HMI display

MANUAL
847000-014

a xylem brand

Your notes:

Table of contents

Introduction

Thank you for choosing the MJK HMI Display unit.
MJK HMI Display are easy to install and operate, to get the most of the HMI Display, MJK recommends reading this manual to get familiar with the details regarding the touch display.
The equipment must be treated and used according to the guidelines provided by MJK Automation ApS, to ensure a stable operation and accurate measurements.

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Changes

As our products are developed continuously, we reserve the right to make any alterations without prior notice.

Trademarks & acknowledgements

MJK Automation ApS is a Xylem brand.

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Specifications & Order Numbers

MJK HMI Display	
Power supply	24V DC ±20%
Power consumption	400 m A@24V
Processor	32Bit RISC CPU 600MHz
Display	7” TFT / Resolution 800 x 480 pixels (W x H)
Memory	256MB / RAM 256MB
Brigtness	(cd/m2) 500 / Contrast Ratio 500:1 / 16.7M Colors
LED Back Light	Back Light Life Time >30.000 hrs
Touch Panel	4-Wire Resistive Type
External Communication	CAN bus / CANopen Protocol / Modbus RTU
Interface	SD Card Slot SDHC Audio Line Out - 3.5 mm jack x 1 USB Host USB 2.0 x 1 / USB Client USB 2.0 x 1 Ethernet Port 10/100 Base-T COM Port COM1 (RS-232/RS-485 2W/4W), COM3(RS-232/RS-485 2W) Supports MPI 187.5K
Enclosure	IP66 front panel (O ring seal) / NEMA 4
Cabinet Material	Aluminum
Operating Conditions	-20°~50°C (-4°~122°F)
Storage Temperature	-20°~70°C (-4°~158°F)
Operation Humidity	10%~90% RH (non-condensing)
Weight	App. 0.9 kg.
Dimensions Panel Cutout	192 x 138 mm (W x H)
Approvals	Compilies with EN 55022:2006+A1:2007 , EN 61000-3-2:2006+A2:2009 .EN 61000-3-3:2008, EN 55024:1998+A1:2001+A2:2003 Comply with FCC class A

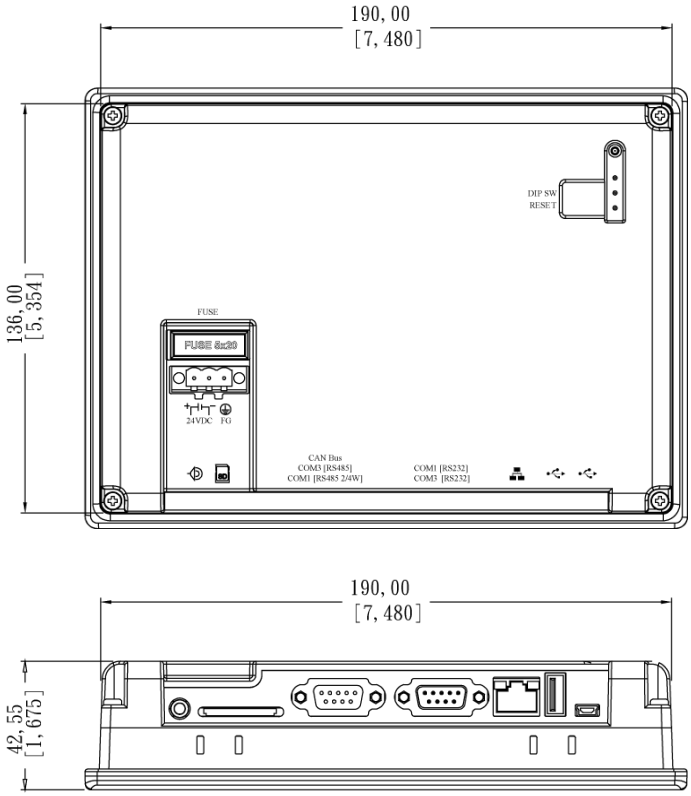
Order Numbers

MJK HMI Display	
205410	HMI Display 7" Touch

Accessories	
205205	Powersupply 100-240V AC to 24V DC/1.75 A
205506	Cable kit for Connect to HMI display, RS 485 cable, 2,5m, Inclusive blind lid for Connect.
205507	Cable kit for Mμ Connect to HMI display, RS 485 cable, 2,5m

205507 Cable kit for Mμ Connect to HMI display, RS 485 cable, 2,5m

Dimensions

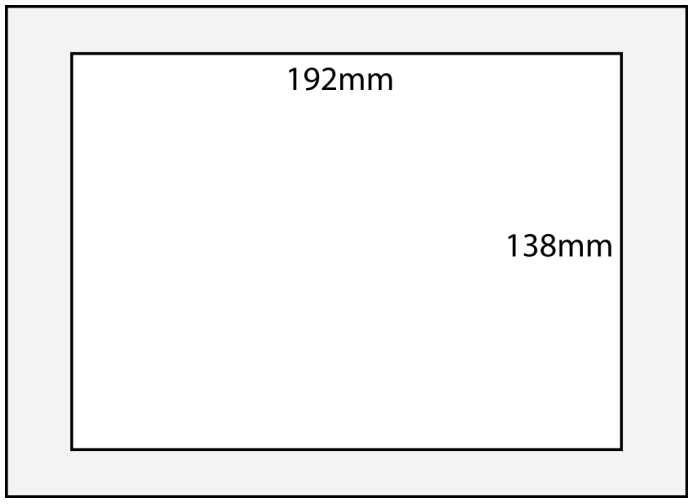


Cut-out Dimensions

For mounting use the cut-out dimensions also seen 192 x 138 mm (W x H).

Allow app. 5 cm of space behind the mounting plate to keep the display ventilated.

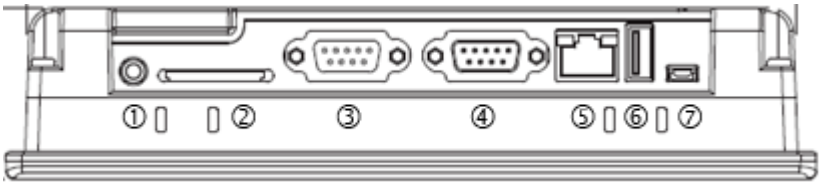
Mount the display by using the included mounting screws.



Electrical and mechanical mounting and connecting

The HMI display provides the following connection options:

1. Audio Line Out - 3.5 mm jack
2. SD Card Slot SDHC
3. COM1 RS-232 2W/4W
4. COM3 RS-485 2W Supports MPI 187.5K
5. Ethernet Port 10/100 Base-T
6. USB Host USB 2.0
7. USB Client USB 2.0

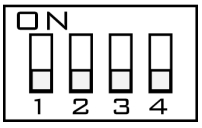


#	Input-Output Ports		
1	Audio Line Out	3.5 mm jack	Currently not used
2	SD Card Slot	SDHC	Upload configuration to HMI
3	COM1	RS-232 2W/4W	Currently not used
4	COM3	RS-485 2W Supports MPI 187.5K	Used for connection to Mμ Connect INET or CNET
5	Ethernet	10/100 Base-T	Option for remote connection via VNC
6	USB Host socket	USB 2.0	Upload configuration to HMI 138
7	USB Client socket	USB 2.0	Only used for Internal Factory programming.

DIP Switch

On the top right corner of the unit the DIP SW setting contacts are found, protected by a rubber cover. Change the switch settings one at the time.

NOTE: Usage of the DIP SW switches should only be performed by educated staff or Xylem technicians.



1	2	3	4	Mode
ON	OFF	OFF	OFF	Touch Screen Calibration Mode
OFF	**ON**	OFF	OFF	Hide HMI System Setting Bar
OFF	OFF	**ON**	OFF	Boot Loader Mode
OFF	OFF	OFF	**ON**	Reserved
OFF	OFF	OFF	OFF	Normal

Mechanical mounting

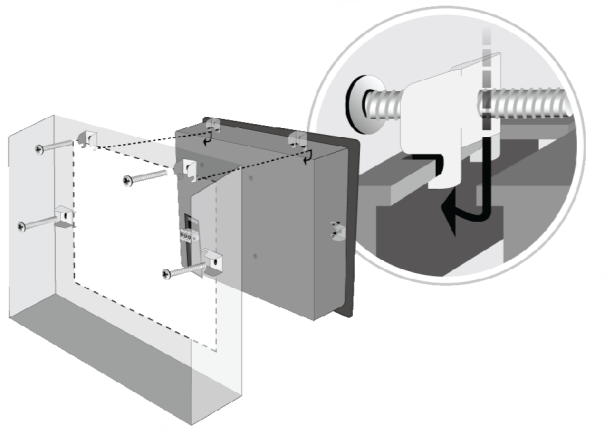
To mount the HMI Display the following tool are recommended:

- Screwdriver
- Saw
- Drill and drilling machine

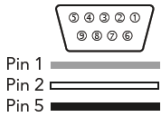
The HMI display is normally mounted on a cabinet door or wall/plate.

Make the hole for the display as shown in dimensions, 192 x 138 (W x H).

Attach the metal brackets in the holes in the side of the hmi display cabinet according to the figure below, tighten the screws.



Mμ Connect / Connect / nConnect RS485 CNET & INET



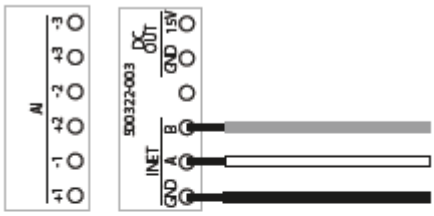
HMI Com 3 RS485

Port pin 9 Pin D-Sub Female	Signal	Wire color
1	B	Grey
2	A	White
5	GND	Black

The HMI must be the only device connected to INET or CNET.
The HMI display cannot be used by additional units simultaneously on INET or CNET as the HMI is Master in the Modbus chain.
Recommended standard connection between Mμ Connect and the HMI Display device should be via the INET port.
In case of additional connected Modbus Devices e.g. VFD the CNET port must be used, with the Wi-Fi turned off.

Mμ Connect RTU

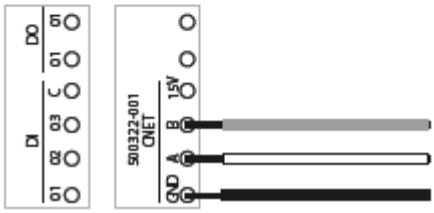
Mμ Connect INET



Port	ID
INET	247
CNET*	1

*) When using CNET the Wi-Fi must be disabled.

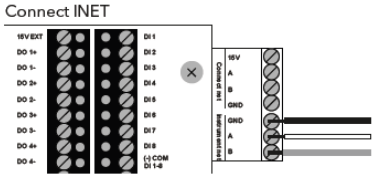
Mμ Connect CNET



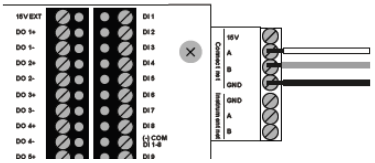
Connecting to Mμ Connect RTU device

Connect

Connect INET



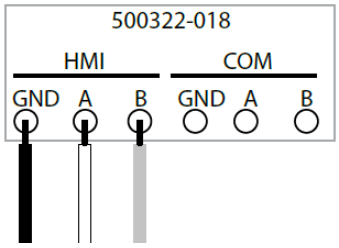
Connect CNET



Connecting to Connect RTU device

Port	ID
INET	Not valid
CNET	1

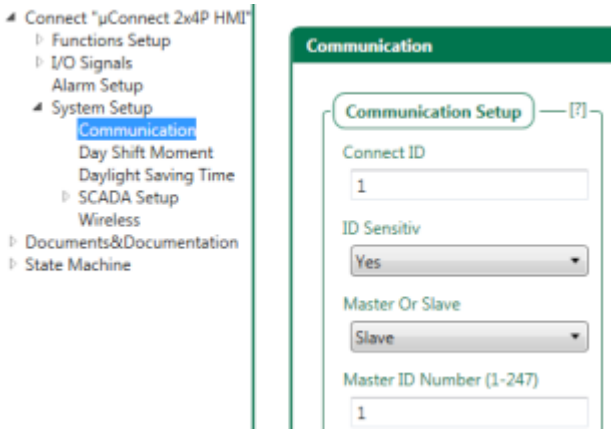
nConnect



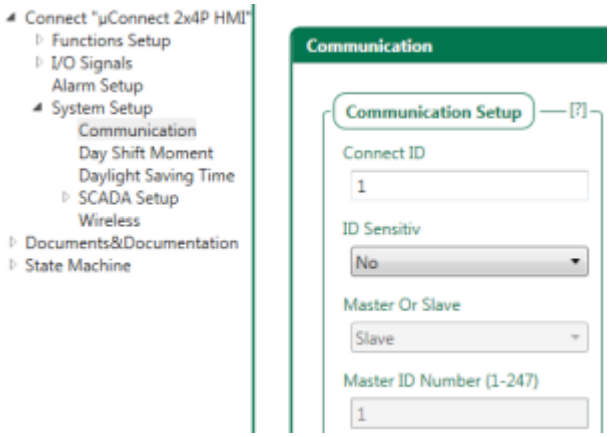
Connecting the HMI to nConnect RTU device.

Port	ID
HMI	1 - Not changeable!

The shown configuration for INET is for Mμ Connect device, made in Connect Link
To be able to connect HMI via INET port on Mμ Connect, do as follows.



Set “ID sensitive” to Yes
Set “Master Or Slave” to Slave

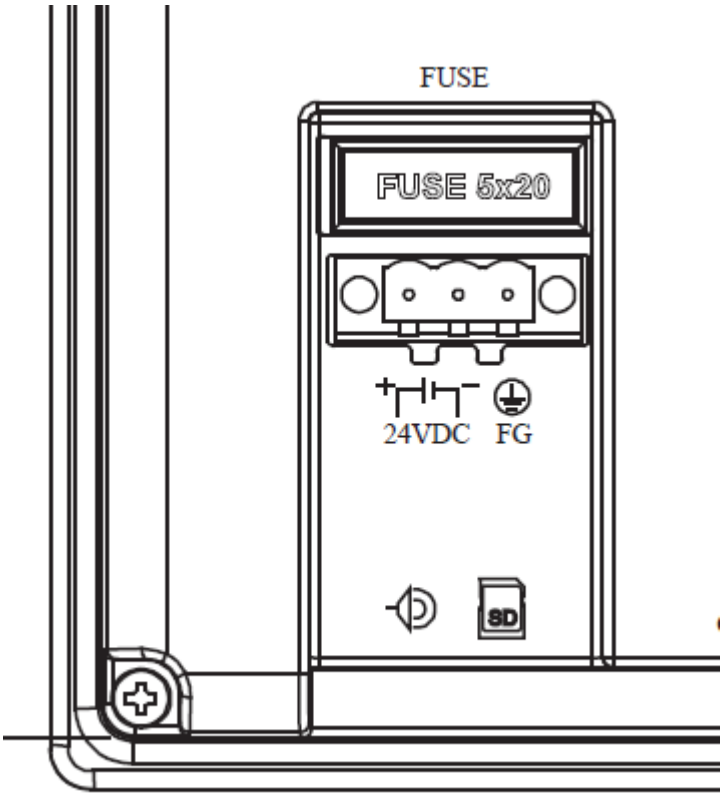


Set “ID sensitive” to No again

Remember to write settings to Mμ Connect.

Power Supply

The HMI Display must be supplied with 24 VDC, Min. 400 mA



Power Supply - 24 VDC

Terminal	Function
-	24 VDC Negative
+	24 VDC Positive

Internal Fuse

Power	Ampere	Order no.	Package
250 V	F 1,25A		5 x 20 mm

If the Display does not start within 5 seconds of power up, disconnect the power supply. An internal fuse will prevent damage if the polarity of the DC power is incorrect. Check the wiring for proper connections and power up again.

Menu Screens and Operation

This manual describes general information and how to use and operate the MJK HMI and it´s functions.
The HMI can be used together with MJK Connect series devices: Mµ Connect / Connect / nConnect.

General information

HMI idea and functionality

The HMI is intended for use in standard pump control configurations, where there are no special functions other than the functions available in pump controllers used.
Custom specialized Connect/Mμ Connect configurations may or may not work to full extend of HMI capability.
Special function HMI configurations can be made specially to order on request.
Contact sales team for further information.

The HMI does not give or control any functions in the connected unit and is only representing the outputs of the functions available.
This manual takes it for granted that the operator has some knowledge of the functions available in the connected unit.
All questions regarding the functionality of any given function must be found in the manual for the Connect/Mμ Connect.

Connect unit must have firmware 844003-017 or newer.
Mμ Connect unit must have firmware version 844008-013 or newer.
nConnect unit must have firmware version 844200-002 or newer.

Different firmware versions will have some limitations of functions.
Mμ Connect firmware version 844008-013 and up contains e.g. 7 days history.
Connect firmware version 844003-017 does not contain 7 days log, and does not have control words for pump controller 2.
nConnect firmware only have pump controller 1, and limited other functionality.

HMI configuration will automatically change appearance and enable functions on the fly, following the configured pump controllers and availability in the firmware, for the connected unit.
If a function is not available in the firmware or not activated in the configuration, that function will not be available in HMI.

The HMI configuration is operating upon the Mμ Connect/Connect/nConnect Pump Controllers, Control words, and is compatible for pump controllers 1, 2, 3(Energy optimized), and SmartRun.
Multiple pump controllers can be active at the same time in the connected unit, and will also be available from the HMI.

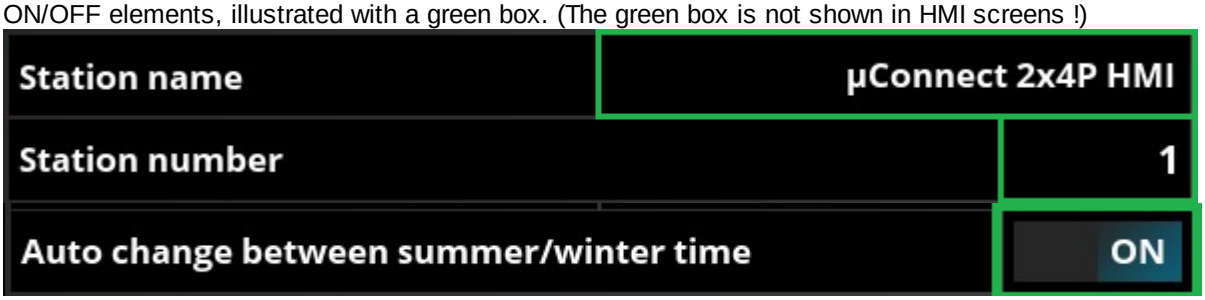
There is no need for special I/O configuration for pumps or level reading in the connected unit, as the HMI will automatically read the configuration in pump controllers, and display the configured I/O's used.
Control word in pump controllers must be activated for the HMI to be able to activate pump control display.

Navigation and input

Throughout the manual and HMI operations in generally, where the input of values & text, + navigation on screens where more information is available, the following is used as general way of operating the HMI.

Which values can be changed

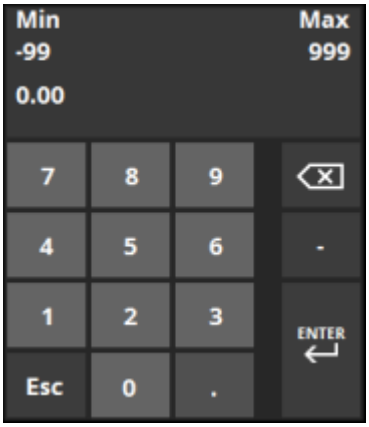
To change a value or setting, select the element that needs to be changed by touching the HMI.
I.e. here Station name, and Station number and summer winter time can be changed, by selecting the text, number or ON/OFF elements, illustrated with a green box. (The green box is not shown in HMI screens !)

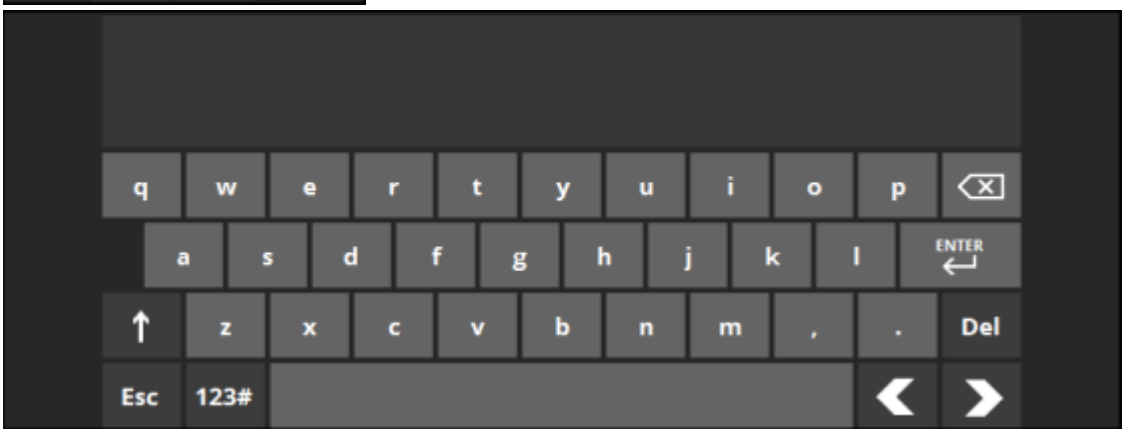


If User login requred is enabled, some settings require an user with the right previledges to be logged in, for the settings to be changed.
In this manual a Class is shown to indicate winch class the user must have available to change the setting.
More information is found in LOCAL - HMI administation section.

Entering values & text

Where HMI allows input of values or texts, an on screen numpad or keyboard will be displayed overlapping the screen.
If value is not allowed to be changed, keyboard or numpad will not pop up.

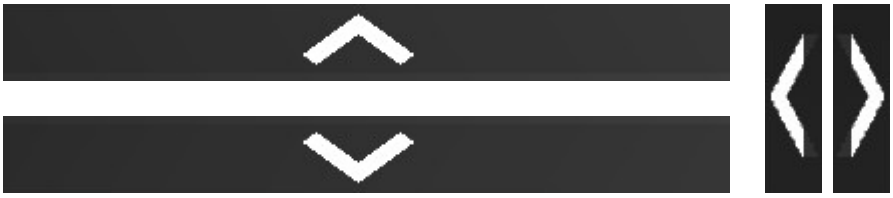




Simply input the desired value, bound by the Min and Max value allowed in the connected unit, and press the enter button.
Esc button will close the numpad / keyboard window, and will not make any changes to the original value.
On numerical input, Min and Max allowed values will be displayed in top of the numpad window.
Entering a value outside these bounds, will in some cases result in the numpad simply restarting, and a new value can be entered, and in other cases the numpad will close and the original value is left without changes.

Navigation

On screens where more information than can fit on one screen is available.
Navigation arrows will be shown to indicate that there is more information available by selecting that arrow.
Navigation arrows all look similar to these:

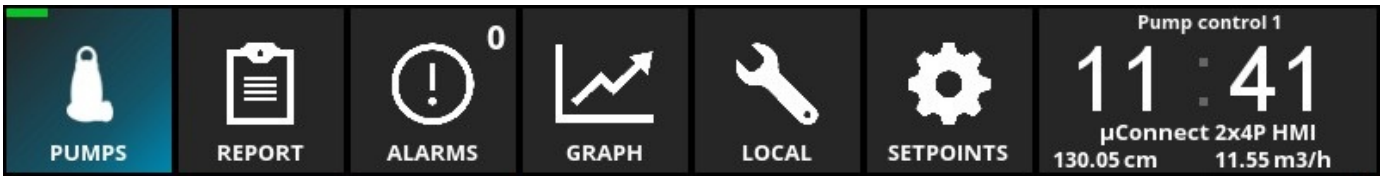


Please wait

In some situations, a “Please wait” message will appear on screen.
It is important to wait and not do any further changes to values on screen, until this message disappears.
The “please wait” indication will look similar to this:

Top menu bar

HMI display provides 6 primary screens plus 1 unit status screen.
The following pages will describe details regarding the individual sub menus and statuses.



The top menu bar gives access to the 6 primary screens, and 1 unit status screen.
From left to right, the 7 buttons can be selected, to access one of the primary screens.
Some buttons have special information and multiple functions.

PUMPS:

Pump indication:
The top part of Pumps button has 4 small bars, representing each of the 4 pumps that can be configured in the selected pump controller.
Detail on colors and states are described in pump element section.
Only the states of the pumps for the selected pump controller are shown on this button.
If an alarm is indicated on one of the pumps, the button will be colored red.

Interlock:
On the pump image an interlock icon will appear, when ever the unit has received an interlock request.
This is just an global indication that the unit is currently interlocked by another station.
To see if the pump controller is actually prevented for running, check the Unit status screen 81 or the pump details screens 28.

Multiple pump controllers:
If more than one pump controller is activated in the unit, this button has 3 functions.

1. When not on pump screen, the button will go to the pump screen for the selected pump controller.
2. When the pump screen is shown, pressing this button will show a selection menu, for selecting another pump controller.
3. This menu can also be accessed from any screen by pressing and holding the pumps button for more than 0.5 seconds.

ALARM:

The alarms button will show a small number on the top right of the button, representing the number of active alarms in connected unit.
When 1 or more alarms are active in connected unit, the button will be coloured red.

LOCAL:

If a language which is not understood by the operator is selected by mistake, the language for the HMI can be reverted to English by selecting and uninterrupted holding the LOCAL button on top menu for more than 10 sec.

CLOCK:

Top right is the clock element, which also gives some information from the selected pump controller.
The Clock element has multiple lines, described below.

Line #1
The name of the selected pump controller that is currently visible, and this is the pump controller that is available in Pumps, Report, Graphs, Setpoint screens.
Only the selected pump controller can be accessed, for changing setpoints, viewing graphs, and pump status.
To view one of the other pump controllers in the unit, change the selected pump controller in HMI.

Line #2
The actual time read directly from the connected unit.
HMI internal clock is synchronized with the connected unit every hour, or if the HMI is off by more than 10 seconds.

If the communication from the HMI to the connected unit is missing or conflicted with errors, the  sign between the HH & MM will turn red.
This means that there are some problems with communication to the connected unit.
The communication errors can be caused by numerous causes, but most common problems are:

1. HMI is physically connected to CNET on the connected unit, and the WiFi is still activated in the unit´s configuration. See. Unit manual for disabling the WiFi.
2. HMI is physically connected to INET on the connected unit, and configuration of the connected unit is wrong. See section for connecting the HMI to unit in INET.

Line #3
The station name read from the connected unit´s configuration is showed.

Line #4
The level from the well in the selected pump controller, and if configured, also the flow from the selected analogue input for flow.

Screenshot

It is possible to save a screenshot to USB drive, from all standard screens in HMI.
To save a screenshot, a USB drive must first be mounted in the HMI Host USB port.
If no USB drive is mounted, the screenshot option is not available.

Mounting USB drive for screenshot

Mount a USB Flash drive in the "USB Host socket" listed as No. 6 in Electrical and mechanical mounting and connecting 9
When mounting an USB drive for doing backup, a “Download/Upload” pop up screen will appear with several options and a countdown.
Select the “Cancel” button to close the pop up screen.

Saving a screenshot

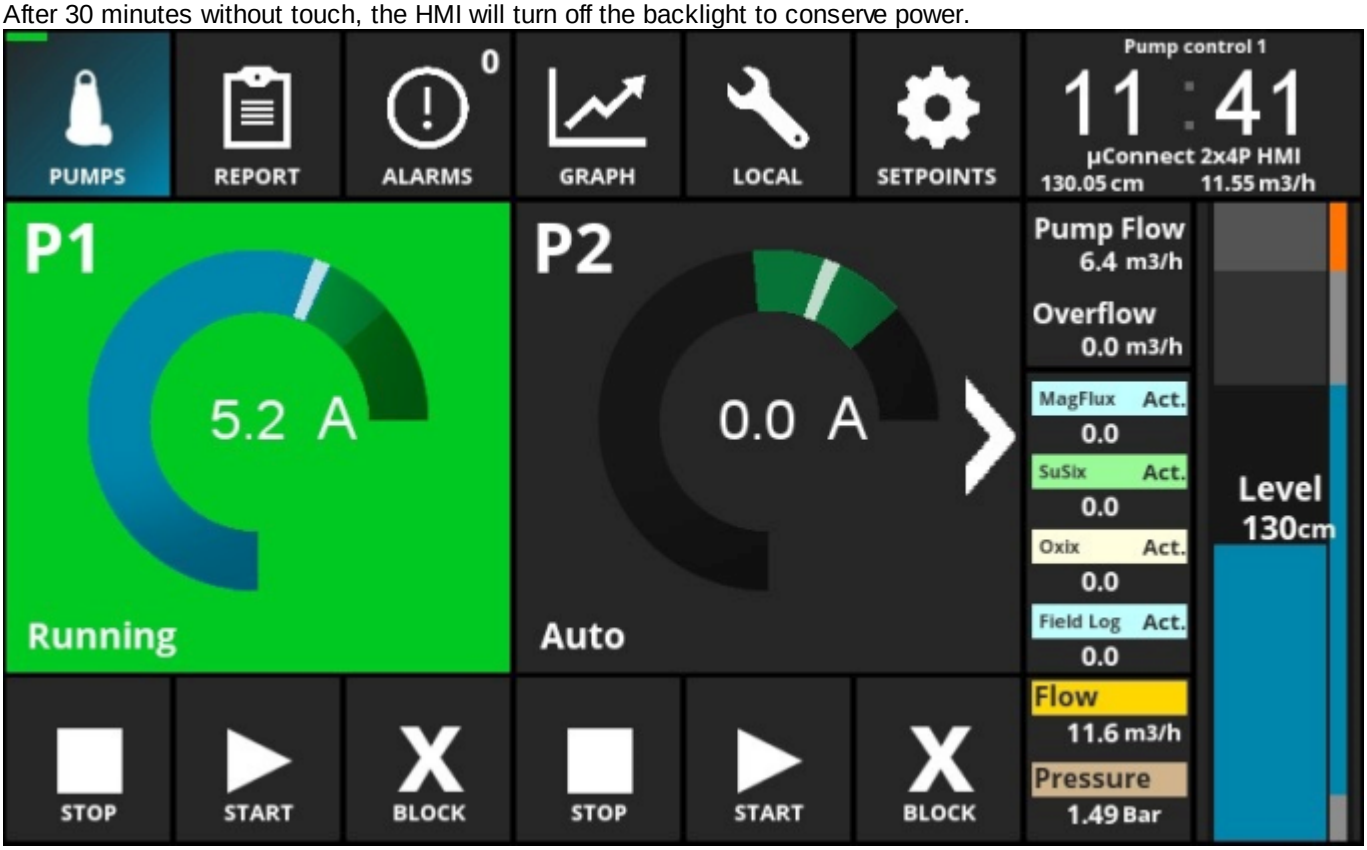
Saving a screenshot is done by pressing an area on the screen for more than 5 seconds, where the desired screen do not switch to another screen or open an input pop up.
When a screenshot is saved to the USB drive, a small icon will be visible for 1 second at the clock element.

Where do I find the saved screenshot

Screenshots are saved on USB drive in a sub folder named “hardcopy”, within a folder named the same as the station name.
Please see “HMI USB data and formatting backup data” chapter for more details, here 134.

Start screen

The main screen is designed to provide the most necessary information when arriving to a pump station.
Besides the top bar and clock/date, the HMI provides the pump screen, including easy readable information on the capacity for the station, status from the individual pumps and the level of the well.
If the screen is black, simply press anywhere on the touchscreen to activate.
The HMI will return to this screen after 15 minutes without any touch on the HMI.
After 30 minutes without touch, the HMI will turn off the backlight to conserve power.



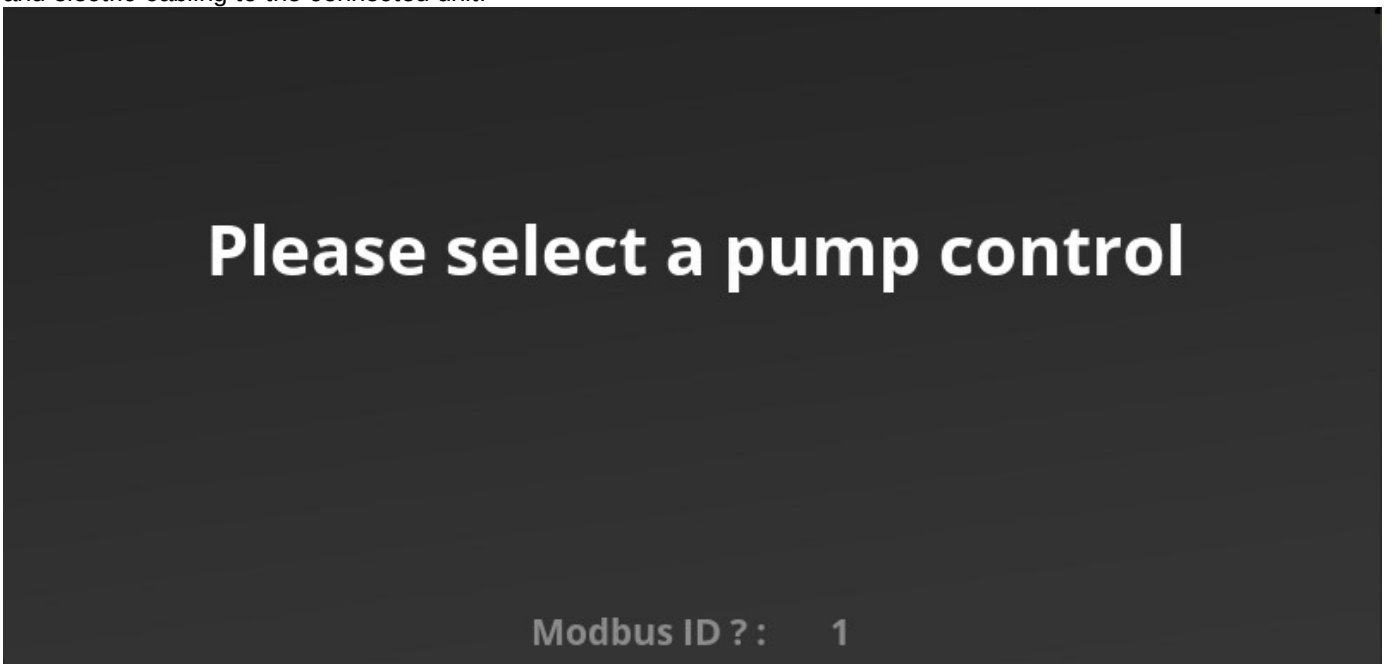
Please select a pump control

If no pump controller is configured in the connected unit, the following message will be displayed as the start screen.

When HMI starts up, this screen can be seen briefly while the HMI is still finding the correct communication ID. The communication ID which is being tested for communication with the connected unit can be seen in the bottom of the screen. Only ID 1 & 247 will be tested by the HMI.
If the connected unit is ID sensitive and uses another communication ID than 1 or 247, the ID nr. For the connected unit can be manually set by selecting the ID nr shown.
Communicating on INET port on the connected unit, can cause the ID search to take longer before a valid ID is found.

When an ID nr has been found, which is answering the questions from the HMI, The HMI displays screen configuration depending on the configurations available in connected unit.
The text “Modbus ID ?:” and ID nr, will disappear from screen, when a valid ID number has been found.

If screen does not change to a pump controller within a minute, Select a pump controller with the PUMPS button drop down, check communication, check correct configuration for the communication port selected in the connected unit, and electric cabling to the connected unit.



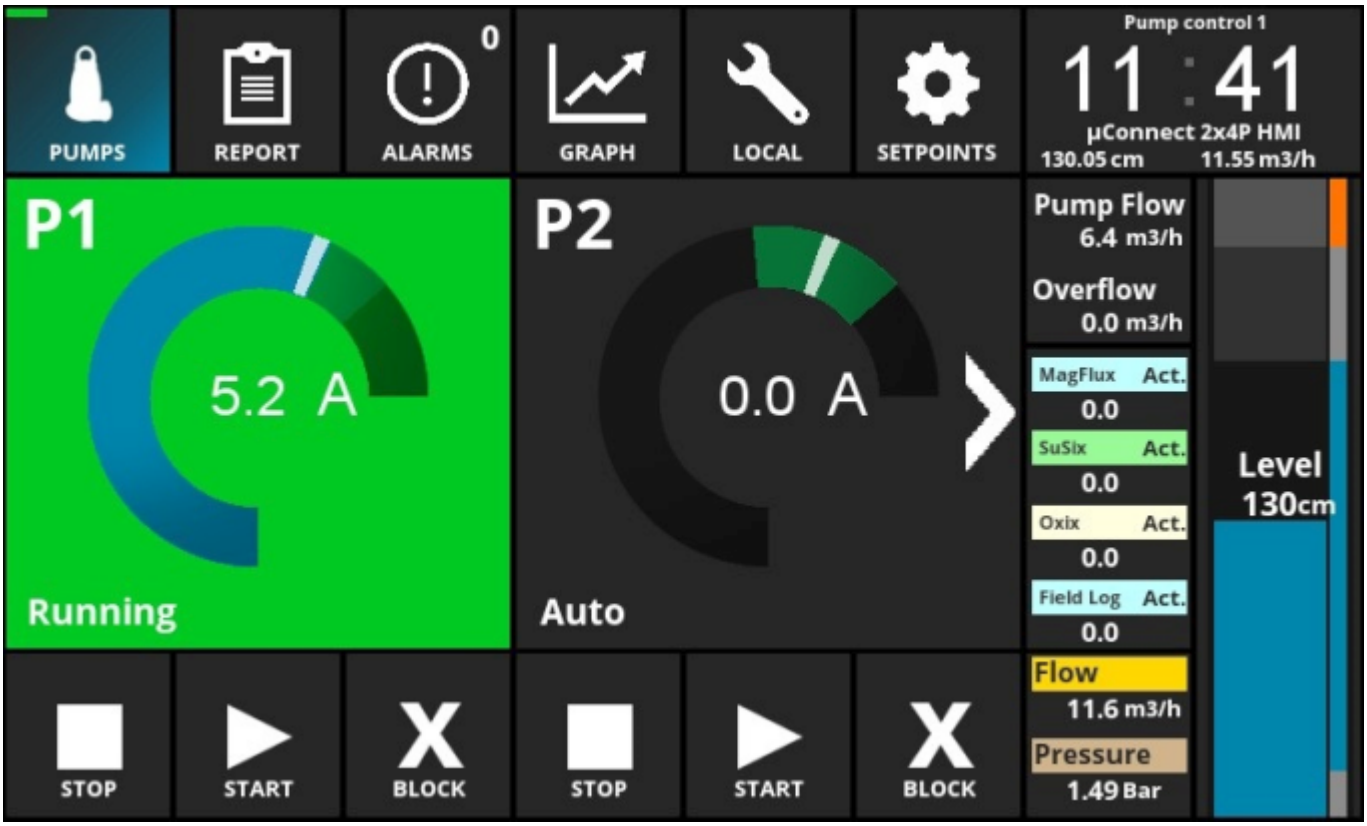
The HMI will not give access to any configuration, set points, graphs, reports and more, if there is no pump controller to read data from.
Please use PC configuration to enable and configure one or more pump controllers in connected unit.

Pumps, overview screen

Pumps screen

The screen shows the status of the pumps, as well as controls to STOP, START, BLOCK the pumps individually.
The actual level in the well is shown on the right hand side.

Depending of the configuration, the Pump Flow, Overflow, Connected MJK instruments, values from selected AI´s for Flow and/or Pressure is shown next to the sump level reading.

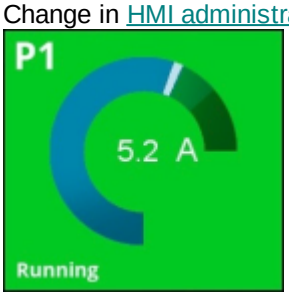


Details on the visible elements are described below.

Pump screen can show up to two pumps at a time.
When more pumps are configured in pump controller it is possible to navigate to next pump screen, by using the Right and Left arrow buttons on the pump elements.
Maximum 4 pumps per pump controller can be accessed from the HMI.

Pump element

The pump element provides values and state of the pump, and can take appearance of 5 states/colours.
Top left on the Pump element, the Pumps number in the pump controller shown. (P1-P4)
It is possible to change this label to use the 15 first chars of the name, for the selected DO configured for the pump.
Change in HMI administration 47



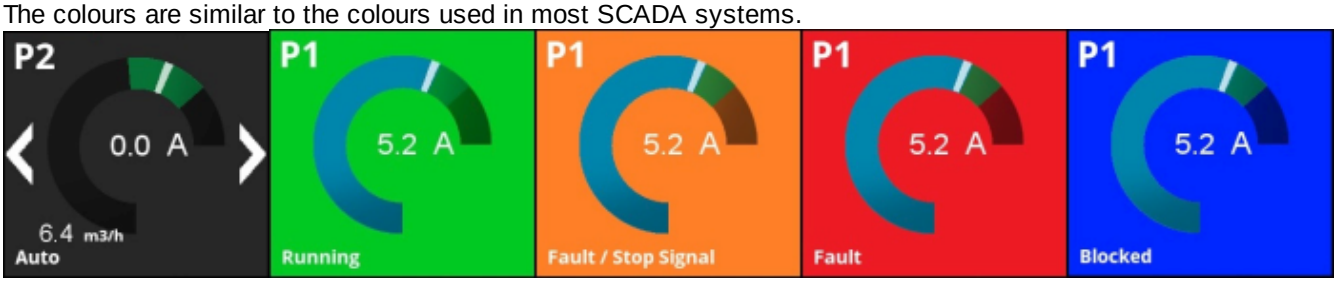
When selecting this element, a detailed screen for the individual pump is shown.
Description of the pump details screen is described later in this section.

For energy optimized pump controller, the pump element will also provide data derived from VFD.

Cleaning:
When available in PC and cleaning is active, an icon will appear on the pump element on the left side, below the pump number.
This will indicate that the pump has pending cleaning, or is currently cleaning, (Depth pumping)

Background colours

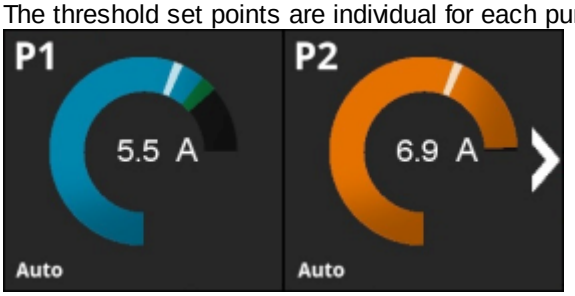
The colour of the background in the element will switch depending on the operating condition of the pump.
The colours are similar to the colours used in most SCADA systems.



Colour	Text	Status	Description
Grey/Black	Auto	Pump Stopped.	No alarms, waiting start command.
Green	Running	Pump is Running.	Run signal in control word is active.
Orange	Fault / Stop Signal	Pump Stopped.	One or more of the stop signals in control word is active. Pump will not auto start at start level.
Red	Fault	Pump Stopped.	One or more of the Alarm signals in the control word is active, or the critical error signal from control word is active. Pump will not auto start at start level.
Blue	Blocked	Pump Stopped.	One of the last two stop signals in control word is active, or the pump Blocked status is active. Pump will not auto start at start level.

Gauge

The gauge will show a representation of the measured value, used for the pump power consumption.
The colour of the gauge can change, after the thresholds given for low and high gauge value.
The threshold set points are individual for each pump, and do not follow the analogue input used for the measurement.



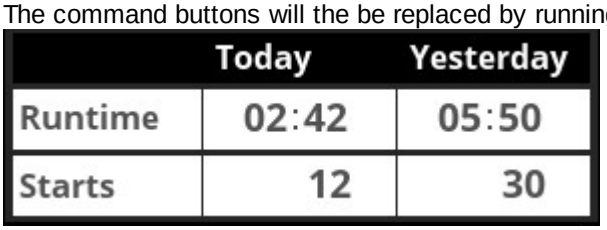
The value and the gauge indication is derived form the selected Analogue input configured on Current 60 page for the pumps in the pump controller.

Colour	Text	Status	Description
Blue	xx.x A	Pump is Running.	Power consumption is within the allowed range.
Orange	xx.x A	Pump is Running.	Power consumption is under or over the max allowed threshold for the pump power consumption.

Control buttons / Runtimes

Button:	Class:	Description
Stop	A	Stops the pump, if level is below start level. Also reset of any alarms in control word.
Start	A	Starts the pump, if level is above the stop level.
Block	A	Stops the pump, and takes it out of normal operation cycles. To reactivate the pump, press stop or start button. When the pump is blocked, no alarms will be activated from the device to the SCADA system.

The control buttons can be disabled by selecting the option "Pump screen show runtimes, not cmd buttons" in HMI administration 47.
The command buttons will the be replaced by running times and starts data. (SmartRun will not show run times)



	Today	Yesterday
Runtime	02:42	05:50
Starts	12	30

Level element

The level element is a visual representation of the level in the well, combined with visual representations of Start/Stop values for pumps & Low/High thresholds.
It also works as a shortcut direct to pumps start and stop levels, for easy access to SETPOINTS->Pump Settings.

Level bars are scaled the same as the limitation High & Low for the configured analogue input in the connected unit.
This scaling is set in SPOINTS->Level 59

Item:	Description
Level, Left area	The wide bar illustrates the actual level of the well. If the level is in between the acceptable values, the bar is colored blue. If level is above High level or below Low level thresholds, the bar is colored orange. If level is given by the high float run function, an icon will appear to indicate the high float run is ative.
Level, Right area	The blue part of the narrow bare, illustrates the area between the start and stop values. The orange part of the bar, illustrates any level above High level or below Low level thresholds.
Level xxx [unit]	This is the actual reading from the selected analogue input in the pump controller. The scaling and unit is not bound to be in cm, and can be configured as desired in the configuration. I.e. Meters, with 2 decimals. When any decimals are chosen in Connect/Mμ Connect configuration, HMI will show the value with 2 decimals on level bar.

High Float Run

When configured and active in PC, the indication of pumps running on high float run is indicated by an icon placed at the top of the level bare.
The Icon will flash White & Orange to visualize that the level for the pump controller is controlled by the high level float, and not the pressure transmitter.
High float run settings are configured under SETPOINTS - Pump settings 63.

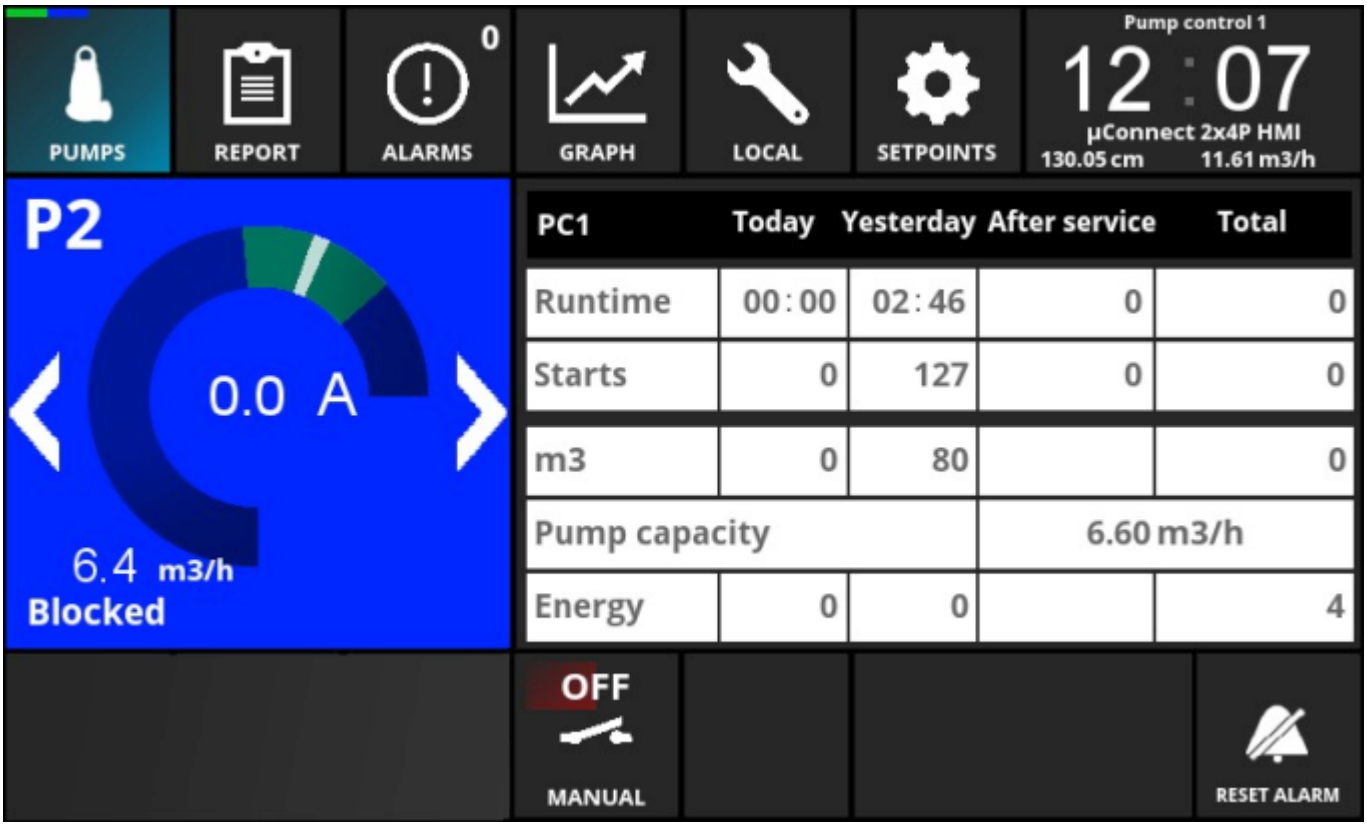
Extended measurements

Depending on the configuration in unit, some extended measurements will be displayed left of the level bar.

Item:	Description
Pump Flow	When enabled in pump controller, the actual calculated pump flow will be displayed.
Overflow	When enabled in unit configuration, the actual overflow value will be displayed. The value is also a direct shortcut to volumes report. REPORT->Navigation right->Navigation right.
INET sensor 1	When enabled in unit configuration, the INET sensor #1 will be displayed
INET sensor 2	When enabled in unit configuration, the INET sensor #2 will be displayed
INET sensor 3	When enabled in unit configuration, the INET sensor #3 will be displayed
INET sensor 4	When enabled in unit configuration, the INET sensor #4 will be displayed
Flow	When there is a selected analogue input selected in LOC AL->Miscellaneous 57 for flow. The value for that analogue input will be displayed.
Pressure	When there is a selected analogue input selected in LOCAL->Miscellaneous 57 for pressure. The value for that analogue input will be displayed.

Pump, detailed screen

Pump details screen



The screen provides detailed information for the selected pump such as running data, volume and energy.
Also the STOP, START, BLOCK commands are available + the manual “Run till you die” button.
It is possible to navigate directly to the next / previous pump by selecting the Right/Left arrow on pump element.

The individual elements are described below:

To return to pump screen, select the pump element again, or select the PUMPS button in top menu.

Pump element

On the pump details screen, additional information is displayed on the pump element.
When enabled, the actual calculated pump flow for the pump controller is displayed as the unit selected in the unit’s configuration.
Also when pump controller 1 is used together with energy optimized pump controller as a VFD gateway, information derived from the VFD will be displayed.

For energy optimized pump controller, the pump element will also show data derived from VFD.

When available in pump controller, an icon indication of depth pumping will be displayed on the pump element.

Operating data

PC1	Today	Yesterday	After service	Total
Runtime	00:20	02:46	1	1
Starts	0	126	105	105
m3	0	79		301
Pump capacity			6.41 m3/h	
Energy	1	0		6

The values available on this screen, represent the readings from the dedicated registers in the pump controllers registers.
PC1 & PC2: These values are copies from the selected run signal, configured in pump controller.
PC3: The Total time and Total starts values are read from the pump controllers dedicated registers. (Values direct from VFD)
The Today and Yesterday values are read from the I/O selected for the pump, in the pump controllers configuration. (Not available in PC dedicated registers)

Item:	Descripton:
Runtime	Running time registered for the pump: Today, Yesterday, After service and Total. Format for: Today, Yesterday are HH:MM. Format for: After service and Total are format whole hours HH. After service value can be set/reset in LOCAL>Readout values
Starts	Number of starts registered: Today, Yesterday, After service and Total.
m3	When activated, the calculated capacity per hour is displayed.
Pump capacity	When activated, the accumulated pumped volume is shown as today, yesterday, and total.
Energy	When activated, the accumulated energy in kWh is shown as today, yesterday, and total

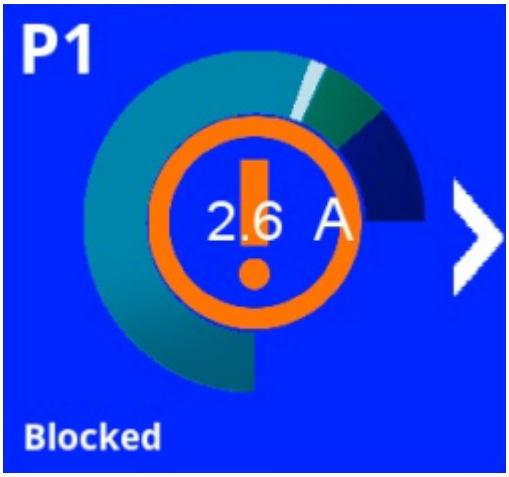
Manual [OFF/ON]

The function is only available, when pump is in blocked state.
The Icon on the button is the electrical symbol for the NO/NC state of the DO selected for running the pump.

When the ON/OFF button is selected, the button will blink orange, indicating that the operator has made changes to the state.
An exclamation mark will be shown and be blinking orange on all pump elements for the pump, indicating that the operator has changed state on the MANUEL button.
When pumps screen is selected, all interactions with control buttons for the pump will return the screen to pump detail screen again,
this is to indicate to the operator that there is something he must do there, for the pump to run in auto again.

Item:	Class:	Descripton:
	A	The normal state for a pump. This button toggles the NO/NC function of the DO selected for running the pump.
	A	The “Run till you die” state. Enabling this, will toggle the NO/NC function to NC, and thus giving the pump its physical start signal. The pump controller will not do any control of the pump, and it is up to the operator to ensure that the pump is stopped manually, as there will be no automated stop function.

		Also, it is important to set this to OFF, before resetting any alarms with the reset alarm button, or using the stop button on main pump screen.



When The Manual button has been changed, the pump element will show an flashing exclamation mark in center, to indicate to the user, that the output for the pump was altered.
The flashing will continue, until the reset alarm button has been selected.

Cleaning

Item:	Class:	Description:
	A	Clean button. When available in PC, a button for cleaning is displayed. When pressing the button, the pump controller will set cleaning pending active internally, meaning that the pump will initiate depth pumping at next pump run. Also an indication with the same icon on pump elements will be visible when cleaning is activated/pending.

Trip code

Item:	Description:
Trip code:	When available in pump controller, a trip code will be shown for the pump, indicating any trip/alarm from the pump connected. Usually this is only available for certain VFDs in energy optimized pump controller.

Reset alarm

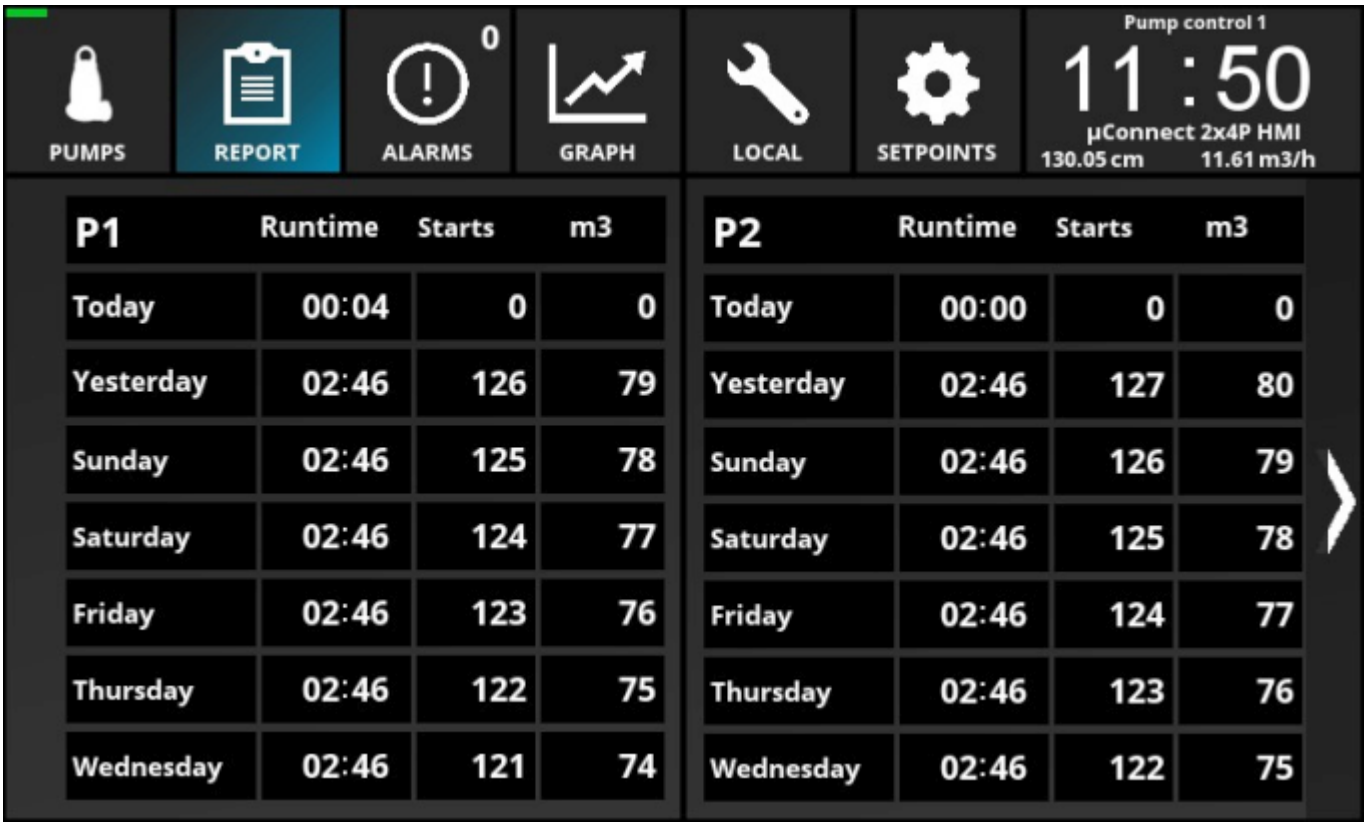
Item:	Class:	Description:
	A	Alarm reset button When pressing the button all active alarms for the pump will be reset and pump will be released for Auto, if it was set as Blocked. This button also disables the ON/OFF “Run till you die” button. Remember to set the OFF/ON state correctly for the pump, before resetting.

Report

Multiple reports for the station are available by navigating Right & Left.

Pumps 7 days history

The screen provides an overview of the capacity per pump, per day for the last 7 days.
For making a simple evaluation of the pumps running condition the past week.

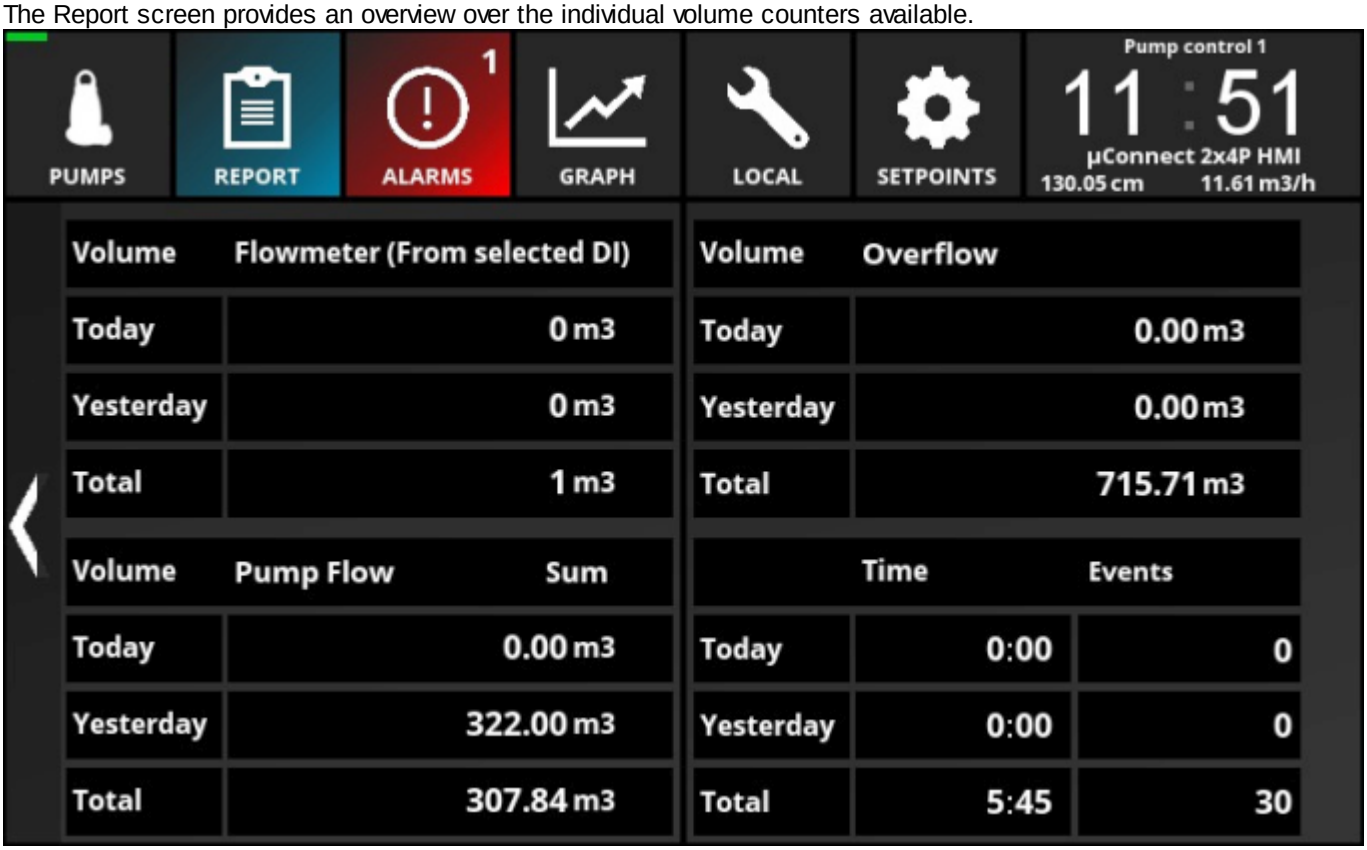


If more than two pumps are configured in unit, the next/previous pumps can be accessed by the navigation arrow on the right/left.
Following the navigation all the way to the right will bring up the counters for flows volumes.

Item:	Descriptoin:
Days	The last 7 days is shown, with today on top, and following yesterday, and yesterday+1 and so on.
Runtime	Runtime for the pumps in hours and minutes on the day, displayed in the format HH:MM
Starts	Number of starts per pump per day
m3	Number of starts per pump per day

Volume report

The Report screen provides an overview over the individual volume counters available.

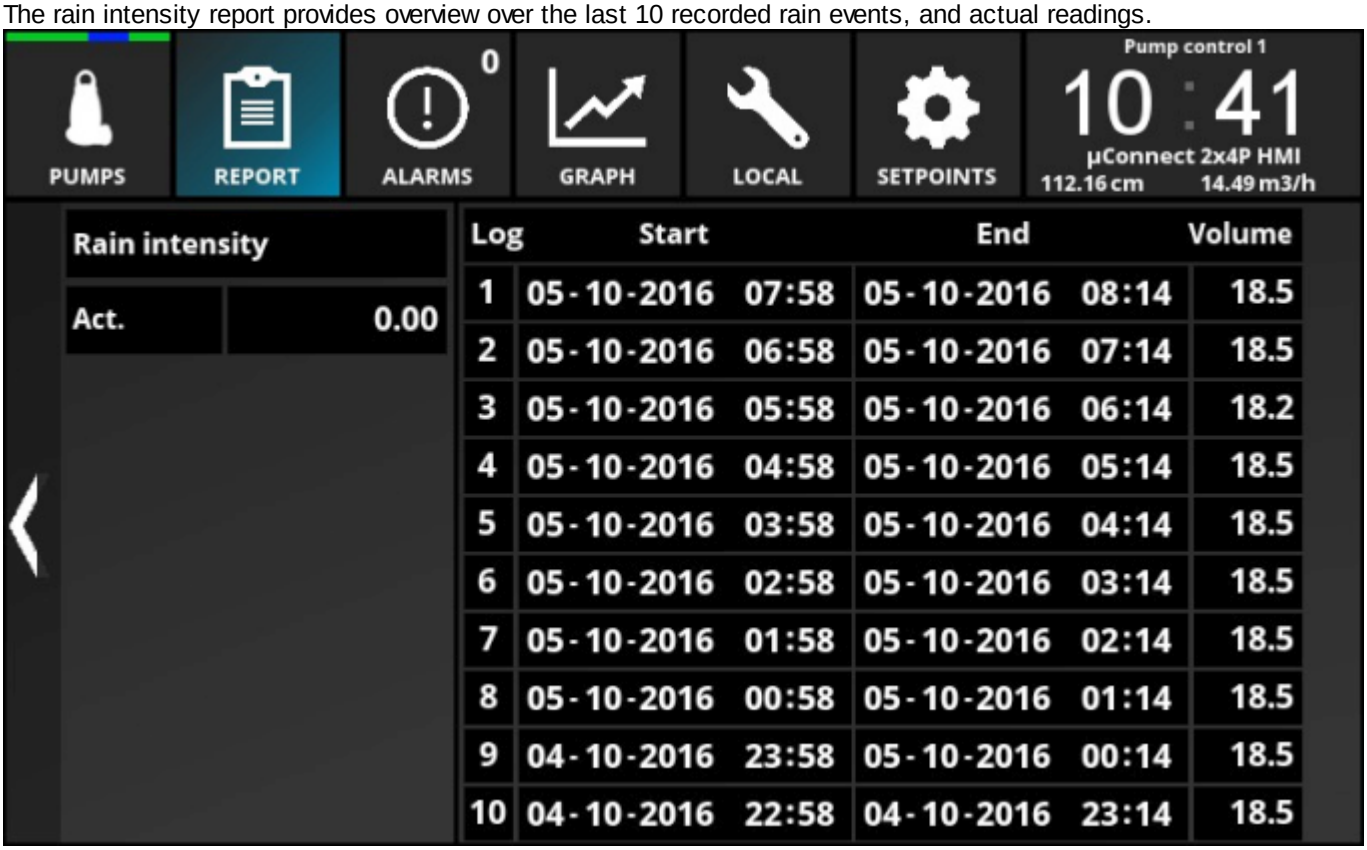


All volume counters are combined on this page, to provide an easy access to accumulated volumes.

Item:	Descriptoin:
Flowmeter (From selected DI)	When there is a digital input selected in LOCAL->Miscellaneous for flow, the counter values for that input will be displayed as Today, Yesterday and Total. HMI Assumes the unit for volume is the same as the unit selected for the analogue input selected for flow input.
Pump Flow	When enabled in unit configuration, the accumulated volume from overflow calculation is displayed as Today, Yesterday and Total.
Overflow Volume (Top)	When enabled in unit configuration, the accumulated volume from overflow calculation is displayed as Today, Yesterday and Total.
Overflow Time (Bottom)	When enabled in unit configuration, the accumulated time and activations from the selected signal, used as overflow activation signal in unit's configuration is displayed as Today, Yesterday and Total. Time is displayed in the format HH:MM.

Rain intensity report

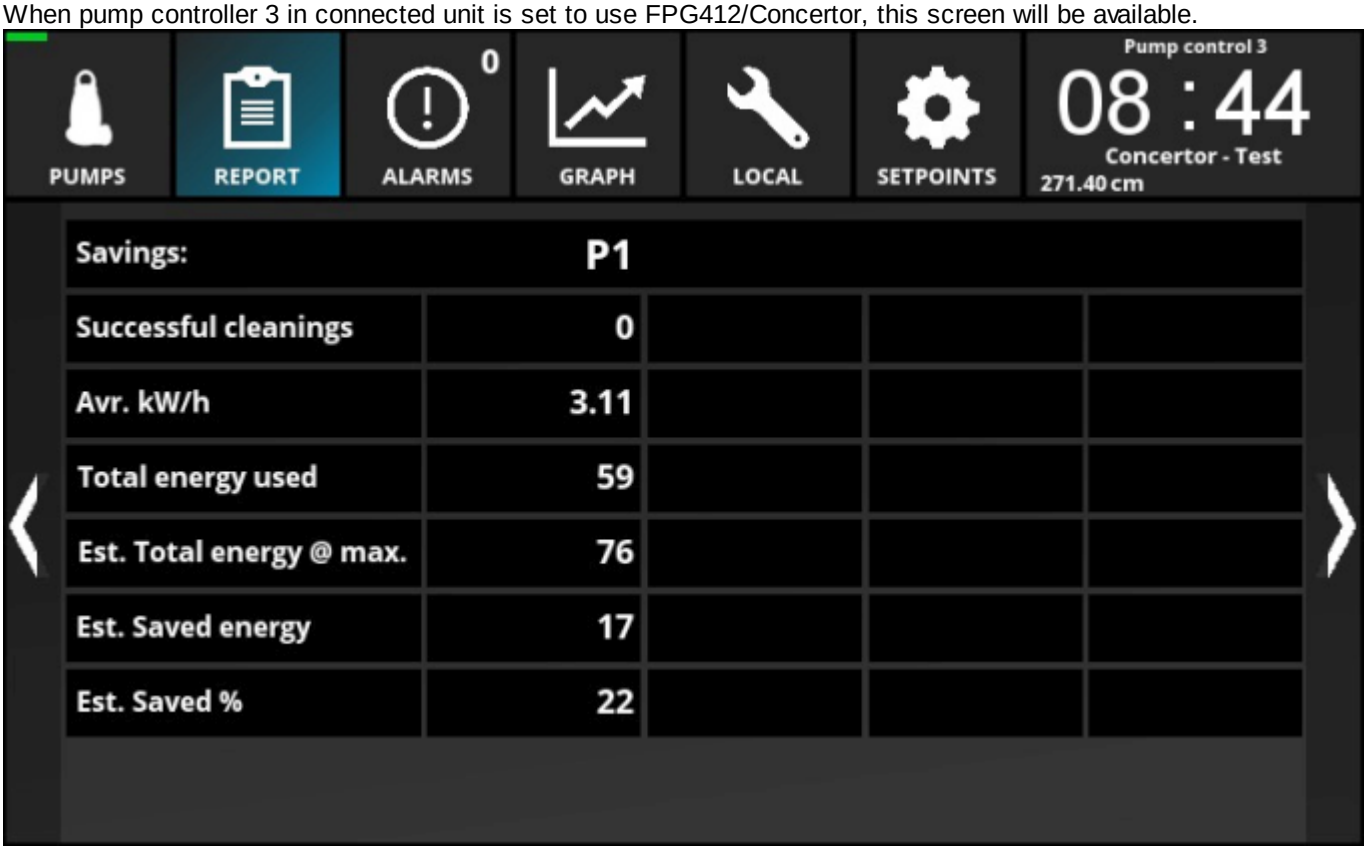
The rain intensity report provides overview over the last 10 recorded rain events, and actual readings.



Item:	Descriptoin:
Log #	The number of the rain event log. Nr. 1 being the latest recorded event.
Start	Start date and time for when the event was logged. Format is: dd-mm-yyyy HH:MM
End	End date and time for when the event was logged. Format is: dd-mm-yyyy HH:MM
Volume	The accumulated amount of recorded volume for the entire logged event.
Act.	The reading of volume accumulated in the actual ongoing event.

FPG412 DP for Concertor savings

When pump controller 3 in connected unit is set to use FPG412/Concertor, this screen will be available.



Text	Description:
Savings:	Indicates by columns, the savings for each pump.
Successful cleanings	The number of cleaning attempts done by the Concertor pump. Value is derived directly from DP/Concertor
Avr. kW/h	The average kW/h the pump has used in its total running time.
Total energy used	The total amount of energy used by the pump in its total running time.
Est. Total energy @ max.	Calculated value for energy that the pump could have used if it had been running at max energy for its total running time.
Est. Saved energy	Calculated value for estimated saved energy. (Est. Total energy @ max. - Total energy used)
Est. Saved %	The calculated estimate for the saved % of Est. Total.. and Total used...

Alarms

The Alarm screen provides a list of the 8 most recent alarms from the station, including information in regards of the state of the individual alarm.

Number	Description	Start time		End time	
1	Overflow Active	Today	11:51	No end time	
2	High Level alarm	Today	11:40	Today	11:40
3	Pressure High	Today	11:39	Today	11:39
4	Low Flow+Run	Today	11:45	Today	11:51
5	High Level alarm	Today	11:34	Today	11:45
6	High Level alarm	Today	11:33	Today	11:33
7	High Level alarm	Today	11:21	Today	11:21
8	Overflow Active	Today	05:27	Today	05:34

The alarm list is direct reading from connected unit.

Alarms without background colour are not active.
Alarms with orange background, is still active alarms.

Item	Description:
Number	The number in ascending order for the last 8 alarms. #1 is the latest alarm.
Description	The signal name of the alarm signal, configured in connected unit. I/O device
Start time	The time in format HH:MM, for when the alarm occurred. If start time is from a date earlier than today's date, the actual date and time will be displayed in the format dd/mm – HH:MM
End time	The time in format HH:MM, for when the alarm ended, if it has ended, else "No end time" will be displayed. If end time is from a date earlier than today's date, the actual date and time will be displayed in the format dd/mm – HH:MMshown as well.

Graph

The Graph screen provides a graphical view of the level of the well, as well as the power consumption per pump, and values from other activated signals that is made available in the unit.

There are 3 graph types available in HMI, 3 hours, day and week, with time spans matching their names.
Changing time span is done by selecting one of the 3 buttons on the bottom left of the graph screen.
All 3 graph views have the same controls and readings.
All Graphs data in HMI are stored in HMI only, and it is possible to back up the graph data to USB.
See Backup data.

Time span selection

Menu Item	Description
3 Hours	Time span of 3 hours
Day	Time span of 24 hours
Week	Time span of one week

Graph element

The centre of the screen is the graph area, where graphs of all the available signals are shown.
The graphs Y-axis is divided into 25% values of the max scaled value for each available signal.
Max scaling values for the individually graphs are displayed in the top of graph element.
Each reading is colour coded with its own colour, to identify readings on graphs throughout.
The scale mark values on the right of the graph are shown as the setting for the level measurement for the pump controller.
Behind the scale mark values, the narrow bar graph from pump screen, for Start/Stop, High & Low level values, for the level are shown.

Graph	Colour	Description:
Level	Blue	Graph: Level value; the actual level of the well. Top Line: Name & scaling are taken from the selected input for pump controller.
Current Pn	Green, Red, Orange, Purple	Graph: Current/Power; the actual reading of the current/power consumption of each pump.
Overflow	Pink	Top Line: Graphs scaling for Overflow Max is direct taken from the overflow configuration in connected unit. The highest number in any of the 10 Q-points is selected as the Max scale.
Rain intensity	Lavender	Top Line: Max scale for rain intensity is shown as a small nr next to actual reading, and is calculates as last highest value read and added 5, though not less than 10.
INET sensors	Aqua, Pale Green, Light yellow, Sky blue	Top Line: Graphs scaling for extended values, are continuous scaled from the highest read value for the individual measurement, and are rounded up to the nearest value and added 5.
Ext. measurements	Gold & Tan	Top Line: Max scaling for these measurements is taken from the selected AIs for the measurements.

Legend

On the right the legend list for the selected pump controller is displayed.

Text	Colour	Description:
Level	Blue	Actual reading of the level for the pump controller
Current Pn	Green, Red, Orange, Purple	For each activated pump, there are two readings on the legend column. **Act.** Is the actual reading from the selected input for the gauge reading for the pump **Nom.** Is the selected set point for the nominal value for the gauge for the pump.
Flow	Alarm Orange	For energy optimized pump controller, also the flow from the selected flow meter in pump controller is displayed.

Extended legend

In the bottom of the screen the legend list for Overflow and extended measurements are displayed.
Values displayed are: Overflow, INET sensor 1-4, Flow and Pressure from selected analogue inputs.

Text	Colour	Description:
Overflow Act.	Pink	Shows the actual reading and unit for the calculated overflow
Rain intensity	Lavender	Shows the actual reading and unit for the Rain intensity calculation
INET sensors	Aqua, Pale Green, Light yellow, Sky blue	Shows the actual reading and unit for the Rain intensity calculation
Flow	Gold	Shows the actual reading from the selected AI for flow.
Pressure	Tan	Shows the actual reading from the selected AI for Pressure.

Hide / Show graphs and readings

It is possible to hide graphs and readings when on graph screens.
This is done by selecting the desired readings, and will result in graphs disappear from graph element, and reading will be dimmed.
Select the readings again to show graphs and readings again.

When switching to another screen than graph screens for more than 1 minute, all graphs and readings will be visible again next time graph screen is selected.

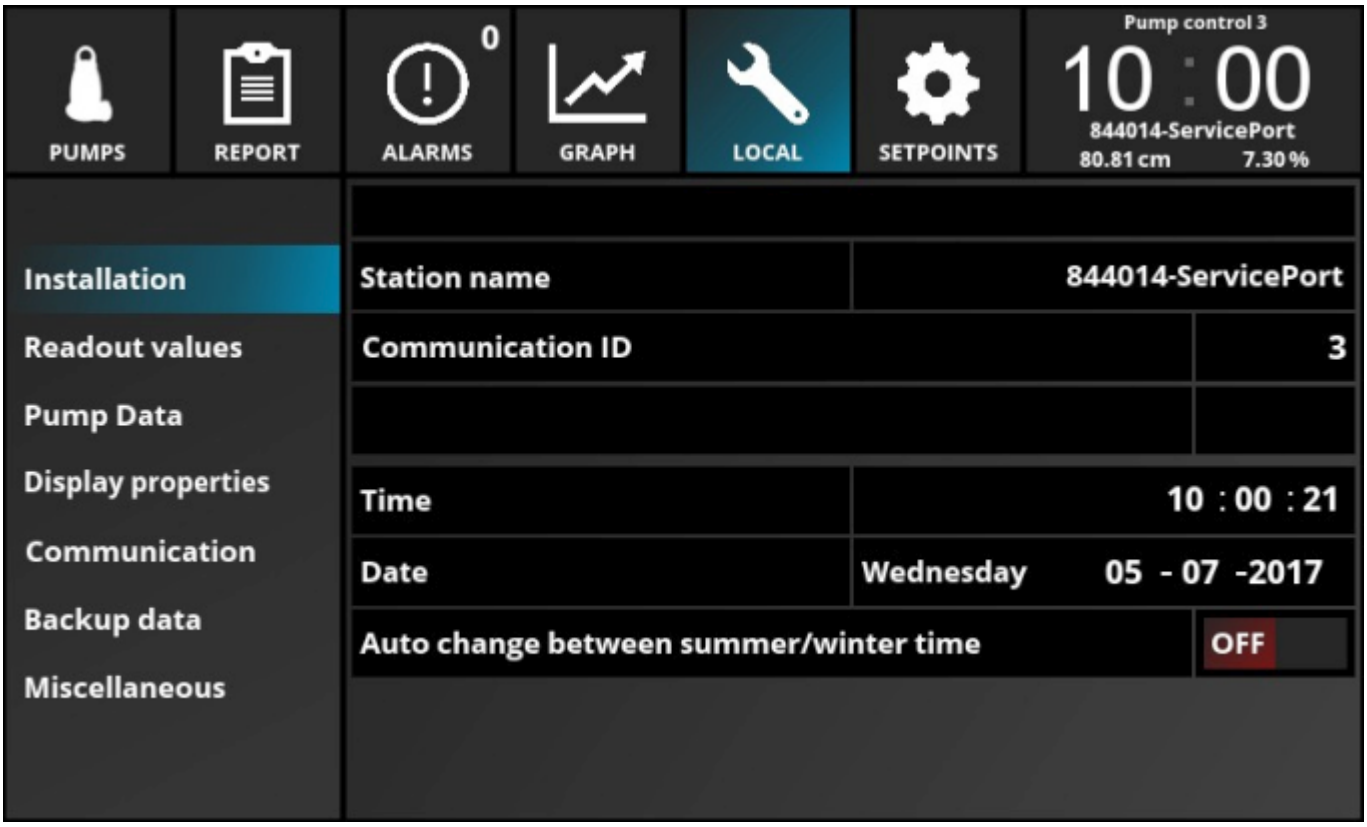
In this example, the current for pump 1 & 2 is selected, graph is hidden and readings are dimmed.
Actual measurements will still be updated when the graph is hidden.

Local

The Local screen allows access to information and configuration of the station, including HMI settings.

Installation

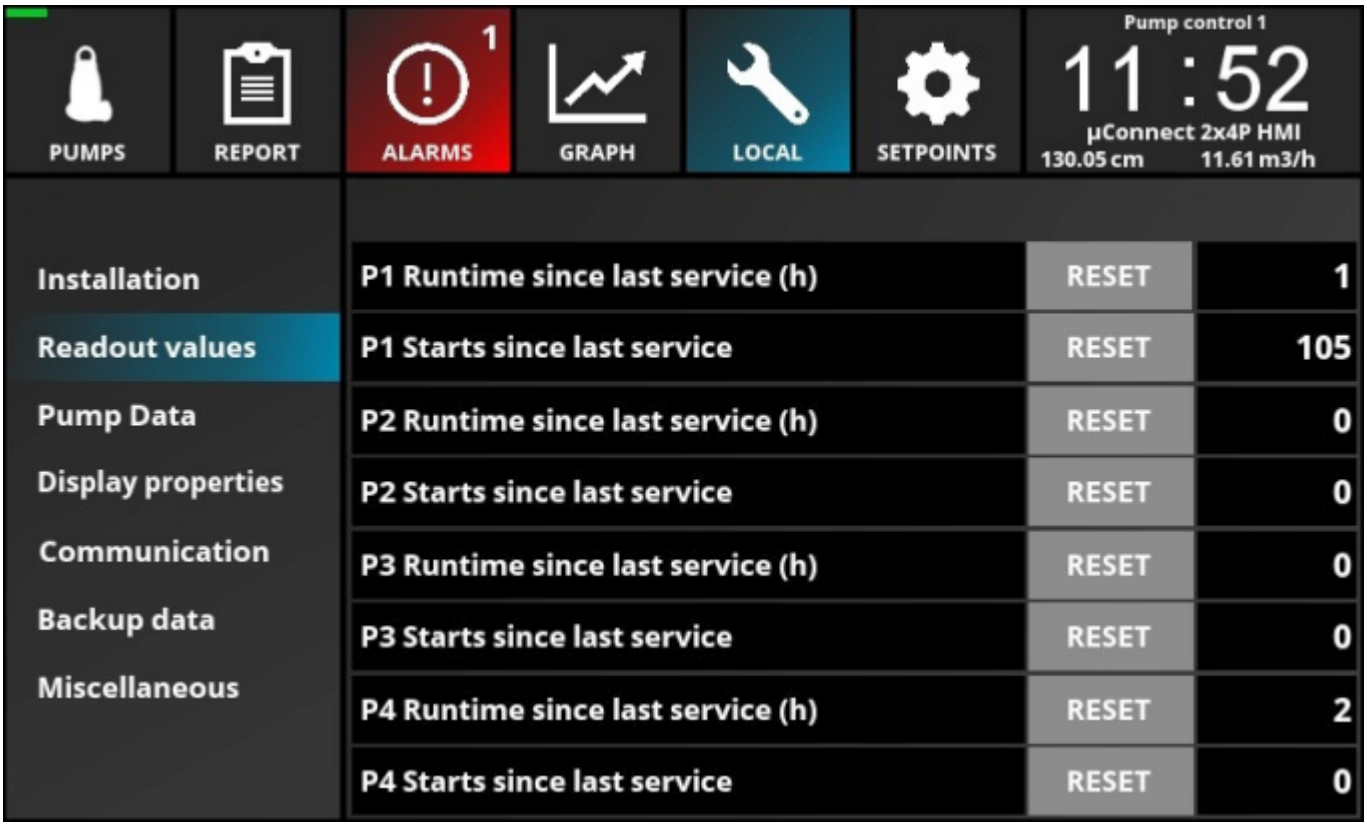
Installation



Text	Class:	Description:
Station name	E	The name of the station as read from the configuration in the connected unit. This is also the name that will be used for the folder, in which logged values and screen shots are saved, and also when doing backup to USB. See Backup data.
Communication ID	E	The communication ID for the station. The ID is used when it is necessary to be able to identify each station in a network where multiple stations are connected via the same communication bus or IP network.
Station number	E	The station number is used to identify the unit, by a number that is not bound by the values of the communication ID.
Time & date	C	The time and date elements represent the values as direct reading from the connected unit. Time is displayed in the format HH:MM:SS and date is displayed in the format dd-mm-yyyy Weekday cannot be changed by its element.
Auto change between summer/winter time	E	If desired, the RTC clock in the connected unit can automatically change between summer and winter time.

Readout values

Readout values



The readout values are read from connected unit, and represent values for the chosen digital output for each pump in pump controller.

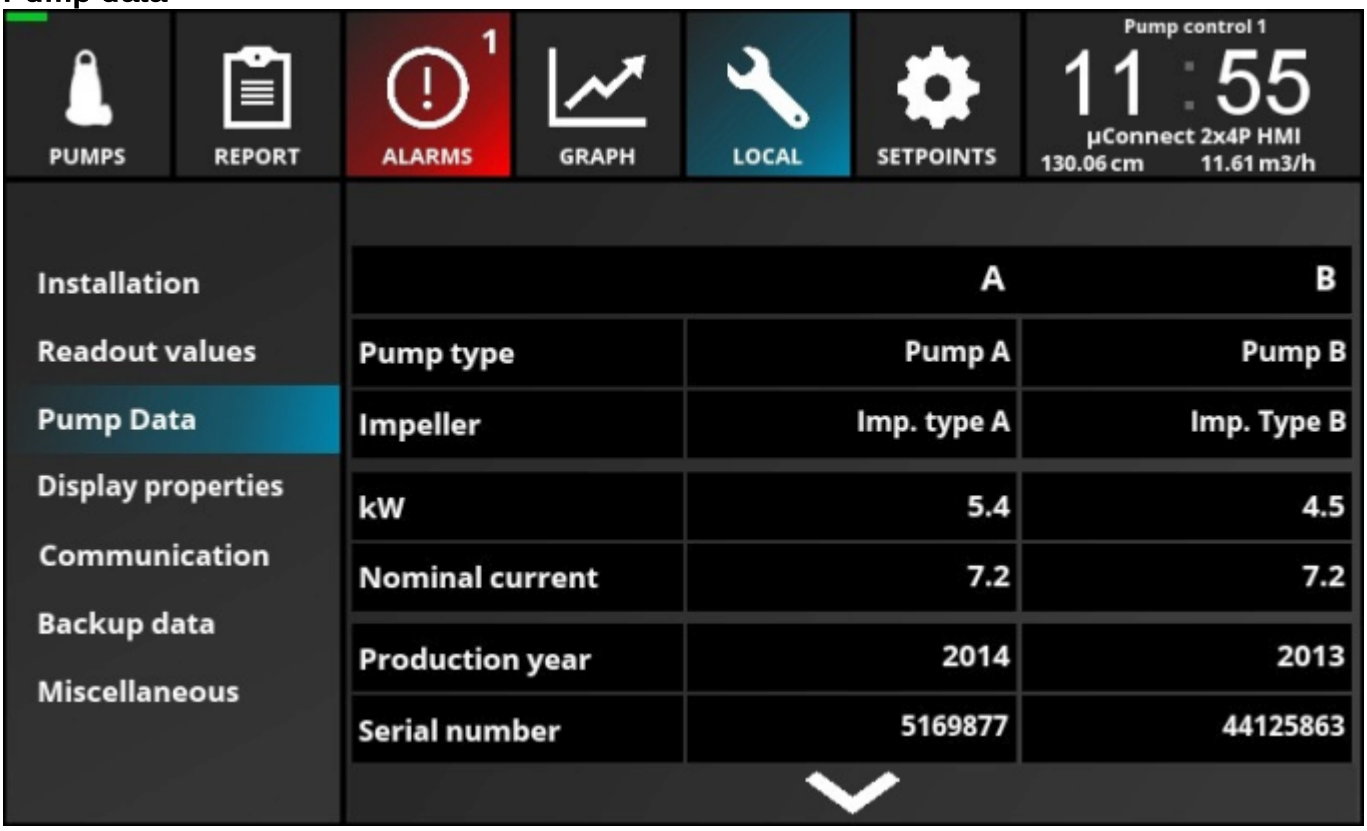
The values can be reset to ‘0’ (Zero), and all values can be pre-set to a desired value by selecting the number elements.

For pump controller 3, if no DO is selected as pump start signal, then these values are not available.

Text	Class:	Description:
Pn Runtime since last service (h)	C	Time is displayed in whole hours of runtime for that pumps digital output.
Pn Starts since last service	C	Starts are displayed as number of activations for that pumps digital output.

Pump data

Pump data



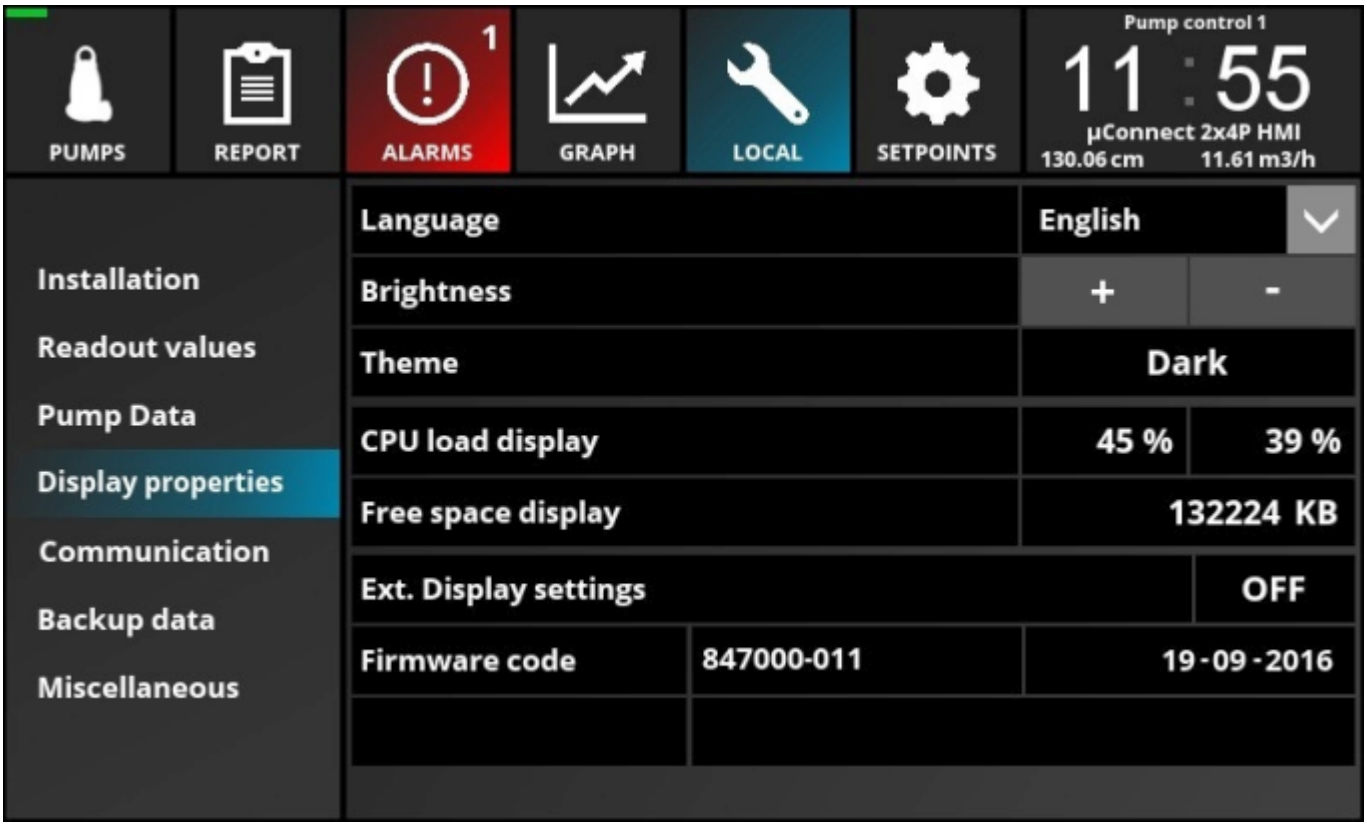
Pump data is a place to save data for up to 4 pumps in a station.
Pump data is global for all pump controllers in connected unit, and all values are saved in the connected unit´s configuration.
Values on this screen are NOT used anywhere else in HMI configuration.
All values require Class C for changing values.

Pumps are named Pump A, B, C, D, as they can be mixed between activated pump controllers.
HMI will count how many pumps are available in the connected unit's configuration for all enabled pump controllers, and enable elements for as many pumps counted, up to max 4 pumps.

I.e. if pump control 1 has 2 pumps available, and pump control 2 has 1 pump available, HMI will enable pump data elements for pumps A, B and C only.
I.e. if pump control 1 has 3 pumps, pump control 2 has 2 pumps, and pump control 3 has 2 pumps, pump data for pumps A, B, C and D are enabled.
It is then up to the operator to select which 4 of the 7 combined pumps that shall have their pump data saved here.

Note: Register for storing these settings can be found later in this manual, here 141.

Display properties

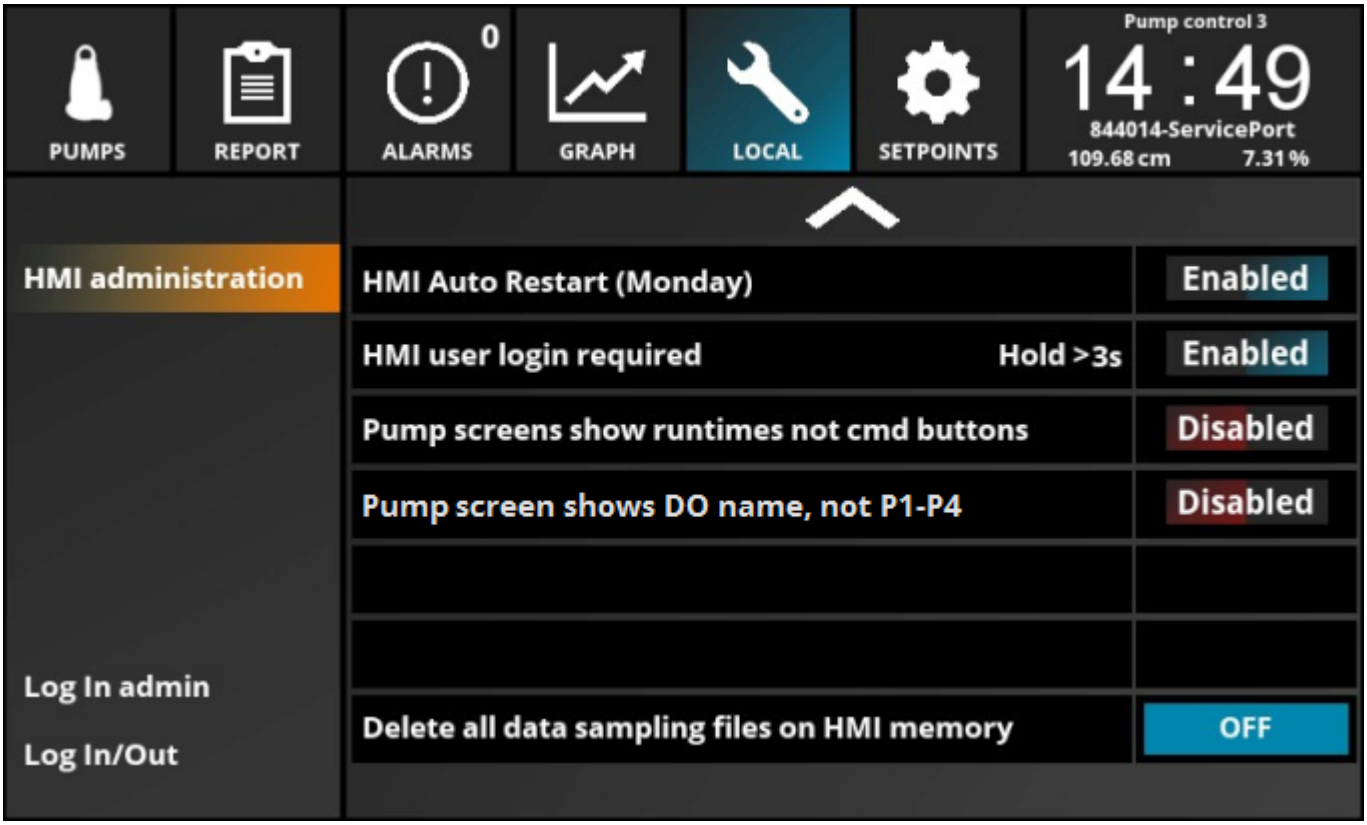


Text	Class:	Description:
Language	C	The language for all texts in HMI can be changed to a desired language by selecting any of the available translated languages implemented in the HMI configuration. Texts which are read from connected unit's configuration are NOT affected by this language selection. If a language which is not understood by the operator is selected by mistake, the language for the HMI can be reverted to English by selecting and uninterrupted holding the LOCAL button on top menu for more than 10 sec..
Brightness	-	The brightness of the HMI backlight is default set to maximum brightness. If desired the brightness level can be decreased and increased.
Theme	-	The theme of the HMI can be selected between Dark and Light theme. 
CPU load display	-	The two values indicate how much load is on the HMI CPU and RAM. Values can vary from station to station and unit configurations.
Free space display	-	The value represents the remaining amount of storage left in HMI, Storage is used for storing graphs and other logged values.
Ext. Display settings	E	This function opens a small floating menu for technical access to HMI user interface. Default is OFF.
Firmware code	-	The firmware code indicated the version and date of the HMI configurations loaded in the HMI. Date is displayed in the format dd-mm-yyyy. When contacting support team, this information can be helpful. See list of HMI-versions 143

HMI administration

When viewing the Display properties screen, access to the HMI administraton screen is achieved by selecting and holding the “Display properties” button for more than 0,5sec.

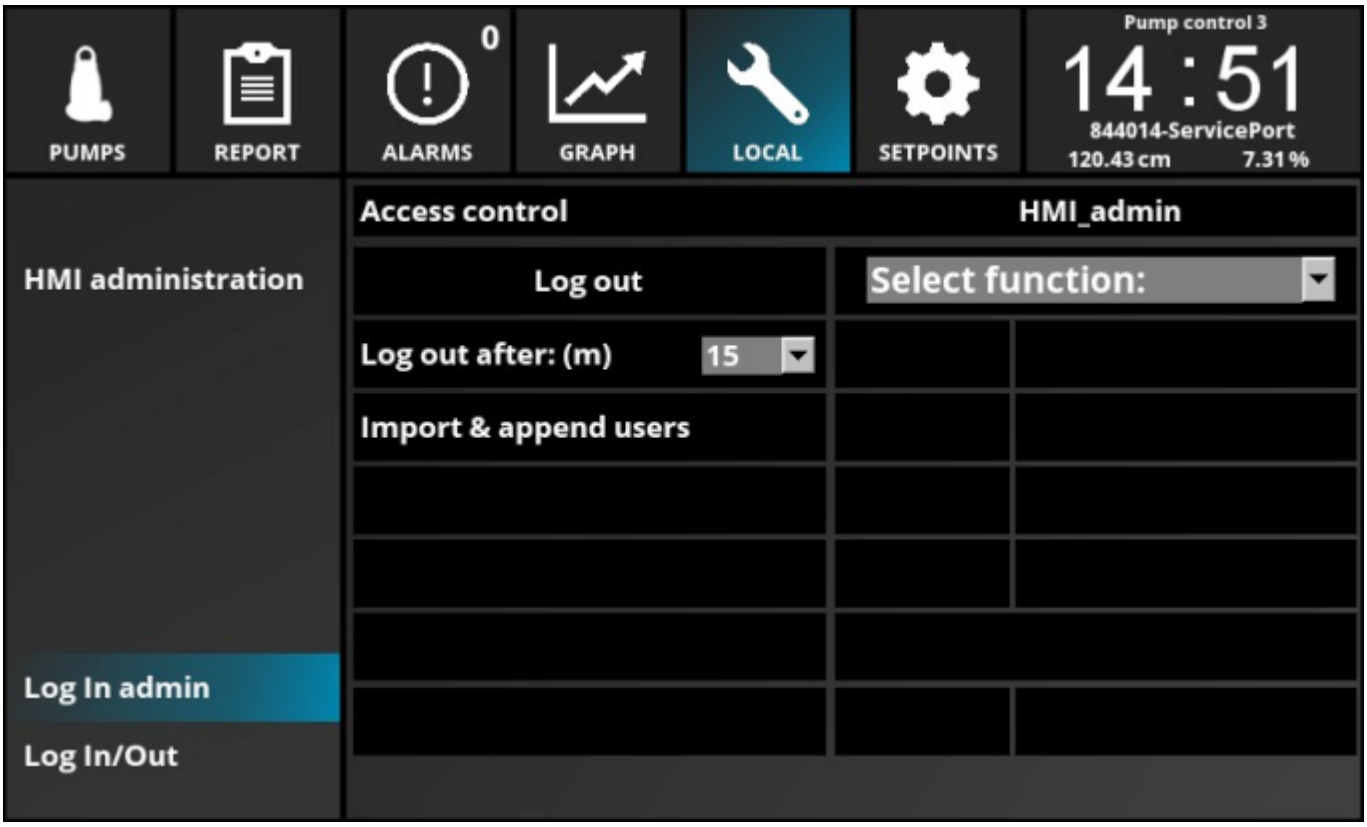
Text	Description:
Reboot HMI	Select and hold button for more than 0,5 second will restart the HMI.
Timeout for touch (Min)	1-30 minutes, Default 15 minutes. Set the time for when the HMI will auto return to pumps screen for the selected pump controller, when no touch has been made for the given time period.
Settings Com 1 & Com 2	Com port settings for the HMI serial communication ports.
Disable mouse curser	Enable/Disable a visual mouse curser by flipping this selection. Mouse curser can be used to point and tell directions to a local operator viewing the HMI, when using remotely connection via VNC. Default is ON.
Open hardware setting dialog.	Gives access to HMI hardware setting menus. Many of the settings for the HMI in this menu system are already implemented in HMI configuration.



Text	Description:
HMI Auto Restart (Monday)	Default is enabled. When enabled, this will make the HMI restart every Monday morning at 3:17. Disabled means that the HMI will never do the auto restart Monday mornings.
HMI user login required Hold >3s	Enable/Disable if the HMI should require user login to change settings, control pumps and more. (Hold button more than 3 seconds to change) Default Disabled **Note:** Once enabled, the only way to disable again, is to login as administrator.
Pump screen show runtimes, not cmd buttons	Enable/Disable if the START/STOP/BLOCK buttons on home/PUMPS screen will be exchanged for runtime information instead.
Pump screen shows DO name, not P1-P4	Enable/Disable if the Pump name on pump elements should show P1-P4, or display the name configured for the DO selected for the pump.
Delete all data sampling files on HMI memory	This will delete all sampling and history files in HMI. Graphs will no longer have any data to show.

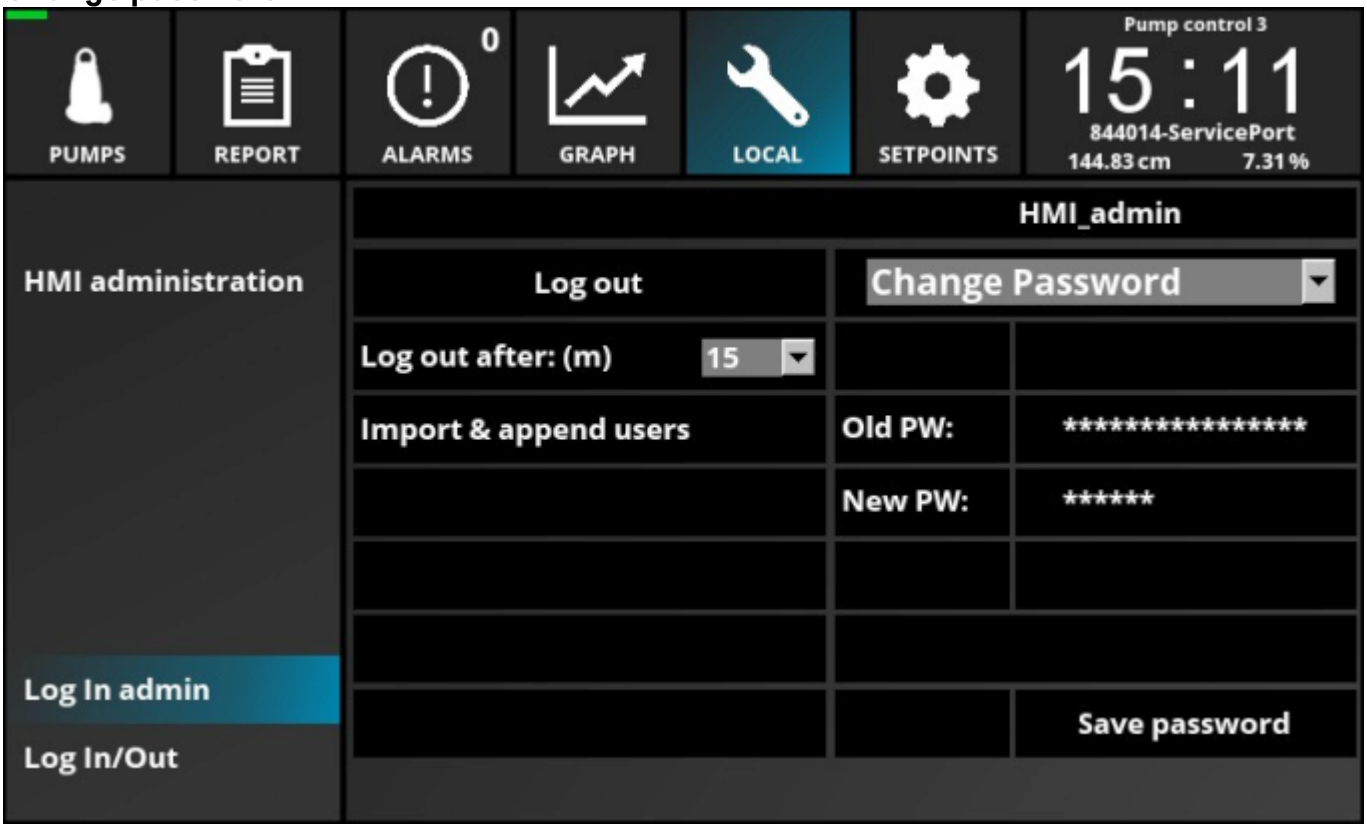
Log In admin

Log In admin gives access to administrate the user log ins and users in the HMI.



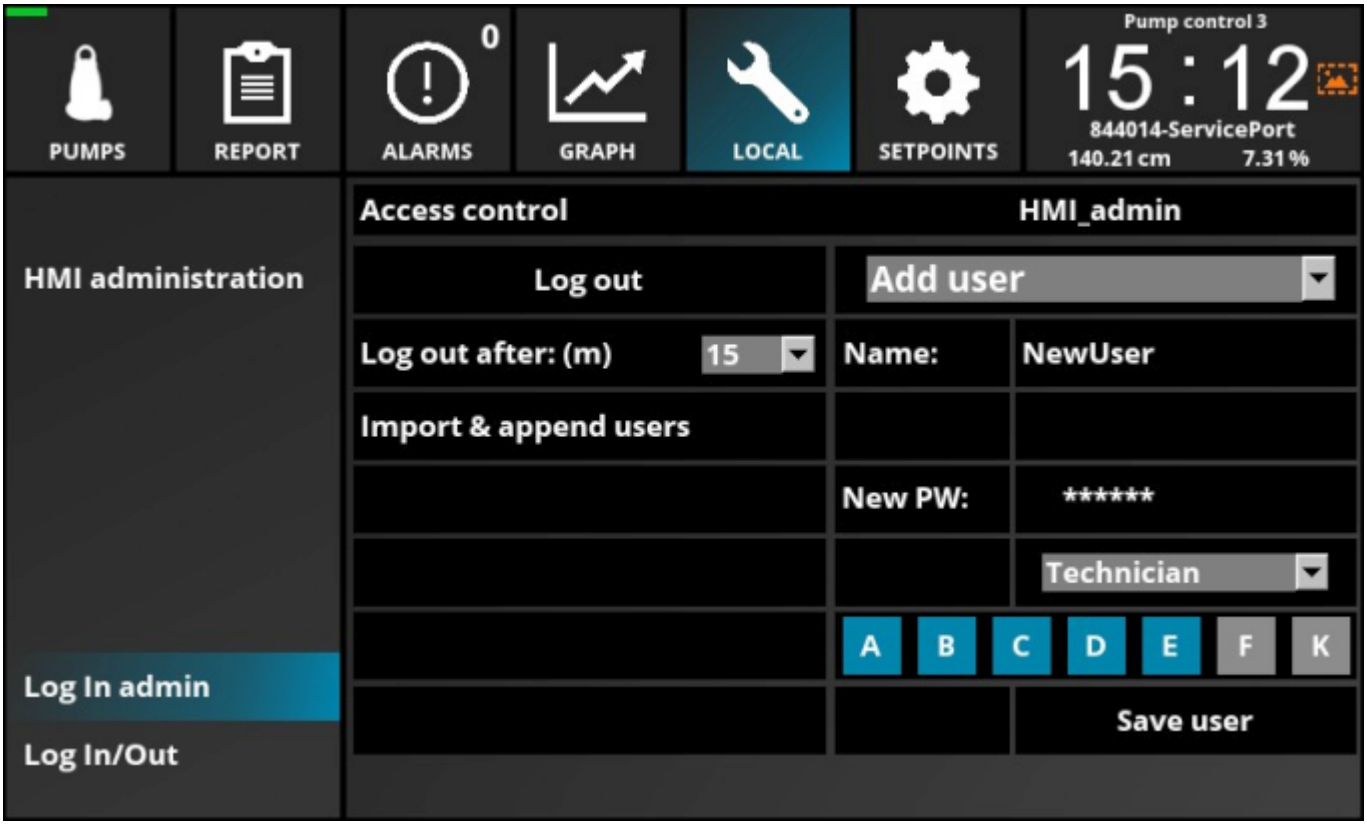
Text	Description:
Log in / out	Log in, will open a small log in window for the user to select the user to login with. Log out, will log the current user out.
Log out after: (m)	Set the time from last touch to the HMI, for when the user is auto logged out
Import & append users	This option is only available for HMI admin, and is used to add users to the HMI with an special created user profile file.
Select function:	This gives the users access to change his own password. The HMI admin can also: Add users Change previledges Delete users.

Change password



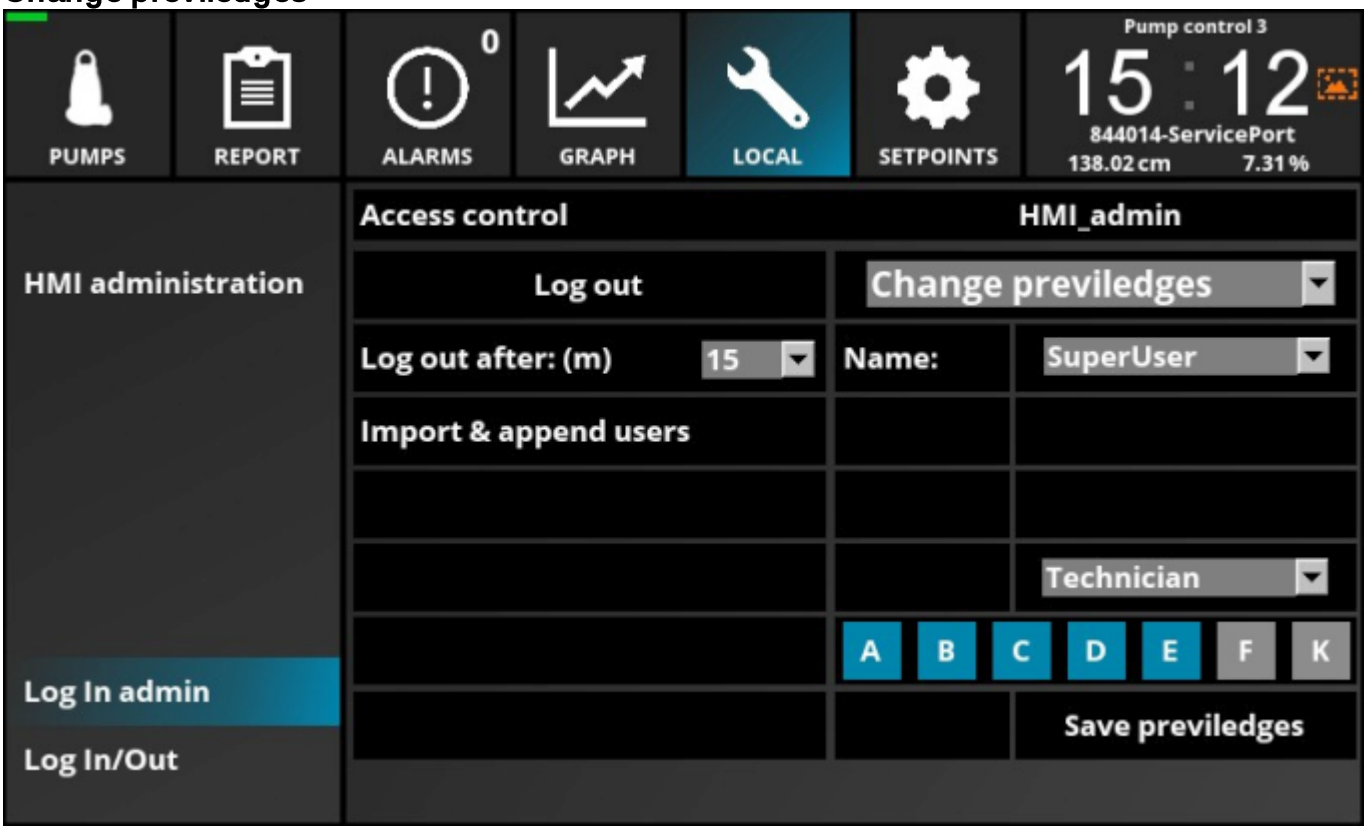
To change the password for the user:
Fill in the actual password in Old PW.
Fill in an new password in New PW
Select Save password.

Add user



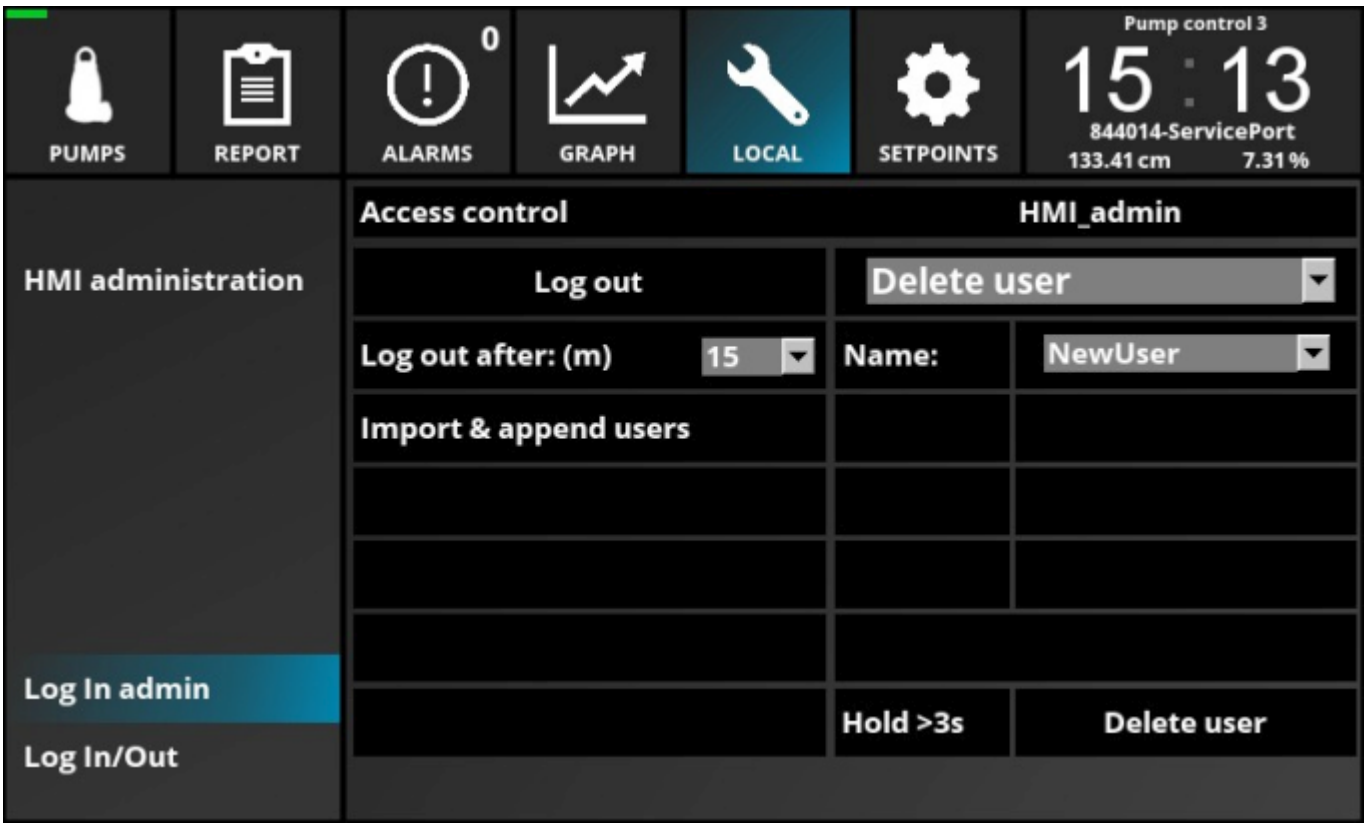
To add a new user:
Fill in the name for the user in Name. **Note !** **Do NOT use space or special chars in user name**
Fill in an password in New PW
Select the previledges for the user
Select Save user.

Change previledges



To change previledges for the user:
Select the user in Name
Select the new previledges for the user from drop down, or manually selecting the letters.
Select Save previledges.

Delete user



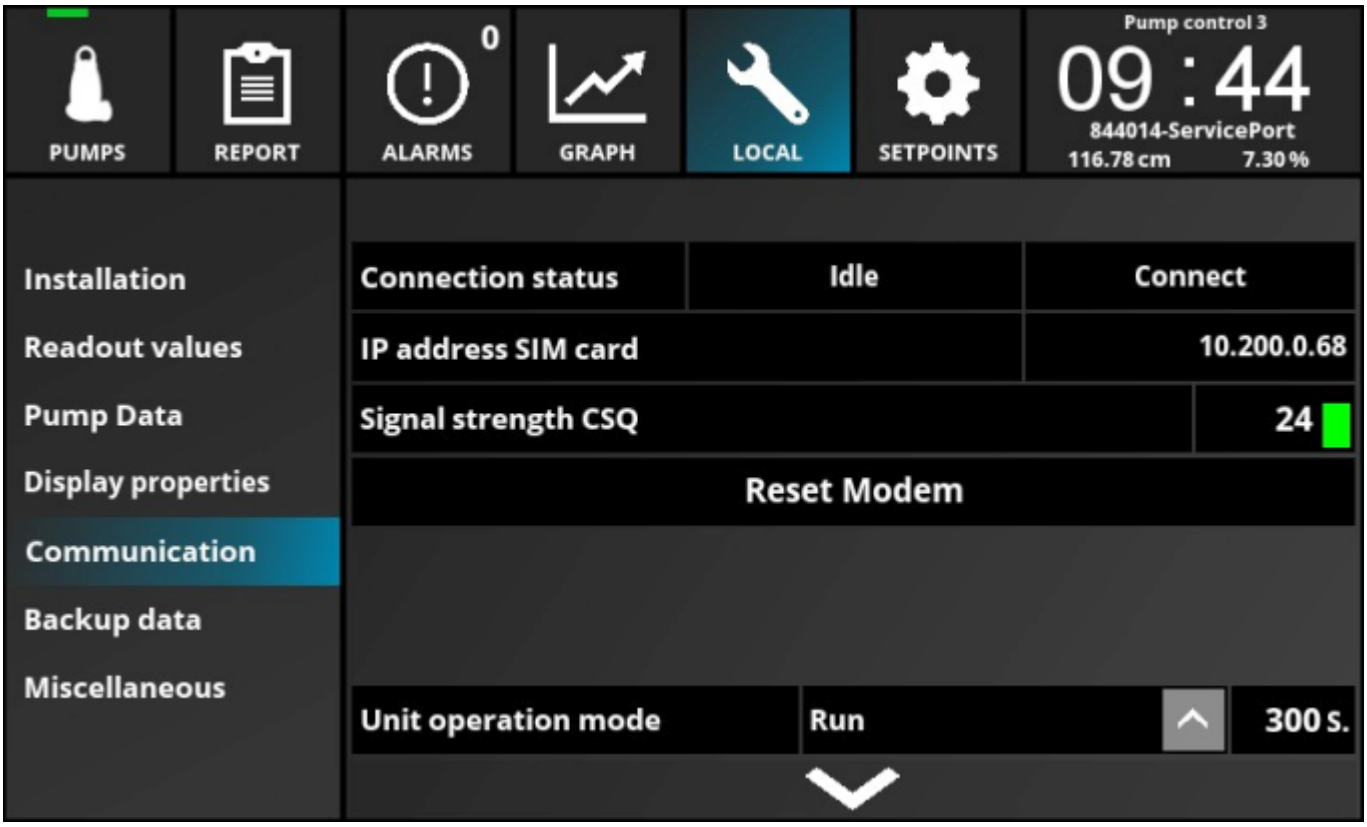
To Delete a user:
Select the user in Name
Select and hold for >3 seconds Delete user.

Default user & previledges

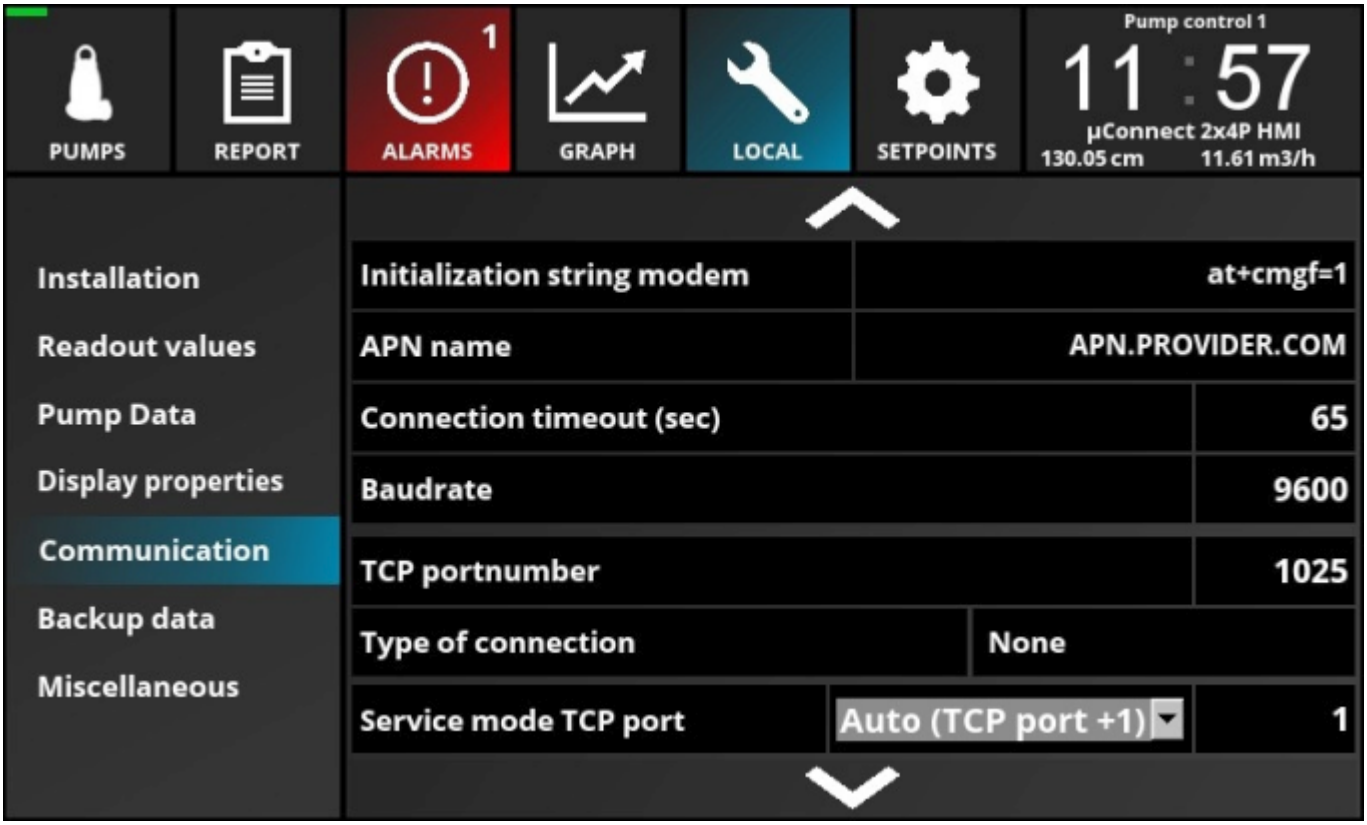
4 default users is implemented:

User name:	Default password:	Classes:	Description:
User	111111	A	Can only control the pumps.
Superuser	222222	A, B	Can also change Start/Stop levels, and configure Level transmitter.
Technician	333333	A, B, C, D, E	Can also Change general set points, Configure I/Os, do system setup (Setup PCs) and more.
HMI_Admin	999999	A, B, C, D, E, F, K	Can also disable the log in function, manage users and rights, Import users from USB.

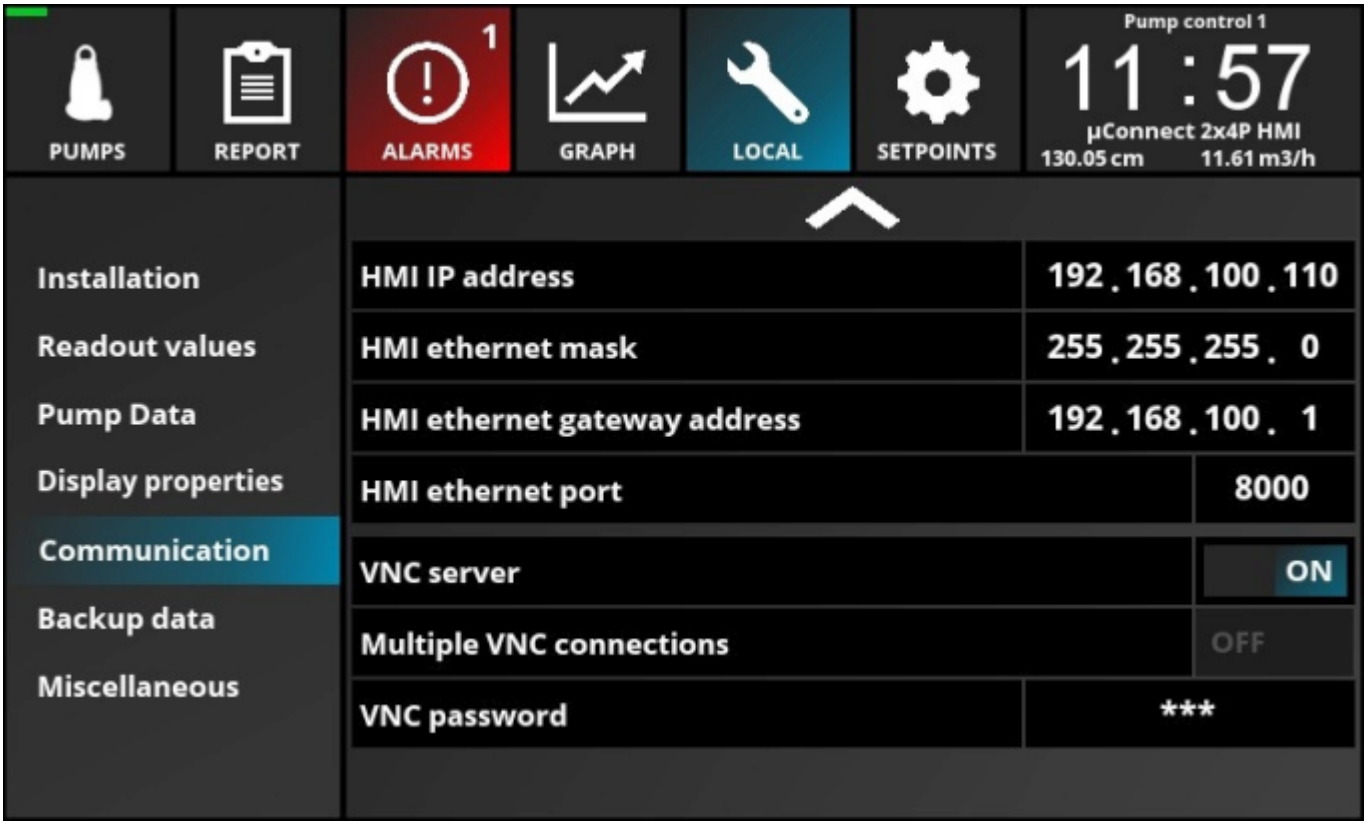
Communication



Text	Class:	Description:
Connection status	-	The two elements displays the status of the internal modem in the connected unit, and if the modem is connected to i.e. SCADA system.
IP address SIM card	-	If connected unit has an internal modem, and a sim card with network access is installed. The assigned IP address for that sim card is displayed here.
Signal strength CSQ	-	If connected unit has an internal modem, and a sim card with network access is installed. The assigned IP address for that sim card is displayed here.
Reset modem	A	Sometimes it can be necessary to do a modem reset to get the internal modem in the unit to respond to communication.
Unit operation mode	A	Shows the status of the operation mode and the timeout when in configuration mode. **Run:** The unit will listen and communicate on the standard TCP ports. (502 & 1025). **Configuration:** The unit will only listen and communicate on the selected configuration mode port. In this mode the timeout will count down when ever there is no communication, and when timed out the unit will change to Run mode. **Pending**; Run & Configuration, the unit is in change between modes, and going to the described mode.
Timeout (s)	C	Set the timeout (300-1800s) for configuration mode.

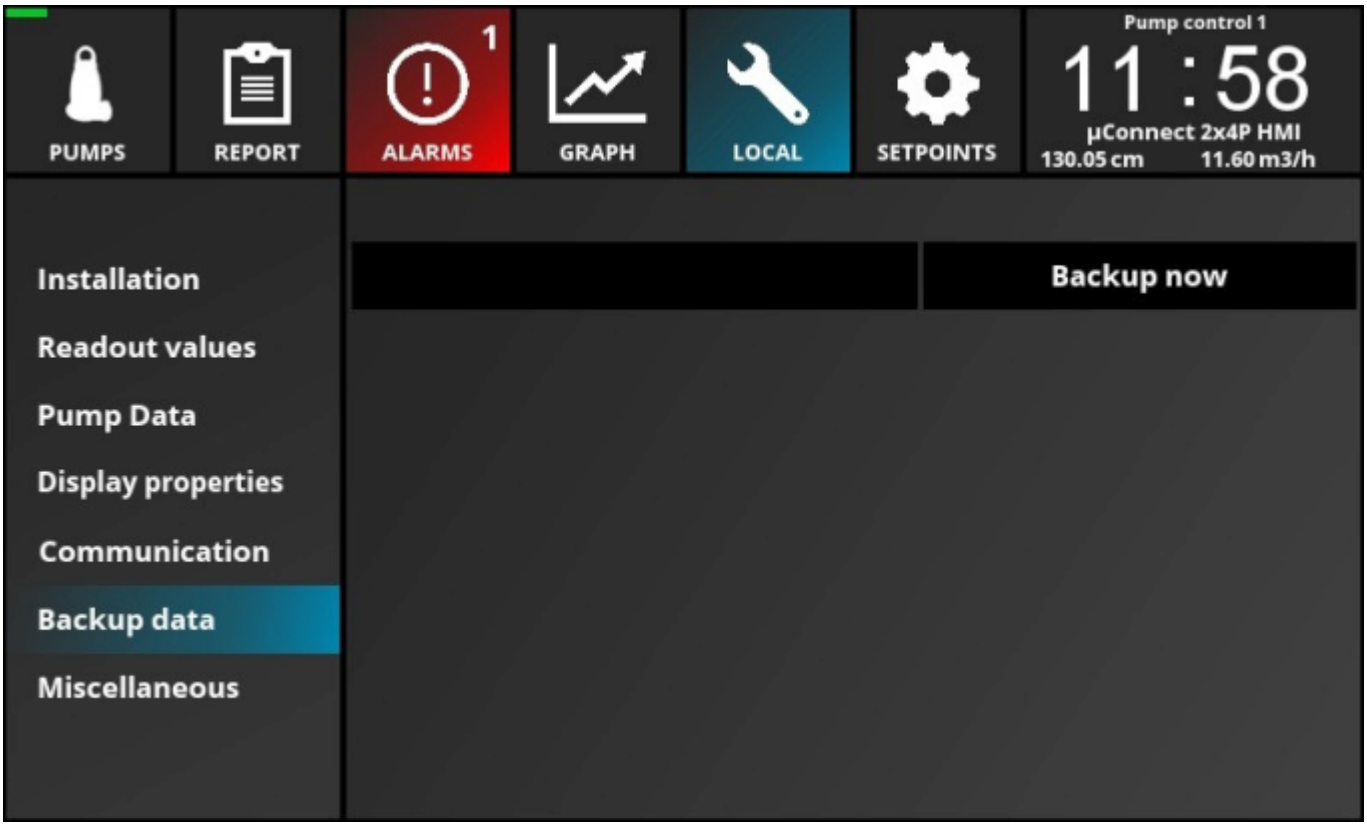


Text	Class:	Description:
Initialization string modem	E	If the internal modem requires a special string for connecting through the service provider, the string can be input here. Note: Initialization string must be input in lower case letters only.
APN name	E	If the sim card installed in the connected unit´s internal modem is allowed to access an IP network, the APN for that network can be set here. Note: APN must be entered as UPPERCASE letters only.
Connection timeout (sec)	E	The connection timeout set in the connected unit´s configuration.
Baud rate	E	The speed from connected unit´s configuration for communicating with the internal modem, or if a serial communication is used, the speed for the serial transmission with the unit.
TCP port number	E	The TCP port number used to communicate with the connected unit, only when using internal modem and IP network. Default value is 1025.
Type of connection	E	If connected unit does not have internal modem, and uses serial communication module, the specific type of communication carrier can be selected.
Service mode TCP port	E	Select the TCP port, for communication when in configuration mode. Default is Auto **Not in use:** The unit will not be able to change to configuration mode. **Auto (TCP port +1):** The unit will use the normal selected TCP port number +1 for its configuration mode. (Ie. 1025+1 = 1026) **Manuel:** The user can select a port number between 1025-65535 for communicating when in configuration mode.



Text	Class:	Description:
HMI IP address, HMI Ethernet mask, HMI Ethernet gateway address	E	If HMI is to be accessed remotely via VNC server, the addresses can be changed to match the connected networks IP range. Remote access to HMI via VNC requires HMI to be connected to a network via the Ethernet port. HMI does not have DHCP lookup enabled and thus must be provided with a fixed IP address.
HMI Ethernet port	E	The TCP port number for communicating with the HMI when using a VNC client.
VNC server	E	When HMI is to be accessed remotely via VNC server, this setting can be activated. If not activated, HMI will not respond to VNC client requests. Default is OFF.
Multiple VNC connections	E	More than one client can access the HMI via VNC server at one time when this setting is ON. The setting cannot be changed if VNC server is already active. Disable VNC server before changing this. Default is OFF.
VNC password	E	When connecting to HMI via VNC it is required to enter a password for access. Password request for access cannot be turned off. Standard password is: mjk

Backup data

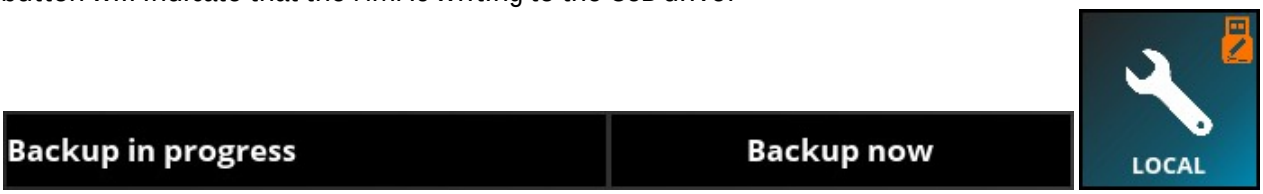


Mounting USB drive for backup

Mount a USB Flash drive in the "USB Host socket" listed as No. 6 in Electrical and mechanical mounting and connecting 9
If no USB drive is mounted, the Backup option is not available.
When mounting an USB drive for doing backup, a “Download/Upload” pop up screen will appear with several options and a countdown.
Select the “Cancel” button to close the pop up screen.

Text	Class:	Description:
Backup now	A	This option will make the HMI do a backup to USB of all graph data available in HMI. Depending on the amount of data available, the saving of graph data can take some time. Please be patient, and let the HMI finish the task.

When backup is running, a text will appear telling that the backup is in progress, and a small icon on LOCAL button will indicate that the HMI is writing to the USB drive.



It is OK to change screens and use the HMI while the backup is in progress.

When backup is finished, the text and small icon will disappear.
It is now safe to remove the USB drive again.

Where do I find the data from the backup?

Logged data are saved on USB drive in a sub folder named “datalog”, within a folder named the same as the station name.

Please see “HMI USB data and formatting backup data” chapter for more details, here 134.

Miscellaneous

Text	Class:	Description:
Trend resolution (sec)	E	Set the log interval, for retrieving the Extend log with SCADA systems. This is not used for the HMI graphs.
AI Nr. For Pressure [0 = none]	E	Set the signal number for an analogue input in connected unit, which is used for measuring pressure. Default signal number is '0' Zero, for not in use. Measurements from this analogue input will be shown on pump screen, be available in graphs and logged values for backup to USB.
AI Nr. For Flow [0 = none]	E	Set the signal number for an analogue input in connected unit, which is used for measuring flow. Default signal number is '0' Zero, for not in use. Measurements from this analogue input will be shown on pump screen, be available in graphs and logged values for backup to USB.
DI Nr. For Flow puls [0 = none]	E	Set the signal number for a digital input in connected unit, which is used for measuring flow volume. Default signal number is '0' Zero, for not in use. Measurements from this digital input will be shown on volume report screen. Volume unit will be assumed the same as the unit chosen for the corresponding flow analogue input.

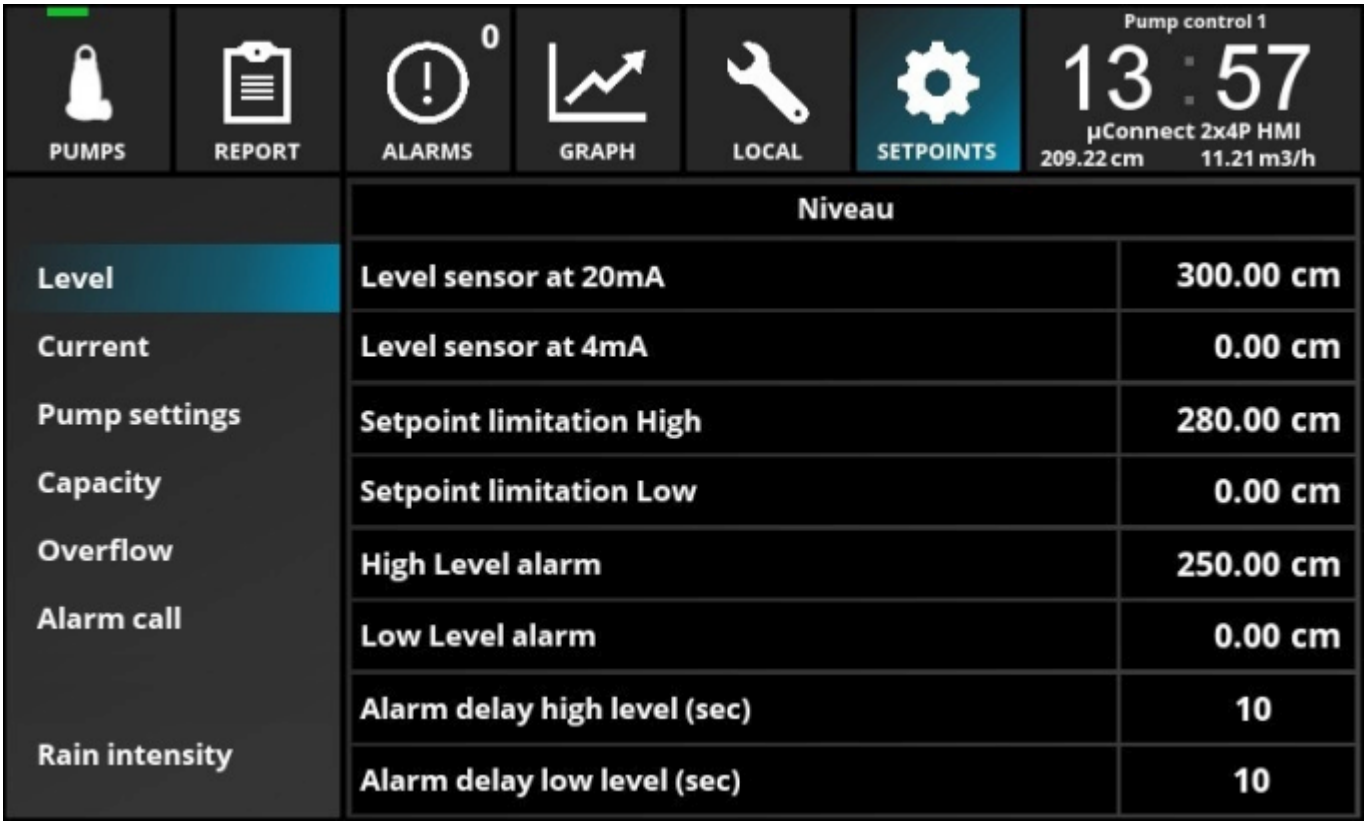
Note: Register for storing these settings can be found in back of this manual, here 141.

Setpoints

The Setpoints screen allows configuration of the start/stop levels of pump controller and much more.

Level

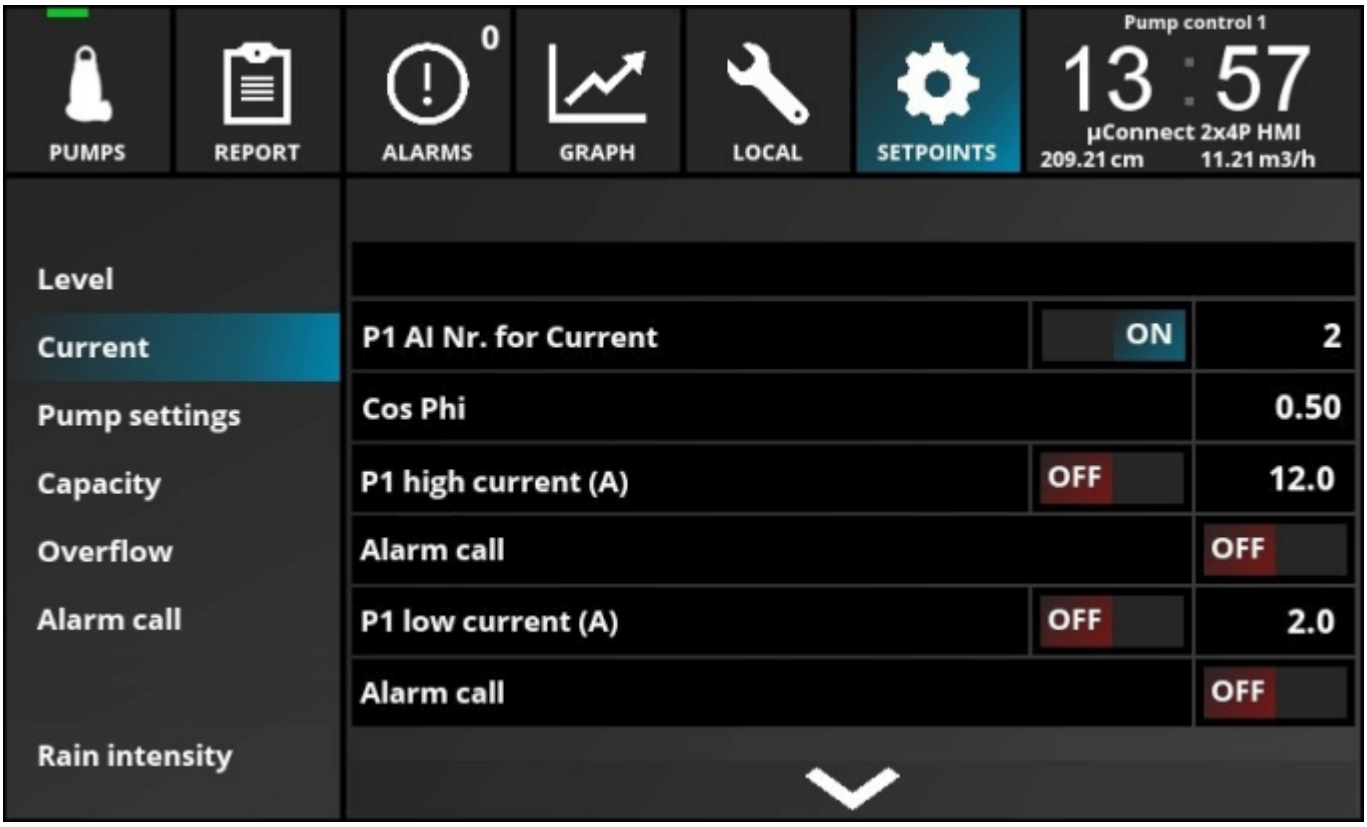
All levels and delays can be changed and is written to the analogue input selected in the pump controller.



Depending on the selected input for level measurement in the connected unit, some of the shown settings may not be available.

Text	Class:	Description:
Level sensor at 20mA, Level sensor at 4mA	B B	The scaling of the level sensor connected to the analogue input for pump controller level measurement. Changing this will have impact on the level reading, and function in the pump controller.
Setpoint limitation High, Setpoint limitation Low	B B	These values set the scale for the level bar on pump screen, and also the scaling of level graph on graph screens. These values also limit the allowed setpoints to be entered for Start and Stop values for pumps + high and low alarm thresholds.
High level alarm, Low level alarm	B B	These values set the high and low level alarm thresholds for the analogue input. Values are used to indicate High and Low limits on level element on pump screen. Changing the values can have impact on the behaviour of alarm conditions in connected unit´s configuration.
Alarm delay high level (sec), Alarm delay low level (sec)	B B	The time the level has to be over or under the threshold before activating High or Low status.

Current



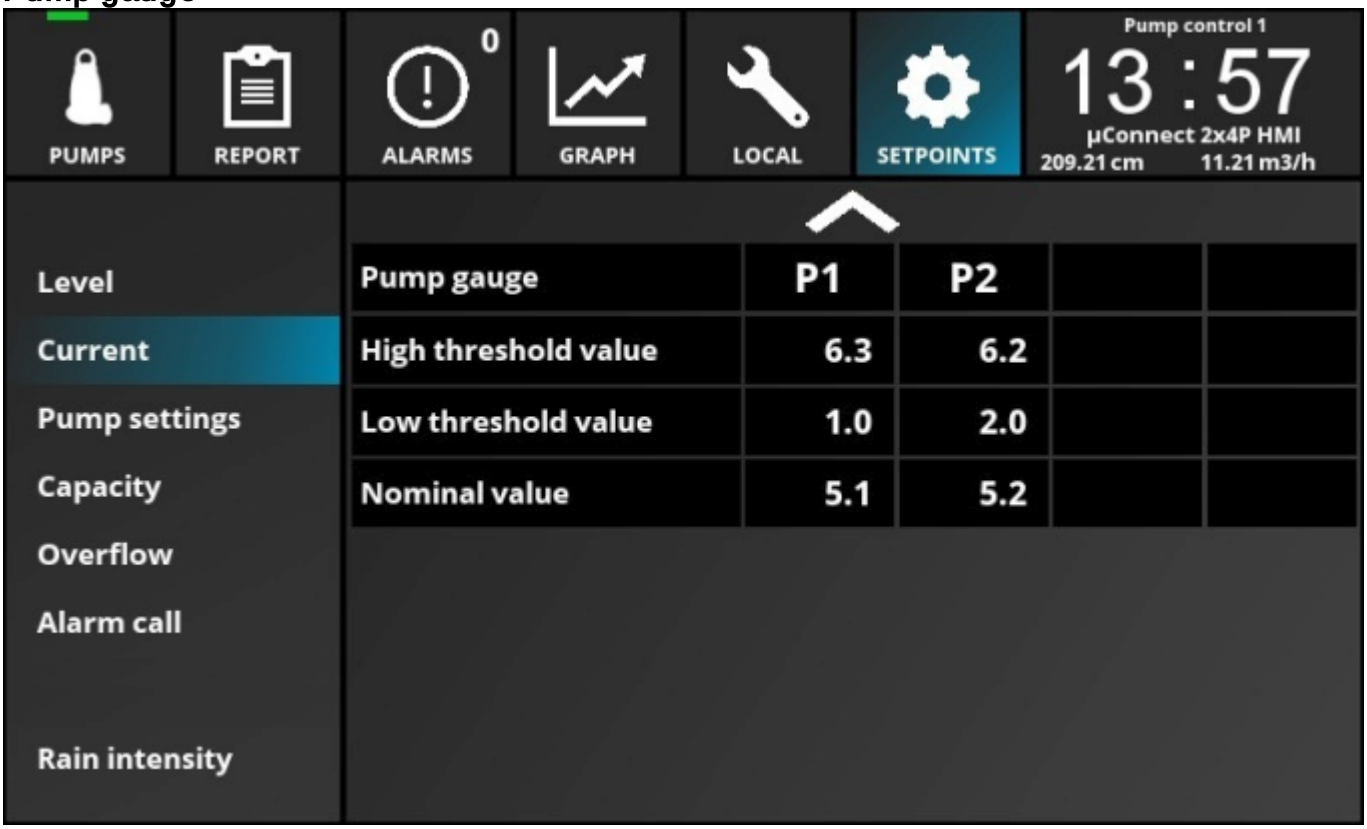
The following screens provide settings for the analogue input used for power consumption for each pump in the selected pump controller.
Additional screens for each pump are activated for as many pumps are available in the selected pump controller's configuration.

The configuration can vary slightly from pump controller to pump controller, and firmware to firmware, but general settings are matching.

The screen after the last available pump is the HMI gauge setup screen.
When viewing any of the pump analogue input screens, the "Current" button on the left menu will act as a direct shortcut to HMI gauge setup screen.

Text	Class:	Description:
Pn AI Nr. For Current PC3: Pn AI nr. for current [0= Use Std kW]	E	Depending on the firmware in connected unit, and the selected pump controller, this will provide the possibility for choosing which analogue input is used for power consumption measurements for the pump. For PC3, the normal value for gauges are the energy derived from VFD, but if desired a analogue input van be selected as current instead.
Cos Phi	E	Where available, it is possible to change the Cos Phi value for the pump.
Pn high current (A) [OFF/ON], Value Alarm Call	E C E	Settings for the chosen analogue input configuration in connected unit. It sets the high current thresholds, and if the unit must send an alarm, when the threshold is exceeded. Note: Changing these values can have impact on pump controller function, as the limit states can be used in pump run indication or “Pump running +low current” errors. Make changes with caution.
Pn low current (A) [OFF/ON], Value Alarm Call	E C E	Settings for the chosen analogue input configuration in connected unit. It sets the low current thresholds, and if the unit must send an alarm, when the threshold is exceeded. Note: Changing these values can have impact on pump controller function, as the limit states can be used in pump run indication or “Pump running +low current” errors. Make changes with caution.

Pump gauge



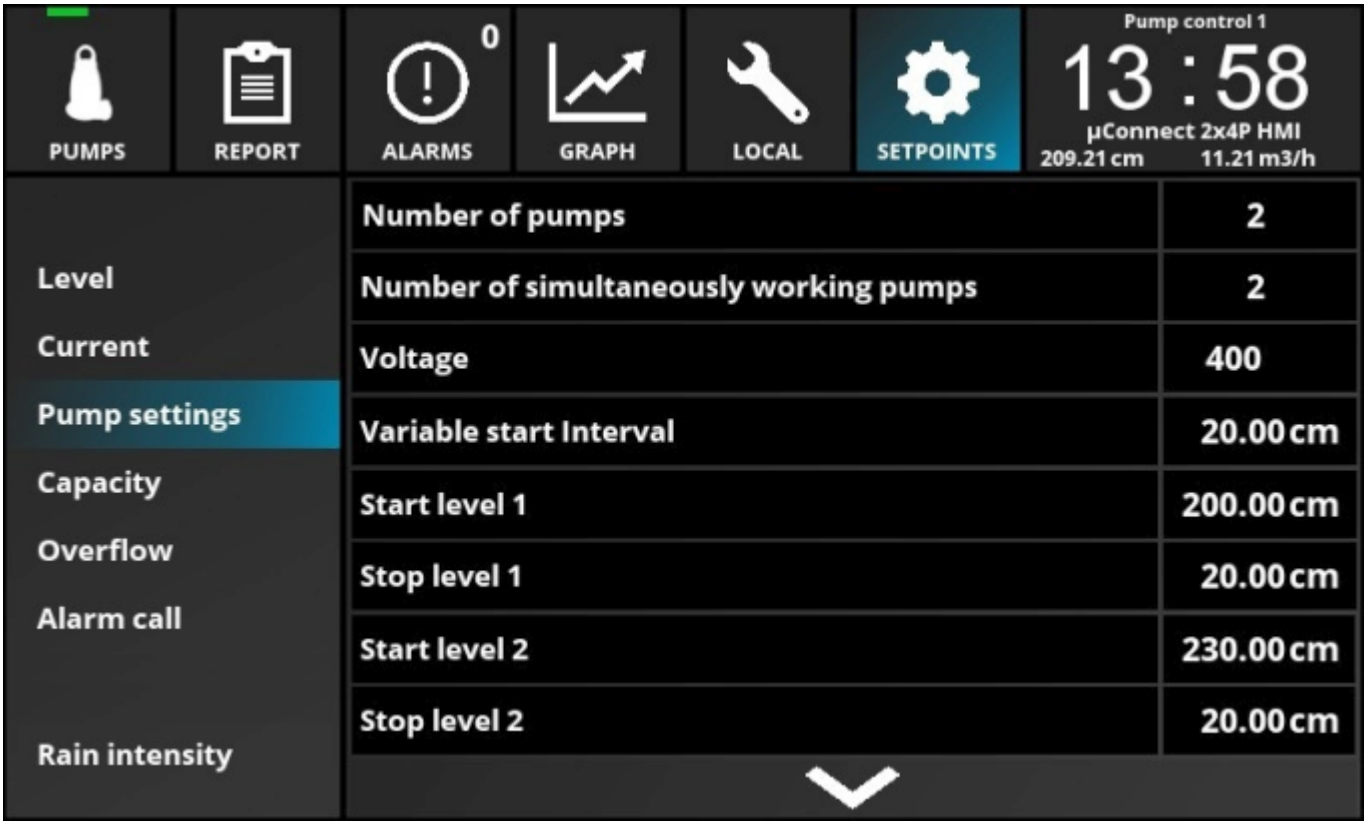
Text	Class:	Description:
Pump gauge	-	Indicate the columns for each pump, for changing the behaviour of the gauges shown in pump elements for each pump. All values are saved in the connected unit.
High threshold value	C	Sets the value for when the gauge on pump element should turn orange, to indicate pump power consumption is too high.
Low threshold value	C	Sets the value for when the gauge on pump element should turn orange, to indicate pump power consumption is too low.
Nominal value	C	This sets the scaling for the gauge, to have its nominal value indicated on the mark in the green gauge field.

Pump Settings

Pump settings differ, depending on the selected pump controller.

Pump settings PC1 & PC2

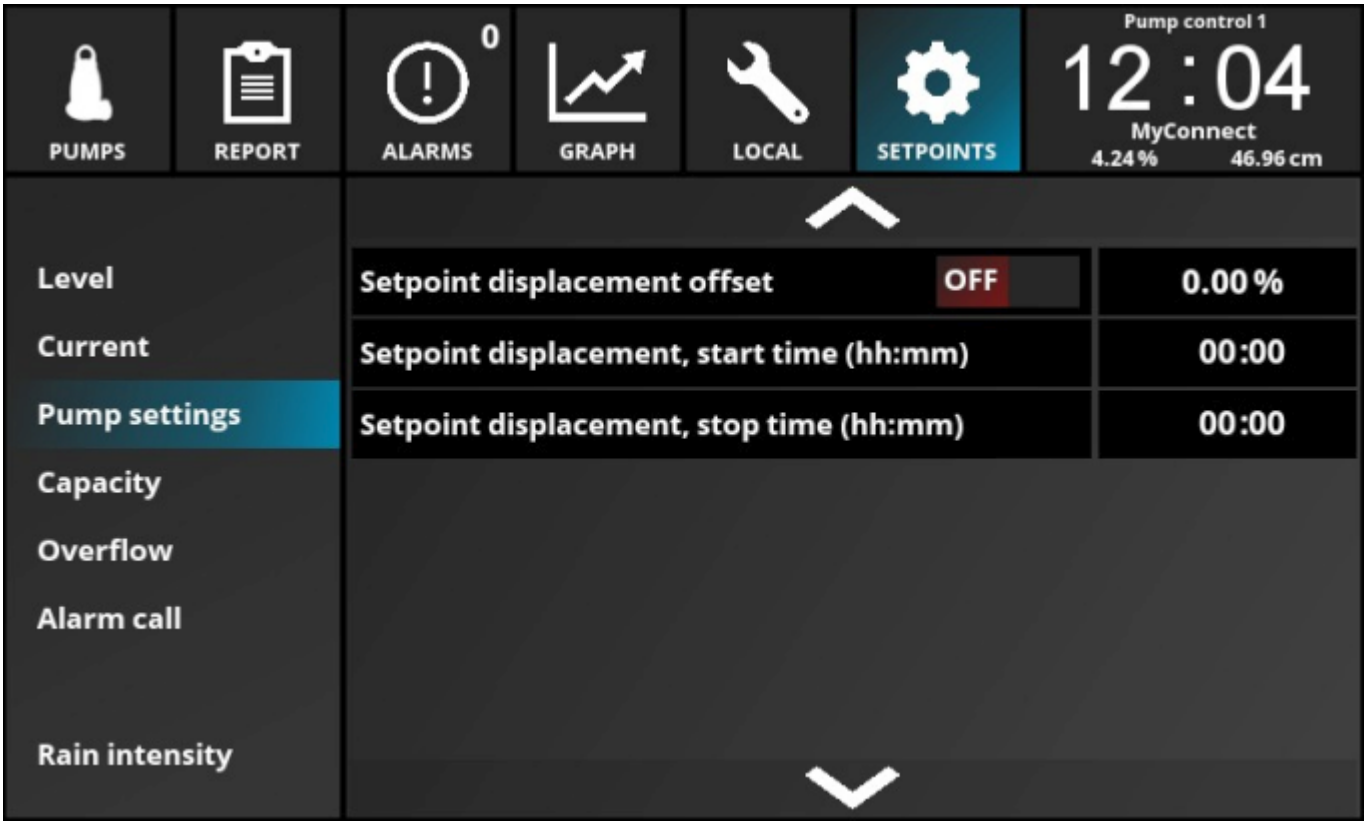
The following screens provide settings for changing the selected pump controller, and its pumps.
All settings are directly changed in the connected unit´s pump controller, and refer to the configuration of the connected unit´s pump controller functions.
Setting screens may vary slightly from firmware to firmware, and pump controller to pump controller, but general settings are matching.



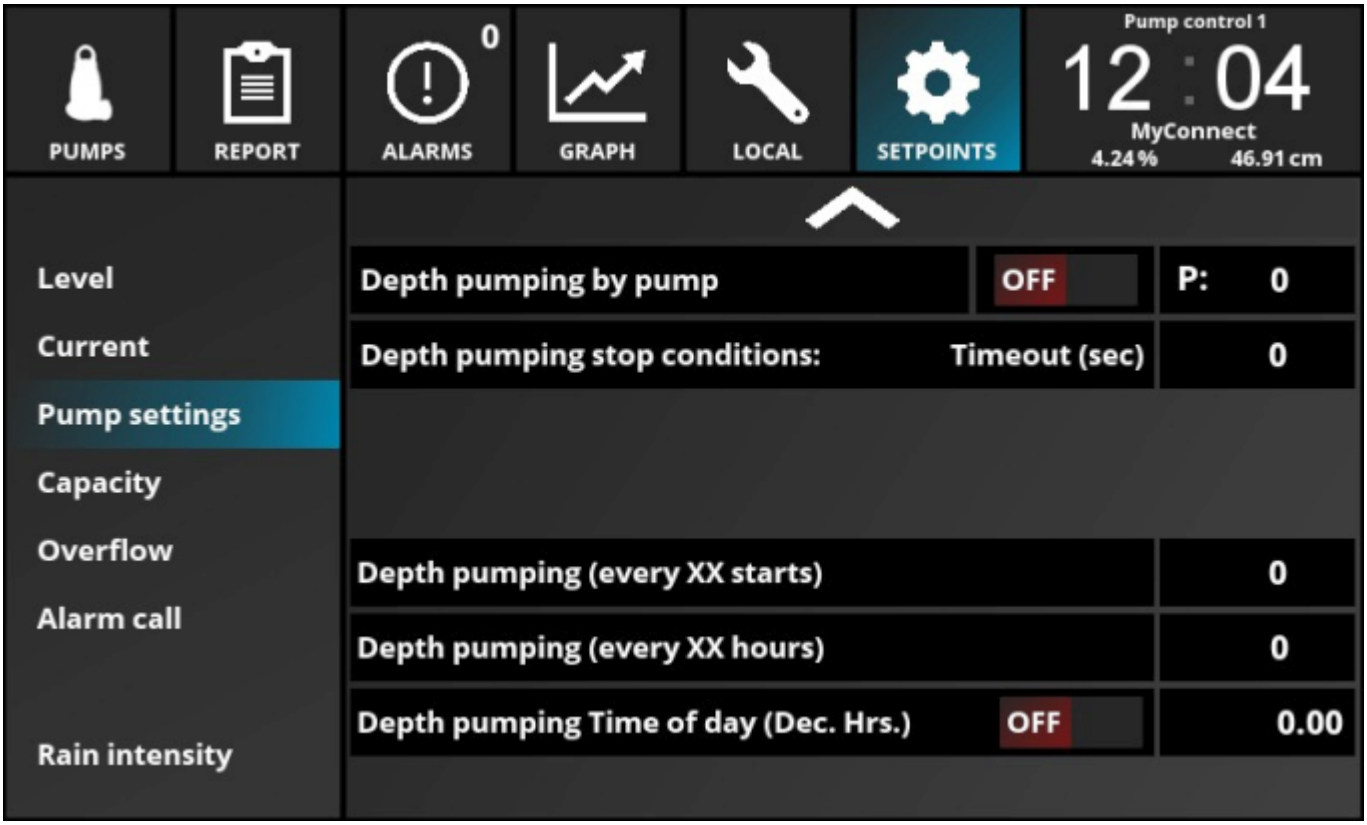
Text	Class:	Description:
Number of pumps	E	The actual number of pumps configured in selected pump controller. Change with caution. Changing this value will have impact on the behaviour of the selected pump controller.
Number of simultaneously working pumps	E	Set the number of pumps that is allowed to run simultaneously, for the selected pump controller.
Voltage	E	The voltage value derived from nameplate for the pump. The value is used in combination with Cos Phi, and power consumption for each pump, to calculate the power used by the pump in kWh.
Variable start interval	E	If desired, the pump controller can calculate a new start value before each time the 1st. pump is set to run. The calculated start value will be random level between “Start level 1” and (“Start level 1” – “Variable start interval”). This can help to reduce sediments in well, at fixed start level. Limitations for this value is (“Start Level 1” – “Stop Level 1”) / 2.
Start level n, Stop level n	B	The start and stop level thresholds for the pumps in the pump controller. Additional screen will be available if more than 2 pumps are available.

Additional screen will be available if more than 2 pumps are available.

Text	Class:	Description:
Pn alternation	E	If the pump controller needs to alternate between pumps at start levels, this can be activated for each pump.
Pn maximum runtime (sec)	E	If desired the pump can be set to only run for a pre-set amount of time before stopping, even if the stop level is not reached the pump will stop. This can be used in wells where inlet is constant high, and pumps will run for extended amount of time as they never reach stop level, so ensure that each pump is motivated equally.
Pump delay (sec)	B	If pumps are not allowed to start simultaneous due to high start current, i.e. when level is above start levels for multiple pumps, a delay for starting the individual pumps can be set. When set, the delay for a pump is always used when starting the individual pump.

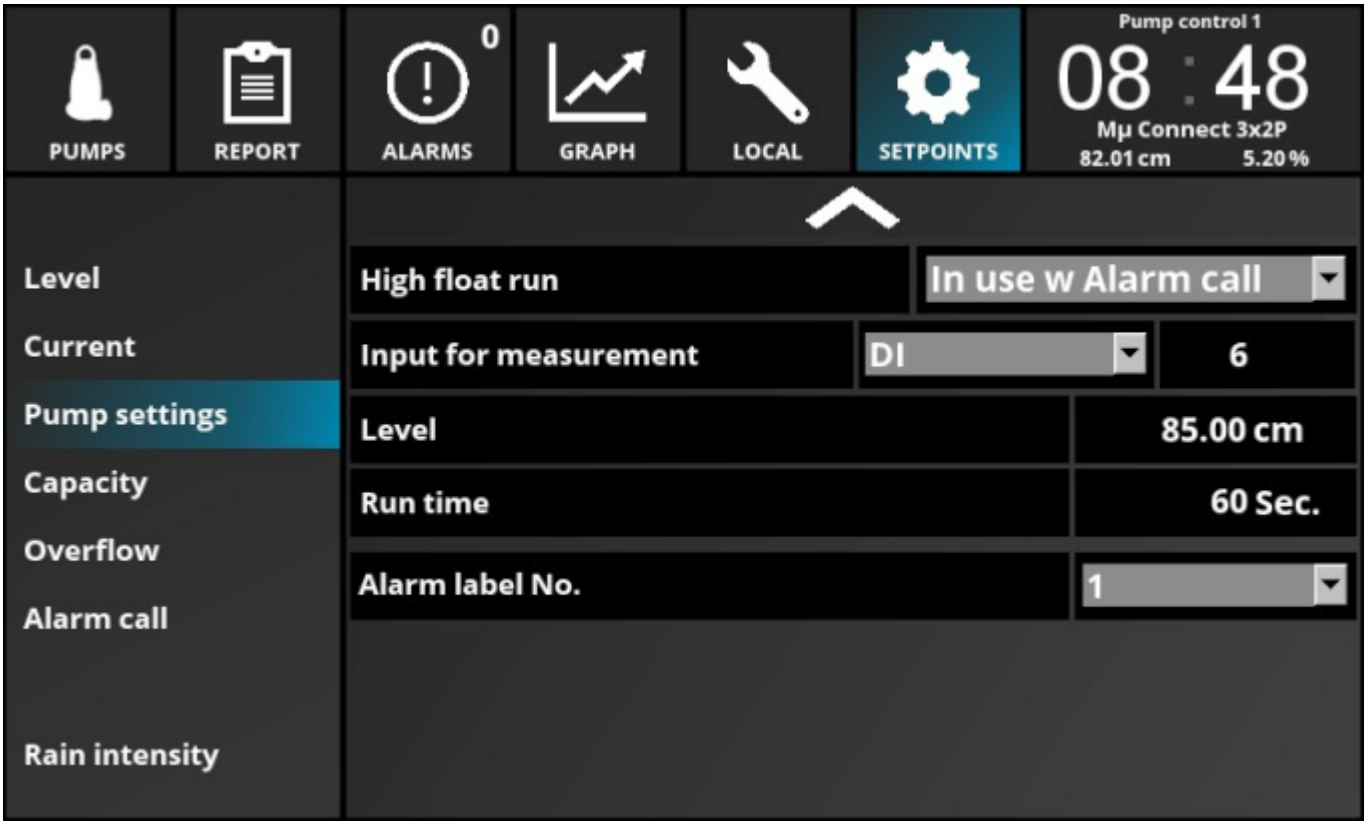


Text	Class:	Description:
Setpoint displacement offset	E C	The level offset for Start and Stop levels for all pumps when function is activated. The function can be used to increase waste water in sewage systems, by offsetting the levels for the selected pump controller. Function can be started from SCADA systems, or the connected unit can do it on a defined time base.
Setpoint displacement, start time (hh:mm) & Setpoint displacement, stop time (hh:mm)	-	The values only represent the configuration in connected unit, and cannot be changed. The values describes the time period for when the setpoint displacement is activated when function is selected as time operated.



Depth pumping set points for pump controller 1 & 2 only

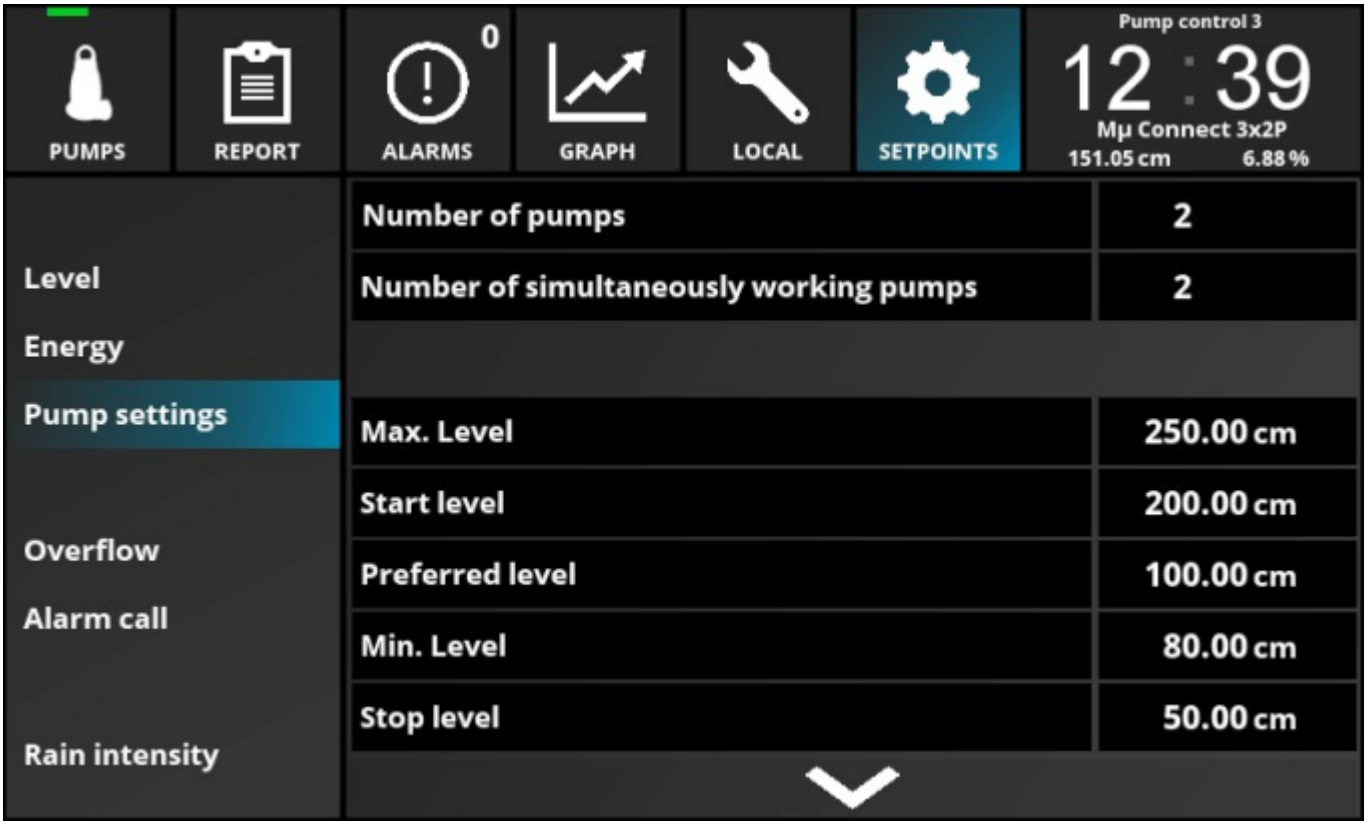
Text	Class:	Description:
Depth pumping by pump	E	Sets weather the function should be active or not, and the pump which should perform the depth pumping. Only one pump can be activated by the function and alternation of which pump to perform the depth pumping do not exists. The function keep the selected pump running after it´s stop level is reached, to remove sediments in well.
Depth pumping stop conditions: Timeout (sec)	C	The time the pump will keep pumping, when level goes below normal stop level.
Periodic pumping (Every XX starts)	C	Set the amount of starts for the selected pump, between the activation of the depth pumping function.
Periodic pumping (Every XX hours)	C	Set the number of hours between the activation of the depth pumping function.
Depth pumping Time of day (Dec. Hrs.)	E, C	Sets weather or not the dept pumping function should activate every day, on a predefined time of day.



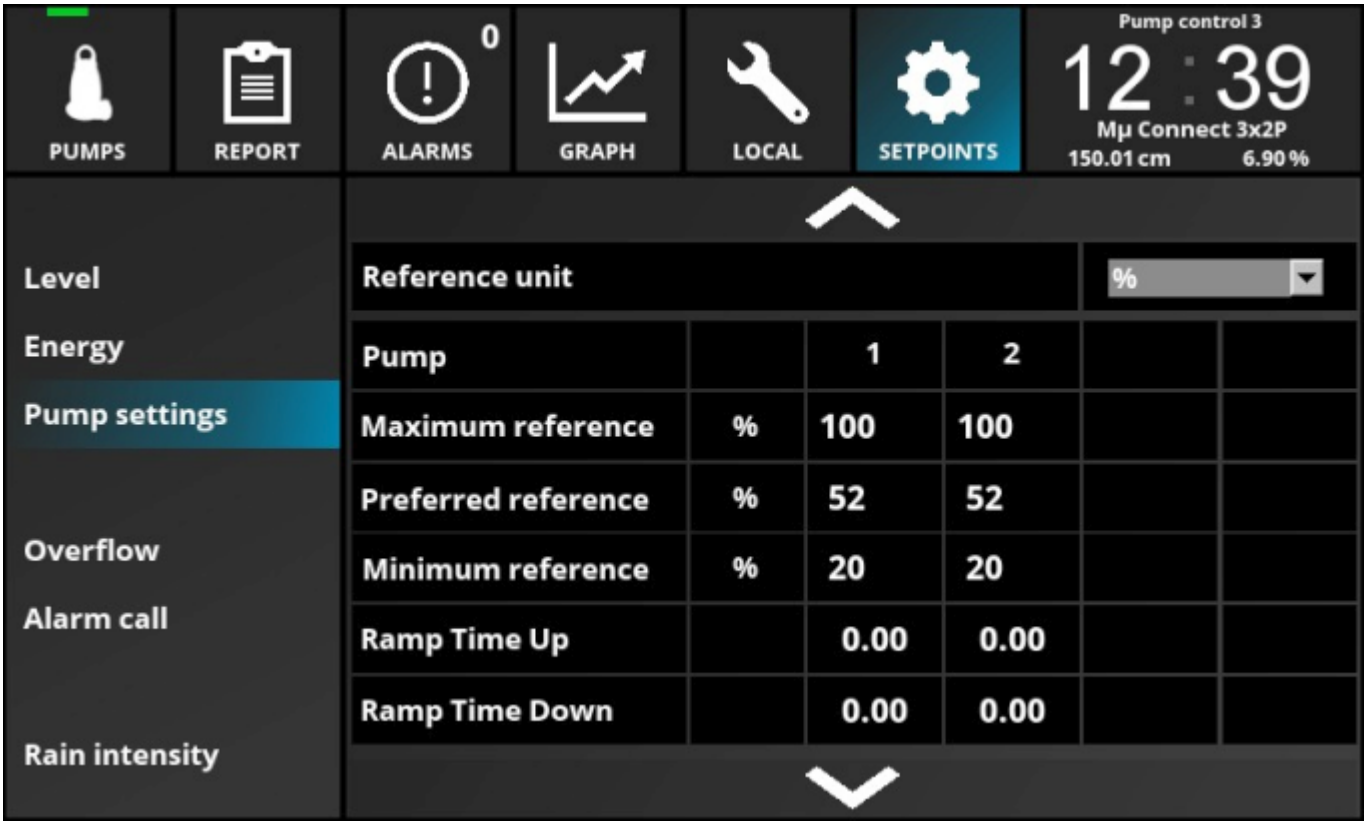
Text	Class:	Description:
High float run	E	Enable the function with or without an alarm is send to the alarm list.
Input for measurement	E	Select the digital signal type and number to activate the High float run function.
Level	B	Set the level where the high float is mounted tin the well. This can also be set to a value i.e. just above start for pump 1, if only one pump should be started.
Run time	C	When the digital signal is deactivated, the function will remain active for this amount of time. (Timeout)
Alarm label no.	E	Select a label number from the label configuration list. The label must be configured under the label configuration functionality.

Pump settings PC3

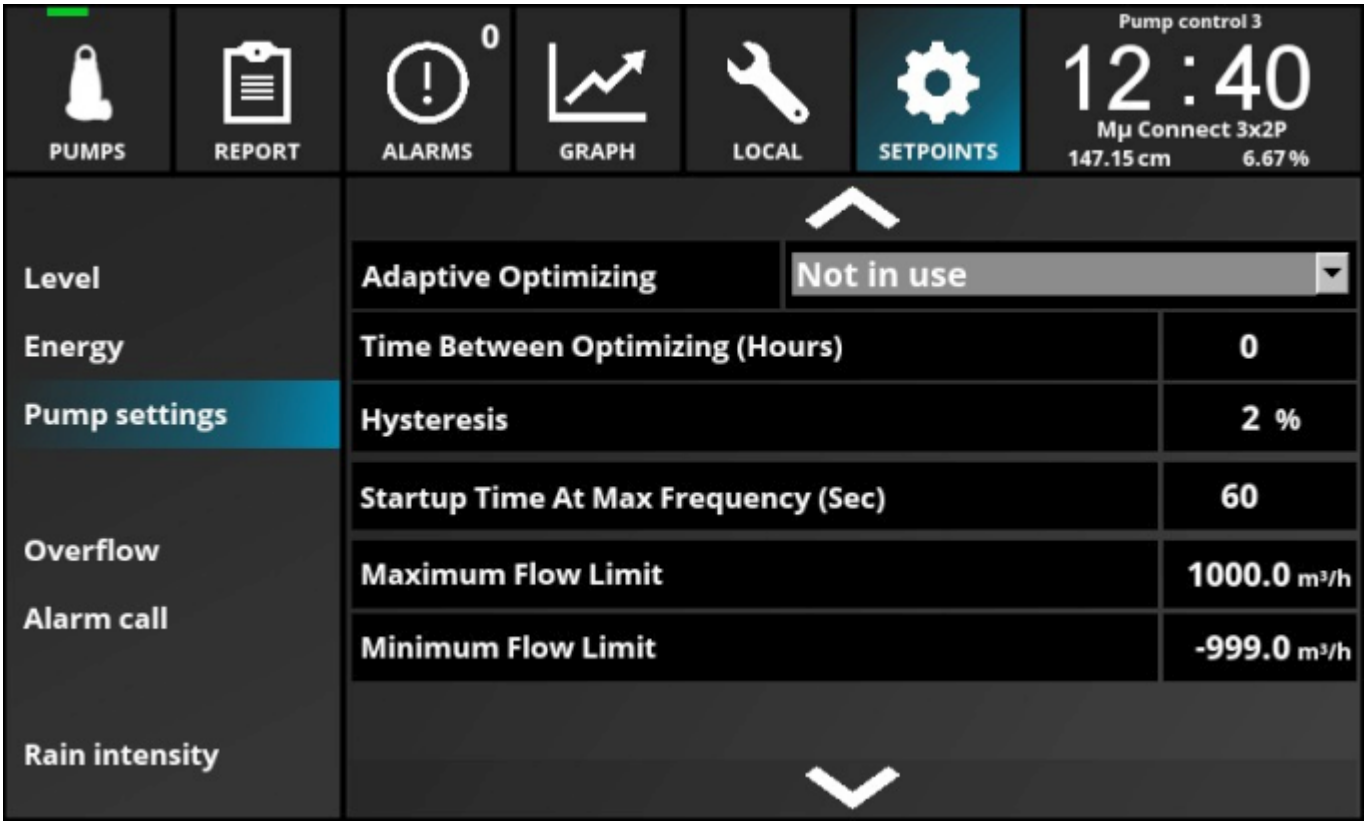
The following screens provide settings for changing the selected pump controller, and its pumps.
All settings are directly changed in the connected unit´s pump controller, and refer to the configuration of the connected unit´s pump controller functions.
Setting screens may vary slightly from firmware to firmware, and pump controller to pump controller, but general settings are matching.



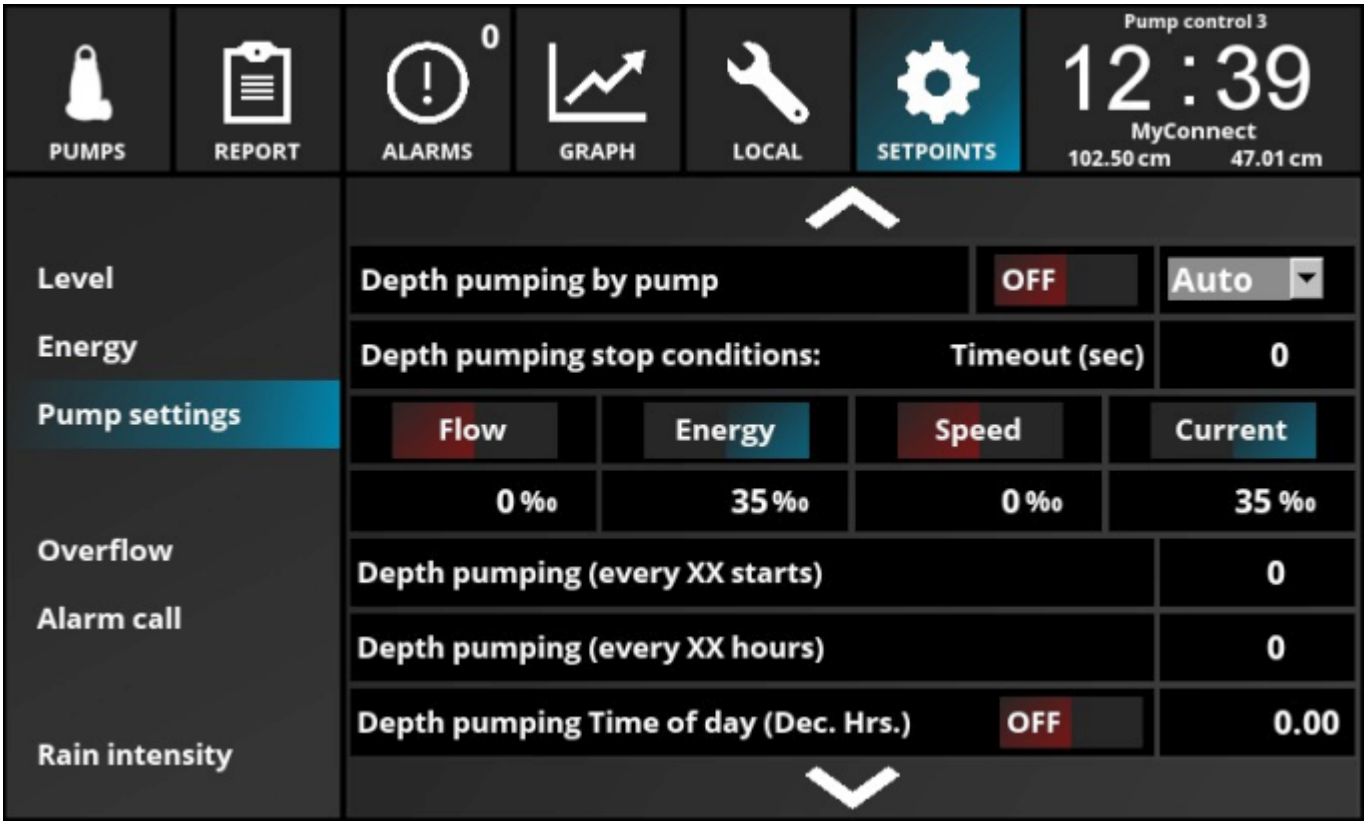
Text	Class:	Description:
Number of pumps	E	The actual number of pumps configured in selected pump controller. Change with caution. Changing this value will have impact on the behaviour of the selected pump controller.
Number of simultaneously working pumps	E	Set the number of pumps that is allowed to run simultaneously, for the selected pump controller.
Voltage	E	The voltage value derived from nameplate for the pump. The value is used in combination with Cos Phi, and power consumption for each pump, to calculate the power used by the pump in kWh.
Max. Level	B	Level above this threshold will start additional pump(s)
Start Level	B	Level above this threshold will start first pump/Next in alternation
Preferred level	B	Level below this threshold will run the started pumps at preferred reference
Min. Level	B	Level below this threshold will run the started pumps at minimum reference
Stop level	B	Level below this threshold will Stop all pumps



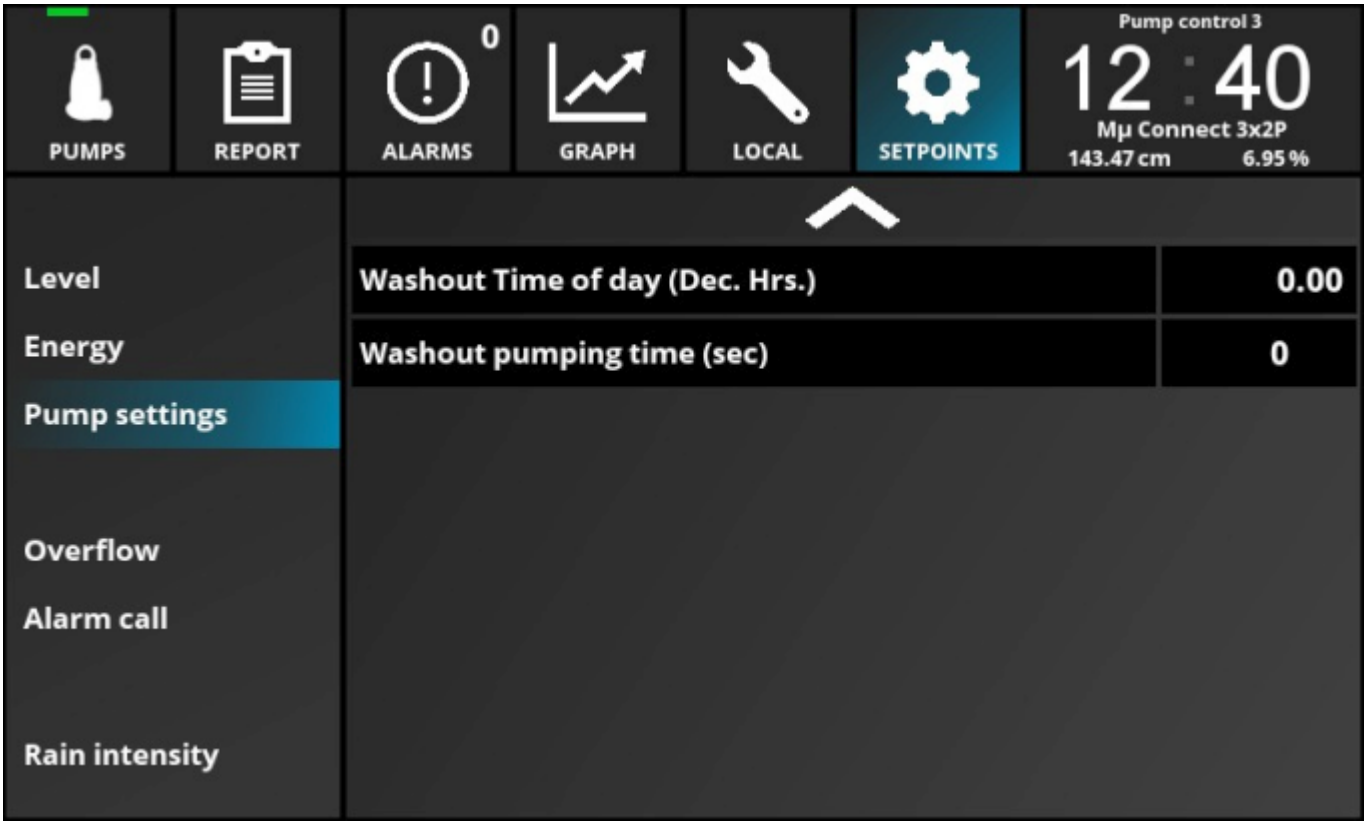
Text	Class:	Description:
Reference unit	E	The reference for the entire controller for controlling the VFDs
Pump		Indicates the column for the values corresponding with the individual pumps
Maximum reference	E	The maximum reference/speed the VFD is allowed to run the pump
Preferred reference	E	The reference where the controller has calculated to move the most water pr. kWh.
Minimum reference	E	The minimum reference/speed the VFD is allowed to run the pump
Ramp Time Up Set power (FPG412 only)	E E	Sets the ramp time directly in the VFD. FPG412 Only: writes the set power directly to the FPG module
Ramp Time Down Min power (FPG412 only)	E E	Sets the ramp time directly in the VFD. FPG412 Only: writes the min power directly to the FPG module



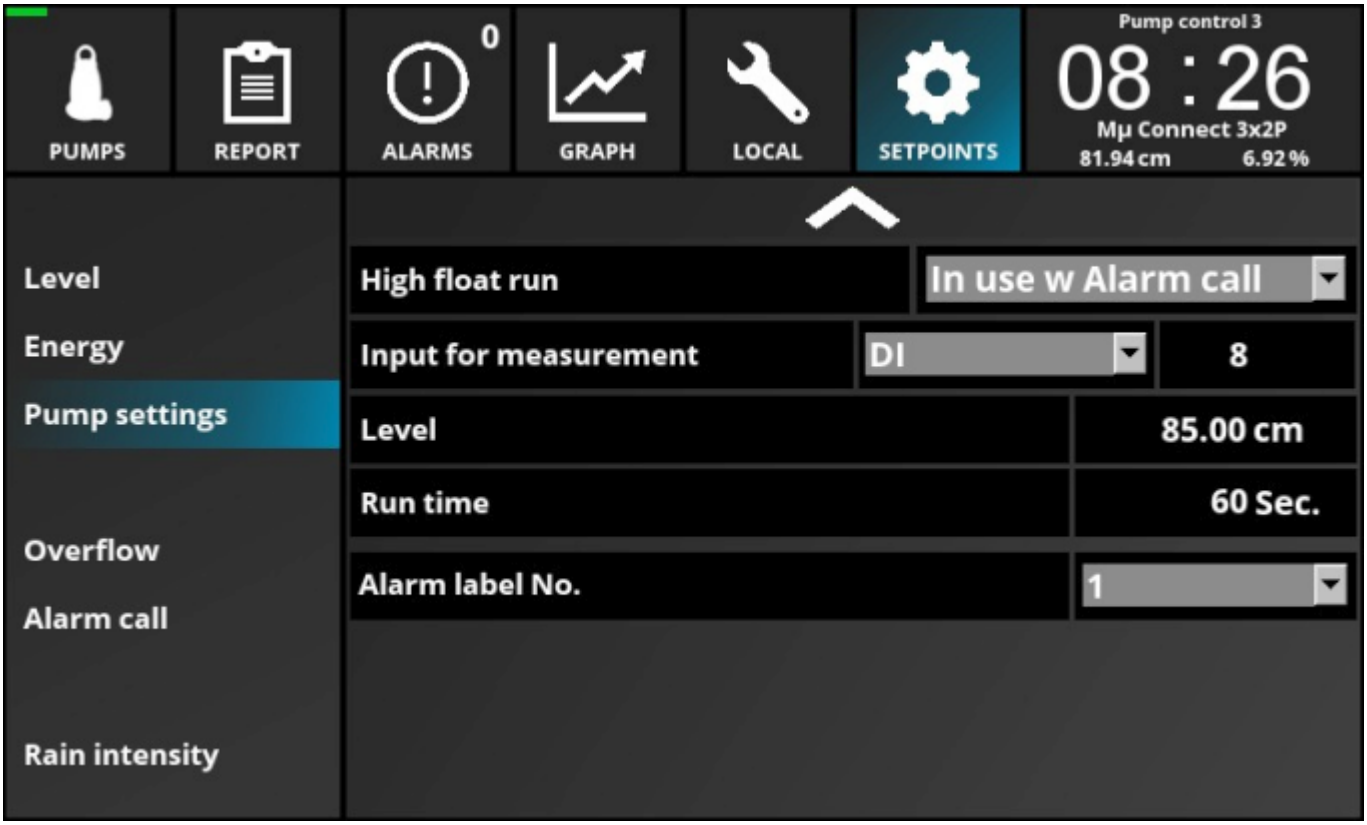
Text	Class:	Description:
Adaptive Optimizing	E	Sets how the pump controller will calculate the optimal flow vs energy, Preferred reference point.
Time between optimizing (Hours)	E	Sets how often the pump controller will try to calculate a better Preferred reference point.
Hysteresis	E	Defines how much reference change to use, when testing for better Preferred reference point.
Startup Time At Max Frequency (Sec)	E	When a pump is started, the pump will run at maximum reference for this amount of time, before regulating
Maximum Flow limit	E	When the selected flow input exceeds this threshold, no more pumps will be started.
Minimum Flow limit	E	When pumps are running, and the selected flow input drops below this threshold, all pumps will be stopped, and error on pumps will be activated.



Text	Class:	Description:
Depth pumping by pump	E	Sets weather the function should be active or not, and the pump which should perform the depth pumping. The function keep the selected pump running after it´s stop level is reached, to remove sediments in well.
Depth pumping stop conditions: Timeout (sec)	C	The time the pump will keep pumping, when level goes below normal stop level.
Depth pumping stop conditions: Flow, Energy, Speed, Current	E	Input a value in per mill. (‰) under the desired value to allow the depth pumping function to stop the pump when the enabled readings fluctuates more than the input value. This is to be able to stop the pump at the moment the level drops below the pumps intake, and the pump draws in air. (Snoring)
Periodic pumping (Every XX starts)	C	Set the amount of starts for the selected pump, between the activation of the depth pumping function.
Periodic pumping (Every XX hours)	C	Set the number of hours between the activation of the depth pumping function.
Depth pumping Time of day (Dec. Hrs.)	E, C	Sets weather or not the depth pumping function should activate every day, on a predefined time of day.

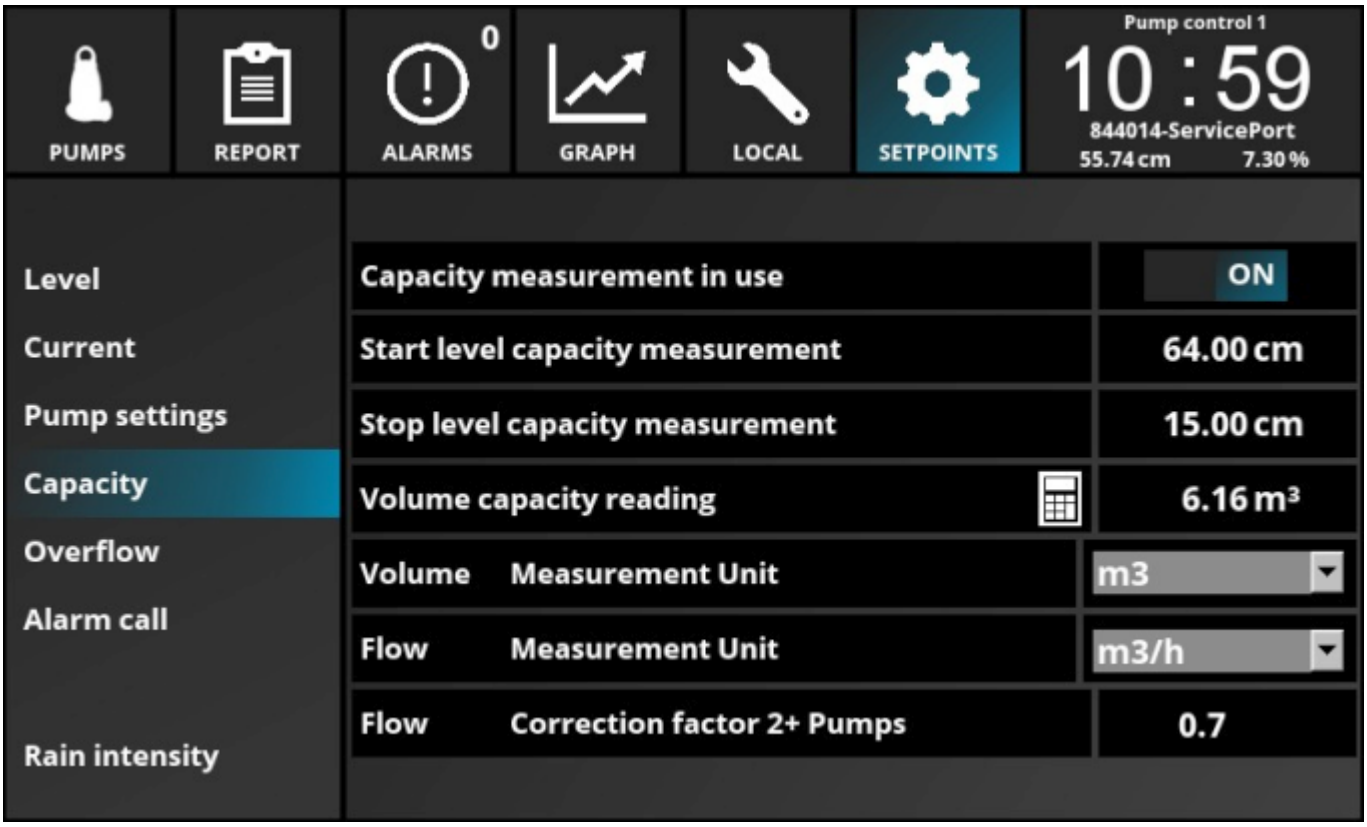


Text	Class:	Description:
Washout Time of day (Dec. Hrs.)	E	Sets when the controller will start a pump at maximum reference, even if level is not above Start level. Value is in decimal hours. I.e. 13.75 means 13:45. 0.00 means function is not in use.
Washout pumping time (sec)	E	When a pump is started by the above setting, the pump will be run for this amount of time. Pump will stop if level drops below stop level threshold.



Text	Class:	Description:
High float run	E	Enable the function with or without an alarm is send to the alarm list.
Input for measurement	E	Select the digital signal type and number to activate the High float run function.
Level	B	Set the level where the high float is mounted tin the well. This can also be set to a value i.e. just above start for pump 1, if only one pump should be started.
Run time	C	When the digital signal is deactivated, the function will remain active for this amount of time. (Timeout)
Alarm label no.	E	Select a label number from the label configuration list. The label must be configured under the label configuration functionality.

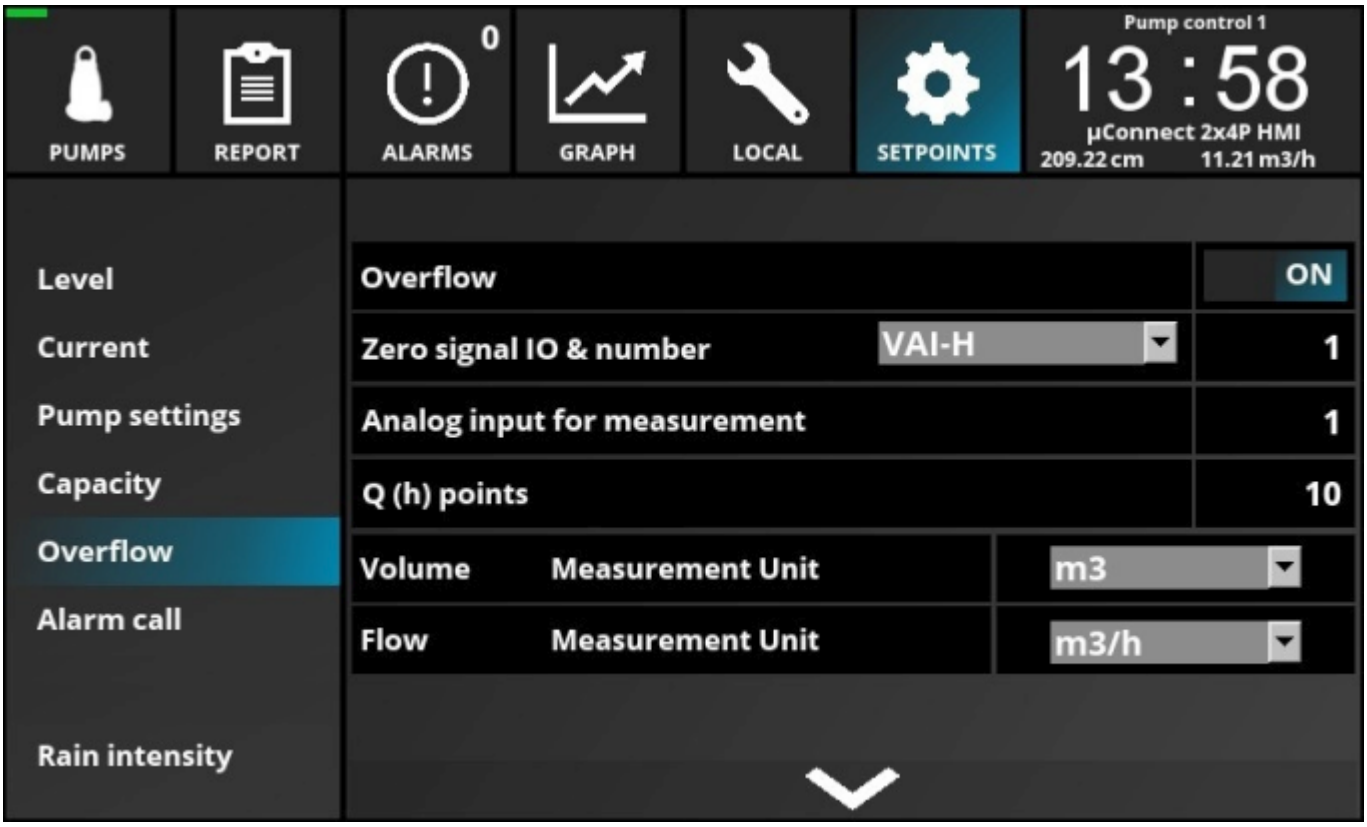
Capacity



Text	Class:	Description:
Capacity measurement in use	E	Sets the function to be activated or deactivated. When activated, the function measures the time the pump uses to move a defined volume between start and stop values in the well. This will result in a calculated volume capacity, and flow for each pump.
Start level capacity measurement, Stop level capacity measurement	C	The levels where the calculation of pump capacity should be performed in-between. Start level must be lower than the lowest pump start level, and stop level must be higher than the highest pump stop level.
Volume capacity reading	C	The operator must calculate this value, to be the volume in the well, between the start and stop levels for capacity measurement. The calculator icon will show a calculator for calculating volume in a cylindrical pump sump.
Volume and flow measurement unit	E	The units for the calculation will be used in other visual representations in other screens in HMI.
Flow correction factor 2+ pumps	C	When two or more pumps are running, this factor will be applied to the calculated pump flow.

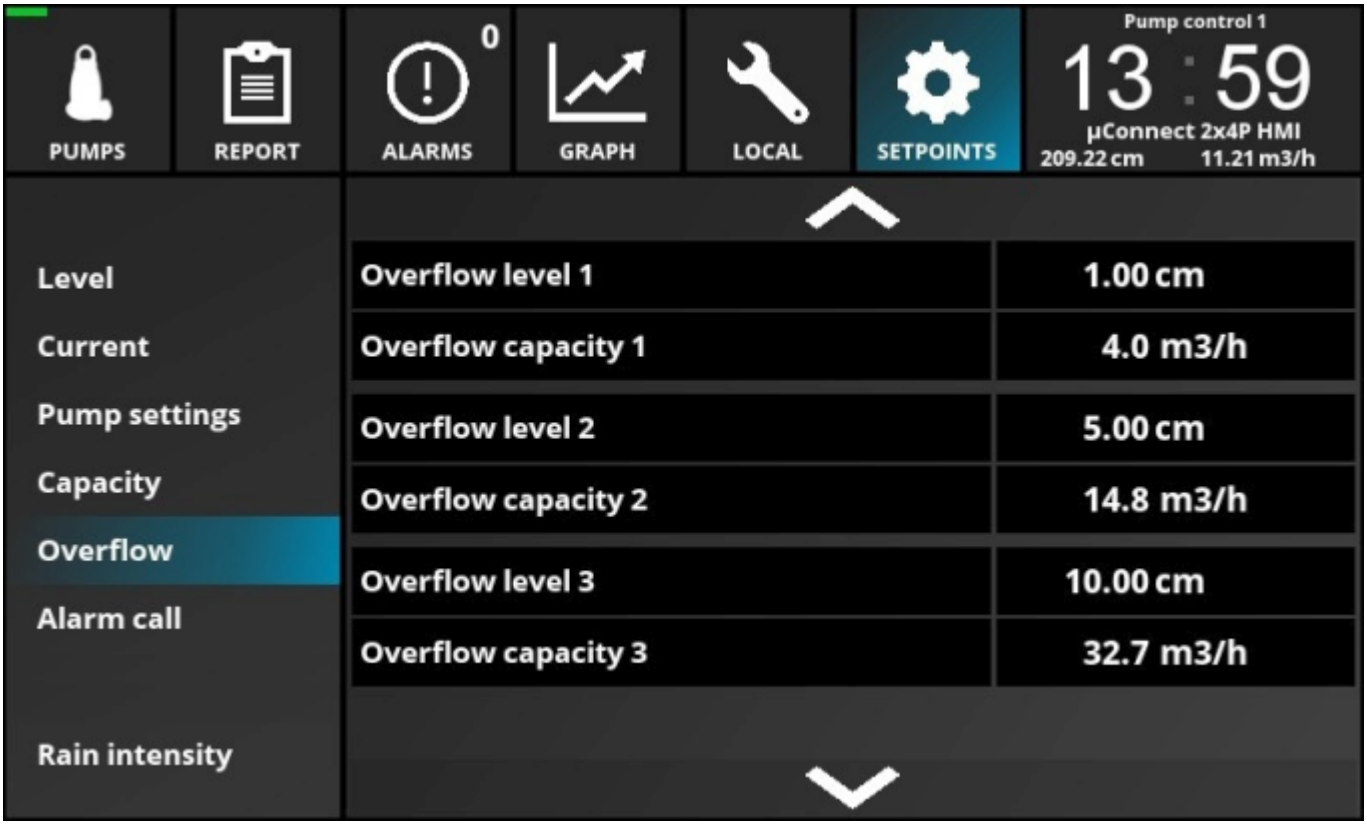
Overflow

Overflow



The function can calculate a flow rate from the level, starting at an activation ´0´point and higher.
The overflow flow rate will be interpolated from the overflow level, between each Q-point.
Additional screens will be available depending on the number of Q-points selected.

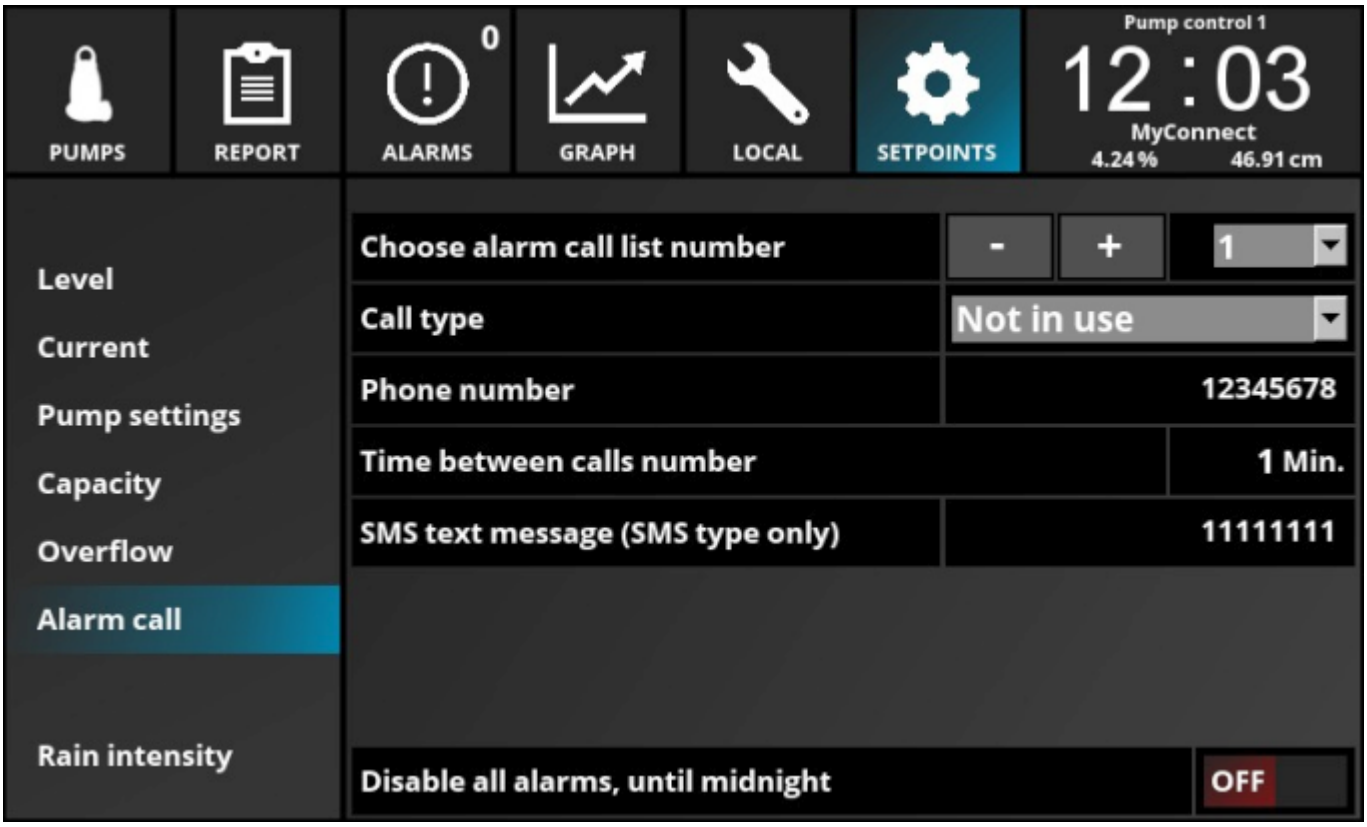
Text	Class:	Description:
Overflow	E	Sets the function to be activated or deactivated
Zero signal IO & number	E	Select the digital signal to zero out the overflow level reading at the point of overflow. I.e. a float switch is activated when level reaches the point of overflow.
Analogue input for measurement	E	The analogue input used for measurement of the actual level, to calculate the flow rate in an overflow situation.
Q (h) points	E	Sets how many points the overflow flow rate curve should be interpolated on, by the overflow level in at an overflow calculation.
Volume and flow measurement unit	E	The units for the calculation will be used in other visual representations in other screens in HMI.



The following screens have the same settings for up to 10 Q-Points.

Text	Class:	Description:
Overflow level n	E	Set the overflow level for the Q point.
Overflow capacity n	E	Set the flow rate at the corresponding overflow level.

Alarm call

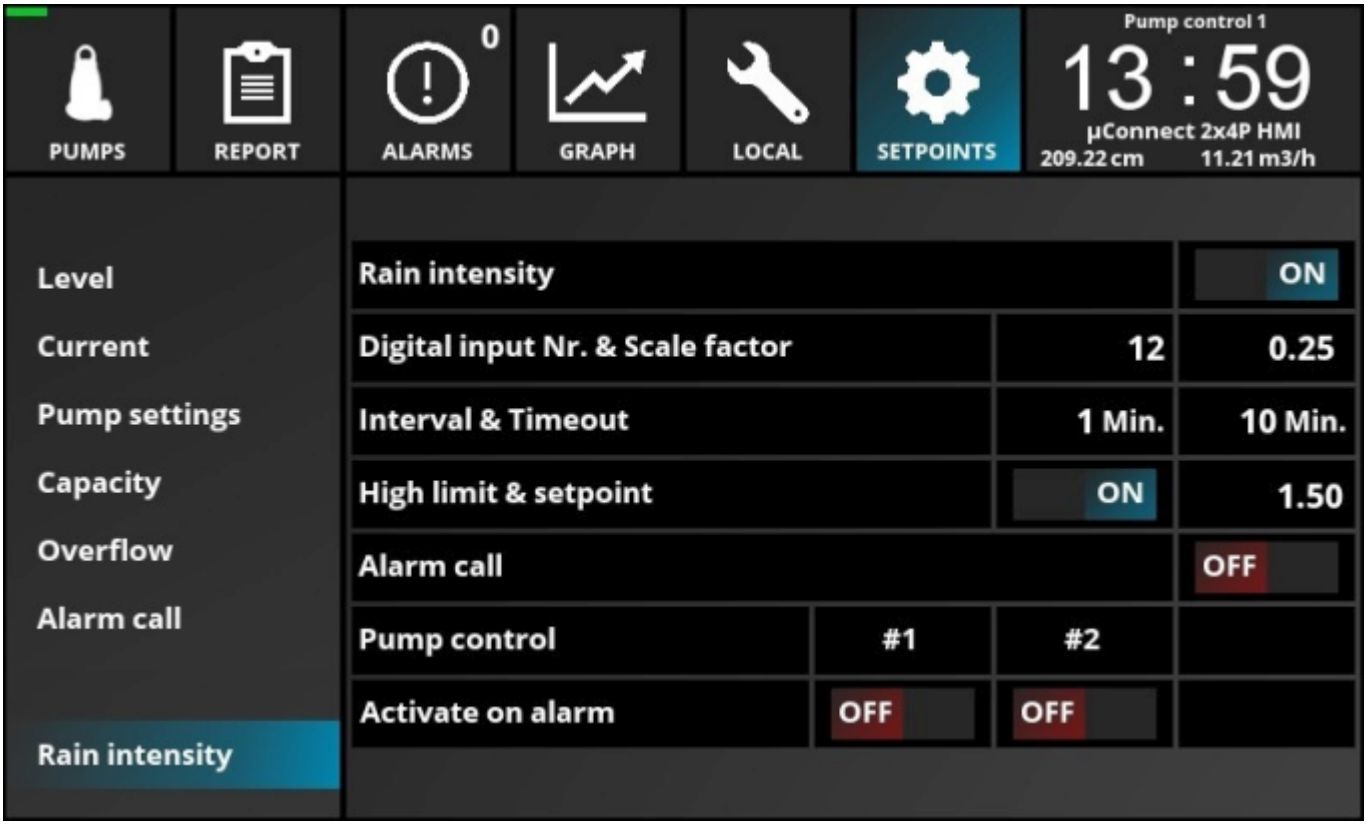


Up to 9 telephone numbers can be entered for direct calling or sending texts messages in an alarm situation.

Text	Class:	Description:
Choose alarm call list number	E	This sets which one of the 9 individual alarm receivers is to be configured. Use + or – buttons or the drop down menu, to navigate through and selecting one of the 9 alarm receivers.
Call type	E	Selects which call type the alarm number should be used as.
Phone number	E	A phone number to be called, if an alarm situation occurs.
Time between calls	E	When one number has been called/texted, the alarm handler in connected unit will wait for this time, before continuing to call the next number in the list.
SMS text message (SMS type only)	E	When “SMS” is selected as call type, a text message can be entered for the alarm call.
Disable all alarms, until midnight	B	When this is set ON, all alarms from unit will not be send to alarm list for the rest of the day, until midnight. After midnight all new alarms will send to alarm list again, and this function will automatic go to OFF position.

Rain intensity

When a rainAhead® rain gauge is connected to the connected unit, the unit can calculate and log the rain intensity.



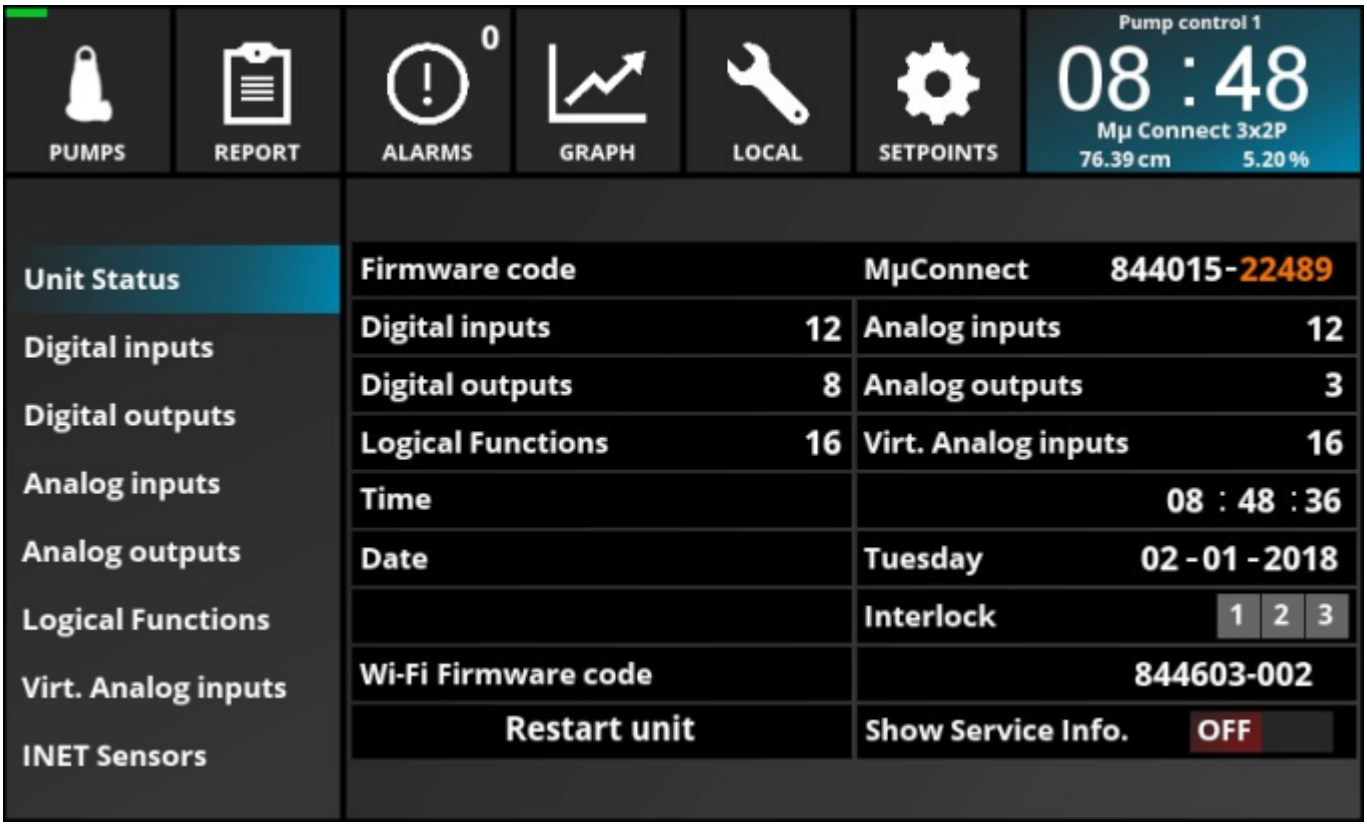
Text	Class:	Description:
Rain intensity	E	Set if the function should be activated or deactivated in connected unit.
Digital input Nr. & Scale factor	E	Set the digital input where the rainAhead® is connected in the connected unit, and the amount of mm/per pulse the rainAhead® is giving. Default value for factor is 0.2 mm/pulse.
Interval & Timeout	E	Interval set the time interval for counting pulses from the rainAhead®. Timeout sets the time interval where no further pulses are received before a new event is triggered.
High limit & Setpoint	E	Sets if the accumulated mm should result in a rain event, and how many mm there should be counted before the limit is activated.
Alarm call	E	Set if the rain event should result in an alarm call via the alarm list.
Pump Control & Activate on alarm	E	The numbers of the activated pump controllers in connected unit, and if the rain event should result in an available pump in the pump controllers should be started, even if start level is not yet reached. This is useful in areas where i.e. rain and sewage collect in the same wells, to ensure empty wells and full capacity before heavy rain pour.

Clock

The Clock screen provides information for the connected unit, screens for viewing the status for the available I/O´s, and basic configuration of the available I/O´s.

The clock screen also have the possibility to enter service menu, for more technical personnel and system configuration.

Unit status



The unit status screen provides information on the connected unit.

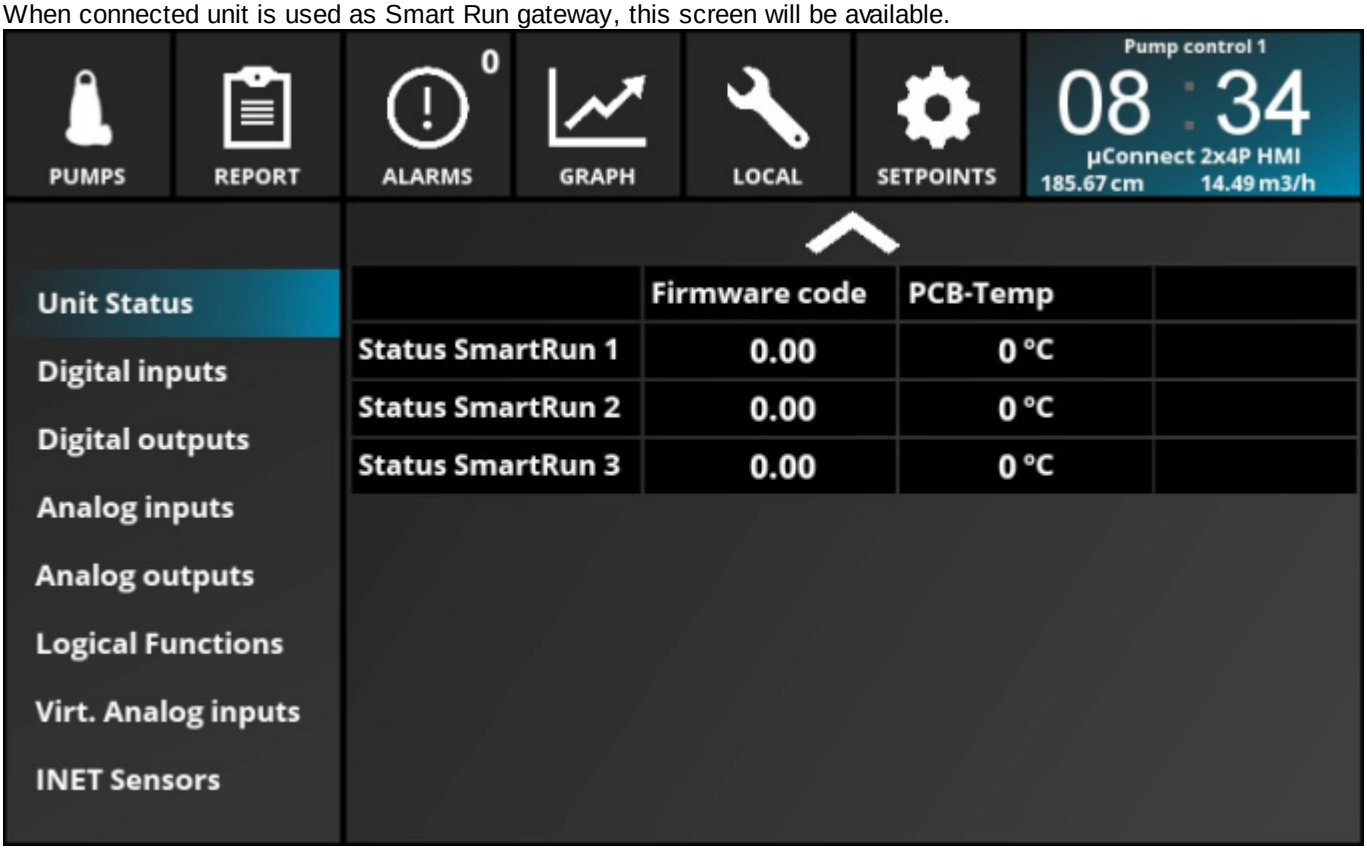
Text	Description:
Firmware code	The firmware version and subversion number in the connected unit. When contacting support team, this information can be helpful. Orange revision nr. means that the FW in connected unit is not an official released or test -version
Digital inputs, Analog inputs, Digital Outputs, Analog outputs.	The amount of the individually available I/O's in the connected unit.
Time & Date	The time and date elements represent the values as direct reading from the connected unit. Time is displayed in the format HH:MM:SS and date is displayed in the format dd-mm-yyyy Weekday cannot be changed by its element.
Interlock	Shows which of the 3 pump controllers are currently interlocked Also the general interlock icon is showed.
Wi-Fi firmware code	If a Wi-Fi module in the connected unit is activated, the FW version for the Wi-Fi module will be visible.
Restart unit	If it is necessary to restart the connected unit, this will tell the connected unit to do a controlled restart. Doing a restart of the connected will also result in HMI rebooting 60 seconds after connected unit.
Show service info.	When enabled, additional visualisation of the pumps control words will be shown on each pumps details screen. Enabling this will also prevent HMI from rebooting, 60 seconds after a connected unit restart occurs. Setting is only active until next HMI reboot, also HMI will not return to pump screen after 15 minutes.

If conditions in configuration of connected unit allows it, a second screen will be available with additional status for selected items.

le: SmartRun, FPG412/Concertor

Smart Run status

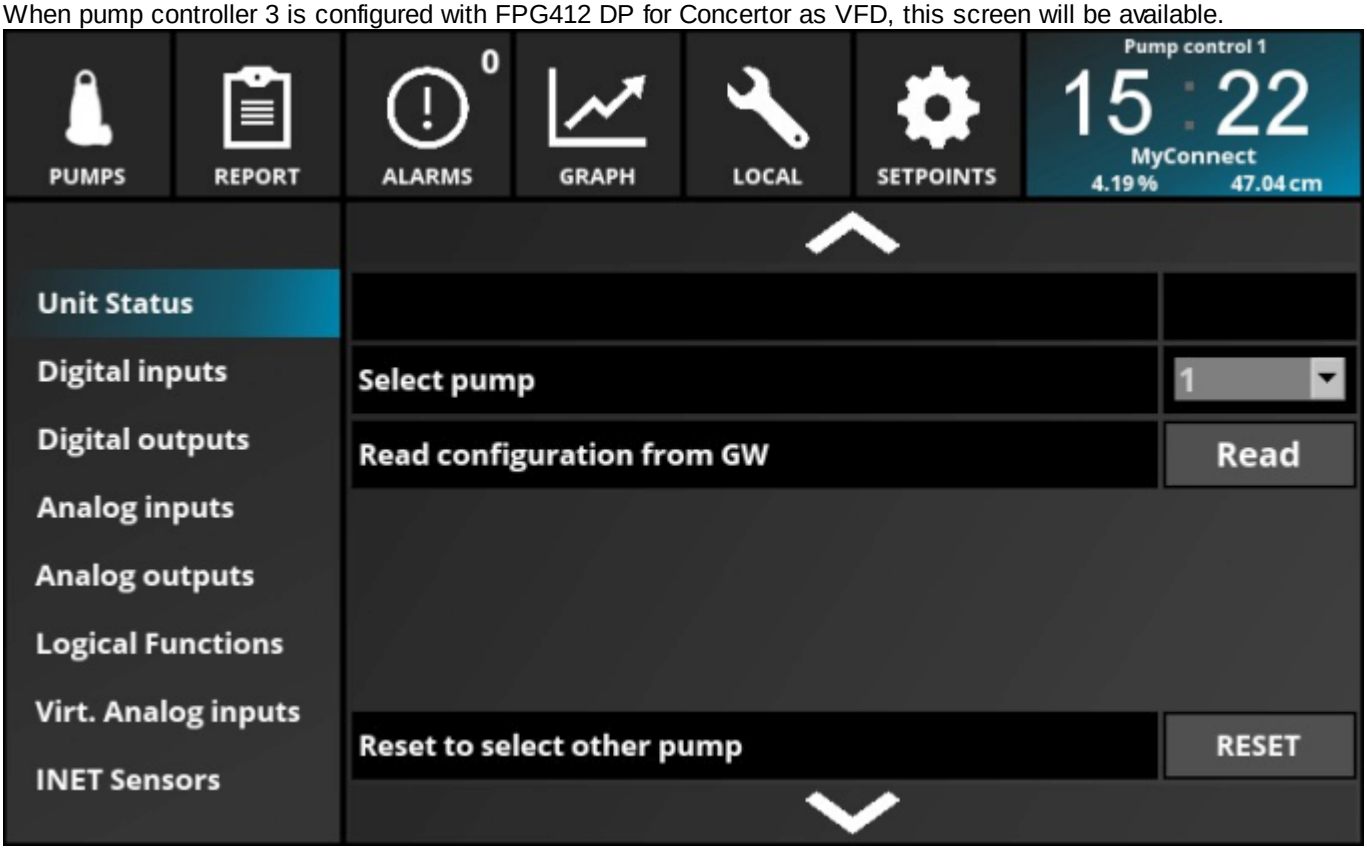
When connected unit is used as Smart Run gateway, this screen will be available.



Text	Description:
Firmware code	The firmware in the connected SmartRun unit
PCB-TEmp	The PCB temperature in the SmartRun device.

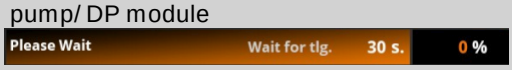
FPG412 DP for Concertor status

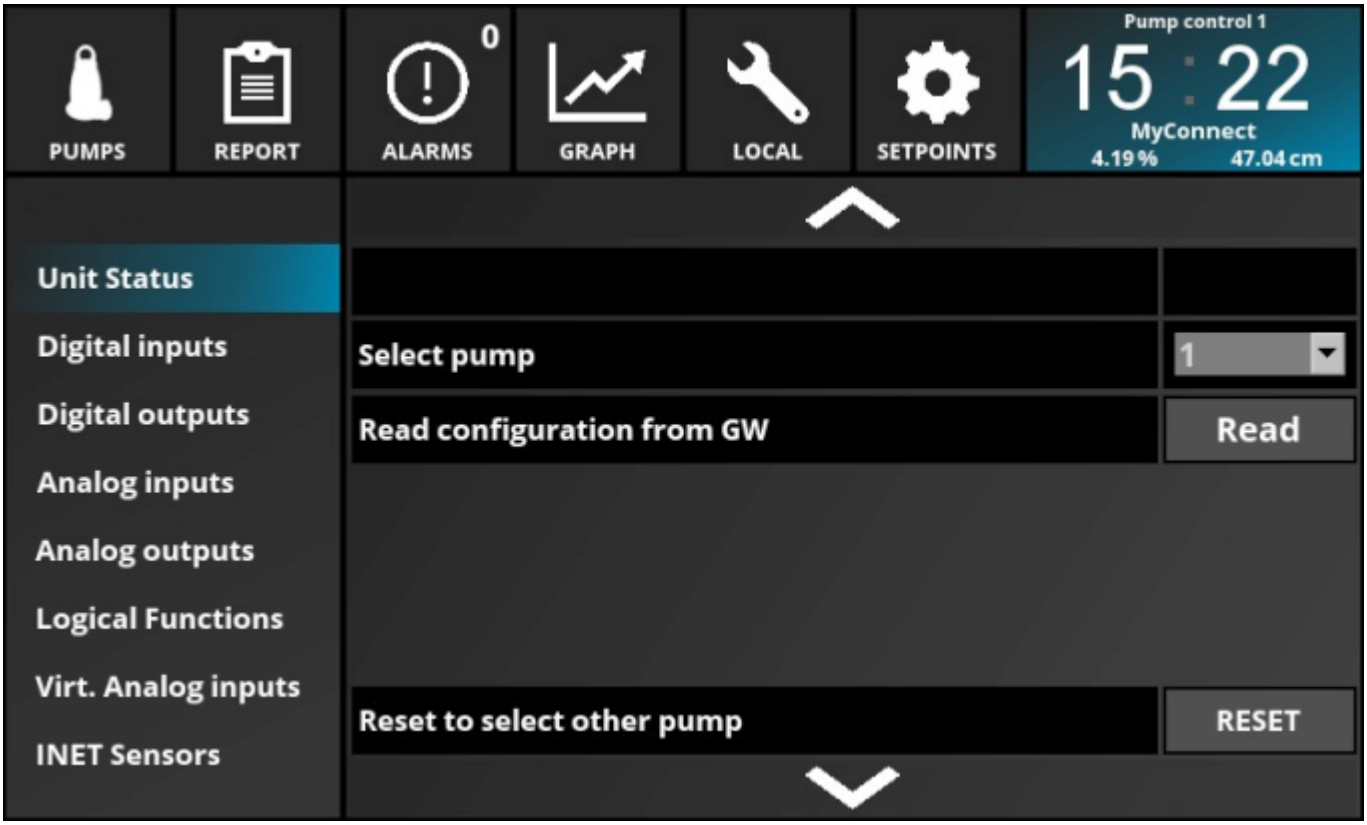
When pump controller 3 is configured with FPG412 DP for Concertor as VFD, this screen will be available.



The unit status screen provides possibility for retrieving information from the connected FPG412 / DP module for Concertor.

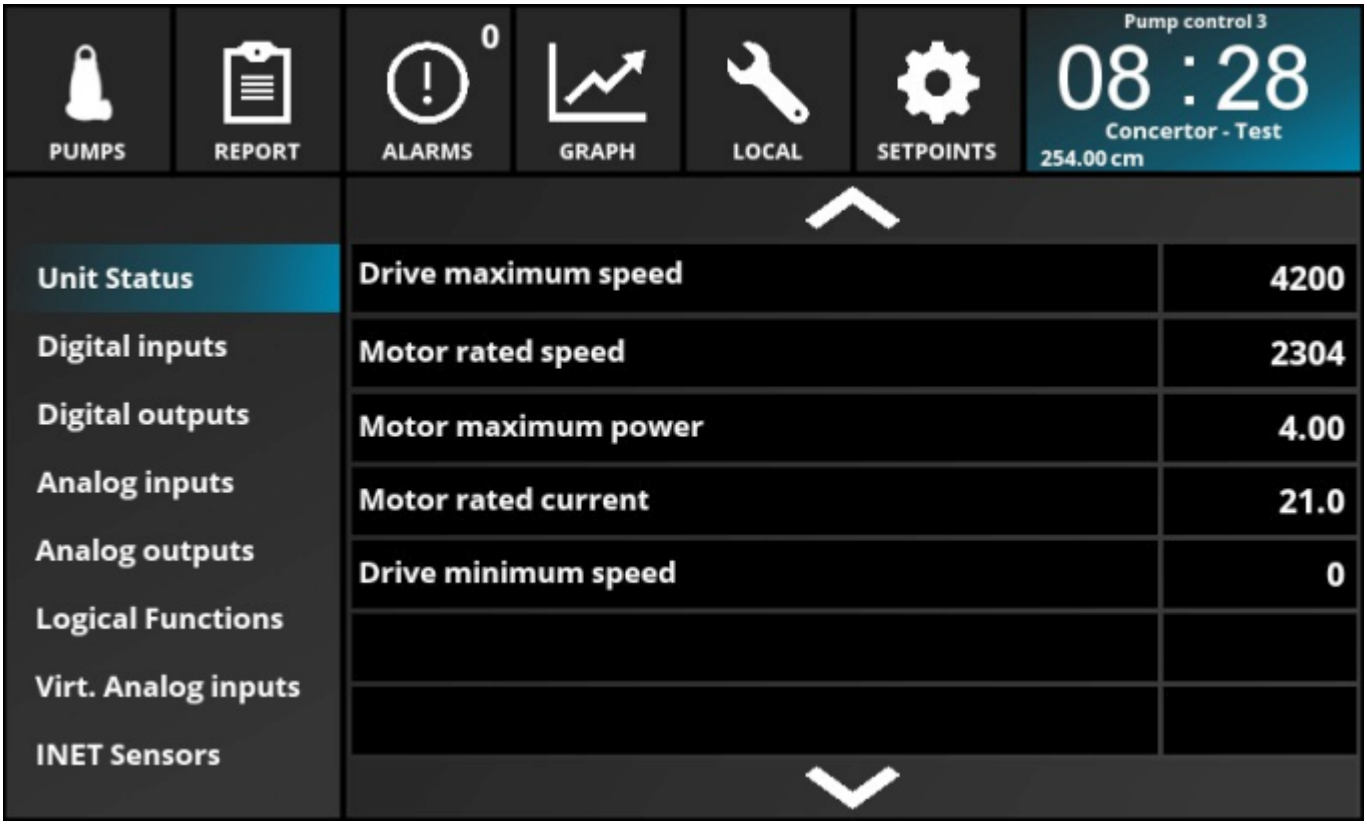
Note: Status values are only read once on every read, and are not live values.

Text	Description:
Progress bare	Shows how far the HMI is, in reading or writing configuration from/to the selected pump/ DP module  While the HMI is reading or writing configuration from/to DP module the progress bare will show please wait on orange background. It also gives some information on what is going on and a count down time is showing. indicating a timeout for waiting on telegram. On the bottom of the progress bare, a small progress line is shown, indicating 0-100% of the over all progress. On the right side of the progress bare , an orange indication in % is shown for how far in the overall progress the function is.
Select pump to configure	Select the pump nr, to configure
Read status from GW	Select Read to activate reading sequence in HMI, to read configuration from the DP module
Reset to select other pump	Select reset, to be able to configure an other pump.

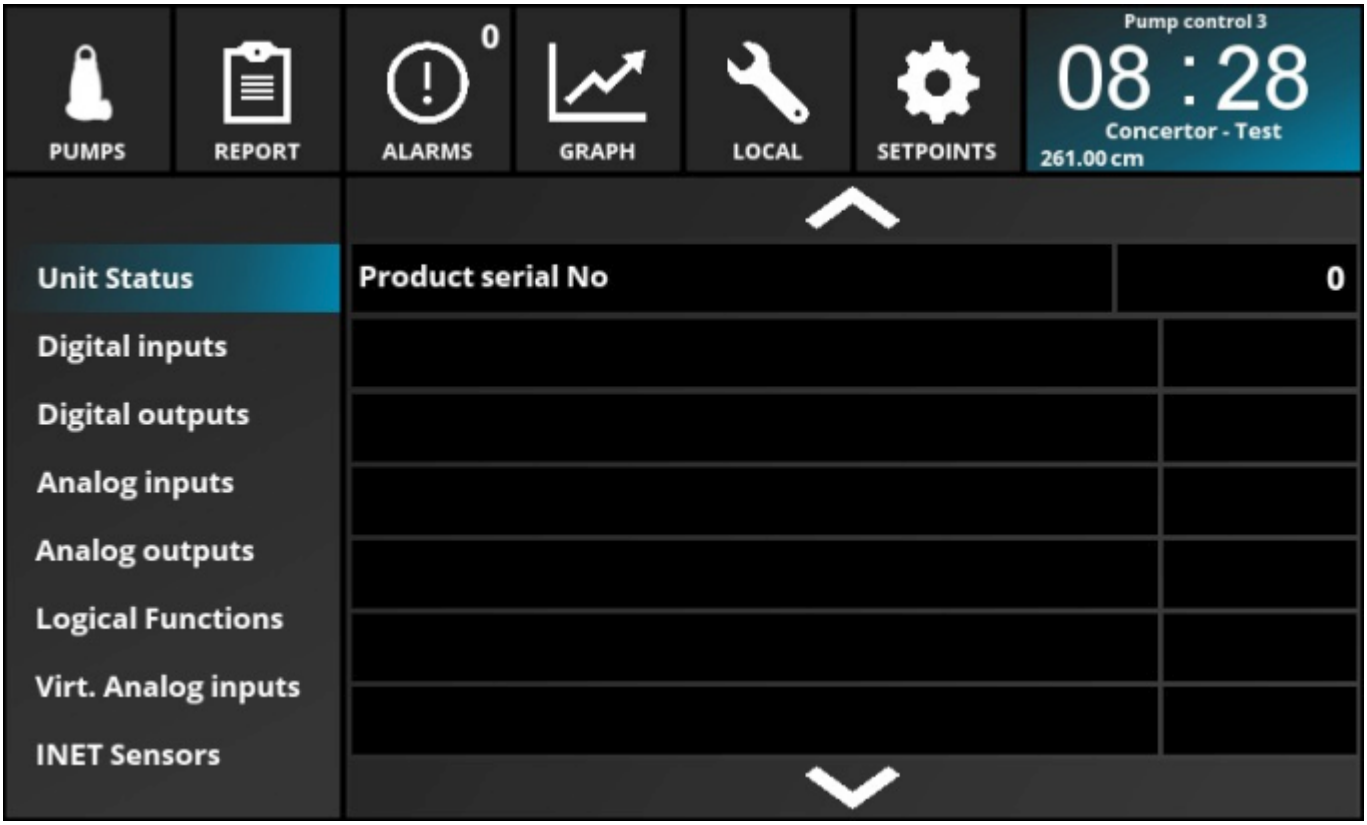


Text	Description:
Output speed	The speed the pump is running.
Output current	The current the pump is using.
Output power	The power the pump is consuming.
Drive heat sink temp	Temperature on heat sink inside the pump
Energy total MWh,kWh	Total energy used by the pump, in its entire life time.
Run time total	The amount of time (hh:mm) the pump has been running in its entire life time.
Pump starts total	The amount of times the pump has been started in its life time.

Text	Description:
Energy today kWh	Energy consumed by the pump today
Energy Yesterday kWh	Energy consumed by the pump yesterday
Running time today	Time the pump has been running today
Running time yesterday	Time the pump was running yesterday
Pump starts today	Number of times the pump has been started today
Pump starts yesterday	Number of times the pump was started yesterday
Successful cleanings	Number of times the pumps cleaning attempts was

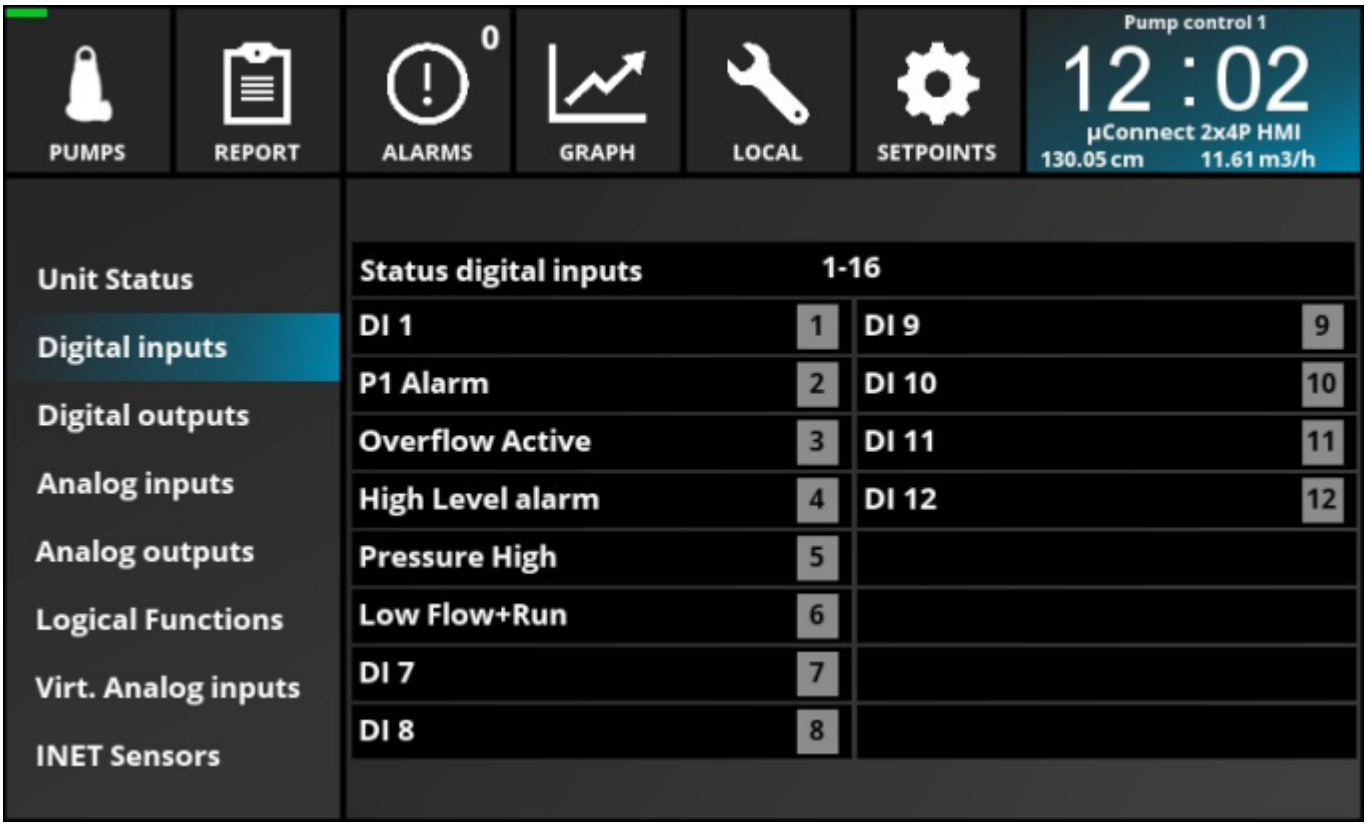


Text	Description:
Drive maximum speed	Maximum allowed speed for the drive (rpm)
Motor rated speed	Rated speed for the Motor (rpm)
Motor maximum power	Maximum power allowed for the Motor (kWh)
Motor rated current	Rated current for the Motor (A)
Drive minimum speed	Minimum allowed speed for the Drive (rpm)



Text	Description:
Product serial No.	Serial no. For the drive

Digital inputs



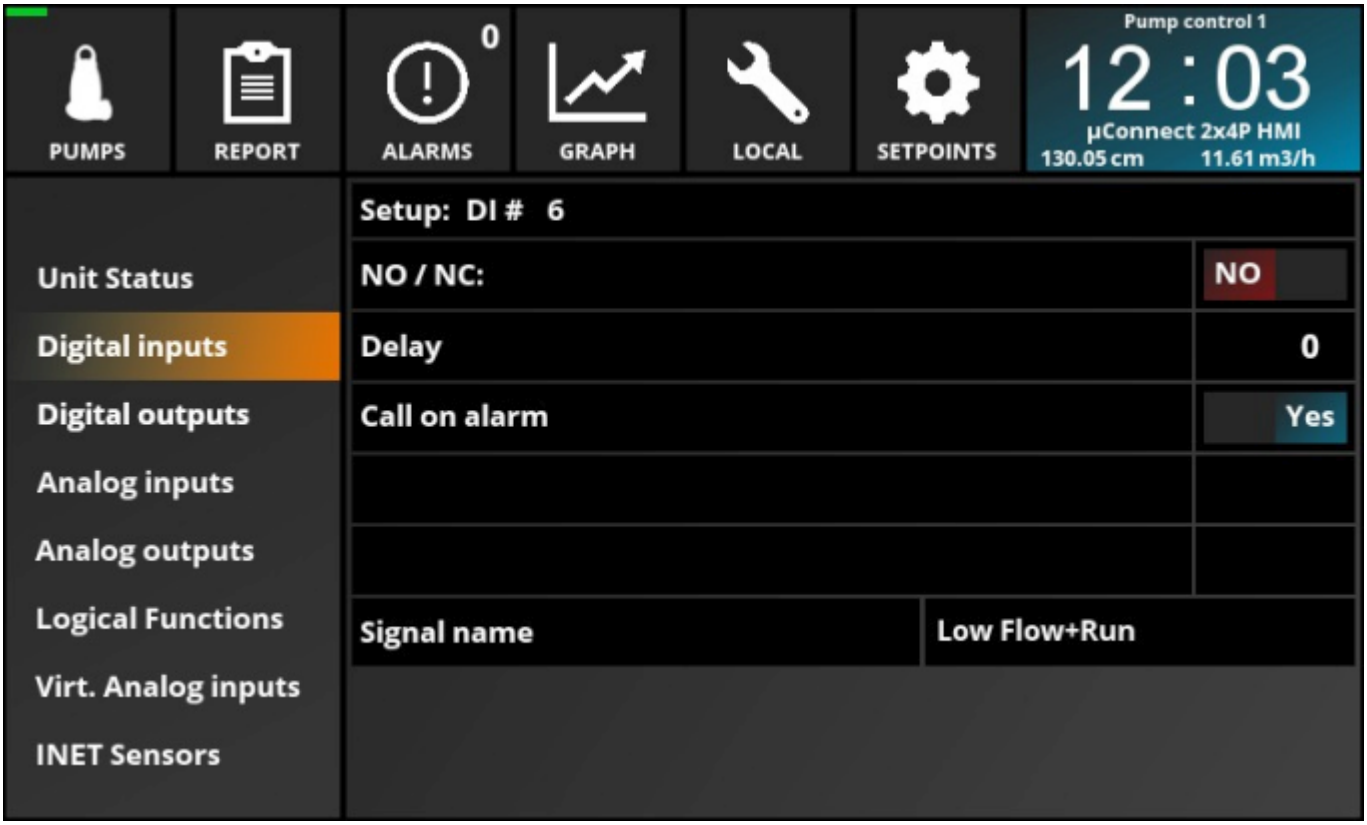
This screen for displays the state of all the signals available of the selected type, in the connected unit.
Additional screens will be available, if the amount of available signals is more than fit in one screen.

Configuration of each signal is available in a sub screen, by selecting the signal name.

For each of the available signals, the following is valid:

Text	Description:
Signal name	The name for the I/O, configured in the connected unit.
Number block	When a signal is Active/ON the number block will switch to blue background colour for the signal. When the signal is Inactive/OFF the number block will switch to gray background colour for the signal.

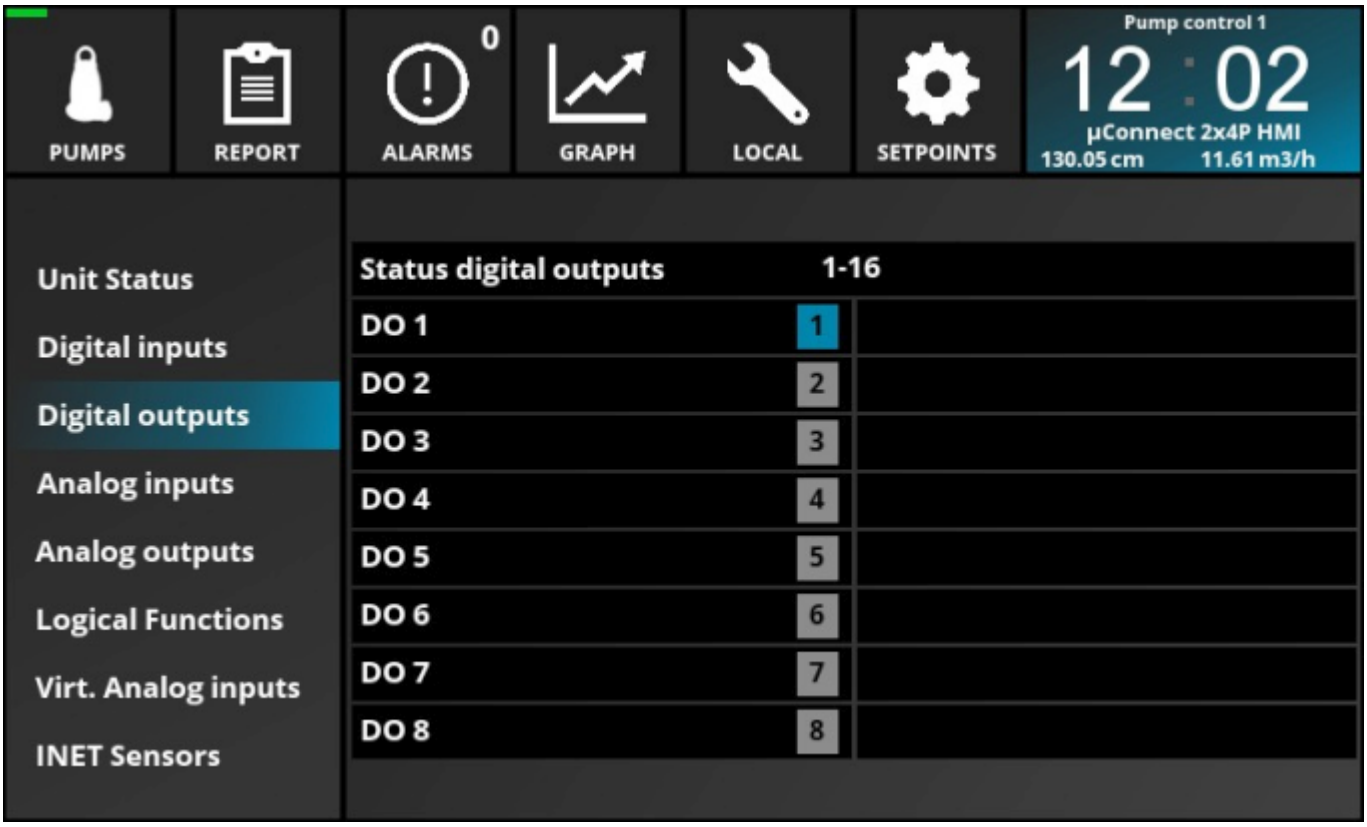
Digital input configuration



Configuration is done directly in the connected unit´s configuration. Changes will affect operation of unit.
Although signal names can be configured with Unicode chars by PC configuration tool, the HMI cannot input Unicode chars, and the new signal name will be limited to ASCII chars, meaning no special chars other than what the pop-up keyboard supply.
To return to the status screen, select the same screen from the left menu again.

Text	Class:	Description:
Setup: DI #	D	Selecting another signal for configuration can be done by inputting another signal number here.
NO / NC:	D	Signal is configured as Normally Open, or Normally Closed.
Delay	D	When signal gets it activation state, the status of the signal will wait for selected amount of seconds before entering the active state.
Call on alarm	E	Indicates if the activation of the signal, after delay, should result in an alarm call.
Signal name	D	The name of the digital input.

Digital outputs

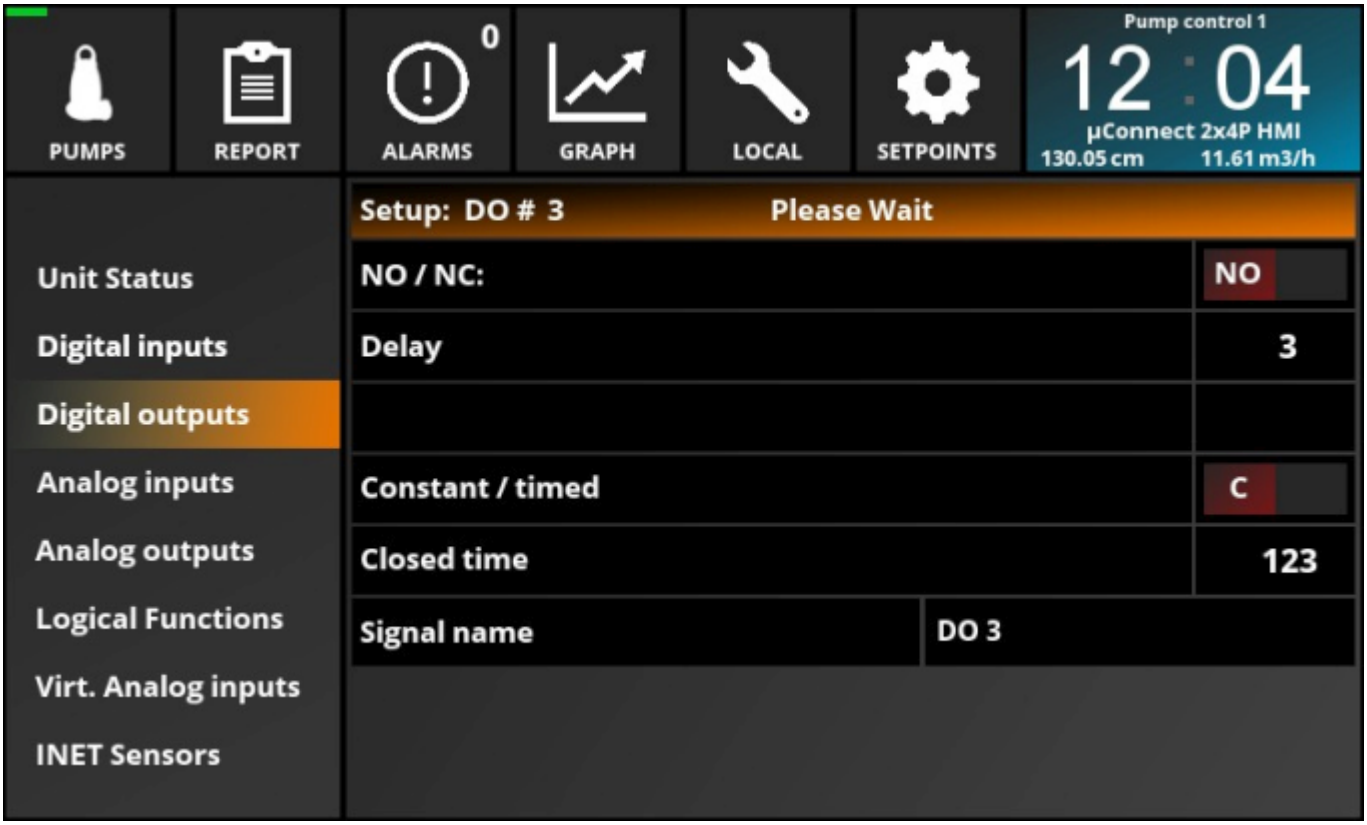


This screen for displays the state of all the signals available of the selected type, in the connected unit.
Additional screens will be available, if the amount of available signals is more than fit in one screen.
Configuration of each signal is available in a sub screen, by selecting the signal name.

For each of the available signals, the following is valid:

Text	Description:
Signal name	The name for the I/O, configured in the connected unit.
Number block	When a signal is Active/ON the number block will switch to blue background colour for the signal. When the signal is Inactive/OFF the number block will switch to gray background colour for the signal.

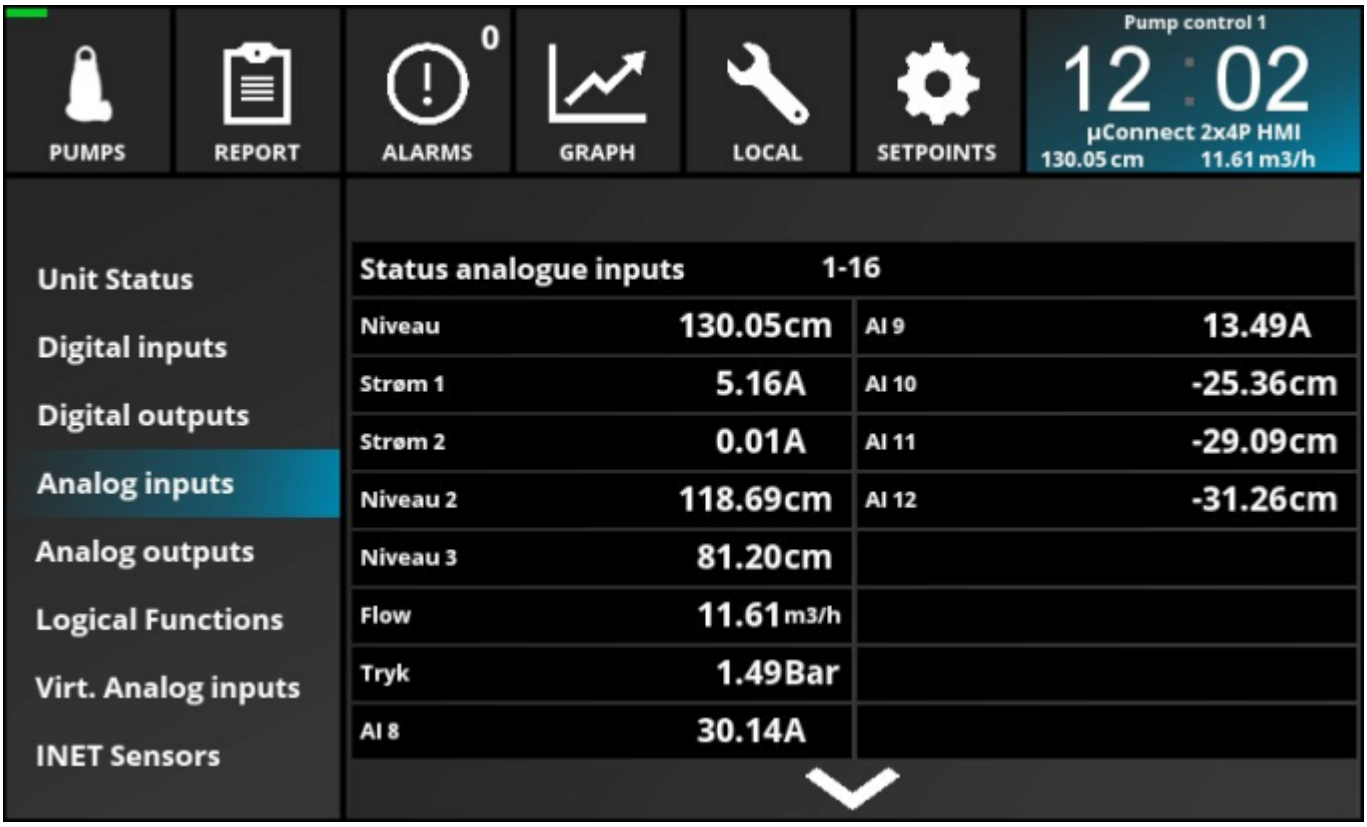
Digital output configuration



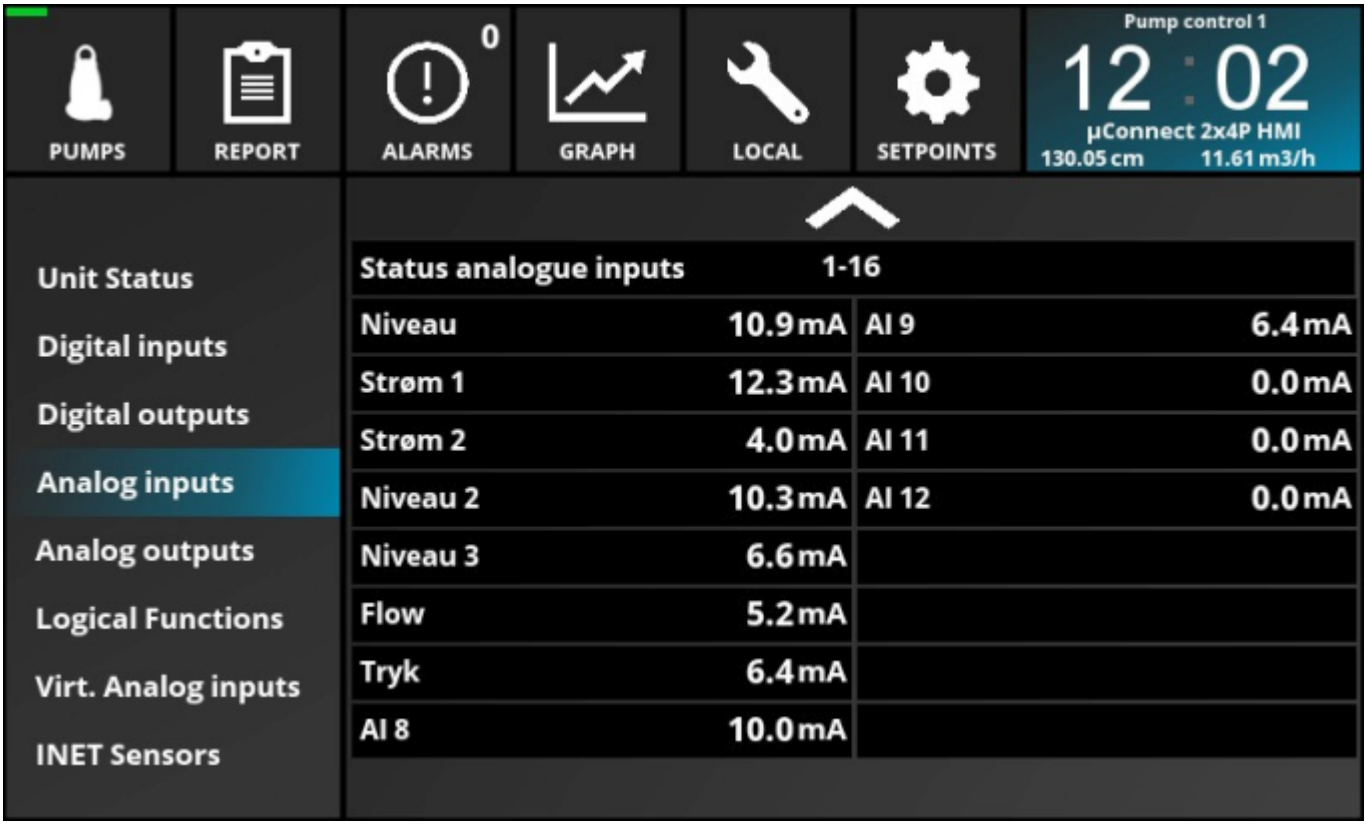
Configuration is done directly in the connected unit´s configuration. Changes will affect operation of unit.
Although signal names can be configured with Unicode chars by PC configuration tool, the HMI cannot input Unicode chars, and the new signal name will be limited to ASCII chars, meaning no special chars other than what the pop-up keyboard supply.
To return to the status screen, select the same screen from the left menu again.

Text	Class:	Description:
Setup: DO #	D	Selecting another signal for configuration can be done by inputting another signal number here.
NO / NC:	D	Signal is configured as Normally Open, or Normally Closed.
Delay	D	When signal gets it activation state, the status of the signal will wait for selected amount of seconds before entering the active state.
Constant / timed	D	If the signal should always be active, after its activation, this is set to C(constant). If the signal should automatically deactivate after a given time after activation, this is set to T(timed)
Closed time	D	The time the signal should remain active for, when timed output is chosen.
Signal name	D	The name of the digital input.

Analog inputs



This screen displays the actual measurements from the signals available in the connected unit, with their corresponding units.
An additional screen with same signals is available, where all measurements are show in the actual mA signal given to the individual input.

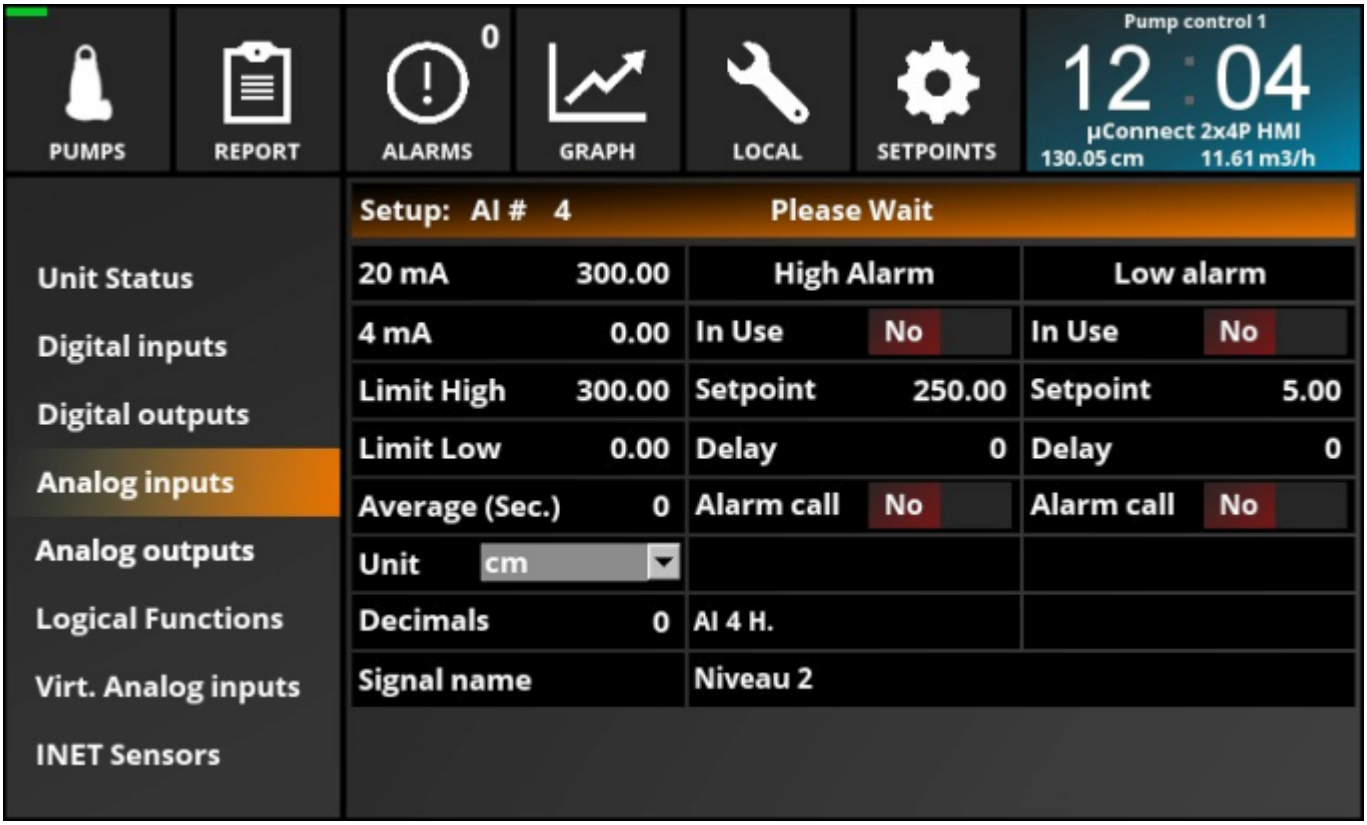


Configuration of each signal is available in a sub screen, by selecting the signal name.

For each of the available signals, the following is valid:

Text	Description:
Signal name	The name for the I/O, configured in the connected unit.
Measurement	On first screen the scaled value from the signal is shown. On second screen the actual mA given to the input is shown.
Unit	On first screen, the unit for the measurement is displayed as read from the configured signal in connected unit. On second screen the unit is shown in mA. Behind the measurement units, the states of the High and Low limit for the measurement is shown on top and lower half of of the measurement unit. When a limit signal is Active/ON the background will switch to blue background colour for the signal. When the limit is Inactive/OFF the background will switch to black background colour for the signal.

Analog input configuration



Configuration is done directly in the connected unit´s configuration. Changes will affect operation of unit.
Although signal names can be configured with Unicode chars by PC configuration tool, the HMI cannot input Unicode chars, and the new signal name will be limited to ASCII chars, meaning no special chars other than what the pop-up keyboard supply.
To return to the status screen, select the same screen from the left menu again.

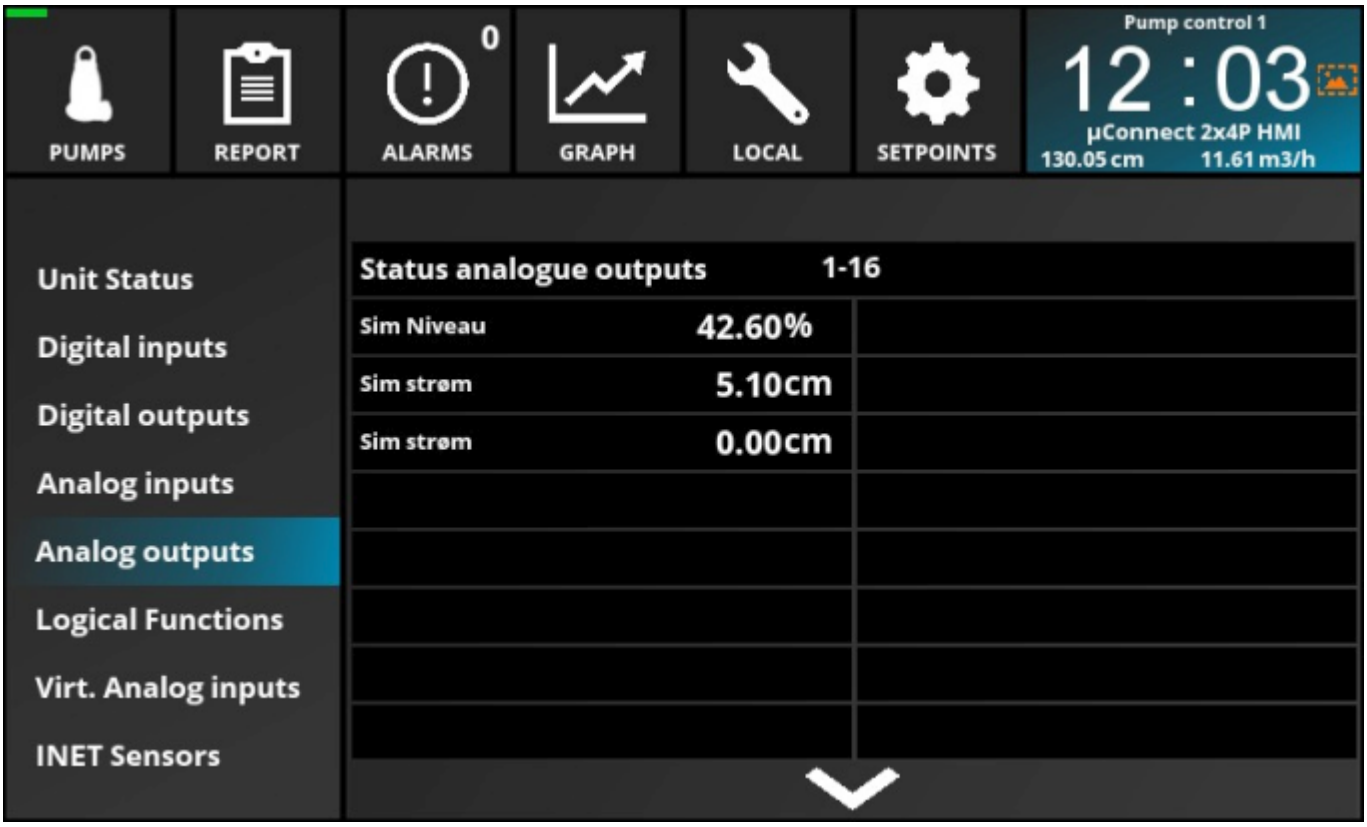
Text	Class:	Description:
Setup: AI #	D	Selecting another signal for configuration can be done by inputting another signal number here.
20 mA, 4 mA	D	Sets the min and max scaling of the connected signal to the analogue input.
Limit High, Limit Low	D	Sets the high and low limitations of input values, for functions in connected unit that uses the selected signal.
Average (Sec.)	D	The measurement can be calculated over a running time period, for x amount of seconds.
Unit	D	The unit used to measure the connected signal on the analogue input.
Decimals	D	For SCADA systems retrieving the extended log for analogue inputs, this will scale the measurements so that the SCADA can read decimal values from the measurement. Also this will result in the reading on level bar in pump screen displaying the reading with two decimals.
Signal name, High alarm signal name, Low alarm signal name	D	The name of the analogue input.

High alarm, Low alarm

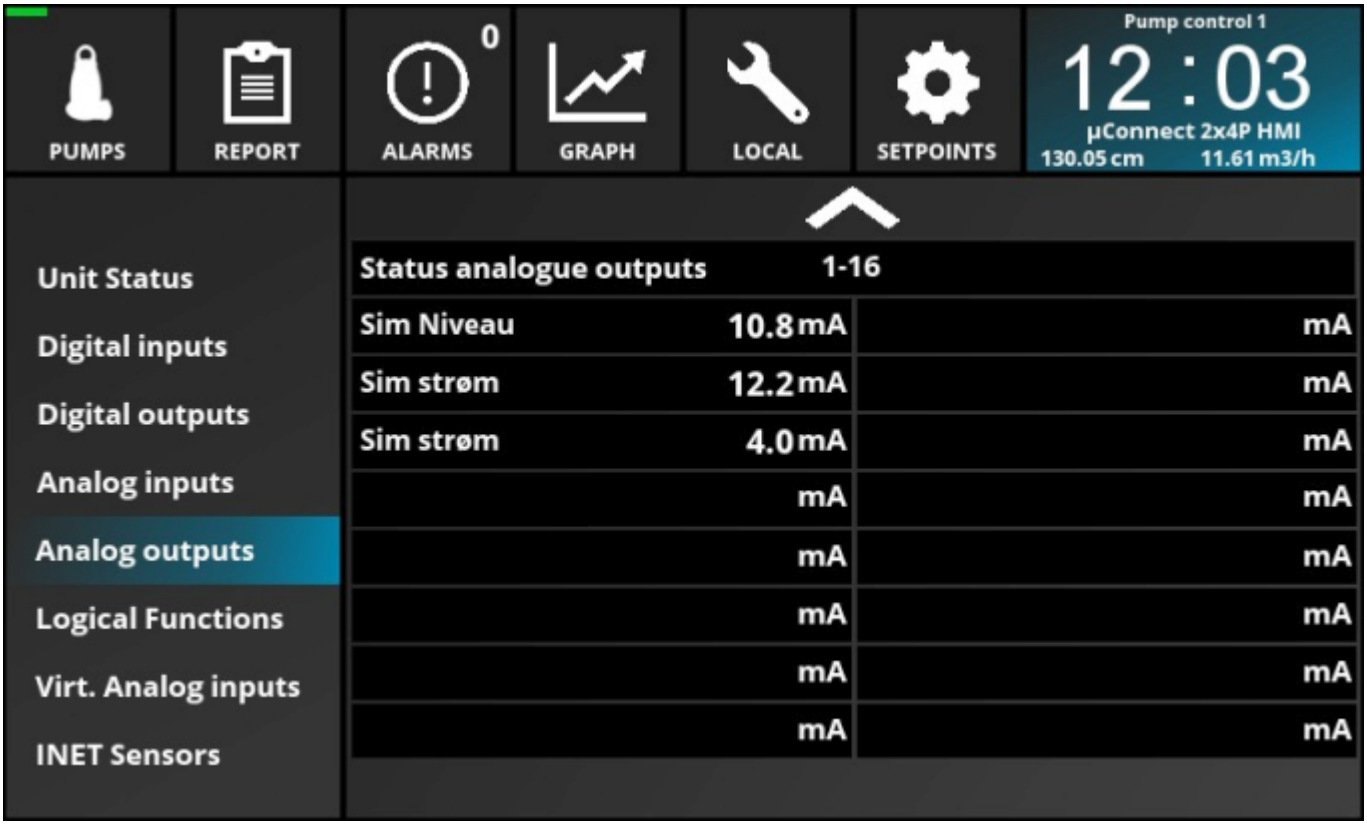
Common settings for the two columns apply.

Text	Class:	Description:
In use	D	Indicates if the high or low threshold should result in active state of their corresponding limits, when exceeded.
Setpoint	D	Sets the signals high or low threshold value. Measurement over or under these values will result in activation of their corresponding limits.
Delay	D	When measurement exceeds high or low threshold, the activation of the corresponding limit will wait for x amount of seconds, before entering the active state.
Alarm call	D	Indicates that the activation of the signal, after delay, should result in an alarm call.

Analog outputs



This screen displays the actual measurements from the signals available in the connected unit, with their corresponding units.
An additional screen with same signals is available, where all measurements are show in the actual mA signal given to the individual input.



Configuration of each signal is available in a sub screen, by selecting the signal name.

For each of the available signals, the following is valid:

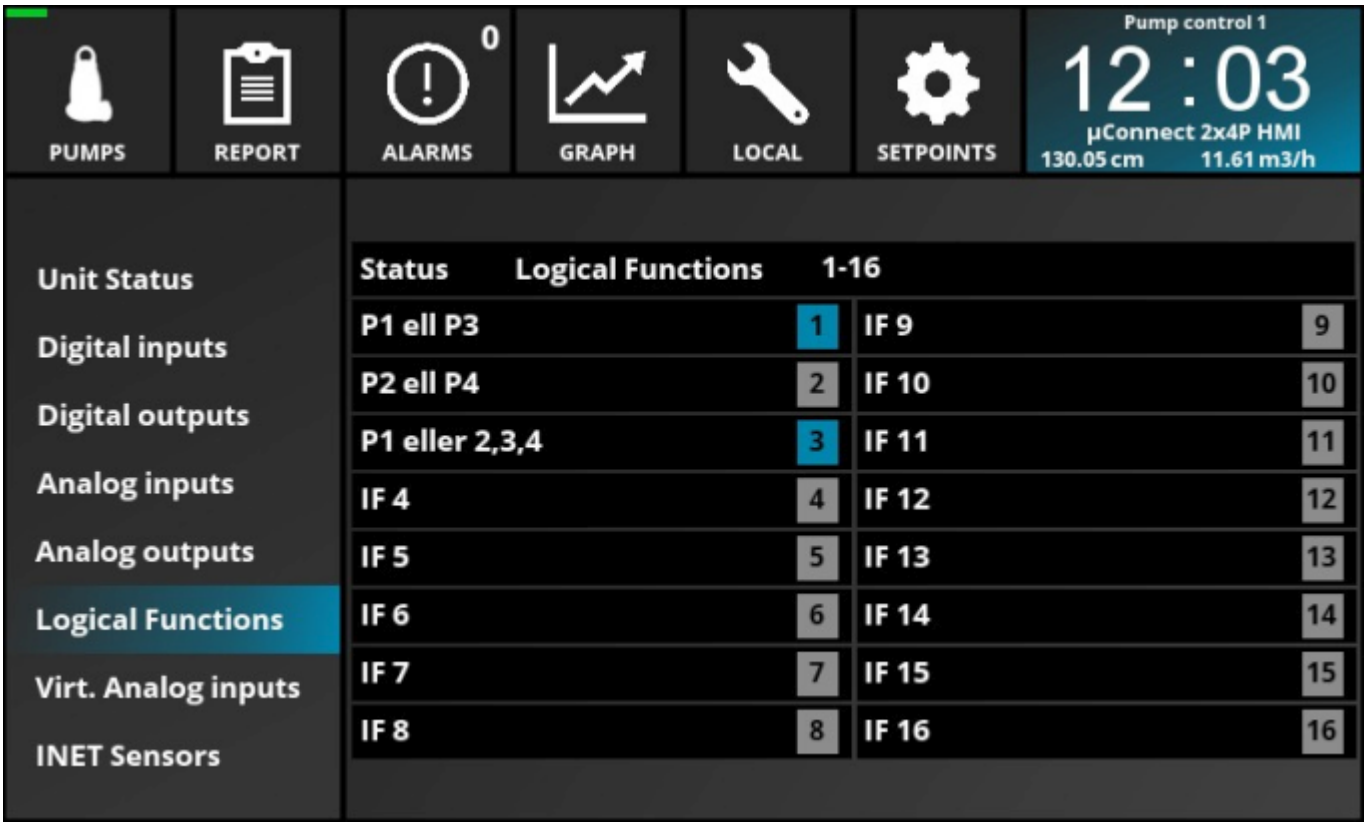
Text	Description:
Signal name	The name for the I/O, configured in the connected unit.
Measurement	On first screen the scaled value from the signal is shown. On second screen the actual mA given to the input is shown.
Unit	On first screen, the unit for the measurement is displayed as read from the configured signal in connected unit. On second screen the unit is shown in mA. Behind the measurement units, the states of the High and Low limit for the measurement is shown on top and lower half of of the measurement unit. When a limit signal is Active/ON the background will switch to blue background colour for the signal. When the signal is Inactive/OFF the background will switch to black background colour for the signal.

Analog output configuration

Configuration is done directly in the connected unit´s configuration. Changes will affect operation of unit.
Although signal names can be configured with Unicode chars by PC configuration tool, the HMI cannot input Unicode chars, and the new signal name will be limited to ASCII chars, meaning no special chars other than what the pop-up keyboard supply.
To return to the status screen, select the same screen from the left menu again.

Text	Class:	Description:
The name of the analogue output.	D	Selecting another signal for configuration can be done by inputting another signal number here.
20 mA, 4 mA	D	Selecting another signal for configuration can be done by inputting another signal number here.
Limit High, Limit Low	D	Sets the high and low limitations of input values, for functions in connected unit that uses the selected signal.
Average (Sec.)	D	The measurement can be calculated over a running time period, for x amount of seconds.
Unit	D	The unit used to measure the connected signal on the analogue input.
Decimals	D	For SCADA systems retrieving the extended log for analogue inputs, this will scale the measurements so that the SCADA can read decimal values from the measurement. Also this will result in the reading on level bar in pump screen displaying the reading with two decimals.
Signal name	D	The name of the analogue output.

Logical functions



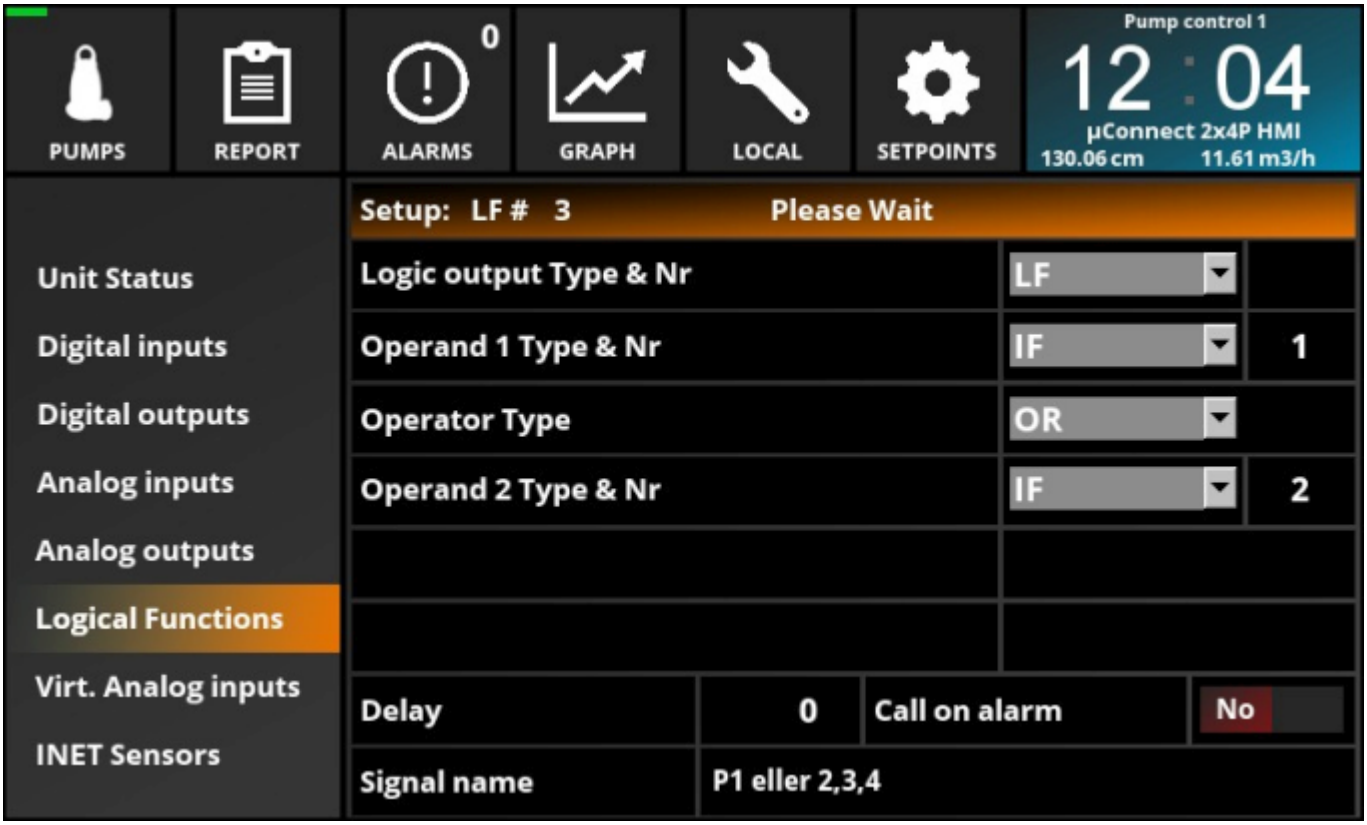
This screen for displays the state of all the signals available of the selected type, in the connected unit.

Configuration of each signal is available in a sub screen, by selecting the signal name.

For each of the available signals, the following is valid:

Text	Description:
Signal name	The name for the I/O, configured in the connected unit.
Number block	When a signal is Active/ON the number block will switch to blue background colour for the signal. When the signal is Inactive/OFF the number block will switch to gray background colour for the signal.

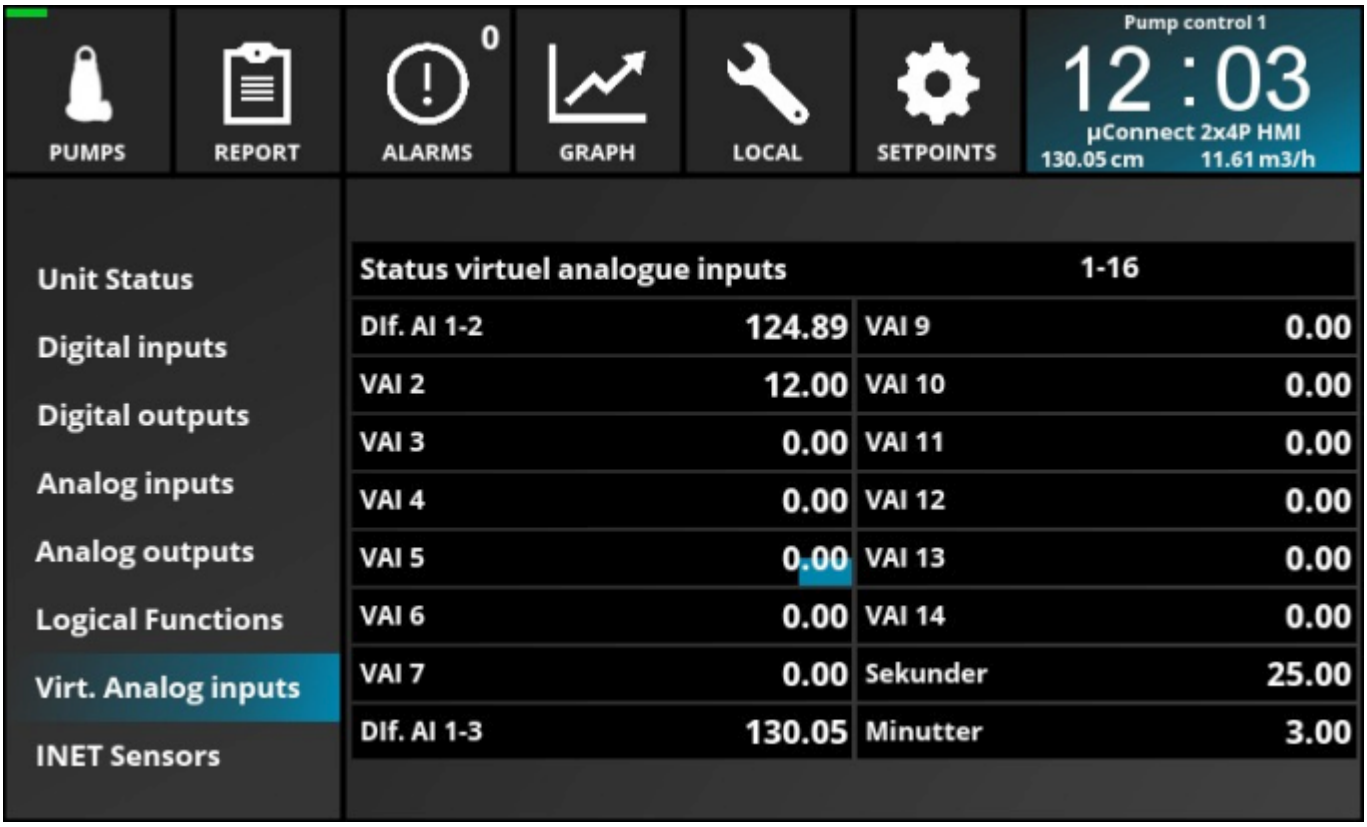
Logical functions configuration



Configuration is done directly in the connected unit´s configuration. Changes will affect operation of unit.
Although signal names can be configured with Unicode chars by PC configuration tool, the HMI cannot input Unicode chars, and the new signal name will be limited to ASCII chars, meaning no special chars other than what the pop-up keyboard supply.
To return to the status screen, select the same screen from the left menu again.

Text	Class:	Description:
Setup: LF #	D	Selecting another signal for configuration can be done by inputting another signal number here.
Logic output Type & Nr.	D	The output type for the Logical function. If DO type is selected, the Digital output number must be entered as well.
Operand 1 Type & Nr, Operand 2 Type & Nr	D	Sets the two signals types, and signal number that should be used in combination with the Operand Type.
Operand Type	D	Sets which function the two operands should use.
Preset / pulses per hour at 100%	D	The activations per hour when the selected analogue input in Operand 1 is at 100%, number of activations is interpolated for the whole scaling of selected analogue input.
Closed time	D	The time the signal should remain active for, when signal is activated.
Start time (Decimal hours), Stop time (Decimal hours)	D	The time of the day for when the signal should activate (Start) and deactivate (Stop). Signal is input in decimal hours, meaning that i.e. 12:30 is input as 12,50hrs
Delay	D	When measurement exceeds high or low threshold, the activation of the corresponding limit will wait for x amount of seconds, before entering the active state.
Call on alarm	D	Sets activation of the signal, after delay, should result in an alarm call.
Signal name	D	The name of the logical function

Virt. Analog inputs



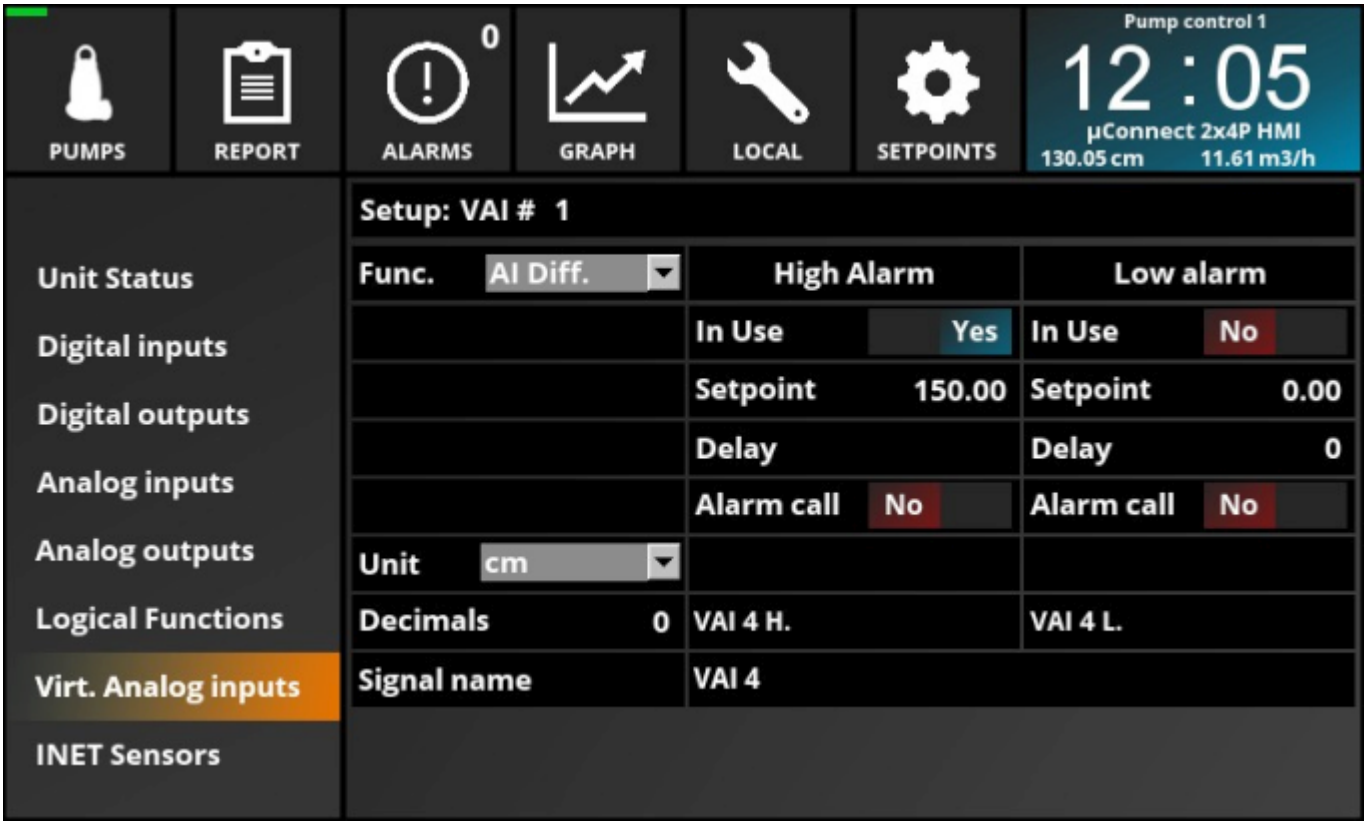
This screen displays the actual measurements from the signals available in the connected unit, with their corresponding units.
No unit for Virtual analogue inputs are shown.

Configuration of each signal is available in a sub screen, by selecting the signal name.

For each of the available signals, the following is valid:

Text	Description:
Signal name	The name for the I/O, configured in the connected unit.
Measurement	The scaled value from the signal is shown.

Virt. Analog input configuration



Configuration is done directly in the connected unit´s configuration. Changes will affect operation of unit.
Although signal names can be configured with Unicode chars by PC configuration tool, the HMI cannot input Unicode chars, and the new signal name will be limited to ASCII chars, meaning no special chars other than what the pop-up keyboard supply.
To return to the status screen, select the same screen from the left menu again.

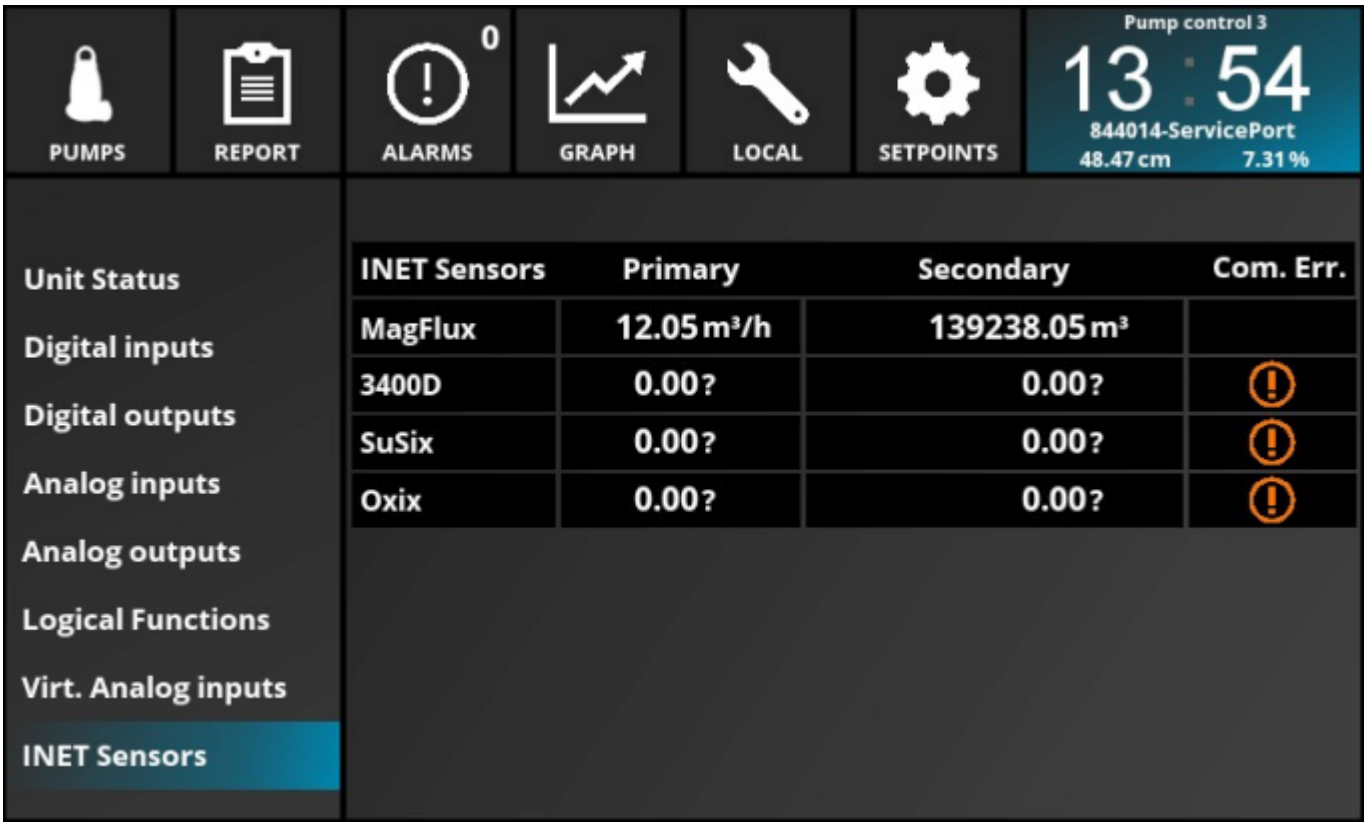
Text	Class:	Description:
Setup: VAI #	D	Selecting another signal for configuration can be done by inputting another signal number here.
Func.	D	Sets the function for the virtual analogue input.
AI no. 1., AI no. 2.	D	Sets the function for the virtual analogue input.
Reg. No.	D	When function is Reg. Adr. The virtual analogue input will read from this address and set the result as its measurement.
Data Type	D	When function is Reg. Adr. The data type for the register chosen in reg. No.
Dev. Fakt.	D	The calculated value can be given a divide factor to scale the measurement.
Unit	D	The unit used to measure the connected signal on the analogue input.
Decimals	D	Decimals to read from the measurement.
Signal name, High alarm signal name, Low alarm signal name	D	The names of virtual analog input, low alarm, and high alarms respective.

High alarm, Low alarm

Common settings for the two columns apply.

Text	Class:	Description:
In use	D	Indicates if the high or low threshold should result in active state of their corresponding limits, when exceeded.
Setpoint	D	Sets the signals high or low threshold value. Measurement over or under these values will result in activation of their corresponding limits.
Delay	D	When measurement exceeds high or low threshold, the activation of the corresponding limit will wait for x amount of seconds, before entering the active state.
Alarm call	D	Indicates that the activation of the signal, after delay, should result in an alarm call.

INET sensors



HMI supports measurements readings from up to 4 MJK INET-sensors, communicating via Modbus to the connected unit.
INET sensors are MJK sensors like MagFlux, Susix, Oxix, and others, that are connected to the Connect/Mμ Connect via INET communication bus.

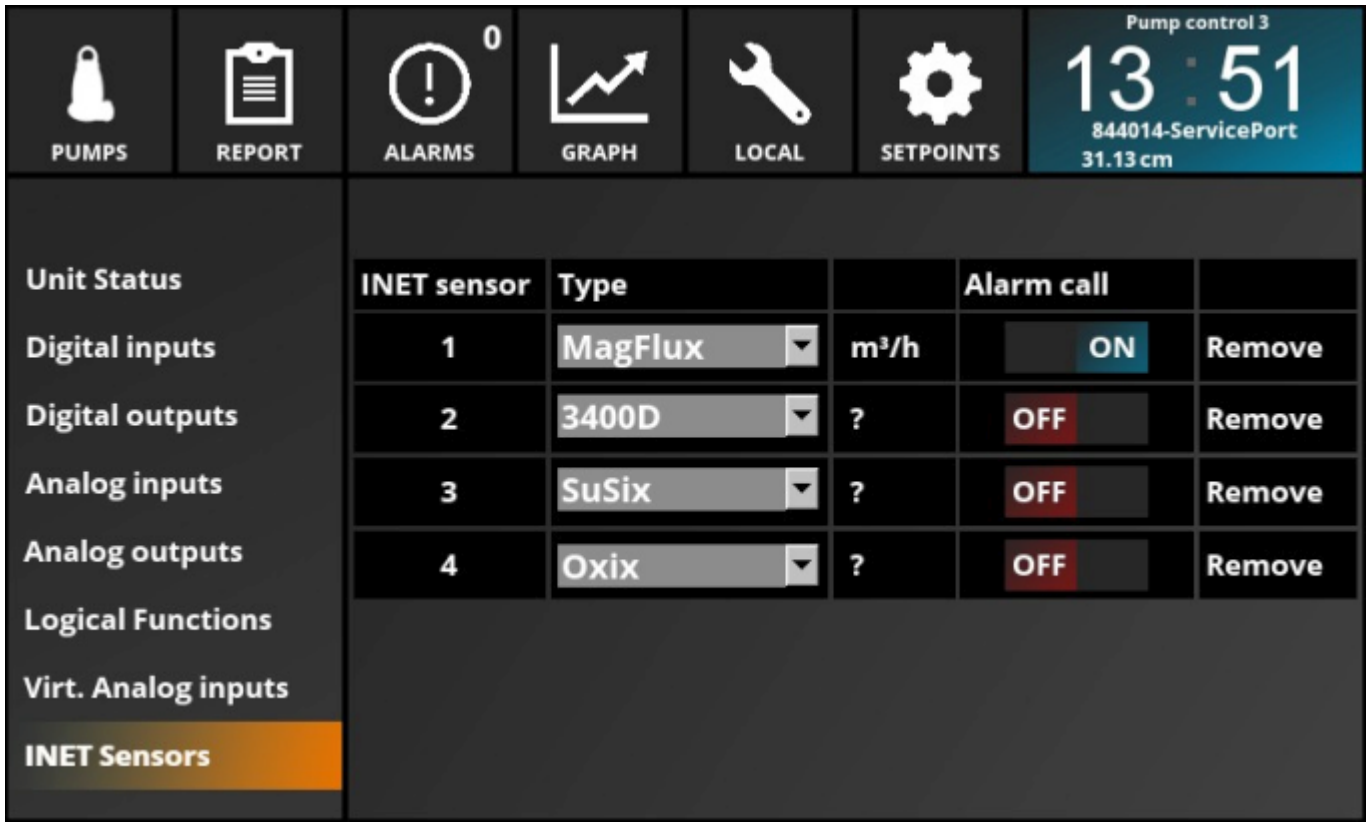
The screen displays the measurements of the INET sensors added to the connected unit.
Each line represents one of the four possible INET sensors that the HMI can display with the following format:
Sensor Type, Primary measurement with unit, secondary measurement with unit.

INET sensors all have different ways of handling the secondary measurement; refer to sensors manual for more information.

Configuration of the INET-Sensors available in connected unit is done by selecting any of the 4 lines available for INET-sensor readings.

Text	Description:
INET sensors	The name for the sensor connected.
Primary	The primary measured value from the sensor is shown.
Secondary	The Secondary measured value from the sensor is shown.
Com. Err.	If the unit cannot communicate with the sensor, a exclamation mark will be shown.

INET sensors configuration



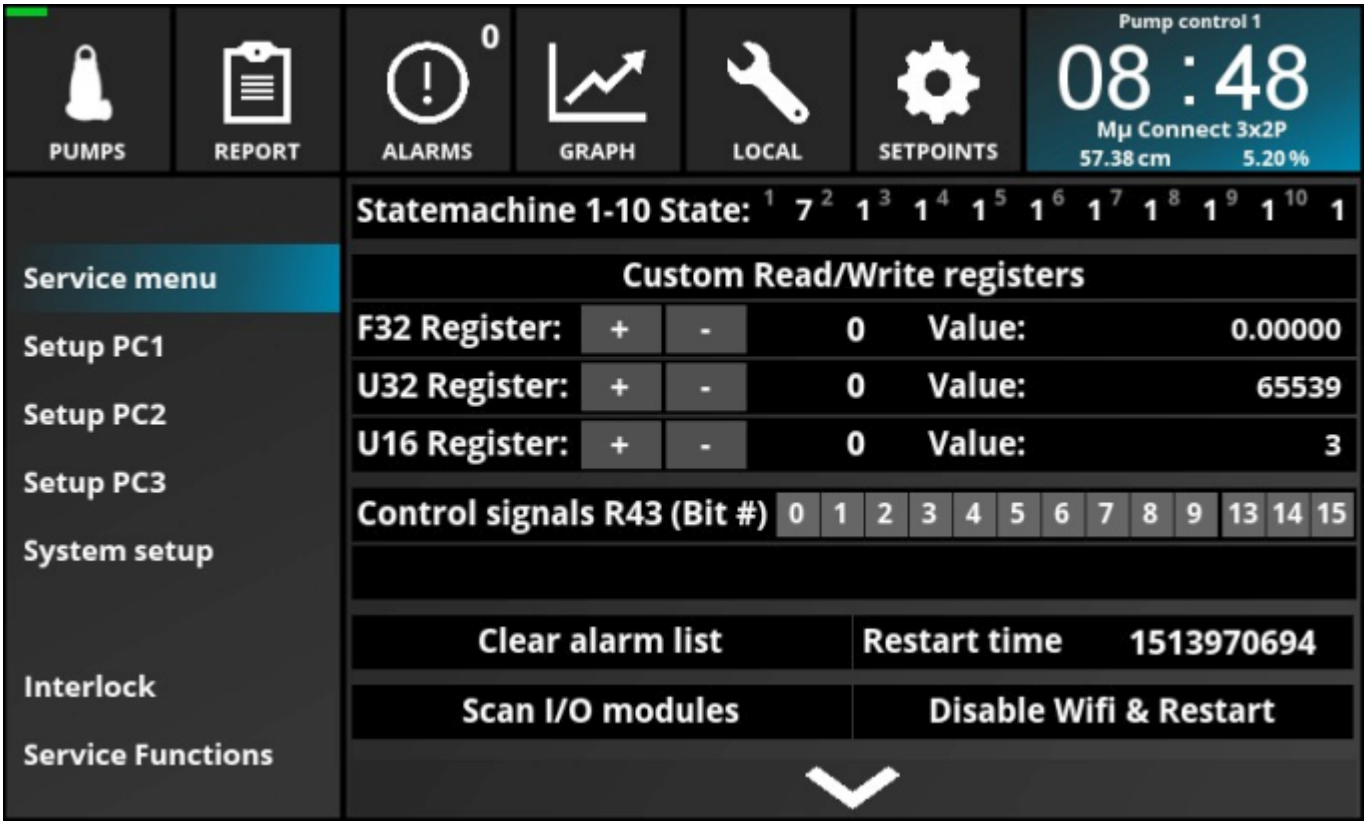
This screen provides the possibility to configure up to 4 INET sensors in the connected unit.
Note: **Changing or removing INET sensors can have impact on connected unit operation**

Text	Class:	Description:
Search for INET devices	E	By using Start Search, the connected unit will initiate a search routine to try and find up to 16 INET-sensors. The progress of the search can be seen next to the Search button.

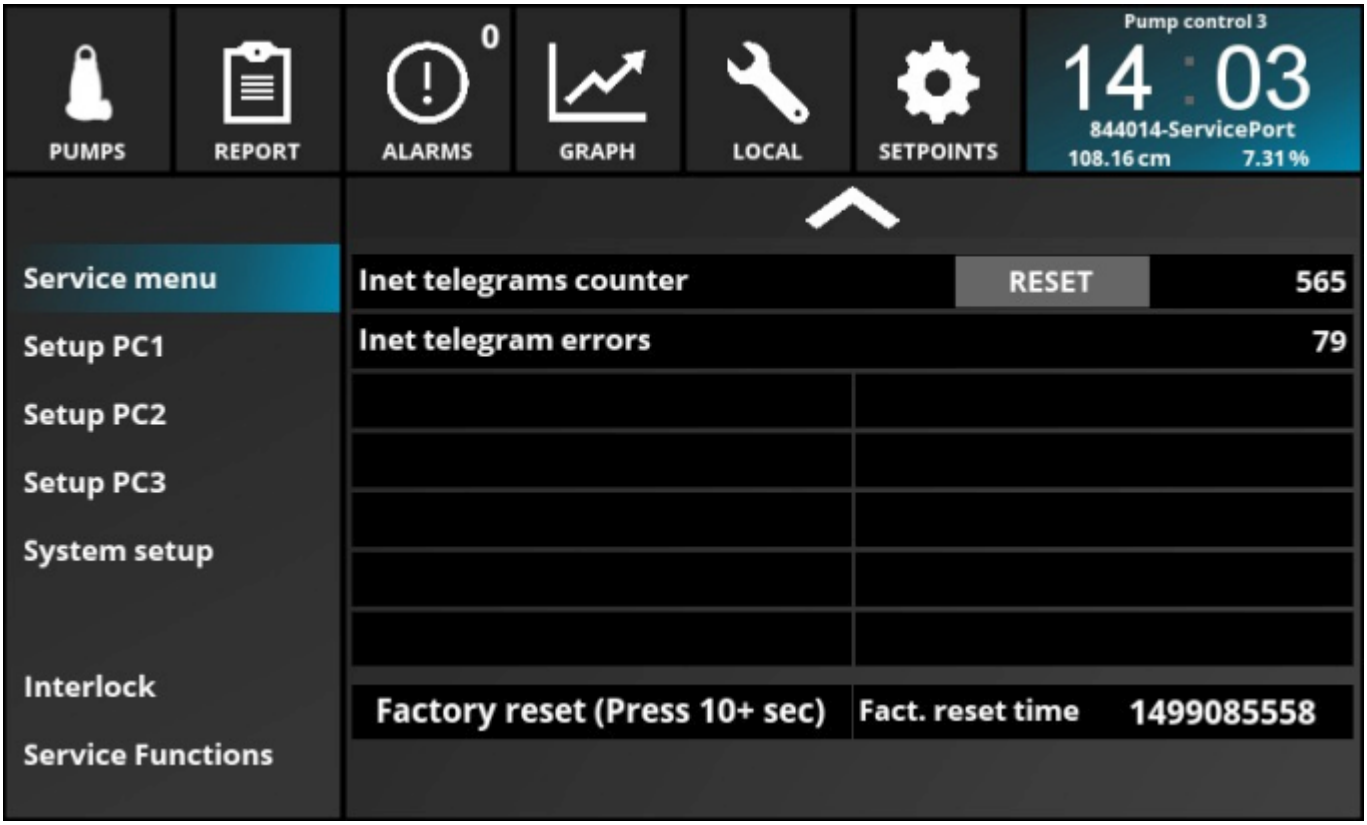
Text	Class:	Description:
INET device column	-	Lists the 4 possible INET-Sensors that can be displayed be the HMI.
Type	E	The type of INET-Sensor that have been found by the search function.
Measurement Unit	-	The measurement unit, for the INET-Sensor, derived from the communication with that sensor.
Alarm Call	C	If an communication error should result in an alarm call, this can be set ON.
Remove	E	**Note:** **Use with caution.** It is possible to remove the INET-Sensor from the INET sensor reading routine in the connected unit. The Connected unit will no longer talk to the sensor, and the measurement will be removed from HMI display. Hold for > 1 second to remove the sensor from unit.

Service menu

When viewing the Unit Status screen, access to the Service menu screen is achieved by selecting and holding the "Unit Status" button for more than 0,5sec.
Caution! Some functions can alter the functionality of HMI and connected unit, and result in unintended behaviour if not used correctly.
Service menu gives additional tools and information for technical personnel.



Text	Description:
Statemachine 1-10 state:	The actual state for each of the 10 state machines running in the connected unit. When state machines are configured and running, the actual state for each state machine is displayed.
Custom Read/Write registers	It is possible to read and write, from and to any of the registers in the connected unit ´s register list. Write functions are limited to the write limitation of the registers in the connected unit. There are 3 different custom read write types, which must be used for their intended data type only, for the register to be accessed correctly. Change the register number for i.e. “F32 Register”, and observe the value for that register in the “Value:” column. If the register chosen is writeable, the value can be changed by selecting it. Writing to a read only register will be allowed, but the connected unit will not store that value.
Control signals R43 (Bit #)	Displays the first 9 & the last 3 bits of register 43 in connected unit. The individual bits have their own meaning. Bit 1=Active alarm, Bit 4=Low batt., Bit 5=Test-call, Bit 6=Alarm-call, Bit 7=PWR Fail, Bit 8=Interlock, Bit 13=PC1 High float run, Bit 14=PC2 High float run, Bit 15=PC3 High float run
Clear alarm list	When choosing to clear the alarm list, the last 8 alarms in alarm list will be cleared. ALARMS screen will be empty again as if no alarm has ever occurred.
Restart time	The last time the connected unit booted up. Time format is in UNIX time.
Scan I/O modules	If necessary, this will tell the Connected Unit to do a new search for available I/O modules. I.e. after connecting additional I/O modules to a Mμ Connect. It may be necessary to restart connected unit, after doing this. Doing a restart of the connected will also result in HMI rebooting 60 seconds after connected unit.
Disable Wi-Fi & Restart	This function is to get the HMI to clear the Wi-Fi SSID and Wi-Fi Password in the connected unit, by writing empty strings to the corresponding registers unit´s configuration. Then the Unit is asked to do a controlled restart Doing a restart of the connected will also result in HMI rebooting 60 seconds after connected unit.



Text	Description:
Inet telegrams counter	When an device is connected to INET and the unit is reading from the device this will count the number of telegrams send via the Inet port. Reset button will reset this counter.
Inet telegram errors	When ever a device is not responding to the requests on inet, this counter will show many faulty telegrams has been observed.
Factory reset (Press 10+ sec)	**Caution! Use with extremely care.** If a factory reset of the connected unit is desired, this will send the command to the connected unit to do a complete factory reset of the device. Unit will restart, and HMI will disable all pump control displays and selections, as they are no longer configured in the connected unit. Connected unit will need to be re-configured after this. Note: it is possible to enable the pump controllers in the unit from HMI service menu.
Fact. reset time	Unix Times tamp for when the unit was last factory reset.

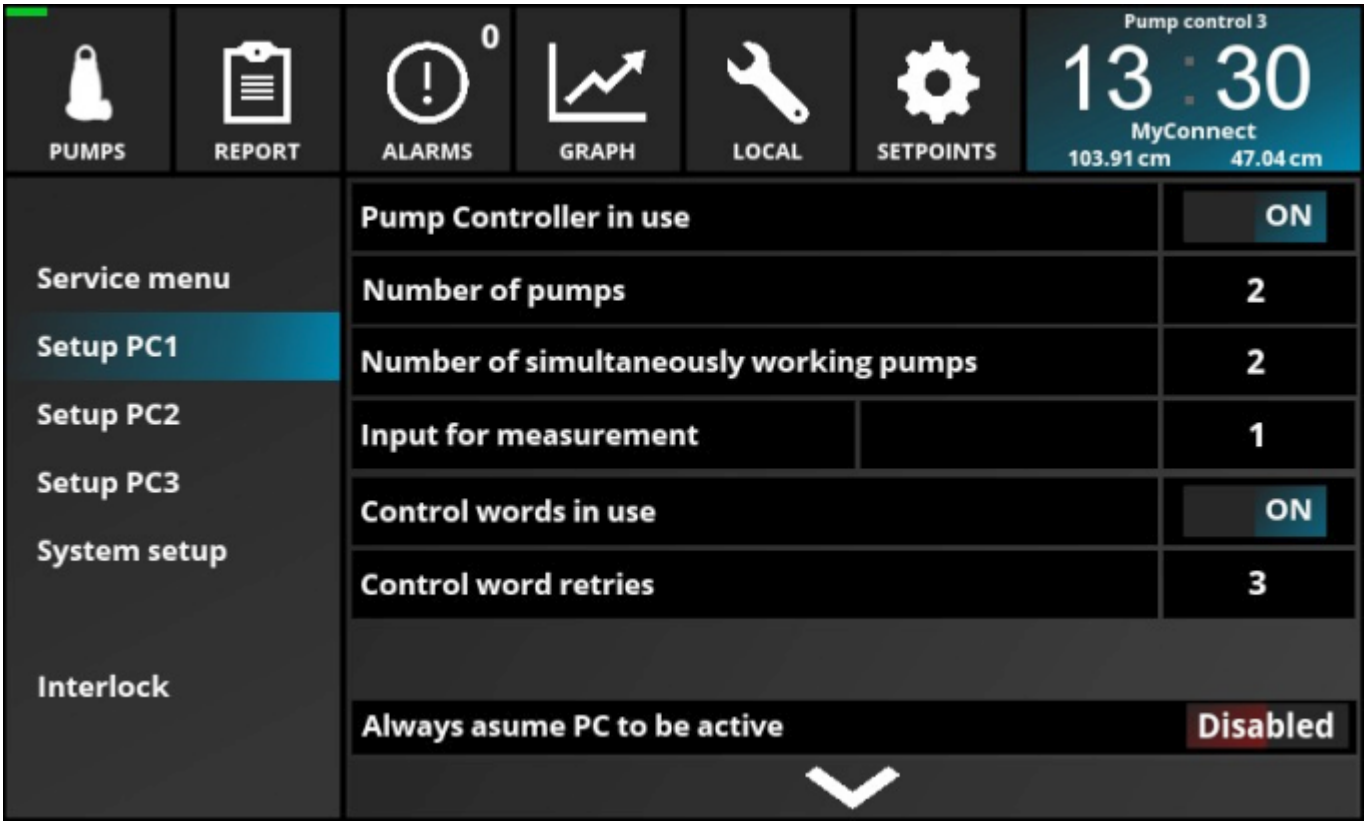
Setup PC1 & PC2

Setup PCx & System setup

The following screens provide setup for pump controllers and system settings, for setting up a pumping station in the site, without need of PC configuration software.
For pump controllers, only the system technical parts of setting up pump controllers are available here.
Standard settings are available on SETUP screens for each pump controller.
All I/O´s and other settings must be configured on their respectfully screens. I.e. Scaling and naming of Analogue input for level, is found on analogue input setup screen.

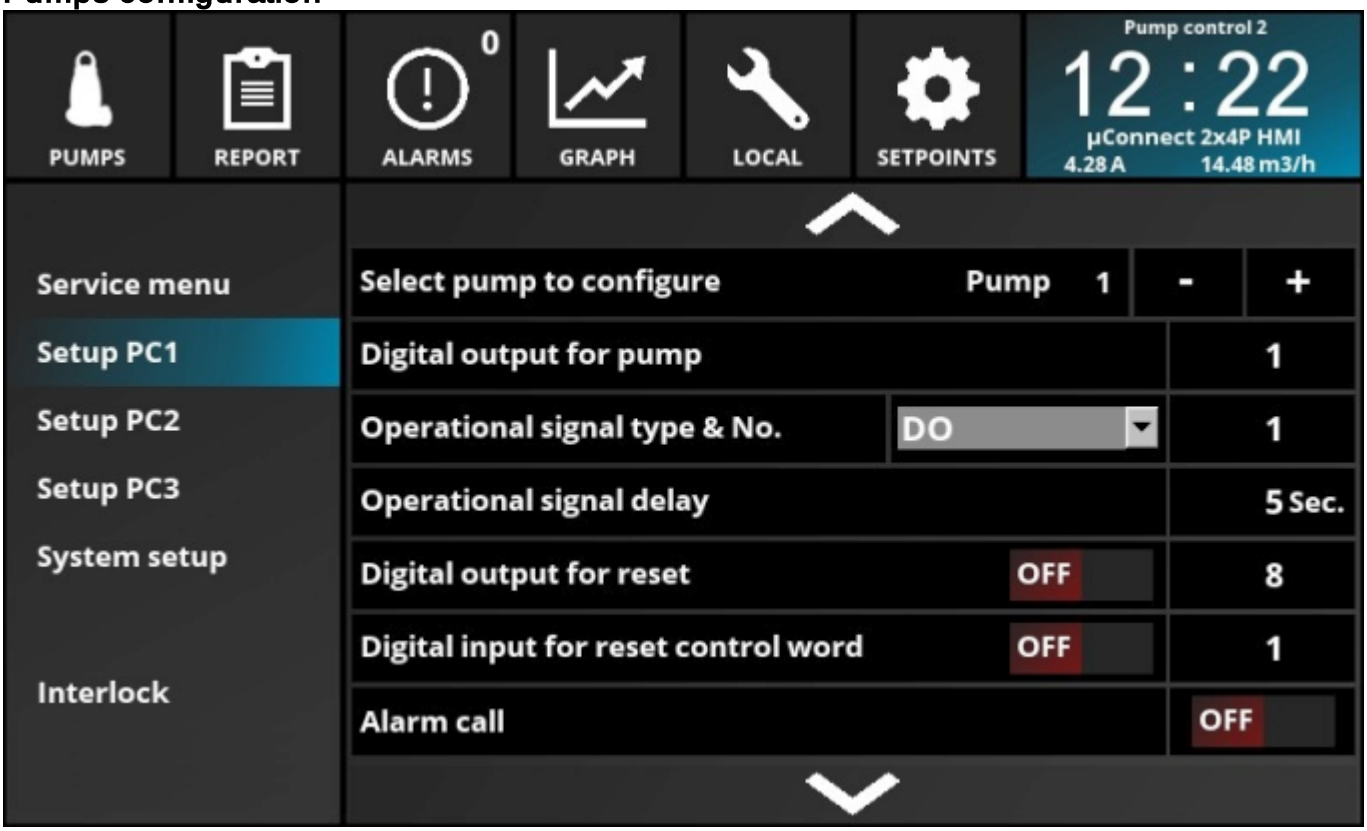
Configuration of PC1 and PC2 are identical.

Initial pump controller configuration



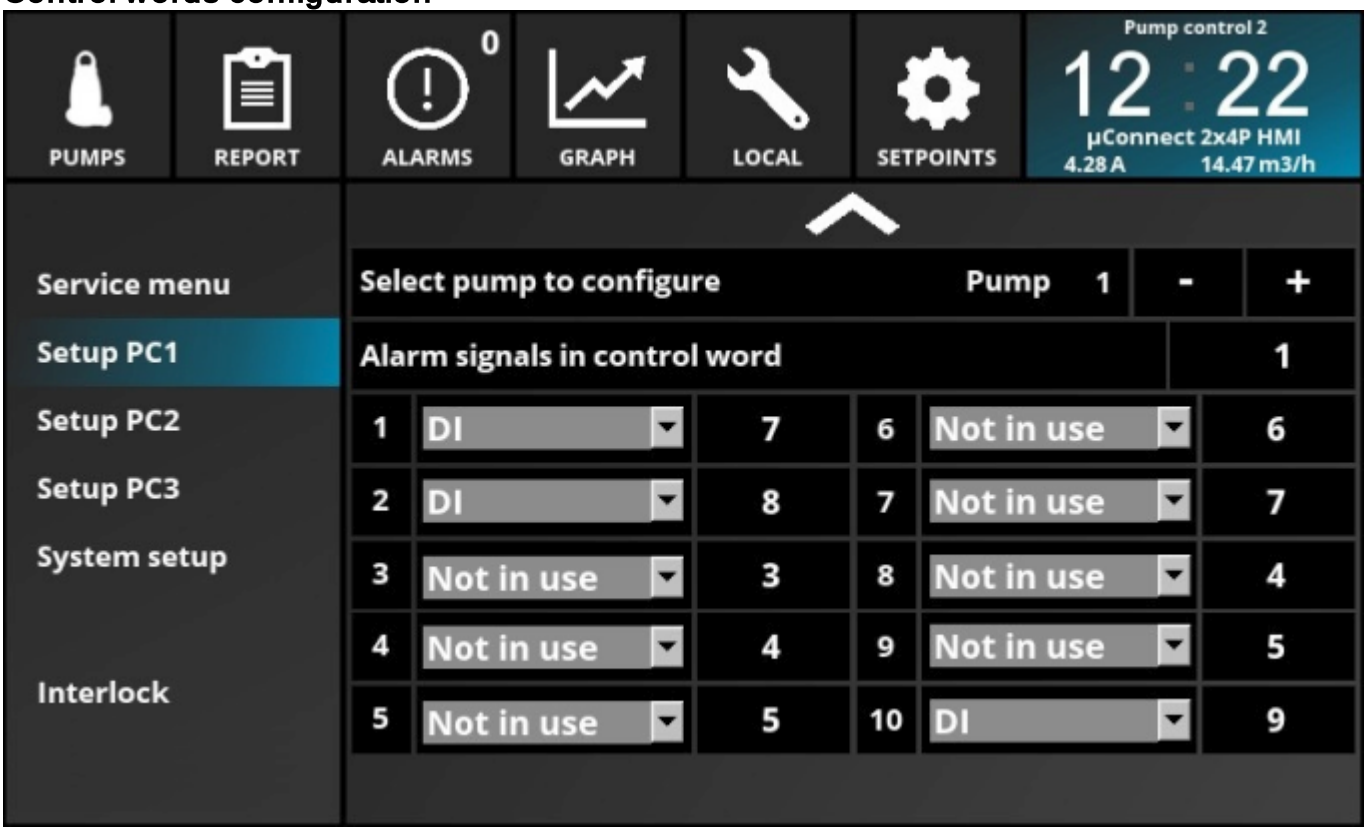
Text	Description:
Pump controller in use	Enable of disable the pump controller
Number of pumps	Set how many pumps should be available for the pump controller
Number of simultaneous working pumps	The amount of pumps which are allowed to run simultaneously.
Analogue input for measurement	Set the analogue input for the pump controller to use for Starting and Stopping the pumps.
Control words in use	Set if the control words should be in use for the pumps.
Control words retries	If a pump encounters a fault, set how many times the pump should be reset and started again, before going into critical error.
Always asume PC to be active	This is intended for special unit configurations only. Enabling one of these will result in HMI always showing the selected pump controller active, even if pump controller is set to “Not in use” in configuration. This is sometimes useful, when special unit configurations, disables one of the pump controllers by use of state machines or situations like such, to still be able to see screens for that pump controller. This settings are limited to the HMI, and will not be saved in the connected unit.

Pumps configuration



Text	Description:
Select pump to configure	Select with '+' & '-' buttons which of the 4 pumps should be configured with the settings on the screen. The pump No. selected is shown left of the buttons.
Digital output for pump	Select which digital output should be used as Start & Stop signal to the pump.
Operational signal type & No.	Select the signal type, and signal number, for indicating pump is running.
Operational signal delay	Set how long time from pump is started till the operational signal must be activated, before resulting in running signal indication error.
Digital output for reset	Set if a digital output with the No. selected should be set to ON state, when pump controller is resetting the error and retrying the pump. Note: The DO chosen should be configured as a timed output for a couple of seconds.
Digital input for reset control word	Set if a digital input with the No. selected should be used as a reset for the pump. Activating of the DI will result in control word reset of errors, and if configured, the reset DO will be activated.
Alarm Call	If a critical alarm occurs on the pump, enabling this will result in an alarm to the alarm list.

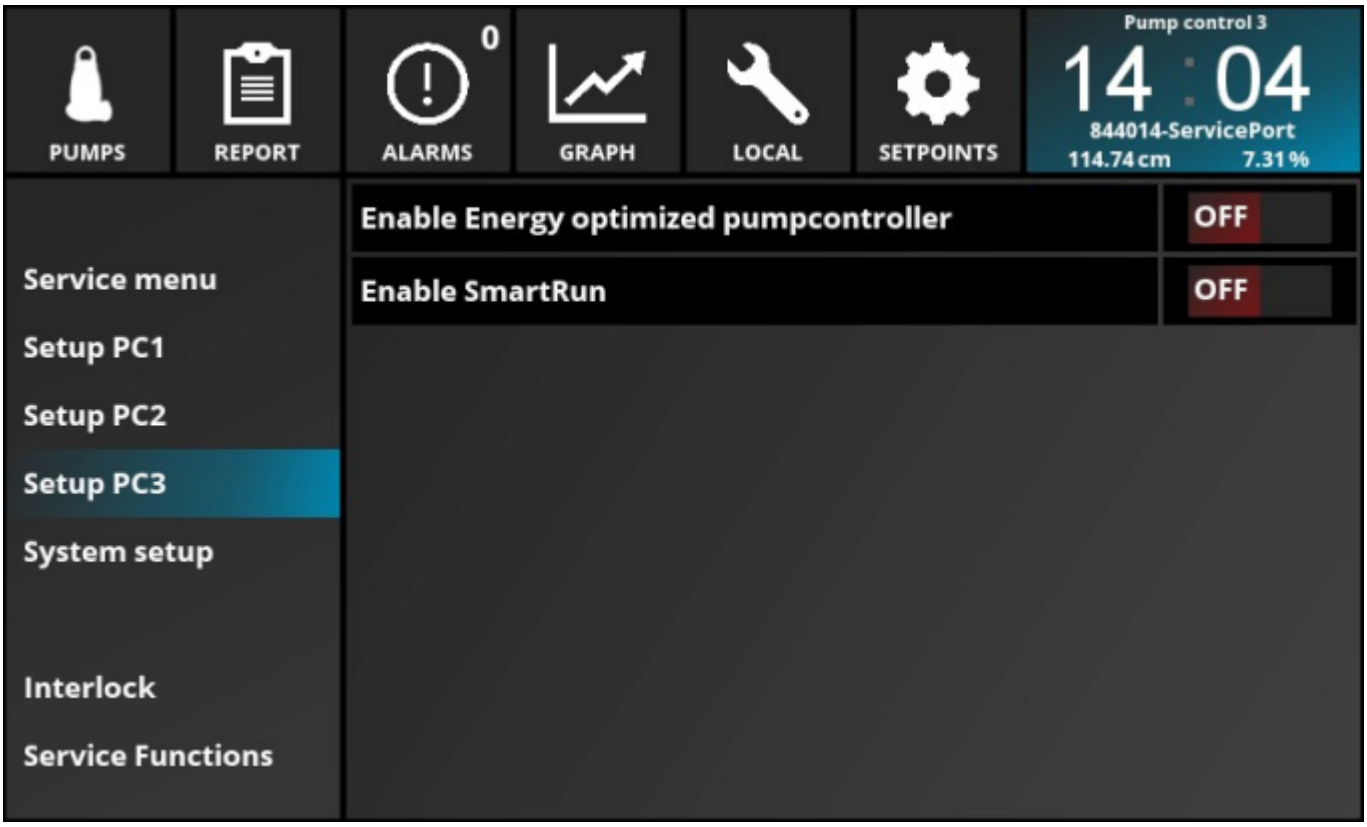
Control words configuration



Text	Description:
Select pump to configure	Select with '+' & '-' buttons which of the 4 pumps should be configured with the settings on the screen. The pump No. selected is shown left of the buttons.
Alarm signals in control word	Set how many of the first signals 1-? Should be considered as an alarm for the pump, the rest of the signal will be considered as stop signals, and the last 2 signal will be displayed as Blocked indication on HMI
Alarm/Stop signals 1-10	Select a signal type and I/O number to be uses as an Alarm or Stop signal for the pump.

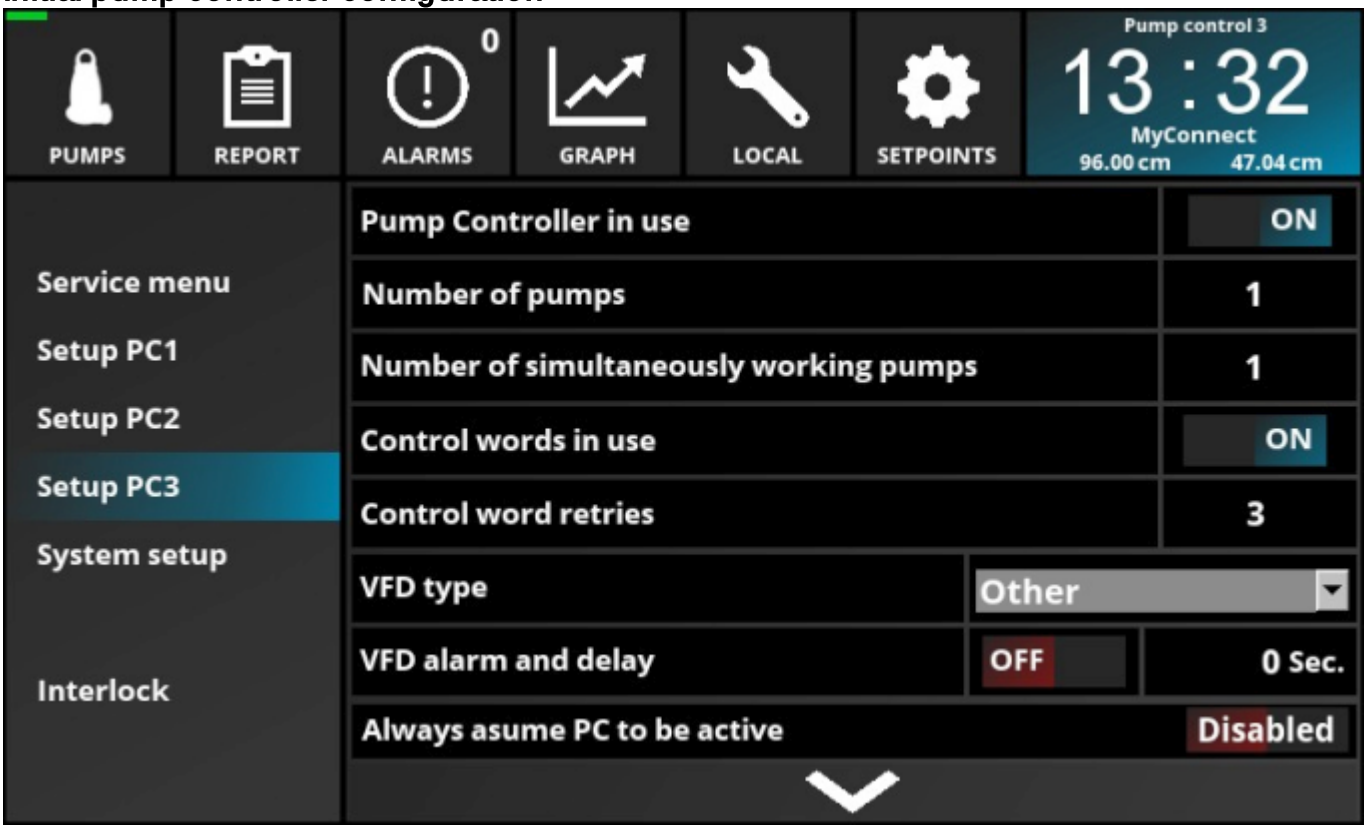
Setup PC3

If PC3 has not yet been selected as energy optimized pump controller or SmartRun this screen will be displayed, else the configuration of PC3 or SmartRun will be selected and displayed directly.
The screen provides the possibility to setup how pump controller 3 should be controlling the pumps, or if SmartRun should be used.
Only one of the two types can be activated at one time.



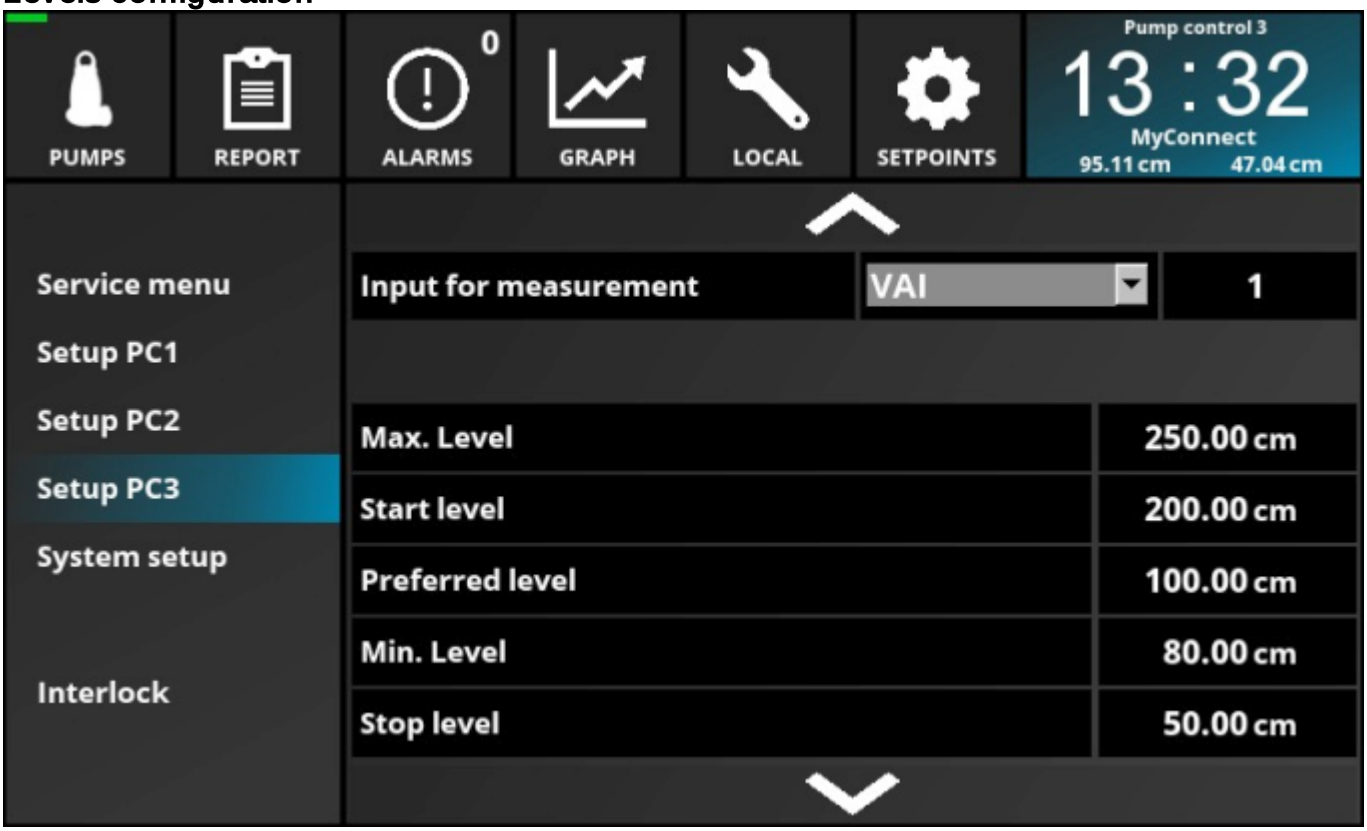
Text	Description:
Enable Energy optimized pump controller	Set to ON if pump controller 3 should be controlling the pumps as energy optimized pump controller.
Enable SmartRun	Set to ON if pump controller 3 should be used as SmartRun gateway.

Initial pump controller configuration



Text	Description:
Pump controller in use	Enable of disable the pump controller
Number of pumps	Set how many pumps should be available for the pump controller
Number of simultaneous working pumps	The amount of pumps which are allowed to run simultaneously.
Control words in use	Set if the control words should be in use for the pumps.
Control words retries	If a pump encounters a fault, set how many times the pump should be reset and started again, before going into critical error.
VFD type	Select which one of the supported VFDs should be used or select.
VFD alarm and delay	If communication with VFD is faulty for a set time, set if this should result in an alarm to the alarm list.
Always asume PC to be active	This is intended for special unit configurations only. Enabling this will result in HMI always showing the selected pump controller active, even if pump controller is set to “Not in use” in configuration. Pumps must be configured with normal pump controller settings for PC3 & SR(SmartRun). This is sometimes useful, when special unit configurations, disables one of the pump controllers by use of state machines or situations like such, to still be able to see screens for that pump controller. PC3 and SR(SmartRun) cannot be enabled at the same time, and element of the other will not be available, if one of them is active. This settings are limited to the HMI, and will not be saved in the connected unit.

Levels configuration



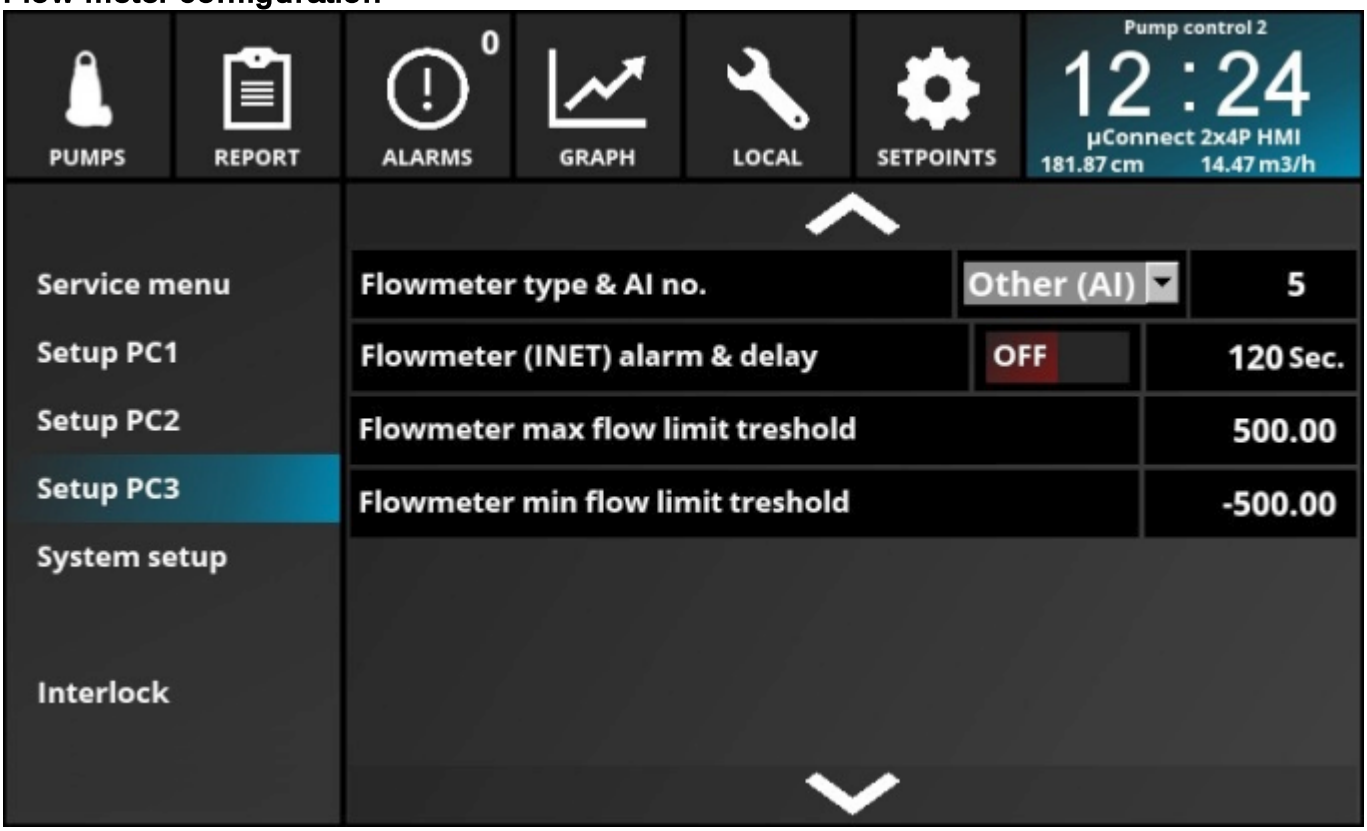
PC3 as VFD gateway or Energy optimized controller.

These settings are required to enable PC3 in HMI, if these values are kept at '0.0' the energy optimized pump controller is not controlling the pumps, and the pump controller is only used as a gateway for communicating with the VFDs.

When PC3 is only used as VFD gateway, some values derived from VFDs will be displayed on PC1 pumps.

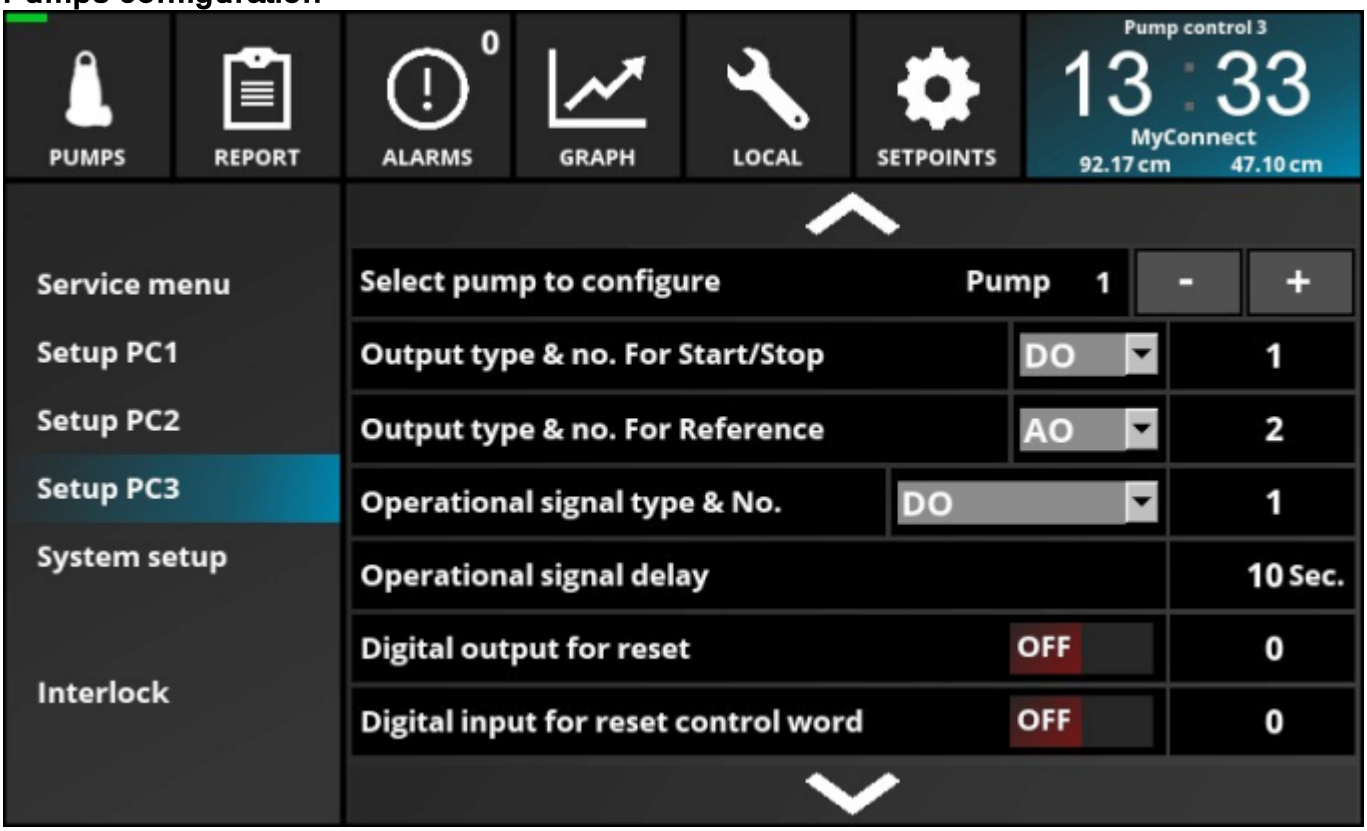
Text	Description:
Input for measurement	Set the input type and No. used as level input for the pump controller to use for Starting and Stopping the pumps.
Max. Level	Set the level where all pumps in pump controller will be started, at max speed.
Start Level	Set the level where the next pump will be started, as energy optimized controlled pump.
Preferred level	Set the level, where the speed for the pump is best for performance of the pump.
Preferred level	Set the level, where level below this threshold will make the pump run at its minimum allowed speed.
Stop level	Set the level, where level below this threshold will make the pump run at its minimum allowed speed.

Flow meter configuration



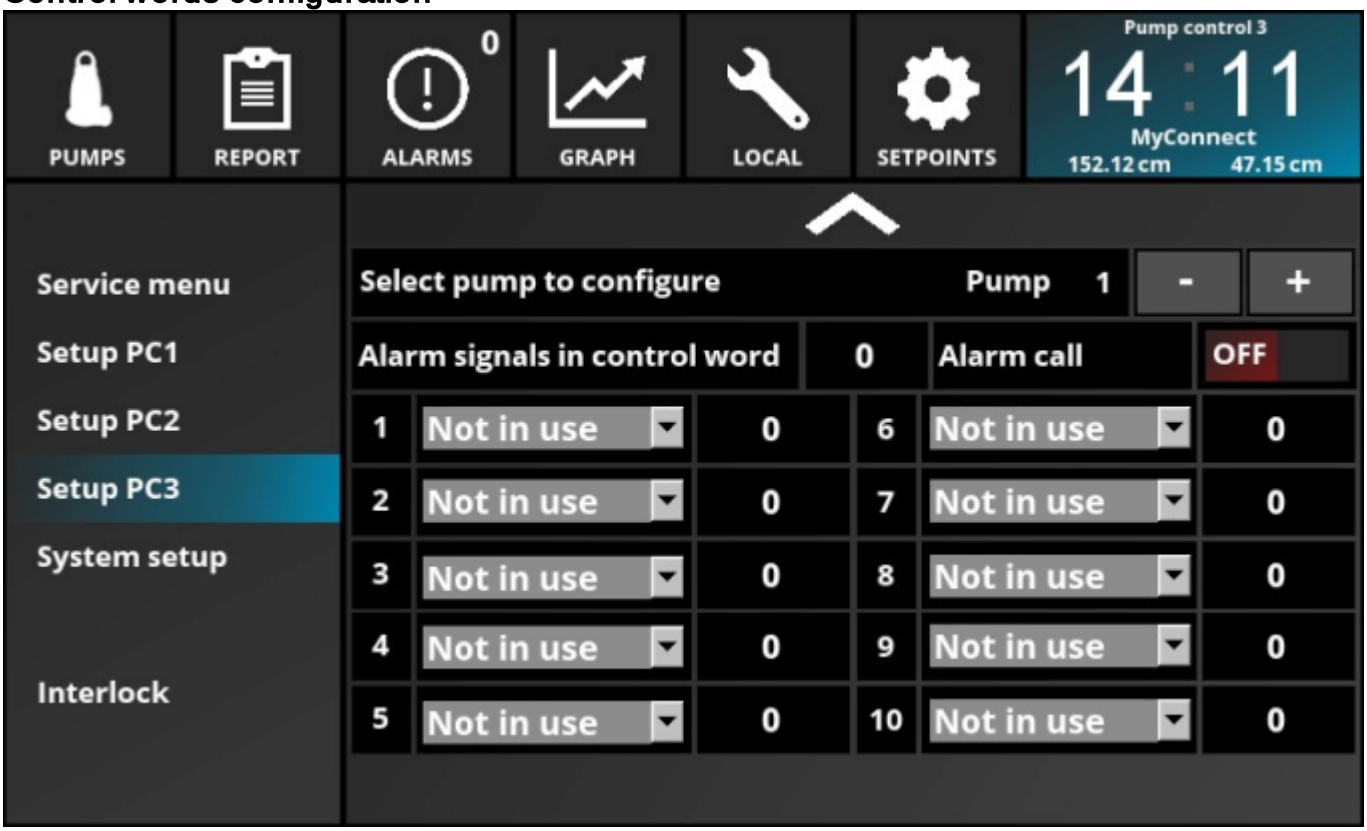
Text	Description:
Flowmeter type & No.	Select if a flow meter should be used in energy calculations in pump controller and which signal type and no. should be used as flow reading.
Flowmeter (INET) alarm & delay	When the flow meter selected is an INET-Sensor, set in the loss of communication for a given time, should result in an alarm to the alarm list.
Flowmeter max flow limit threshold	When pumps are running and the flow reading exceeds this value, the pumps will be stopped again.
Flowmeter min flow limit threshold	When pumps are running and the flow reading exceeds this value, the pumps will be stopped again.

Pumps configuration



Text	Description:
Select pump to configure	Select with '+' & '-' buttons which of the 4 pumps should be configured with the settings on the screen. The pump No. selected is shown left of the buttons.
Output type & no. For Start/Stop	Select which digital output and No. should be used as Start & Stop signal to the pump, or if the Start & Stop signal should be send to the VFD via the INET.
Output type & no. For Reference	Set which output type and no. should be used for setting the reference to the VFD.
Operational signal type & No.	Select the signal type, and signal number, for indicating pump is running.
Operational signal delay	Set how long time from pump is started till the operational signal must be activated, before resulting in running signal indication error.
Digital output for reset	Set if a digital output with the No. selected should be set to ON state, when pump controller is resetting the error and retrying the pump. Note: The DO chosen should be configured as an timed output for a couple of seconds.
Digital input for reset control word	Set if a digital input with the No. selected should be used as a reset for the pump. Activating of the DI, will result in control word reset of errors, and if configured, the reset DO will be activated.

Control words configuration

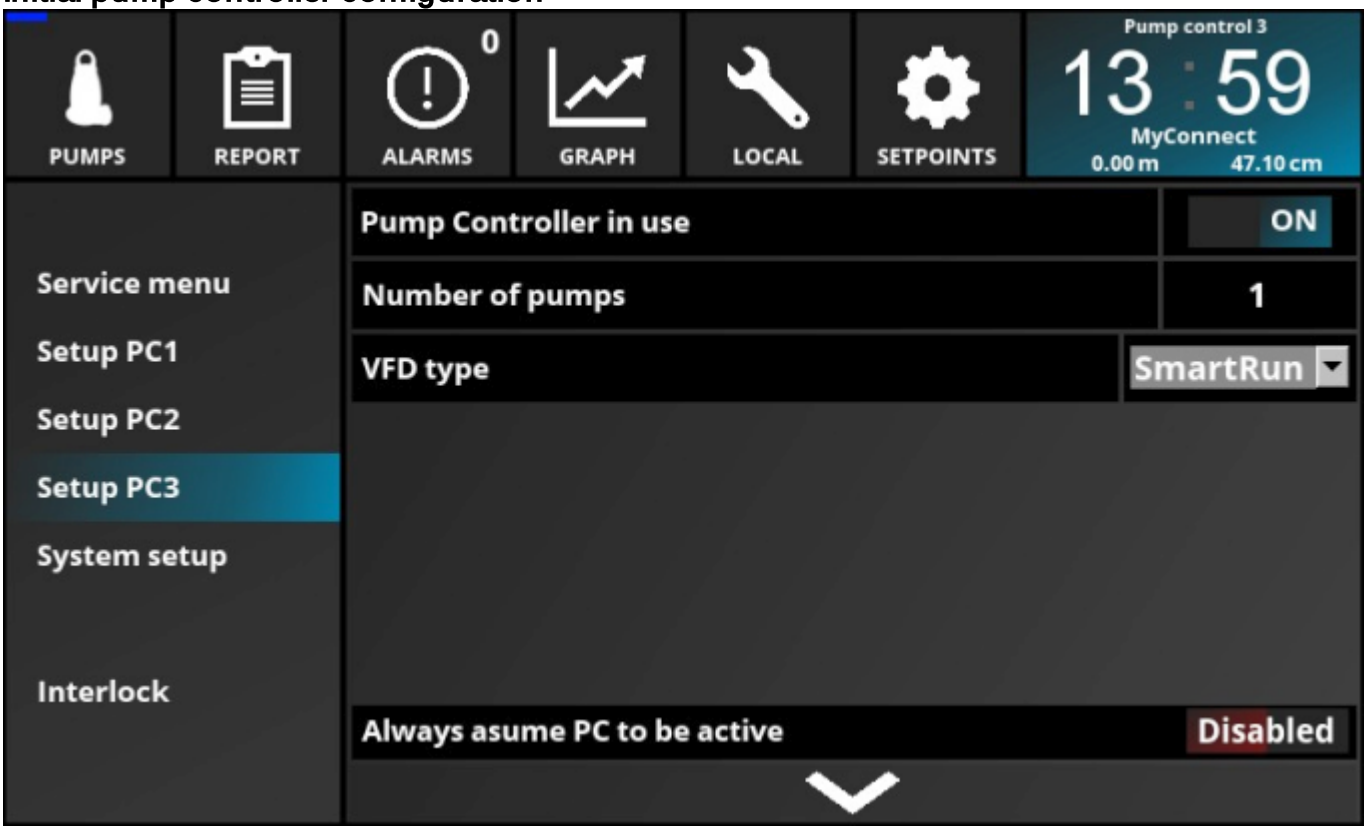


Text	Description:
Select pump to configure	Select with '+' & '-' buttons which of the 4 pumps should be configured with the settings on the screen. The pump No. selected is shown left of the buttons.
Alarm signals in control word	Set how many of the first signals 1-? Should be considered as an alarm for the pump, the rest of the signal will be considered as stop signals, and the last 2 signal will be displayed as Blocked indication on HMI.
Alarm Call	If a critical alarm occurs on the pump, enabling this will result in an alarm to the alarm list.
Alarm/Stop signals 1-10	Select a signal type and I/O number to be uses as an Alarm or Stop signal for the pump.

PC3 as SmartRun gateway

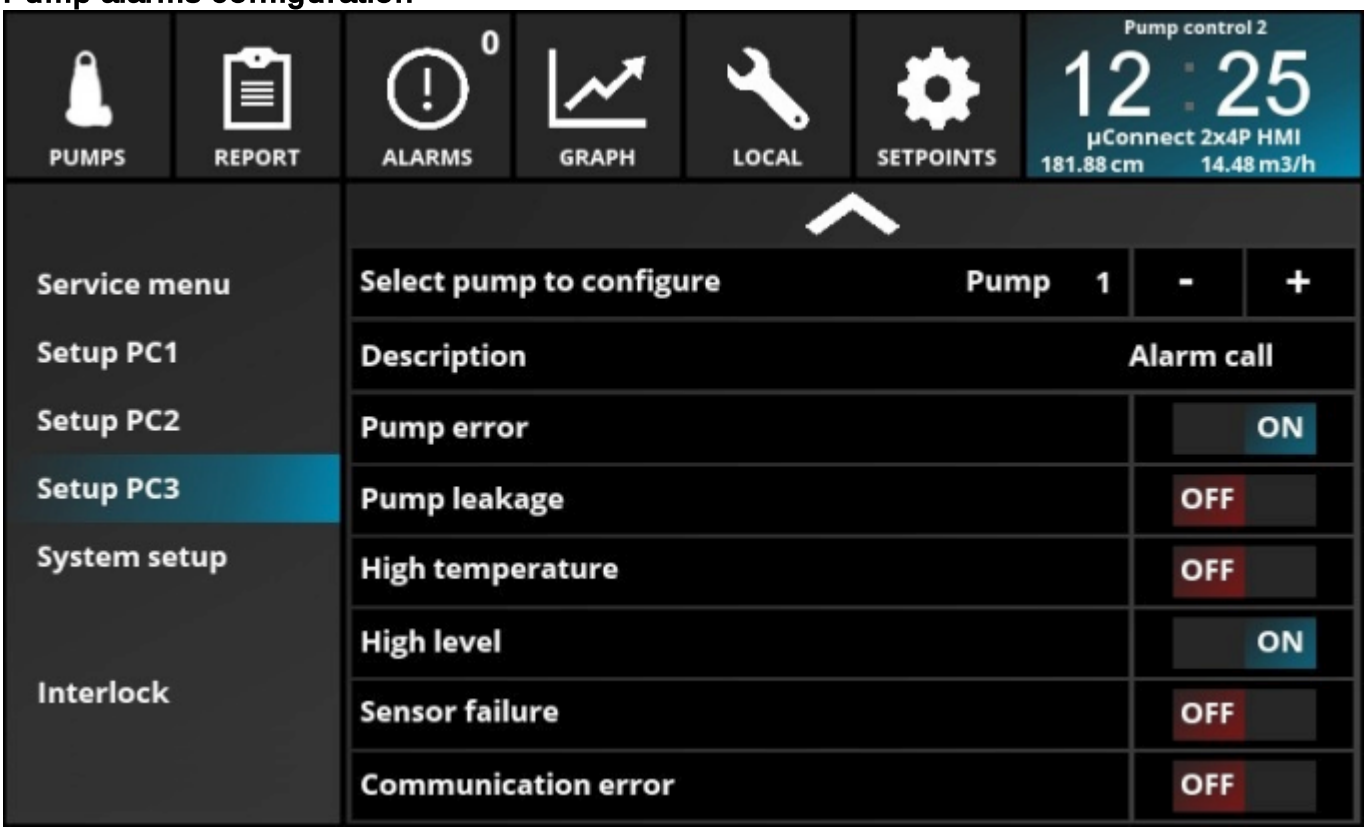
When PC3 is set to act as SmartRun gateway.

Initial pump controller configuration



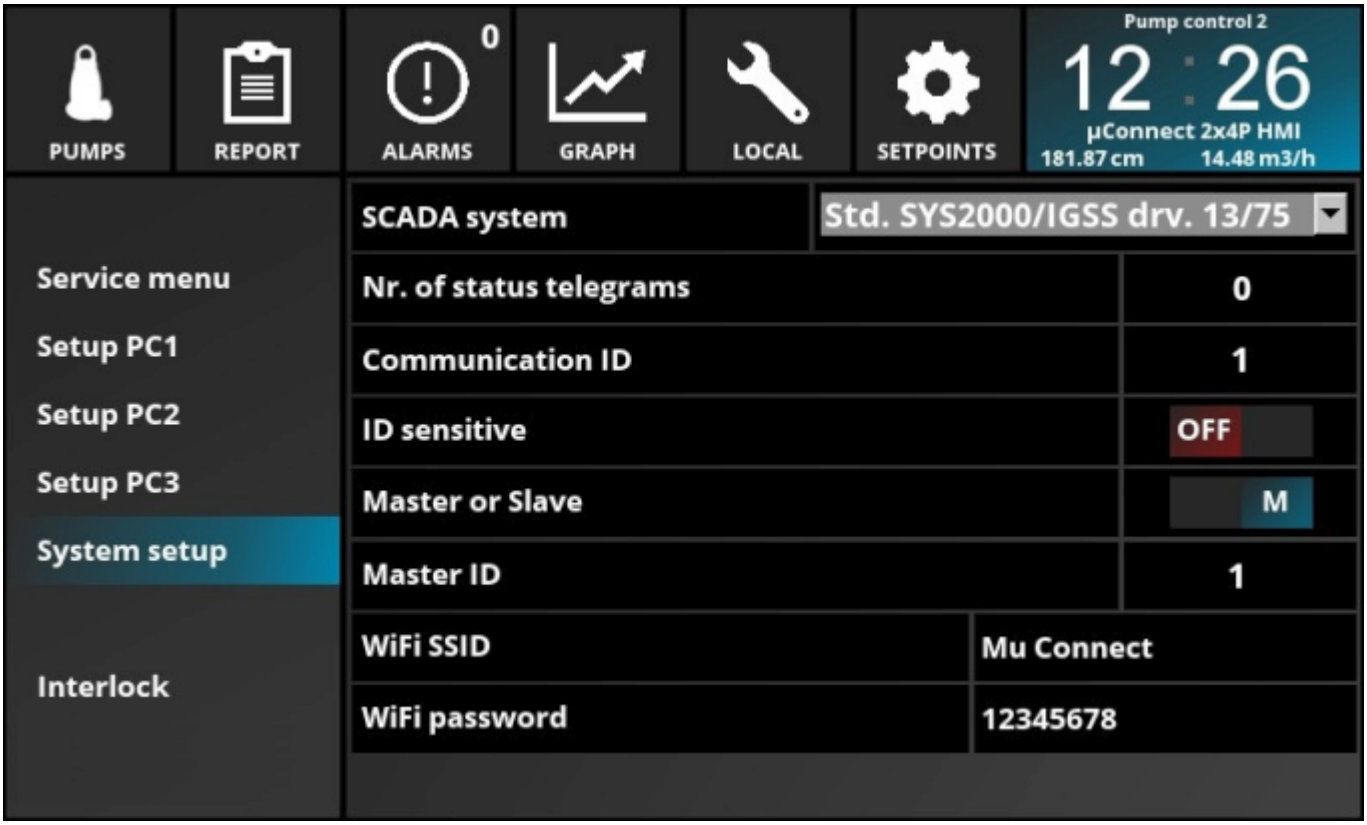
Text	Description:
Pump controller in use	Enable of disable the pump controller
Number of pumps	Set how many pumps should be available for the pump controller
VFD type	This must always be set to SmartRun.
Always asume PC to be active	This is intended for special unit configurations only. Enabling this will result in HMI always showing the selected pump controller active, even if pump controller is set to “Not in use” in configuration. Pumps must be configured with normal pump controller settings for PC3 & SR(SmartRun). This is sometimes useful, when special unit configurations, disables one of the pump controllers by use of state machines or situations like such, to still be able to see screens for that pump controller. PC3 and SR(SmartRun) cannot be enabled at the same time, and element of the other will not be available, if one of them is active. This settings are limited to the HMI, and will not be saved in the connected unit.

Pump alarms configuration



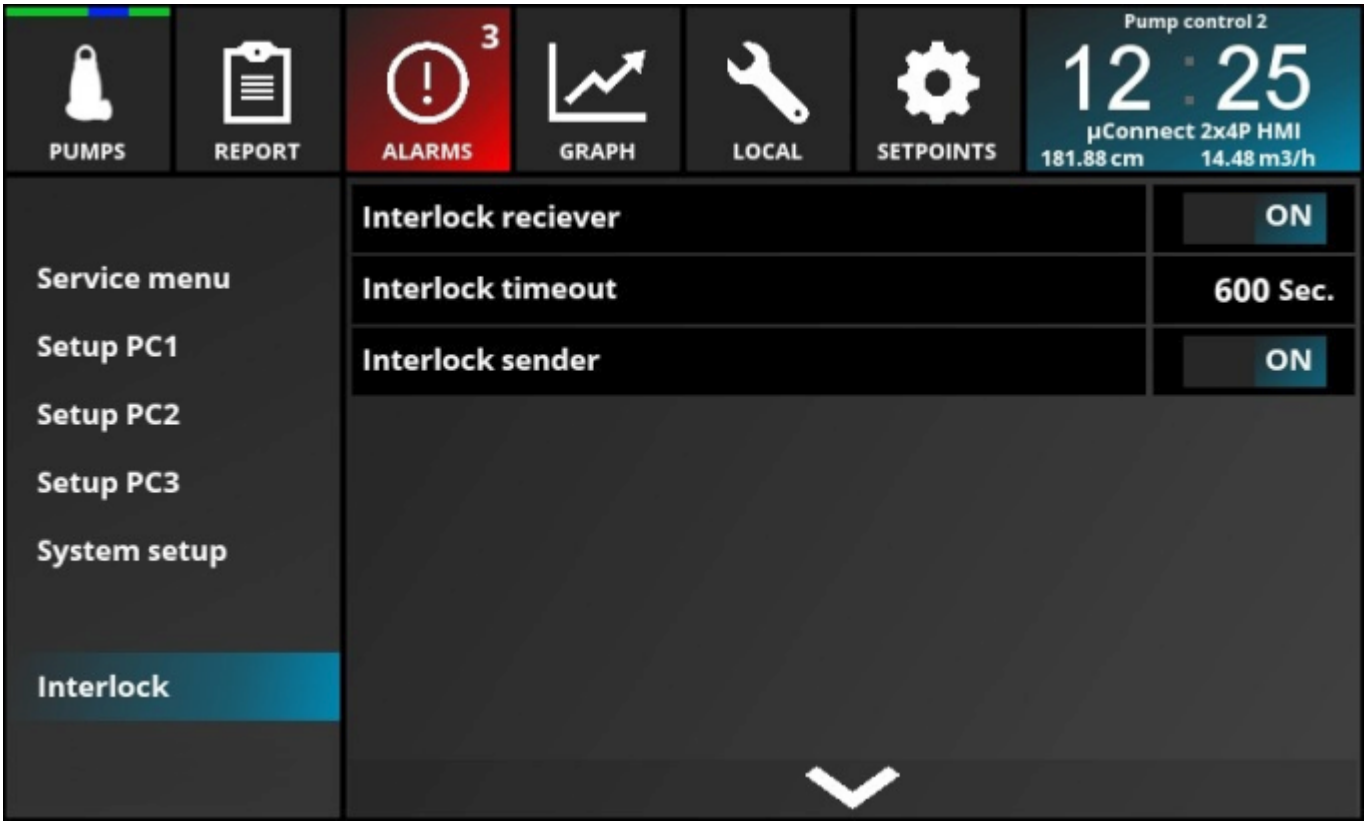
Text	Description:
Select pump to configure	Select with '+' & '-' buttons which of the 4 pumps should be configured with the settings on the screen. The pump No. selected is shown left of the buttons.
Description (SmartRun alarm signals)	The alarm signal from SmartRun pumps
Alarm call	If one of the alarm signals is activated in SmartRun pumps, enabling this will result in the alarm being send to the alarm list.

System Setup



Text	Description:
SCADA system	Wi-Fi SSID & Wi-Fi password
No. of status telegrams	Sets how many alarm status telegrams should be send to IGSS, when an alarm occurs.
No. of status telegrams	Set the ID no. for the unit, for communicating with SCADA system.
ID sensitive	If the unit is connected in a wired network with other units, set this to ON for the unit to only respond to its own communication ID nr. If HMI is mounted in INET port, this must be set to OFF
Master or Slave	If the unit is connected in a wired network with other units, and this unit holds the modem communication from SCADA to connect to all units through, this must be set to M (Master). If HMI is mounted in INET port, this must be set to S (Slave)
Master ID	If the unit is connected in a wired network with other units, this must be set to the ID no. of the Master unit.
Wi-Fi SSID & Wi-Fi password	Set the name and the password for Wi-Fi network generated by connected unit, if Wi-Fi module is available.

Interlock



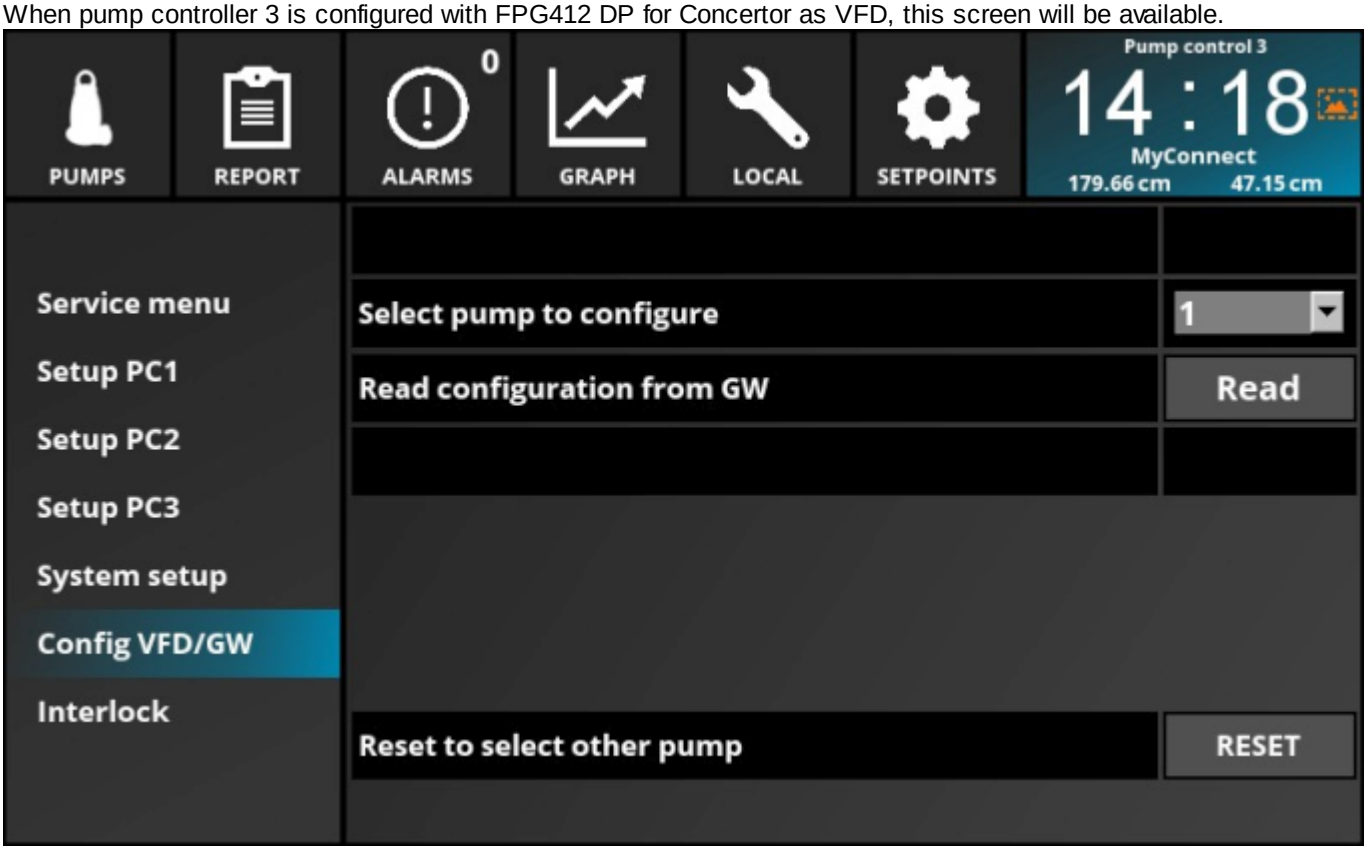
Text	Description:
Interlock	Set if the connected unit should be able to receive interlock commands, from another unit. (always and only PC1) When FW in unit allows it, it will be possible to select which pump controllers should be interlocked. (PC 1, 2 & 3)
Interlock timeout	Set the timeout for the last received interlock command. I.e. if a pump controller has been deactivated by an interlock command, the pump controller will reactivate automatically after this time.
Interlock sender	Set if this unit should be able to send interlock commands to another unit. This also enables further settings on next screen, for setting up the sending conditions for up to 9 receivers.

Interlock sender

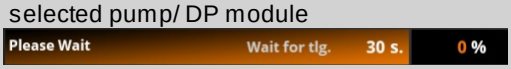
Text	Description:
Interlock sender nr.	This sets which one of the 9 individual sender commands is to be configured. Use + or – buttons or the drop down menu, to navigate through and selecting one of the 9 sender options.
Start signal & Nr. + Stop signal & Nr.	This sets which one of the 9 individual sender commands is to be configured. Use + or – buttons or the drop down menu, to navigate through and selecting one of the 9 sender options.
Output signal Type & nr.	Set the output type and number on the receiver, to activate or deactivate on start and stop condition.
Sender interval (min.)	Set how often the start condition should be resend to the receiver, when the condition is continuously active.
Remote / Local	Set if the receiver is remote or local unit (The connected unit).
Sender type	Set if the command should be send via wired network, or via dialup/SMS to the receiver.
Remote phone Nr. / ID	If the receiver is remote, then the phone number and communication ID for that unit can be set. If the receiver is on wired network, the communication ID can be set.

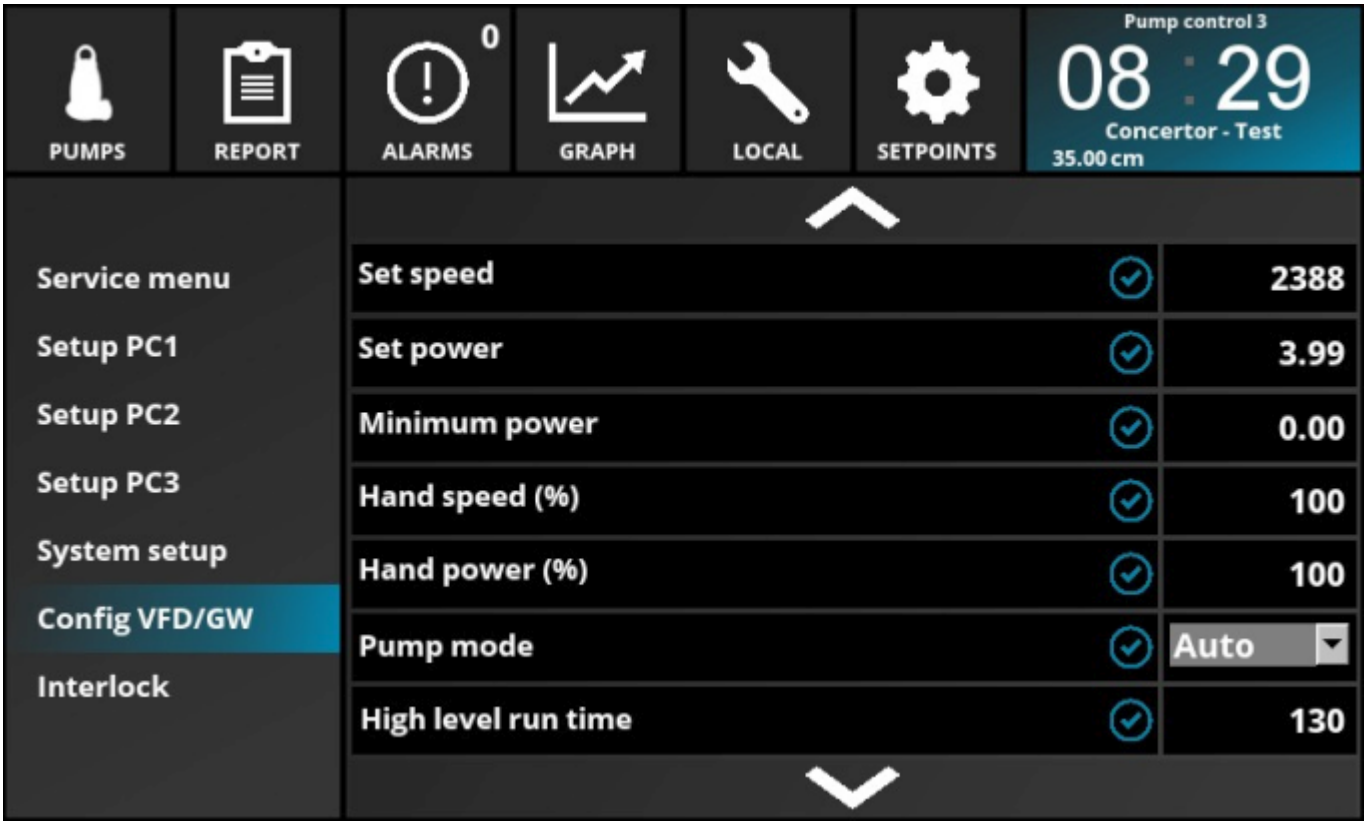
Config VFD/GW

When pump controller 3 is configured with FPG412 DP for Concertor as VFD, this screen will be available.



The screen gives the possibility to read the configuration from the DP module, make changes to the configuration, and writing the changes back to the DP module

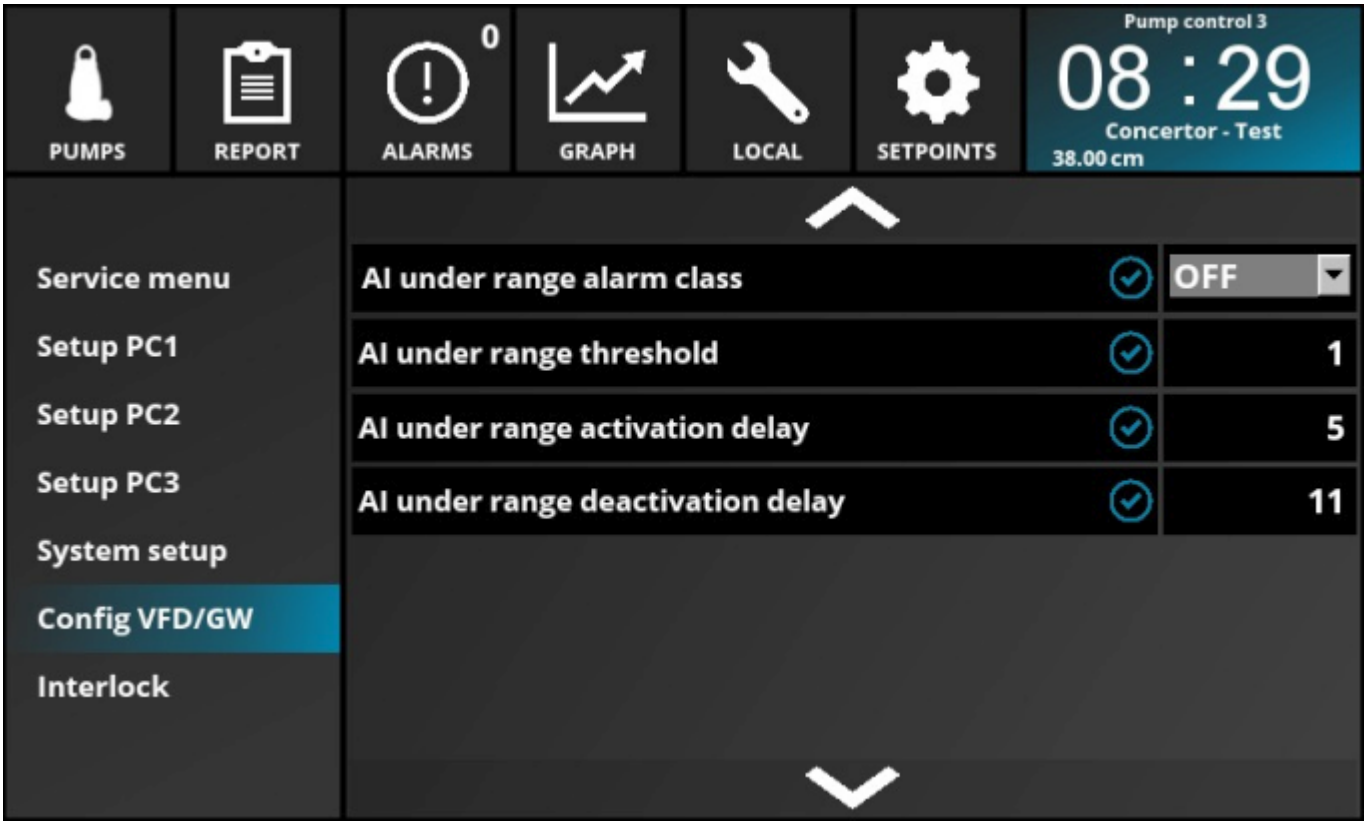
Text	Class:	Description:
Progress bare	-	Shows how far the HMI is, in reading or writing configuration from/to the selected pump/ DP module  While the HMI is reading or writing configuration from/to DP module the progress bare will show please wait on orange background. It also gives some information on what is going on and a count down time is showing. indicating a timeout for waiting on telegram. On the bottom of the progress bare, a small progress line is shown, indicating 0-100% of the over all progress. On the right side of the progress bare , an orange indication in % is shown for how far in the overall progress the function is.
Select pump to configure	-	Select the pump nr, to configure
Read configuration from GW	-	Select Read to activate reading sequence in HMI, to read configuration from the DP module
Write configuration to GW	D	Select Write to activate writing sequence in HMI, to write all changes made to the DP module
Reset to select other pump	-	Select reset, to be able to configure an other pump.



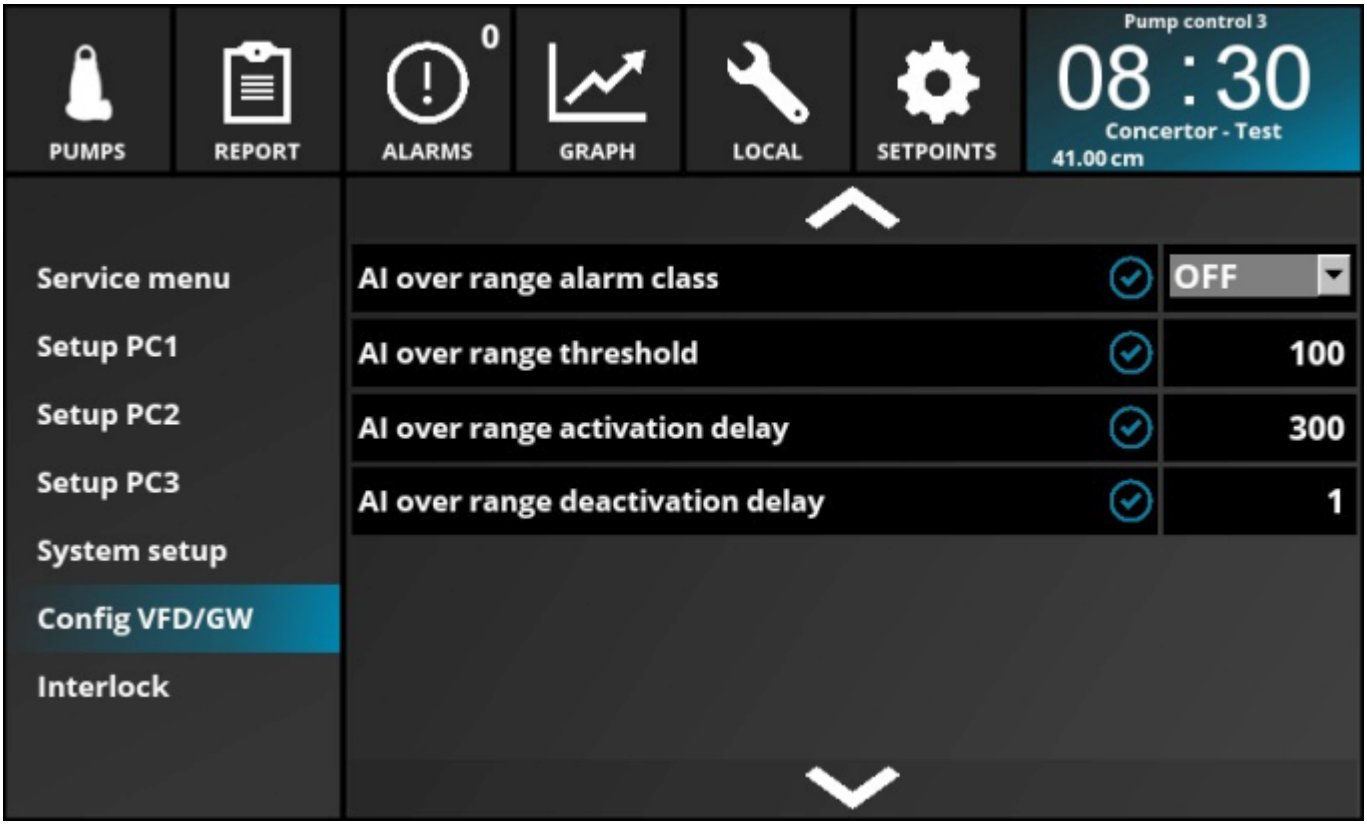
For all set points for the DP module configuration, there are an small Icon to show status on the value.
Check mark indicates that the value was read from the DP module
Exclamation mark indicates when changes has been made to the value, and that the value is ready to be written to DP module.
If no Icon is shown, and value is grayed out, then tat value was not read from the DP module. Do another read sequence.

Refer to the FPG412/DP module manual for further information on values and settings.

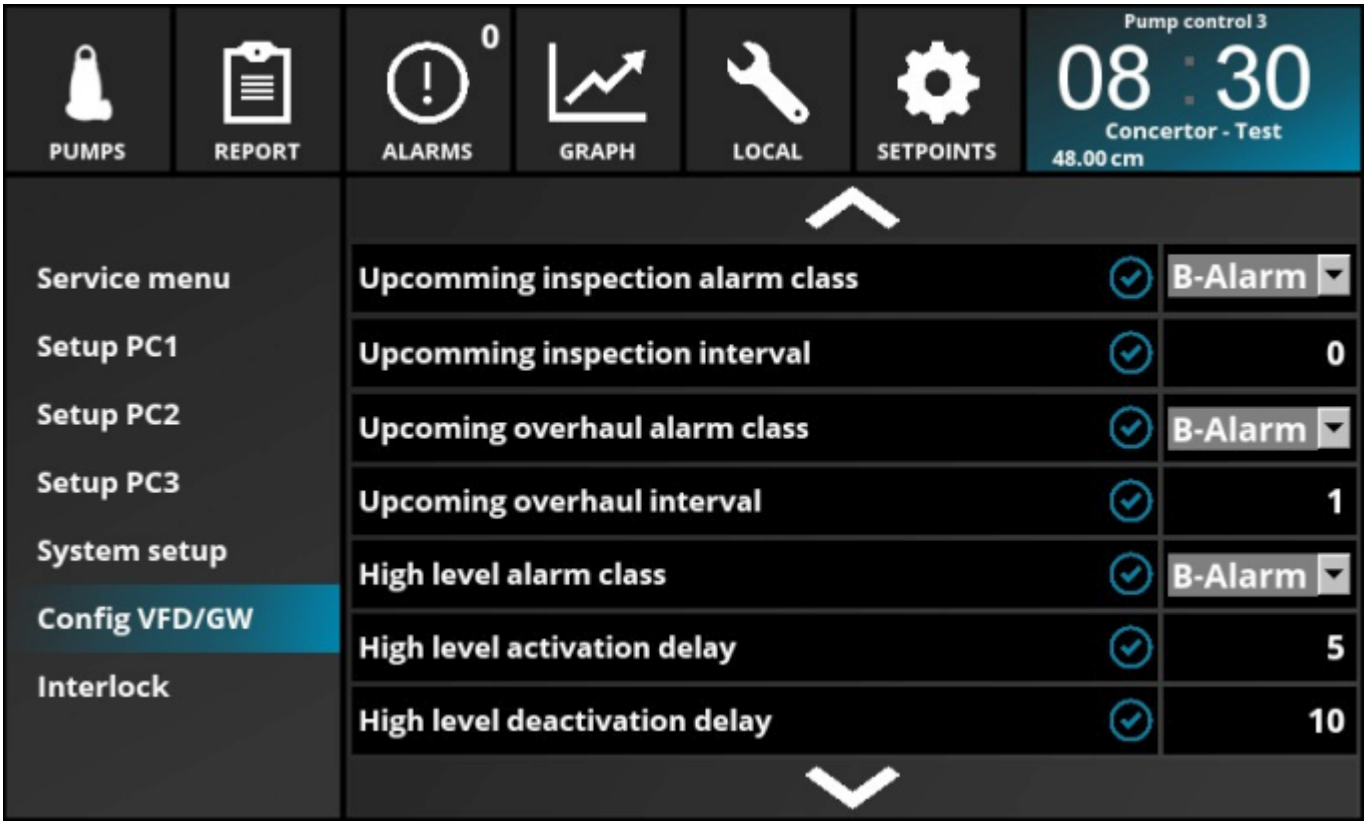
Text	Description:
Set speed	Set speed is the configurable max speed at 100% reference.
Set power	Set power is the configurable max power at 100% reference.
Minimum power	The minimum power the pump should be using, when start signal is given.
Hand speed (%)	The speed reference the pump will run in Hand mode
Hand power (%)	The power reference the pump will run in Hand mode
Pump mode	Set if the pump should be in Auto, Hand or OFF mode. (PC3 will be able to overrule this)
High level run time	The time the pump will run, when High level input in DP module is activated.



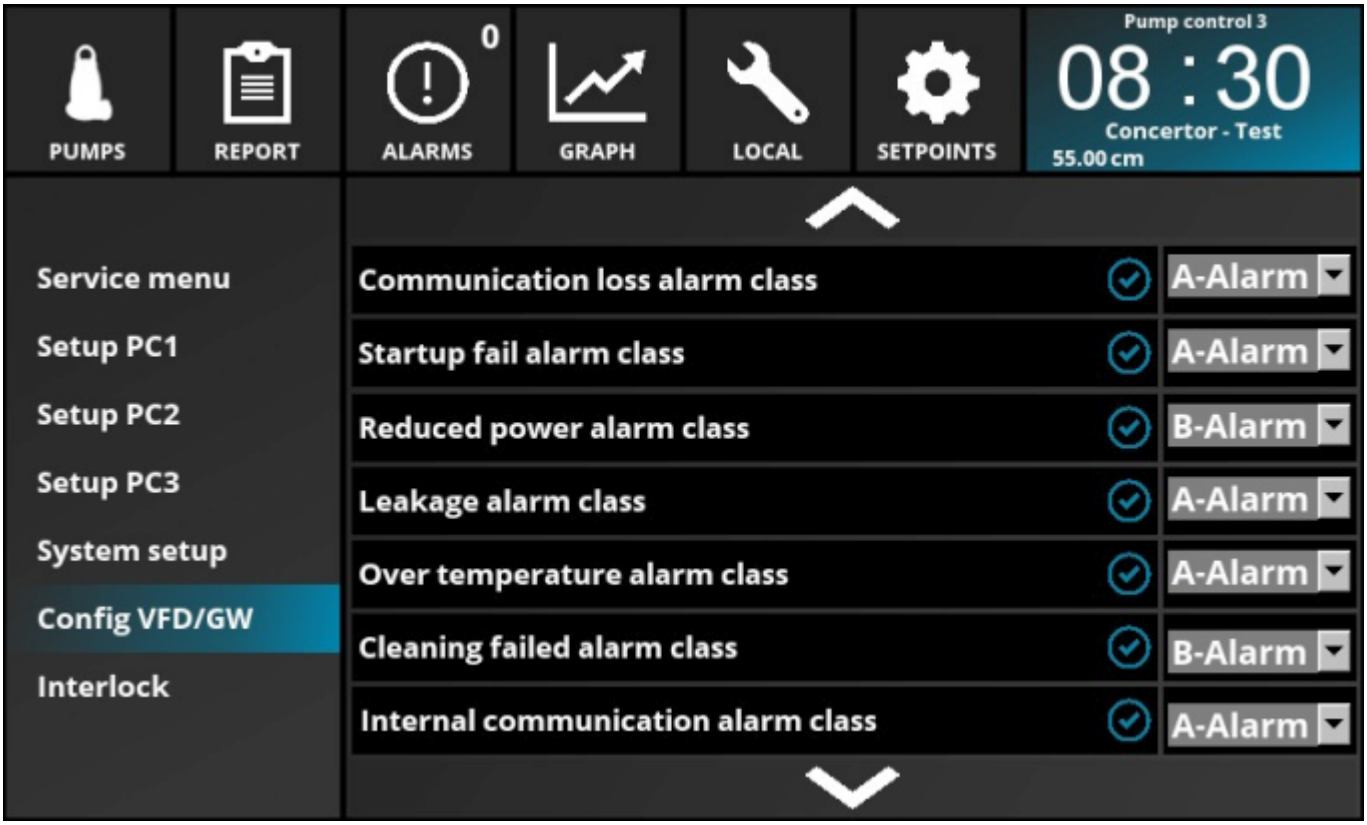
Refer to the FPG412/DP module manual for further information on values and settings.



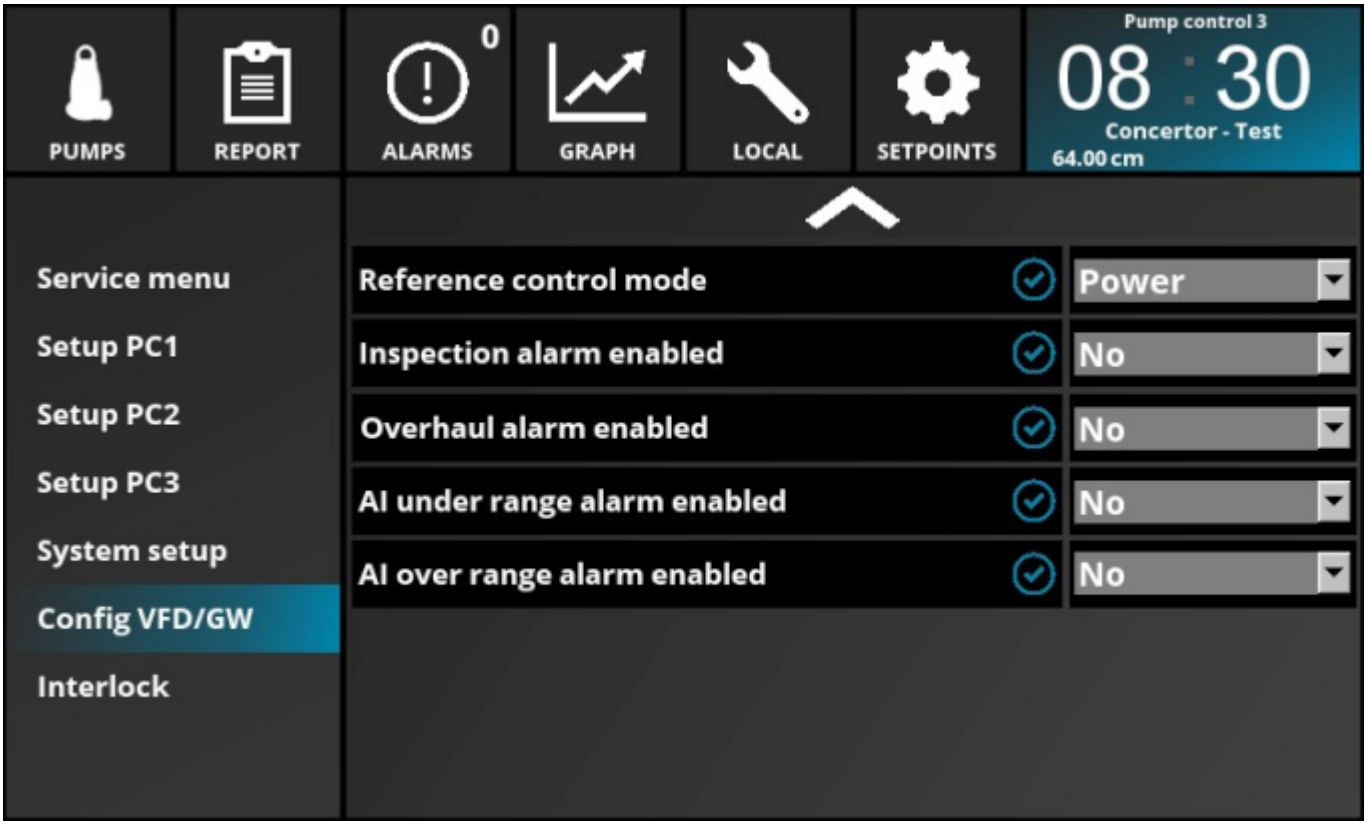
Refer to the FPG412/DP module manual for further information on values and settings.



Refer to the FPG412/DP module manual for further information on values and settings.



Refer to the FPG412/DP module manual for further information on values and settings.



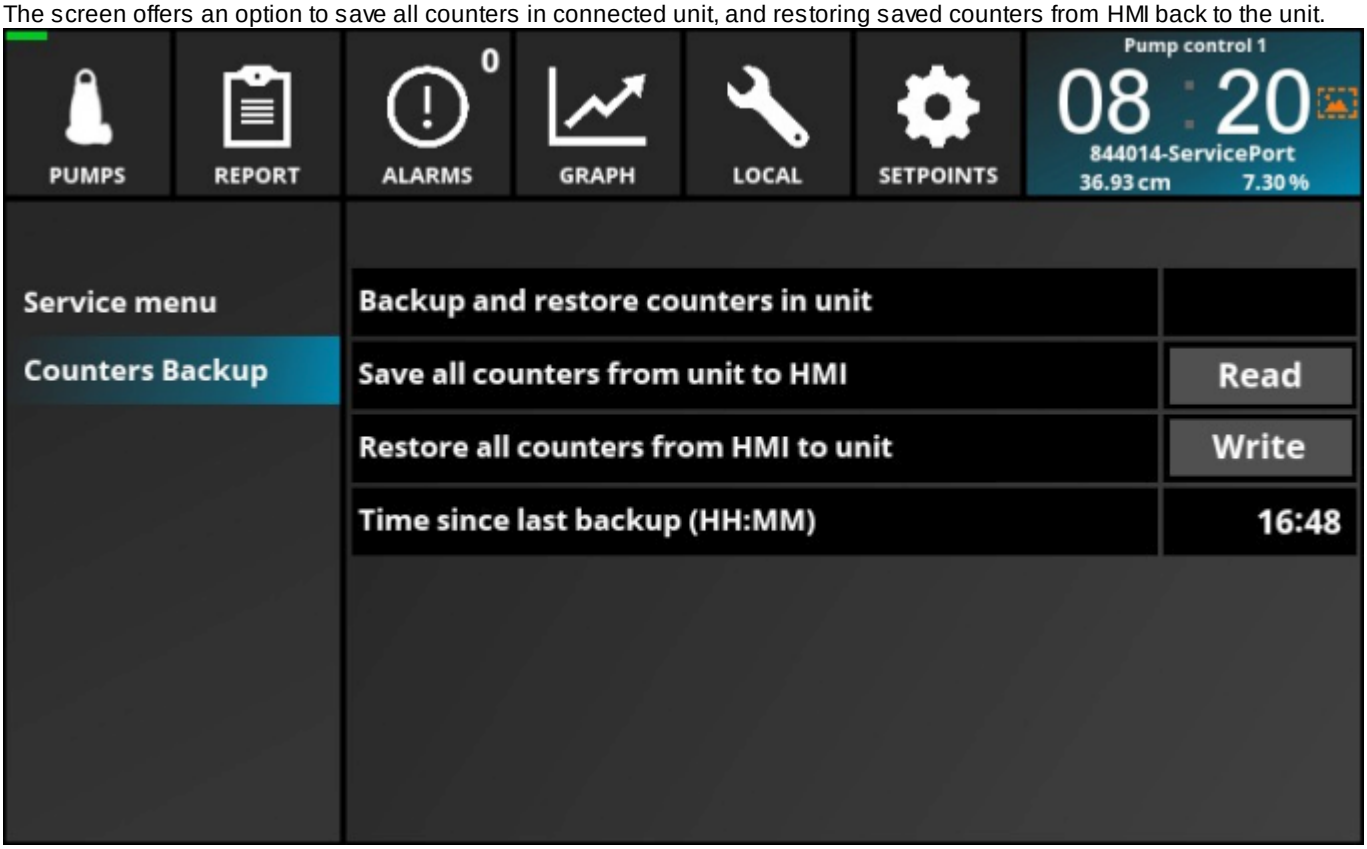
Refer to the FPG412/DP module manual for further information on values and settings.

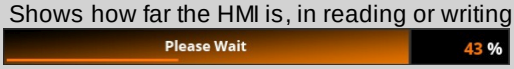
Service functions

Helpful functions for the service technician.

Counters backup

The screen offers an option to save all counters in connected unit, and restoring saved counters from HMI back to the unit.



Text	Class:	Description:
Progress bare	-	Shows how far the HMI is, in reading or writing counters from or to the unit  While the HMI is reading or writing configuration from/to connected unit the progress bare will show please wait on orange background. On the bottom of the progress bare, a small progress line is shown, indicating 0-100% of the over all progress. On the right side of the progress bare , an orange indication in % is shown for how far in the overall progress the function is.
Save all counters from unit to HMI	E	The HMI will read all available counters in the connected unit, and save them in HMI memory.
Restore all counters from HMI to unit	E	If counters have previously been read and saved from the unit, it is possible to write all saved counters back to the unit.
Time since last backup (HH:MM)	-	Shows the time in hours and minutes, for how long time ago the counters was last saved in HMI. When counter backup is more than 24Hrs. old, a warning Icon will flash next to the time, indicating that the backup is old.

This function is useful when i.e. FW updating the connected unit.
Before programming the connected unit, save all counters from unit to HMI, and after programming FW in the connected unit, Restore all counters from HMI to unit.

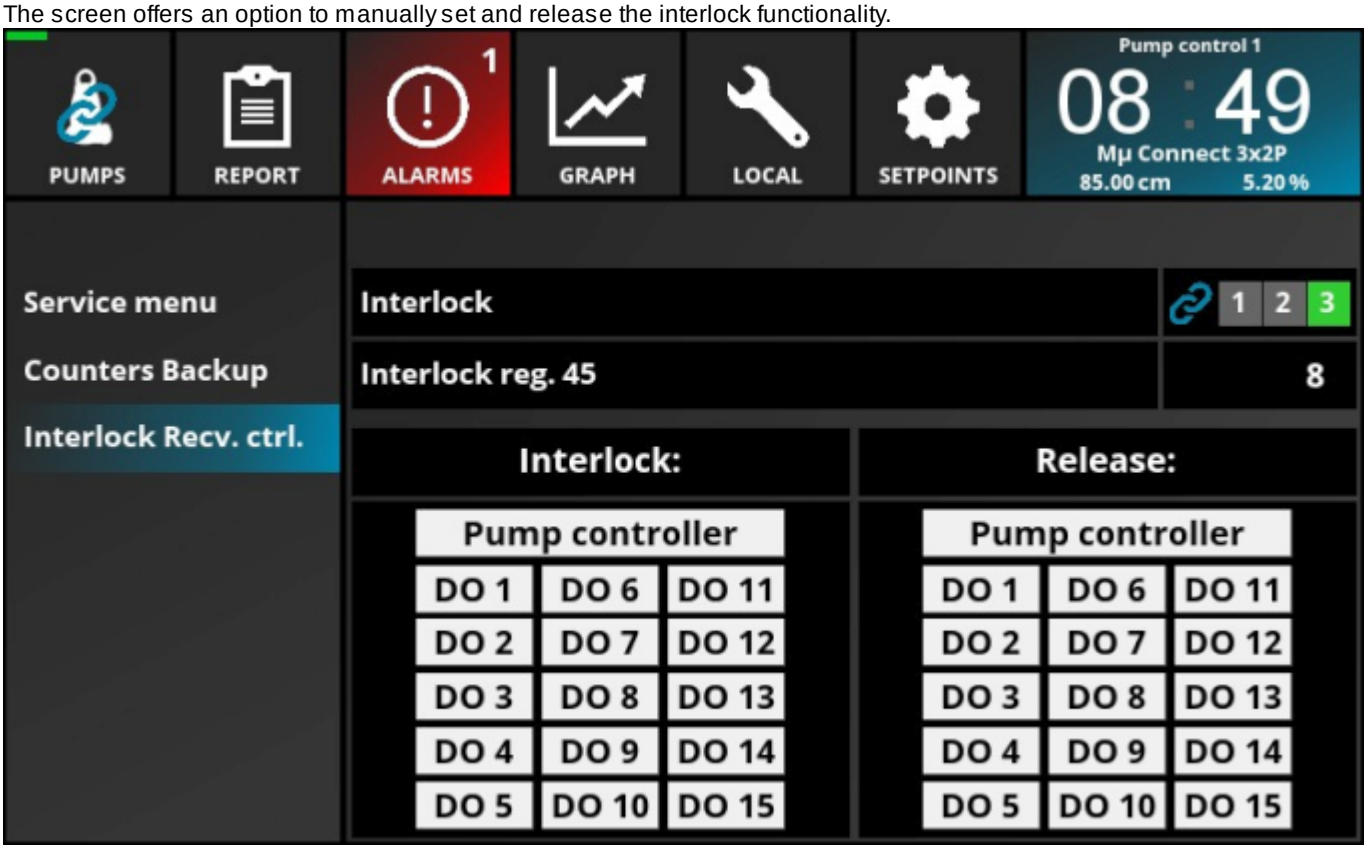
Saved counters will survive power OFF/ON or reboot of the HMI, but not HMI configuration updates.

The backed up counters include Total, Today and Yesterday counters for:

Digital in, Digital out, Analogue in High, Analogue in Low, Internal flag, Virtual Analogue in High, Virtual Analogue in Low, PC1 Pump volumes, PC2 Pump volumes, Storm flow volume, Rain intensity

Interlock recevier control

The screen offers an option to manually set and release the interlock functionality.



Interlock receiver must be enabled in the unit to use this functionality.

Text	Class:	Description:
Interlock		Shows which of the 3 pump controllers is being interlocked Also the general interlock icon will appear.
Interlock register 45		Shows the value of the interlock control register
Interlock:		Set the different interlocks active.
Release		Deactivate the different interlocks.

Troubleshooting

The HMI display does not turn on within 5 seconds

Issue	Solution
The fuse is blown from incorrect polarity of the DC power.	Replace the fuse and reconnect the wiring correctly.
The fuse is blown from incorrect power supply voltage.	Check that the power supply provides with the correct voltage range, 24 ± 20% VDC. Peak starting current up to 2A is allowed.

The HMI display freezes

Issue	Solution
Run time error in HMI Display software.	Press the reset button behind the rubber hatch on the back of HMI Display.

The entered text does not appear correct in the Status menu

Issue	Solution
The name I entered is not correctly read in the display	Even tho It is possible to use special characters in labels and names in the connected unit, the HMI will try to convert and show them as Unicode characters on screen. Sometimes a character is used that is not possible to convert, the label is cut off at this character and the rest of the label is missing. Try alternate spelling.

The entered text does not appear correct in the Alarm menu

Issue	Solution
The name I entered is not correctly read in the display	Even tho It is possible to use special characters in labels and names in the connected unit, the HMI will try to convert and show them as Unicode characters on screen. Sometimes a character is used that is not possible to convert, the label is cut off at this character and the rest of the label is missing. Try alternate spelling.

Appendix

HMI USB data and formatting backup data

HMI USB data and formatting backup data

This section describes where to find the data which is saved to USB drive from HMI is found, when the USB drive is mounted and looked at by from PC.

Where to find data from HMI on USB drive?

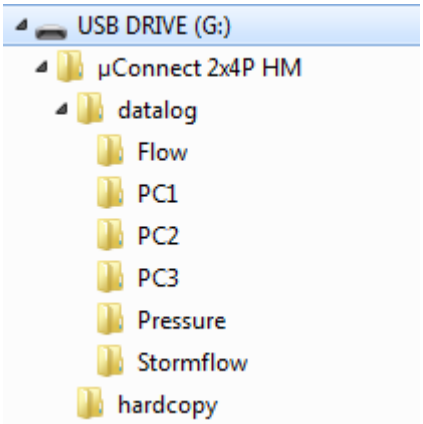
The data saved from the HMI to USB drive will be saved in a folder with the same name as the station name, to the root of the USB drive
The folder name can be shortened by the HMI if it does not fit into the HMI´s file system length, or if the station name contains a char which is not recognized as an ASCII character.

If the same USB drive is used again and again, without removing any of the saved data, the HMI will simply overwrite existing files with the same names, and add new files to the folders already excising.

Folders and folder tree structure

The folder tree on the USB drive for HMI data will look similar to the example.
Depending on the configuration in the connected unit, some folders may not exist or others will appear.

Here the data from a station with the name “µConnect 2x4P HMI” is saved to USB drive.



In the root of the USB drive the folder with the name of the station is found, in this folder there will be folders containing the logged graph data, and a folder where all the screenshots have been saved for that station.

Datalog folder

The “datalog” folder contains the logged data from the all the graphs.
The data is split into multiple sub folders containing logged data for the individual graphs.
The “Flow” folder contains logged data from the selected analogue input for flow.
The “INET1-4_PV1” folder contains logged data from the 4 INET sensors.
The “PC1”, “PC2”, “PC3” folders contains logged data from the individual pump controllers.
The “Pressure” folder contains logged data from the selected analogue input for pressure.
The “Stormflow” folder contains logged data from Stormflow.
The “RainIntensity” folder contains logged data from the rain intensity function.
The values logged from pump controllers are: Level and Power consumption for 4 pumps.
PC3 also have pump flow logged.

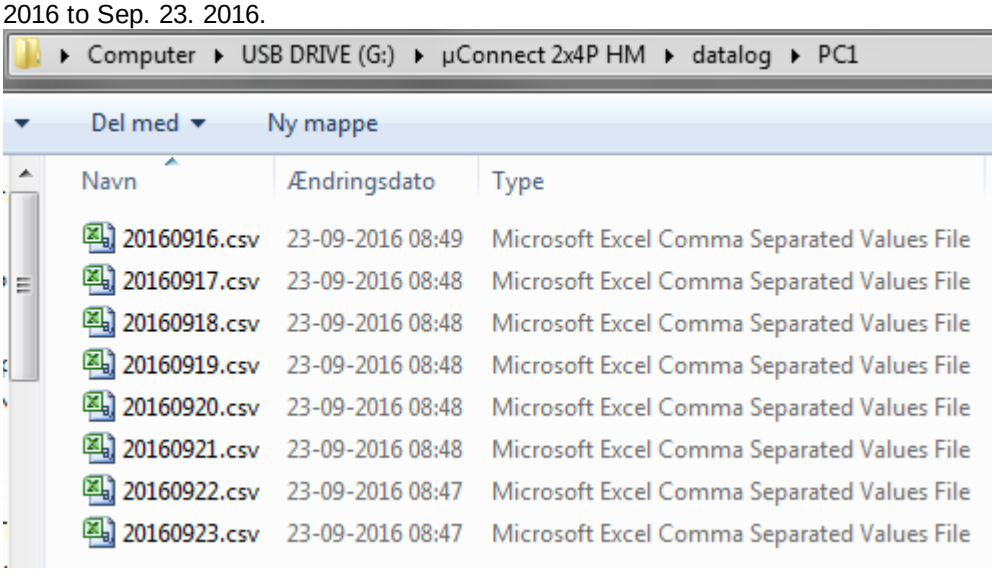
Hardcopy folder

The “hardcopy” folder contains screenshots from the HMI, if any screenshots have been made while the USB drive was mounted in HMI.

Files names

Files with the logged values from the individually types follow the same naming convention, and represents the date for the day the data was logged, in the format yyyymmdd.csv.

Here the logged data with all data from pump controller 1 is logged into one file for each separate day from Sep. 16. 2016 to Sep. 23. 2016.



Data format

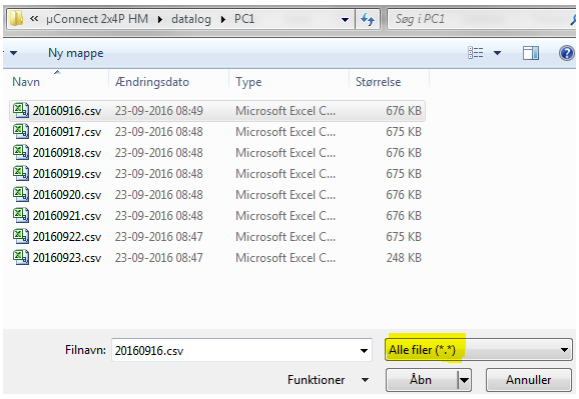
The data in the files are saved as comma separated values, where the decimal separator for values are defined as '.' (Period).

The logged data is formatted as follows in the csv file, where "Gauge Pn" represents the power consumption measurement logged from the pump gauge element.

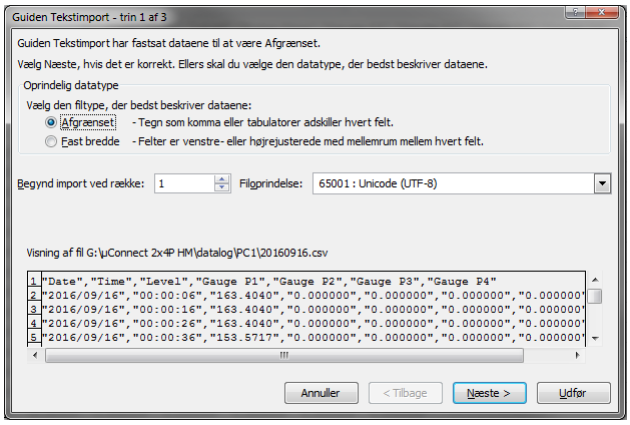
```
Date,"Time","Level","Pump Flow","Gauge P1","Gauge P2","Gauge P3","Gauge P4"
2016/07/20,"13:20:14","47.52342","0.000000","0.000000","0.000000","0.000000","0.000000"
2016/07/20,"13:20:24","47.52342","0.000000","0.000000","0.000000","0.000000","0.000000"
2016/07/20,"13:20:34","47.52342","77.43103","0.014732","0.007959","0.014732","0.000000"
```

Converting and formatting the data in .csv files

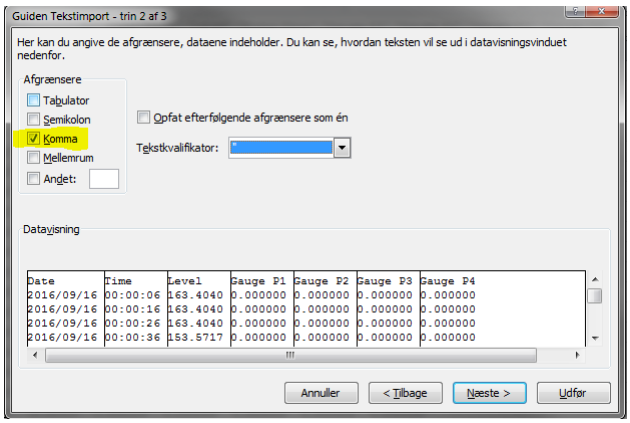
The instruction is based on Microsoft Excel 2010, and it is expected that the operator has basic knowledge in using Excel.



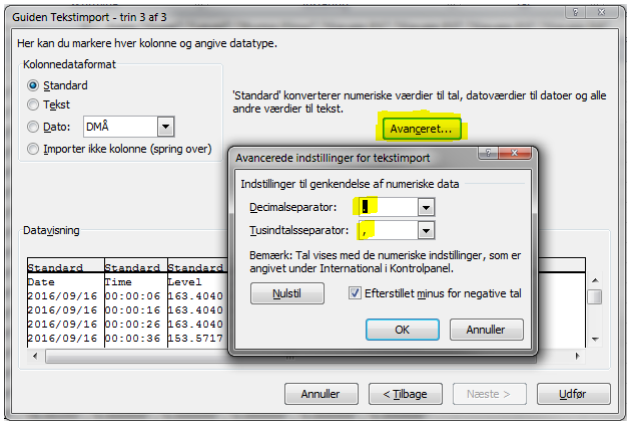
Open a .csv file in Excel by using the open dialog.
Remember to set the file type to: All files (*.*)



The text import dialog should pop up.
In the first step, just select “Next”



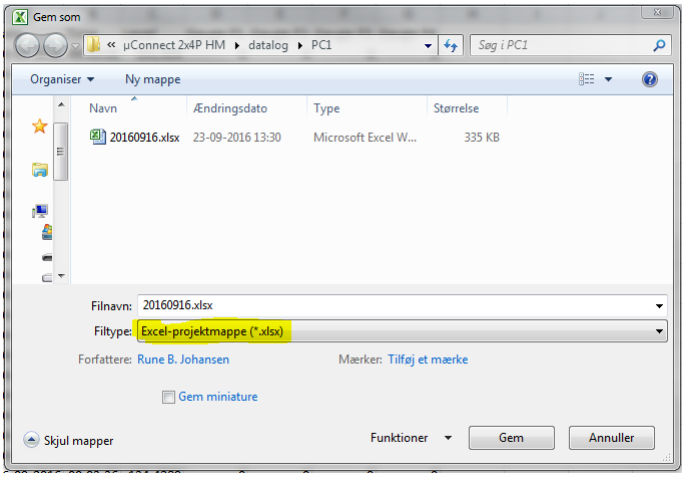
In second step the tick for “Tabulator“ must be removed, and the tick for “Comma” should be set.
Select “Next”



In step 3, select the advanced button.
In the advanced settings for text import window.
Select and change the “decimal separator” to ‘.’ (Period)
Select and change the “Thousands separator” to ‘,’ (Comma)
Select “OK”
Select “Finish”

	A	B	C	D	E	F	G
1	Date	Time	Level	Gauge P1	Gauge P2	Gauge P3	Gauge P4
2	16-09-2016	00:00:06	163,404	0	0	0	0
3	16-09-2016	00:00:16	163,404	0	5,765471	0	0
4	16-09-2016	00:00:26	163,404	0	5,765471	0	0
5	16-09-2016	00:00:36	153,5717	0	5,765471	0	0
6	16-09-2016	00:00:46	153,5717	0	5,765471	0	0
7	16-09-2016	00:00:56	153,5717	0	5,765471	0	0
8	16-09-2016	00:01:06	153,5717	0	5,765471	0	0
9	16-09-2016	00:01:16	153,5717	0	5,765471	0	0
10	16-09-2016	00:01:26	153,5717	0	0	0	0
11	16-09-2016	00:01:36	153,5717	0	0	0	0

The data is now imported, and the data can now be manipulated, values can be used in calculations and more, and the file can be saved as a regular Excel file.



Save the file by using the “Save As” function in Excel, give the file a name, and remember to set the Filetype to “Excel-projectfolder (*.xlsx)

Installing Configuration Software

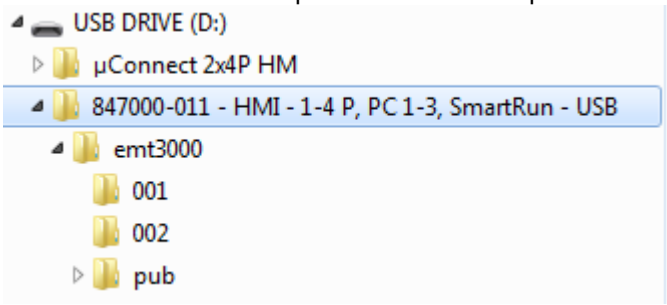
Standard deliveries of the HMI Display device will have the latest MJK HMI software installed.
If a new configuration is installed, in some situations this can cause as a complete reset of HMI data, and will then delete all stored graphs and figures in the HMI.
Any configurations stored in Connect/Mµ Conenct/nConnect or in Connect Link will however not be influenced, therefore HMI configuration can still be installed on top of a running system.

Before an eventual update it is possible to do a backup of the graphs, this is done to a USB drive using Local>Backup data

Preparing new files for HMI configuration

Typically a new HMI configuration will be send via E-Mail or delivered in a zip packaged file.
This packed zip file must be unpacked and the content must be copied to the USB drive or SD card, before the HMI will recognize the files as a new configuration/project.

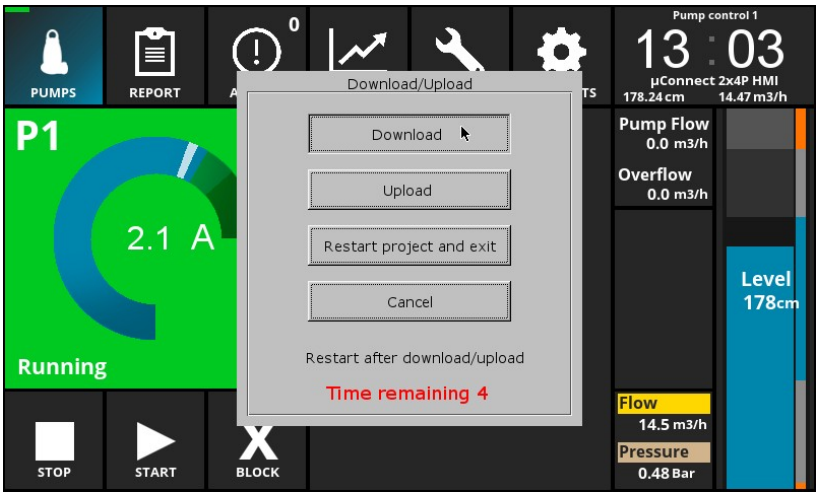
Here the content of the zip folder has been unpacked to the root of the USB drive.



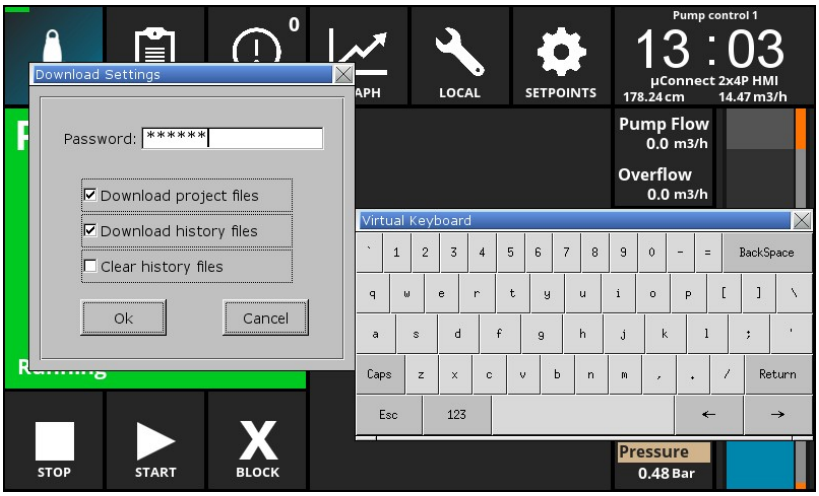
The HMI configuration folder contains some sub folders, which is the actual HMI project configuration.
It is important that no folders or files is altered or added to the HMI configuration folder as this will result in the HMI configuration/project to be invalid.

Installing a new HMI configuration

Mount the USB Flash drive in the "USB Host socket" listed as No. 6 in Electrical and mechanical mounting and connecting 9
A a Download/Upload pop up screen will appear.



Select Download button



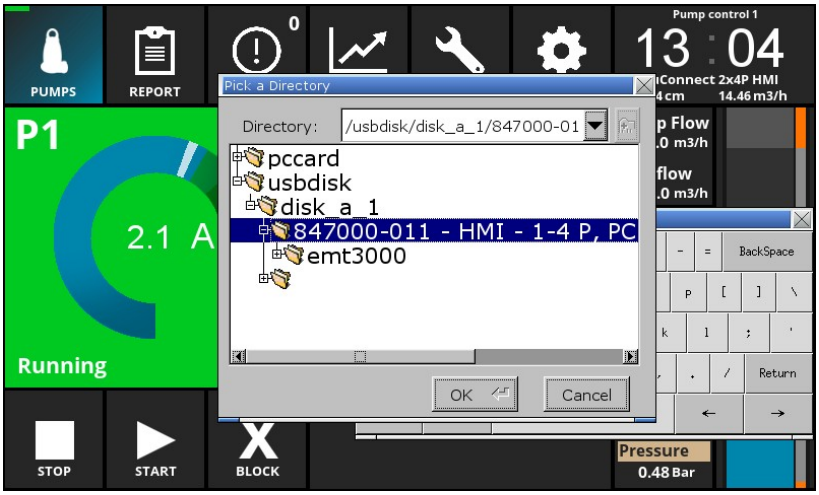
Ensure “Download project files” is selected with a ‘tick’ in the box.

Enter password, default is: **111111**

Select the Ok button

“Download history files” does not need to be selected, but it is ok if it is.
Just leave this as is.

Tip: If Password screen is covering the Keyboard, touch and hold the blue title bar, and drag the little window to the left.



Browse to the folder with the new HMI configuration on USB drive or SD-Card.
I.e. on USB drive do as follows:

Expand the folder “usbdisk”
Expand the folder “disc_a_1”
Expand the folder with the new configuration.
Select the folder
Select OK button.

It is important that the folder which contains the emt3000 folder is selected and NOT the emt3000 folder itself.
See picture!

The configuration will now be downloaded and installed into the HMI display.
Wait for the HMI to reboot and start up.

When the HMI starts up again, the SD-Card or USB drive can be removed from the HMI.

Troubleshooting:

If the text “Incorrect project” appears on screen, the wrong folder was selected, or the zip file was not extracted and copied to USB drive/SD card correctly.
In some situations the zip file can be damaged by anti virus software, when sending via Email, in this case some other form of transferring the zip file must be used.

Connecting to HMI via VNC

VNC allows the operator to remotely connect to the HMI form PC or smartphone, via internet or local network, and operate the HMI as if the operator was in front of the HMI.

Download VNC viewer

For Windows PC, go to the website realvnc.com
Download the version for the operating system and install the VNC viewer.
When installing, only the VNC viewer is needed.

For Smartphones go to the app store for the device and search for VNC player.
Android Google Play store: play.google.com/
iTunes app store: itunes.apple.com
Find VNC viewer from RealVNC provider, download and install app on smartphone.

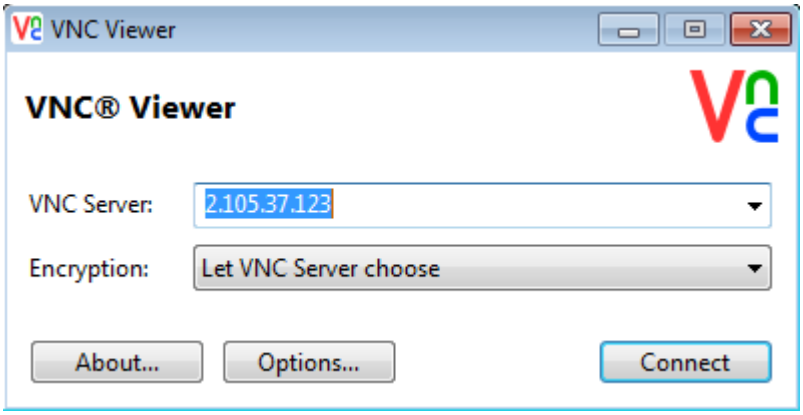
Configuring network

For connecting to HMI from VNC viewer via local network, the IP address of the HMI must be known.
Also when connecting to the HMI via the internet, the public IP address for the internet connection must be known and the routing must be setup to route communication for the HMI from the WAN side to the dedicated local IP for HMI.
Standard port for VNC viewer communication is port 5900.

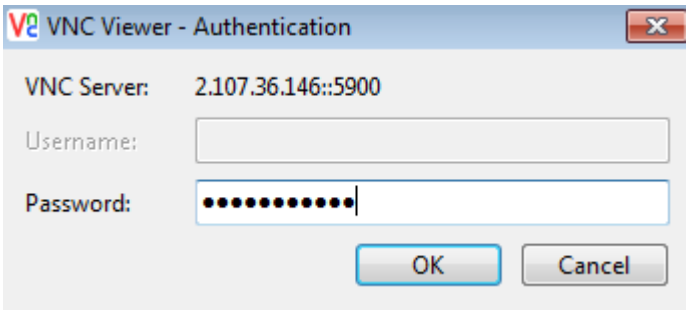
Connecting to HMI via VNC

For Windows PC, Open the VNC viewer.

For Smartphones, open the app and select the + icon for creating a new connection.



Enter the IP address for the HMI, and click Connect.



Enter the password for the HMI, and click OK.

Special registers for HMI information

The HMI uses registers in connected unit, for storing special information shown in HMI.
These registers are still in use due to historical compatibility.

Registers

The following registers are used in Mμ Connect/Connect/nConnect, for Pump data, Current/Power readings, and gauge setup in HMI.
NOTE! Registers in use are the same as registers for AO5 to AO16.
This means that none of these AOs can be used, when using HMI for displaying the values.

Descriptions and communication protocol info.				PC1 – HMI gauge values			
	Comli	Modbus	Datatype	P1	P2	P3	P4
Low-Current	R/W Ram - 60/61	RW 3/16	F32	61971	62013	62040	62082
High-Current	R/W Ram - 60/61	RW 3/16	F32	62124	62166	61887	61929
Nominal-Current	R/W Ram - 60/61	RW 3/16	F32	62133	62175	62049	62091
AI for Current	R/W Ram - 60/61	RW 3/16	U16	*62145	62187	*62061	*62103
				*) Only for FW w.o. AI in PC registers			

Descriptions and communication protocol info.				PC2 – HMI gauge values			
	Comli	Modbus	Datatype	P1	P2	P3	P4
Low-Current	R/W Ram - 60/61	RW 3/16	F32	61866	61908	61950	61992
High-Current	R/W Ram - 60/61	RW 3/16	F32	61872	61914	61956	61998
Nominal-Current	R/W Ram - 60/61	RW 3/16	F32	61881	61923	61965	62007
AI for Current				Setup is done in PC2 only.			

Descriptions and communication protocol info.				PC3 – HMI gauge values			
	Comli	Modbus	Datatype	P1	P2	P3	P4
Low-Current	R/W Ram - 60/61	RW 3/16	F32	61698	61740	61782	61824
High-Current	R/W Ram - 60/61	RW 3/16	F32	61704	61746	61788	61830
Nominal-Current	R/W Ram - 60/61	RW 3/16	F32	61713	61755	61797	61839
AI for Current	R/W Ram - 60/61	RW 3/16	U16	*61725	*61767	*61809	*61851
				*) Only for FW w.o. AI in PC registers			

Descriptions and communication protocol info.				Common for all PCs Pump data			
	Comli	Modbus	Datatype	Pa	Pb	Pc	Pd
Production Year	R/W Ram - 60/61	RW 3/16	F32	62118	62160	62034	62076
Energy / kW	R/W Ram - 60/61	RW 3/16	F32	62139	62181	62055	62097
Sn.	R/W Ram - 60/61	RW 3/16	str20	62148	62190	61896	61938
Impeller	R/W Ram - 60/61	RW 3/16	str20	62064	62106	61812	61854
Pump Type	R/W Ram - 60/61	RW 3/16	str20	61980	62022	61728	61770

Descriptions and communication protocol info.				Pressure, Flow and Volume.			
	Comli	Modbus	Datatype	AI no. Pressure	AI no. Flow	DI no. Volume	
I/O no for value	R/W Ram - 60/61	RW 3/16	U16	62075	62117	62159	

HMI versions

Introduced in firmware version	Version Details	Function introduced
847000-001	1-2P, PC1	
847000-002	1-4P, PC1	• Support for 4 pumps
847000-003	1-4P, PC1	
847000-004	1-4P, PC1	
847000-005	1-4P, PC1	• Support for Connect HW
847000-006	1-4P, PC1	• Auto detect Mμ Connect/Connect
847000-007	1-4P, PC1	• Auto detect of PC1 level input 1-6 • AI for current not fixed anymore • Extended measurement and graph for flow meter with selectable AI • Report for accumulated volume from flow meter with selectable DI • Extended measurement and graph for pressure • HMI Firmware code displayed on LOCAL-Display properties • Setpoint displacement introduced • Capacity configuration improved • All alarm calls can now be configured
847000-008	1-4P, PC1-3, SmartRun	• New support for multiple pump controllers (PC1-3, SmartRun) • Auto detect which I/O is used in pump controllers => No more fixed configurations • Supports up to 4 MJK Inet devices (MagFlux, Susix, Oxix, mA-Converter) • All Graphs is now logged in real values, and not in 1/1000 values as previously. • I/O´s in unit can be configured. Ie. [Clock] – Digital inputs – (Tap) an I/O name. • Selectable AI for Pressure and Flow meter + DI for flow volume. • Full configuration of overflow/storm flow (All 10 Q points, and setup available) • Volumes for Overflow, selected DI and Pump flow is available on reports. • Full configuration of alarm calls. • All amp gauges can be configured to a custom selected AI. (Not in SmartRun!) • Liberated VAI 3-6 for pump gauges. These are now free for configuration. • Pump power (Voltage, kWh, and Cos phi) are available for PC1 & 2 when FW in unit allows it. • Pump capacity Can now be fully configured, and values is shown in pump details. • Flow meter selected in PC3(Energy) is shown on pump screen, and in graphs. • Status for all available DI, DO, AI, AO, IF is available from CLOCK screen • Backup function will make backup of all activated graphs/values. • It is possible to turn ON/OFF viewing of graphs by tapping the values. • New State for all pumps (Orange), indicating the Stop signals in control words.
847000-009	1-4P, PC1-3, SmartRun	PC3 • Added readings for Start & Time Today + Yesterday, according to the selected input used as running signal in control word for each pump. • Total Running time is in Hours, directly reading from VFD SmartRun • SmartRun FW. V4 now Supported. • Level is now auto selected, and viewed from the first pump, which is communicating. • Pump Screen • Pump Data, is now available for all SmartRun Pumps connected
847000-010	1-4P, PC1-3, SmartRun	• Added feature, to save a screenshot to USB(If mounted). • There are now a second screen under CLOCK-Analog inputs, which shows the scaled values of all the analog inputs available • Added the possibility to get more details for service personnel where available. I.e. Show the bits for Pump Control words on Pump Details. • A limit on HMI reboot is set internally, that 5 minutes must have passed since last HMI boot time, and one minute after last unit restart

		• Button for Acknowledge alarms on alarm list has been removed, as the function has caused some misunderstandings. PC1 • When Connect/Mμ Connect has an older FW, HMI will no longer assume that that there is current inputs on AI 2-5 • Pressure & Flow selected on Miscellaneous set up page. Function no longer use VAI7 & VAI8 to store the selected AI´s PC1,2,3 • The two last stop signals in controlword for all pumps, are by default shown as Blocked pump, and pump is given blue colour. • Level reading is only shown with 2 decimal, if 1 or more decimals are selected in the AI for the PC. Connect I/O expansion. • When a Connect is used with another Connect as an I/O expansion, the Search for the second Connect as I/O expansion, can be initialized on I-Net sensors setup screen. It is not possible to see the Connect, or “delete” the second Connect, from I-net sensor setup screen Language: • Added Russian as the 11.th Language.
847000-011	1-4P, PC1-3, SmartRun	• Support for nConnect • Clock menu – Analogue In & Out Status. “Analog Inputs” and “Analog Outputs” now have scaled values on first page, and mA values on second page. • Clock menu – I/O Configuration Signal names. All signal names are now shown as Unicode, with special characters. • Clock menu – Logical functions. It is now possible to configure the logical functions. • Clock menu – Added page: “Virt. Analog inputs” in Clock menu, with scaled values for Virtual analog inputs. • REPORT: Overflow. Added events and time for selected start signal for overflow. • REPORT: Rain intensity. Report now supports reading of Rain intensity logs • Service menu. Added screens to configure all pump controllers from scratch without need of configuration software. • Service menu- Interlock. Added interlock configuration for interlock receiver and sender options. • GRAPH: Rain intensity The value for actual intensity is available on all graphs. • SETPOINTS – Rain intensity It is now possible to configure the Rain intensity function in connected unit. • It is now possible to configure alarms and values for High and Low alarm, for the selected AI´s for pump gauges. • HMI will now return to pump screen for selected pump controller, when no touch has been made for 15 minutes. • Graph Data & Backup to USB All data for each pump controller is now combined into one log file for each day, instead of 1 for Level + one for each pump. All data for I-net sensors are now combined into one log file for each day, instead of 1 log file for each I-net sensor pr. Day. Languages: • To ensure the possibility to revert language to English, if a language that is not understood by the operator is selected. • Turkish is added as 12th Language.
847000-012	1-4P, PC1-3, SmartRun	• HMI now supports MJK 3400D transmitter as INET sensor readings. • Startup/HMI boot - Auto select pump screen overruled. When HMI is starting up and user changes screen while HMI is waiting for communication ID to be found, and read setup for pump controllers. • Moved "HMI auto restart (Monday)" selection from Service menu, to Local- Display properties-HMI administration REPORT: • Added extra report page with savings, for when FPG412(DP module for Concertor) is selected ad VFD in PC3 LOCAL-HMI administration. • Added possibility to change timeout period, for when no touch has been made to the HMI, and the screen will auto return to PUMPS screen.

		• Added "HMI user login required" A log in functionality for operating the HMI. CLOCK INET sensors status: • Added indication of communication error status for the 4 INET sensors. CLOCK - Unit Status: • Added extra page for when PGF412(DP module for Concertor) is used as VFD in PC3, to get status details read from the FPG412 • Added Wi-Fi Firmware code information to unit status page, when a Wi-Fi module is available and configured in connected unit. CLOCK - Service menu: • Added functionality for PC3 to Configure FPG412(DP module for Concertor) when selected as VFD in PC3 Pump details for PC3: • Trip code information is shown when FPG412 is selected as VFD in PC3. • New pump command button introduced. CLEAN, which will activate Depth bumping and washout for the actual pump run. CLOCK - Service menu • Added Sub menu with “Service functions” and new function “Counter Backup” Function can read all counters from unit and save in HMI memory, or write all saved counters in HMI memory back to unit. SETPOINTS - Pump settings PC3: • Pumps/levels: Added "Number of simultaneously running pumps" SETPOINTS – Alarm Call. • Added functionality from Mμ Connect: “Disable all alarms, until midnight” PC3 generally: • HMI now supports configurations, where PC3 has level set points set in NAP as values below ‘0’ PC1 & 2 – SETPOINTS – Capacity. • Added a calculator for calculating volume in a circular well/sump for use in pump capacity measurements. PUMPS & Pump details • Changed behavior for when using Manuel run button. Pump details for PC1, PC1, PC3: • Changed button for MANUAL, from ON/OFF indication, to indicate NO/NC with electrical icon. • Moved "Always assume PC to be active" settings, to Setup for each pump controller pages. Languages: • Dutch added as 13th Language • Romanian added as 14th. Language • Hungarian added as 15th. Language • German translation updated • Spanish translation updated
847000-013	1-4P, PC1-3, SmartRun	PC 1, 2 & 3 SETPOINTS • High float run Added the functionality to configure the High float run functionality. CLOCK – Service Menu – Service Functions – • Interlock receiver control Added functionality for controlling the interlock commands to the interlock receiver. CLOCK – Service Menu – Setup PC3 • Added Schneider ATV600 to the list of VFDs supported by pump controller. SETPOINTS – Pump settings – Adaptive optimizing. • It is no longer allowed to choose “Level deviation vs Energy w. inflow” PC3 - PUMPS – Pump details. • Trip code (?) is no longer showed for VFDs other than FPG 412, when they have an error code
847000-014	1-4P, PC1-3, SmartRun	SmartRun • It is now possible to hide the command buttons for SmartRunon pump screen and pump details screens. Disabled by enabling the "Pump screens show runtimes, not CMD buttons" in HMI administration menus.

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2) a leading global water technology company.

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