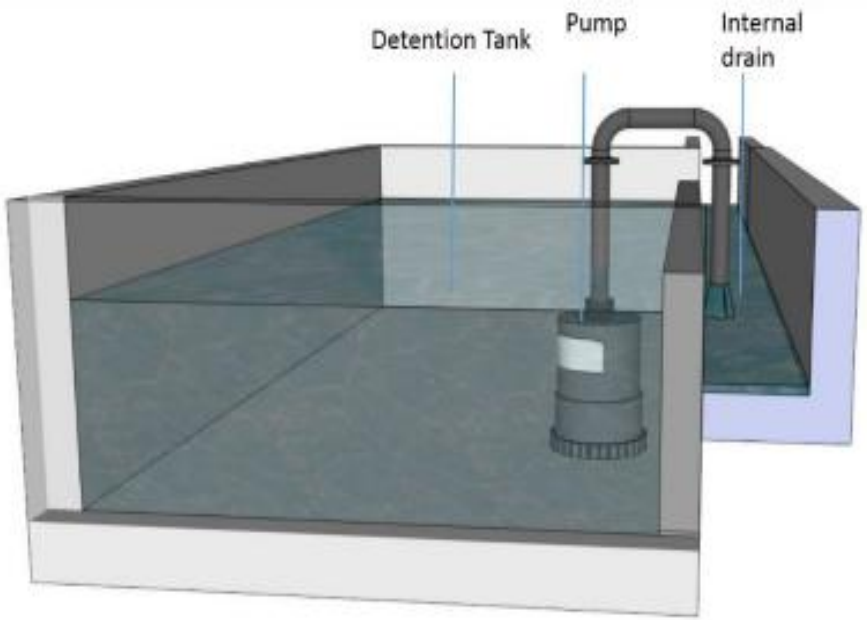
MultiSmart : World’s first Intelligent Pump Station Manager

WESTLEY FOONG

AUTOMATION MANAGER, MONITORING & CONTROLS

Large Detention Tank System



Pump Detention System



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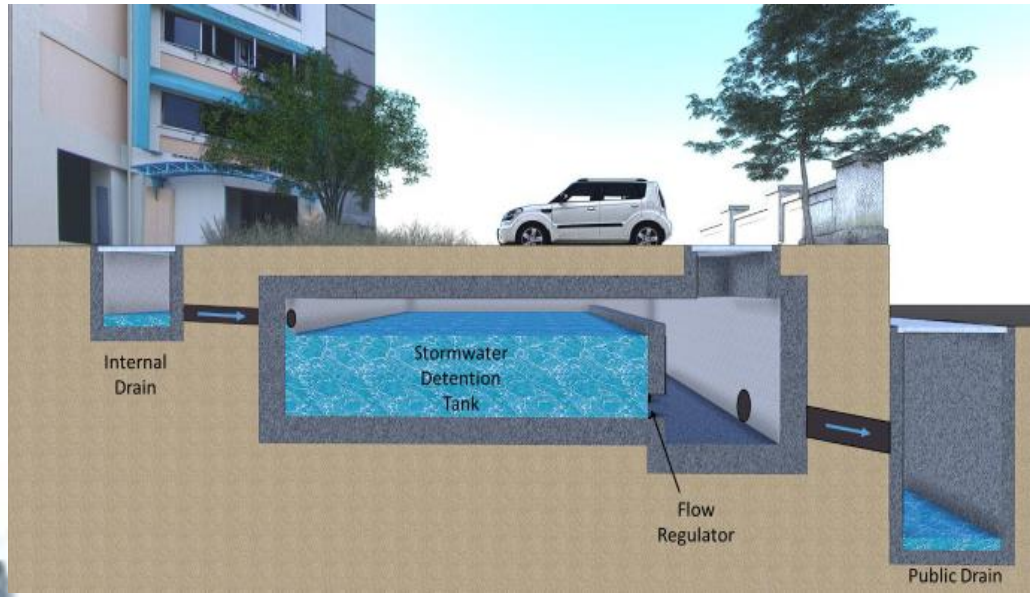
Why consider Pump Detention System?

Pump Detention System	Receives only a portion of the flow from drain, discharge rate from site is regulated by diversion of runoff that exceeds maxumum allowable peak runoff, such as side flow weir, into detention system.
Equipments Required	# mechanically controlled valves or pumps # water level sensors
Benefits	# Requires smaller detention volume # Discharge systems operate only after significant storm events (O&M savings)
Design Method & Calculations	# Hydrological & Hydraulic Modeling





What issues facing sewage pumping system?

- **Floating scum**
  - Storm water content (organic & inorganic matter), stagnant water buildup
- **Odor**
  - Buildup of odor/ dangerous fumes
- **Impeller seizing / freeze**
  - Requires manual running
- **Pump protection**
  - Large asset investment



Larger Flow => Larger Pumps => More pump protection

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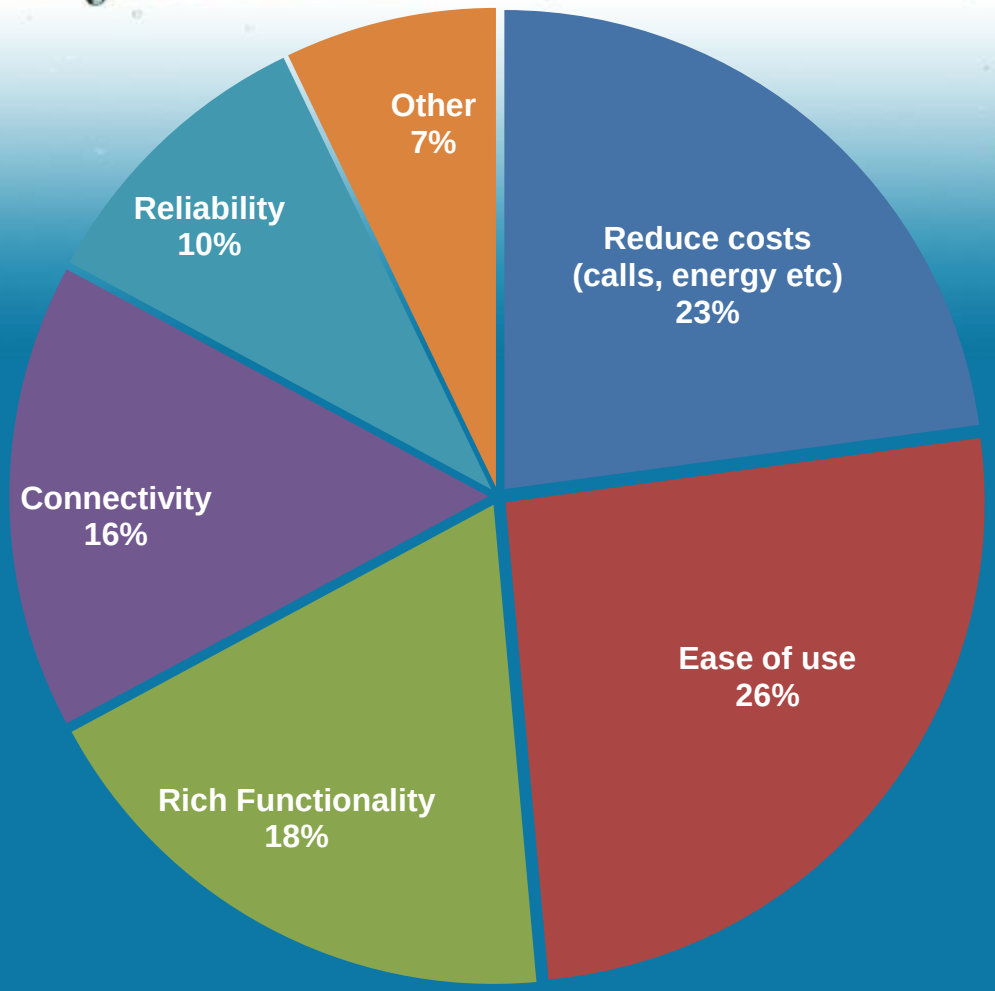
WHAT DO CUSTOMERS WANT FROM PUMP CONTROL?



Results from 70 participants feedback from Technical Staff Xylem Canada, Argentina and Malaysia

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Sewage Pumping System – Singapore



Dear Mr. Consultant,

Can you design a pumping station with these features :

1) Reduce pump clogging problems
2) Eliminate floating scum
3) Simplify maintenance

Look forward to your proposal, thanks.

Pump Station Manager

Xylem Solution



Dear Mr. Consultant,

Yes, we have the right solution that can :
1) Reduce pump clogging problems
2) Eliminate floating scum
3) Simplify maintenance

Please take a look at our feature solutions.

Ms. Xylem

Risks With Inferior Pump Control

- **Clogging**
- Sedimentation
- Buildup of floating debris
- High maintenance
- Decreased equipment life
- High energy consumption





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Challenge 1 : Clogging

Why it occurs :

- Common issue in sewage ejector system, not just any big pumping station
- Can’t control upstream inflow
- No pump protection
- Pump wear and tear/ corrosion









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Hard Clogging Vs. Soft Clogging

A large piece stuck in the pump hydraulics stops the pump.

⇒ Easy to see, but require manual clean up



A fibe… whe… b… sump, and w… restarts it works with redu… performance

- **Decreased /unstable *flow***
- **Increased /unstable *current***
- **Vibration & noise**



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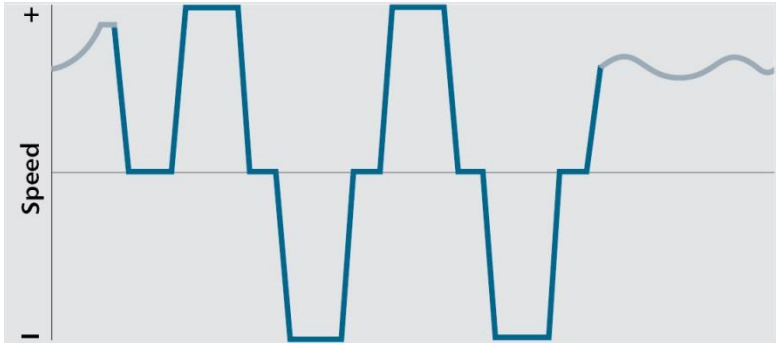
Challenge 1 Solution : Pump Cleaning

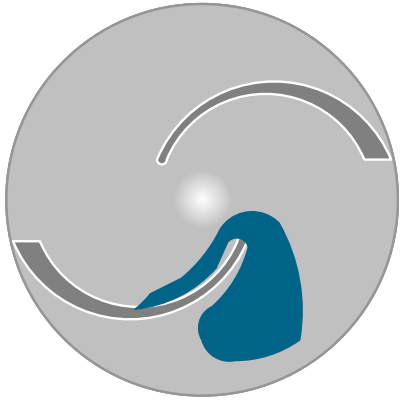
Feature:

- If clogging occurs -> a pump cleaning sequence is started



Benefit:

- Cost savings due to reduced energy consumption
- Increased reliability of the pump station



✓Monitors clogging criteria

✓Automatically release clogging

✓Maximizes starting torque

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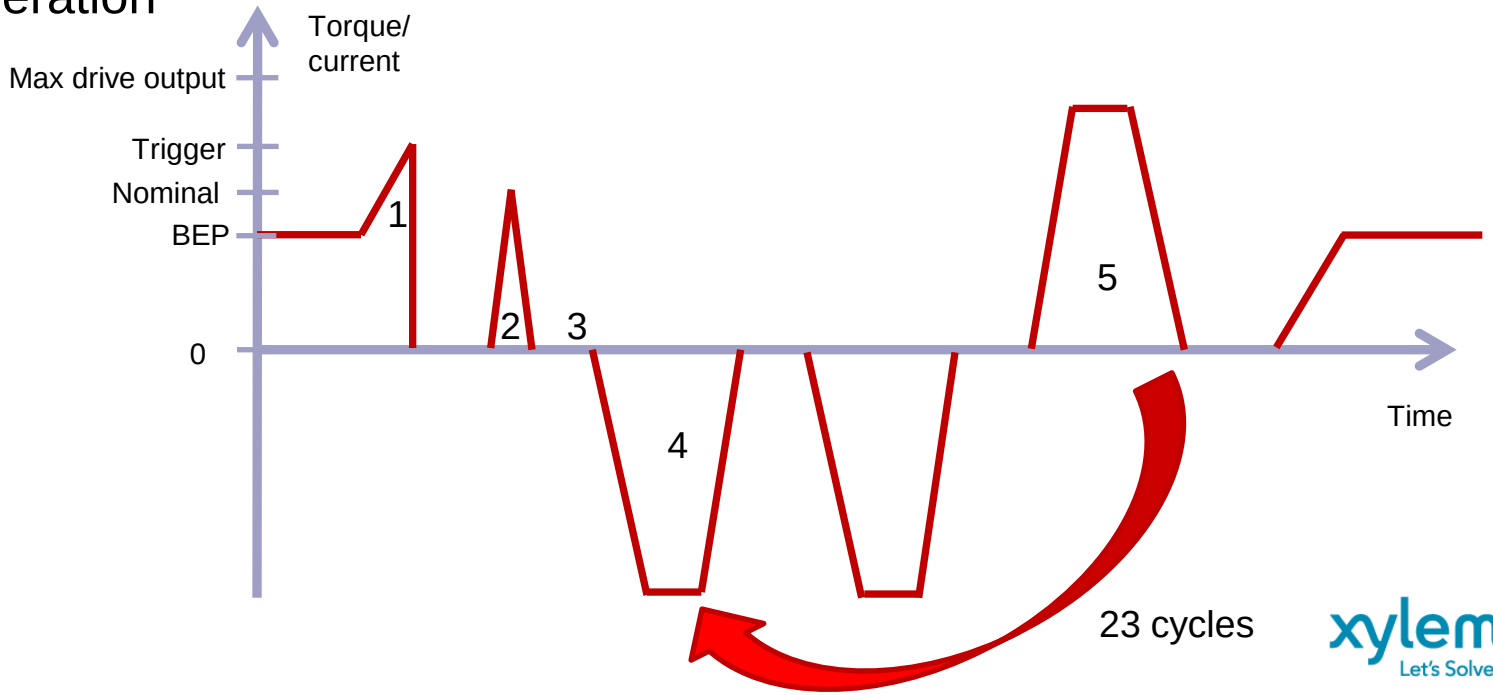
Challenge 1 Solution : Pump Cleaning

Blockage cleaning sequence, tailored to N-adaptive hydraulics

1. Quick reaction to blockage event, coast to stop
2. False trigger test
3. Increase current limit from rated motor current to drive max output current
4. Run cleaning sequence
5. Restore current limit to nominal motor current and go to normal operation



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Challenge 1 Solution : Pump Cleaning



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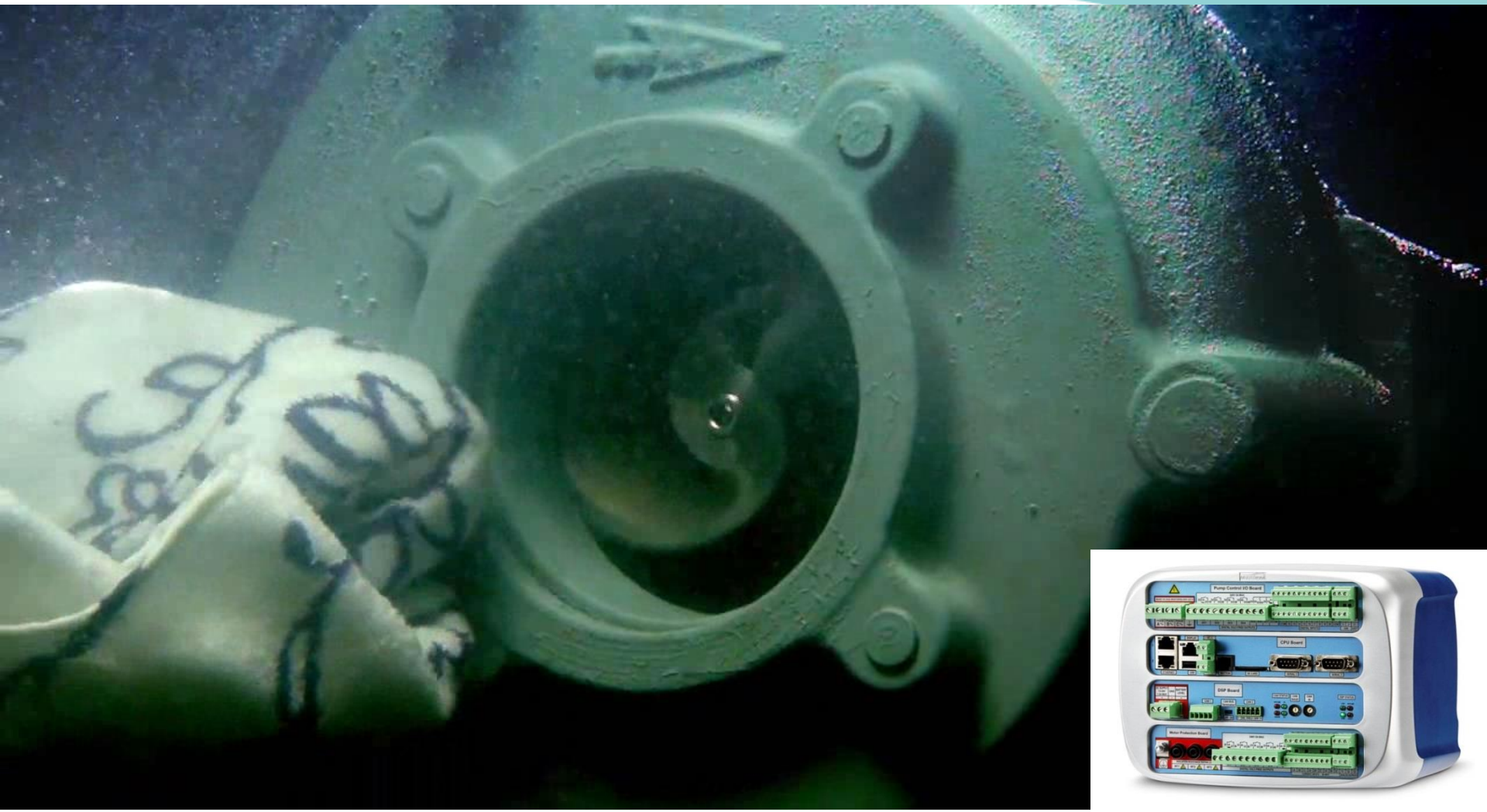
Clog Free Video



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Risks With Inferior Pump Control - Solution

- ~~Clogging~~
- **Sedimentation**
- **Buildup of floating debris**
- High maintenance
- Decreased equipment life
- High energy consumption





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Challenge 2 : Floating Debris

Why it occurs :

- Common issue in storm water, carries debris into pumping station
- Mechanical screens may not capture most debris
- Minimum submerge to prevent pump cavitation
- Requires manual maintenance (vacuum truck, intensive flush down)



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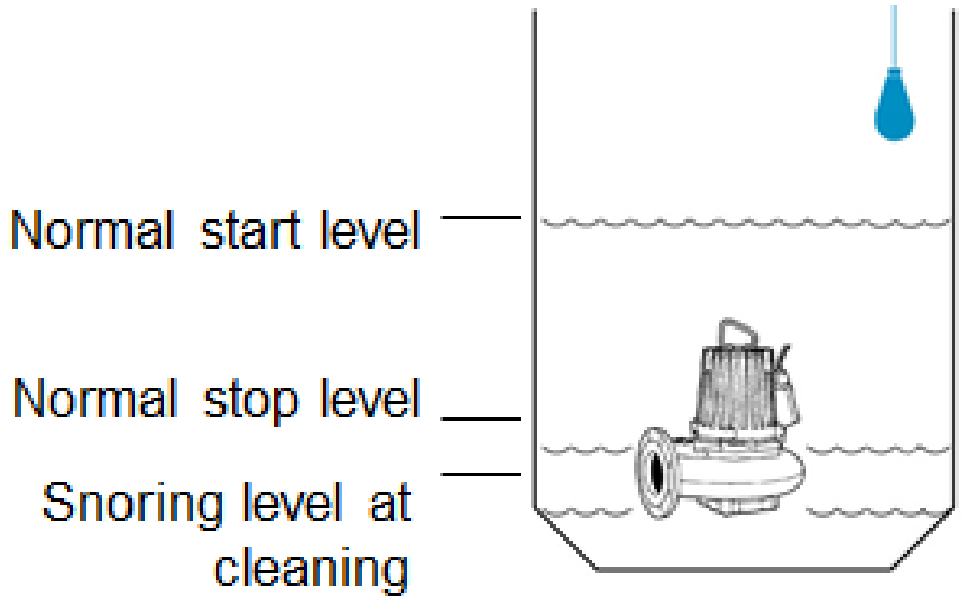
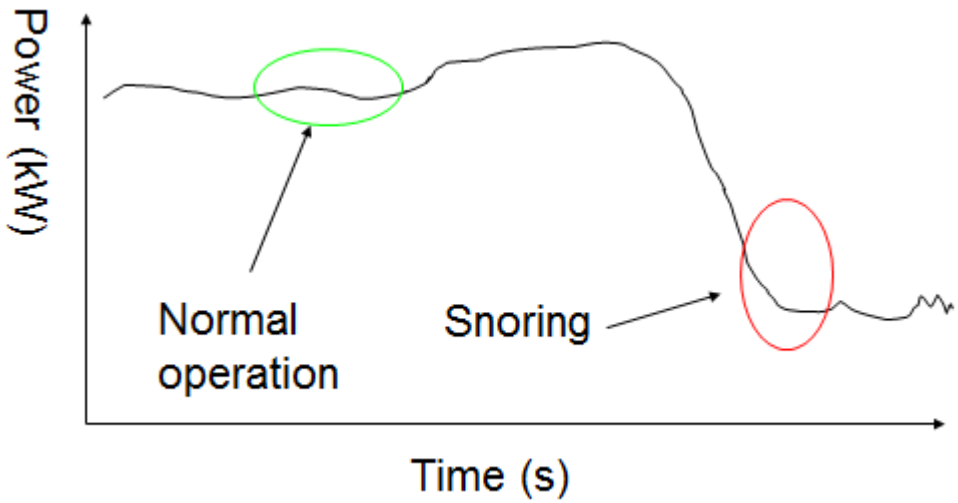
Challenge 2 Solution : Sump Cleaning

Sump cleaning cycles

- Pumps down to snoring level
- Removes floating debris from the sump
- Reduces odor
- Reduces sedimentation
- Reduces clogging





Challenge 2 Solution : Sump Cleaning

Benefits:

- *Prevents clogging* as debris that enter the sump are pumped out
- Cleaner sump with *less odor*
- *No scum line sedimentation* around start level, reduces maintenance
- *No need to manually pump down* and clean the sump, reduces labor
- *Less vacuum truck call outs*, reduces maintenance costs



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Animation sump cleaning



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Risks With Inferior Pump Control - Solution

- ~~Clogging~~
- ~~Sedimentation~~
- ~~Buildup of floating debris~~
- **High maintenance**
- **Decreased equipment life**
- **High energy consumption**





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Challenge 3 : Simplify Maintenance

Main concerns :

- Constant call outs leads to high maintenance & labor costs
- Vacuum trucks di… …tenance costs
- Challenge to keep pit… …t high maintenance, flush downs, pump clogging
- Pump maintenance – manual IRT, no pump protection

Do you know WHY pump stops?



Wear



Corrosion

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Challenge 3 Solution : Preventive Maintenance

Controller Built-in Functionality

- MONITORING of pump efficiency, flow rates, run times, starts-stops
- MEASURING of all electrical data
- AUTOMATIC Insulation Resistance Testing
- PUMP PROTECTION
- AUTO-RESET OF NON-CRITICAL FAULTS (20% OF YEARLY CALL OUTS)



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Challenge 3 Solution : Flow MONITORING

- Analogue input, pulse input or derived calculation
- Inflow, individual pump flow rates, total station volumes
- Individual pump flow warnings and alarms
- Records overflow events, time / volumes
- Time to wet well spill or full information
- SCADA tags



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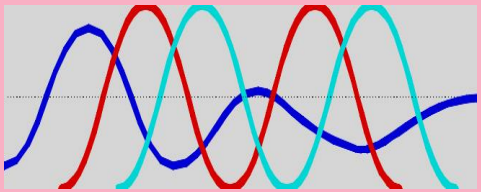
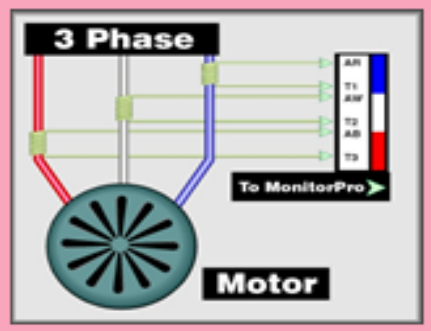
Challenge 3 Solution : Phase MONITORING

- Phase voltages displayed & logged
- Phase current monitoring for each pump
- Phase fail/ imbalance
- Phase rotation detection
- Over / under voltage
- Hold off pumps during voltage fluctuations - events, low voltage brown outs etc.
- Earth/ ground fault detection
- SCADA tags

The unit monitors all 3 phases





The unit monitors all three phases

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Challenge 3 Solution - AUTOMATIC Insulation Resistance Testing

Reduce site visits and maintenance costs





- User defined testing intervals
- 250, 500 or 1000V
- User defined fault limits
- Separate warning and fault levels
- Send readings to SCADA
- Preventative maintenance indicator

The ULTIMATE Preventive Maintenance Indicator!

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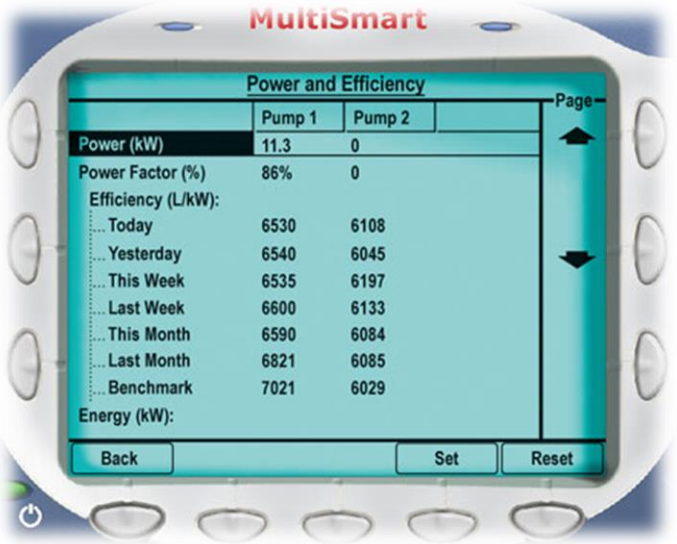
Challenge 3 Solution : Auto reset faults

Guarantee to eliminate nuisance call outs

- Auto reset tripped pumps
- Over current, thermal/ leakage alarms, etc
- Manage voltage fluctuations events

Benefits

- Reduces H&S risk of site visits
- Lower operational costs
- Reduce fuel usage and CO2 emissions
- Prevent pump burn out





Improving operational efficiencies lowers your carbon footprint overall

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Added Benefits : Reduce Energy Costs

Energy Monitoring per Pump

KW

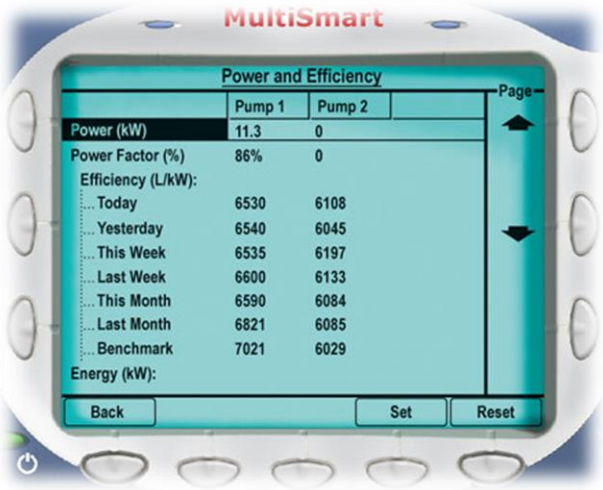
KWHr

KV, KVA, KVAr,

Power Factor

Pump energy efficiency (specific energy)

SCADA Tags



EnergySmart Pumping

- Unique bias pumping to most energy efficient pump
- Save approximately 15% energy per station
- Learn function sets low specific energy alarms automatically



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Energy Comparison



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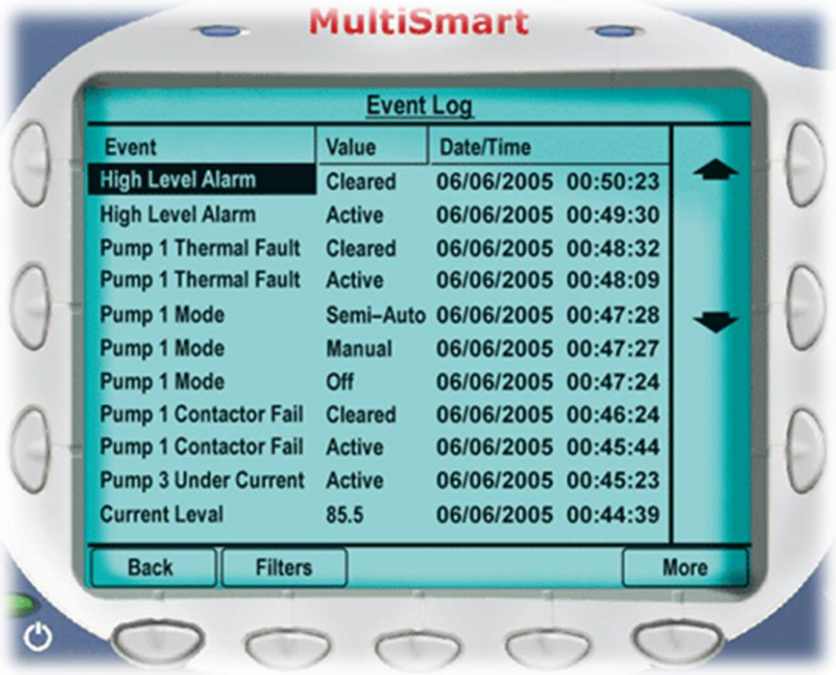
Challenge 3 Solution : PUMP PROTECTION - On Board Data-logger

- 50,000 Events stored locally (expandable)
- User defined – any tag
- Editable event/fault names
- Real time and date stamped
- Download in CSV or send to SCADA
- Filter available information



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Challenge 3 Solution :
Simplify Maintenance Capabilities

Authorised ***operators*** can easily

- Control pumps
- Change pump set points
- View faults & history
- Reset faults
- Replace unit in under 4 minutes (eg. direct lightning strike)



Trained ***electricians*** can

- Easily set up and/or change station configuration
- Set up communications
- Diagnose any issues from user interface
- No laptop required
- Restrict access via password

Engineers can

- Custom program for complex stations or the RTU only as a PLC with ISaGRAF PLC programming environment in MultiSmart
- ISaGRAF PLC programming compliant to IEC 61131

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What does a pump controller do?

1) Starts and stops the pump

- Inputs
  - Level in sump (level switches or analogue sensor)
  - Status of pumps and pump station
- Output
  - Start / stop signal

2) Monitor the pump sensors

- Inputs
  - Sensor signals (Thermal contact, FLS/CLS etc)
- Output
  - Alarm

3) More functions (alternation, cleaning functions etc)

4) Communication (red lamp, buzzer/siren, SMS, SCADA etc)

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How to achieve intelligent pump station manager?



=

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Flygt MultiSmart

Our goal is to help decrease your pump station operational and energy costs

- ✓ Reduce energy consumption
- ✓ Eliminate unnecessary call-outs - guaranteed
- ✓ Simplify maintenance
- ✓ Information for predictive maintenance
- ✓ Quick retrofit to deliver benefits by scale
- ✓ Enable smarter networks



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Introducing MultiSmart, world's first iPSM

- Manufactured specifically for the water industry
- 2 Year manufacturers warranty
- Out of the box product specifically for water industry pumping applications up to 6 pumps
- Designed to simplify water and sewage pumping applications and improve operational efficiencies.
- Provides all pump station control, communications and data requirements in one box eliminating solution
- Reduces energy consumption
- Reduces whole of life costs
- Future Proof – Implement Smarter Networks



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Configurable Functionalities



Alternation Methods

- Standard Alternation (Default)
- Operating Hour
- Starting Time
- Other various alternation methods.

Level Simulation

- Enable level simulation during T&C or maintenance to speed up testing time.

Auto reset for Pump Trip Alarms

- Over Current
- Thermal / Leakage Sensor Alarms
- Other configurable alarms.

Multiple Layers of Access Security

- Assigned up to 3 layers of security access :
  - Operators
  - Skilled Technicians
  - Administrators

Maintenance Run

- Configurable maintenance run cycle for idle pumps.
  i.e. every 24 hours

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Integrate VFDs via Modbus

SCADA/Telemetry

Data via DNP3

control





Option to control

3 Phase Supply

Power to the drive



Data via Modbus

VFD Output



If using MultiSmart IRT Isolation testing with VFD's isolation contactor is required

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MultiSmart VFD control

Intelligent built in configurable algorithms

VSD algorithm for control of terminal pump stations or energy optimisation



Connects with 4-20mA or Modbus, serial or Ethernet



If using MultiSmart IRT Isolation testing with VFD's isolation contactor is required

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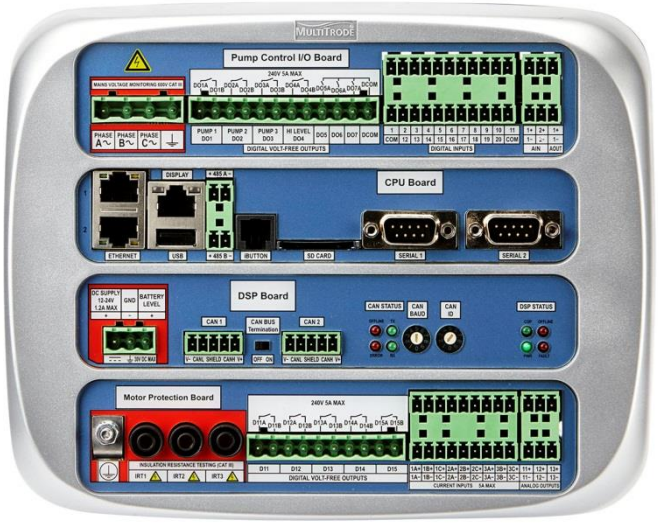
Future Proof Communications

RTU Open protocols

- DNP3 master/slave (compliant)
- Aquacom slave
- Modbus master/slave



High speed comms

- 2 x ethernet ports
- 2 x serial ports
- 2 x 485 ports
- 1 x USB port
- 1 x SD card reader

Media

- Radio, PSTN, mobile phone network, TCP/IP, UDP/IP
- Comms redundancy – auto switchover

dnp Distributed Network Protocol

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Hardware - Simplified Panel Design

Reduce the panel size and cost

- No phase fail relay
- No panel voltmeter or current meters
- No hours run and starts meters
- Reduces push buttons, lights, selector switches
- No PLC programming and commissioning
- No separate RTU
- No relays for seal/thermal (FLS etc)
- Reduces number of panel relays





















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Retrofit to deliver benefits by scale

Before Installation



After



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The largest Water Companies trust MultiSmart

Largest in Australia - 1,500 WW Stations

Water Corporation of Western Australia

Largest in USA - 1,200 WW Stations

Miami Dade County - FL

Largest in the World – 8,000 WW Stations

Thames Water



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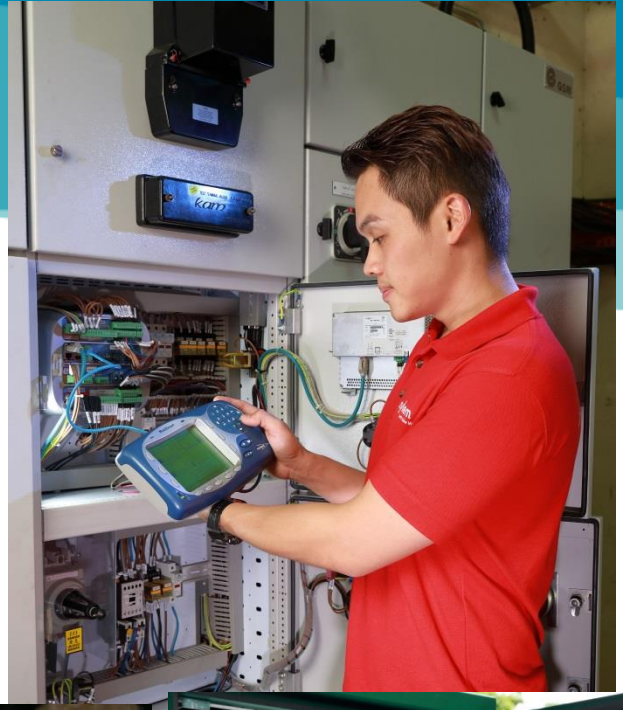
Proposal Accepted –
Sewage Pumping Station - Singapore



Installation & Setup

Background :

- First MultiSmart installation in Singapore in 2016
- 7 pumping stations, with a mix of wet and dry pits, 2/3-duty pumps





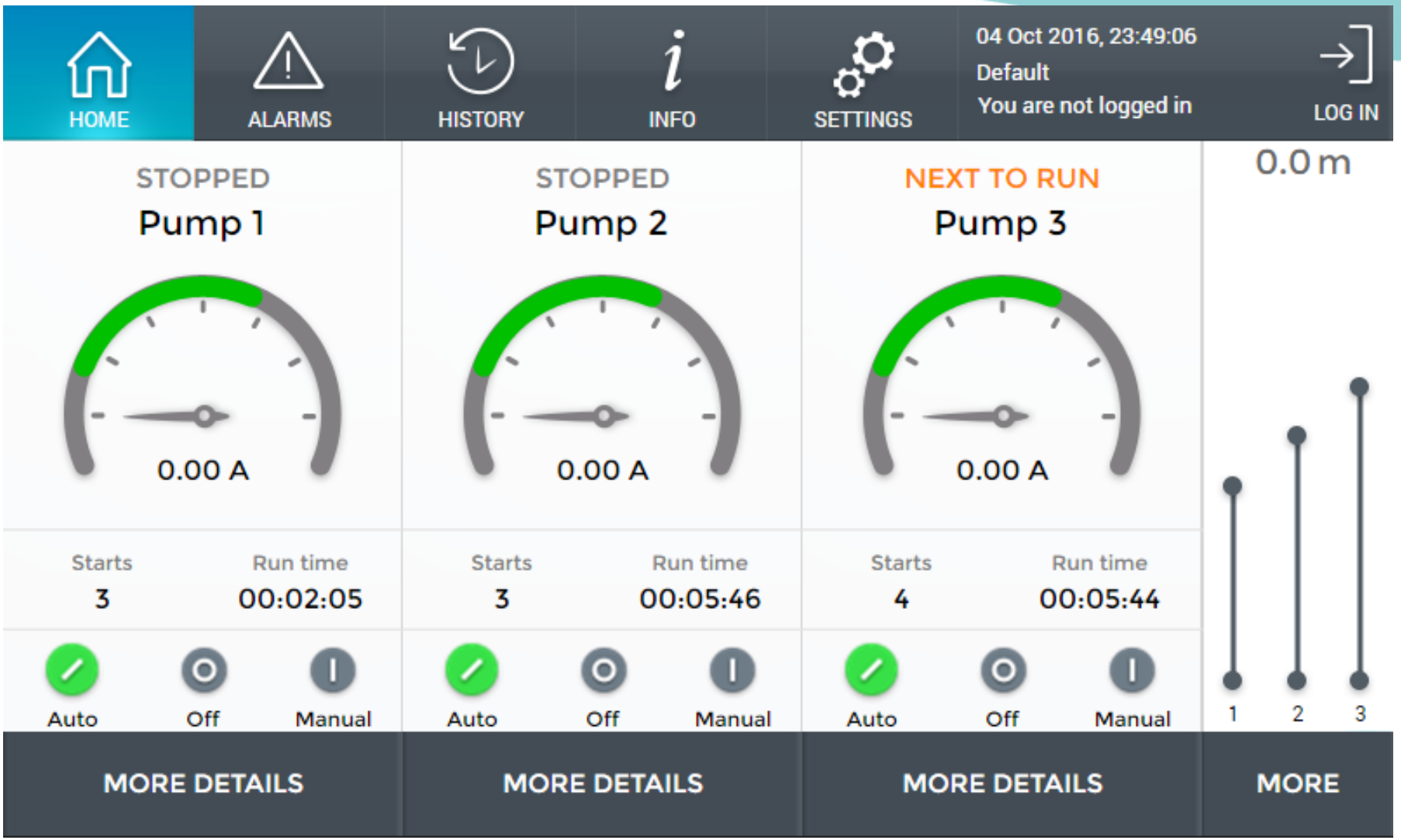




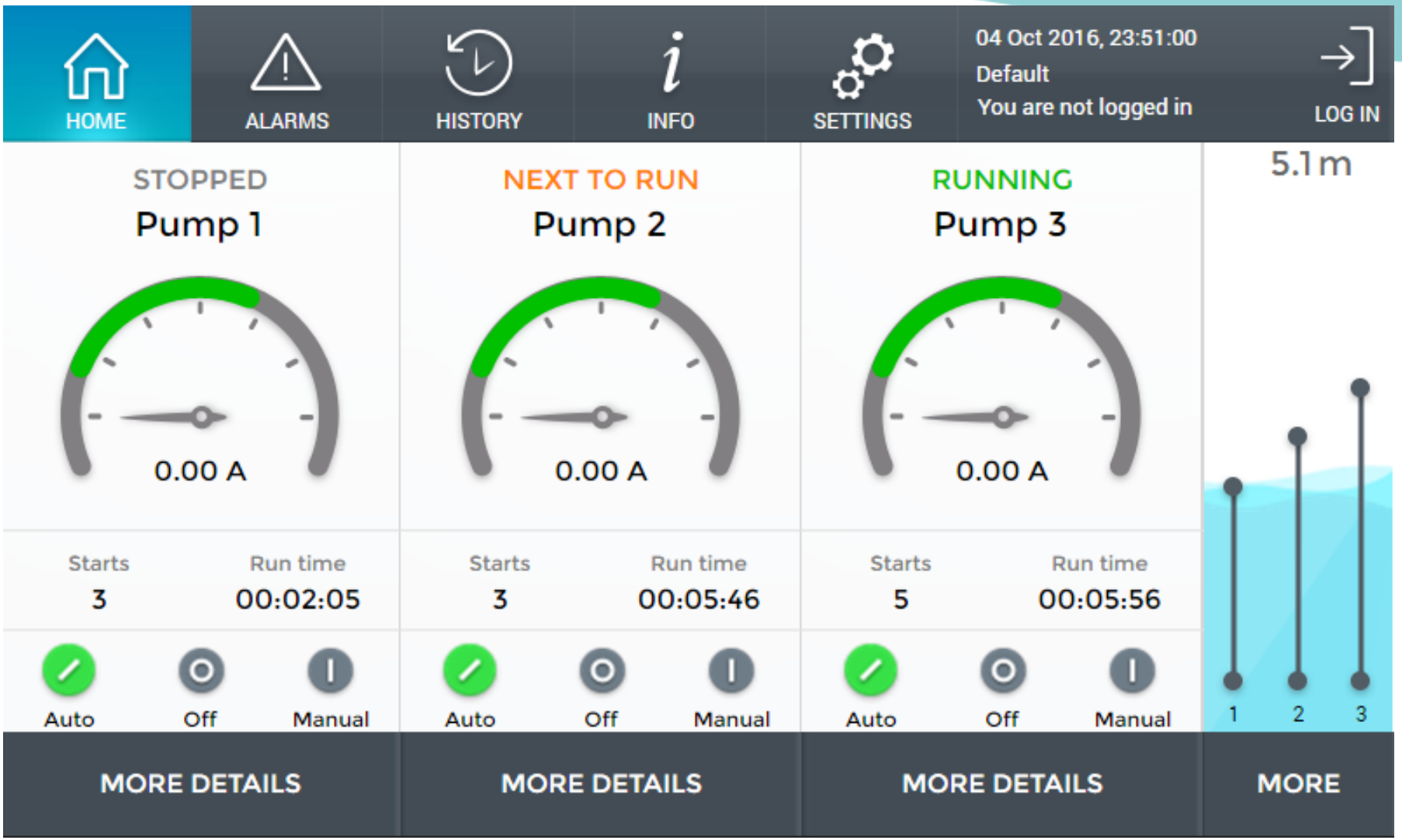
Setup – Plug & Play 3-Min Setup Wizard Functionality, Let's Demo!



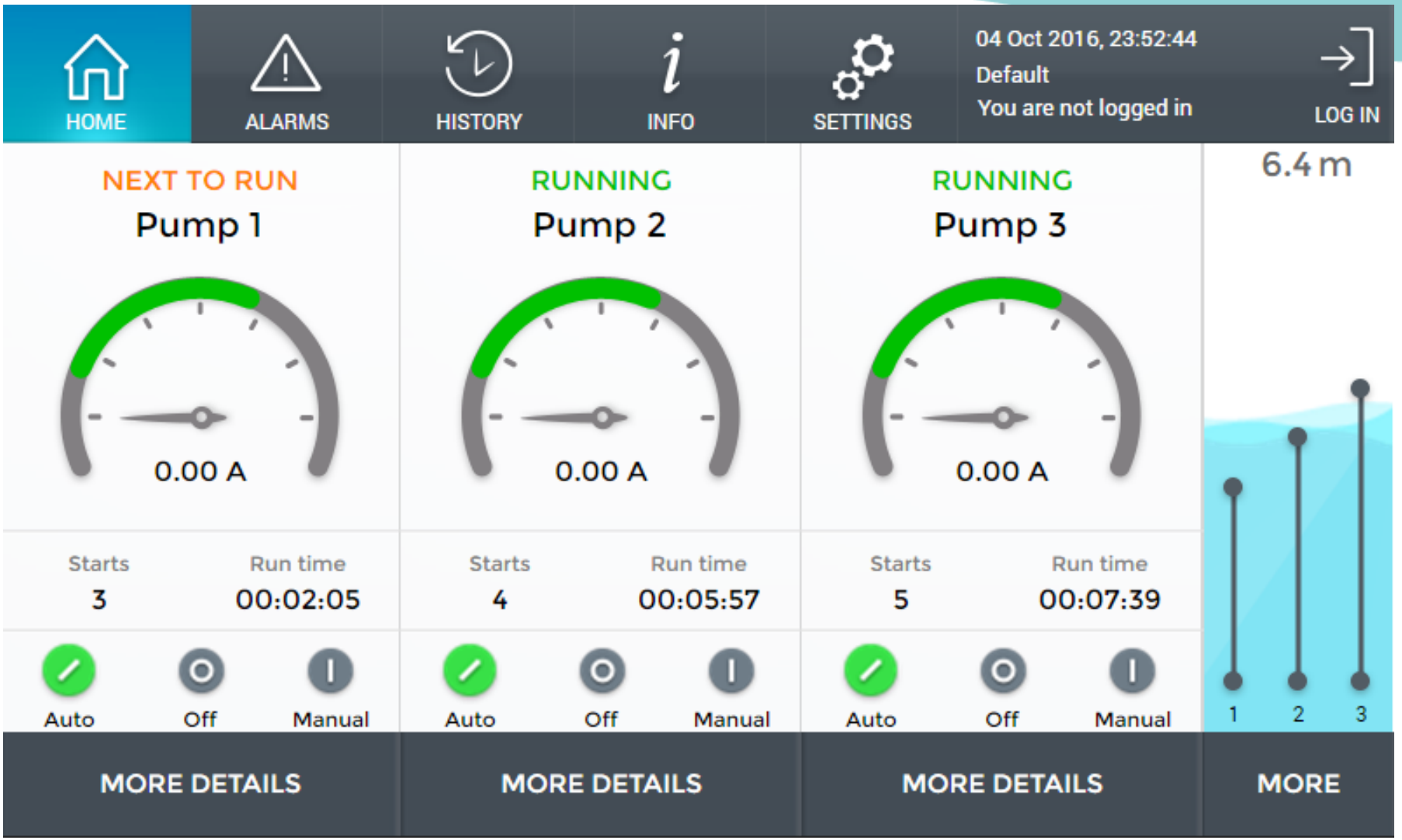
Simplify T&C – Level Simulation



Simplify T&C – Level Simulation



Simplify T&C – Level Simulation



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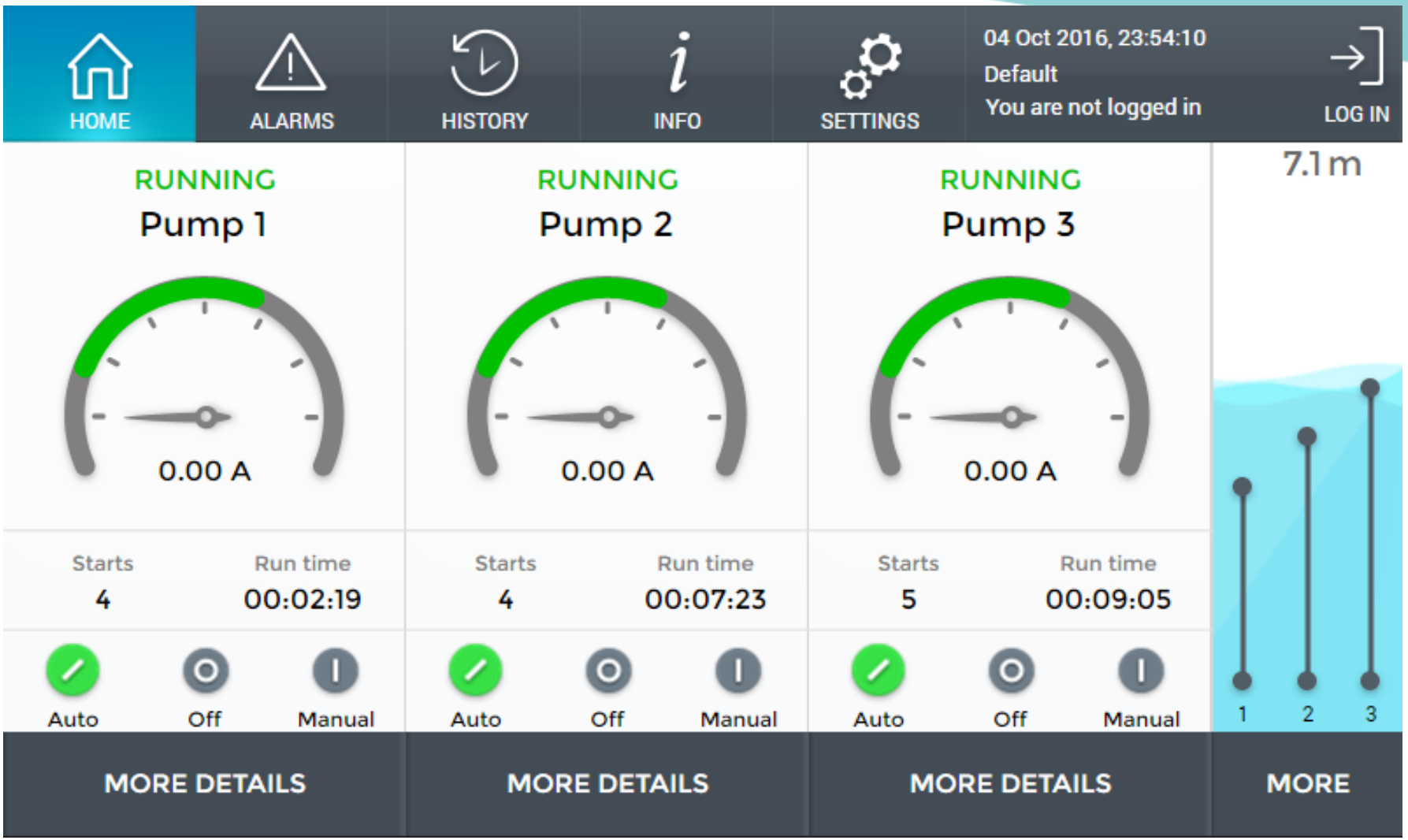
Simplify T&C – Level Simulation – Let's Demo!



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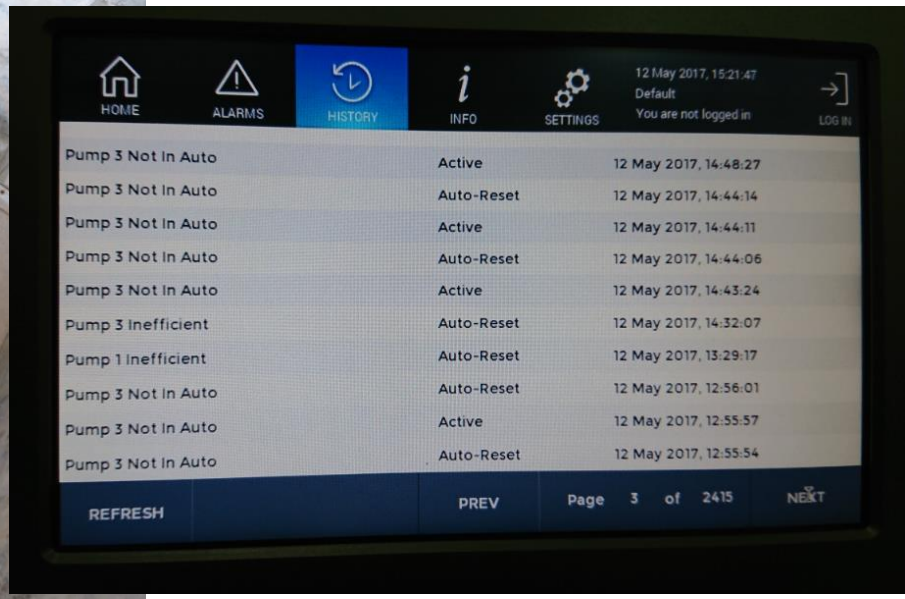
Challenge 1 Results : Pump Reliability

- With no clogging issues, pumps are able to run reliably without unexpected trips
- Event and alarm history logs provides routine daily checkups for operators, remote notification via SMS messaging
- Power consumption data logging available for analysis, helps to estimate lifespan and predict maintenance cycle, allowing replacement in due time.





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Challenge 2 Results – Floating Scum Eliminated!



BEFORE



AFTER

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Challenge 3 Results : Maintenance Cost Savings

BEFORE :

- Frequent monthly vacuum truck engagement
- Cost : ~$1,000 - $2,000/ trip

AFTER :

- Since 7 months installation, **ZERO** vacuum truck engagement
- Cost savings : 7 months x $2,000/ month

= ***$14,000 SAVINGS***



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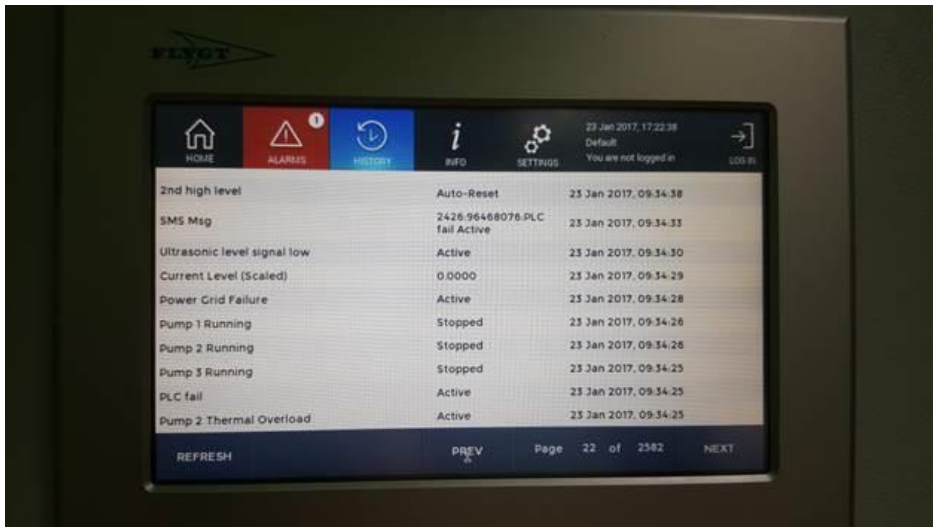
Real Solution, Real Results

Event Monitoring :

- Flash flood occurred on Jan 23rd, 2017, whereby one pump station was totally submerged in storm water
- Prior to panel trip, all three pumps were in full operation.
- Pump controller able to provide in-depth sequence of events that lead to pump station failure as a result of power trip.





MultiSmart Value Proposition

Pump Station Manager Features	Standard	Enhanced	Other PLCs
Comprehensive pump control	Y	Y	Hours of programming, prone human error
Pump Station optimisation	Y	Y	Hours of programming, may not optimized for pump operations
Flow calculations	Y	Y	Not available
3-Phase Voltage monitoring	Y	Y	Additional component required
Data logger	Y	Y	Available
RTU Built in	Y	Y	Available
6 Set-point profiles	Y	Y	Hours of programming, prone human error
Level Simulation	Y	Y	Additional programming required
Pump 3 Phase currents	-	Y	Additional component required
Motor protection	-	Y	Additional component required
Energy monitoring	-	Y	Additional component required
Alternation by energy efficiency	-	Y	Hours of programming, may not optimized for pump operations
Insulation Resistance Testing	-	Y	Not available

Flygt MultiSmart

Designed for wastewater application, applicable for sewage ejector system, not just big pumping station to reduce operational and energy costs

- ✓ Reduce pump clogging
- ✓ Eliminate floating scum
- ✓ Simplify maintenance by reducing unnecessary call-outs, energy consumption & preventive maintenance
- ✓ Optimize pump station controls and reliability
- ✓ Quick retrofit & installation to deliver benefits by scale
- ✓ Enable smarter networks



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Level Probes for WasteWater Solutions

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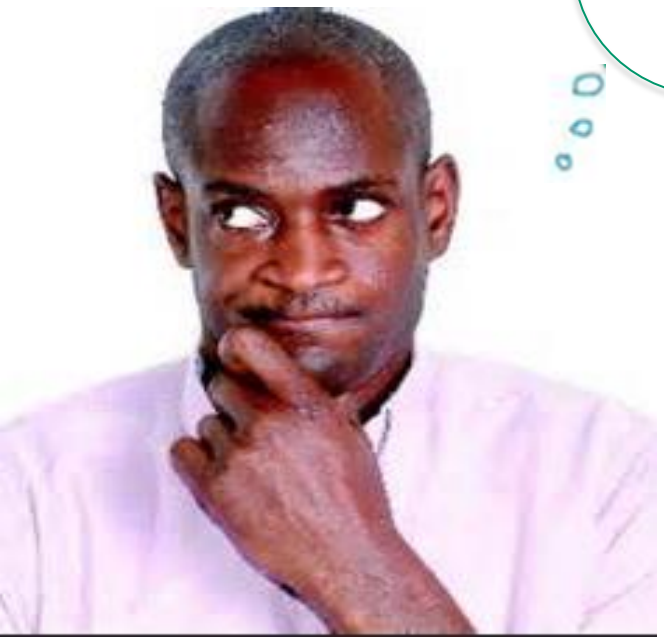
AUTOMATION MANAGER, MONITORING & CONTROLS

Level Probes Choices…

There are so many choices for level probes, how do I select the right one for my application?





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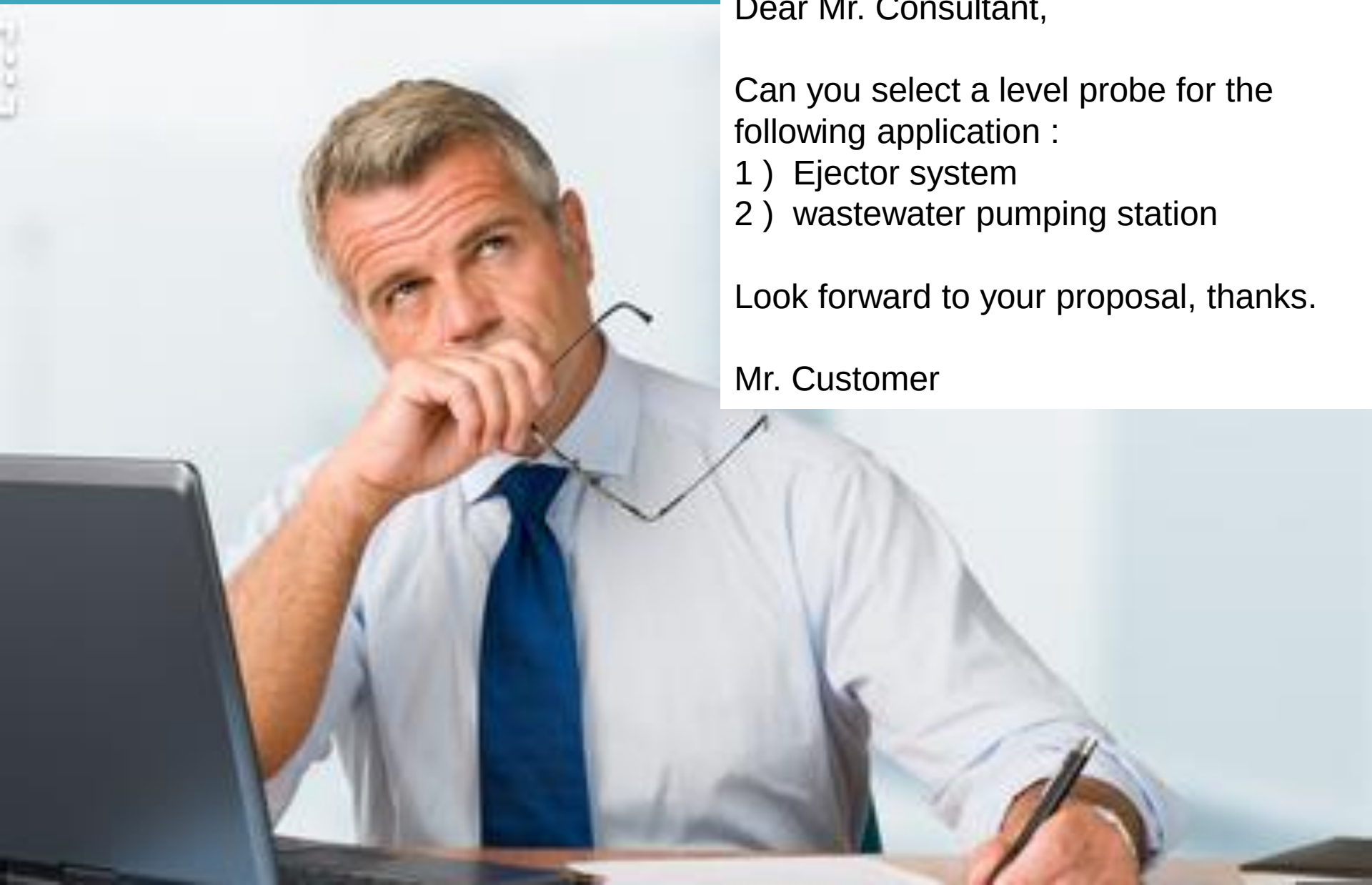
Sewage Pumping System – Singapore



Dear Mr. Consultant,

Can you select a level probe for the following application :

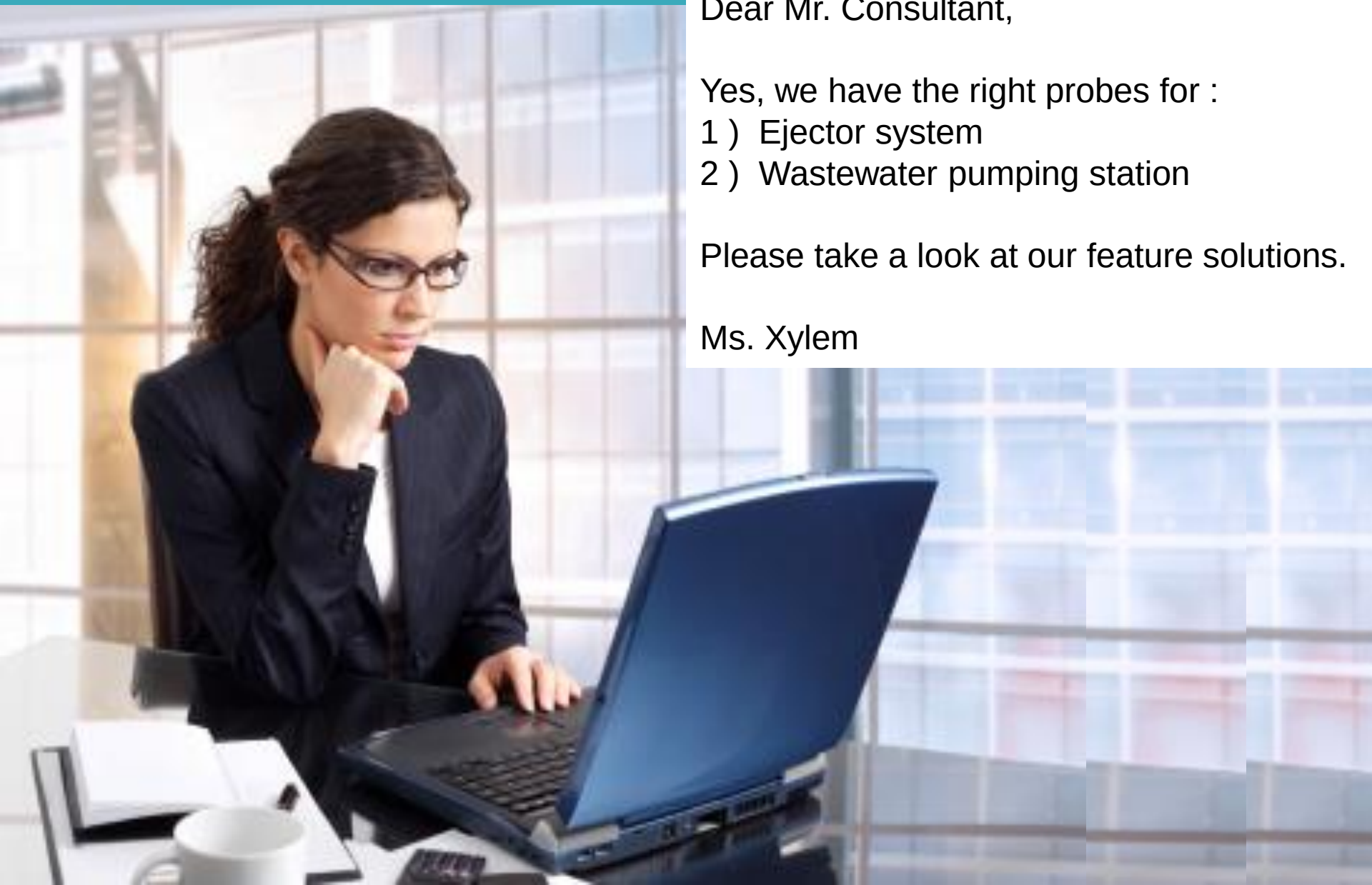
1) Ejector system

2) wastewater pumping station

Look forward to your proposal, thanks.

Mr. Customer

Xylem Solution



Dear Mr. Consultant,

Yes, we have the right probes for :
1) Ejector system
2) Wastewater pumping station

Please take a look at our feature solutions.

Ms. Xylem

Level Probes Selection

Criteria for long lasting performance:

- Adapted for wastewater
- Wide range of level products to fit a wide variety of applications
- Combining robustness, price and performance to match today's demands
- Appropriate accessories selected for level product range



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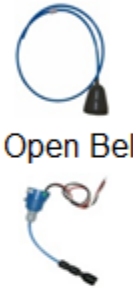
Measuring Devices Product Range

Analog Level | **Semi-Analog / Digital Level** | **Flow**

Ultrasonic	Hydrostatic			Conductive	Acc.	Pneumatic	Level Switches & Over Flow			El.Magnetic
	High-End  To be Released 2016	Mid-End 	Low-End 			 Open Bell	Standard 	EX  		
LSU 100	LTU 801	LTU 601	LTU 401	Level Probe	LI 531 etc.	LTU 301	ENM 10		NF 5	003S	MagFlux

WhyXylem Measuring Devices from Xylem?

In order to boost pump and RTU sales and to be a complete supplier for wastewater installations, Xylem offers a full range of level & flow control products under the Flygt name!

Nobody understands level & flow measuring better than ourselves from the years of gained experience and the assortment has been developed to combine robustness, price/performance with attractiveness to offer an outstanding product range to match today's demands.

The product range covers every angle of measurement to fit all possible purposes: simple solutions, advanced functionality, PSS, non-contact, over flow, the right approvals and the needed accessories like cable holders & safety barriers!

Flygt Level Products Are Meant to Last!

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Selection 1 : Ejector System - Hydrostatic

Types of Hydrostatic Level Transmitters

• **Piezo-Resistive Devices**

Difference in pressure causes a physical movement in the sensor, which results in a change of resistance. This change in resistance is turned into a 4-20mA signal. Conventional resistive pressure measurement devices include film resistors, strain gauges, metal alloys, and polycrystalline semiconductors. Flygt's LTU 601 is a Piezo-Resistive device.





• **Capacitive Devices**

Changes in hydrostatic pressure creates microscopic movement in capacitive plates, which is converted to an analog output by the device. Flygt's LTU 401 is a Capacitive device



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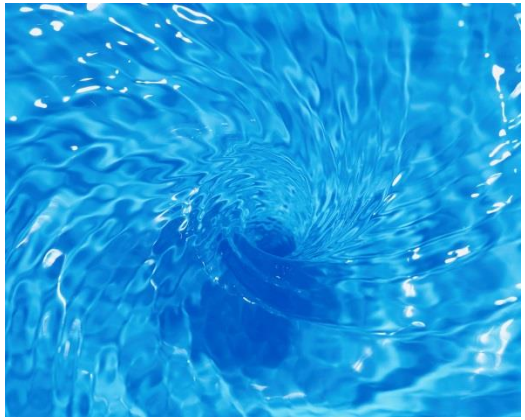
Installation Considerations- Hydrostatic Level Transmitters

- Should be installed minimum of 0,15m from the bottom of the well and installed such that it cannot come into contact with the pump.



- Where swirling inside the well causes a whirlpool effect due to large amounts of inflow, install a “stilling” tube where the level transmitter can stay in without moving around due to the water motion caused by the inflow. Make holes in the tube that allows for easy cleaning of the level transmitter with a hose if necessary.

- Hydrostatic level transmitters need to always use the moisture filter/vent cap that comes pre mounted on the reference/air tube at delivery. It prevents moisture from entering the reference tube. Do not cut or remove! Moisture inside the vent tube will cause the device to malfunction.

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Selection 1 : Ejector System - Hydrostatic

The Next Step in Robust High Performance Level Measurement

✓ **The Flygt Level Transmitting Unit LTU 701, is a HART-programmable piezoresistive silicon pressure level sensor, intended for measuring a liquid level.**

✓ **The output is a standard 4–20 mA direct current, proportional to the measured level.**

✓ **LTU 701 is well adapted to the prevalent control systems on the market including, of course the Flygt controllers of the APP, FGC and ATU-ranges.**

✓ **Approvals incorporate ATEX & cCSAus, with 0.1% accuracy and configurable via HART communication**



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Selection 1 : Ejector System - Hydrostatic

LTU 701 is specifically engineered to withstand the harsh environmental conditions typically encountered by Flygt pumps:

- sewage

- slurry

- viscous liquids

as well as

- sea water



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Selection 1 : Ejector System - Hydrostatic

Accessories

Part	Part number
EX-barrier	843055
Junction box, including surge arrester and HART resistor	839505
HART modem, including USB connection with clips, 470 Ω resistor and PC software CD	830062

N.B. The sensors (part no. 837578, 837579, 838201, 838202, 838203 and 838204 - See table on next page) all have the same pressure sensor (range 0–20m) and can be calibrated from 0 to 20m, by means of a Hart modem.

Exception:

The 0–3,5m sensor (part no. 838200) can only be calibrated within its range.

LTU 701 standard measuring ranges

Measure range, m H_2O (bar)	Max overload, m H_2O (bar)	Cable length, m	Intrinsic safety	Part no.
0–3.5 (0–0.35)	25 (2.5)	15	Ex II 1G	838200
0–5.0 (0–0.50)	60 (6.0)	20	Ex II 1G	838201
0–5.0 (0–0.50)	60 (6.0)	50	Ex II 1G	838202
0–10 (0–1.0)	60 (6.0)	25	Ex II 1G	838203
0–20 (0–2.0)	60 (6.0)	35	Ex II 1G	838204
0–5.0 (0–0.50)	60 (6.0)	20		837578
0–10 (0–1.0)	60 (6.0)	25		837579



843055

Zener Barrier



839505

Junction Box



830062

PC-package



832174

Cable Holder

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Selection 1 : Ejector System - Hydrostatic

LTU601 - Mid-End Hydrostatic Level Transmitter



Features:

✓Accuracy 0,5 %.

✓Withstands temperatures up to 60°C continuously

✓Rugged plastic design

✓Large membrane protection holes to prevent clogging

✓Heavy weight for easier and safer installations

✓Attractive looks and feel at first impression with printed part number information

✓Suitable for sea water

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Selection 1 : Ejector System - Hydrostatic

- ✓ LTU 601 FITS PERFECTLY IN FLYGT'S RANGE PRODUCTS
- ✓ LTU 601 IS SPECIFICALLY ENGINEERED TO WITHSTAND THE HARSH ENVIRONMENTAL CONDITIONS TYPICALLY ENCOUNTERED TO FLYGT PRODUCTS (SEWAGE, SLURRY, VISCOUS LIQUIDS, AND SEA WATER)
- ✓ LTU 601 IS A ROBUST HYDROSTATIC LIQUID LEVEL TRANSMITTER FOR USAGE AT WASTEWATER PUMPING STATIONS, TANKS AND CONTAINERS AT SEWAGE PLANTS, WATER WORKS, AND IN INDUSTRIAL PLANTS



Very robust	• Heavy weight enables easier and safer installations • Plastic design with high pull strength PUR Cable • Suitable for sea water installations • Part information is printed on the sensors body to secure long term readability
Minimum clogging	• Large membrane protection holes • Improved technology • Fewer service visits
Excellent reputation and strong track record	• Installed in thousands of units



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Selection 1 : Hydrostatic Comparison

	LTU 701	LTU 601
Standard Measurement Ranges	0-3,5m 0-5m 0-10m 0-20m 	0-3m 0-5m 0-10m 
Max Measurement Range	350m	10m
Standard Cable Lengths	15, 20, 25, 35, 50	12, 20
Max Cable Length	1000m	20m
Customer Specific Measurement Range or Cable Length	On request	No
Suitable RTU?	MultiSmart/APP700 Works with MyConnect/FGC/ATU as well of course!	MyConnect, FGC, Smart Run
Suitability for battery power	Medium	Medium
Specific Approvals	ATEX/cCSAus	
Temperature	Up to 80° C	Up to 60° C
Accuracy	0,1%	0,5%
Able to change measurement range	Yes (HART)	No
Built-in Lightning protection	Selected part numbers	No
Market Price	Premium	Medium

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Selection 2 : Wastewater pumping - Ultrasonic

Ultrasonic Level Transmitter

Features

✓Withstand harsh environment

✓Supplied from a protected power supply

✓A HART communicator can be used in order to re-program level values for the sensor

✓ Low maintenance costs





Typical applications :

✓Non-contact measurement

✓Generally rough conditions

✓Where there is lots of dirt and mud (not foam)

✓In high temperature liquids

✓Where there is limited space for sensors

✓EX-hazardous applications (ATEX & FM/CSAus approved)

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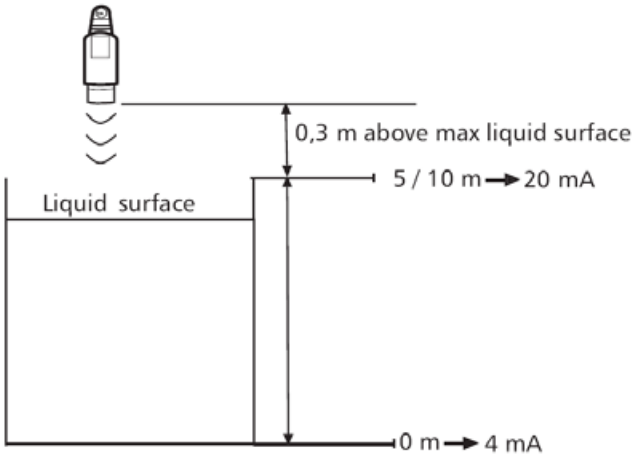
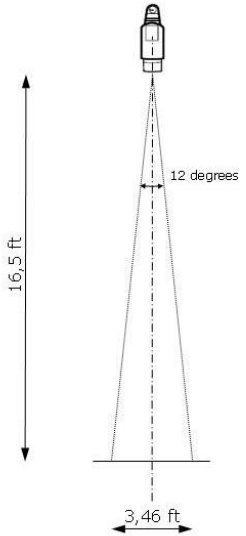
Installation Considerations- Ultrasonic Level Transmitters

- Manufacturer's information with regard to device's beam angle and blanking distance must be taken into consideration
- Should not be placed where surface is foamy or very turbulent; will give erroneous ultrasonic pulse readings *(work around, see next slide)*
- Installations with lots of fat may lead to a fat layer on the lense, which will give erroneous ultrasonic pulse readings unless the lense is cleaned on a regular basis
- Installation should take into account obstructions such as pipes, guide rails, inflow water column, etc.



Blanking distance

Beam angle



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Selection 2 : Wastewater pumping - Ultrasonic

Typical Applications:

- ✓ **Generally rough conditions**
- ✓ **Where there is lots of dirt and mud (preferably no foam)**
- ✓ **In high temperature liquids**
- ✓ **Where there is limited space for sensors**
- ✓ **EX-hazardous applications (ATEX & FM/CSAus approved)**



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Level Accessories – When that extra is needed!









Why?	**Level Indicator LI 531** **834530** - To ease installations - for field indication of the level where the sump and control room are placed far away from each other - When a junction box for connecting extra cable length is needed - When a general digital indicator of a measured value is needed	**Cable Holder** **832174** - When a robust and easy to use spare/extra cable holder is needed	**Cable Holder** **834602** - When used, it will decrease the wear of the cable in the long term perspective compared to when hung by a knot. For a complete package of ENM-10 with the 834602 included, see part numbers 5828840 (Includes 5828802, 1,2 kg / 0,95-1,10 / 6m cable) and 5828841 (Includes 5828803, 1,7 kg / 0,95-1,10 / 13m cable).	**Zener Barriers** **843055 (4-20mA)** **840107 (ENM-10)** - When Flygt ATEX approved products or simple apparatus classified products are to be used in EX environments	**Junction Box** **839595** - When noise/interference protection for VFD applications is needed - For protection for splicing of the sensor cable including any vent tubing, to the screened control leads from the RTU - When needing to connect Flygt HART modem and PC-package for LTU701 (with integrated 470Ω resistor & selectable by ON/OFF switch - For Lightning protection by means of a surge arrester - For easy testing of the sensor setup by means of an internal power control LED - For extra moisture protection of the level transmitter in humid climates
Price?	Mid	Low	Low	Mid	Mid
Suitable for?	LTU 701, LTU 601, LTU 401, LSU 100	Hydrostatic Level Transmitters like LTU701, LTU601 and LTU401	ENM-10	LSU100, LTU701, ENM-10	LTU 701, LTU 601, LSU 100 & Flygt Pump Controllers
More info	http://oasis.xyleminc.com/tpi/tpi.asp	http://oasis.xyleminc.com/tpi/tpi.asp	http://oasis.xyleminc.com/tpi/tpi.asp	http://oasis.xyleminc.com/tpi/tpi.asp	http://oasis.xyleminc.com/tpi/tpi.asp

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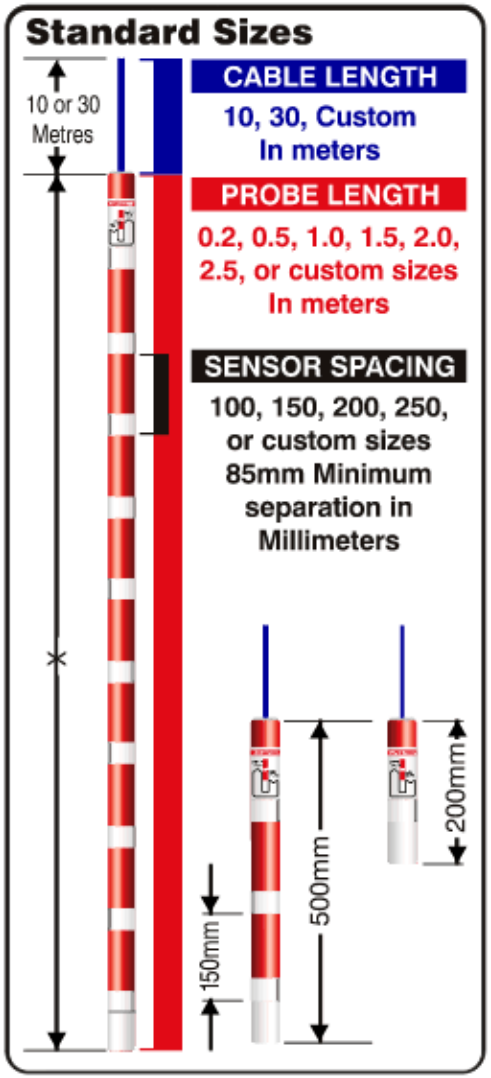
selection 2 : wastewater pumping - Multitrode

- 32mm dia uPVC tubing
- Avesta 254 SMO SS alloy sensors
- PVC/PVC multi-core cable
- Fully encapsulated, resin filled
- No moving parts
- Long Life



- No moving parts
- No electronics in the probe
- 12VAC probe voltage continuously applied to each “sensor”
- 0.8mA current flow
- No calibration required
- CE and UL Approved
- Ten year warranty
- Extremely low maintenance

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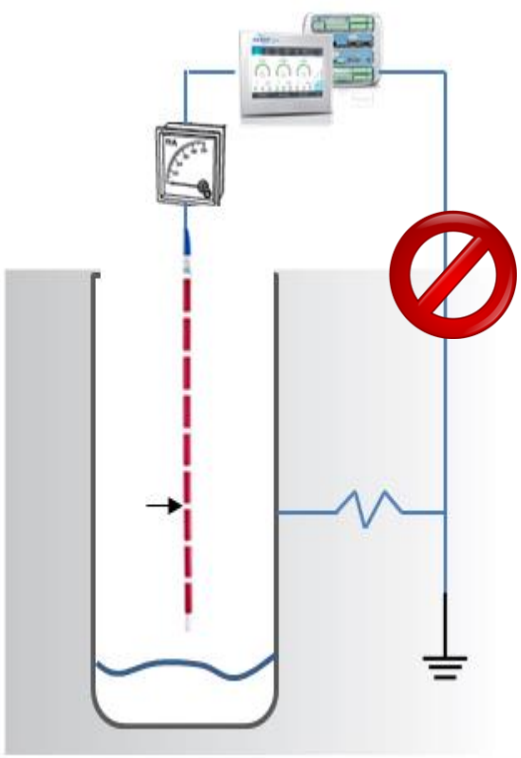
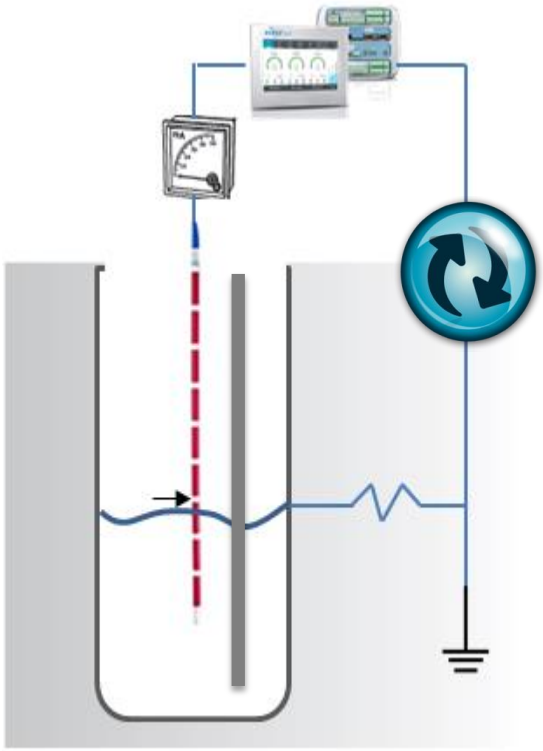
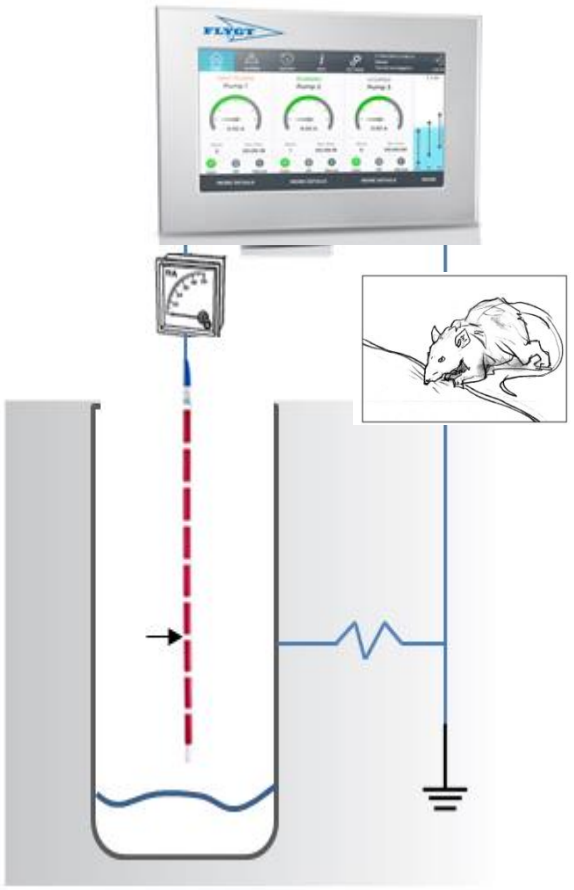
selection 2 : wastewater pumping - Multitrode

- Provides fail-safe reassurance that probe is functional at all times
- Severed cable will provide probe alarm







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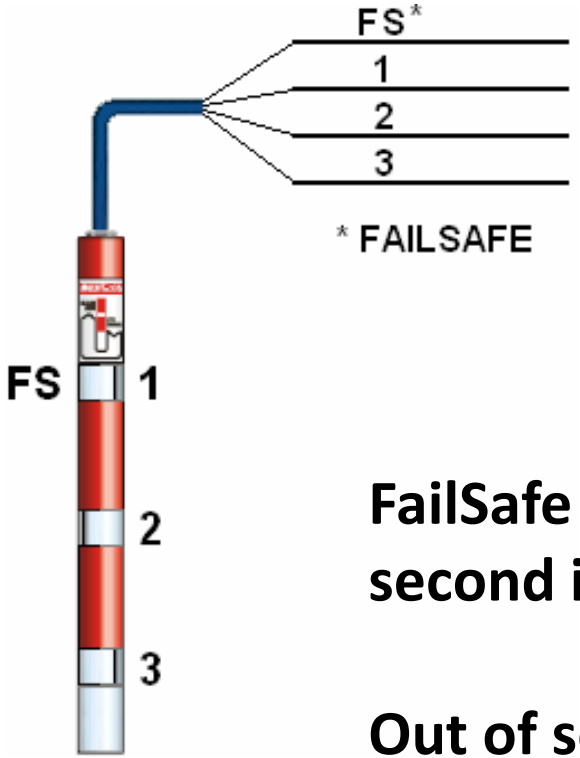
FailSafe Probe Wiring Details



FS = FailSafe integrity test
1 = High-level alarm sensor (pump on)
2 = High-level sensor (pump on)
3 = Low-level sensor (pump off)

FailSafe / alarm sensor continuity sampled at 10 second intervals.

Out of sequence sensors also raise probe fault.

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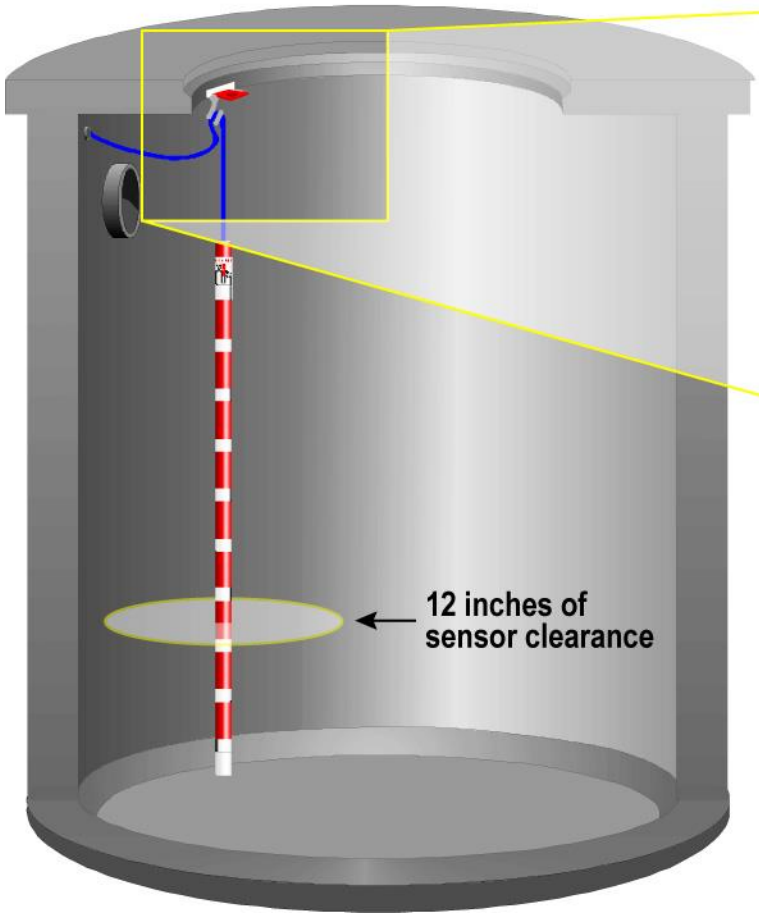
selection 2 : wastewater pumping - Multitrode





- Mount close to inflow
- Install bottom of probe just above the “snore point” of the pump (volute)
- Ensure 300mm/12 inches of clearance around the probe

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selection 2 : wastewater pumping - Multitrode

- Inflow turbulence naturally prevents build-up on walls
- Also prevents build-up on probe.
- Mount close to, but not directly under, inflow.
- This allows SELF-CLEANING on Multitrode.



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selection 2 : wastewater pumping - Multitrode



Mount the bracket to the side of the well

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selection 2 : wastewater pumping - Multitrode



Leave enough room for convenient access

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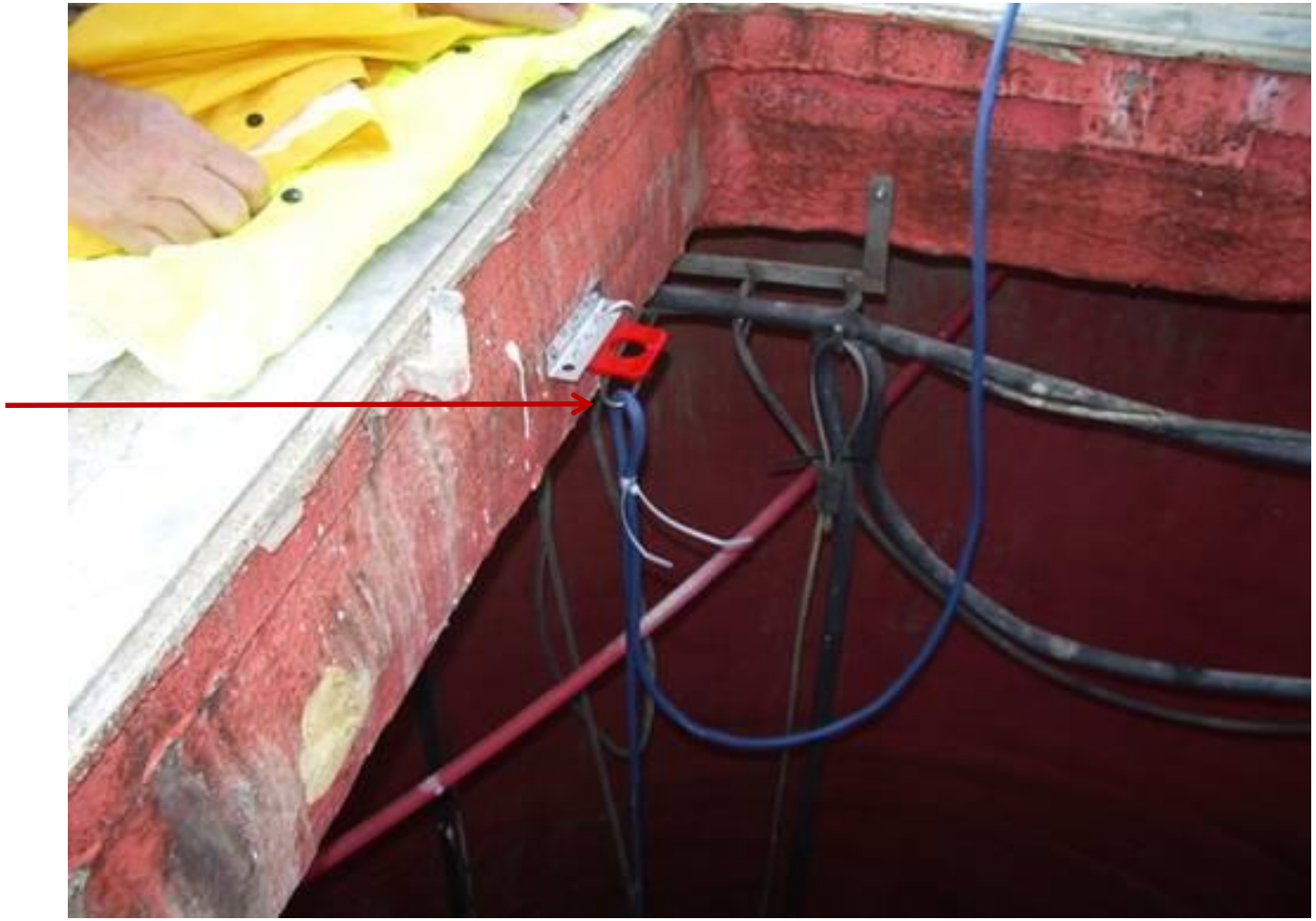
selection 2 : wastewater pumping - Multitrode



Hang the cable from the bracket using hook

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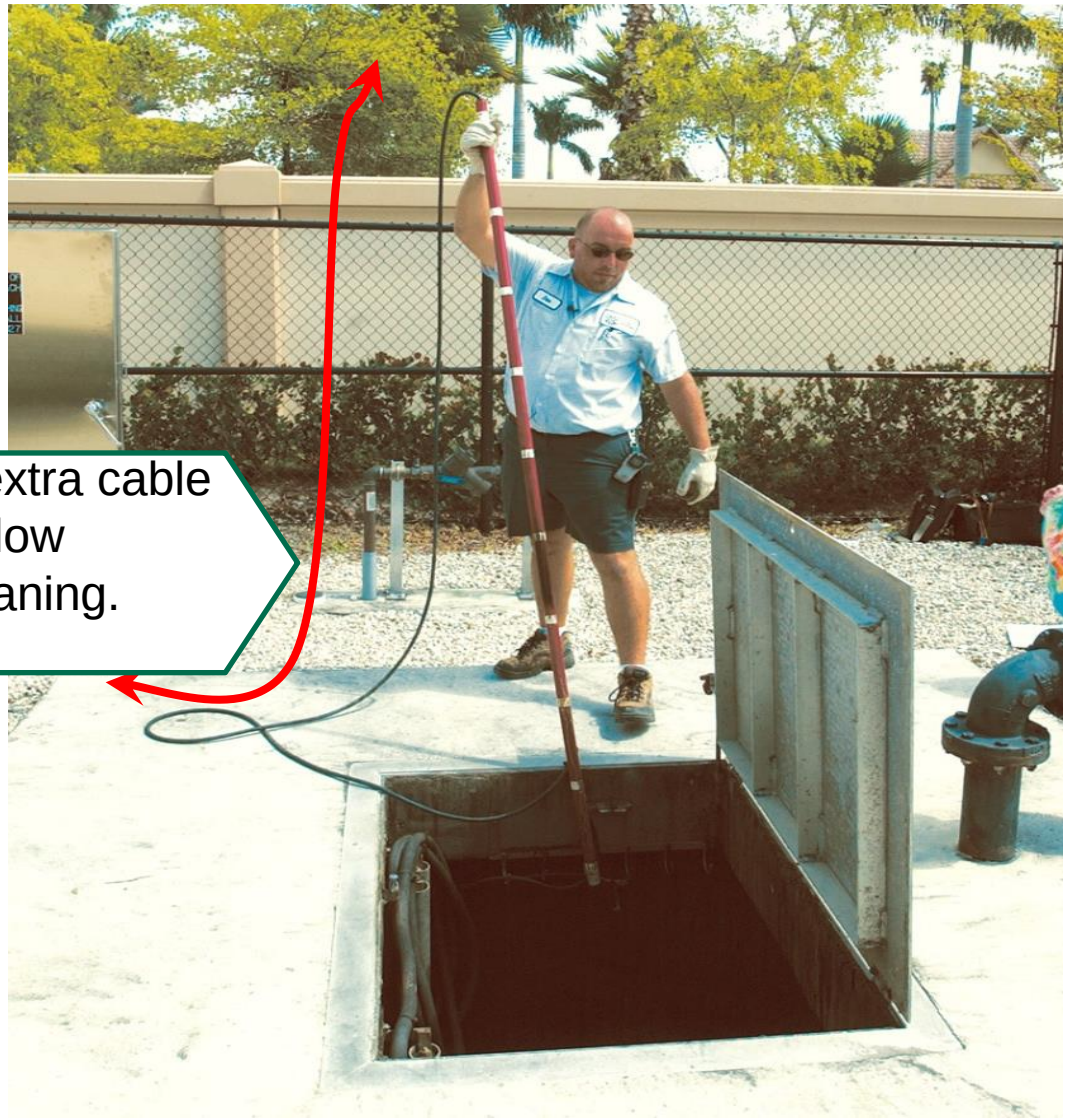
selection 2 : wastewater pumping - Multitrode



Allow enough extra cable in the well to allow removal for cleaning.

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selection 2 : wastewater pumping - Multitrode



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selection 2 : wastewater pumping - Multitrode



Extreme Foam



Heavy Sludge



Fat, Oil and Grease (FOG) in sewage

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selection 2 : wastewater pumping - Multitrode

Probe will work reliably in extreme conditions:

- Sewage with fat, oil, grease
- Thick sludge
- Foaming wet wells
- Cluttered wet wells
- Narrow wet wells
- Turbulence
- Blood and bone in abattoirs



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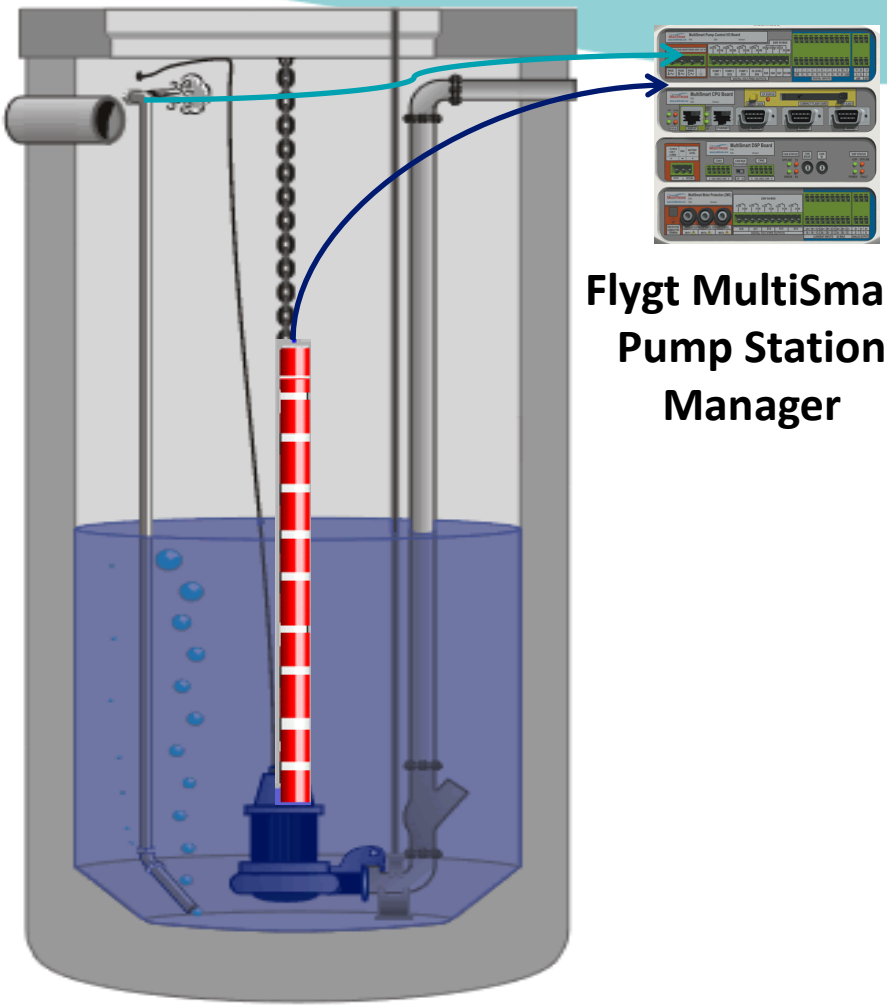
Backup Level Sensing Device

Upon failure of the primary level sensing device, the MultiSmart will automatically switch to the backup level device.

Example:

Primary level input: Bubbler

Backup level input: Probe



Flygt MultiSmart Pump Station Manager

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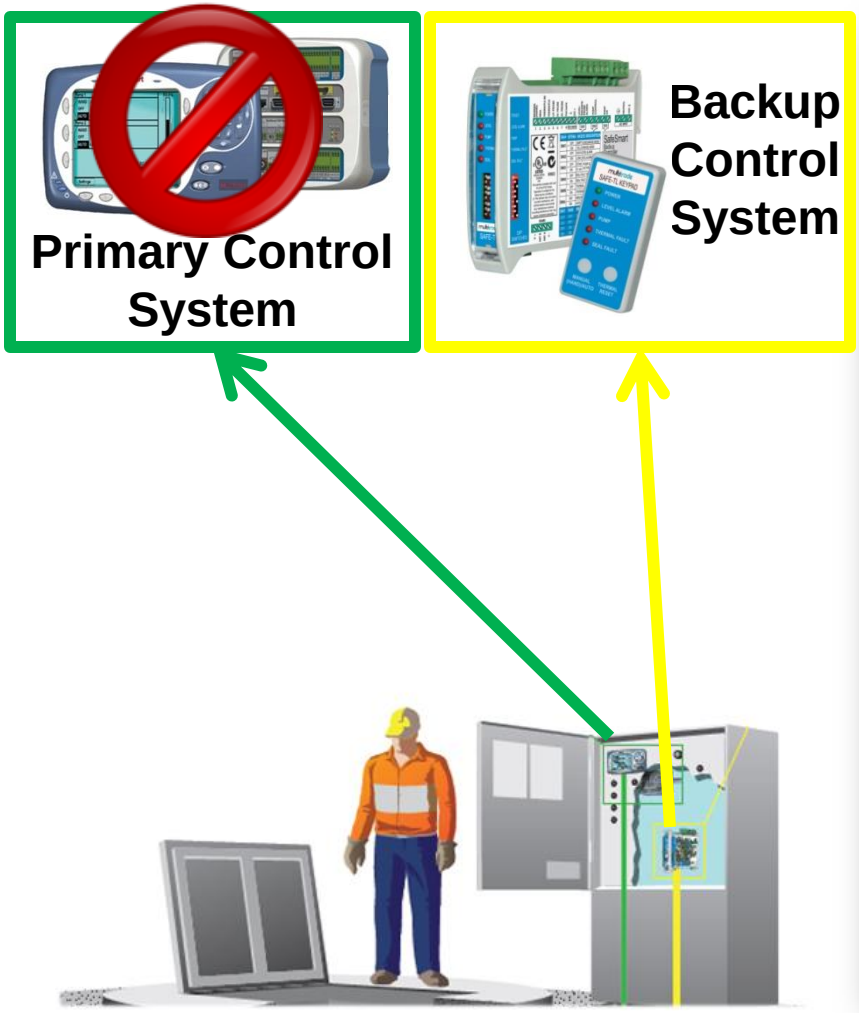
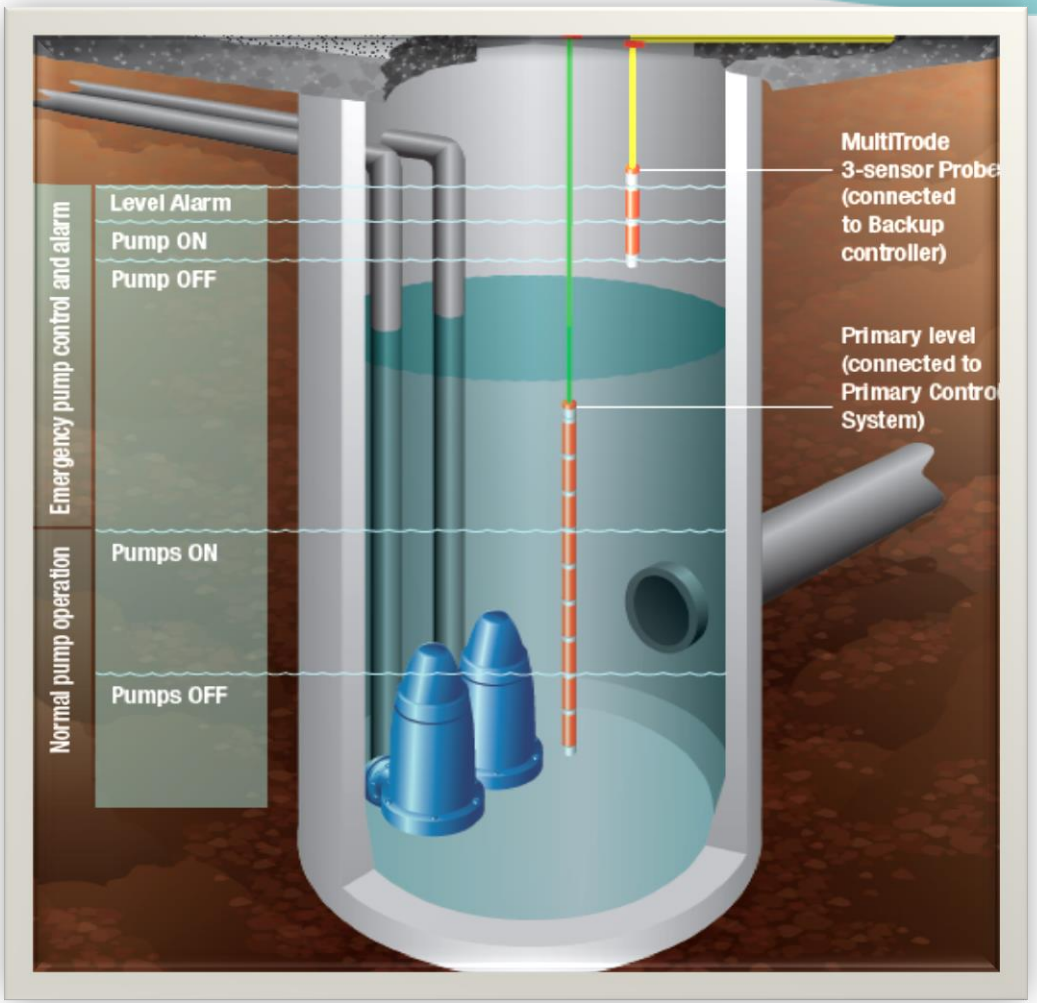
Backup Control and Level Sensing Device





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selection 2 : wastewater pumping - Multitrode

SAFE-FSP

- All AC/DC supply voltages
- Covers functionality of FS, MTR & MTRA
- Charge or discharge mode
- Pump control and high/low level ALARM
- Probe fault alarm output
- Monitors pump thermal
- Single pump control or back-up



SAFE-TL

- Same as FSP, with added :
- Monitors pump thermal **and seal**
- Separate keypad for operation



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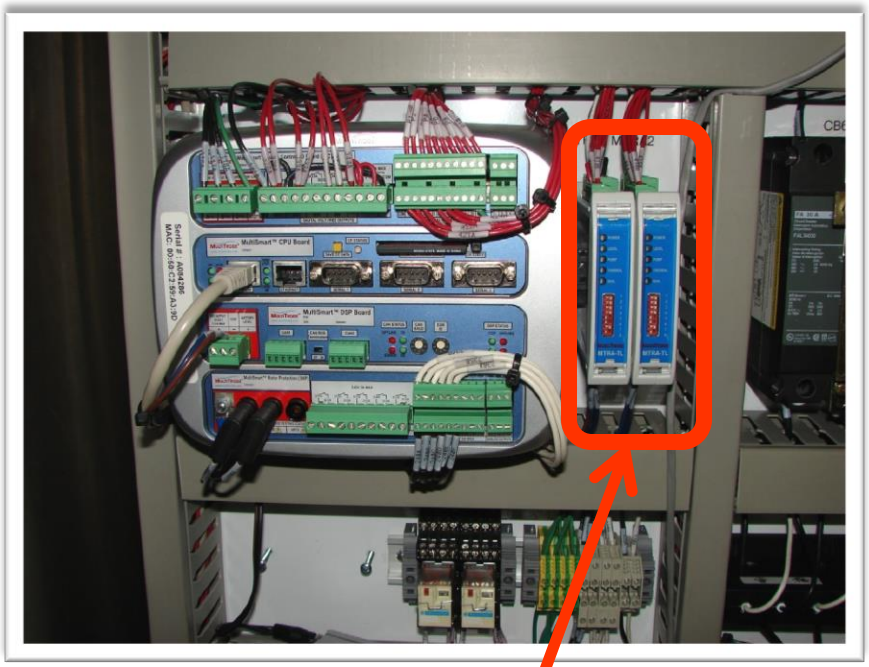
SAFE-FSP or -TL Backup Controller Pictures





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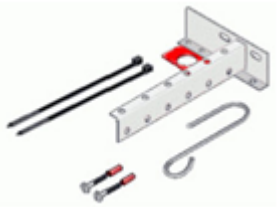
selection 2 : wastewater pumping - Multitrode



- The 837924 MTAK-2 is an extended mounting bracket and cleaning unit to be used when extra space is needed.

Previous part number: 84800049.





- The 837923 MTAK-1 is the part number for the spare mounting bracket and cleaning unit if the one coming with the Level Probe for some reason would need to be replaced. Previous part number: 84800048.



837820 is the part number for the MTISB-10 – the 10 channel Intrinsically Safe Barrier making the Level Probe Suitable for hazardous locations. Previous part number: 84800060

837819 is the part number for the 5 channel MTISB-5. Previous part number: 84800061

The MTISBs are UL and CSA approved.

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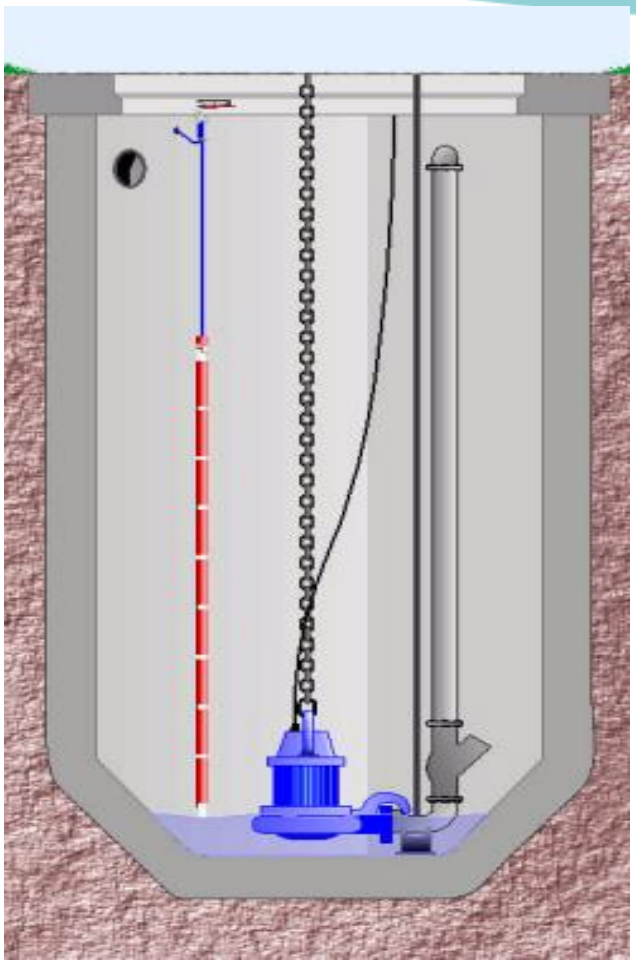
selection 2 : wastewater pumping - Multitrode

Benefits

- ✓ Simple to install
- ✓ Reduces maintenance
- ✓ Eliminate false readings
- ✓ Eliminate pump run on
- ✓ Reduce pump burn out
- ✓ Cuts the risk of spills
- ✓ Ultra reliable and repeatable



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QUESTIONS?











KNOW YOUR LEVEL

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Thank
You
Merci
Gracias
Takk
Mèsi
Xièxie
Grazie
Chokrane
Kiitos
Dziakuju
Mauruuru
GratiasAgimus
Ačiū
Dankie
Tak
Sagolun
Motashakkeram
TänanVäga
Chnorakaloutioun
GratiasAgo
KopKhunKha
Gracie
CámOn
Multumesc
Saha
Salamat
Obrigado
KamSahHamnida
Arigatô
Hvala
NajisTuke
Bayarlalaa
Nirringrazzjak
Efharisto
Faleminderit
Gràcies
Grandmercé
Dakujem
Taiku
Mercé
Matondo
TerimaKasih
Rahmat
Blagodaram
ThintKo
Buznyg
WaadMahadsantahay
TapadhLeat
Köszönöm
Murakoze
aDank
BarakAllahuFiik
Grazzi
Aabhar
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Dhanyavaad

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