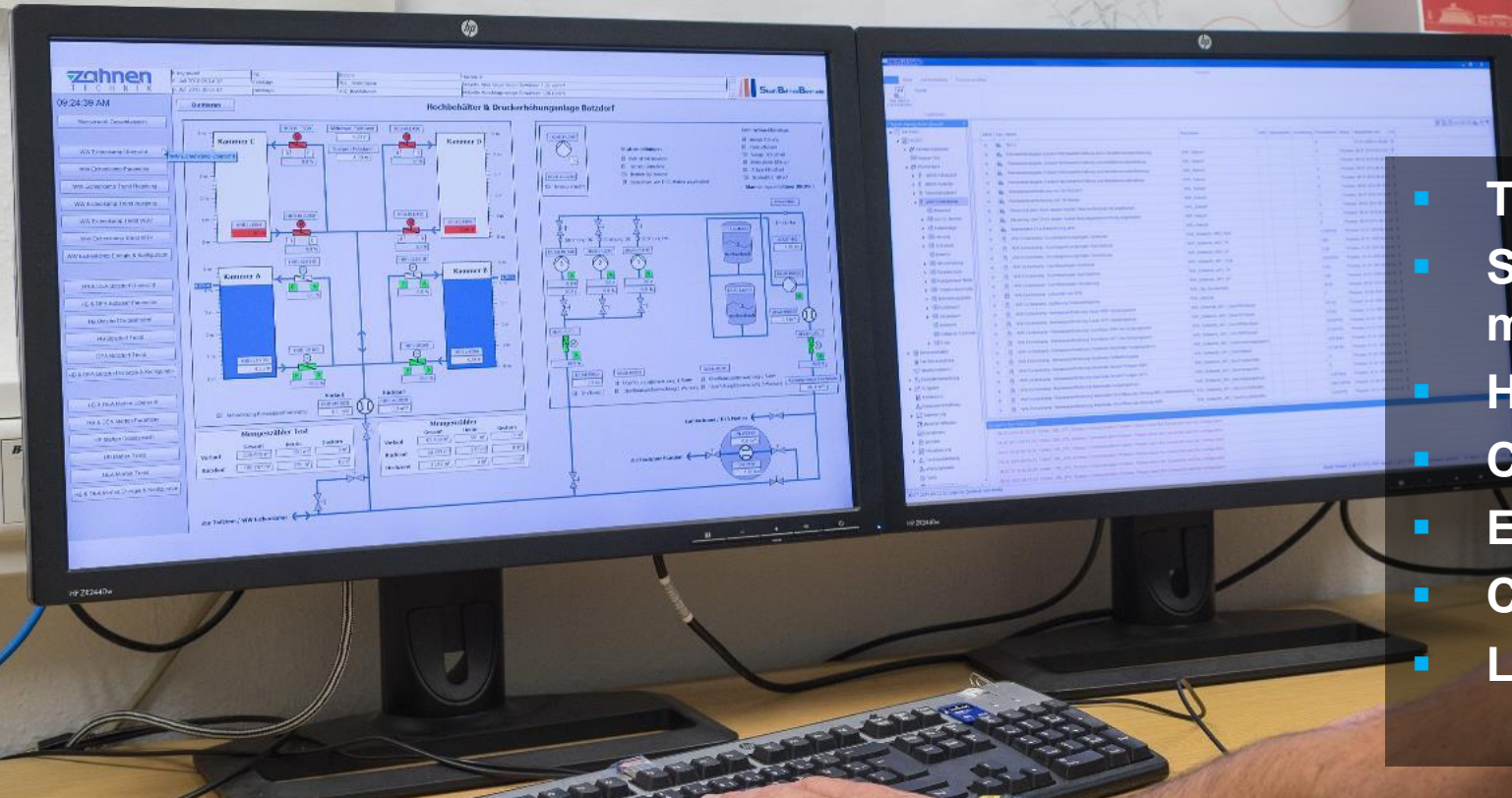
- North Rhine-Westphalia
- District Cologne
- Area: 82.69 km²
- Pop. 49,739
- 600 Inhabitants per km²

Initial Situation and Task

A man with short brown hair and blue-rimmed glasses, wearing a dark blue short-sleeved button-down shirt, is standing in an industrial facility. He is leaning forward, with his right hand on a large, silver-colored industrial valve handle. The valve is part of a complex system of pipes and machinery, painted in light blue and white. In the background, more industrial equipment and pipes are visible, creating a sense of a large-scale manufacturing or processing plant. The lighting is bright and even, highlighting the man and the machinery.

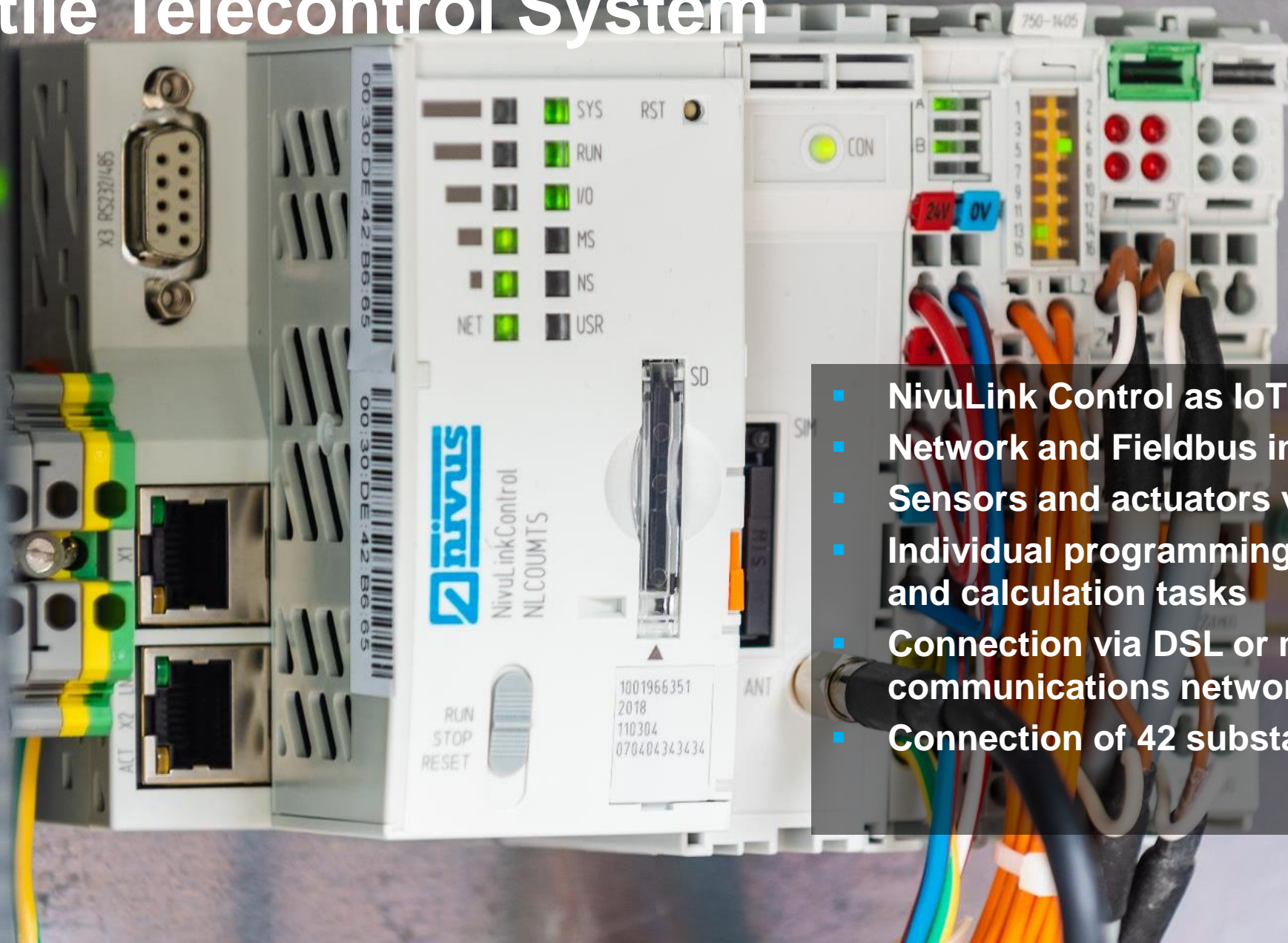
- Substations network needs to be modernised
- Future-proof design
- Drinking water supply and wastewater operations to share one conducting system
- KRITIS-conform IT security
- Unified and user-friendly system

Central Telecontrol System



- Telecontrol system NICOS
- Same system for operational management and on-call planning
- Highly available
- Clear visualisation
- Easy parameterisation
- Centralised monitoring
- Logging of structures/constructions

Versatile Telecontrol System



- NivuLink Control as IoT gateway
- Network and Fieldbus interfaces
- Sensors and actuators via modules
- Individual programming of control and calculation tasks
- Connection via DSL or mobile communications network
- Connection of 42 substations

KRITIS-Secure And Future-Proof

A man in a blue shirt is working in a server room. He is standing in front of a rack of servers, looking at the equipment. The room is filled with server racks and cables. The man is smiling and looking towards the right. The background shows more server racks and cables. The overall scene is a professional server room environment.

- IoT communication via MQTT
- Integrated IPsec encryption
- Remote diagnostics possible through connection
- High availability
- Secured remote access for operation, maintenance and status request
- Integration into existing IT security concept

WATER CLIMATE FUTURE

Instrumentation & Digital Services

Thank You!
Danke!