



# CACTUS UNIVIEW

We create systems that help our customers optimise and control their installations.

# References

## **Åvesta Municipality.**

4 treatment plants and 5 water works produce 2.7 million m<sup>3</sup> of water a year. There are also 50 or so pump stations and water towers, etc.

Population: 22,000.  
Project start: 1988, 2001, 2007.

## **Bergen Municipality, Norway.**

5 water works and 6 treatment plants. Water from rainfall and mountain lakes.

Population: 240,000.  
Project start: 1992, 1997, 2006.

## **Drammen Municipality, Norway.**

2 treatment plants and 50 or so sub-stations.

Population: 80,000.  
Project start: 1990, 1999, 2007.

## **Gothenburg water and sanitation plant.**

Göteborg Vatten produces 174,000 m<sup>3</sup> of water a day. The Cactus system controls and supervises the Lackarebäck plant and over 300 stations in a 2,500 km water and sanitation pipe network.

Population: 500,000.  
Lackarebäck: 1988, 1998, 2002.  
Ringön: 2002.

## **Kumla Municipality.**

The water works in Kumla produces 3.5 million m<sup>3</sup> a year. The treatment plant is dimensioned for 30,000 people (2.5 million m<sup>3</sup> of household and industrial wastewater a year).

Population: 20,000.  
Project start: 1989, 1999, 2007.

## **Kungälv Municipality.**

3 water works produce 3.2 million m<sup>3</sup> a year for 25,000 people. 3 treatment plants can receive between 30 and 50 m<sup>3</sup>/hour each.

Population: 40,000.  
Project start: 2001, 2008.

## **Malmö water and sanitation plant.**

Malmö's drinking water comes from Bulltofta (20%) and Sydvatten's plant in Vomb. The Klagshamn plant is dimensioned for a p/e of 90,000.

Population: 275,000.  
Bulltofta: 1990, 1999, 2008.  
Klagshamn: 2000, 2008.

## **Norrköping Municipality.**

Norrköping Vatten produces around 13 million m<sup>3</sup> of water a year. Each day 45 million litres of wastewater are processed at the large Slottshagen treatment plant.

Population: 125,000.  
Project start: 1991, 2002, 2008.

## **Oxelö Energi.**

Oxelö Energi runs a newly renovated plant with a biological treatment process.

Population: 12,000.  
Project start: 2005.

## **Stockholm Vatten.**

Lövö and Norsborg works produce water for a population of around 1 million (15,000 m<sup>3</sup>/h).

Population: 1,000,000.  
Lovö: 1982, 1996, 2000, 2005.  
Norsborg: 1986, 1994, 2000, 2005.  
Network: 2006.

## **Sydvatten.**

Ringsjö and Vomb water works produce 8,300 m<sup>3</sup>/h. Sydvatten was formed in 1966 and is one of Sweden's largest producers of drinking water. People served by the systems: 730,000.

Ringsjö: 1974, 1987, 2001, 2008.  
Vomb: 1990, 1997, 2002, 2008.

## **Tjörn Municipality.**

Tolleby water works, 9 water towers and 5 booster stations. 100 or so pump stations. 3 treatment plants with mechanical, chemical and biological processes.

Population: 15,000.  
Project start: 2006.

## **Trelleborg Municipality.**

4 water works deliver 2.8 million m<sup>3</sup> of water a year. 5 treatment plants process 4.6 million m<sup>3</sup> a year.

Population: 40,000.  
Project start: 1979, 1989, 2003, 2005.

## **Vattenfall Service Syd.**

Vattenfall is responsible for a water works that serves both the population of Stenungsund Municipality and the petrochemical industry.

Capacity: 360 m<sup>3</sup>/h.  
Population: 20,000.  
Project start: 1991, 2000.

## **Västervik Municipality.**

The Hjorten plant produces 8,000 m<sup>3</sup> of water a day. Västervik also has 18 municipal treatment plants with 400 km of wastewater pipes.

Population: 37,000.  
Project start: 1988, 1999, 2007.

## **Växjö Municipality.**

Bergaåsen water catchment delivers 720 m<sup>3</sup>/h. The water is transported to Växjö via 2 parallel 50 km pipes. 11 water works and 13 treatment plants in total.

Population: 77,000.  
Project start: 1993, 1999, 2007.

## **Svensk Biogas.**

The two production plants in Linköping and Norrköping produce 7 million Nm<sup>3</sup> of biogas a year to replace an equal number of litres of petrol and diesel.

Project start: 1996, 2006.

## **Tekniska Verken Linköping.**

2 water works produce 40,000 m<sup>3</sup> of water a day. The majority of the wastewater is processed at the Nykvarn plant.

Population: 140,000.  
Project start: 1992, 1996, 2007.

## **Oskarshamn Municipality.**

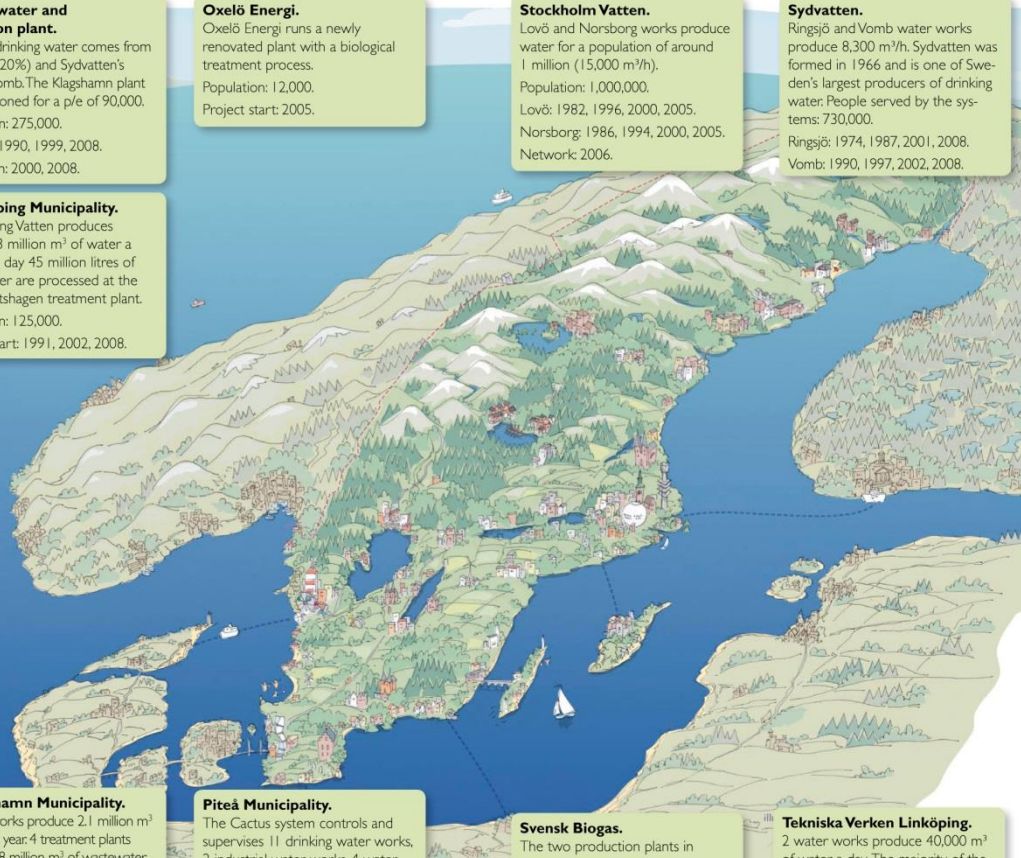
5 water works produce 2.1 million m<sup>3</sup> of water a year. 4 treatment plants process 3.8 million m<sup>3</sup> of wastewater a year. Wastewater pipe network: 162 km with 63 pump stations.

Population: 30,000.  
Project start: 1987, 1997, 2001, 2008.

## **Piteå Municipality.**

The Cactus system controls and supervises 11 drinking water works, 2 industrial water works, 4 water towers, 7 booster stations and 90 wastewater pump stations.

Population: 41,000.  
Project start: 1988, 2005.



We provide:

Software – SCADA - DCS

Hardware - PLC

Service agreements



# SCADA – Supervisory Control And Data Acquisition

A control system for monitoring and supervision of industrial processes

HMI – Human Machine Interface

Many SCADA systems are a  
DCS – Distributed Control System

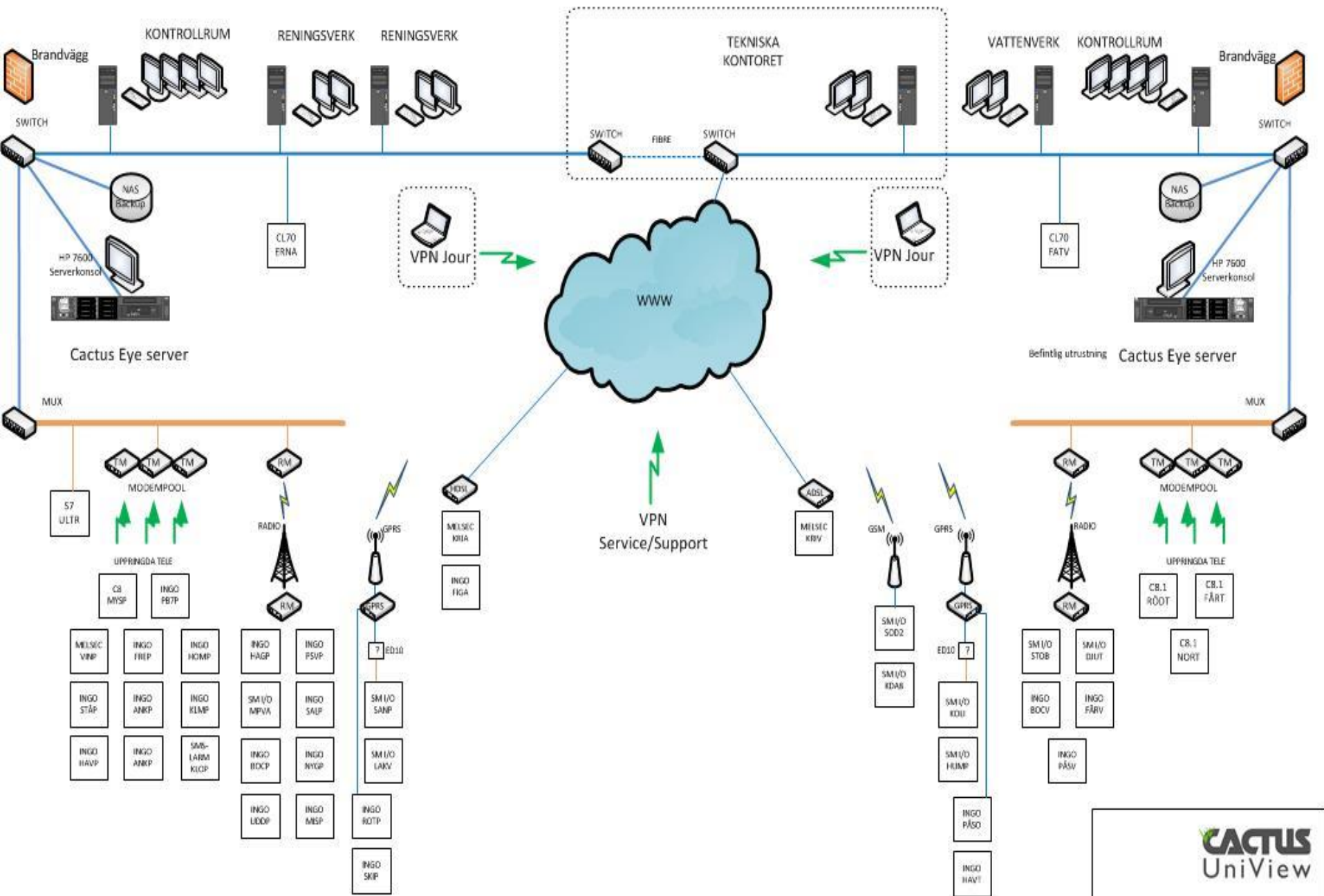
Programming

Reports and trend curves



# AVLOPPSRENINGSVERK

# VATTENVERK





# PLC - Programmable Logic Controller

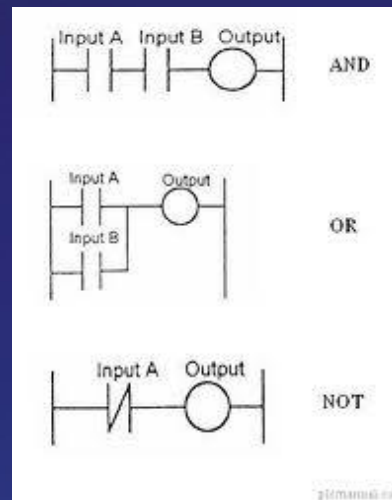
I/O-based programming

Logical programs that control I/O in a safe and effective way

Most common languages are:

- LD - Ladder
- FB – Functional blocks
- ST – Structured Text

# LD - Ladder



Effective to use in simple circuits

Complex and difficult to overview in advanced circuits





# ST – Structured text

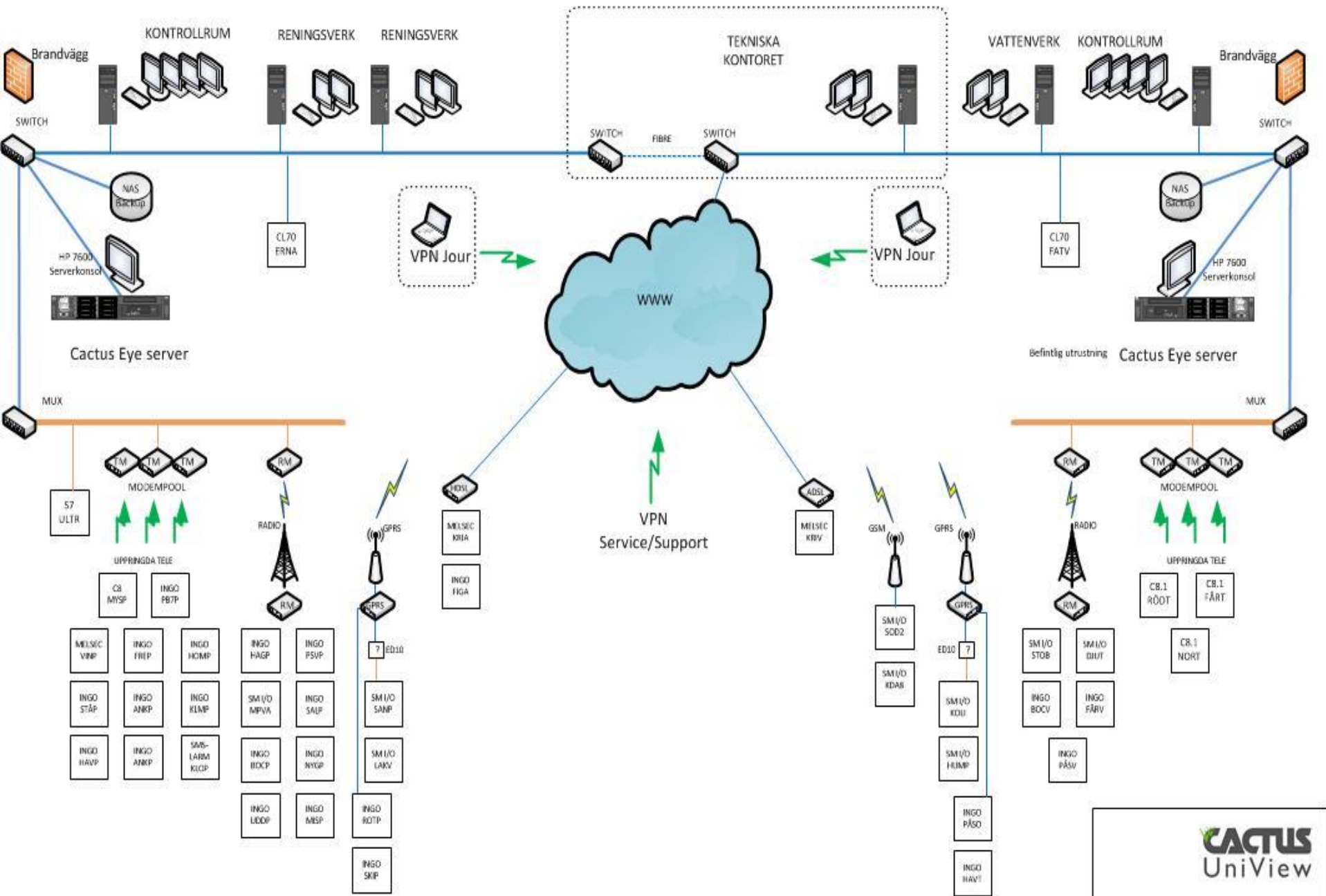
Effective to reuse

```
END_IF;
Setpoint_IN_STAGE_1_FAILED:
(* During 'STAGE_1_FAILED': '<S1>:119' *)
IF (stage3_sensor <= 0) OR (stage2_sensor <= 0) THEN
(* Transition: '<S1>:150' *)
(* Transition: '<S1>:152' *)
IF stage2_sensor > 0 THEN
(* Transition: '<S1>:155' *)
is_c2_Setpoint := Setpoint_IN_STAGES_1_3_FAILED;
(* Entry 'STAGES_1_3_FAILED': '<S1>:120' *)
rtb_stage1_setpoint := L0;
rtb_stage2_setpoint := L0 - overall_target;
distributed_target := rtb_stage2_setpoint;
ELSE
(* Transition: '<S1>:154' *)
IF stage3_sensor > 0 THEN
(* Transition: '<S1>:159' *)
is_c2_Setpoint := Setpoint_IN_STAGES_1_2_FAILED;
(* Entry 'STAGES_1_2_FAILED': '<S1>:121' *)
rtb_stage1_setpoint := L0;
rtb_stage2_setpoint := L0;
distributed_target := L0 - overall_target;
ELSE
guard_0 := TRUE;
END_IF;
END_IF;
ELSE
guard_0 := TRUE;
END_IF;
```

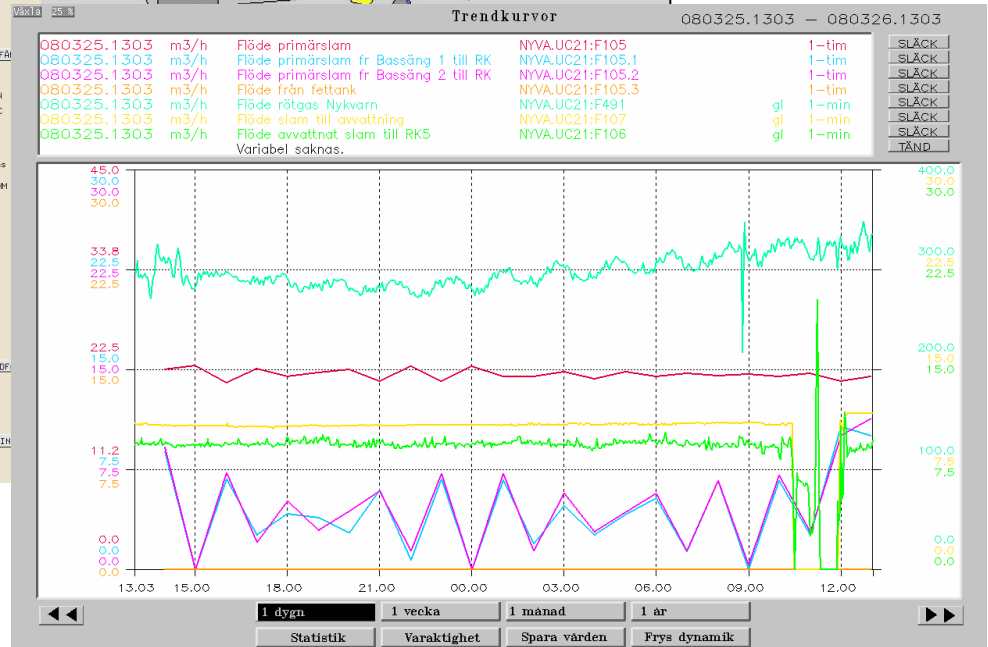
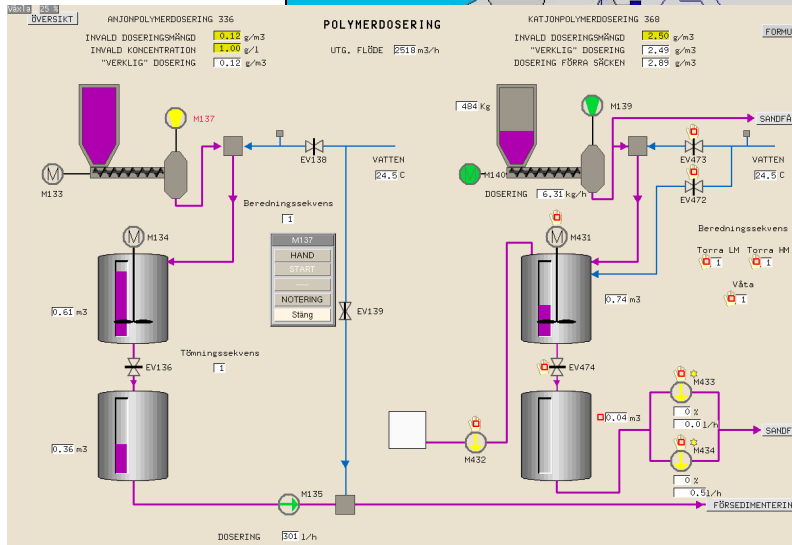
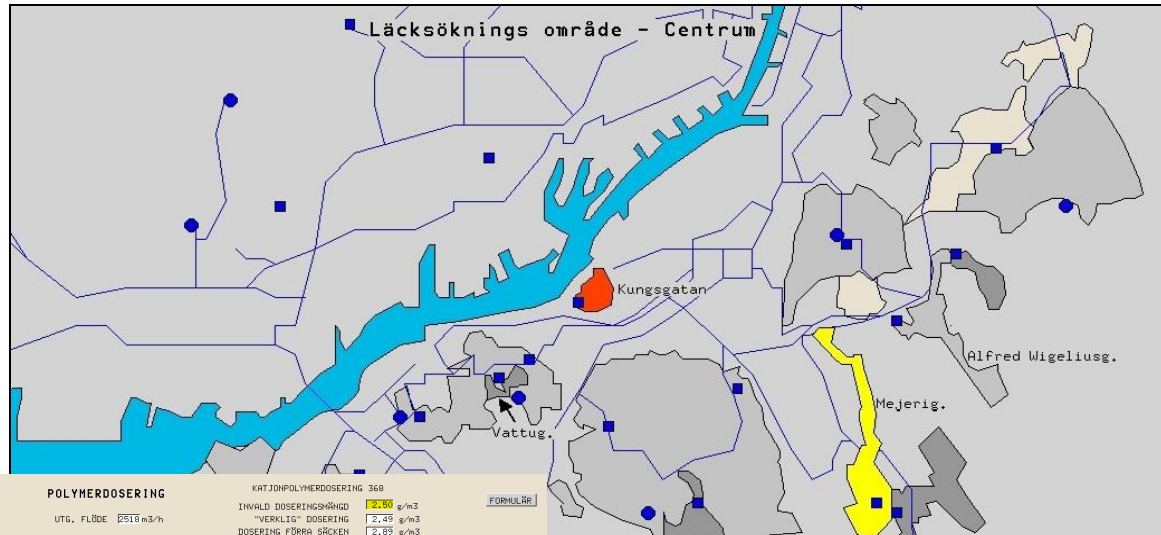
Complex and and difficult to overview  
even in a simple circuit

# AVLOPPSRENINGSVERK

# VATTENVERK



# Overview of your system



# Operator functions

Larmlista NYVA

Typ av lista: Larmlista | Tidsperiod: Senaste 24 tim | Från: | Till: | Sök

726 träffar. 080325.131818 - 080326.124134 | Sökvillkor >>

Tidpunkt	Typ	Nod	Ustn	Variabelnamn	Beskrivning	Bildlänk
080326.083655	B-TILL	STAR	MsAer1_Nh4State		Felsignal ammoniumhalt Bio1 AM102	
080326.083643	B-TILL	UC31	FV102.AL		A-larm från filtrax STARmätare bio1	
080326.083635	B-FRÅN	STAR	MsAer1_No3State		Felsignal nitrat halt Bio1 NM102	
080326.083635	B-FRÅN	STAR	MsAer1_Nh4State		Felsignal ammoniumhalt Bio1 AM102	
080326.083633	B-FRÅN	UC31	FV102.AL		A-larm från filtrax STARmätare bio1	
080326.083242	B-TILL	STAR	PsAer1_ConLevSp		Styrstrategi 2:a res Master 1 OUR	
080326.083241	B-TILL	STAR	GeAer1_No3QSp		Dålig signalkvalitet NM102 i STAR	
080326.083241	B-TILL	STAR	GeAer1_Nh4QSp		Dålig signalkvalitet AM102 i STAR	
080326.083125	B-TILL	STAR	MsAer1_No3State		Felsignal nitrat halt Bio1 NM102	
080326.083125	B-TILL	STAR	MsAer1_Nh4State		Felsignal ammoniumhalt Bio1 AM102	
080326.083114	B-TILL	UC31	FV102.AL		A-larm från filtrax STARmätare bio1	
080326.083042	B-FRÅN	STAR	PsAer1_ConLevSp		Styrstrategi 2:a res Master 1 OUR	
080326.083041	B-FRÅN	STAR	GeAer1_No3QSp		Dålig signalkvalitet NM102 i STAR	
080326.083041	B-FRÅN	STAR	GeAer1_Nh4QSp		Dålig signalkvalitet AM102 i STAR	
080326.082915	B-FRÅN	STAR	MsAer1_No3State		Felsignal nitrat halt Bio1 NM102	
080326.082915	B-FRÅN	STAR	MsAer1_Nh4State		Felsignal ammoniumhalt Bio1 AM102	
080326.082914	B-FRÅN	UC31	FV102.AL		A-larm från filtrax STARmätare bio1	
080326.082635	B-TILL	STAR	MsAer1_No3State		Felsignal nitrat halt Bio1 NM102	

Sök i listan: | Sök nedåt | Sök uppåt

Stäng | Utskrift | Hjälp



## Alarm management

# Operator functions

## Information system

**Cactus Informationssystem**

[HEM](#) | [KATEGORIER](#) | [SÖK OBJEKT](#)

**M981:DANSJÖN**

Fabrikat:   
 Modell:  
 Placering: Dansjön Alvesta  
 Beskrivning: Mäter nivån i Dansjön  
 Text: Kontakt Alvesta Kommun  
 Håkan Nilsson  
 Tel: 0472-152 39, Mobil: 0708- 746 714  
 hakan.nilsson@kommun.alvesta.se

**Dokument**

[IO lista](#)  
[Karta](#)

**Noteringar**

**Nivåkontroll**  
 Mätområdet justerat efter samtal med Håkan N, 142.46 -146.46. Lokalt avläst 142.79 vilket oxo är det som läses på skärm

Skapad:2008-02-29 14:20 Signatur:SF

**Nivåkontroll**  
 Mätområdet justerat efter kontroll på plats av Håkan Nilsson 142.48 - 145.48. Mätt nivå 143.88 lokalt samt även på skärm efter ändring

Skapad:2008-02-13 10:58 Signatur:SF

**Nivåjustering**  
 Efter samtal med Håkan Nilsson Alvesta har givaren justerats. avläst nivå är 143.95.

Skapad:2008-02-08 15:48 Signatur:SF

		TEKNISKA VERKEN <small>Din vardag. Vår drivkraft</small>					Månadsrapport Inp. Rötkammare		Mars 2008	
		Inpumpad mängd till rötkammare								
	Föresd Tot	Föresd. 1	Föresd. 2	Fett	Silbord IN	Silbord UT	TS IN	Gasprod		
Dag	m3	m3	m3	m3	m3	m3	%	m3		
01	549	133	132	6,3	246	193	3,99	7378		
02	510	94	98	0,6	281	178	3,82	7100		
03	530	109	103	2,6	281	176	3,91	7326		
04	557	127	108	1,8	279	173	3,87	7821		
05	554	140	109	0,8	267	163	3,55	7566		
06	564	138	106	0,7	277	203	3,50	7296		
07	574	148	115	0,7	277	209	3,49	7259		
08	582	153	121	0,7	263	175	3,30	7239		
09	585	158	130	0,6	252	167	3,09	6694		
10	595	160	132	0,7	249	169	3,26	6998		
11	618	150	163	6,2	250	179	3,39	7693		
12	665	163	206	0,7	248	165	3,34	8053		
13	700	164	191	0,0	286	187	2,97	7852		
14	605	103	118	0,2	308	234	2,91	7167		
15	535	82	76	0,6	308	265	3,22	6680		
16	569	105	87	0,6	304	292	3,32	6793		
17	573	119	100	5,6	280	250	3,34	6761		
18	573	119	99	6,4	290	230	3,80	7324		
19	585	156	128	1,8	240	190	3,95	7484		
20	601	121	128	1,5	287	231	3,87	8041		
21	596	114	138	0,8	283	225	3,74	7965		
22	578	109	118	0,7	278	226	3,80	7389		
23	566	112	121	0,2	263	185	3,07	6739		
24	564	109	116	0,0	257	198	3,05	6710		
25	549	97	104	0,0	261	232	3,34	6874		
26	284	64	67	0,0	127	114	3,93	4003		
Sum	14761	3247	3114	40,8	6942	5209		186206		
Max	700	164	206	6,4	308	292	3,99	8053		
Min	284	64	67	0,0	127	114	2,91	4003		
Medel	568	125	120	1,6	267	200	3,49	7162		

## Reports

# Laboratory and water analysis

Labbvärden | [Provgrupphantering](#) | [Användarhantering](#) | [Hjälp](#) | [Lathund](#)

## Labbvärden för Lovö 1\_Råvatten 20081124

Förinställd tid:

[Visa värden](#)

[Visa inmatningsfält](#)

Nod	Ustn	Variabelnamn	Beskrivning	Undre	Övre	Enhet
SPOV	LRA2	L_TEMPERATUR	Råvatten 2, vattentemperatur	0,0	20,0	°C
SPOV	LRA2	L_LUKT_STYRKA	Råvatten 2, lukt styrka	1	12	
SPOV	LRA2	L_LUKT_ART	Råvatten 2, lukt art	0	8	
SPOV	LRA2	L_TURB	Råvatten 2, turbiditet	0,0	10,0	FNU
SPOV	LRA2	L_PH	Råvatten 2, pH	0,0	14,0	pH
SPOV	LRA2	L_ALKALINITET	Råvatten 2, alkalinitet (tit 4,8)	0,0	100,0	mg/HCO3
SPOV	LRA2	L_KONDUKTIVITET	Råvatten 2, konduktivitet (ext)	0,0	50,0	mS/m
SPOV	LRA2	E_AMMONIUM	Råvatten 2, ammonium (omr från NH4-N)	0,000	1,500	mg/INH4
SPOV	LRA2	E_ALUMINIUM	Råvatten 2, aluminium	0,000	10,000	mg/l, Al
SPOV	LRA2	L_HARDHET_1	Råvatten2 , hårdhet	0,0	50,0	mg Ca/l
SPOV	LRA2	L_HARDHET	Råvatten 2, hårdhet	0,0	10,0	dH°
SPOV	LRA2	L_TOC	Råvatten 2, TOC	0,00	20,00	mg/l
SPOV	LRA2	L_UV_254_4CM	Råvatten 2, UV-abs mätt i 4 cm	0,000	5,000	AE/4cm
SPOV	LRA2	E_FARG_FILT410	Råvatten 2, färg filtrerat 410nm	0	60	mg Pt/l
SPOV	LRA2	L_MIKROORG_3D	Råvatten 2, mikroorganismer 3 d	0	10000	st/ml
SPOV	LRA2	L_LANGSAMVAX	Råvatten 2, långsamväx. mikroorg 7d	0	10000	st/100ml
SPOV	LRA2	L_KOLIF_COL	Råvatten 2, koliformer (Colilert)	0	10000	st/100ml
SPOV	LRA2	L_E_COLI	Råvatten 2, E. coli (Colilert)	0	10000	st/100ml

