Monitoring & Control
Product Guide
Monitoring & Control

The same great knowledge and experience that builds the best pumps in the world lets you control and monitor your assets.

At Xylem we are continually striving to find ways to improve our customer experience, through the development of new systems and products to remotely monitor and control essential equipment, providing cost effective intelligent solutions.

As well as supplying the hardware such as pump controllers, sensors, electrical start equipment and control panels, we also have software for running the system.

The Flygt AquaView supervision software provides PC based SCADA (Supervision, Control and Data Acquisition) know-how.

The applications range from those operating in wastewater treatment plants and pump stations to products pumping ground water from building sites.

By combining these new system controls with our TotalCare provision, we can help to ensure the on-going quality and life of customers’ pumps, whilst weekly electronic preventative checks increase the pumps operational effectiveness.

Explore the dynamics of Flygt Monitoring & Control

Being in total control of a water and wastewater pumping system is just a question of the right equipment. High-quality pumps combined with intelligent monitoring and control ensure that the system runs reliably and at optimal efficiency.

The wide range of Flygt Monitoring & Control products enables you to control every part of your system.
**SCADA**

**Process controllers**

Flygt APX water transport automation controller

The advanced Flygt APX controller is exclusively designed for water transport applications. The modular design and platform let your plant expand free from care and the built-in functions such as flow measurement, capacity calculation and energy calculation can be uniquely configured. An advanced alarm handling provides immediate attention and time-stamped data.

<table>
<thead>
<tr>
<th>Product</th>
<th>Type</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>APX 761</td>
<td>Customized controller</td>
<td>Water and waste water treatment plant applications, pump stations.</td>
</tr>
<tr>
<td>APX 751</td>
<td>Pump, mixer and valve controller</td>
<td>Retention basins</td>
</tr>
<tr>
<td>APX 711</td>
<td>LON handler</td>
<td>LON applications</td>
</tr>
</tbody>
</table>

**Flygt AquaView**

Flygt AquaView SCADA (Supervisory Control And Data Acquisition) system enables remote control of connected stations or plants within a network providing a complete overview of the operational status.

All data automatically present the information as trends, graphs and reports. It provides extensive alarm functionality so that, should a problem occur, all necessary information will be available in precise detail and on time. Flygt AquaView provides cost-effective, efficient, convenient and practical plant operations.

- Innovative software designed for water and wastewater systems
- Provides complete overview of the operational status of your system
- Enables remote control of connected stations or plants within your network
- Data collection like reports and trends, tailored to your operational requirements

**Customer checklist**

- Application?
- Customized or standardized functions?
- Type of sensors?
- Overflow sensor?
- Type of modem?
- Battery backup?
- Power supply?
- Surge voltage protection?

**What**? Process controllers especially made for water supply and sewer systems.

**What for**? It is suitable for medium and large applications within all areas such as wastewater treatment plants, retention basins and pump stations.

**Why**? For a reliable and intelligent water supply and sewer system when high functionality and great communication possibilities are required. The flexible and expandable platform let your plant expand free from care, step by step.
### Pump Controller / Manager range

#### What pump control features do I need in my pump station?

The list below shows the major differences between our pump controllers.

<table>
<thead>
<tr>
<th>Application</th>
<th>Customer values</th>
</tr>
</thead>
<tbody>
<tr>
<td>APP 700 1-4</td>
<td>LCD screen and display</td>
</tr>
<tr>
<td>APP 500 1-4</td>
<td>Customized, future proof, flexible and expandable platform</td>
</tr>
<tr>
<td>FGC 300 1-2</td>
<td>Possible to perform changes in your software, customized, future proof, flexible and expandable platform</td>
</tr>
<tr>
<td>MultiSmart 1-6</td>
<td>LCD screen and display</td>
</tr>
</tbody>
</table>

#### Protocol

- **AquaCom**
- **Modbus**: - dedicated line, - dialed
- **Comli**: - dedicated line, - dialed
- **AquaCom TCP**

#### Media

- **Dedicated line**
- **Dialed**
- **Ethernet** with adapter
- **Fibre**
- **GPRS**
- **GSM**
- **Radio**

### Complete range of pump controllers

Xylem Water Solutions offer a complete range of pump controllers to suit all sizes of pump stations. The series has been exclusively designed for pumping applications and the standardized features and control mean that users can easily operate the entire range. The pump controllers have a user friendly front panel with self-instructive symbols, and can be connected to supervisory control. Based on Flygt APP 700 please see further standard features listed below.

- Local status display on site
- Maintenance support
- Comprehensive pump control
- Remote control and reports
- Advanced pump supervision
- Open architecture
-准确的流量计算
- Web access
- Free programmable
- Capacity calculation
- Built in communication
- Building of pumps
- High data memory
- Flexible and expandable platform
- Precise level measurement
- Supervision of pump condition
- Effective cleaning functions
- Monitoring of energy costs
- Safe alarm handling
- Superior disaster control

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### Application

<table>
<thead>
<tr>
<th>No. of pumps</th>
<th>Customer values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-4</td>
<td>LCD screen and display</td>
</tr>
<tr>
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</tr>
<tr>
<td>1-6</td>
<td>LCD screen and display</td>
</tr>
</tbody>
</table>

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### Flexibility

- Local Display
- Expandable I/Os
- Free-programming

- Insulation resistance testing, phase rotation, runtime meters, maintenance mode
- Reliability, preventive maintenance, pump condition, logging, future dimension of the system
- Discover leakages, pumped volume
- Optimize the pump running, follow up energy costs, measuring and/or reporting power consumption
- Eligibility to prevent the overflow or to overflow

#### Communication

- Built-in communication to SCADA
- Communication to external units e.g. M4200
- Built-in communication card
- Connects direct to SCOPEX, SCX6, I/FX, ICONICS, PVSS and TRIHEDRAL

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### Modems

The modems used by Xylem Water Solutions are characterized by a comprehensive view. Tele modems are robust and developed for industrial use. Some modems can be used as dialled up communication and others for dedicated lines. They can easily be adapted to different AT commands or switches, protocols, signal requirements and unmanned stations.
MultiSmart
Intelligent Pump Station Manager

MultiSmart - Intelligent Pump Station Manager (iPSM)

Xylem offers the MultiSmart Pump Station Manager, the next generation of technology for water and wastewater pumping stations. The MultiSmart combines the best of PLC's, RTU's and pump controllers into a comprehensive intuitive package.

The Pump Station Manager integrates numerous control panel components, lowering control panel cost. It also includes pre-programmed logic specifically designed to significantly reduce operating costs. The MultiSmart is a pure 'out of the box' solution and has a user friendly HMI with an easy to configure “Setup Wizard” for commissioning of new stations.

Why invest in PLCs, RTUs, pump controllers and £1000s of programming?

MultiSmart integrates numerous control panel components, lowering control panel cost.

It’s easy, it’s fast, it pays for itself

Guaranteed to eliminate nuisance call outs by preventing trips caused by supply voltage fluctuations and auto resetting tripped pumps

Deskill maintenance - MultiSmart only requires configuring, no PLC programming skills required - maximum skill level - electrician

Reduces control panel costs due to small enclosure size, lower design costs, significantly less wiring, fewer internal devices, lower deployment and commissioning cost, lower fabrication and installation costs

Easy to configure – “Setup Wizard” for commissioning of a new station

Built-in DNP3 and WITS DNP3 RTU, no separate outstation required

Full remote control of your pump stations reduces maintenance cost and frequency of site visits

Reduces energy cost and CO₂ footprint

Establishes pump energy efficiency by monitoring pump voltage and amperage to calculate real power consumption

Measures the energy used by each pump, calculates the flow and derives the energy efficiency of each pump

Energy smart pumping – BIAS pumping to most energy efficient pump, saving up to 15% energy

Pump reversal feature allows you to avoid or remove pump blockages automatically

Trending pump energy efficiency over a period of time ensures intelligent maintenance and capital improvement programs

Determines ROI for maintenance procedures, providing predictive maintenance via Insulation Resistance Testing of motor windings

Valuable pre-programmed functions; odour reduction, maximum run time, station maximum pumps to run, minimise fat build-up, pump maximum starts per hour, minimise excessive start, blocked pump detection and predictive maintenance alarming
Flygt FGC pump controllers

The Flygt FGC range is available in several different models with a common basic functionality and can be used in different applications. It has built in contactors, space for breakers and modem. The model needed depends on the required number of pumps, kW, display, cabinet, accessories and sensors.

**FGC pump controllers**

**Product**

- **FGC 300**

**Type**

- 1-2 pump controller

**Application**

- Pumps <5,5 kW
- Small and large residential areas

**APF Pump sump cleaner**

APF Cleaner is a device for pump sump cleaning. It can be used for pump stations equipped with Flygt type CP/DP 3085-3300 pumps in both standard and EX-versions. The APF cleaner is especially effective in combination with the TOPS pumping stations.

**APP pump controllers**

The Flygt APP pump controller is exclusively designed for water transport applications with a number of built-in pumping functions such as flow measurement, capacity calculation and energy calculation. An advanced alarm handling provides immediate attention and time-stamped data.

**Customer checklist**

- Application? Number of pumps?
- Standardized or customized functions?
- Communication?
- Type of sensors?
- Overflow sensor?
- Type of modem?
- Battery backup?
- Power supply?
- Surge voltage protection?

**APP 700**

**APP 500**

**What?**

- An advanced pump controller for up to 4 pumps
- A robust pump controller for up to 4 pumps

**What for?**

- It is suitable for medium and large pump stations within all areas such as pump stations, retention basins and water treatments.
- It is suitable for small to medium pump stations and is for example intended for installation in existing stations without pump controllers where external hardware such as contactors, current sensors and level sensors are present.

**Why?**

- For an utmost reliable and intelligent water supply and sewer system. Flygt APP 700 provides high functionality, already built-in or uniquely programmed, and great communication possibilities such as web access. The flexible and expandable platform let your plant expand free from care, step by step. See also page 6 for further features.
- For a robust controller with a great number of essential pump control functions. The APP 500 is available as stand-alone or with add on communication, making it possible to add on a communication module later if required. It is extremely hands-on and defined by simplicity both in design and functioning.

**APP 721**

**APP 541**

**APP 521**

**What?**

- Medium and large size pump stations. Customized or standardized functions. Web access.

**What for?**

- Medium and large size pump stations
- Small to medium size pump stations

**Why?**

- By need of a robust and flexible pump controller for e.g. pressurized sewage systems. It provides not only essential pump control features, but also a great over current protection and a unique possibility for communication compared to similar controllers on the market.

**APP Pump sump cleaner**

APF Cleaner is a device for pump sump cleaning. It can be used for pump stations equipped with Flygt type CP/DP 3085-3300 pumps in both standard and EX-versions. The APF cleaner is especially effective in combination with the TOPS pumping stations.
## Alarm & Telemetry

<table>
<thead>
<tr>
<th>Product</th>
<th>ATU 800/900</th>
<th>ATU 401</th>
<th>FAU 100</th>
<th>MultiSmart - RTU only</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td>General controller monitoring unit</td>
<td>Alarm &amp; overflow monitoring unit</td>
<td>Audible alarm unit</td>
<td>General controller monitoring unit</td>
</tr>
<tr>
<td><strong>Application</strong></td>
<td>Remote monitoring and control applications in harsh, robust environments.</td>
<td>Water wells, spillage, over-flows, booster stations, water.</td>
<td>High I/O processing, high speed counters, complex control function</td>
<td></td>
</tr>
<tr>
<td><strong>Protocol</strong></td>
<td>AquaCom</td>
<td>Modbus dedicated line</td>
<td>Modbus dialled</td>
<td>WITS DNP3 verified</td>
</tr>
<tr>
<td></td>
<td>Modbus dialled</td>
<td>FSK</td>
<td>DNPv3</td>
<td>SDI-12</td>
</tr>
<tr>
<td></td>
<td>WITS DNP3 verified</td>
<td>Self-certified</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Media</strong></td>
<td>Dedicated line</td>
<td>Ethernet</td>
<td>3G / 4G</td>
<td>GSM</td>
</tr>
<tr>
<td></td>
<td>PSDN (Dialed)</td>
<td></td>
<td></td>
<td>Radio (Mounted externally)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>RS232 / 485</td>
</tr>
</tbody>
</table>

### Flygt FPC pump controller

Flygt FPC 100 is an intelligent automatic pump controller that enables pumps to think for themselves. Flygt FPC 100 operates the pump automatically without the use of level sensors, which makes it ideal for tough applications like mining, construction, tunnelling and quarries as well as for EX environments.

#### Features
- 3-phase automatic pump control without external floats or sensors
- Monitors and protects the pump from:
  - Overheating
  - Phase unbalance
  - Incorrect rotation
  - Displays key operating information

### Flygt ATU alarm & telemetry units

Flygt ATU series is a range of general controllers/Remote Terminal Units (RTUs) with varying levels of inputs and outputs and PLC functionality for many applications including remote monitoring and control of pumping stations, combined sewer overflows and remote assets generally. The ATU series offers a wide range of power options from mains powered to ultra-low battery/self powered.
Alarm & Telemetry

Below shows the features of the ATU range.

Application
Local display
Digital/count inputs
Analogue inputs
Digital outputs
Self Powered (internal Batteries)
DC supply
Mains supply
Programmable
IEC 61131 compatible
IP Rating

<table>
<thead>
<tr>
<th>ATU 800</th>
<th>ATU 900</th>
<th>ATU 400</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 (expandable)</td>
<td>32 (expandable)</td>
<td>4</td>
</tr>
<tr>
<td>2 (expandable)</td>
<td>8 (expandable)</td>
<td>2</td>
</tr>
<tr>
<td>2 (expandable)</td>
<td>8 (expandable)</td>
<td>2</td>
</tr>
<tr>
<td>IP 67</td>
<td>IP 67</td>
<td>IP 68</td>
</tr>
</tbody>
</table>

Manual 1-phase

Product
START 151, 161, 156-A
START 156-B1

Type
Portable hands operated
For pumps
2000-, 3000- series*
3000-, 4000- series*

Electrical data
Voltage
115, 230, 220-240V
115, 230, 220-240V
Current range
0-16 A
0-16 A

Protection/Monitoring
Thermal overload protection
Thermal contact supervision

Enclosure
Polycarbonate
IP 55
IP 55

Power supply connection
Terminal with cable glands

Pump connection
Terminal with cable glands

*See product sheet for the specific pumps
Control panels

Pump supervision

<table>
<thead>
<tr>
<th>Product</th>
<th>Type</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>MiniCAS II</td>
<td>Monitoring relay</td>
<td>To be used with thermal switches and leakage detectors and powerful troubleshooting</td>
</tr>
<tr>
<td>MAS</td>
<td>Pump supervision</td>
<td>Pump monitoring system featuring embedded web functionality</td>
</tr>
<tr>
<td>PAN 312</td>
<td>Power analyzer</td>
<td>To monitor electrical quantities such as power, energy, power factor, voltage, current phase unbalances. Together with MAS or standalone</td>
</tr>
</tbody>
</table>

Pump supervision

Flygt provides monitoring relays well adapted for the different models of pumps and mixers. The list below shows the differences between our pump supervision units.

**Features**
- Stop of pump at serious fault, A-alarm
- Early warning of imminent fault, B-alarm
- Embedded web pages
- Operator panel
- Fault indication LEDs
- Data logging
- “Black box” for fault analysis
- Pump memory
- Modbus communication to APP 700/PLC
- High motor temperature shut off
- Temperature measurement
- Leakage monitoring:
  - Stator housing
  - Junction box
  - Inspection chamber/Oil housing
- Vibration monitoring
- Current measurement
- Current unbalance
- Voltage or voltage unbalance
- Power
- Power factor
- Energy totalizer

**Product**
- MiniCAS II
- MAS
- PAN 312

**Type**
- Monitoring relay
- Pump supervision
- Power analyzer

**Application**
- To be used with thermal switches and leakage detectors and powerful troubleshooting
- Pump monitoring system featuring embedded web functionality
- To monitor electrical quantities such as power, energy, power factor, voltage, current phase unbalances. Together with MAS or standalone

**Series**

<table>
<thead>
<tr>
<th>Type</th>
<th>E Compact</th>
<th>Basic Compact</th>
<th>iCompact</th>
<th>SmartCompact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. power range (400V)</td>
<td>Up to 6kW</td>
<td>Up to 54kW</td>
<td>Up to 54kW</td>
<td>Up to 45kW</td>
</tr>
</tbody>
</table>

**Features**
- Display showing:
  - Voltage
  - Pump current
  - No. of starts
  - Running hours
- Audible alarm
- High Level alarm
- Start priority
- Start delay of 2nd pump
- Duty assist/duty standby operation modes (2-pumps)
- Thermal contact supervision
- Leakage sensor supervision
- Output for outdoor alarm beacon
- Potential free contacts for pump failure & high level alarm
- Lockable door interlocked main isolator
- Short circuit protection for each pump

**Bespoke Control Panels**

We supply bespoke control panels up 400kW power range and designed to meet the specifications of a wide range of applications. These are built to order and size will vary according to customer requirements. Contact your local Xylem representative for specific details and further information on our products. (See back page for contact details.)
### Pump drives

Flygt provides a wide range of pump drives tailored for different applications. The list below shows the differences between our pump drives.

<table>
<thead>
<tr>
<th>Feature</th>
<th>PumpSmart (PS 200)</th>
<th>Hydrovar</th>
<th>SmartRun (SRC311)</th>
<th>SRCompact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow economy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensorless pump protection</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protection limit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Torque balance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PID process control</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PID sleep function</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cavitation control</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advanced pressure control</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multipump synchronous</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multipump constant slave</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary protection</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condition monitoring</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy savings calculator</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cleaning sequence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow calculation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Flygt provides a wide range of pump drives tailored for different applications. The list below shows the differences between our pump drives.

#### Features

- **Flow economy**
- **Sensorless pump protection**
- **Proportion limit**
- **Torque balance**
- **PID process control**
- **PID sleep function**
- **Cavitation control**
- **Advanced pressure control**
- **Multipump synchronous**
- **Multipump constant slave**
- **Secondary protection**
- **Condition monitoring**
- **Energy savings calculator**
- **Cleaning sequence**
- **Flow calculation**

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### Level sensors

<table>
<thead>
<tr>
<th>Product</th>
<th>Type</th>
<th>Application</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level switches</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LTU 701</td>
<td>Pressure</td>
<td>Level measurement in wastewater treatment plants and water tanks</td>
<td>4-20 mA SSS/Ceramic Polyurethane ±0.1% .20°C - 80°C ATEX</td>
</tr>
<tr>
<td>LTU 401</td>
<td>Pressure</td>
<td>Level measurement in wastewater treatment plants and water tanks</td>
<td>4-20 mA SSS/Ceramic Polyurethane &lt;1% FS 5°C - 40°C ATEX</td>
</tr>
<tr>
<td>LSU 100</td>
<td>Ultrasonic sensor</td>
<td>Level measurement in wastewater treatment plants and water tanks</td>
<td>4-20 mA PVC (stabilized) PVC -40°C - 60°C ATEX</td>
</tr>
<tr>
<td><strong>Multirode - Probe</strong></td>
<td>Conductivity Pressure (Duo Probe)</td>
<td>Level Measurement (Duo Probe) and Level step detection (Probe) Water and Sewage</td>
<td></td>
</tr>
</tbody>
</table>

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### Level switches

<table>
<thead>
<tr>
<th>Product</th>
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<th>Application</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENM-10</td>
<td>Float switch</td>
<td>Backup system</td>
<td>Microswitch C/NO/NC Polypropylene</td>
</tr>
<tr>
<td>NFS</td>
<td>Float switch</td>
<td>Ultrasonic Switch</td>
<td>Microswitch C/NO/NC Polypropylene</td>
</tr>
<tr>
<td><strong>ENM-10</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>NFS</strong></td>
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</tbody>
</table>

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1. Zener barrier required
Xylem ['zɪlm]

1) The tissue in plants that brings water upward from the roots
2) A leading global water technology company

We’re 12,000 people unified in a common purpose: creating innovative solutions to meet our world’s water needs. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. We move, treat, analyse, and return water to the environment, and we help people use water efficiently, in their homes, buildings, factories and farms. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise, backed by a legacy of innovation.

For more information on how Xylem can help you, go to xyleminc.com.