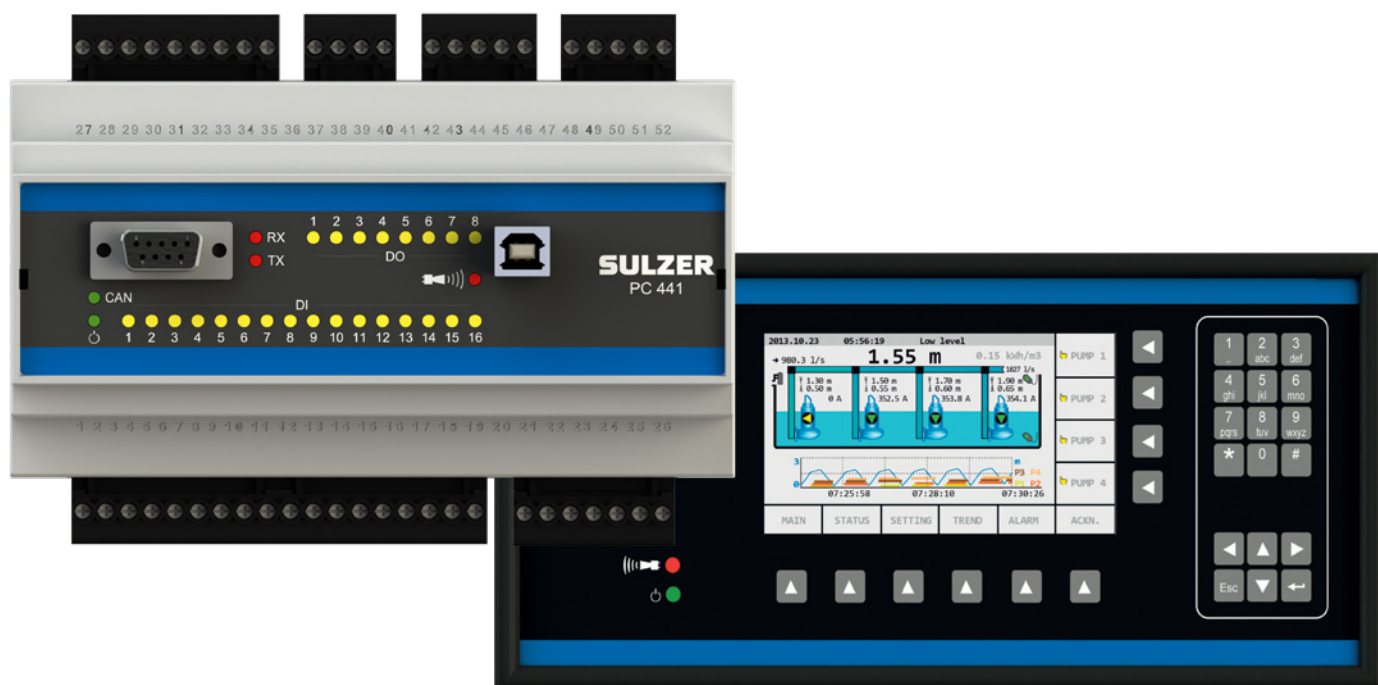


# Pump controller type ABS PC 441



# One solution for monitoring, control or both

There are many ways to improve the efficiency and reliability of your collection network – even without changing a single pump. Using the Sulzer pump controller type ABS PC 441 to monitor and/or control your pumps is an easy way to boost and safeguard your network's performance.

## Monitoring keeps you informed

When you can see events in your network as they happen, you can make decisions in time to make a difference. The PC 441 provides tools and possibilities that let you to monitor your whole collection system in real time.

Monitoring gives you instant access to alarms, pump status, level information and trends – both on site and remotely. With their help, you can optimize your network's operation and avoid incidents by taking preventive measures.

## Control saves you time, effort and money

Even better than monitoring your network is being able to influence it. The PC 441 provides control functions that help not only to prevent downtime and flooding, but also to reduce maintenance and energy costs. Pumps and other equipment can be automatically started, stopped or regulated in many smart ways. Doing so increases pumping station availability, minimizes energy consumption and even reduces stress on the network downstream. Naturally, the PC 441 can control and monitor at the same time. So you always have instant access to alarms, trends and other important data.

## A sophisticated system – yet easy to use

Many users are surprised by how much monitoring and control can improve their network. Perhaps even more surprising is how simple the PC 441 is to implement.

Connecting and configuring the PC 441 is easy, regardless whether you use it with one pump or several. Even non-Sulzer equipment can be connected to the system, giving you all alarms and information in one place.

## Information at your fingertips

Best of all, there are many ways to access the PC 441. Configuration can be done on site via the control panel, or remotely using our PC software. Thanks to AquaApp, our solution for Android and iOS, it can even be done via smartphone.

Alarms, logs, trends and other information can also be accessed remotely, either through our PC software or AquaApp. By making the most important functions available from your phone, AquaApp puts your whole network right in the palm of your hand.

## How you can benefit

### Collection network managers

- Reduced risk during peak loads
- Reduced equipment and labor costs
- Reduced tankering and energy costs

### Collection network operators

- Fewer emergency call-outs
- Reduced service needs
- Clear information for correct decisions

### Technicians

- Easy installation
- Easy configuration
- Simple expansion and upgrading







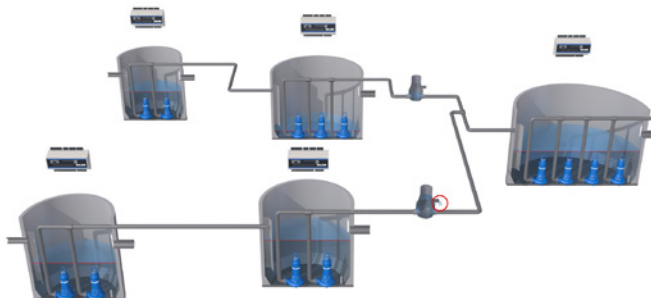
# How it works in practice

Here are just a few examples of how you can use the Sulzer pump controller type ABS PC 441 to increase availability while reducing maintenance, energy use and costs.

## Detecting flow deviations between pumping stations

Leakages and overflows are not limited to pumping stations. Leakage can occur out of a pipeline, just as water can leak into a pipeline and add pressure downstream.

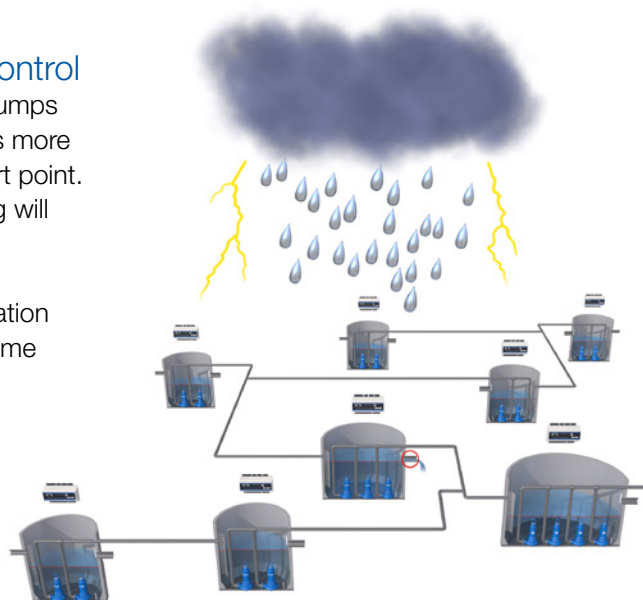
Using the PC 441 to measure the outflow at one station and the inflow at the next, any problem between can be quickly identified. If the pump energy consumption is also monitored, the actual pumping efficiency can be calculated as well.



## Preventing flooding through intelligent level control

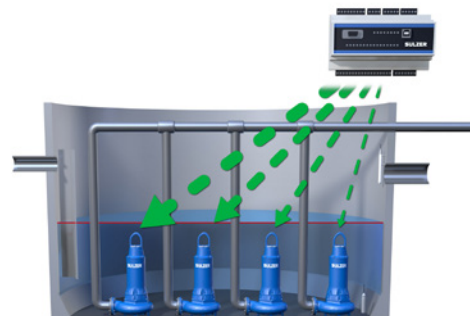
During heavy rainfall, the PC 441 can start and stop the pumps based on the speed of level change. If the water level rises more quickly than normal, pumping will begin before the set start point. If the water level drops more quickly than normal, pumping will stop before the stop point is reached.

This function prevents peak stress in both the pumping station and the network, because it spreads out the pumped volume over time.



## Preventing clogging with individual pump exercise runs

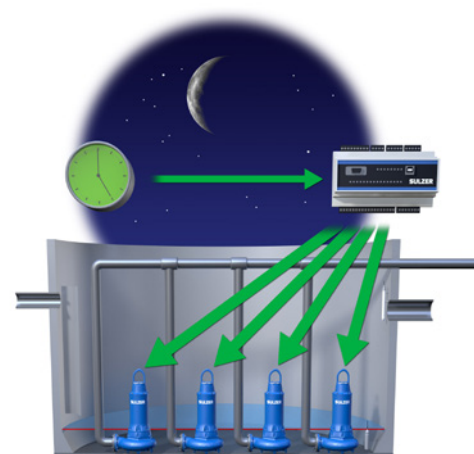
The control functions of the PC 441 allow the different pumps in a station to run independently of each other, with different start/stop levels and different start/stop delay times. If a certain pump is not used for a period of time, the controller can force an exercise run to prevent it from clogging due to disuse.



### Cutting electricity costs by running pumps at off-peak hours

Using the PC 441, pumps can be assigned start/stop levels that differ by day and by night. This function can be used to empty the station during off-peak hours, when electricity costs less.

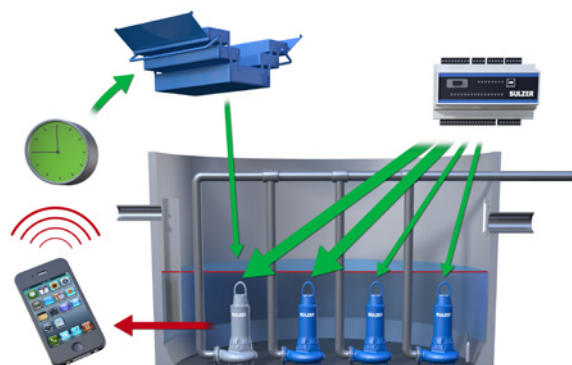
The same function can be used to temporarily lower the stop level and minimize sludge build-up, or to temporarily increase the difference between start and stop level for a pipe-flushing effect.



### Lowering the risk of total stops and repeated blockage

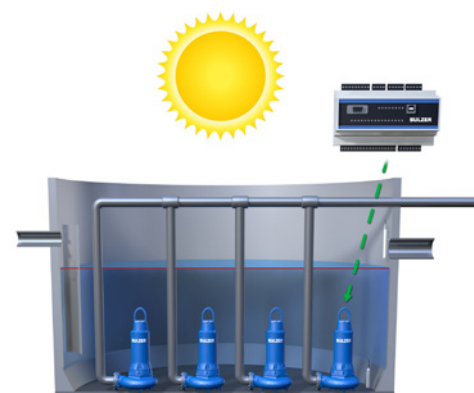
Using the asymmetric start function of the PC 441, one pump can be run for fewer hours than the others. This increases availability by reducing the risk of simultaneous breakdowns.

Alternatively, a pump that frequently clogs due to flows within the pumping station can be run more frequently, which will help to keep it blockage-free. If a breakdown does occur, the controller will send an SMS alert.



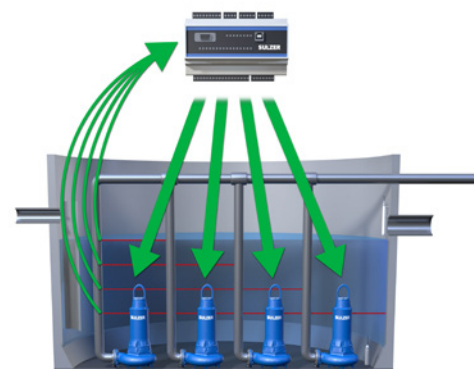
### Saving energy by pumping no more water than needed

When there is less rain, there is less risk of a sudden rise in water level. During dryer periods, energy can be saved by setting higher start/stop levels, so that the pumps run less often. With the PC 441, this change can be made via the operator panel or a PC using Sulzer monitoring and configuration software type ABS AquaProg.



### Avoiding water hammer and network choking

Using the PC 441 to set individual start and stop levels for pumps and pumping stations puts less pressure on hydraulic and electrical networks. Each pump starts at the optimal time, thereby avoiding water hammer and preventing flooding in the most efficient way. If the risk of flooding arises, the PC 441 sends an SMS alert.

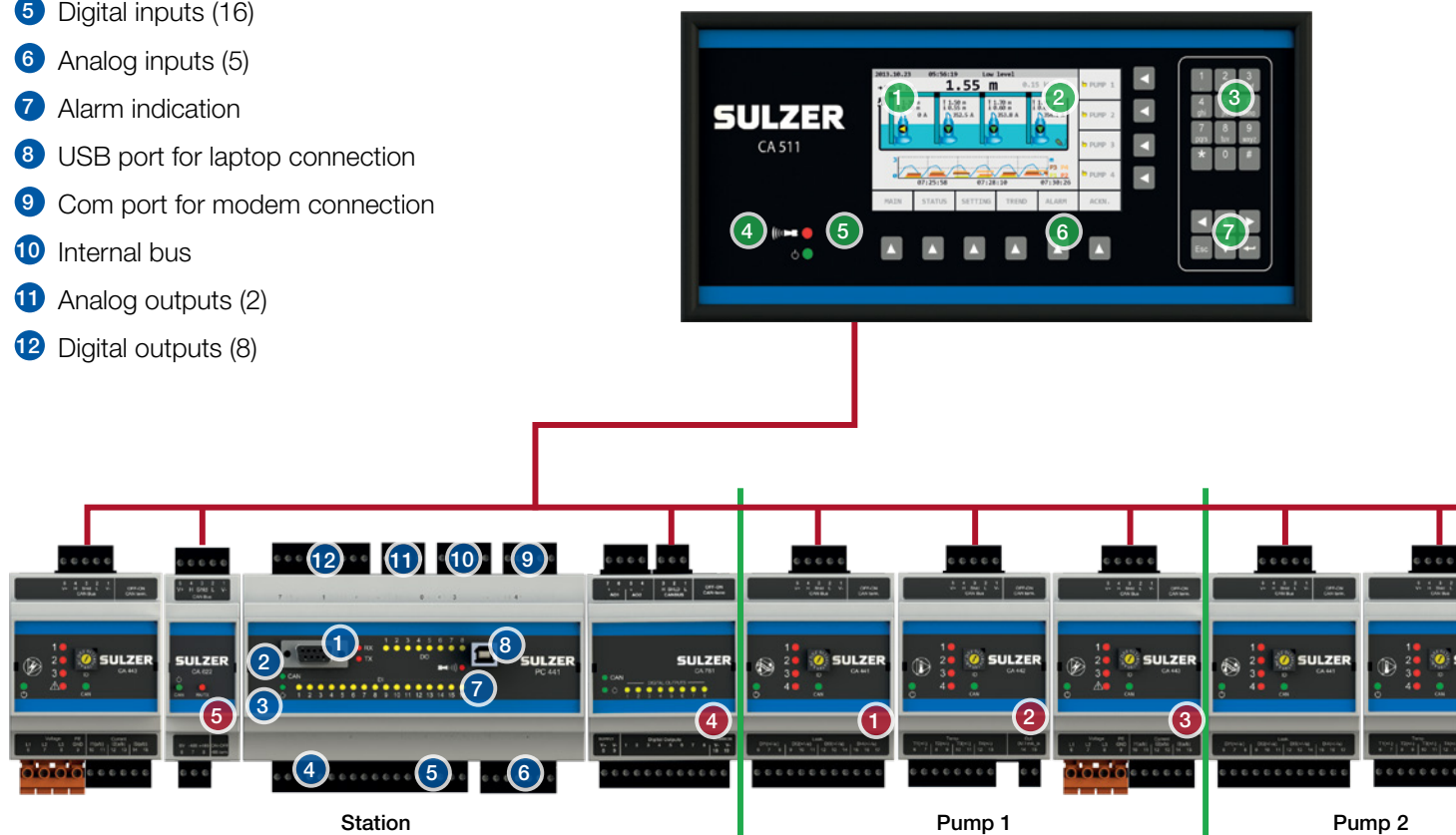


# A modular system to suit your applications

The Sulzer pump controller type ABS PC 441 is part of a modular monitoring and/or control system whose basic configuration can be expanded with additional functions.

The system shown here provides advanced monitoring of electrical properties, temperature and leakage per pump. The operator panel and the modules described to the right are connected to the PC 441 via the CAN bus interface.

- ❶ Com port for laptop connection
- ❷ Internal bus indication
- ❸ Power indication
- ❹ Power connection
- ❺ Digital inputs (16)
- ❻ Analog inputs (5)
- ❼ Alarm indication
- ❽ USB port for laptop connection
- ❾ Com port for modem connection
- ❿ Internal bus
- ⓫ Analog outputs (2)
- ⓬ Digital outputs (8)



- ❶ Graphical display showing pump status  
The operator panel ensures easy configuration and operation of the PC 441, allowing the operator to see pump status at a glance. Data can be viewed or accessed in several formats: alphanumeric characters, animated graphical symbols or trend curves.

- ❷ Used energy / pumped volume
- ❸ Alphanumeric keypad
- ❹ Alarm indication
- ❺ Power indication
- ❻ Display menu buttons
- ❼ Menu navigation buttons

❶ Leakage monitoring module type ABS CA 441

This module can be used in various ways to detect leakage in a range of submersible sewage pumps. Its four signal inputs provide an alarm in the event of moisture detection (Di). As with the temperature monitoring module, combined or separate alarms are possible.

❷ Temperature monitoring module type ABS CA 442

This module allows temperature monitoring of up to 4 pumps with combined alarms (one alarm per pump), or up to 4 separate alarms using one module per pump. It has an extra mA input for connection of a vibration sensor.

❸ Electrical property measuring module type ABS CA 443

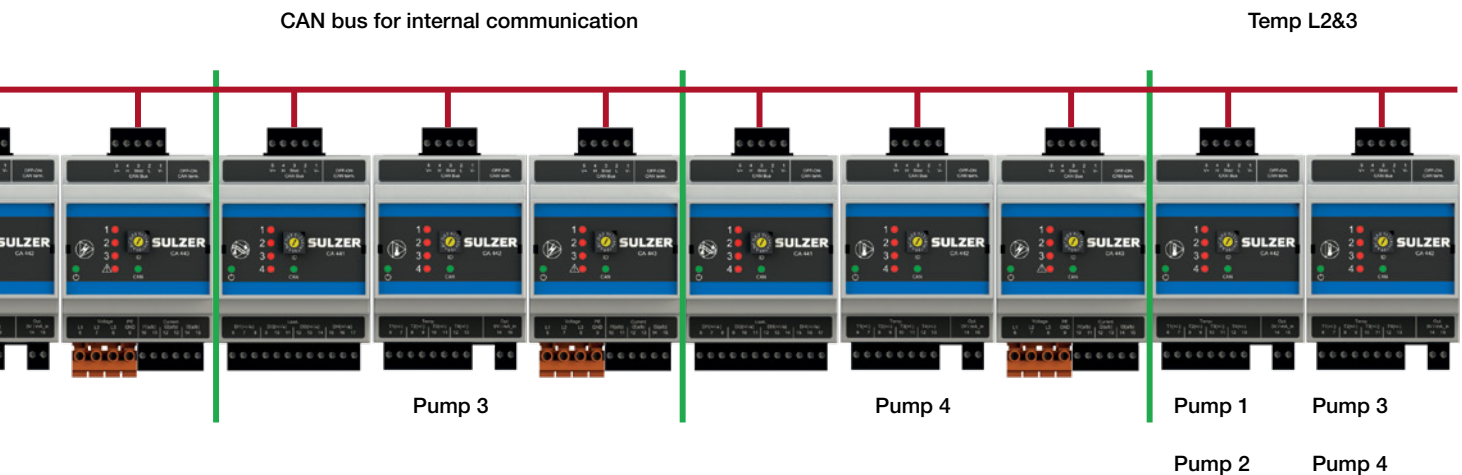
This module measures the electrical properties of an entire pumping station and/or one pump.

❹ Output expansion module type ABS CA 781

This expansion module provides 8 nb of digital outputs and 2 nb of analog outputs. The module requires power from an external source.

❺ RS 485 communication module type ABS CA 622

This module enables communication with peripheral devices such as variable frequency drives, soft starters, energy meters, etc. via a Modbus RTU protocol. Incorporating them in this way can reduce the need to install additional cables and ports. The devices are connected via the module's RS 485 communication port and can be accessed via the same web interface as other equipment in the system.





# The information you need, when and where you need it

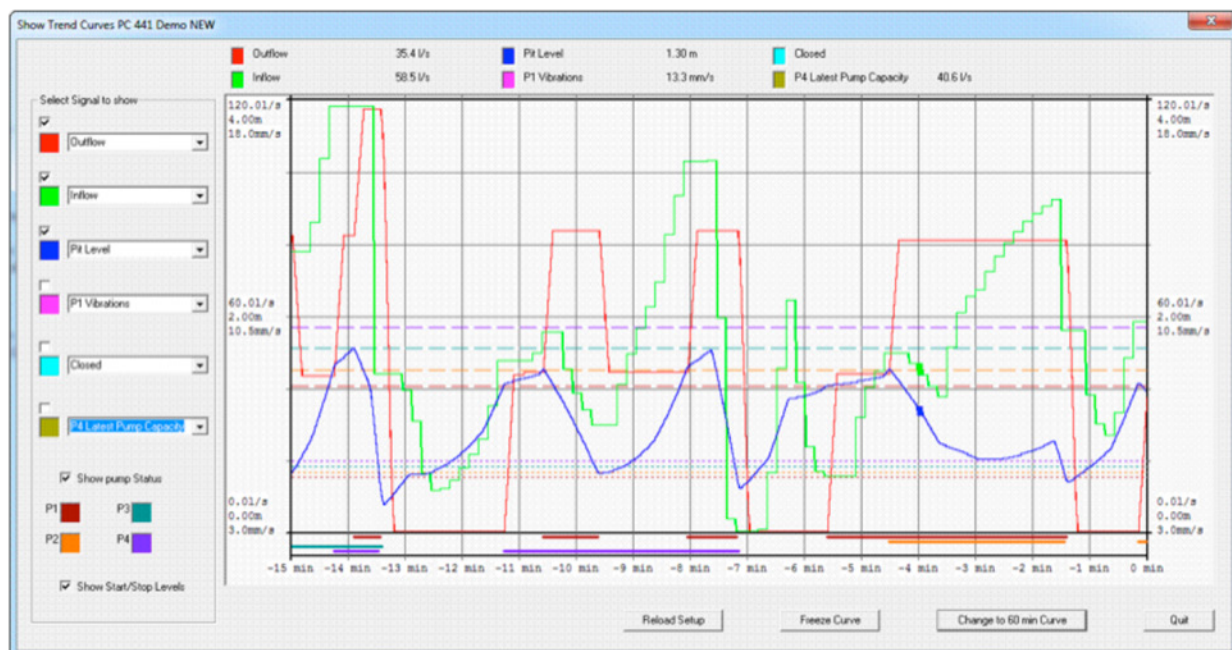
The Sulzer pump controller type ABS PC 441 provides a wealth of information about the status and operation of pumps and pumping stations. But even more importantly, it provides the right information in the right way. Wherever you are, Sulzer tools let you see events and easily understand their significance.

## Monitoring and configuration software type ABS AquaProg

AquaProg is the PC software hub for configuring and working with every aspect of your PC 441 monitoring and/or control system, either locally or remotely. Using AquaProg, you can view, transfer and restore all settings, status data and logged values, as well as perform firmware upgrades of system components. You can even view trends online with a range of timeframe options, which lets you analyze and improve the performance of pumps and pumping stations.

## AquaWeb makes it all accessible

AquaWeb is a web-based interface that offers access to all the most important information and PC 441 functionality. It provides a complete range of options for alarm management, including alert messages and alarm acknowledgment via SMS. Tools for viewing and analyzing the status of pumps and pumping stations, as well as operating trends, are also included.







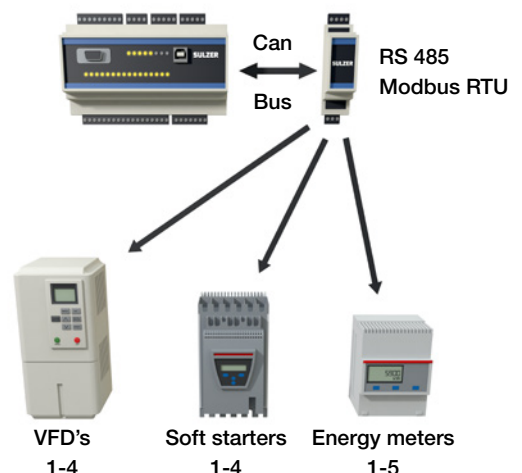
## Mobile information with AquaApp

When needs arise, you may be far from a computer. AquaApp, Sulzer's solution for Android and iOS smartphones, puts key functionality in your pocket. AquaApp offers a graphical pit status display for 1-4 pumps, including inflow, outflow and alarms, plus the ability to change start/stop levels or reset the motor protector. Events, running hours and electrical properties can also be reviewed, and there is even a tablet-optimized version of the app: AquaPad.



## Alarms and trends for connected units with the RS 485 module

Best of all, alarms and status data from non-Sulzer devices can also be viewed with a PC 441 monitoring and/or control system – even if they lack web functionality. When variable frequency drives, soft starters, energy meters or other devices are connected to the PC 441 via the Sulzer RS 485 communication module type ABS CA 622, they can be accessed in the same way as Sulzer's own equipment.



# Pump controller type ABS PC 441 in overview

## Main applications

The Sulzer pump controller type ABS PC 441 is designed primarily for municipal pumping stations. It forms the core of a modular system for control, monitoring or both.

Applications include:

- Control and/or monitoring of up to 4 pumps
- Use as a stand-alone monitoring unit
- Linking to additional equipment such as submersible mixers and drainage pumps

## Key control parameters

- Level set-point, incl. time delays
- Speed of level change
- Random start levels
- Tariff control
- Maximum runtime
- VFD control logic, incl. flow calculation, day set-points, night set-points and adjustable pump reversal speed

## Data communication

- Communication via CAN bus between the central controller and all modules in the PC 441 concept
- Communication via ModBus (RTU/TCP) protocol with other telemetry or SCADA systems
- I/O and register cross-reference tables for efficient communication setup

## Features and benefits

- Control and monitoring in one system
  - Use one function or both
- Advanced in-/outflow and capacity calculation
  - Level-based evaluation and compensation for pump curves, system curve and rpm variation
  - Overflow calculation
- Pump alternation
  - Normal
  - Asymmetrical
- Cyclic motion timer
- Emergency pump run timer and level sensor check on high float
- Control logic for sump mixer and drain pump
- Thorough data logging capabilities
  - Analog: 15 days with 16 channels and 1-minute interval
  - Digital: 4096 time-stamped events
- Powerful PC software tool
  - Set-up, maintenance and backup
  - Local and/or remote viewing and restoration of settings, status and logged values
  - Local and/or remote firmware upgrade support

# Complete wastewater solutions

Control and monitoring equipment form complete solutions with our pumps, mixers and grinders for handling today's and future wastewater challenges, ensuring trouble-free operation and maximum uptime.

## Submersible sewage pumps type ABS XFP

- Premium Efficiency IE3 motor in accordance with IEC 60034-30
- Excellent rag handling
- Specially designed impellers for reliable delivery of wastewater containing solids and fibrous material
- Hazardous locations: Approval for ATEX (Ex II 2G k Ex d IIB T4), FM and CSA available
- Quick and easy installation, safe operation, easy maintenance and service



## Muffin Monster™, Channel Monster™

- Dual-shafted, slow speed, high-torque design grinds tough solids
- Protects pumps and other critical equipment from clogs and damage caused by large debris
- Grinding separates organic from inorganic materials for more efficient wastewater treatment processes
- Cutter stack heights up to 1'500 mm

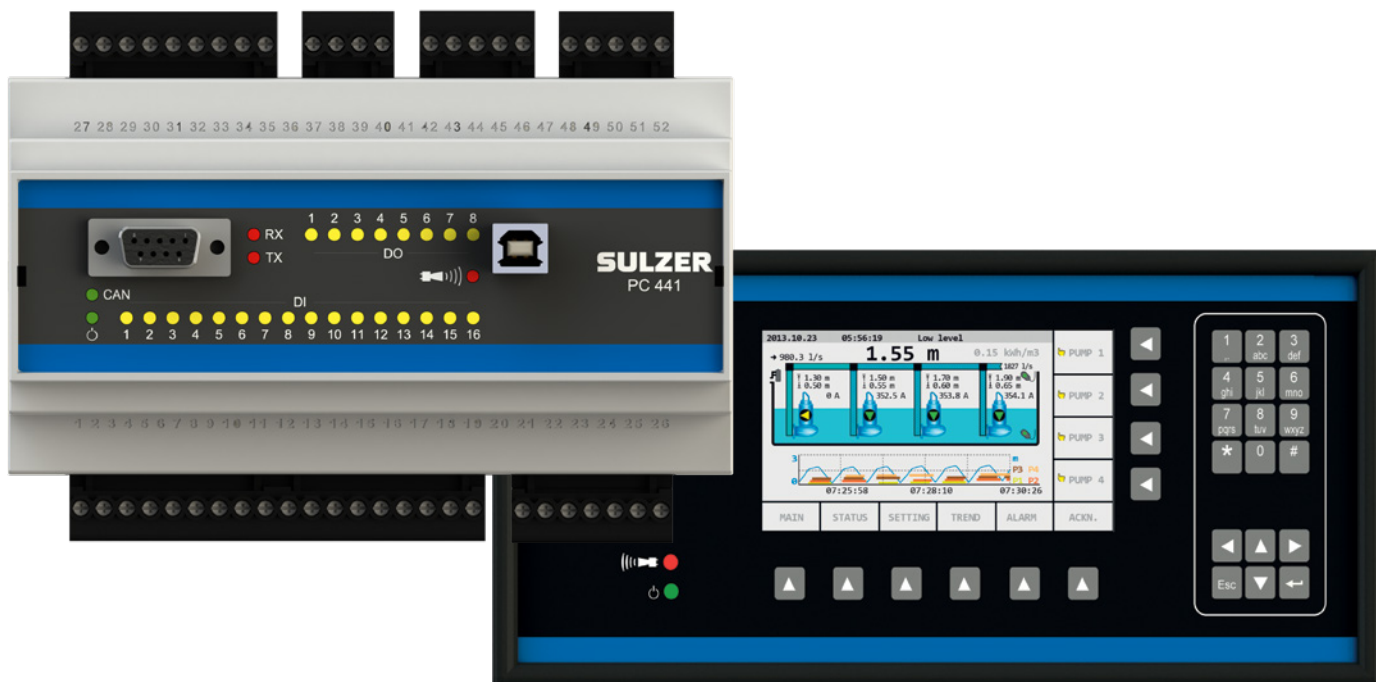


## Submersible mixer type ABS XRW

- Lowest energy consumption
- Easy upgrade of existing installations supported by a wide range of brackets and adapters
- Operational flexibility with variable speed to match the real mixing task and to manage changes throughout the year
- The robust design and the Premium Efficiency motor give superior reliability and long operating life







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