Digitaliserad kraftförsörjning

Agenda

1	Globala trender
2	Varför digitalisera?
3	Exempel på applikationer
4	Varför digitalisera?

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20 år att bli mer effektiva

x1.5
Energy Consumption

÷2
CO^2 Emissions

3x
Efficiency

Source: IEA and Schneider Electric's forecast

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Våra eldistributionslösningar genomgår ett paradigmskifte

Mer ELEKTRISK

Behov av tillförlitlig kraftförsörjning

Mer DIGITALISERAD

Uppkopplings-möjligheter accelererar effektiviteten

Mer DECENTRALISERAD

Alternativa matnings-källor med lokal generering

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Elbranschen behöver växla upp…

…och möta utmaningen

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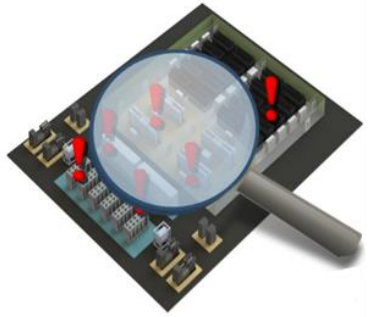
Varför digitalisera?

Koppla upp

Samla in

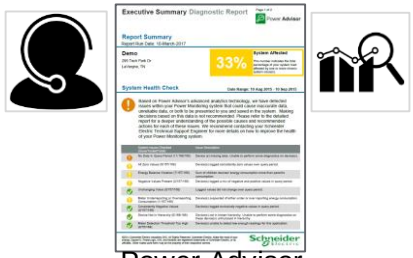
Analysera



Agera

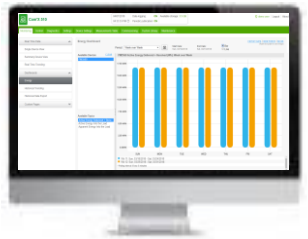
Hur ser Schneider på dessa steg?

Rådgivande tjänster



Power Advisor

Mätning, övervakning

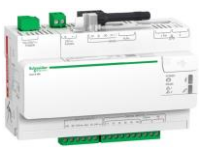


Com’X inbyggda webbsidor

Power Monitoring Expert

Power SCADA Operation

Uppkopplade produkter



Com’X Energiserver

Smart Panels, Msp

Reläskydd

RTU

Temperaturgivare

Mätare

Elbilsladdare

Smart Panels Lsp

ACB

MCCB

MCB

Isolationsövervakning

Elkvalitet

UPS

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PME's Grundfunktion

1. Mätning

2. Insamling

3. Lagring

4. Behandling / Utvärdering

5. Rapportering

Dashboards

Rapporter

Trends

Alarms

Exempel på applikationer

Säkerhet
Människor | Utrustning

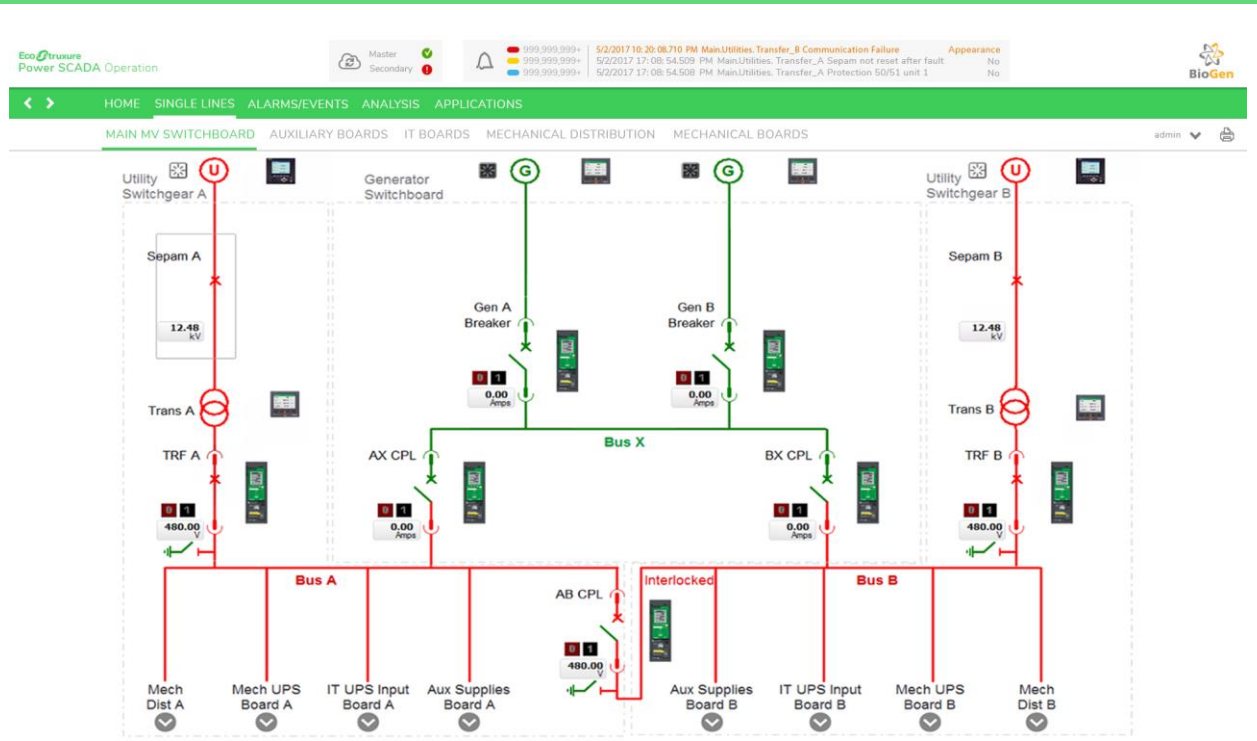
Tillgänglighet
Drifttid | Återhämtning

Effektivitet
Underhåll | Energi

Applikationer

Säkerhet - Övervakning & Alarm

- Få insyn i din eldistribution
- Få larm på avvikande elektriska förhållanden
- Meddela relevant personal via email eller SMS.



IEC

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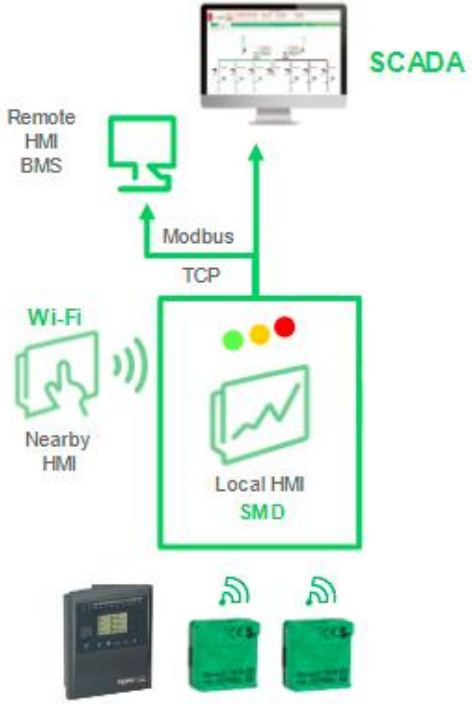
Säkerhet - Kontinuerlig Termisk Övervakning

- Trådlösa sensorer för temperaturövervakning.
- Undvik kostnaden för periodisk och manuell IR-scanning.
- Få larm INNAN branden bryter ut.



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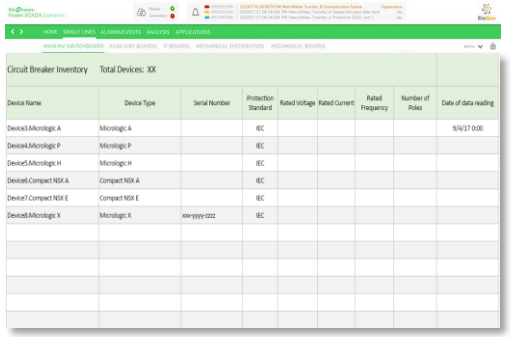
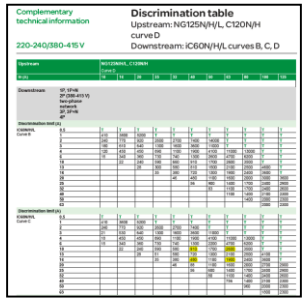
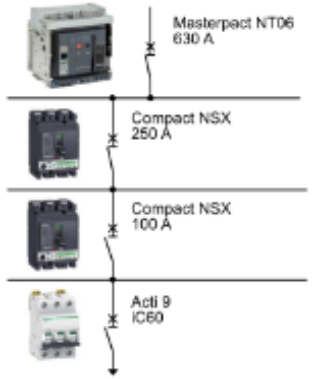
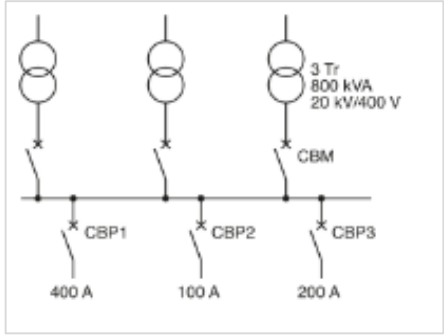
Tillgänglighet - Övervakning av brytarstatus och Inställningar (underhåll)

- Spara pengar och tid
- Upptäck förändringar
- Minska risken
- Peace of mind
- Brytare (åldersanalys)









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Underhåll - Säker och enkel återställning av kraft

- Minimera driftstopp och återställ strömmen
- Slå till och från brytaren på säkert avstånd
- Viktig data sparas innan brytaren slår ifrån
- Få reda på faktiskt orsak till strömavbrott

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Det finns många fler applikationer

Säkerhet
Människor | Utrustning

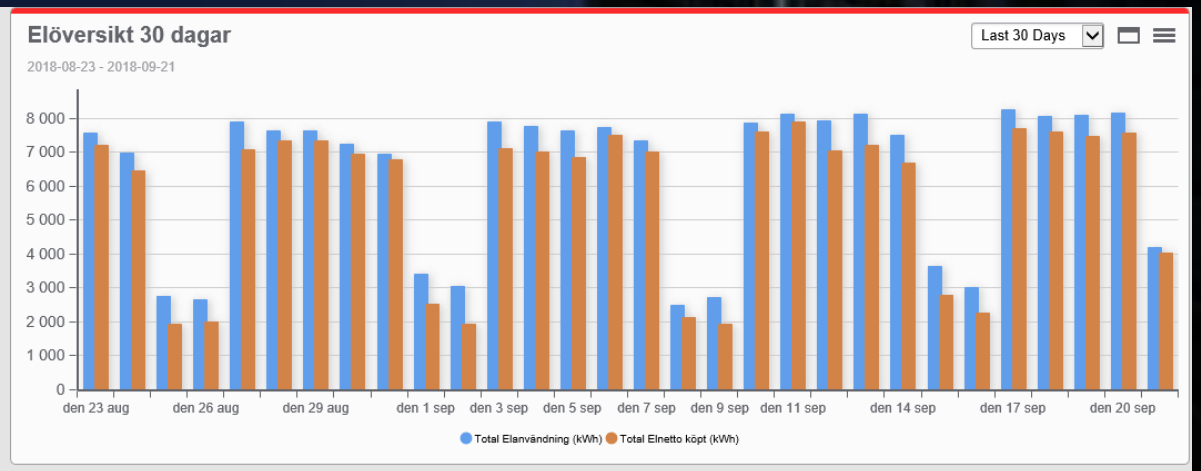
Tillgänglighet
Drifttid | Återhämtning

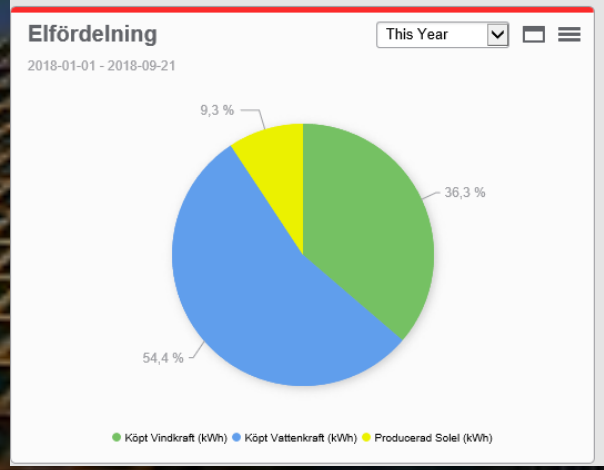
Effektivitet
Underhåll | Energi

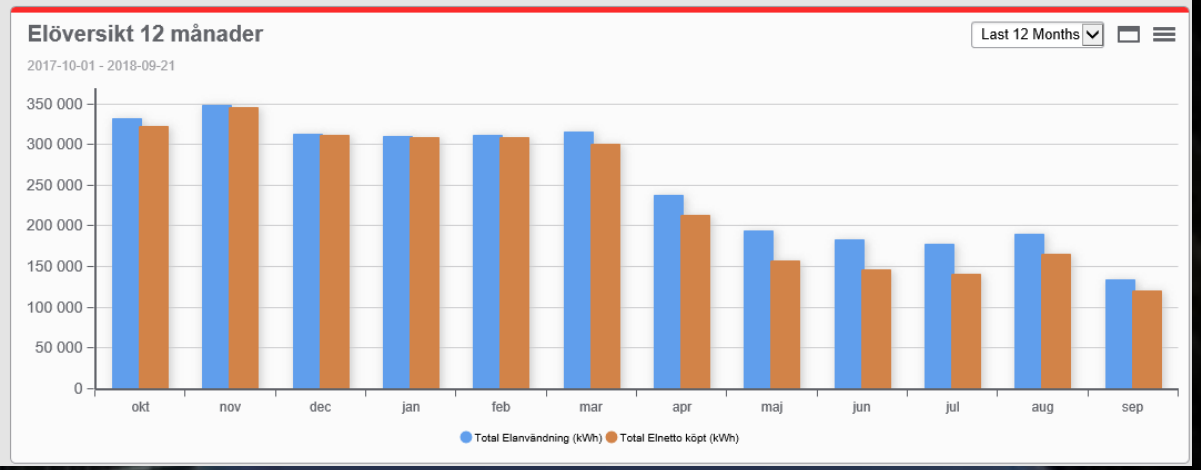
- *Thermal Monitoring*
- *Arc Fault Protection*
- *Insulation Monitoring*
- *Breaker Settings Monitoring*
- *Power Restoration*
- *Backup Power Testing*
- *Capacity Management*
- *Source / Network Control*
- *Power Events Analysis*
- *Power Quality Correction*
- *Power Quality Monitoring*
- *Energy Usage Analysis*
- *Data Quality Management*
- *Energy Performance Verification*
- *Energy Performance Analysis*
- *Energy Benchmarking*
- *Power factor correction*
- *Utility Bill verification*
- *Asset Performance*
- *Energy Efficiency Compliance*
- *Power Quality Compliance*
- *Regulatory Compliance*

Traditionella diagram

- Snabb översikt
- Enkelt att designa
- Många olika mätvärden
- Energiekvivalenter
- KPI'er







Regressionsanalys

Förväntad användning

Avvikelse

Verklig användning

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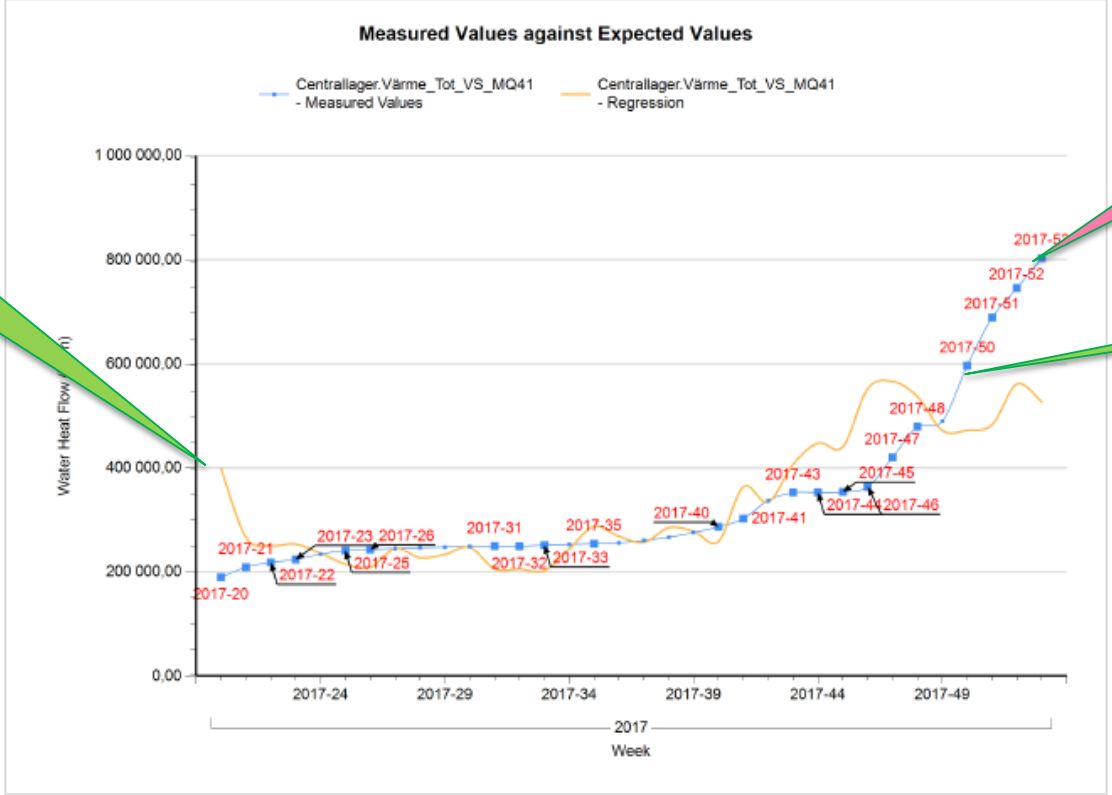
Regressionsanalys Värme tot

2017-01-01 00:00:00 - 2018-01-01 00:00:00 (Server Local)

Regression Analysis Main Characteristics Table

Side	Slope	Y-Intercept	R^2	RMSE
Single	3 639,16	134 910,25	0,785	95 817,99



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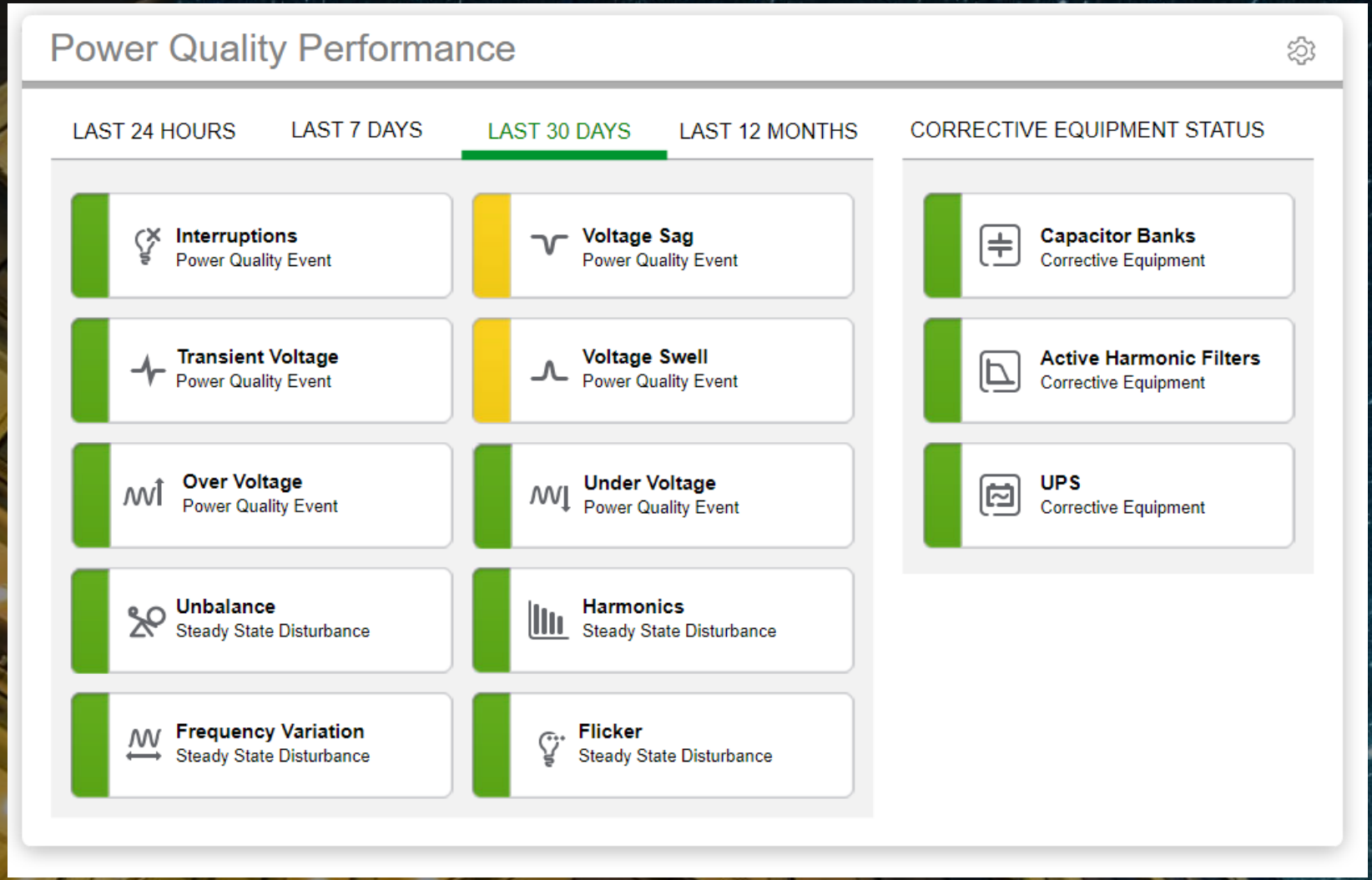
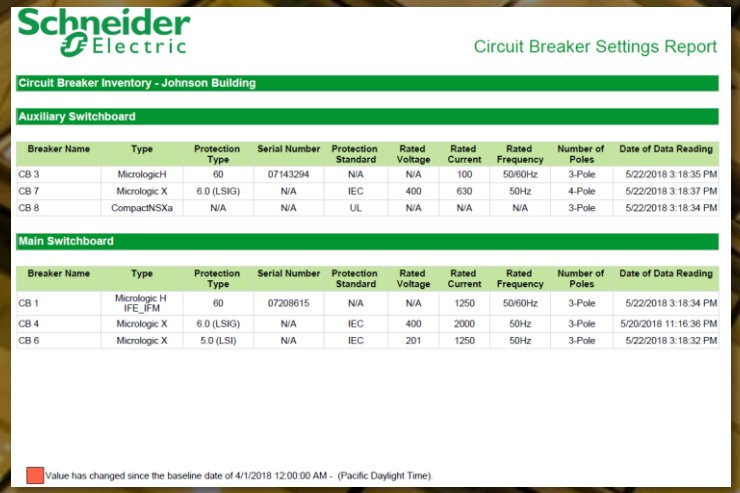
PQ Performance module

- Sammanställer data
- Överskådligt
- Lättförståeligt
- Reläskyddsinställningra (selektivitet m.m.)





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Circuit Breaker Settings Report

Circuit Breaker Inventory - Johnson Building

Auxiliary Switchboard

Breaker Name	Type	Protection Type	Serial Number	Protection Standard	Rated Voltage	Rated Current	Rated Frequency	Number of Poles	Date of Data Reading
CB 3	MicrologicH	60	07143294	N/A	N/A	100	50/60Hz	3-Pole	5/22/2018 3:18:35 PM
CB 7	Micrologic X	6.0 (LSIG)	N/A	IEC	400	630	50Hz	4-Pole	5/22/2018 3:18:37 PM
CB 8	CompactNSXa	N/A	N/A	UL	N/A	N/A	N/A	3-Pole	5/22/2018 3:18:34 PM

Main Switchboard

Breaker Name	Type	Protection Type	Serial Number	Protection Standard	Rated Voltage	Rated Current	Rated Frequency	Number of Poles	Date of Data Reading
CB 1	Micrologic H IFE_IFM	60	07208615	N/A	N/A	1250	50/60Hz	3-Pole	5/22/2018 3:18:34 PM
CB 4	Micrologic X	6.0 (LSIG)	N/A	IEC	400	2000	50Hz	3-Pole	5/20/2018 11:16:36 PM
CB 6	Micrologic X	5.0 (LSI)	N/A	IEC	201	1250	50Hz	3-Pole	5/22/2018 3:18:32 PM

Value has changed since the baseline date of 4/1/2018 12:00:00 AM - (Pacific Daylight Time).

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Breaker Performance Module

Brytarföråldring

Minor Aging/Wear · Moderate Aging/Wear · Critical Aging/Wear

	HC.Gen_MAIN_Bkr	HC.Gen_1_Bkr	HC.Gen_2_Bkr
Status:	Closed	Closed	Closed
Electrical Wear:	90.0 %	68.0 %	5.4 %
Breaker Aging:	22.5 %	16.8 %	13.7 %
Mechanical Wear:	1.5 %	16.8 %	13.7 %
Environmental Aging:	0.3 %	0.3 %	0.3 %
Control Unit Aging:	22.5 %	12.5 %	12.5 %
Thermal Aging:	22.5 %	12.5 %	12.5 %
Corrosion Aging:	0.9 %	0.9 %	0.9 %
Number of Operations:	215	346	318
Load Profile:			
0 - 49 %:	17,972.0 h	17,990.0 h	18,007.0 h
50 - 79 %:	556.0 h	557.0 h	557.0 h
80 - 89 %:	0.0 h	0.0 h	0.0 h
90 - 100 %:	0.0 h	0.0 h	0.0 h
Temperature Profile:			
< -30 deg. Cel.:	0.0 h	0.0 h	0.0 h
-30 - 59 deg. Cel.:	1,524,772.1h	1,526,335.8h	1,527,734.9h
60 - 74 deg. Cel.:	303,842.8 h	304,154.4 h	304,433.2 h
75 - 89 deg. Cel.:	24,085.1 h	24,109.8 h	24,131.9 h
90 - 99 deg. Cel.:	0.0 h	0.0 h	0.0 h
> 99 deg. Cel.:	0.0 h	0.0 h	0.0 h

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Circuit Breaker Aging Report
3/23/2015

Breaker Aging and Wear Summary

Switchboard	Level	Breaker Name	Electrical Aging (%)	Electrical Wear (%)
Switchboard A1	Critical	Breaker A2	84.8	53.7
		Breaker A3	87.8	85.7
		Breaker A4	96.7	71.9
		Breaker A5	30.8	90.3
		Breaker A7	73.2	74.5
		Breaker A8	38.2	66.3
		Breaker A9	42.5	66.8
		Breaker A10	6.3	89.1
		Breaker A11	2.3	78.3
		Breaker A12	47.4	53.2
		Breaker A13	67.3	71.7
		Breaker A14	57.2	69.5
		Breaker A15	80.7	50.8
		Breaker A16	12.1	93.9
		Breaker A17	81.4	13.6
		Breaker A18	19.7	53.5
		Breaker A21	56.6	3.4
		Breaker A22	55.9	61.0
		Breaker A24	6.1	93.5
		Breaker A25	47.0	81.1
		Breaker A26	98.6	35.4
		Breaker A27	11.9	72.4
		Breaker A28	14.0	62.3
		Breaker A29	96.5	31.6
		Breaker A30	86.4	16.2
		Breaker A32	91.1	80.0
		Breaker A33	78.2	50.9
		Breaker A34	31.4	59.6
		Breaker A35	54.8	84.7
		Breaker A36	28.6	99.5
		Breaker A37	36.0	59.1

Generated on: 3/23/2015 2:49:41 PM
Page 1 of 4

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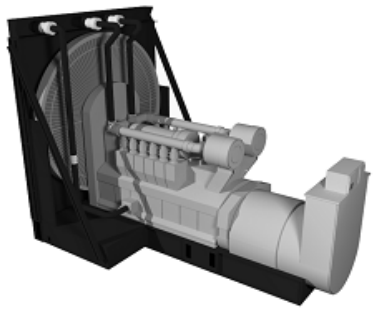
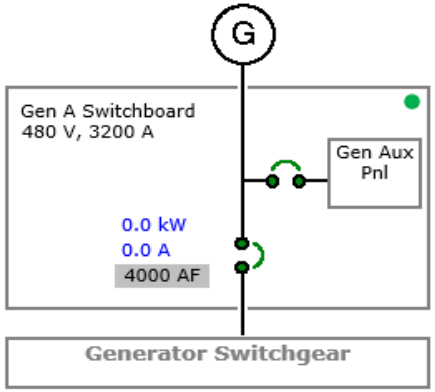
Backup Power Management Module

Generator A



Diesel Generator
2.5 MVA, 2 MW, 480/277 V



Apparent Power	0.0 kVA	Fuel Pressure	0.0 Bar	Bulk Fuel Tank Pump 1A	OFF
Reactive Power	0.0 kVAR	Battery Voltage	2.0 VDC	Bulk Fuel Tank Pump 1B	OFF
True Power	0.0 kW	Engine RPM	0.0 RPM	Bulk Fuel Tank Pump 2A	OFF
Power Factor	0.00	Engine Oil Temp	0.0 C	Bulk Fuel Tank Pump 2B	OFF
Voltage A-B	0.0 V	Engine Oil Pressure	0.0 Bar	Bulk Fuel Tank 1 Fuel Lvl	OK
Voltage B-C	0.0 V	Engine Coolant Temp	0.0 C	Bulk Fuel Tank 2 Fuel Lvl	OK
Voltage C-A	0.0 V	Engine Coolant Pressure	0.0 Bar		
Voltage A-N	0.0 V	Exhaust Gas Temp	0.0 C		
Voltage B-N	0.0 V	Engine Percent Load	0.0 %		
Voltage C-N	0.0 V	Engine Run Hours	12.0 Hrs		
Current A	0.0 A				
Current B	0.0 A				
Current C	0.0 A				

System in Auto	Low Fuel
Remote/Manual Start	Low Fuel Pressure
Ready to Start	Low Battery Voltage
Failed to Start	AC Battery Charger Fault
Emergency Stop	Overcrank
Generator CB Closed	Overspeed
Control Pnl CB Closed	Low Lube Pressure
Shutdown	High Engine Oil Temp
Common Alarm	High Engine Coolant Temp
Generator Running	Low Engine Coolant Temp

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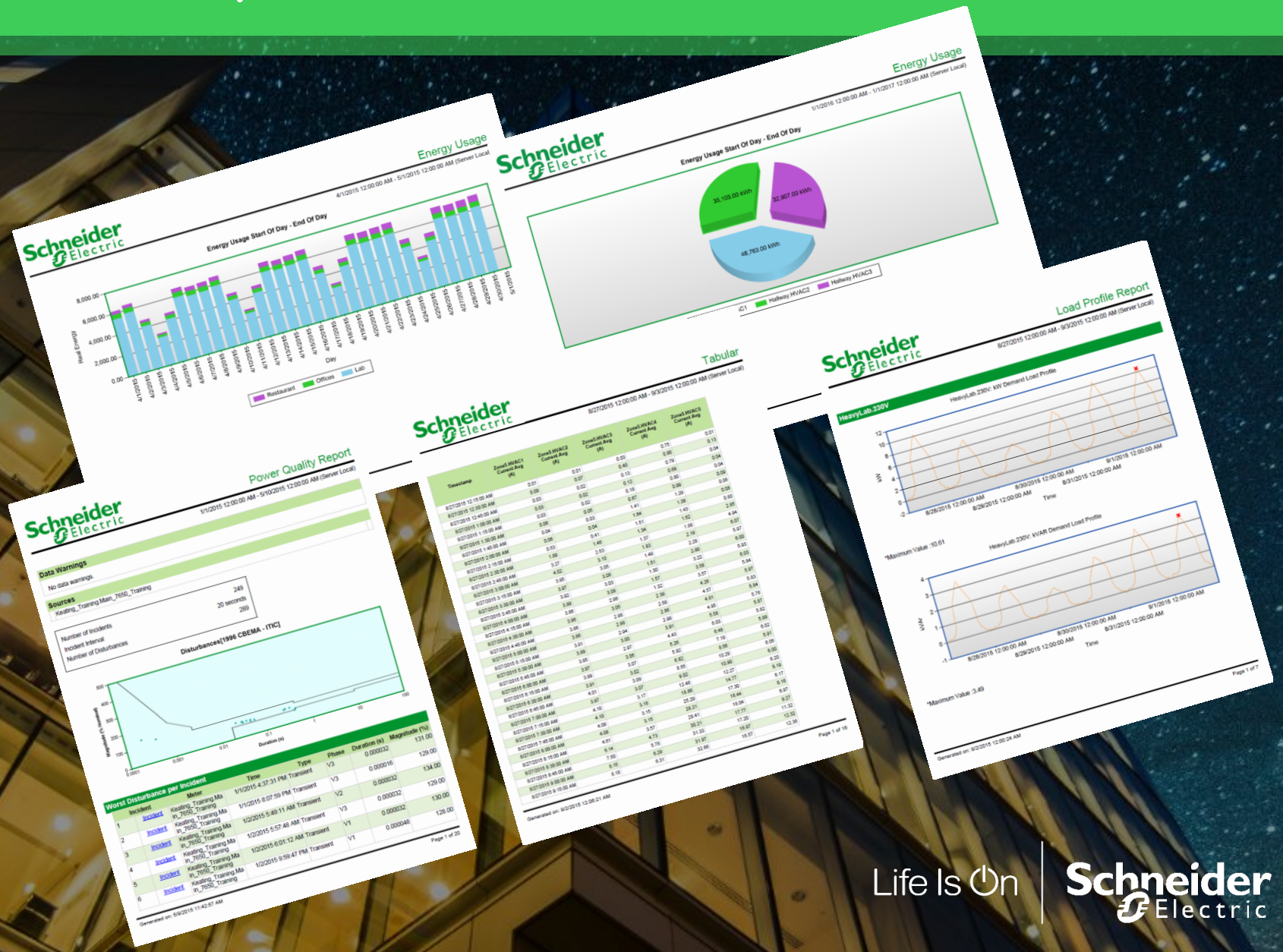
Rapporter

- Konfigurerbar
- PDF, Excel, Tiff
- Prenumeration
- Mail, FTP, Printa direkt
- Händelsetriggad



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Traditionell eldistribution

Smart eldistribution

Varför digitalisera?

1. Insikt och förståelse
2. Minskade energi- och driftkostnader
3. Förstå och åtgärda den faktiska orsaken
4. Undvika akuta situationer

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