

The logo for Janitza electronics, featuring the word "Janitza" in a bold, black, sans-serif font, with a yellow horizontal bar underneath it. Below the bar, the word "electronics" is written in a smaller, black, sans-serif font. The logo is set against a background of white, wavy, grid-like lines that sweep across the slide.

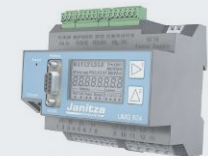
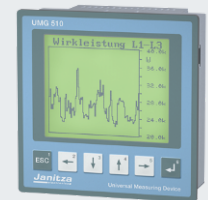
Janitza
electronics



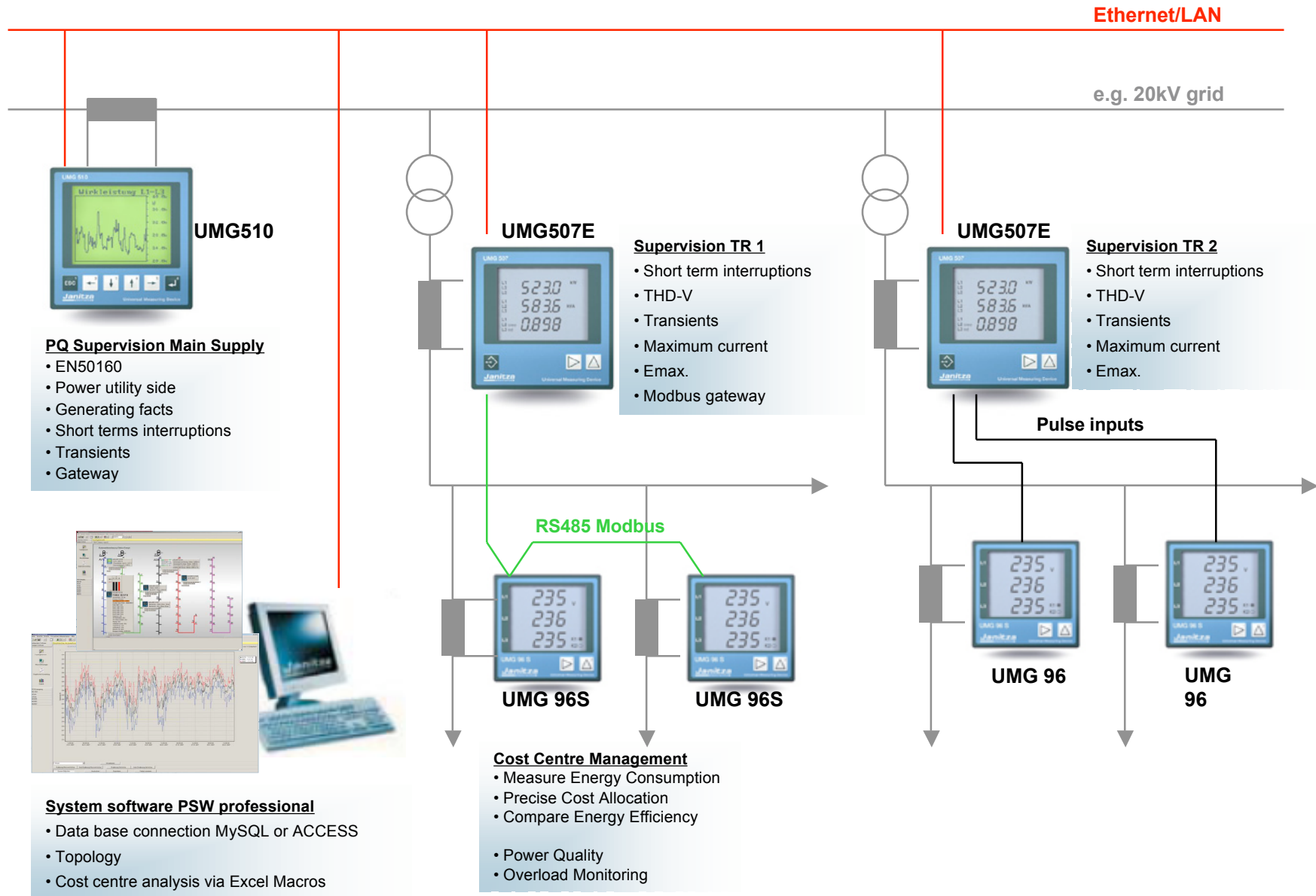
EEF Milano, 6th of March 2008
Power Quality Monitoring,
Management & Solutions

Targets of Energy Management Systems

- Basic power metering
- Demand management
- Cost centre management
- Remote control
- Power quality monitoring
- 3P-Strategy: Measure it – manage it – fix it!



Transparency for your grid!



A scenic view of a desert canyon with a winding river and a semi-transparent text box overlay. The canyon walls are made of layered, light-colored rock. The river is a deep greenish-blue. The sky is blue with scattered white clouds. A large, bold, black number '3' is positioned on the left side of the text box, and a large, bold, black letter 'D' is at the bottom left corner of the image.

3

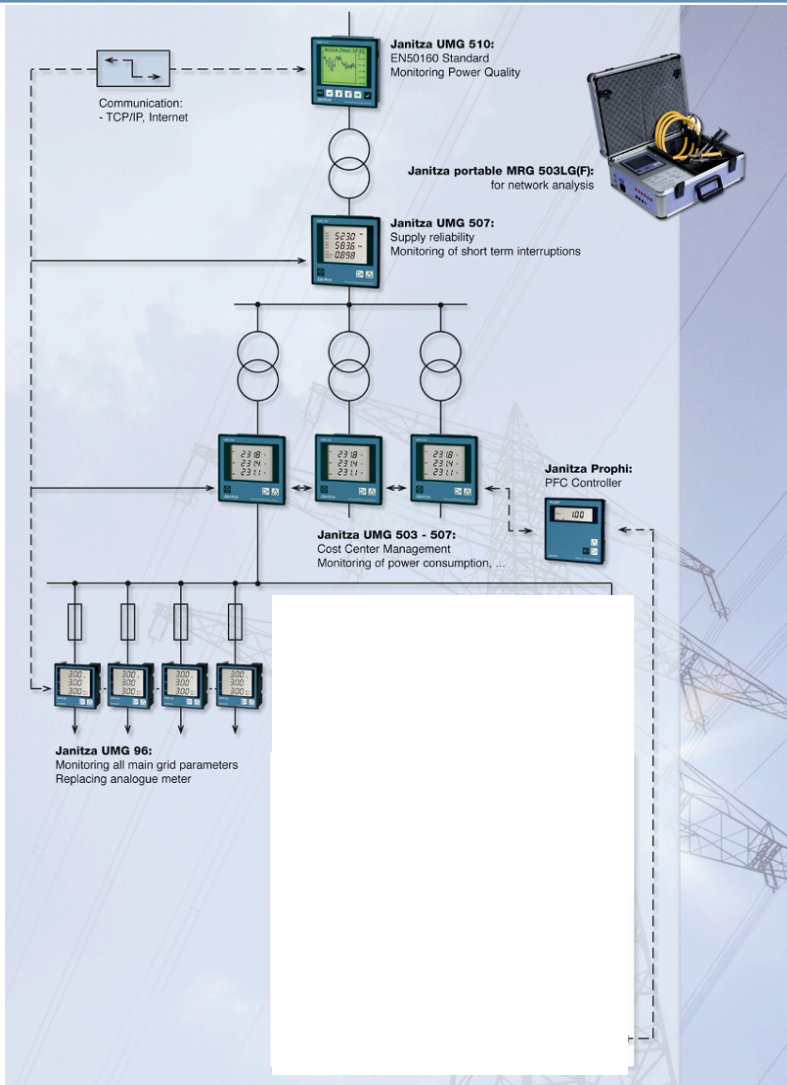
**Power Quality
Monitoring**

**Power
Management**

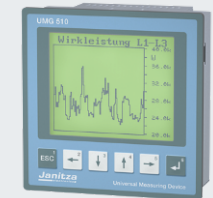
**Power Quality
Solutions**

D

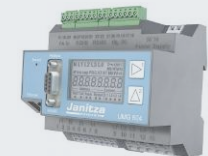
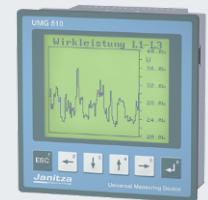
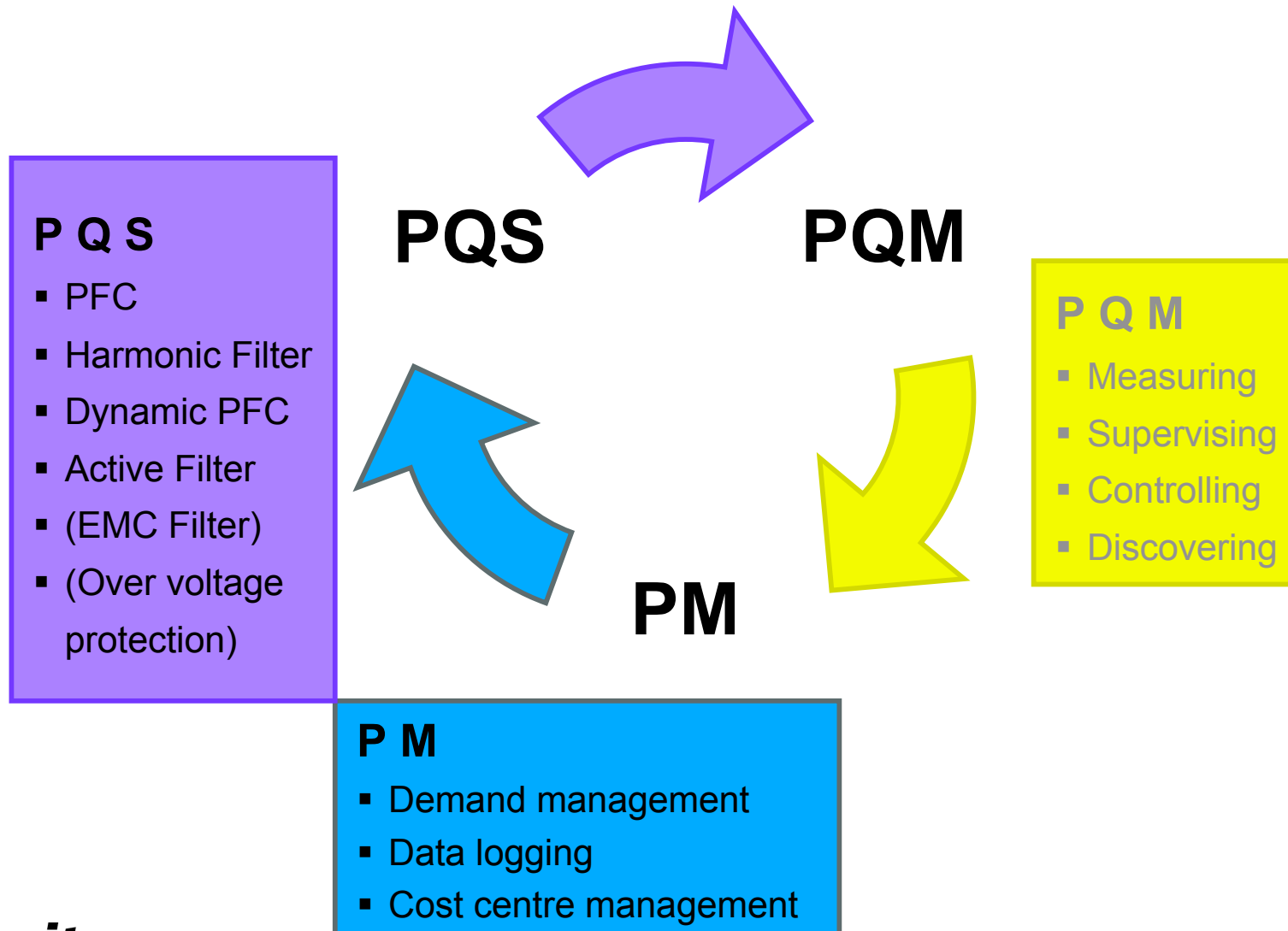
3P-Strategy



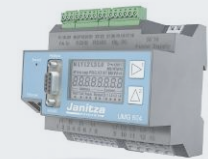
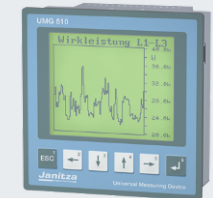
- Power Quality Monitoring
- Power Management
- Power Quality Solutions



3P-Strategy



3P-Strategy

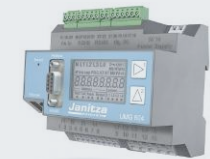
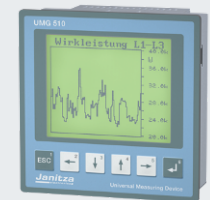


3P-Strategy

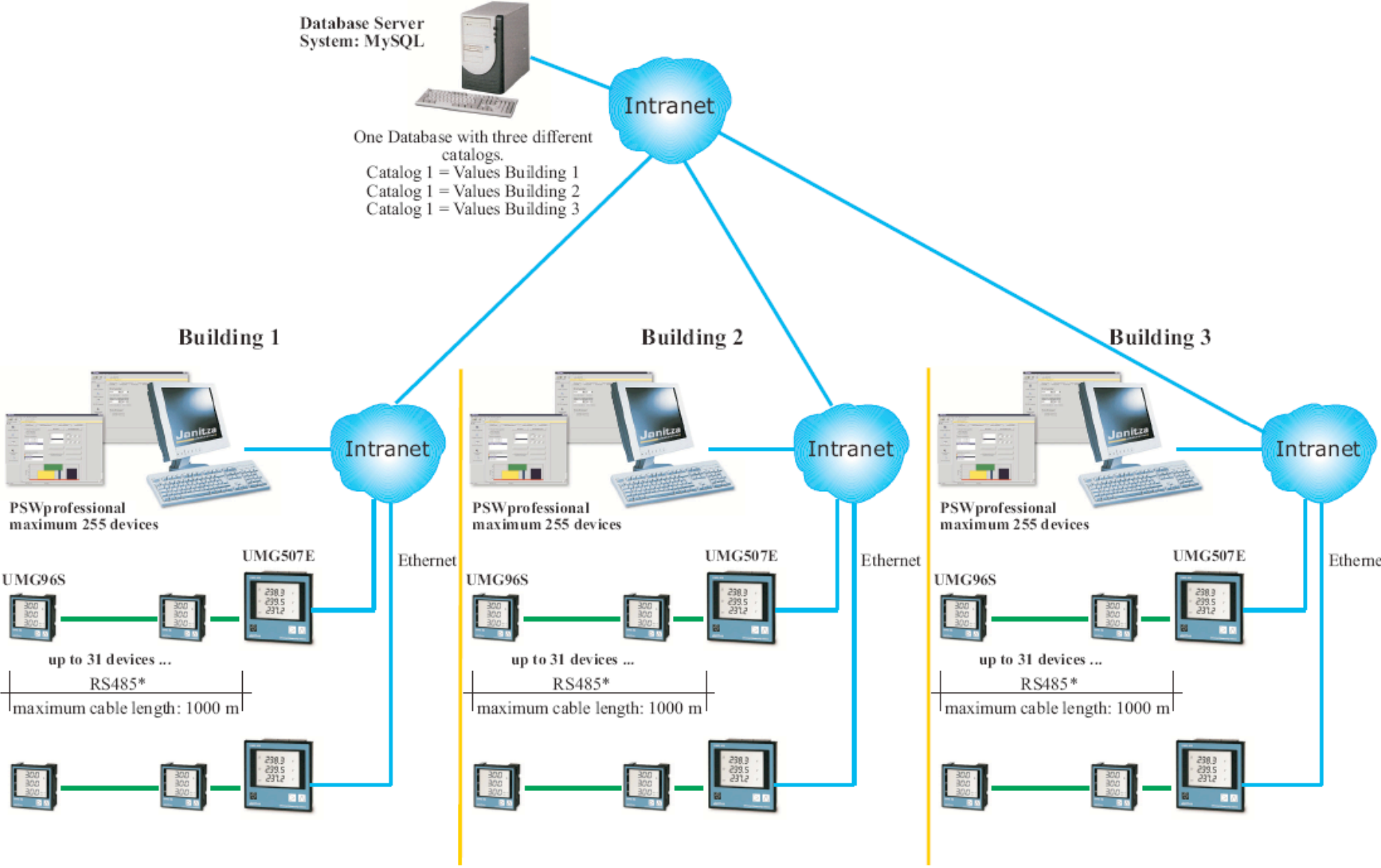
More Transparency for your Grid!

- Power Quality Monitoring
- Power Management
- Power Quality Solutions

Combining the 3Ps Janitza offers from monitoring the power quality and identifying possible problems, up to the counter-measures with appropriate solutions everything out of one hand:



Office Building in Hong Kong



Iceberg Analogy

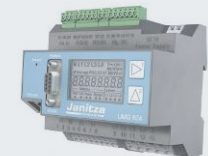




„Real is what we can measure.“
Max Plank

Reduce Electricity Cost

- Implement fact based electricity reduction concepts
- Reduce peak demand through load management
- Optimize energy purchase by precise demand forecasts
- Identify energy inefficiencies and waste of energy
- Review and reconcile utility bills to identify mistakes
- Precise measuring and sub-billing of electricity cost



Reduce Electricity Cost

Identify energy inefficiencies and waste of energy

Motor $\eta = 93.8 \%$

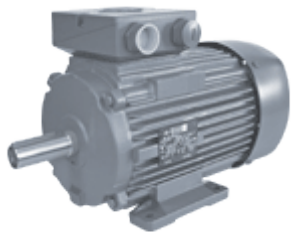
$P_{\text{cons.}} = 23.45$
kW

Motor $\eta = 89.7 \%$

$P_{\text{cons.}} = 24.55$
kW

Delta (only) = 4.1 %

Delta \rightarrow 42 %



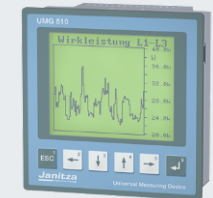
Savings
Electricity Cost
(0.08 € / kWh)

1000h \rightarrow 84 €
3000h \rightarrow 252 €
6000h \rightarrow 504 €
8760h \rightarrow 735 €

Purchasing motor < 1000 €

ROI < 1.5 years (energy saving)

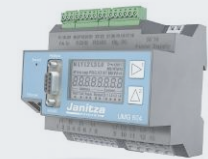
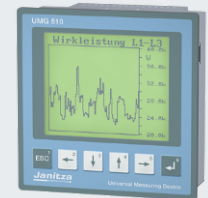
Life expectancy = 10 years \rightarrow EARNINGS = 6247 €



Energy Management - PM

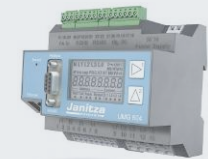
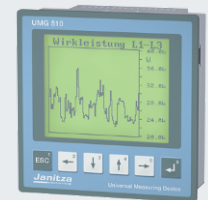
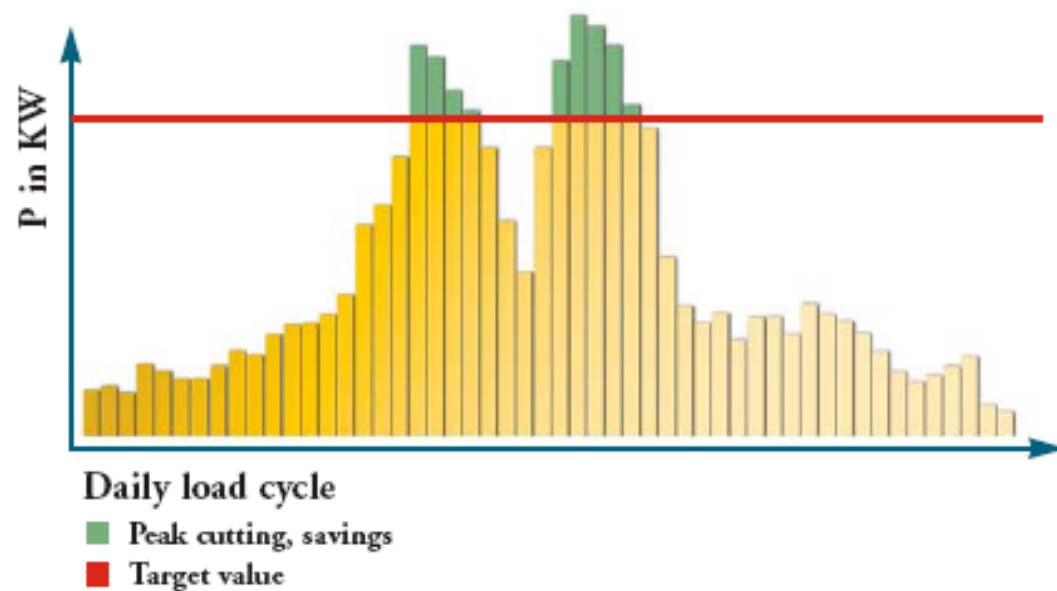
Proactive managing of the electrical loads and energy distribution considering topics such as:

- Emax. – Demand management
- Cost centre management
- Monitor overload (THD, I, balancing, ...)
- Data logger

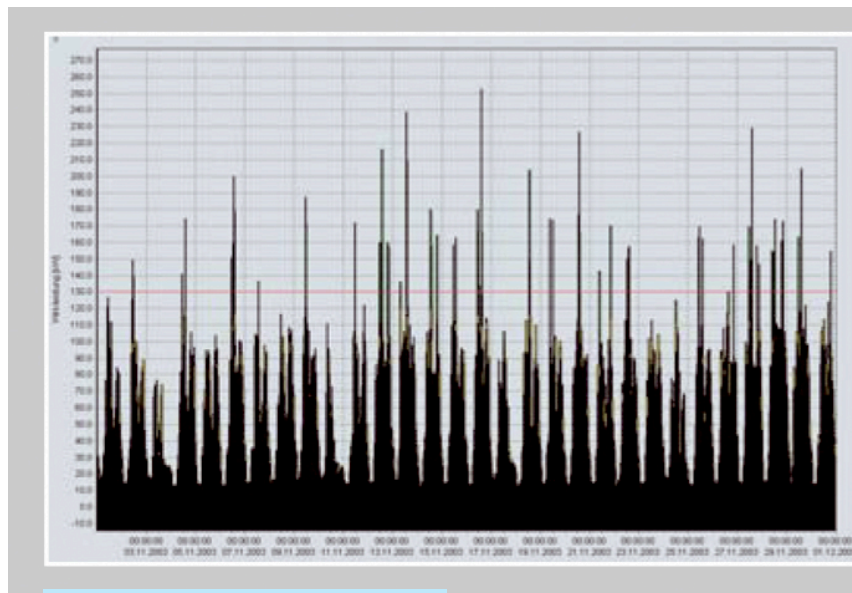


Demand Management

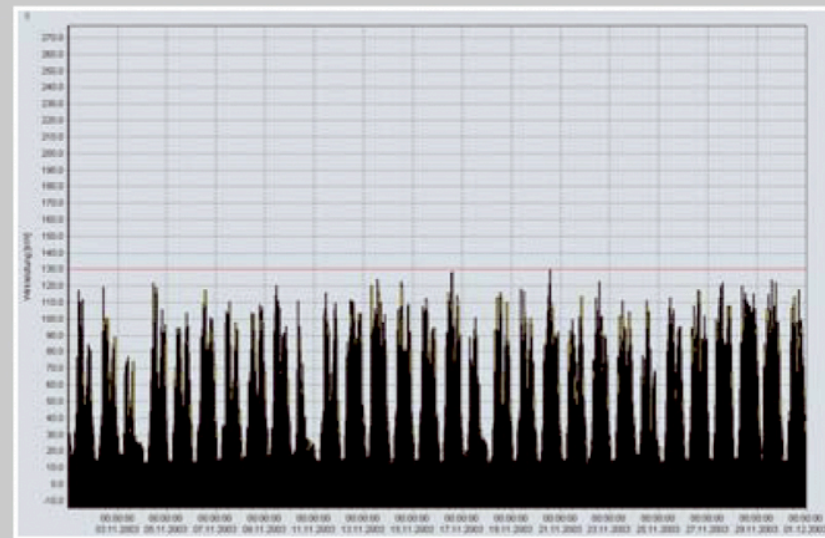
- Avoid costly peak tariffs from power utilities
- Avoid overload of distribution system (e.g. breaker tripping)



Demand Management: Hotel in Switzerland



without Emax



with UMG507Emax

DETAILINFORMATION

without Emax

Rechnungsnummer 610 463 297
 Vertragsnummer xx xxx xx Hotelbetrieb

Preisstruktur top1: Spezial

Verbrauchstabelle 01.01.2004 bis 31.03.2004

Bezugsart Gerätenummer	Zähler- stand alt	Zähler- stand neu	Differenz	Ablese- faktor	Blindstrom- verbrauch	zulässiger Blindstrom- verbrauch	Effektiver Ver- brauch/Blind- stromüber- verbrauch	Preis pro Einheit in CHF	Betrag in CHF
Leistung									
74635398									
Leistung	572.1	634.4	62.3	6			373.8 kW	10.1000	3'775.38
Wirkenergie									
74635398									
Hochtarif	143'071	156'631	13'560	6			81'360 kWh	0.1400	11'390.40
Niedertarif	29'724	32'598	2'874	6			17'244 kWh	0.0820	1'414.01
Blindenergie									
74635398									
Hochtarif	46'689	61'017	14'328	6	85'968	32'544	53'424 kvarh	0,045	2'404.08
Niedertarif	9'440	10'926	1'486	6	8'916	6'898	2'018 kvarh	0,045	90.81
Zwischentotal									19'074,68
Zuschlag für Sekundärmessung 9 % von CHF 19'074,68									1'716,72
Rundungsdifferenz									-0,02
Total exkl. MWST									20'791,40
Mehrwertsteuer 7.6 % von CHF 18'071.95									1'580,14
Total inkl. MWST									22'371,54
Abzüglich Teilrechnung(en) inkl. MWST									
Rechnungsbetrag inkl. MWST									22'371,54

Comparison of monthly utility billing:
 Hotel operation: Kitchen, sauna (w/o pool) ...
 Key customer tariff, CKW Luzern
 Cost w/o Emax.: 22 371 SWF
 Cost with Emax.: 15 017 SWF

DETAILINFORMATION

with UMG507Emax

Rechnungsnummer 610 463 297
 Vertragsnummer xxx xxx xx Hotelbetrieb

Preisstruktur top1: Spezial

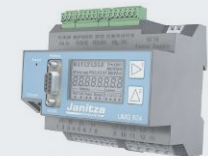
Verbrauchstabelle 01.01.2004 bis 31.03.2004

Bezugsart Gerätenummer	Zähler- stand alt	Zähler- stand neu	Differenz	Ablese- faktor	Blindstrom- verbrauch	zulässiger Blindstrom- verbrauch	Effektiver Ver- brauch/Blind- stromüber- verbrauch	Preis pro Einheit in CHF	Betrag in CHF
Leistung									
74635398									
Leistung	624,4	634.4	10	6			60 kW	10.1000	600
Wirkenergie									
74635398									
Hochtarif	143'071	156'631	13'560	6			81'360 kWh	0.1400	11'390.40
Niedertarif	29'724	32'598	2'874	6			17'244 kWh	0.0820	1'414.01
Blindenergie									
74635398									
Hochtarif	46'689	51'017	4'328	6	25'968	32'544	0 kvarh		
Niedertarif	9'440	10'326	886	6	5'316	6'898	0 kvarh		
Zwischentotal									12'804,41
Zuschlag für Sekundärmessung 9 % von CHF 12'804,41									1'152,39
Rundungsdifferenz									-0,04
Total exkl. MWST									13'956,80
Mehrwertsteuer 7.6 % von CHF 18'071.95									1'060,70
Total inkl. MWST									15'017,51
Abzüglich Teilrechnung(en) inkl. MWST									
Rechnungsbetrag inkl. MWST									15'017,51

Savings:
 Per quarter: 7354 SWF
 Per month: 2451 SWF

Optimize Equipment Utilization

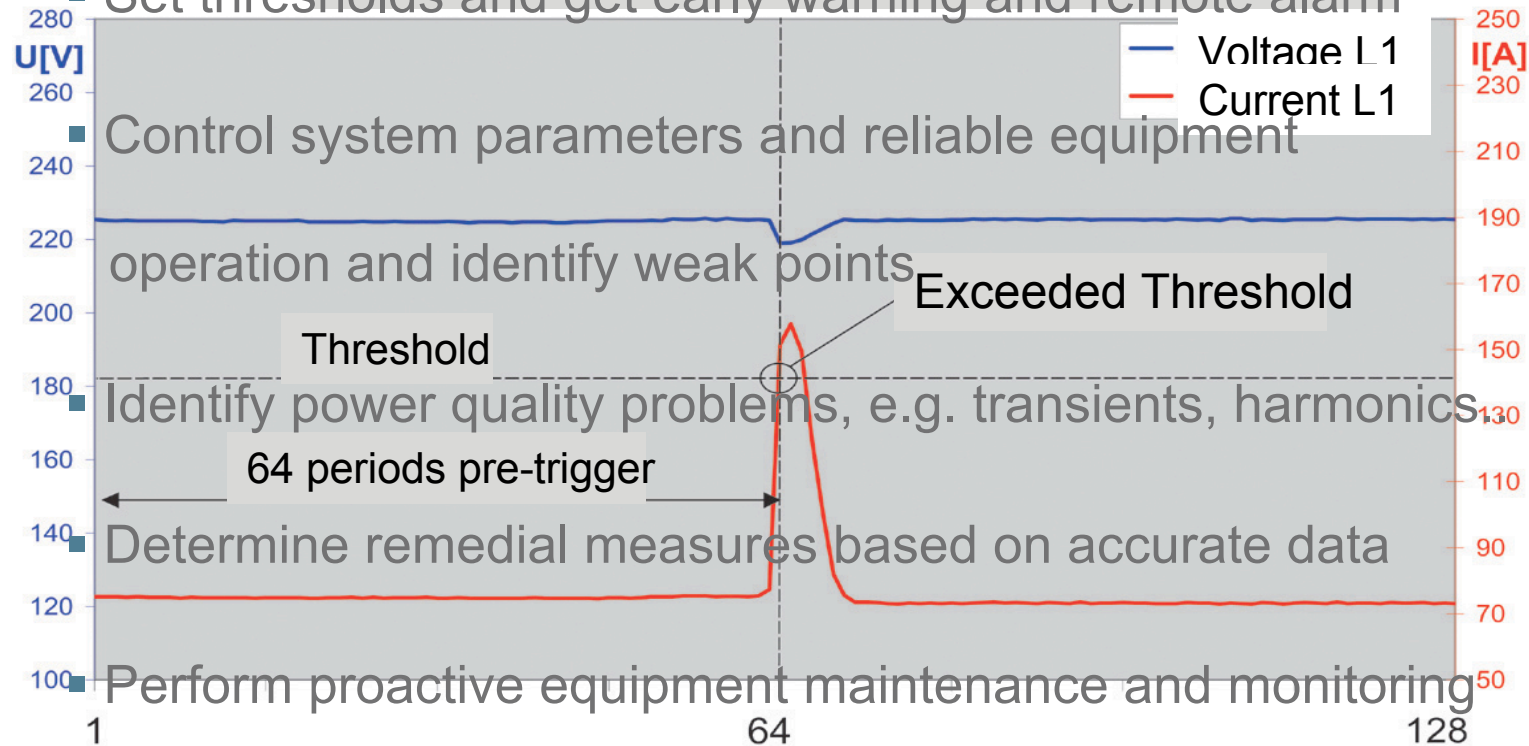
- Prolong equipment life by identifying stress factors, e.g. high harmonics, unbalanced systems, transients, short term interruptions, over current or over voltage.
- Optimize use of existing distribution equipment capacity to delay or eliminate capital expenses
- Compare the performance of facilities or processes
- Active load management to cut-off peak loads, e.g. eliminate costly peak demand tariffs, avoid overloading or tripping of breakers



Improve System Reliability

- Time stamp and event recording support failure tracking

Effective value line writer (128 periods)



- Set thresholds and get early warning and remote alarm

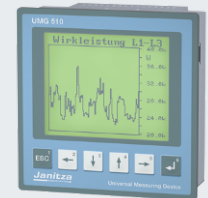
- Control system parameters and reliable equipment

- operation and identify weak points

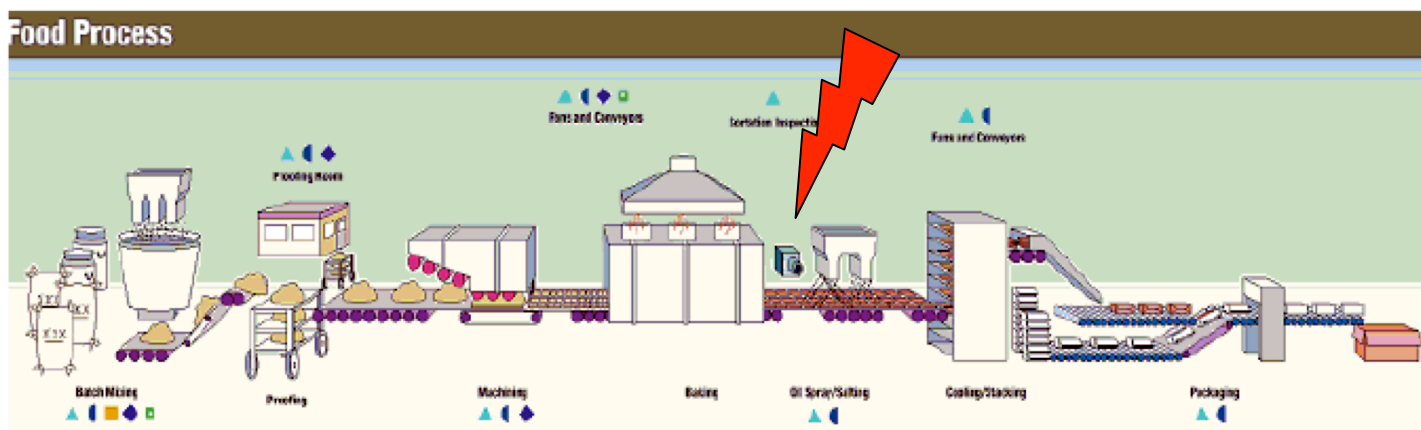
- Identify power quality problems, e.g. transients, harmonics

- Determine remedial measures based on accurate data

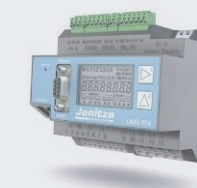
- Perform proactive equipment maintenance and monitoring



Continued Processes

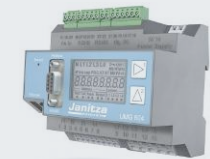
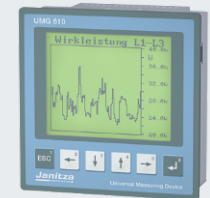


- Voltage Dips are known to cause problems with continuous manufacturing processes.



Continued Processes

- Paper Mill
- Chemical Processes
- Cable factories
- Plastic industry
- Rolling mills
- Semiconductor industry

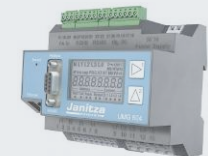
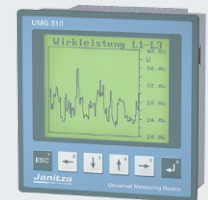




Remote Monitoring

Typical Application: Remote Monitoring

- Manufacturer of large machinery usually have to provide guarantee and a service contract
- Service engineers travel worldwide for failure tracking
- Root cause is often poor power quality
- Resources are wasted

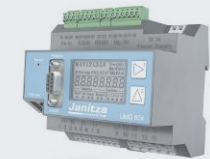
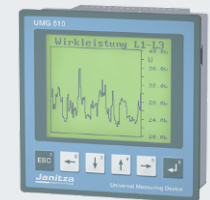


Remote Monitoring: Real Case – Ring spinning



Typical Application: Remote Monitoring

- Spinning mills
- Large electrical motors
- Paper plants
- Bottle filling and packing plants
- Plastic injection molding machines
- Machine tools
- Printing machine, rotary printing press
- Wind turbines
- Generating (incl. regenerative) equipment





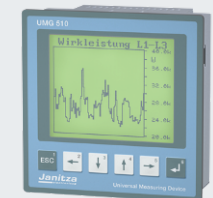
IT and Data Centre

Typical Application: Global Data Centers

Modern computers require an increasing amount of electrical energy – this is expensive and ecologically unfriendly.

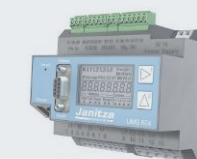


Article: "Welt am Sonntag", Issue 2nd of March 2008

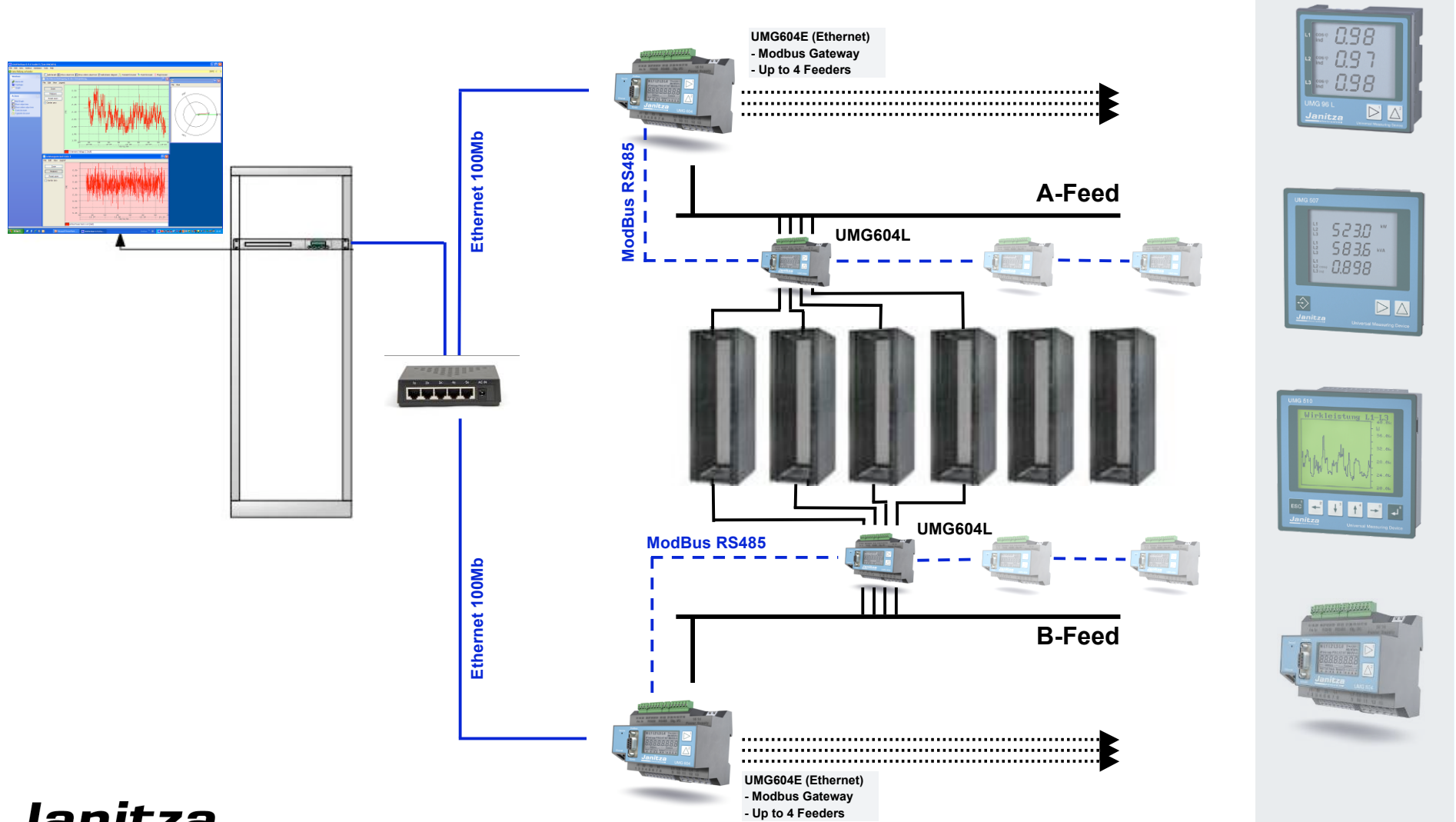


Cost of Poor Power Quality

- Poor power quality and reliability problems cost US businesses approximately \$150 billion annually in lost data, materials and productivity
- Typical utility deliver 99.9%, or three nines, which translates into about eight hours of downtime/year
- Data centres require 99.9999% reliability, or six nines, which equates to 31.5 seconds of downtime/year
- **Server downtime costs:**
 - \$108,000/minute for brokerage operations and
 - \$43,000/minute for lost credit card operations



IT Configuration: 4 Feeders/Racks one UMG604!



PQM is Not Only Hardware!

- Measurement instruments

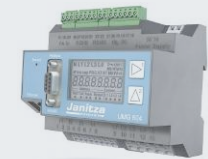
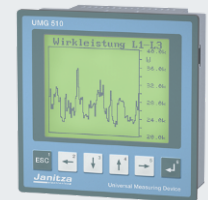
(User friendliness, accuracy, product range ...)

- Communication features

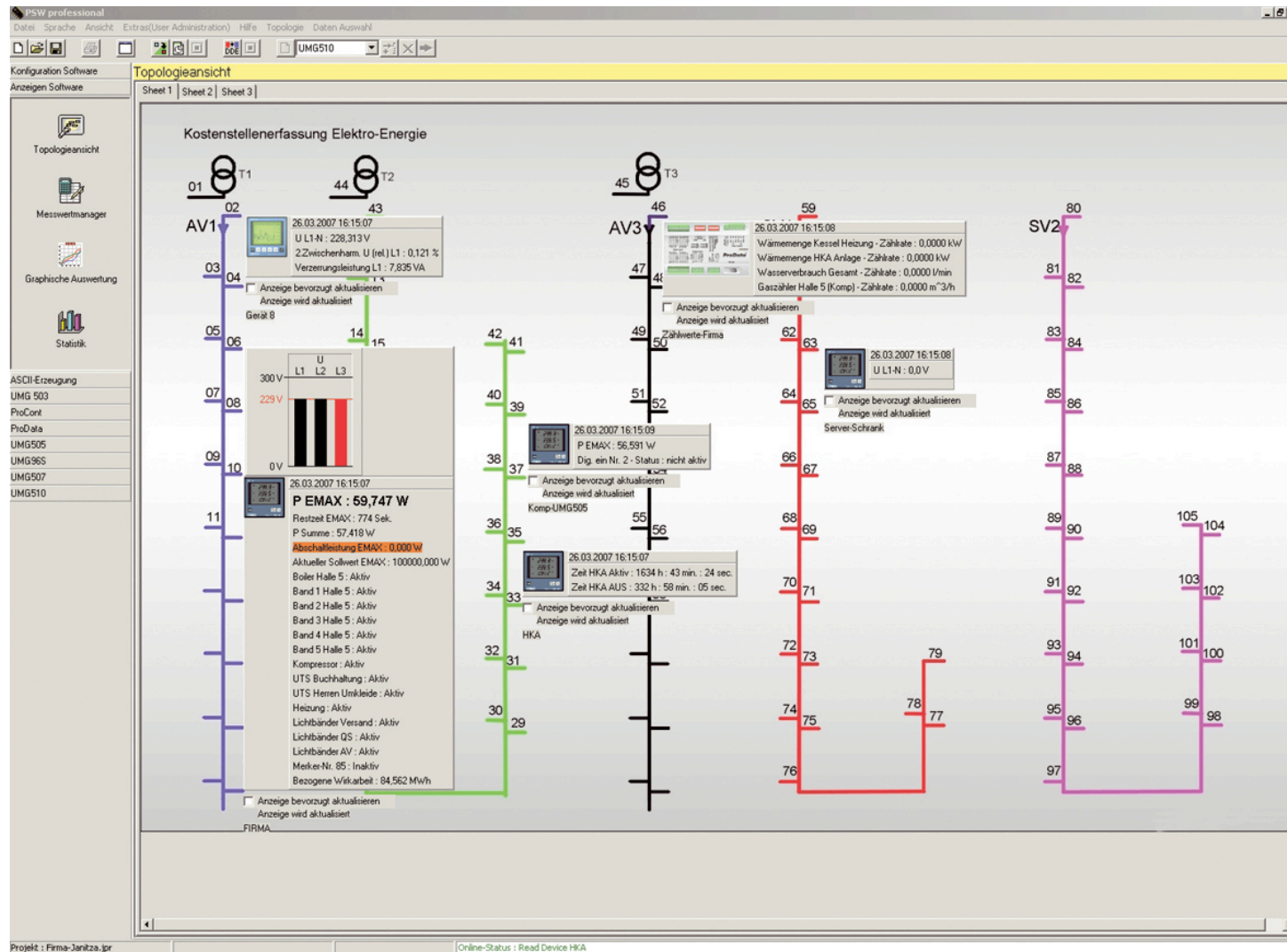
(IOs, Ethernet, Profibus, Modbus, LON, RS232,

..)

- Visualization - and analysis software



PSW Software: Topology View for Visualization



Konfiguration Software

Anzeigen Software



Topologieansicht



Messwertmanager



Graphische Auswertung



Statistik

ASCII-Erzeugung

UMG 503

ProCont

ProData

UMG505

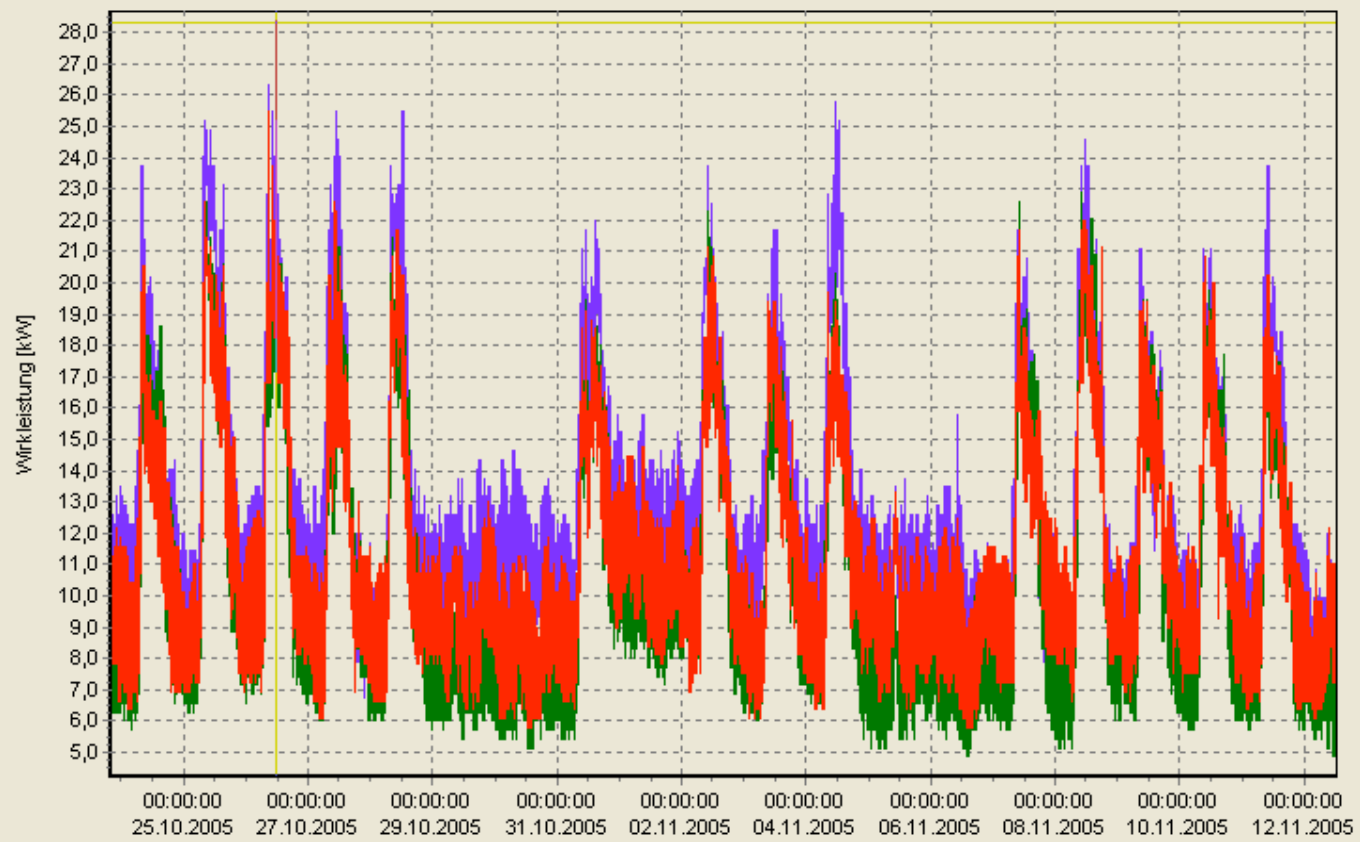
UMG96S

UMG507

Graphische Auswertung

11:40:27 26.10.2005 28,3kW -

3 von 18 Graphen!



- AVG - P L1
- AVG - P L2
- AVG - P L3

15 Minuten

Aktualisieren

Skalierung Messwert-Achse

Auto-Skalierung Messwert-Achse

Skalierung Zeit-Achse

Auto-Skalierung Zeit-Achse

Ganzer Bildschirm

Ausdrucken

Exportieren

Farben zuweisen

PSW professional

Datei Sprache Ansicht Extras(User Administration) Hilfe Topologie Daten Auswahl

Konfiguration Software **Topologieansicht**

Anzeigen Software Übersicht Trafo1 Sheet 3

Topologieansicht

Messwertmanager

Graphische Auswertung

Statistik

ASCII-Erzeugung

UMG 503

ProCont

ProData

UMG505

UMG96S

UMG507

Neuer Pavillon, Erdgeschoss

Alter Pavillon

0,5 kW

0 kW

23.11.2006 13:27:31

Temperatur in UMG507

CII

PSW professional

Datei Sprache Ansicht Extras(User Administration) Hilfe

Konfiguration Software **Automatische Auslesung konfigurieren**

Geräteauswahl Zeiten festlegen Konfiguration Modemauslesung

Gerätename	Zykluszeit (Tage)	Zyk...
UMG507E	2	0
UMG96S	2	0
UMG96S-2	2	0

Längstmögliche Auslesezykluszeit ermitteln

Messgeräte einrichten

Datenbank-Konfigurator

Upgrade

Automatische Auslesung konfigurieren

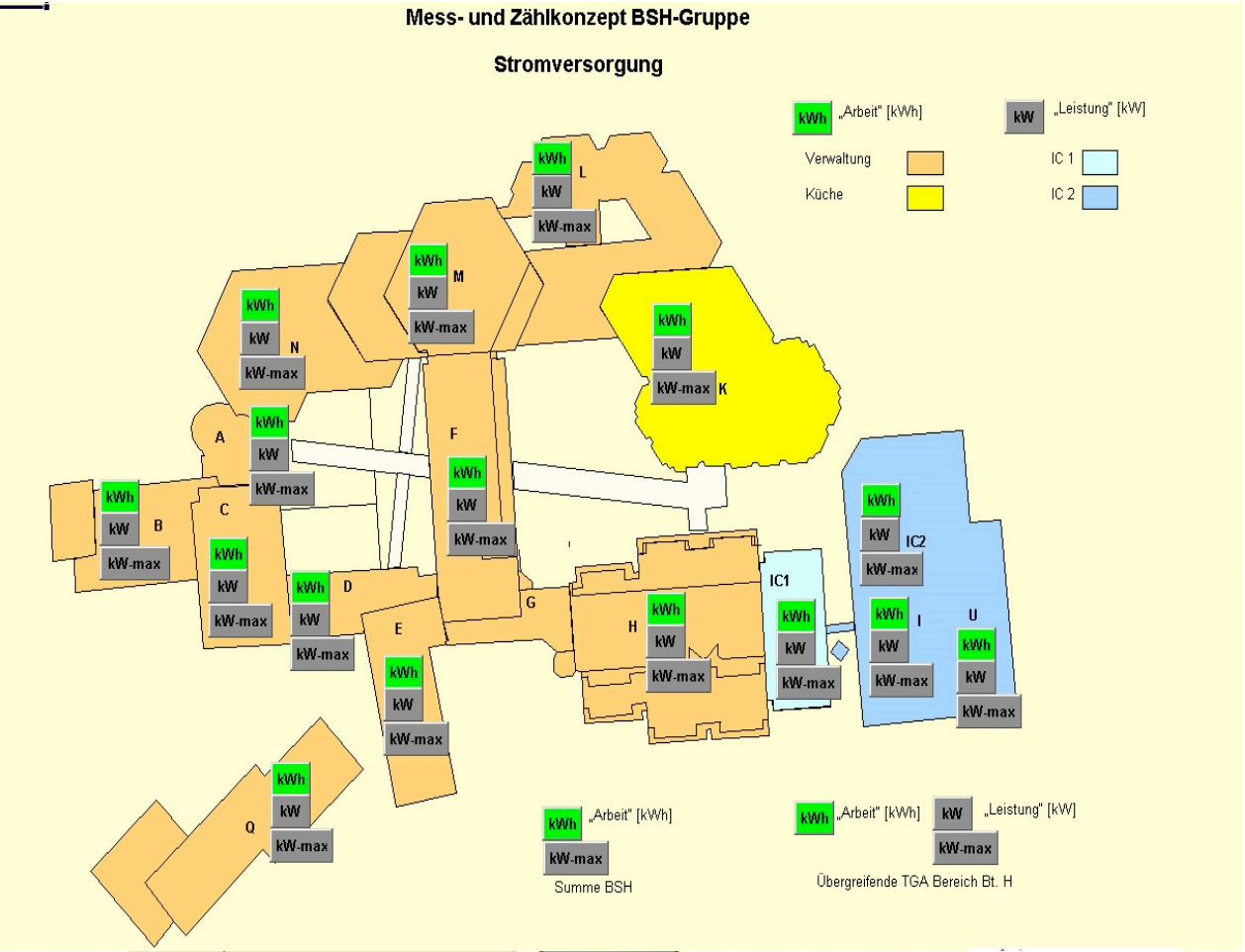
Online-Erfassung konfigurieren

DDE-Verbindungen konfigurieren

Anzeigen Software

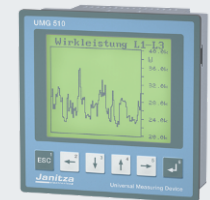
ASCII-Erzeugung

UMG 503

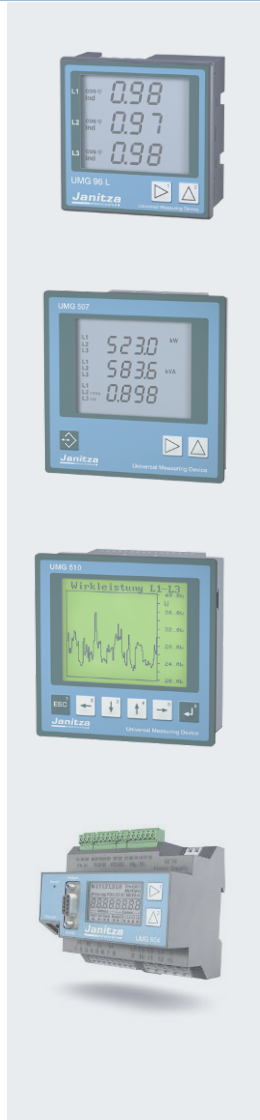
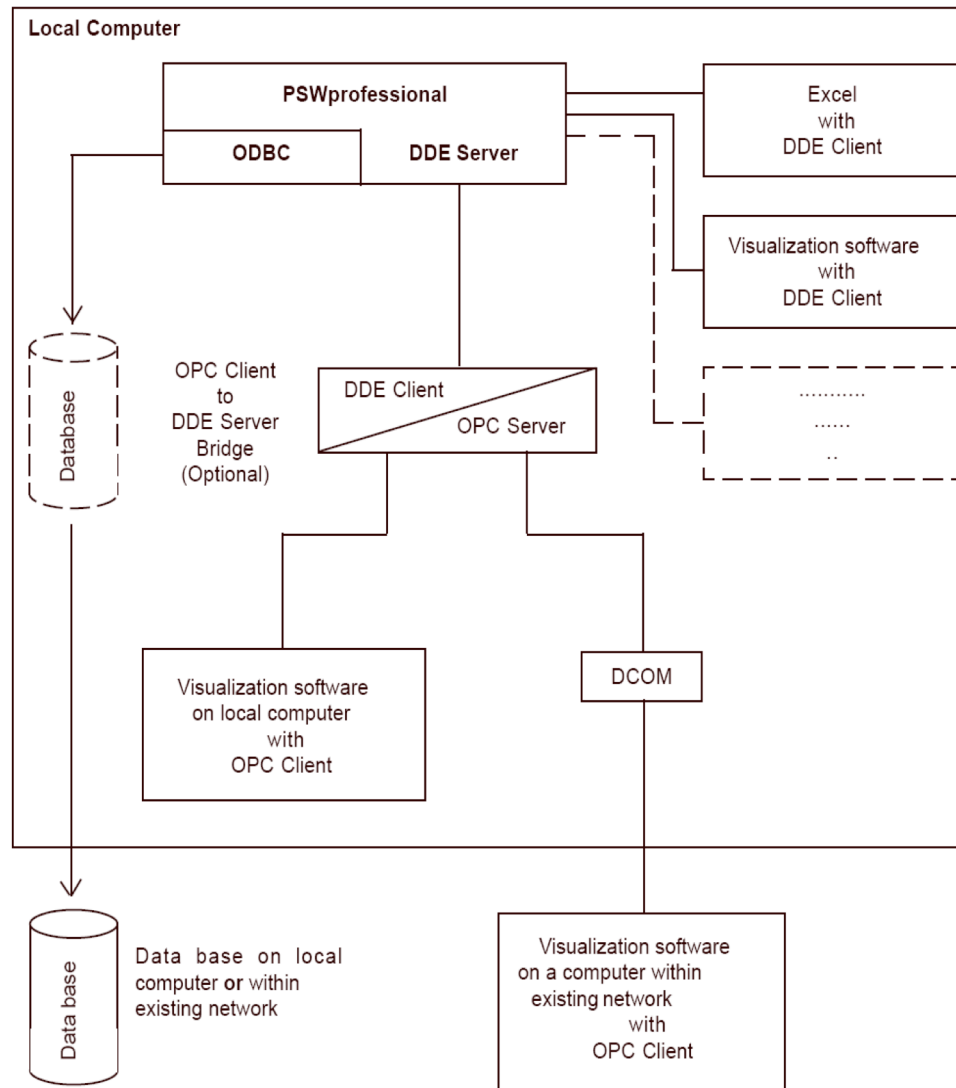


Data Exchange

- Targets:
 - Integration into existing PLC, BMS, SCADA Systems ...
 - Exchange of data with other systems
- Different ways of data exchange
 - TXT – ASCII Files
 - DDE
 - OPC
 - OPC Server
 - EXCEL Makros
 - Database

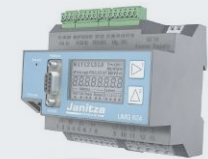
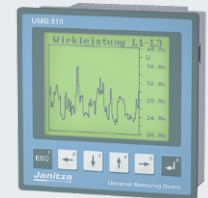


Data Exchange



Digital Meters are More than Multimeter!

- Multi Meter
- Energy Meter (kWh)
- Harmonic Analyzer
- Transient Recorder
- Event Recorder
- Emax. – Peak Load Management System
- PLC (integrated comparators and logical functions)
- Data logger (e.g. Modbus Gateway)
- Condition Monitoring





Thank you!

Janitza
electronics

UMG 604

31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16
15 14

I1 I2 I3 I4 L1 L2 L3 L4 N
1 2 3 4 5 6 7 8 9 10 11 12 13